Application Category Table

Applied Sciences

B000 Applied Sciences
B100 Agriculture
B102 Agriculture — Animal Science
B104 Agriculture — Crop Science
B106 Agriculture — Horticulture
B108 Agriculture — Soil
B200 Computer Science
B204 Computer Science — Base Conversions and Arithmetic
B206 Computer Science — Data Base Manegement
B208 Computer Science — Input - Output Applications
B209 Computer Science — Utilities
B300 Forestry/Forestry Engineering
B400 Hydrology
B600 Space Sciences
B800 Surveying
B802 Surveying — Aerial or Photogrammatic
B804 Surveying — Cadastral
B806 Surveying — Control
B808 Surveying — Topographical

Business/Finance

D000 Business and Finance
D050 Accounting
D052 Accounting — General
D054 Accounting — Payroll
D100 Cost Analysis Estimation
D150 Forcasting/Planning
D200 General Investment Analysis
D250 Industrial Production
D300 Insurance/Retirement
D350 Inventory Control
D400 Leasing
D450 Lending/Savings
D500 Marketing Sales
D550 Personal Finance
D600 Real Estate
D650 Securities
D700 Taxes

Diversions

F100 Games
F102 Games — Board and Table
F104 Games — Games of Chance
F106 Games — Word and Number
F200 Hobbies
F202 Hobbies — Aerobics
F204 Hobbies — Amateur Radio
F206 Hobbies — Biorythms

Educational
Medical Arts/Sciences
Probability/Statistics
Social Sciences

H000 Educational (Programs that teach)
N000 Medical Arts and Sciences
N100 Anesthesia
N200 Blood Chemistry
N300 Cardiopulmonary Medicine
N400 Clinical Laboratory
N402 Clinical Laboratory — Radioimmune Assay
N500 Dentistry
N600 Nutrition
N700 Optometry
N800 Pharmacology
N802 Pharmacology — Drug Dosage
N900 Pharmacology — Toxicology
R000 Probability and Statistics
R100 Analysis of Variance
R200 Curve Fit/Regression/Correlation
R300 General Statistics
R400 Non-Parametric Inference
R500 Parametric Inference
R600 Probability
R700 Probability Distribution
R800 Quality Assurance/Reliability
V000 Social Sciences
V100 Economics
V200 Educational
V300 Psychology

Chemical Engineering
Electrical/Electronic Engineering

J250 Chemical Engineering
J252 Chemical Engineering — Design (Optimization)
J254 Chemical Engineering — Process Control
J256 Chemical Engineering — Stoichiometry
J360 Electrical/Electronic Engineering
J362 Electrical/Electronic Engineering — Antennas
J364 Electrical/Electronic Engineering — Circuits
J366 Electrical/Electronic Engineering — Computers
J368 Electrical/Electronic Engineering — Dynamic Systems
J370 Electrical/Electronic Engineering — Fields and Waves
J372 Electrical/Electronic Engineering — Transmission Lines

Civil Engineering

J300 Civil Engineering
J302 Civil Engineering — Environmental Engineering
J304 Civil Engineering — Hydraulics
J306 Civil Engineering — Soil Mechanics
J308 Civil Engineering — Structural Engineering
J310 Civil Engineering — Transportation
J312 Civil Engineering — Urban Planning

Other Engineering

J000 Engineering
J050 Aeronautical/Aerospace Engineering
J100 Agricultural Engineering
J150 Architectural Engineering
J350 Drafting/Design
J400 Energy Conservation and Management
J500 Geotechnical Engineering
J550 Industrial Engineering
J552 Industrial Engineering — Operations Research
J554 Industrial Engineering — Production Control
J556 Industrial Engineering — Quality Control
J558 Industrial Engineering — System Analysis
J600 Mechanical Engineering
J602 Mechanical Engineering — Automotive Engineering
J604 Mechanical Engineering — Design and Analysis
J606 Mechanical Engineering — Dynamics of Physical Systems
J608 Mechanical Engineering — Energy Conversion Systems
J610 Mechanical Engineering — Fluid Dynamics
J612 Mechanical Engineering — Fuels and Lubricants
J614 Mechanical Engineering — Heating/Ventilating/Air Conditioning
J616 Mechanical Engineering — Heat Transfer
J618 Mechanical Engineering — Metallurgy and Materials
J650 Nuclear Engineering
J700 Ocean Engineering
J750 Petroleum Engineering
J752 Petroleum Engineering — Drilling
J754 Petroleum Engineering — Facilities
J756 Petroleum Engineering — Petrophysics
J758 Petroleum Engineering — Reservoir
J800 Solar Engineering

Mathematics

L000 Mathematics
L050 Complex Variables
L100 Conversions
L150 Differential Equations
L152 Differential Equations — Finite Differential
L154 Differential Equations — Finite Element
L200 Extended Precision
L250 Integration
L300 Interpolation
L302 Interpolation — Approximation
L350 Linear Systems/Matrices
L352 Linear Systems/Matrices — Simultaneous Equations
L400 Number Theory
L450 Polynomials
L500 Series/Sequences/Progressions
L550 Special Functions
L600 Symbolic Mathematics
L602 Symbolic Mathematics — Algebra
L650 Trigonometry/Analytic Geometry

Misc. Technical Applications

P000 Miscellaneous Technical Applications
P100 Aviation
P102 Aviation — Avigation
P104 Aviation — Aircraft Operation
P200 Chronology
P202 Chronology — Date/Calendar
P204 Chronology — Time
P300 Marine Navigation
P302 Marine Navigation — Ship Stability
P304 Marine Navigation — Yachting
P400 Photography
P500 Special Information Applications
P502 Special Information Applications — Data Bases/Files (non-programs)
P600 Subroutine Packages

Science

T000 Science
T100 Atmospheric Sciences
T200 Astronomy
T300 Biology
T320 Biology — Ecology
T340 Biology — Genetics
T360 Biology — Molecular Biology
T380 Biology — Microbiology
T400 Chemistry
T410 Chemistry — Acid-Base
T420 Chemistry — Agricultural
T430 Chemistry — Biochemistry
T440 Chemistry — Chromatography
T450 Chemistry — Crystallography
T460 Chemistry — Nuclear
T470 Chemistry — Physical
T472 Chemistry — Physical — Electrochemistry
T474 Chemistry — Physical — Kinetics
T476 Chemistry — Physical — Spectroscopy
T478 Chemistry — Physical — Thermodynamics
T480 Chemistry — Quantitative Analysis
T500 Geography
T600 Geology
T700 Geophysics
T800 Oceanography
T810 Oceanography — Biological
T820 Oceanography — Chemical
T840 Oceanography — Physical
T900 Physics
T910 Physics — Classical Mechanics
T920 Physics — Nuclear and Atomic Physics
T930 Physics — Optics
T940 Physics — Quantum Mechanics
T950 Physics — Relativity
T960 Physics — Thermal

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APPLIED SCIENCES

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B804 Surveying — Cadastral
B806 Surveying — Control
B808 Surveying — Topographical

Documentation only programs include program description, user instructions, sample problem(s), and program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

B000 APPLIED SCIENCES

02123-41 : X-Ray Characteristic Lines

Provides the practicing x-ray analyst with ready conversion between wavelength of characteristic emission line and atomic number of emitting atom. Combines the technique of interchangeable solution and Kelly's equations.

94 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03065-41 : Earthwork Directly From Topo or Cross Section Surveys

This program calculates cut and fill quantities from a topographic map having existing and proposed contours or from cross section surveys which use the same cross sections and base line for both existing and proposed grades. This program eliminates the need to plot and plainimeter cross sections, and will handle a job of any size.

691 Program Steps
Necessary Accessories: Four memory modules or quad memory. Printer optional.
Documentation — $14.00 Cost of 7 cards — $8.75

B100 Agriculture

00811-41 : Acreage for Rectangular Fields

Calculate the area of rectangular fields in acres and hectares from length and width in feet, yards, rods or miles.

81 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

00812-41 : Center Pivot Irrigation for Applying Pesticides and Fertilizer

This program provides for field calibration of chemical injection equipment for application of pesticides and fertilizers with center pivot irrigation systems. Also provided are calculations for acres covered by the system, inches of water applied to the crop, and the total amount of chemical needed to treat the field.

101 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00813-41 : Growing Degree Days: Weather Service Method

The development of many crops, weeds, insects, and plant diseases is well correlated with degree day accumulations. This program uses daily maximum and minimum temperatures to calculate and accumulate growing degree days according to the National Weather Service method.

67 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00814-41 : Field Population and Planter Calibration

Calibrate planter according to number of seeds to be dropped in 10 feet to achieve desired planting density for specified row spacing. Calculate actual field populating (plants per acre) according to number of plants sampled in any measured length of row for specified row spacings.

52 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

01001-41 : Sod

This program computes the cost of sodding a landscape site. Input are the raw measurements,the cost per yard of sod, and a mark-up (or profit) factor. Output is the total yardage required, the cost of materials, total cost, gross revenue, and the gross profit per yard of installed sod.

Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01091-41 : Fertilizer Least Cost Blending

This program provides lease cost blending of up to six fertilizer materials for three variants. The output includes the pounds of each material needed to formulate a desired blend, the cost per acre, and the actual amount of each nutrient if composition is utilized. The program is based on Esterhuizen's "Simplex" (00320-41) with appropriate input-output modifications.

497 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C. A Printer is optional.
Documentation — $12.00 Cost of 4 cards — $5.00

01689-41 : Grain Capacity

This group of programs calculates the grain storage capacity of vertical and/or slant wall buildings for one or two slope piles. The grain pile starts part way up the wall and then either slopes away to its peak at a determined angle less than or equal to the natural repose angle or slopes away at the natural repose angle until a predetermined distance below roof and then follows the roof slope to the peak.

986 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $16.00 Cost of 12 cards — $15.00

01740-41 : Grain Capacity for Circular Bin

This program calculates the grain storage capacity of a vertical walled circular bin which is level full or heaped full.

126 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02061-41 : Agricultural Band and Broadcast Spraying Calculations

The program performs eight types of calculation common to agricultural band and broadcast spraying. It manages two sets of data, each with a file of eight chemical records and eight facts. It figures costs of spraying and keeps an inventory. The chemicals are selectively included in tank-mix formulations.

749 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 7 cards — $8.75

02095-41 : Degree Day Calculation at a Given Base Temperature

Program calculates degree days and cummulative degree days above a user given base temperature, making it adaptable to many biological and engineering applications. Alpha prompts and local labels make the program easy to use and provides reminders of important data points. One step modification for heating need estimations.

84 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02623-41 : Calculating Daylength

Calculates daylength between 60 degree North and South latitude for any day given the date, minimum light intensity and latitude. The photosensitivity of many crops makes knowing the length of time the light intensity is above a certain level useful.

138 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02957-41 : Sequential Analysis of Negative Binomial Distribution Data

Sequential analysis serves to classify populations rather than to provide estimates of population parameters. It is particularly applicable to surveys — most notably, agricultural pest surveys. Such surveys are the first line of attack in minimizing losses by destructive pests. Many pest populations fit a negative binomial distribution making sequential analysis widely applicable and very useful.

127 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03235-41 : Chlorophyll Estimation From Reflectance Spectra of Potatoes

This program converts percent reflectance values for potato tubers at 675 and 650 nm (700 nm set at 100%) obtained using a spectrophotometer and reflectance attachment into chlorophyll content. The values given are for total chlorophyll, chlorophyll a, chlorophyll b, and the ratio of a/b. The conversion equations were obtained by correlating percent reflectance to 19 mm diameter discs of peel (approx. 2mm thick) with extracted chlorophyll content. Equations used are from Arnon (1949). Full alpha prompts and labeling are included.

71 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03575-41 : Anova: The Split-Block

This program generates a complete analysis of variance table for the split-block experimental design given: a) the number of the main plots, b) the number of strip, or ribbon plots, c) the number of blocks or replicates, and d) the observation values. Observations are prompted for by block-main treatment-ribbon treatment.

363 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 3 cards — $3.75

B102 Agriculture Animal Science

02623-41 : Calculating Daylength

Calculates daylength between 60 degree North and South latitude for any day given the date, minimum light intensity and latitude. The photosensitivity of many crops makes knowing the length of time the light intensity is above a certain level useful.

138 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03142-41 : Small Livestock From Birth to Slaughter

This program takes an initial date and calculates three periods for changes in diet: environment outputs are labeled and are displayed or printed twice for convenience. Suitable for rabbits and poultry.

353 Program Steps
Necessary Accessories: Printer useful
Documentation — $12.00 Cost of 4 cards — $5.00

B104 Agriculture Crop Science

02304-41 : Perennial Crop Production Table

Given yield data (tons/ha) and a planting program (hectares per year) generates a production table.

450 Program Steps
Necessary Accessories: Printer. Quad Memory Module for the HP-41C. Card Reader is optional.
Documentation — $12.00 Cost of 6 cards — $7.50

02623-41 : Calculating Daylength

Calculates daylength between 60 degree North and South latitude for any day given the date, minimum light intensity and latitude. The photosensitivity of many crops makes knowing the length of time the light intensity is above a certain level useful.

138 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02865-41 : Boom Sprayer

Precise application of agricultural chemicals is both economically and ecologically desirable. Boom sprayer calculates the proper nozzle discharge rate, and suggests pressure corrections to obtain this rate, for broadcast and row crop spraying. It also calculates the dilution factor for tank mixing the chemical and displays the maximum acreage coverable per tankload.

61 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03235-41 : Chlorophyll Estimation From Reflectance Spectra of Potatoes

This program converts percent reflectance values for potato tubers at 675 and 650 nm (700 nm set at 100%) obtained using a spectrophotometer and reflectance attachment into chlorophyll content. The values given are for total chlorophyll, chlorophyll a, chlorophyll b, and the ratio of a/b. The conversion equations were obtained by correlating percent reflectance to 19 mm diameter discs of peel (approx. 2mm thick) with extracted chlorophyll content. Equations used are from Arnon (1949). Full alpha prompts and labeling are included.

71 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

B106 Agriculture Horticulture

02623-41 : Calculating Daylength

Calculates daylength between 60 degree North and South latitude for any day given the date, minimum light intensity and latitude. The photosensitivity of many crops makes knowing the length of time the light intensity is above a certain level useful.

138 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02865-41 : Boom Sprayer

Precise application of agricultural chemicals is both economically and ecologically desirable. Boom sprayer calculates the proper nozzle discharge rate, and suggests pressure corrections to obtain this rate, for broadcast and row crop spraying. It also calculates the dilution factor for tank mixing the chemical and displays the maximum acreage coverable per tankload.

61 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03251-41 : Greenhouse Heatloss

Given any eight of the quantities in the formula for heat loss (in BTU/HRS) the "GRNHS" program will solve for the ninth. Top run keys are used to facilitate sensitivity analysis. This program prompts for all inputs.

272 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

03252-41 : Chemical Fertilizer Mixing

Program "mix" finds the average percent of nitrogen, potassium phosphorous in a blend of chemical fertilizers. Prompted entry with easy correctability.

69 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03321-41 : Parts Per Million

This program allows you to figure the parts per million of diluted solutions of chemical fertilizer. The program will also solve, interchangeably, for any of the other three variables of the formula (ounces of fertilizer blend)/(# of gallons)×(% of chemical in blend) × 75 = PPM.

115 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

B108 Agriculture Soil

03252-41 : Chemical Fertilizer Mixing

Program "mix" finds the average percent of nitrogen, potassium phosphorous in a blend of chemical fertilizers. Prompted entry with easy correctability.

69 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03361-41 : Time of Concentration for Surface Water Run-Off

This program quickly calculates time of concentration in either Imperial Units or SI Units using the methods of Bransby-Williams and Kiepich. The input variables are the size, shape and topography of the rainfall catchment. Output is given as minutes.

64 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03552-41 : Plot and Block Size in Field Experiments

Using the results of an analysis of variance data set from a randomized-block experiment a researcher, who wants to conduct a similiar experiment on the same area, may determine if experimental precision can be improved by altering the plot size or if the set up can be economized without substantially reducing the precision.

69 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

B200 Computer Science

00308-41 : Diminishing Increment Sort

Sorts from 3 to 46 numbers using the sort method (diminishing increment) due to D.L. Shell. Illustrates the indirect addressing capability of the stack to save space and speed sort. Larger sets may be sorted with Memory Modules. Increments are of the form $2^K - 1$. Quite fast.

99 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00317-41 : Quicksort I

Numbers are sorted in ascending order by this implementation of the quicksort algorithm due to C.A.R. Hoare. Data is partitioned into smaller sets which are more easily sorted by the straight insertion sort subroutine (included). For larger randomly ordered sets, run time is exceptionally fast. E.g., 192 numbers takes about 10 minutes or so.

137 Program Steps
Necessary Accessories: Memory Modules necessary for sets larger than about 23.

Documentation — $12.00 Cost of 2 cards — $2.50

00336-41 : Graphics Aid Program

This program helps users generate special graphics for the HP82143A printer. Utilizing a single visually formatted input number, the user can produce dot matrices row by row, compute column print numbers, build special characters, edit his results, or create negative images.

73 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

00364-41 : Alphanumeric Character String Manipulations

This program consists of several subroutines to manipulate alphanumeric character strings in the alpha-register. The entire string may be reversed, or shifted left or right any number of desired spaces. These routines easily interact with other programs by preserving the contents of the stack and require only eight data registers.

138 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00404-41 : Datablock Manipulation

If you are looking for a minipackage of programs to exchange, copy, clear, roll-up and roll-down your data (considered as a block) without using a single memory, then you cannot be in better hands! Program even allows you to triple your data block. Can be used in parts of other programs.

109 Program Steps
Necessary Accessories: Card Reader

Documentation — $8.00 Cost of 1 card — $1.25

00420-41 : Data Storage, Recall and % Computation

As a set of data is entered, each element of the set is stored and the subtotal displayed along with the item number. The stored data, either as entered or in %, may be recalled and displayed with the item number, one at a time in the order of original entry.

82 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00462-41 : Base Ten Conversions

This program will convert any positive integer in base ten to any other base from 2 to 16 (hex).

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00483-41 : Permutation Generator

Given a prime integer n of the form $(8n+3)$ or $(8n+5)$, (n is any positive integer), this program will display all integers x, $0 < x < n$, in scrambled order once before repeating the numbers. Applications are in situations where a definite sequence of numbers is desired but repetitions not wanted until all numbers in that sequence have appeared.

50 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00581-41 : Alphanumeric to Numeric Conversion

This program will convert any valid alphanumeric string located in the alpha register to a number which will be pushed on the stack. Examples of use are converting character strings entered by user and reconverting numbers that have been "ARCL'ed" into the alpha register.

211 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00588-41 : 8080 Disassembler Mnemonic Generator

Program generates 8080 microprocessor mnemonics for a given machine code input in decimal or octal format.

362 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

00606-41 : Data Sort and Handling Routines for HP-41C

This program will rapidly sort any number of inputs in ascending order and display them in either ascending or descending order. New data may be inserted and resorted. In addition, any value may be reviewed, changed or deleted. The sort routine is short, only 35 steps long, and relatively fast. It takes about 15 seconds to sort 10 values, and progressively more for additional inputs.

165 Program Steps
Necessary Accessories: One Memory Module if more than 8 inputs are used.
Documentation — $12.00 Cost of 2 cards — $2.50

00614-41 : Register Sort

This program sorts registers R_{00}–R_{nnn} (R_{nnn}, the last register, does not need to be known) in ascending order without using any storage registers itself. It can be modified to sort in descending order or to start at any storage register. It is very useful as a subroutine.

26 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00630-41 : Office Calculator Simulator

This converts the HP into a standard desktop office calculator with one accumulating memory. The novice user of HP calculators or the uninitiated may thus either use the HP as a standard office calculator or as an algebraically operated scientific calculator (without parentheses). HP-41C printer not required as HP generates its own audit trail, unless a printed tape is desired.

Documentation — $12.00 Cost of 2 cards — $2.50

00656-41 : Master Mind - Data Bureau

This program correlates any alpha string up to a maximum of six characters to a corresponding number (up to a maximum of 10 digits) automatic 'feed in' and review of data is incorporated in the program.

Necessary Accessories: Card Reader. Printer optional.
Documentation — $8.00 Cost of 1 card — $1.25

00657-41 : PDP-11 RAD 50 Number Conversions

Converts 3 character alpha text to PDP-11 rad 50 number or a rad 50 number to alpha text.

170 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

00658-41 : PDP-11 Floating Point Conversions

Converts PDP-11 floating point numbers to octal and vice versa.

Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00675-41 : Bubble Sort with Up to 42 Entries

This program will sort up to 42 numbers in a file, into ascending or descending sequence, using a bubble sort. A merge function allows you to add to the file, and a view function allows you to view the file. Each memory module increases the maximum number of entries by 64.

64 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00681-41 : Serial Data Compression

This is a very versatile data compression routine which stores 2 data points per register (data points must be ≥ 0), with 5-digit accuracy. Included are: a scaling factor for data ≥ 1000; a correction and easy data review routine for confirming data entry, and basic statistics.

127 Program Steps
Necessary Accessories: For the HP-41C: One Memory Module for each 128 data points after the first 74 points.
Documentation — $8.00 Cost of 1 card — $1.25

00690-41 : Time Sharing

Up to 4 people can use the calculator without interfering with each others calculations ... businessmen in conference or students doing homework. The stack and R_{01}–R_{03} are available for each user. Other functions as normal. Listings are also provided for 2 shorter routines which save a bit less.

130 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

00693-41 : Data Input (Store) and Review

Numeric and/or alphanumeric data may be stored in a user-specified series of data registers (error correction available for value just input). Register numbers are provided in a "prompt" message. Any or all data registers may be reviewed, by register number and contents, without a printer. User specifies data display format. Also. included, routine performing same function, but saving 9 registers (at the expense of some prompts).

70 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00736-41 : Binary, Octal and Decimal Integer Conversions

This program performs conversions from octal to decimal, decimal to binary, octal to binary, or vice versa. Assumes the inputs are integers.

Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00760-41 : Central Server Model of Multiprogramming

Given the service rates, branching probabilities, and multiprogramming level for a closed central server queueing network, this program computes the device utilizations, queue lengths, and system throughput for each multiprogramming level from 2 to the level specified. It features streamlined data entry and editing options and a storage efficient algorithm allowing the analysis of large models.

367 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

00766-41 : Decimal to Binary

Transform any decimal number between 0 and 4,294,967,295 ($2^{32} - 1$) in binary code.

Necessary Accessories: Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

00772-41 : Alpha Barcode in Binary Format

HP-41C programmers can create their own alpha-replace and alpha-append (types 7 and 8) barcodes using the output of this program. Computer generated and hand drawn bars are easily handled with the binary and decimal numbers created by this program. Only numbers are created by the program, not 82153A wand-readable bars.

129 Program Steps
Necessary Accessories: Printer Optional.
Documentation — $12.00 Cost of 2 cards — $2.50

00801-41 : Decimal to Floating Point Binary Conversion

Converts a decimal number in the x register to a binary floating point format similar to that used by microcomputers both in software and hardware floating point arithmetic. Mantissa is calculated to 25 bits of precision but can easily be modified for any amount of precision desired.

74 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00819-41 : CDC Floating Point Number to Base 10 Conversion

This program takes a CDC floating point number (octal) and converts it to the equivalent base 10 value.

66 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00821-41 : 6800 Disassembler Mnemonic Generator

Program generates 6800 microprocessor mnemonics for a given machine code input in decimal.

364 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

00864-41 : Binary to Decimal and Decimal to Binary Conversions

This program converts any integer from zero to 1023 to its binary equivalent or the reverse direction. The program is also structured to detect both a real number of a non-binary number and signal a "data error".

73 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00882-41 : Condensed Delta Storage

This is a set of subroutines useful in storing numbers compactly. All 10 digits of each memory register are usable with a code that identifies which register, where in the register the number begins and ends, and where the decimal point is located. One data card can hold more numbers than 3 IBM cards.

120 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00883-41 : 7 x 7 Dot Character Builder (Wand)

Based on the character builder program in Wand Owners Manual, this program uses the full 7 x 7 dot matrix for special charcters. The wandscan grid for the search and destroy game is used. Once a character has been printed for inspection you can edit it by changing individual dots — adding or deleting, store the character for later use and, make a 'negative' of the character. Stored characters may be recorded on a magnetic card.

111 Program Steps
Necessary Accessories: Wand, Printer, One Memory Module for the HP-41C, Wand Manual. Card Reader optional.
Documentation — $8.00 Cost of 1 card — $1.25

00884-41 : X-Register Manipulations

Six short fast routines for manipulating a number in the x-register. Included are: removal of most significant digit (msd), increase msd by 1, decrease msd by 1, replace all but msd with zeros, replace msd with 1 and remaining digits with zeros, digit reversal. Only the t-register is lost by any operation, and digit reversal is the only operation to use data registers.

74 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00904-41 : Octal Register Expansion

This program is used to convert numbers in octal form into a form suitable for loading into a 8-bit register and to convert a register pair into an understandable 16 bit octal address.

291 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00906-41 : Alpha Register Manipulation

This program is a combination of three subprograms which allow the user to isolate certain characters of the alpha register. By using these programs, the user can take a specified amount of letters, counting from either the left or right side of the alpha memory. A middle character can also be extracted.

166 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00925-41 : Data Packing

Numbers of fewer than 10 digits are packed into data registers according to a format specified by the user. For instance 2 x 4 digit numbers or, 4 x 2 digit numbers or, combinations such as a 5-digit number, a 3-digit number and a 2-digit number in each register. Very flexible in this respect. These "mini" registers are designated by number like the normal registers. Store, recall, exchange are provided for.

122 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00953-41 : Bin/Dec Conversions

This program will convert a 10-bit binary number either side of the radix (e.g., $0.00096 \leq n \leq 1023$) to its decimal equivilant, or any decimal number ($0.001 < n < 4096$) to its binary equivalent. Program is easy to use (full prompting) and output may be printed double-wide under program control. Ideal for HP-85, BPLOT users.

231 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00983-41 : CDC Word Conversions

Program will convert CDC 6000 Series / Cyber 70 Series / Cyber 170 Series word represented by 20 octal digits in either integer or real format to its decimal representation. Also provided is 18 bit ones' complement arithmetic for use in address manipulations. The integer conversion is exact. Special displays indicate indefinite and infinite numbers.

203 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00990-41 : Insertion Sorting Routines

This package contains two insertion sorting routines, each designed to function either as a stand-alone program or as a subroutine in a user program. A single control number in the x-register determines the set of contiguous data registers which are to be sorted.

33 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01037-41 : RCA 1802 Microprocessor Mnemonic Generator

Those of you with "Elf" and similar microcomputers can now decode long machine language programs with ease, as this program displays the assembler mnemonics for a given machine code input. The program is fast and simple to use and the input is in convenient hexadecimal format.

196 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01061-41 : Hex/Bin/Dec Conversion Table

Program designed to print a conversion table of all hexadecimal, binary, and decimal numbers from 0 to 255 decimal. [a] key starts printing the table beginning from 0 and [b] key prompts for the decimal number to be converted, or as a starting point for the table.

142 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01067-41 : Algebraic Operating System

This program enables your HP-41 to run under the algebraic operating system (AOS) with full hierarchy, eight pending operations, 99 levels of parentheses, and implied parentheses opening and closure. If you have trouble using an AOS calculator, this program is not for you.

137 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01069-41 : Bubble Sort

Two 63-line programs are included which sort numerical data. One program sorts data in ascending order and the other sorts in descending order. Both programs use only the operational stack for computation and both can sort data from any starting register address to any ending register address specified by the operator.

126 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01115-41 : Microcalc

At last, the electronic worksheet for the HP-41C! Yes Microcalc is the starting program that enables you to be a match to microcomputer users. You can ask "what if" questions and recalculate your worksheet. Microcalc can even be an electronic memo!! Yes you can store dates and appointments. Microcalc is a must for everyone that wants a program that grows with his needs.

106 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01139-41 : Scan Building Special Characters

This program lets the user build a full 7x7 dot character with the upside down, mirror image or "negative" characters may be created at will, key, card and Wand programs and a 7x7 matrix are provided. A running summary and the finalized characters are printed.

275 Program Steps
Necessary Accessories: One Memory Module, Printer and Wand

Documentation — $12.00 Cost of 3 cards — $3.75

01152-41 : Floating-Point Octal Conversion and Octal Arithmetic

This program performs octal-decimal conversions for numbers that are integer or non-integer, zero, positive or negative in range of 10-82 to 10-90, and performs direct octal addition, subtraction, multiplication and division between two octal numbers. Useful in Computer Science and other mathematical applications.

75 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01170-41 : Bar Code Classification and Analysis

Lines of bar code are classified and analyzed by this program. The type indicator is extracted and printed along with the type name. Row numbers or sequence numbers are printed where applicable. The total number of bytes in the line plus their binary, decimal and hexadecimal equivalents are printed.

234 Program Steps
Necessary Accessories: Printer, Wand, at least one Memory Module.

Documentation — $12.00 Cost of 4 cards — $5.00

01343-41 : Increasing Data Storage Efficiency

This set of three subroutines enables the user to store and recall two data points from each data storage register. Each stored number contains three significant digits, exponent, and sign. The program optionally will clear a storage location. The routines use 25 registers for code, so with 50 or more data points, the program will save memory.

106 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01352-41 : Hexadecimal / Decimal / Binary Number Conversions

This program converts binary or hexadecimal values to decimal values; without data re-entry converts decimal to binary or hexadecimal representation. Program limit decimal 1023 max for binary conversions, decimal 1,048,575 max for hex conversions.

272 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01448-41 : Programmer Plus

A development and testing tool for programmers. Inter base conversions between Hex, Decimal, Octal. Select input/output modes independently. Signed and unsigned display for all bases. Boolean functions: AND, OR, EXCLUSIVE OR, 1'S AND 2'S Complementation. Bit rotation and justification operations. Variable simulated word size (2 to 32 bits). All routines usable in Boolean Calculator style or callable from user written program. Techniques given for reducing memory requirement.

616 Program Steps
Necessary Accessories: Quad Module

Documentation — $16.00 Cost of 7 cards — $8.75

01467-41 : Assembly Language Simulator

This program simulates a simple integer assembly language processor. Integer range: ± 499,999. Negative integers are handled with ten's complement notation. Instruction codes include: load, store, add, subtract, multiply, divide, conditional and unconditional branching. Six digit instructions and data can be loaded into 89 memory addresses. Simple review/editing of programs.

215 Program Steps
Necessary Accessories: Two Memory Modules. Card Reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01475-41 : Interchangeable Solutions (Important Subroutine)

This set gives two programs that resolve the following problem: you have N variables that related to each other by some formulas, for instance, Var 1=F(Var2,Var7); K variables are given as data. You want to compute the value of the N-K remaining variables. The first program uses a so called "descending" method which is very "intelligent" and the last a so called "ascending" method, very powerful and rapid. Extensive documentation.

1447 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $20.00 Cost of 16 cards — $20.00

01560-41 : Quick-Sort

Sorts up to 200 numbers in ascending order much faster than a bubble sort.

213 Program Steps
Necessary Accessories: 4 Memory Modules

Documentation — $12.00 Cost of 2 cards — $2.50

01615-41 : Barcodes on the 82143A Printer

This program will generate one, two and three byte wand legible barcodes using the standard HP-82143A Printer and the black thermal paper.

103 Program Steps
Necessary Accessories: HP-82143A Printer

Documentation — $12.00 Cost of 1 card — $1.25

01662-41 : Binary / Hex / Decimal Conversions

Programs to convert Binary or Hex values 'to or from' their Decimal equivalent's w/o data re-entry; so each can be easily called as a subroutine. Outputs are labeled and incorrect inputs yield 41C error messages. Conversion limits are up to a 21 digit-span for Hex or Binary values.

93 Program Steps
Necessary Accessories: Extended Functions Module

Documentation — $8.00 Cost of 1 card — $1.25

01721-41 : Heap Sort

Sort numbers in ascending order with R01 = min. The algorithm has time complexity of N log N, which is the theoretical limit. Sort time for 200 numbers is 12 to 13 minutes, and is fairly data-independent. No scratch register required. Input/viewing routines provided.

111 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01737-41 : Alphabetical Sort

Puts random lists of words into alphabetical order. Words can be added at any time, and the list will be reordered.

187 Program Steps
Necessary Accessories: 1 Memory Module is necessary, but a Printer, Card Reader and Additional Memory Modules extend the program's capability

Documentation — $12.00 Cost of 2 cards — $2.50

01789-41 : Mass Flag

This program allows you to have up to thousands of Flags, depending on the number of available Storage Registers. SF, CF, FS? and FS?C Routines are included. These Routines can be used manually or can be called by other programs. One Register is necessary per 33 Flags.

47 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01843-41 : CDC 6000 Series Disassembler

Given the octal, machine-code representation of the CDC 6000 series Computer, this program will produce the corresponding COMPASS (Comprehensive Assembler) mnemonics. This can be used as an aid in interpreting dumps.

364 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01893-41 : Auto Computer

This program computes eta, mpg for current fillup and trip, miles traveled, avg. mph, gal of fuel remaining in tank and miles to travel on remainder of fuel. Updated information is computed after entry of current odometer reading and time is entered.

156 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01941-41 : SC/MP II Disassembler

This 1.9 kB program supplies the user with a comfortable disassembler for machine-language programs of the micro-processor SC/MP II. Prints a clearly arranged program and/or date listing.

574 Program Steps
Necessary Accessories: Printer, Extended Functions Module; (Quad Memory Module if using the 41C)

Documentation — $12.00 Cost of 9 cards — $11.25

01985-41 : Computer Communication Network 1 — Capacity and Delay

Program performs capacity allocation and obtains message delay for each link in a computer communication network. Four types of assignment rules used: Square-Root (min. system delay), Min-Max (equal link delay), Proportional and Equal allocation. User friendly and printer compatible.

239 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02032-41 : Index Calculation for Busines Basic Isam Files

This program simulates business BASIC's "INDEXCALC" program. After you enter the length of the Isam key, the length of a data record, number of data records, and index blocking factor, program calculates keys per index block, number of index blocks at each level, total index blocks, and total data blocks.

138 Program Steps
Necessary Accessories: None; (Printer is helpful)

Documentation — $12.00 Cost of 2 cards — $2.50

02085-41 : Table Calculations

This program allows columns of a numerical table to be stored as files in data registers. Given the formula of an unknown column the program will create values in a new file from known columns. Also included are housekeeping routines, a data file editor, and file storage on magnetic cards.

526 Program Steps
Necessary Accessories: Two Memory Modules; (Card Reader is helpful)

Documentation — $12.00 Cost of 5 cards — $6.25

02126-41 : Hex/Dec Conversion for 32 Bit Floating-Point or 2's Comp Integers

This program converts 32 bit floating-point (Intel) or 32 bit twos complement integers from hexadecimal to decimal and vice-versa. Easy to use and user friendly, the program will warn if the input is "OUT OF RANGE" or a "DATA ERROR" occurs.

453 Program Steps
Necessary Accessories: Two Memory Modules or HP-41CV

Documentation — $12.00 Cost of 5 cards — $6.25

02149-41 : Mini Bar Code Generator

This program generates one and two byte "mini" bar code. Unique features include: Inputting bar code data with or without Wand; Can generate null byte; Program is user friendly; Extensive knowledge of bar code unnecessary; Error checks are built into program; Paper keyboard with decimal byte values included with literature.

138 Program Steps
Necessary Accessories: 82162A Printer, Optical Wand, Black Thermal Paper

Documentation — $12.00 Cost of 2 cards — $2.50

02170-41 : Calculation of Data File Size For Honeywell Level-6 Database

This program calculates the amount of disk space required for standard Honeywell Level-6 Mod 400 Database Detail Files. It uses formulae provided by Honeywell on page 70-22 of Manual CF87 (System Performance). It allows these calculations to be performed quickly and easily so that optimum disk space can be utilized.

124 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02174-41 : Basic 1.0 System

With these three programs, you can execute basic-programs on your HP-41C/CV.

2455 Program Steps
Necessary Accessories: HP-41C: Quad-RAM and Printer. Card Reader optional.

Documentation — $25.00 Cost of 22 cards — $27.50

02322-41 : Turing Machine Simulator

This program contains an editor, display routines, and an execution routine to develop and execute state tables for a Turing machine. The Turing machine ws a conceptual development of Alan P. Turing in 1936 and is the lowest level machine containing the basic characteristics of any computer system: storage, program and logic.

647 Program Steps
Necessary Accessories: Four memory modules

Documentation — $12.00 Cost of 6 cards — $7.50

02345-41 : 6502 Disassembler Mnemonic Generator

For a given machine code input, in either hexadecimal or decimal, program generates 6502 microprocessor mnemonics.

346 Program Steps
Necessary Accessories: Quad Memory and Extended Functions Module. Card Reader optional but recommended.

Documentation — $12.00 Cost of 8 cards — $10.00

02409-41 : 6502 Disassembler

This program disassembles machine-coded programs of the 6500 microprocessor family. The listings are printed and contain address, hex-code and mnemonic. The program also allows for printing of data and calculates length of the disassembled routines, as well as the target addresses for relative branch operations.

1057 Program Steps
Necessary Accessories: Printer and X-Functions module. Quad RAM for HP-41C

Documentation — $14.00 Cost of 10 cards — $12.50

02480-41 : Synthetic Checksum Calculator

This synthetic program calculates the HP bar code checksum needed at the beginning of each barcode line. You must supply the byte coding for each function. Step-by-step byte-jumping instructions are provided. HP Barcode Manual or byte table necessary. Works for all types of HP barcode.

198 Program Steps
Necessary Accessories: HP Barcode Manual or byte table. Printer helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

02518-41 : Save and Restore Machine State

Comprises two programs: SSAVE and RESTO. SSAVE saves the states (set or clear) of flags 00-48. RESTO takes SSAVE output as input to: 1. Set flags 00-30. 2. Set display format and No. of digits according to flags 36-41. 3. Set grads, rads, or degrees according to flags 42-43. 4. Set alpha mode on/off according to flag 48.

195 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02526-41 : User Program Analysis and Compilation

This package analyzes any HP-41C program, preparing and displaying/printing a table of labels with line numbers and branch distances. In some circumstances the user program can be compiled and executed while in Extended Memory. Supporting functions such as checksum recomputation are included. Synthetic techniques used.

866 Program Steps
Necessary Accessories: 3 memory modules, Extended Functions memory module, card reader or wand (for synthetic functions)

Documentation — $14.00 Cost of 8 cards — $10.00

02543-41 : Turing Machine Simulator With Extended Memory

This program contains an editor, display routines, and an execution routine, all with extensive error recovery, to develop and execute state tables for a Turing machine. It is similar to 02322-14, Turing Machine Simulator, except that it uses extended memory to store tapes and state tables. Consequently, several tables may be stored simultaneously and used by the program.

640 Program Steps
Necessary Accessories: Three memory modules and Extended Functions/Memory Module
Documentation — $12.00 Cost of 6 cards — $7.50

02571-41 : Direct Execution Bar Code For XROM Functions

"XROMBC" will generate two-byte direct execution bar code from XROM function numbers. The user simply inputs the XROM accessory number and function number for any plug-in module or peripheral. The program will print bar code for as many XROM functions as the user specifies. All function bar code outputs are labeled by their XROM numbers; dividing lines are printed to separate each two-byte section. This makes identification and cutting much easier.

123 Program Steps
Necessary Accessories: Plotter Module, Extended Functions Module, Printer (82162A)
Documentation — $12.00 Cost of 2 cards — $2.50

02575-41 : First and Follow Sets

This program enables us to compute FIRST and FOLLOW sets for one as input given context-free grammar (In BNF). It can be a valuable tool by constructing compilers (27 pages, 1697 bytes).

820 Program Steps
Necessary Accessories: Quad RAM, X-function and memory, printer
Documentation — $14.00 Cost of 9 cards — $11.25

02630-41 : Z80 Disassembler

Given the machine-code representation of the Z80 miscroprocessor in decimal or octal format, this program produces the corresponding Zilog/Mostek mnemonics.

716 Program Steps
Necessary Accessories: Three memory modules
Documentation — $12.00 Cost of 7 cards — $8.75

02638-41 : Nonlinear Least Squares

For an arbitrary user defined function y=f(x,B1,B2 ...) of x and up to nine parameters Bi this program will find the best values of Bi to fit a set of data points (xi, yi). Parameters may be linear or non-linear. Program requires an initial guess, usually within 25 to 50% of the final Bi values. Program is slow, but careful.

464 Program Steps
Necessary Accessories: Two to four memory modules, Math Pac application module and Extended Functions memory module.
Documentation — $14.00 Cost of 5 cards — $6.25

02698-41 : Transitive Closure

This program transforms a given matrix M into its transitive completion M+.M is the square Boolean matrix with maximal rank of 175. Some error correction and editing routines are added. Program runs quite long, so some current status informations are shown in the display. The routine for nice printing is included but printer is not necessary for running this program. Warshalls algorithm is used in this program.

473 Program Steps
Necessary Accessories: Two memory modules, X-Functions module and X-memory module. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02703-41 : Increasing / Decreasing Sort

This program sorts certain number of registers in decreasing or increasing order using the index of registers. You can display or print the registers. It can be used by another program like routine.

87 Program Steps
Necessary Accessories: Memory modules and printer are optional
Documentation — $8.00 Cost of 1 card — $1.25

02863-41 : Computer Long Division

This program will print an entire long division problem illustrating all steps that would ordinarily be done by hand. Very easy to use, the only inputs required are divisor and dividend. Average printing time is 20 to 30 seconds. Excellent as an educational diagnostics/learning aid for students or teachers.

250 Program Steps
Necessary Accessories: One memory module and printer
Documentation — $12.00 Cost of 3 cards — $3.75

02877-41 : Hewlett-Packard HP-41C/V Text Editor

This program handles up to 36 lines of text, each of 24 character length, the length of the HP-41 alpha-register. It simulates the line editors available on much larger mainframe computers. A few simple commands control the whole system, avoiding the annoyance of a "menu-driven" structure. The simulated file can be added to, edited, re-arranged, saved on card and much more. Ideal for smaller text processing.

377 Program Steps
Necessary Accessories: Quad memory. Card Reader advisable.
Documentation — $14.00 Cost of 4 cards — $5.00

02906-41 : The HP-16C Emulator

With this set of routines, the HP-41C becomes a slow but sure computer science calculator (ala the HP-16C). It performs almost all of the functions of the HP-16C but is limited to word sizes of 32 bits or less. It does not do windows like the HP-16C. It will route output to a printer or video display. With full memory it is even programmable.

689 Program Steps
Necessary Accessories: Two memory modules and HP-IL Dev ROM
Documentation — $14.00 Cost of 6 cards — $7.50

03107-41 : Base Conversions

This program converts a number (up to 26 digits or letters or both) in any base (2-36) to bases (2-36). Full use of Alphanumeric capabilities.

79 Program Steps
Necessary Accessories: Extended Functions Module
Documentation — $8.00 Cost of 1 card — $1.25

03137-41 : Arabic Roman Conversions

A program that will determine the roman numeral from any 1-4 digit arabic number, or determine a 1-4 digit number from any roman numeral of 15 or less numerals.

185 Program Steps
Necessary Accessories: Extended Memory
Documentation — $12.00 Cost of 2 cards — $2.50

03166-41 : 6502 Disassembler

The program generates 6502 microprocessor mnemonics for a given machine code input in hexadecimal format and prints the mnemonic.

558 Program Steps
Necessary Accessories: Two memory modules, X-Function module, Printer, Cassette Drive
Documentation — $12.00 Cost of 6 cards — $7.50

03168-41 : 6800 Disassembler

The program generates 6800 microprocessor mnemonics for a given machine code input in hexadecimal format and prints the mnemonic.

613 Program Steps
Necessary Accessories: Three memory modules, X-Function Module and Printer

Documentation — $12.00 Cost of 7 cards — $8.75

03351-41 : Continuous Printout of Text Files on a Tape

This program provides for a continuous printout of all designated text (ASCII) files on a tape in a digital cassette drive.

89 Program Steps
Necessary Accessories: HP-41CX, HP-IL Module, Digital Cassette Drive, Thermal Printer.

Documentation — $8.00 Cost of 1 card — $1.25

B204 Computer Science Base Conversions and Arithmetic

00848-41 : Hexadecimal - Decimal Conversions

This program converts positive integers between the hexadecimal and decimal number systems. Two versions of this program are included. Version 1 requires no accessories. It can convert decimal integers up to 268,435,455 and hexadecimal integers up to FFFFFF. Version 2 requires the Extended Functions/Memory Module. It can convert integers of 10 or less decimal digits. It is also smaller and faster than version 1. Both programs offer considerable improvements over the version given in the HP-41 Applications Manual.

92 Program Steps
Necessary Accessories: Version 2: Extended Functions/Memory Module Version 1: None

Documentation — $8.00 Cost of 2 cards — $2.50

01087-41 : Base Conversions

This program converts to and from any base b, $2 \leq b \leq 10$.

111 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01216-41 : Conversion To and From Three-Byte Floating Point and More

A package of three programs which can convert any real number in x to a 3 byte floating point number (6 base 16 alpha characters), convert a floating point number in the alpha register to a real number in x, and produce base 16 integers of a specified number of bits.

157 Program Steps
Necessary Accessories: One Memory Module is needed to hold all three programs at once, but this is not required.

Documentation — $12.00 Cost of 4 cards — $5.00

01616-41 : Double Precision Hexadecimal Conversion

Program computes hexidecimal-to-decimal and decimal-to-hexidecimal conversions for 12-digit hex values. Twelve digit hex corresponds to 15-digit decimal (FFFFFFFFFFFF is approximately 2.81×10^{15}). Conversions are efficient, taking about 1 1/2 second per hex digit (slightly longer for H-D than D-H).

189 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01809-41 : Hex to Decimal Conversion

Program exploits key assignments to convert from hexadecimal to decimal almost as fast as normal key entry. Integer only. Number of digits limited only by precision of calculator, effectively eight hex. digits.

135 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01966-41 : Binary Operations

This program solves many problems with binary numbers. The user can compute all arithmetic operations ($+$, $-$, $\div$, $\times$) and the following logical operations: XOR, AND, OR and negation. It is also possible to convert binary numbers to decimal and decimal numbers to binary. The maximum size of numbers is 10 bits.

200 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02010-41 : Base Conversions

This program performs base conversions of a positive integer from one base N_1 to another base N_2 ($2 \leq N_1, N_2 \leq 16$), base 10 to base N and base N to base 10 ($2 \leq N \leq 16$).

229 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02184-41 : 8085 Disassembler

This program disassembles machine-coded programs of the 8080/8085 microprocessor. Program listings are printed and contain address, hex-code and mnemonic. Printing of data lists is possible. Also calculates length of disassembled routines.

794 Program Steps
Necessary Accessories: Printer and X-Functions Module and Quad RAM for HP-41C

Documentation — $14.00 Cost of 9 cards — $11.25

02290-41 : Decimal-Binary & Binary-Decimal Conversions Using X-Function

Binary to decimal and decimal to binary conversions based on 2's compliment notation are easily made using the enhanced ALPHA manipulation ability of the HP 82180A Extended Functions/Memory Module. This program accepts integers between -2^{22} and 2^{23} in either decimal or binary form.

163 Program Steps
Necessary Accessories: HP 82180 Extended Function Module

Documentation — $12.00 Cost of 2 cards — $2.50

02499-41 : Ultimate Base Conversions

This program converts numbers from an arbitrary base to another with three major features: 1) converts signed integers 2) of up to 24 digits (using alpha) 3) conversion bases nge from 2 to 36 (to 73 with printer). Uses letters A-Z (for bases < 37) as "digits". Ready to be used as a promptless subroutine or as a prompting program. Needs no data registers (but the stack plus alpha) nor extended memory. Uses no synthetic programming.

162 Program Steps
Necessary Accessories: Extended Functions module

Documentation — $12.00 Cost of 3 cards — $3.75

02541-41 : Base Conversions With Complements

This program converts between decimal and any base from 2 to 36. Both integers and real numbers may be converted, and the program also provides for conversions using the complements of these bases, if the user chooses this option.

221 Program Steps
Necessary Accessories: Extended Functions/Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02554-41 : Floating Point Conversions

This program converts between decimal and binary floating point. The user defines the bias and number of bits for the exponent and mantissa, which only needs to be done once per type of word. The bits are packed 10 per register, and the only constraint on the size of the word is number of available registers. All inputs are prompted for, and the outputs are clearly displayed and available in the storage registers.

321 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02583-41 : Base Conversions To and From Base 10 to 2 Through 37

This program converts base 10 numerals into any specified base ranging from 2 to 37. It also takes any specified base between 2 and 37 inclusive and will convert it into base 10.

79 Program Steps
Necessary Accessories: Extended Function Module

Documentation — $8.00 Cost of 1 card — $1.25

02631-41 : Octal Utilities/Fractional Fixed Point Functions

The Octal Utilities program provides octal/decimal scaled conversions, boolean algebra, shift and 2's complement arithmetic functions for fractional fixed point and integer octal numbers. It provides trigonometric functions for fractional numbers and limited (28 bits maximum) double precision multiplication/division for integer and fractional octal numbers. The program can be initialized to handle numbers from 1 to 24 bits in size.

638 Program Steps
Necessary Accessories: Two memory modules

Documentation — $20.00 Cost of 5 cards — $6.25

02661-41 : Base and Floating Point Conversions

This program converts between decimal and any other base from 2 to 36 or any base floating point. Both integers and real numbers may be converted in the simple conversion, and the base b number may be up to 24 characters. In the floating point conversion, the user defines the bias and number of places in the exponent and mantissa. The only constraint on the size of the word is amount of available storage.

410 Program Steps
Necessary Accessories: One memory module and Extended Functions memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02732-41 : Conv of Number Including Fraction of Any Base to Decimal

This program will convert any number with fraction part in any base C to its equivalent value in base 10 (decimal number). The base value C must be an integer in the range $2 \leq C \leq 9$.

104 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02801-41 : Bin-Oct-Dec-Hex Conversions For Microcomputer Users

Interconverts numbers between binary, octal, decimal, and hexadecimal. All outputs clearly labeled. Very fast; e.g., Dec to Hex in 4 secs; Hex to Dec in 5 secs. Uses 2 synthetic instructions, append 2 nulls and RCL M, to aid Hex to Dec conversions. Also finds distance between two 4-digit Hex addresses. This program uses synthetic functions.

208 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03102-41 : Sorting Program

This bubble sorting program permits the user to sort numerical values in increasing or decreasing order. Input values are stored by a labeled prompting routine. No preliminary limits need be given. All data may be reviewed and corrected before sorting. Review of stored data or output of sorted data may be labeled with the register number or not as the user chooses.

173 Program Steps
Necessary Accessories: One or more memory modules required depending on the quantity of data to be sorted.

Documentation — $12.00 Cost of 3 cards — $3.75

03107-41 : Base Conversions

This program converts a number (up to 26 digits or letters or both) in any base (2-36) to bases (2-36). Full use of Alphanumeric capabilities.

79 Program Steps
Necessary Accessories: Extended Functions Module

Documentation — $8.00 Cost of 1 card — $1.25

03137-41 : Arabic Roman Conversions

A program that will determine the roman numeral from any 1-4 digit arabic number, or determine a 1-4 digit number from any roman numeral of 15 or less numerals.

185 Program Steps
Necessary Accessories: Extended Memory

Documentation — $12.00 Cost of 2 cards — $2.50

03289-41 : Convert Numbers to Engish Words

Key in a number and the computer types out the number in words. For example, input is 2258, the display will read two, two, five, eight.

203 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

B206 Computer Science Data Base Management

01459-41 : Phone Directory

The HP-41 becomes your phone directory. Names and phone numbers are stored in pairs of registers, and the HP-41 can search for a given name, returning the corresponding number. Other functions include easy entry of names/numbers, correction of a name or number, review of all names and numbers, and instant recall of last name/number retrieved.

Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

01772-41 : Alphabetic Sort

This program will alphabetize over 200 words in under 18 minutes and display the result accordingly. It is surprisingly fast. This program can also sort hex numbers as well as any alpha display according to its ASCII number.

270 Program Steps
Necessary Accessories: Extended Function Module, 1 Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01805-41 : ASCII File Resized

Useful housekeeping program to automatically change the size of an existing Extended Function/Memory ASCII file without the need to key in any of the original file over again. The only required input for this program is the name of the file to be resized and the size desired.

92 Program Steps
Necessary Accessories: Extended Function/Memory Module

Documentation — $8.00 Cost of 1 card — $1.25

01932-41 : Automatic Banner

Automatic banner printing of A–Z, 0–9 and eleven special symbols. Provides fast, automatic printing of well shaped characters. Text up to 72 characters long. Techniques of synthetic programming have been efficiently used. Print any desired phrases. Ideal for names, posters, slogans, etc.

842 Program Steps
Necessary Accessories: 82143A or 82162A Printer (Quad Memory Module if using 41C)

Documentation — $14.00 Cost of 10 cards — $12.50

02162-41 : Medical Dental Service Business S Revenue Ananlysis

Nine interactive programs. Very transparent and friendly. File for each month, quarter, half and year. 43 user-definable accounts per file. Data input: time spent and revenue produced. Outputs (single account or block of accounts): input data, revenue/hr., % of total revenue, productivity ratio, file totals and plot of ratios. Programs and four years data on each cassette. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

2224 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV, Extended Functions Module, HP-IL, HP-82162A Printer and HP-82161A Digital Cassette Drive.

Documentation — $20.00

02284-41 : Sort/Merge for Extended Memory ASCII Files

This is a general utility sort program for Extended Memory ASCII files. Sort fields may contain any character except the null byte. Each character is ordered according to its equivalent numeric value. The user must specify the sort field's starting location and length (up to 24 characters long), and whether the sort is to be in ascending or descending order. New records may easily be merged into an already sorted file. A subroutine entry point is also provided.

139 Program Steps
Necessary Accessories: Extended Functions Module

Documentation — $12.00 Cost of 2 cards — $2.50

02329-41 : Files: Rename, Change Size and Duplicate

This program facilitates the handling of data and ASCII files. Three routines: one will change the name of a file, the second will duplicate a file (under a different name), and the third will increase or decrease the size of a file. All three preserve the contents of the file.

129 Program Steps
Necessary Accessories: Extended Functions Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02553-41 : ASCII File Editor

This program contains a complete editor for handling ASCII files in extended memory with maximum 24 character records. Facilities include: appending, inserting, deleting, exchanging, locating strings, substituting one string for another, duplicating a record, copying a block of records, reading part or all of a file into the current one, writing part or all of the current file into another, determining the length, displaying, clearing, and purging. Very extensive error recovery is also implemented.

717 Program Steps
Necessary Accessories: Three memory modules, extended functions/memory module

Documentation — $12.00 Cost of 8 cards — $10.00

02921-41 : Data File Statistics

This program performs general statistics on all or part of a data file in extended memory. Input and output routines are implemented, and the program sorts in either ascending or descending order, calculates mean, standard deviation, median, and max and min values and range. It also searches for a particular value in the file or counts all the occurances within an interval. Using only one register for storage, the routines are easily adaptable for subroutines.

347 Program Steps
Necessary Accessories: One memory module and Extended Functions Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

03116-41 : File Manager

A "shell" program for use with files or lists in extended memory. Both text and data files are handled. The A-E keys perform operations on whole FILES: add/goto, directory, clear, delete, and copy FILE. The a-e keys operate on RECORDS or data REGISTERS within a file: add record/data, recall file, insert record, delete record/data, and edit record/register. Easy to use instructions are by single keystroke. The edit modes work by record number or text string search.

195 Program Steps
Necessary Accessories: Extended Functions module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03119-41 : ASCII File Viewing and Editing on the 41-CX

Program uses many functions exclusive to the HP-41CX. ASCII files can be viewed by "SST" and "BST" through records in extended memory. The 41CX text editor can be invoked at any time to manipulate a file. Program prompts for alpha input, searches for character string and displays entire record containing string. File resizing is completely automated. Ideal for phone, address and general record keeping files. Additional routines included for mass file printing and file creation.

75 Program Steps
Necessary Accessories: HP-41CX. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03144-41 : I.V. Label-Generating Programs

The programs (handheld computer programs for generating labels for selected I.V. (intervaneous) admixtures) were developed based on a hospital pharmacy model preparing large and/or small-volume I.V. admixtures for anywhere from zero to 42 patients daily. The program's objectives are to 1) reduce the time spent and errors occurring in the typing of labels; 2) supplement existing manual systems, and 3) serve as a back-up for existing computerized systems.

936 Program Steps
Necessary Accessories: A manual system for maintaining I.V. profiles; Printer; Card Reader; Maximum Memory

Documentation — $25.00 Cost of 35 cards — $43.75

03239-41 : Fast Sorting Program

This sorting program is relatively fast and requires only three more registers than values to be numerically sorted. It requires an HP-41CX since it uses "X <NN?" and "REGMOVE". It sucessfully uses "REGMOVE" with overlapping registers even though the instruction book supplied with the HP-41CX states blocks cannot overlap. (Ref. Volume 2 Page 201) Input and output are fully prompted.

110 Program Steps
Necessary Accessories: HP-41CX

Documentation — $12.00 Cost of 1 card — $1.25

03319-41 : Memo and Expense Note Pad

This is a useful program for keeping short memos (up to 24 characters long) and for keeping a record of expenses by category, such as food, hotel, gas, etc., during a trip. Expenditures can be accumulated by category or entered into new categories at any time. Each item can be retrieved by indexing on the first part of the item name or all items can be reviewed. All data is stored in extended memory.

65 Program Steps
Necessary Accessories: Extended Functions Module, Extended Memory Module

Documentation — $8.00 Cost of 1 card — $1.25

03449-41 : Rolodex

This program allows easy access to names and numbers stored in an extended memory text file. With a single key, the user can choose to view, add, delete, or update entries.

261 Program Steps
Necessary Accessories: HP-41CX or HP-41CV with Extended Functions Module.

Documentation — $12.00 Cost of 3 cards — $3.75

03495-41 : Extended Memory Utility

Have you been frustated lately by keying in long letter sequences when managing your extended memory (EM)? Here is the perfect tool for the job: Use simple, one letter mnemonics to Create, Append, List, Resize, and Purge files. Insert and Delete records. Tailor ASCII-files to minimum size. Save programs in EM and there are still more options. The Extended Memory Utility (EMU) comes complete with a telephone directory and a notebook facility plus two handy universal input routines.

224 Program Steps
Necessary Accessories: HP-41CX (HP-41CV cannot use all utilities). Two short universal subroutines N (20 bytes) and W (21 bytes) are included in package.

Documentation — $12.00 Cost of 4 cards — $5.00

B208 Computer Science Input/Output Applications

00476-41 : High Resolution Plot Routine (Relatively) Fast Version

Using the 41C special graphics capabilities, this program plots 7 values of a user supplied function per line of printer output, providing much higher resolution than the standard plot routine. Execution time is 37 seconds per line for a simple f(x).

158 Program Steps
Necessary Accessories: Printer, Card Reader and One Memory Module

Documentation — $8.00 Cost of 2 cards — $2.50

00577-41 : Row Plot (High Resolution Plot)

Plot of single-valued function, $y = f(x)$, plotting one point per row of printer output. Program to be compatible with printer plotting programs. Plotting program PRPLOT and PLOTHR, PRPLOTP and PLOTHP, REGPLOT and REGHP are same to use except for memory requirements. PLOTHR and PLOTHP use additional registers R_{12} to R_{19}, in addition for REGPLOT plot points stored in R_{12} to R_{18} inclusive.

292 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00732-41 : Plot of 2/3 Functions on One Graph

This program extends the capability of plotting on the 82143A printer enabling up to three functions of x to be plotted on one graph. The program works in a similar way as the PRPLOT function of the printer prompting for function name and limits of x and y axes.

183 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00834-41 : Banner Printer

Letters 1 1/2" high are printed sideways on the 41C printer. This program features maximum contrast block letters. Using an 8 wide by 12 high matrix concept, characters are generated from the stored data. Other characters can be generated in addition to the 40 supplied.

141 Program Steps
Necessary Accessories: Two Memory Modules, Card Reader and Printer

Documentation — $12.00 Cost of 6 cards — $7.50

00887-41 : Poor Edward's Barcode Maker for Type 7 Barcode

Type 7 barcode (alpha replace : data) can be done relatively easily and for little added cost using the software and hardware in this 'how to' program.

130 Program Steps
Necessary Accessories: Wand

Documentation — $12.00 Cost of 2 cards — $2.50

00945-41 : Plot II

Similar to "PRPLOT", "PLOT II" takes your single-valued function and widens the plot to the number of printer tapes you specify. No scales or axes are printed. A cut and paste operation is required when the plot is finished.

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00966-41 : Poor Edward's Barcode Maker Type 6 Numeric Data

This program generates a pattern of 8 bit bytes in 1's and x's which may be used to generate numeric data type barcodes using the Poor Edward's barcode maker. Then with only a waft of the wand you, too, will be able to put Avagadro's number, the golden ratio, etc. in the 41CV.

215 Program Steps
Necessary Accessories: Wand

Documentation — $12.00 Cost of 2 cards — $2.50

00967-41 : Time VS Data Graph

Program will plot straight line (linear regression) through up to 48 consecutive data points. Plots y-intercept and point $n + 1$ so that a line can be easily drawn. Program useful for any data to be plotted against time (i.e., consecutive months).

248 Program Steps
Necessary Accessories: Two Memory Modules and Printer

Documentation — $12.00 Cost of 3 cards — $3.75

01113-41 : Bar Graph

This program constructs a y axis and graphically represents data as non-contiguous bars that can be individually labeled.

270 Program Steps
Necessary Accessories: One Memory Module and Printer

Documentation — $12.00 Cost of 2 cards — $2.50

01167-41 : Graph Plotter

This program simplifies the plotting of any graph (except Pie graphs) by giving the point on the x axis in inches, accurate to the nearest 1/32nd of an inch. The fraction is always reduced to its simplest form.

126 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01195-41 : Geometric Patterns

This program calculates the x, y coordinates for three geometric shapes, a line at an angle, an evenly divided arc, and an evenly divided circle. Inputs are, radius of arc/circle or distance on line, degrees to first coordinate, x,y origin of pattern, incremental degrees (if arc), and number of coordinates to generate. All inputs and outputs are printed when printer is attached. Outputs in the form of x, y coordinates suitable for use in n/c programming, drafting, or engineering.

275 Program Steps
Necessary Accessories: One Memory Module. Printer and Card Reader helpful.

Documentation — $12.00 Cost of 3 cards — $3.75

01297-41 : Histograms with Text

A textline up to 4 characters long below the columns, and an axis is made as desired in any position, but it can be suppressed if this is more satisfactory. The program takes up 440 bytes of program memory and 7 data registers are needed.

245 Program Steps
Necessary Accessories: One Memory Module and Printer

Documentation — $12.00 Cost of 2 cards — $2.50

01324-41 : 41CV-Decorative Patterns and Letter Banner Printing

Prints large size letters a-z, numbers 0-9 and eight special symbols. Prints seventeen large size patterns of arbitrary length. Included are zig-zags, block styles, chain, saw tooth, happy-sad faces, heart, arrow piercing a heart, ornament, and arrow of optional length. Instructions provided for constructing user's own patterns. Ideal for party decorations, border decorations for posters, bulletin boards, etc.

920 Program Steps
Necessary Accessories: Printer

Documentation — $25.00 Cost of 20 cards — $25.00

01445-41 : Fine Curve Plot with HP-82143A Peripheral Printer

This program gives a high quality plot of any function Y=F(X). It works in a way similar to "PRPLOT" printer program, but uses maximum definition of 168 columns in one print line, and plots 3 points in one print line, giving a more "continuous" aspect to the output curve and/or allowing shorter paper length for similar number of plotted points.

230 Program Steps
Necessary Accessories: One Memory Module.

Documentation — $12.00 Cost of 2 cards — $2.50

01552-41 : Giant Pattern

As the name implies, this program generates a Giant Pattern using the input data, and can be presented in any of the following modes: double-wide, standard character, special character, or continuous std. character 1-127. Once the data is entered in any of the above modes, it can be used again in any other mode simply by storing it on mag cards and rerunning the program in a different mode. The program allows for many changes to the original pattern matrix, only in respect to appearance, not the backbone matrix.

430 Program Steps
Necessary Accessories: One Memory Module, Printer and Card Reader.

Documentation — $12.00 Cost of 4 cards — $5.00

01592-41 : Super-Plot

This program (S-PLOT) is able to plot up to five functions in one diagram. For each axis you can chose, whether it is divided linear or logarithmic. A suitable format for the axis labels is determined automatically; relative labels or scientific format is used if necessary. Some extra services are available.

697 Program Steps
Necessary Accessories: 3 Memory Modules and Printer.

Documentation — $14.00 Cost of 6 cards — $7.50

01704-41 : Automatic YMIN and YMAX Calculator

Program finds YMIN and YMAX for a function within-range specified by XMIN and XMAX and then plots the function. The extrema are found by checking each Y value that results as the X value is incremented from XMIN XMAX. The X increment is user specified. Using this program, the extra plot will fit on one piece of paper.

65 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

01767-41 : Time vs Data Plot III — Two Data Sets

Program will plot linear regression for two data sets on two separate axis. The y-axis scale is the same for both plots. The y-intercept and point $n+1$ are plotted so that a line can be easily drawn. Up to 36 consecutive data points (per set) will be plotted. Program useful for any data to be plotted against time (i.e., consecutive months).

358 Program Steps
Necessary Accessories: 2 Memory Modules for the HP-41C, Printer

Documentation — $12.00 Cost of 4 cards — $5.00

01774-41 : Formatted Register Review

Provides for viewing the contents of the registers in main memory beginning with a given register number. Features: (1) Shows all significant digits (useful for viewing very large or very small numbers), (2) Does not show insignificant zeros, (3) Identifies alpha contents of registers, (4) Uses stack, lastx and alpha registers, and (5) Main memory registers are undisturbed.

86 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01781-41 : Design Special Characters

This program aids in designing special characters on the HP82143A Peripheral Printer.

60 Program Steps
Necessary Accessories: HP82143A Peripheral Printer

Documentation — $8.00 Cost of 1 card — $1.25

01822-41 : PRPLOT 5

1 - 5 functions of X can be plotted in one diagram with high resolution and good readability. During execution, 21 X-values and corresponding function values are displayed for manual notation if a table is desired. AWO, by noting corresponding values, the curves are separated.

298 Program Steps
Necessary Accessories: Peripheral Printer (82143A)

Documentation — $12.00 Cost of 3 cards — $3.75

01879-41 : Solid Bar Graph

You will like these bold, legible, easy-to-read Graphs. Complete control of Y and X Axis included. Program includes fast, easy Data Register input. Ideal for Graphs of weather, market, sales, costs, financial or whatever Data you have. Comprehensive comparison at a glance.

152 Program Steps
Necessary Accessories: HP-IL Module, HP-82162A Thermal Printer and 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01930-41 : Greek Characters

With this program, you can write Greek words with majuscules or minuscules. Minuscule vowels bearing accents are also available. The program contains synthetic lines. Without a card reader (or wand), knowledge of synthetic programming is necessary ("REG"/"CODE" Method).

181 Program Steps
Necessary Accessories: 1 Memory Module; 82143A or 82162A Printer

Documentation — $12.00 Cost of 3 cards — $3.75

01947-41 : High Resolution Print Plot

Similar to "Prplot", "Hrprpl" plots seven points per line and widens the axis to as many tapes as you specify. Both a scale and an axis are printed, if desired. Execution time is approximately 48 seconds per line. A printer and two Memory Modules are needed.

383 Program Steps
Necessary Accessories: HP-82143A Printer and Two HP-82106A Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01989-41 : Fret and Holiday Patterns

Prints six large size fret patterns (similar to classic art of ancient Greece) of arbitrary length. Also prints patterns associated with the winter holiday season. Holiday patterns include snowflake, snow, holly (bell's?), and an ornamented tree. Ideal for border decorations and cheer in the holiday season.

953 Program Steps
Necessary Accessories: 82143A or 82162A Printer; (Quad Memory Module if using 41C)

Documentation — $14.00 Cost of 10 cards — $12.50

02055-41 : 48 Column Word Processing Printer W/Four Character Fonts

This program will print five horizontal lines of 48 characters each. Roman upper and lower cases, full greek upper and lower cases, numerals, and 18 special characters are available. Automatic text entry. Fonts can be mixed, ideal for formulas and writing which use greek characters, i.e., Math, Physics, Philosophy and History. Synthetic program.

512 Program Steps
Necessary Accessories: Quad RAM, Printer (Card Reader or wand unless user can key in synthetic functions)

Documentation — $14.00 Cost of 9 cards — $11.25

02077-41 : 82905B Word Processor

This program is designed to use the HP-41/82905B impact printer to type letters or memos, it also allows reports to be typed. The cassette based program has the facility to hold addresses, text files capable of holding approximately five pages of text and sign-off files to end letters. Review, correction, insert and delete/insert routines are provided to access and alter text routines. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC.

429 Program Steps
Necessary Accessories: HP-41CV, HP-82160A HP-IL Module, HP-82161A Digital Cassette Drive, HP-82905B Impact Printer and HP-82180A Extended Functions/Memory Module; (Also recommended: HP-82181A Extended Memory Module and HP-82182A Time Module).

Documentation — $14.00

02087-41 : Bar Code on the HP-82143A Peripheral Printer

This program produces bar code on the HP-82143A Peripheral Printer. The bar code is NOT directly readable. Only boundaries for the bars are printed. The user must fill in the bars and photocopy in order to use. Inputs are made in either hexadecimal, binary, or decimal. Includes a full list of references.

333 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV, Printer; (Card Reader is helpful)

Documentation — $12.00 Cost of 4 cards — $5.00

02098-41 : Banner Printing Special

This program prints all 127 standard characters in banners, using any standard print symbol, in positive or negative print. It uses the Extended Functions/Memory. It has 4 modes: PHRASE, CHAR NO?, DECIMAL CODE (build your own char.), and BINARY CODE (graphics). All 4 can be used as subroutines.

207 Program Steps
Necessary Accessories: One Memory Module, Card Reader, Printer, Extended Function/Memory Module and One Memory Module

Documentation — $12.00 Cost of 7 cards — $8.75

02195-41 : TV Plotting a First Approximation

"TVP" is a very low resolution plotting routine for the HP 82163A Video Interface. The user codes the function to be plotted and then runs "TVP". The range of "x" is prompted for and the values and range of "y" are computed and displayed. Final output is an unlabelled "dot-sketch" (31x15) of the function on the video screen. Better resolution is sacrificed in the interest of having something happening on the video screen: deemed more desirable for demonstration and/or classroom use.

169 Program Steps
Necessary Accessories: HP-IL module, Video Interface. One memory module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02212-41 : Text Editor

This program enables to create an ASCII file in Extended Memory Module. It is easy to edit (insert new lines or characters, delete, print or display lines) with this program.

209 Program Steps
Necessary Accessories: Extended Functions Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02367-41 : Gross Printing

The program enables you to print with the HP 82162A Printer up to 9 lines of alpha-text sideways on the paper (HP 82143A up to 4 lines). For the text you can use the characters 13 and 28–127 of the standard character set. The program uses synthetic functions.

433 Program Steps
Necessary Accessories: Three memory modules, Printer, Card Reader, Wand or Cassette Drive (to load program — due to synthetic functions)

Documentation — $12.00 Cost of 7 cards — $8.75

02371-41 : HP-11C Program Printer

This program takes the HP-11C keycodes as input and produces formated program listing (line number, keycodes and function names) on the printer. Editing functions are provided for program stored, including goto line number, delete, insert and renumber lines. Useful for program development and documentation.

531 Program Steps
Necessary Accessories: Minimum of two memory modules and Printer

Documentation — $12.00 Cost of 6 cards — $7.50

02372-41 : HP-15C Program Printer

This program takes the HP-15C keycodes as input and produces formated program listing (line number, keycodes and function names) on the printer. Editing functions are provided for program stored, including goto line number, delete, insert and renumber lines. Useful for program development and documentation.

541 Program Steps
Necessary Accessories: Minimum of two memory modules and Printer

Documentation — $12.00 Cost of 6 cards — $7.50

02448-41 : Multi-Purpose Bar Graph

Program produces graphs from a function or data, with or without an average bar(s) and a choice of bars showing one or two values. All choices have prompts. Ideal for comparing two sets of values such as two year monthly comparison of sales, growth, yields, rainfall or whatever.

229 Program Steps
Necessary Accessories: Two memory modules, HP-Interface Loop, 82162 Thermal Printer

Documentation — $12.00 Cost of 4 cards — $5.00

02461-41 : XROM Bar Code Generator

This program generates two byte paper keyboard (type 5) bar code for any XROM or group of XROM's within the same HP-41 application pac or peripheral device. Extensive knowledge of bar code generation is not essential. The user must simply input title of desired XROM module and desired start and finish XROM ID and Function numbers. A list of XROM ID and Function numbers is included with literature for easy reference.

159 Program Steps
Necessary Accessories: 82162A IL-Printer, Black Thermal Paper. Optical Wand optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02464-41 : Multiprinting of Matrices

This program enables multiprinting of matrices. Multiprinting denotes printing on more stripes and then glued these together. The user must input the number of rows and columns, the number of places and the number of decimal places for one number. With this input parameters the user can choose his/her own format for printing. Note that this program is meant as a subroutine.

103 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

02472-41 : Extended Memory ASCII File Management

This program provides the capability to easily construct ASCII files in extended memory, to record the contents of these files on magnetic cards for future use, and to read them back into extended memory when required.

239 Program Steps
Necessary Accessories: Extended Functions/Memory Module, HP 82180A; Card Reader, 82104A.

Documentation — $12.00 Cost of 3 cards — $3.75

02548-41 : HP41 to HP-75 Data File Conversion

These two programs (one each of the HP-41 and HP-75) provide a quick method of transfering the contents of a block of registers resident in the HP-41 main memory or the contents of a BASIC data file in HP-75 memory, to a LIF1 file on the 82161A Digital Cassette Drive. Data transfer routines in each program allow both read and write capabilities for immediate processing of data.

296 Program Steps
Necessary Accessories: 82180A X-Functions Module. 82160A HP-IL. 82161A Digital Cassette Drive.

Documentation — $12.00 Cost of 3 cards — $3.75

02552-41 : Reading and Writing X-funct. ASCII Files to and From Cards

This program reads cards for the HP82104A Card Reader and stores them in X-function ASCII files. It also writes cards storing data from X-function ASCII files onto cards.

157 Program Steps
Necessary Accessories: Extended Functions/Memory Module and Card Reader

Documentation — $12.00 Cost of 2 cards — $2.50

02765-41 : Universal Table Generator Max-Min-Zero-Plot

This program is used to create numerical tables from the vast unlimited simple to complex $f(x)$ equations that lie within the interval of convergence (I.O.C.) $x_1 \leq x \leq x_2$. This program also will locate points and their corresponding maximum, minimum and even zero $f(x) = 0$ values in the order of their occurrences in a given $f(x)$; do plottings of $f(x)$ equations. A "must" program for structural/stress engineers who deal with points of maximum design values; mathematicians. Ten examples included!

268 Program Steps
Necessary Accessories: HP-41C/CV peripheral printer; quad module optional depending upon the registers used in the secondary program.

Documentation — $12.00 Cost of 8 cards — $10.00

03119-41 : ASCII File Viewing and Editing on the 41-CX

Program uses many functions exclusive to the HP-41CX. ASCII files can be viewed by "SST" and "BST" through records in extended memory. The 41CX text editor can be invoked at any time to manipulate a file. Program prompts for alpha input, searches for character string and displays entire record containing string. File resizing is completely automated. Ideal for phone, address and general record keeping files. Additional routines included for mass file printing and file creation.

75 Program Steps
Necessary Accessories: HP-41CX. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03138-41 : Bar Graphs With the HP 82905B Printer

The program prints vertical bar graphs of 2 to 16 bars using the HP 82905B printer. Numeric scale values are calculated and printed on the left. The user can specify the height of the graph. The width of each bar (0.3 inch) is fixed. A title may be printed at the top and the bars may be labelled at the bottom of the graph. Synthetic programming is used to send data to the printer.

281 Program Steps
Necessary Accessories: IL module and 82905B printer with HP-41CX. HP-41C requires memory and extended function memory modules in addition.

Documentation — $12.00 Cost of 4 cards — $5.00

03283-41 : More Appealing Printout of an ASCII File

Have you ever printed out an ASCII file and had the printer cut off a few of your words because it only prints twenty-four characters per horizontal line? If you have, this is the program for you. It remedies that problem, and also included is a short editor program which enables easier insertion and deletion of ASCII characters than the HP-41CX text editor.

125 Program Steps
Necessary Accessories: HP-41CX and printer.

Documentation — $12.00 Cost of 2 cards — $2.50

03314-41 : Multi Width ASCII File Printout on HP 82143A and HP 82162A

Printing an ASCII file usually means that record having more than twenty-four characters are cut or at least printed on several lines. This program prints the ASCII file content in twenty-four character long "slices" which can be put together presenting a clear chart of the content. "Multi Width" is foolproof and easy to use.

166 Program Steps
Necessary Accessories: HP 41CX or Extended Functions Module and one Memory Module, Printer.

Documentation — $12.00 Cost of 2 cards — $2.50

03336-41 : Extended Mass Storage Directory

This utility extends the directory information provided by the DIR function in the HP 82160A HP-IL Module. For each entry in the directory space, a line is supplied with the following information: recorded file name, file condition (deleted or not), starting track address, records reserved, and file length in registers. Output is directed to a printer or video interface. Documentation analyzes the directory structure established by the HP 82160A.

209 Program Steps
Necessary Accessories: Extended I/O or HP-IL Development Module; HP-IL Module; mass storage device; printer or video interface.

Documentation — $12.00 Cost of 3 cards — $3.75

03447-41 : ThinkJet PRPLOT — A Four Function Plotting Program

A PRPLOT type routine for the HP 2225B ThinkJet Printer. Up to four data points may be plotted on a single row, each with its own plot symbol. A 122 character plot field is used with both X and Y axes labeled with scales and units. A title is printer centered on the page. Axis labels are centered on their respective axes.

444 Program Steps
Necessary Accessories: HP-IL Module, Extended Functions Module, ThinkJet Printer or equivalent.

Documentation — $12.00 Cost of 5 cards — $6.25

03536-41 : Coordinate Plotting (Manual)

With a minimum of materials and a HP-41, the user can quickly plot coordinates with very high precision at any scale. Program prompts for input, computes map dimensions (optional) and outputs plotting information. All output is labeled and easy to comprehend. A printer is not needed but is most useful.

282 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

03564-41 : Headers For Labeling Printouts

This program conveniently collects date, day of week and time for display or to provide a useful one-line header on printouts. An independently addressable section enables ALPHA entry of an identifying title which is printed as a separate one-line header. Day-to-day manual execution can be facilitated by assignment to USER keyboard (two positions). Program uses stack only and restores initial keyboard conditions.

53 Program Steps
Necessary Accessories: Printer.

Documentation — $8.00 Cost of 1 card — $1.25

09114-41 : HP-41 TO HP 9114A Utility

This program allows an HP-41C/CV/CX to fully utilize the 630K bytes of storage available on an HP 9114A 3.5" Flexible Disc Drive. All legal file types can be created.

370 Program Steps
Necessary Accessories: Extended I/O Module; 2 Memory Modules; HP-IL Module; HP 9114A Disc Drive

Documentation — $8.00 Cost of 5 cards — $6.25

B209 Computer Science Utilities

00371-41 : Array Index Conversions

Array 1: given the number of rows or cols in a 2-d array, and a specific row and column designation representation, the 41C will return a single offset number for a one-dimensional array. Array 2: given the number of rows or columns in a 2-d array, and an offset number in a corresponding one-dim array, the 41C will give the row and col. Designation for the 2-d array.

94 Program Steps
Necessary Accessories: Card Reader optional.

Documentation — $8.00 Cost of 2 cards — $2.50

00498-41 : Value Comparison

The best value can be selected from a large number of offerings (in supermarkets or other situations) on the basis of varying prices for varying quantities (weight, number, size etc). Then in case the best value is no longer available, the second best value can be called up immediately and reliably.

85 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01093-41 : Label Storage

This program makes it possible to store and recall numbers by alphanumerical labels instead of ordinary two digit numbers. This is very useful during complex calculations. It's very annoying to realize after 20 minutes of artful calculation that you've forgotten in which register you stored what. With this program you name your number, press STO "Name", and when you need it, simply RCL "Name". The program also includes a function for changing already stored numbers, XCH, and calculates the number of accessible registers. Size $2n + 7$.

144 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01463-41 : Store Program

This program substitutes the normal storage-functions and arithmetic storage-operations, used in programs and over keyboard, without using register-addresses, but an alpha-name consisting of 1 to 6 alpha-signs, for each variable.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

03016-41 : Conversion From Upper Case to Lower Case Letters

This program converts upper case alphabets in an ASCII file in extended memory to lower case alphabets. Also, with this program is a small editor program that allows easier inserting and deleting of ASCII characters than the HP-41CX text editor. It also enables the user to add non-keyboard characters into an ASCII file.

185 Program Steps
Necessary Accessories: HP-41CX. An 82162A Printer would be useful.

Documentation — $12.00 Cost of 4 cards — $5.00

B300 Forestry/Forestry Engineering

00874-41 : Lumber Invoicing

This program automatically calculates board feet of a quantity of lumber and extends these amounts based on a price per thousand or per hundred. Both board footage and extensions are accumulated eliminating the need to calculate twice. Input is in the form feet, inches, and 1/16 inches–no conversion necessary.

88 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00890-41 : Western Spruce Budworm Egg Mass

Computes the average number of western spruce budworm egg masses/square meter of foliage from cluster samples of 3 trees/cluster, 2 branches/tree. average branch values for tree, tree values for cluster, cluster values for unit.

176 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00992-41 : Growth and Yield Estimate for Young-Growth Conifers in Northern California

This program calculates growth and yield data for seven conifers in northern California. Program also expands data to per acre values. All volumes are in cubic feet.

377 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

01163-41 : Fuels

This program prompts for fuel (timber) inventory data and calculates the results in tons/acre. It makes maximum use of the HP-41C features; works with or without the printer; takes data in any order; checks for proper format and is nearly foolproof. Easier and cheaper than using computer time.

682 Program Steps
Necessary Accessories: Quad Module or HP-41CV and Card Reader. Printer recommended.

Documentation — $14.00 Cost of 8 cards — $10.00

01457-41 : Growth and Yield of Douglas Fir

Program computes stand data from three knowns: age, site index or height, basal area or percent of normal basal area. Selectable outputs available: age total or breast high, site index, basal area data. Tarif, height, diameter, cubic volume total stem or to a 6 inch top, Scribner volume 16 or 32 foot logs to a six inch top and grows the stand for a user specified number of years providing new stand data at requested intervals.

562 Program Steps
Necessary Accessories: Two Memory Modules. Card reader and printer helpful.

Documentation — $14.00 Cost of 6 cards — $7.50

01521-41 : Red Pine Yield Projection for Field Use

For red pine, age 25 or older, compute height and average DBH for age. Compute basal area, cubic feet, cords and board feet for acre and stand. Thin to residual basal area stored and display thinning volumes. Project per acre annual increment to years of thinning interval. Cumulate thinning volumes.

371 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 15 cards — $18.75

01536-41 : Yields for Second Growth Species of California's Coast

This program calculates volume, basal area (BA), volume-BA ratio, BA growth, volume growth, height growth, and volume growth percent for individual trees of redwood, Douglas-fir, and white wood species. Volume and growth information can be calculated in either board foot or cubic foot measure. The program also expands data to per acre values given individual tree data and an average basal area per acre.

469 Program Steps
Necessary Accessories: 3 Memory Modules (Printer - optional)

Documentation — $12.00 Cost of 5 cards — $6.25

01586-41 : Fire Danger

This program computes fire danger for both grasslands and forests; a numerical index, a hazard rating, rate of spread, and in the case of forest fires - flame height and spotting distance. Two subprograms compute drought and humidity. Fire danger can be projected forward using current and forecast conditions.

863 Program Steps
Necessary Accessories: Quad Memory. Printer advantageous but not essential.

Documentation — $16.00 Cost of 11 cards — $13.75

01589-41 : Growth and Yield of Alder

Program computes stand data from three knowns, age, site index, or height, basal area or percent of normal basal area. Selectable output available: age total or breast high, site index, basal area data, tarif, height, diameter, cubic volume total stem or to a 6 inch top, Scribner volumes 16 or 32 foot logs to a 6 inch top and grows the stand for a user specified number of years providing new stand data at requested intervals.

472 Program Steps
Necessary Accessories: 2 Memory Modules, Card Reader and Printer helpful but not needed.

Documentation — $12.00 Cost of 5 cards — $6.25

01687-41 : Interior Alaska Variable Plot & Individual Tree Cruise Calcs

Given number of trees of size class, number of trees per plot, acreage and defect % for a variable plot cruise program will generate volumes, V-BAR's, etc. and will output entire cruise volumes on a per acre basis and all statistics. For Individual Tree Cruise inputs are # trees by size class, % cruise and % defect to output all gross and net volumes and statistics. Solves for white spruce, bd. ft. or cu. ft.; paper birch and quaking aspen, cu. ft. only.

439 Program Steps
Necessary Accessories: Two Memory Modules or Quad RAM Module

Documentation — $14.00 Cost of 5 cards — $6.25

01757-41 : Horizontal Curves: Widening and Safe Stopping-Sight Distance

This program computes required safe stopping-sight distance, actual stopping-sight distance, required curve widening and runout distance for curve widening tapers on roads with fixed radius horizontal curves for either a standard lowboy or log truck.

298 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01881-41 : West Coast Board Foot Volume

This program calculates and cumulates by species the gross, net and cull volumes for any 9 species at a time. It is based on the volume calculations established in the "Official Rules for the Following Log Scaling and Grading Bureaus: Columbia River, Grays Harbor, Northern California, Puget Sound, Southern Oregon, and Yamhill."

251 Program Steps
Necessary Accessories: For diameters up to 56 inches, 2 Memory Modules are necessary; diameters to 120 inches require 3 Memory Modules. Printer and card reader optional.

Documentation — $12.00 Cost of 7 cards — $8.75

02734-41 : Horizontal and Vertical Displacements of Movement Markers

Field usable program calculates the horizontal distance and direction and vertical distance through which a marker moved, as on a glacier surface, or in unstable soils on a slope, during the time between two triangulation and vertical angle surveys. Simple program additions allow use of card reader for storing data of initial surveys for use during later surveys.

407 Program Steps
Necessary Accessories: Two memory modules. Card reader optional.

Documentation — $14.00 Cost of 5 cards — $6.25

03255-41 : Forest Management Costs

A general cost model, developed by Gonsior, tests the sensitivity of total on-site forest management cost and the harvesting components of cost to alternative silvicultural utilization and other forest management objectives.

358 Program Steps
Necessary Accessories: Two memory modules or quad memory.

Documentation — $12.00 Cost of 4 cards — $5.00

03265-41 : Log Skidder Loading Predictions

A traction model developed by Wismer and Luth predicts the tractive capability of an off-road vehicle taking both vehicle and terrain conditions into consideration.

289 Program Steps
Necessary Accessories: One memory module or quad memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

03361-41 : Time of Concentration for Surface Water Run-Off

This program quickly calculates time of concentration in either Imperial Units or SI Units using the methods of Bransby-Williams and Kiepich. The input variables are the size, shape and topography of the rainfall catchment. Output is given as minutes.

64 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03521-41 : Percent Slope Reduction

When using a Clinometer or Abney, and a measuring tape, this program solves for the horizontal and vertical components and accumulates the results, giving stationing and elevations. It computes the slope distance to pull for any required horizontal distance on any slope. Much easier and convenient than interpolating table values.

99 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 1 card — $1.25

03550-41 : Deflection Angle Computer

This program is particularly well suited to the reduction of staff compass survey notes. Specifically, it computes the deflection angle (left or right) from the backsight bearing to the foresight bearing. This is especially useful when local attraction is evident and foresights alone won't do. The deflection angles can then be used to compute the traverse.

103 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 1 card — $1.25

03553-41 : Culvert Length Computer

Knowing the percent sideslope or angle (decimal degrees), subgrade width, fillslope ratio, amount of fill and degree of skew, the forest engineer can quickly determine the length of culvert needed. Answers are given in two foot increments. This program works only for "through-fill" situations. Typical running time is ten seconds.

196 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

B400 Hydrology

00956-41 : Channel Flow

Given various physical properties of a flow in a channel, the program determines the water elevation, wetted perimeter, and velocity of the flow. channel may be canal, river, or any other type of open flow.

213 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01683-41 : Well Function of U

This program calculates the well function of U from the Theis equation for all positive values of U. A polynomial approximation is used which is more accurate and computationally more efficient than the infinite series approximation. No data registers are used.

50 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01727-41 : Steady Radial Groundwater Flow in a Finite Leaky Aquifer

This program solves for piezometric head in an isotropic homogeneous leaky aquifer of finite extent with a discharge well in its center.

208 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01806-41 : Oxygen Deficit in a Polluted Stream with Time

This program determines the oxygen deficit in a polluted stream with time. Oxygen deficit will be printed out in 1/10 of a day interval until it is at a maximum. Input data can be entered either by hand or a data card. Computed maximum oxygen deficit and original input data can be saved on a magnetic card.

367 Program Steps
Necessary Accessories: 3 Memory modules and printer.

Documentation — $14.00 Cost of 7 cards — $8.75

03069-41 : SCS Runoff Equation

Program computes SCS runoff equation variables. Solve for Q in inches, when CN and P are known; solve for P in inches when Q and CN are known; solve for CN when Q and P are known.

171 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03095-41 : Flood Estimate (10-yr., 24-hr)

The program calculates design flood volume and peak flow resulting from runoff generated by the 10-yr., 24-hr. precipitation event. Procedures utilized are those recommended by the SCS and BOR for the design of small reservoirs. Data input cards are provided for three different storm distributions, the SCS types I and II, and the BOR general storm.

419 Program Steps
Necessary Accessories: A card reader is recommended.

Documentation — $14.00 Cost of 10 cards — $12.50

03122-41 : Hydrology For Small Watersheds

This program is designed to solve for the peak runoff in cfs for a given 24 hour storm frequency, storm rainfall and curve number for watersheds less than 2000 acres. The program uses the methodology developed by USDA SCS for estimating peak runoff from small watersheds. THIS PROGRAM IS SOLD RECORDED ON MAGNETIC CARDS ONLY. DOCUMENTATION ONLY IS NOT AVAILABLE.

325 Program Steps
Necessary Accessories: Card reader is necessary. Two memory modules for HP-41C. Printer is optional.

Documentation — $12.00 Cost of 8 cards — $10.00

03361-41 : Time of Concentration for Surface Water Run-Off

This program quickly calculates time of concentration in either Imperial Units or SI Units using the methods of Bransby-Williams and Kiepich. The input variables are the size, shape and topography of the rainfall catchment. Output is given as minutes.

64 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03407-41 : Rainfall Intensity - Duration - Frequency Curves

This program calculates rainfall intensity (In/Hr) for the 2, 5, 10, 25, 50 and 100 year (return period) storms through the duration (minutes) of 5, 10, 15 and 30 minutes. NOAA Technical Memorandum NWS HYDRO-35 Isopluvial Maps are included to obtain the six input precipitation values.

263 Program Steps
Necessary Accessories: Printer required.

Documentation — $12.00 Cost of 4 cards — $5.00

B600 Space Sciences

00502-41 : Orbital Parameters

The parameters of an orbit are calculated by this program given the position and velocity vectors of the body in geocentric-equatorial coordinates. The parameters are displayed and printed but if a printer is not attached, any desired parameter can be individually displayed by pressing a local label key.

385 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00645-41 : Thermal Conduction Equation with Radiative Boundary Condition

This program solves the thermal conduction equation in a semi-infinite plane surface with radiative boundary condition for periodic and non-periodic variation of incident radiative flux. The program is intended for the calculation of the temperature variation of planetary surfaces such as the moon during a "day" or an eclipse.

172 Program Steps
Necessary Accessories: One Memory Module. Printer desirable.

Documentation — $12.00 Cost of 2 cards — $2.50

00851-41 : External Tank to Orbit Space Shuttle

Computes additional fuel required in the tank to accelerate the orbiter+tank assembly to orbital velocity, with variable loads carried in the payload-bay. Grossweight of orbiter (incl. Payload). The empty weight of the tank, fuel consumption at full power and delta velocity to be inputs, the acceleration of the assembly is limited to 3g-s. The orbital maneuvering thrusters ignite at unchanged (suborbital) speed, to supplement thrust.

105 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00852-41 : Escape Velocity from Planets

The program simply computes a required velocity to achieve escape-trajectory from a planet, as a function of the radius of the planet and - the gravitational acceleration - from any altitude above the surface of the planet. The needed inputs are the altitude above the planet and the name of the planet, within our solar-system.

101 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00920-41 : Calculating the Center of Pressure of a Model Rocket

This program calculates the center of pressure of a model rocket flying at subsonic speed and at small angles of attack. It may be used to design a stable model rocket or to check the margin of stability of an existing model. Full use of the alphanumeric capabilities of the HP-41C is made.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01205-41 : Geosynchronous Satellite

This program will compute great circle angle, slant range, bearing, and elevation to any geosynchronous satellite from any ground station, and will indicate when satellite is below horizon. Program uses full alpha-numeric properties of the HP-41C including alpha prompts for input data, and the display of slant range, bearing, and elevation.

153 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01332-41 : Satellite Tracking Oscar 7 & 8

This program will compute the bearing and elevation to any satellite in circular orbit (posigrade or retrograde) in real time or rapid list. Orbital parameters and ground station corrdinates may be input from keyboard or from data cards during initialization of program. Program utilizes full alpha-numeric properties of HP-41C.

270 Program Steps
Necessary Accessories: One Memory Module. Card Reader helpful.

Documentation — $12.00 Cost of 4 cards — $5.00

02047-41 : Look Angles

On occasions it is necessary to provide observers with the azimuth and elevation at which they must look in order to observe a certain point or event along the trajectory of a sounding rocket. Given the pertinent data, this program will calculate the appropriate "Look Angles" for each observer.

270 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02151-41 : Ephemerides of Asteroids

This program generates ephemerides for asteroids. Quantities calculated include right ascension and declination of the asteroid, with respect to the mean equator and equinox of both 1950 and of date, heliocentric and geocentric distances, magnitude (including the opposition effect), phase angle, elongation, and ecliptic longitude and latitude.

644 Program Steps
Necessary Accessories: Three Memory Modules; (Card Reader and Printer are optional)

Documentation — $14.00 Cost of 6 cards — $7.50

02700-41 : Amateur Satellite Tracking

This program, uses the capabilities of the Time Module. Automatically calculates, at 2-minute intervals, the elevation and approximate bearing of a satellite in circular orbit. Input data includes station coordinates (2), satellite parameters (3), and data for the specific orbit (2). Once the data is entered, no other keystrokes are needed, and the program will continue to give the satellite's position until it goes out of range.

385 Program Steps
Necessary Accessories: One memory module and time module

Documentation — $12.00 Cost of 4 cards — $5.00

03372-41 : Horizon, Drop, and Refraction

For any spherical body, program computes for any altitude above surface, the slant range to horizon, range over surface, and subtended angle at center of body (dip of horizon). Constants for all solar system planets are given. Provision is made for iterative operation. For terrestrial altitude observations of celestial bodies, program computes angular correction for atmospheric refraction, dip of horizon, height of observer above sea level, and with sextant zero index correction input, the total correction to be applied to the observed celestial altitude, or zenith distance.

84 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03408-41 : Gravitational Parameters

This program computes, for all planetary bodies, the acceleration of gravity, equatorial, mean, or for any geodetic or geocentric latitude. Also computes the acceleration as a function of radial distance from the center of the primary, as well as the altitude of an isochronus satellite. Supplemental subroutines compute the radius of an ellipsoid and the difference between surface and center oriented latitude, as well as the mean radius of an ellipsoid.

251 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

B800 Surveying

00327-41 : Straight Line Forced Through Any Point

This program calculates the bearing of a least squares fit straight line forced through any given point. Predictions of new e^8 and n^8 on that line may be made from values of n and e. Coordinate pairs (n, e) may be added or deleted at any time.

86 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00408-41 : Area of Land by Point-To-Point Traversing

This program computes the area of land by point-to-point traversing, given the bearing, distance, and radius of curvature of each side. The error in closure is displayed as well as the area in square feet and acres. Bearings and quadrants are previewed and may be changed.

147 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00504-41 : Length of Circular Arcs

By the use of this program the length of any arc may be found if the length of the radius and the angle of the segment are known. Given two concentric arcs and a given angle the program also solves for the area of the configuration.

51 Program Steps
Necessary Accessories: Printer, Card Reader

Documentation — $8.00 Cost of 1 card — $1.25

00505-41 : Slope Staking on a Var Slope

This program computes the appropriate cut or fill and its corresponding sideslope, for sections on a variable slope.

85 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00605-41 : Superelevation of Railroad Curves

Given any two (2) of the speed, degree, or elevation, the program computes the unknown. Program may be used with any underbalance. Will not work for highway curves.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00692-41 : Stadia Reduction

This program solves reduction of stadia observations to distance and elevation by height of instrument.

41 Program Steps
Necessary Accessories: Printer optional.

Documentation — $8.00 Cost of 1 card — $1.25

00711-41 : Blue Top I

This program computes center-line and shoulder grades for symetrical sections. The grades calculated may be for any of the following: finished grades, base grades, sub-base grades, and subgrade. This program will compute the above grades on any predetermined interval automatically. Top back sidewalk, top back of curb and the elevation for a given distance from centerline may also be computed.

471 Program Steps
Necessary Accessories: Three or more Memory Modules

Documentation — $14.00 Cost of 7 cards — $8.75

00745-41 : Stadia Reduction

This program reduces stadia directly from the hair readings. All prompts and outputs are alpha labeled for ease of use. This program is similar to program #00223C, however for this program, the user is not required to compute a rod interval or angle from line of sight, this is done by the program to simplify user input.

97 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00790-41 : Cogo

The program is ideal for the practicing surveyor in the field. The program offers 5 separate subroutines: 1) recall pt. #, 2) traverse, 3) inverse, 4) sideshot, 5) enter & assign, for coordinate calculation and inverse capability between 38 stored coordinate pairs.

376 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader
Documentation — $12.00 Cost of 4 cards — $5.00

00807-41 : Stake

This program is designed to assist the field surveyor in setting control points (i.e. property corners, sewer line, water line, etc) from known points. Coordinates of backsight point, occupied point, and points to be set are input. Final output is azimuth, field angle, and distance to point to be set. Program may also be used to calculate field angles for field checking traverse, and sideshots.

95 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00875-41 : Computer Slope Staking

This completely automated grade staking program quickly computes catch point or daylight point from user input sideslope angle. All other constants need only be input once, but can be changed with a single key-press. Also affords full prompting elimnating the need to refer to instructions.

120 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00886-41 : Contours

This program is designed to find contours on a topo map whether the elevation shots be on a grid or shot in by stadia.

68 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00892-41 : Equal-Tangent Vertical Curve

For initial input of B.V.C. & E.V.C. Stations, and B.V.C. & V.P.I. & E.P.C. elevations, this program will calculate, curve elevations for stations within the vertical curve, and grade elevations for stations outside the vertical curve. The program will also calculate chainage of the zero slope station, and the zero slope station's elevation.

144 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00893-41 : Balanced Horizontal Traverse by the Compass (Bowdich) Rule

This program is intended to provide an "idiot proof" solution for calculating area and precision, forcing closed, and balancing a horizontal traverse by the compass (Bowditch) rule. Memory modules, depending on the number of traverse stations.

195 Program Steps
Necessary Accessories: Memory Modules depending upon the number of traverse stations.
Documentation — $14.00 Cost of 2 cards — $2.50

00951-41 : Offset Taping

This program allows for a unique approach to a topographic or a reasonable amount of accuracy must be maintained. By offsetting the zero end of the tape the Rodman chainman reads distance, leaving the transitman free to record angles.

88 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00995-41 : Traverse, Inverse, Sideshots, Area and Intersections

Travplus performs the following survey calculations: traverse, by either az./brg. or field angle input; inverse; sideshots; area; bearing-bearing intersections and bearing-distance intersections as well as automatic compass adjustment of a polygon. Define and print point routines allow user to assign, record and print up to 93 coordinate pairs according to arbitrary point numbers.

377 Program Steps
Necessary Accessories: Quad Memory Module and Printer
Documentation — $14.00 Cost of 4 cards — $5.00

01072-41 : Tilted Plane Curb Returns

Program calculates gutter elevations of curb returns such that all points in the gutter lie in a plane which is defined by the grade lines of the two intersecting curbs. This method is superior to a straight grade from P.C. to P.T. due to its aesthetic value and ease of forming.

165 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01127-41 : Elev on VC or Tangent in Super Transition at Pts or Interval

Given in and out grades, LVC, PI station and elevation, program calculates and stores curve properties for future calculations. Optional super transition requires cross-slopes and stations at two locations plus an offset dimension to function. Additional user options include storing and printing elevations plus choice of auto-interval or isolated point calculations.

235 Program Steps
Necessary Accessories: One Memory Module, card reader.
Documentation — $12.00 Cost of 2 cards — $2.50

01132-41 : Field Book Data for Centerline and Curb Offset Staking

Program is designed to calculate deflection angles and short chords for three concentric circular curves, the central curve being centerline, the other two curves being two foot offset lines to back of curb. Data is generated in a format allowing easy entry in a field book. Full use of alphanumerics is made.

184 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01153-41 : Point on Curve

Given curve data and incoming bearing and quadrant or azimuth of tangent, the program determines bearing perpendicular to the tangent of any station on the curve. Need this bearing to slope stake and cross section roadway at specific station on curve (use hand compass).

216 Program Steps
Necessary Accessories: One Memory Module and Card Reader
Documentation — $12.00 Cost of 3 cards — $3.75

01177-41 : Spiraled Curve with Offset Baseline

This program eliminates the method of setting up the transit on the tangent to spiral (T.S.), and spiral to tangent (S.T.), to lay in the spirals, and then setting up on the spiral to curve (S.C.) or curve to spiral (C.S.) to lay in the simple curve. Any station with any offset can be layed in with the transit at any station and offset.

Necessary Accessories: One Memory Module
Documentation — $14.00 Cost of 4 cards — $5.00

01182-41 : Land Survey Measurement

This program computes the error of closure, adjusts the traverse and determines the final coordinates, elevations, bearings, horizontal distance of the sides and the area of a polygon. It also computes coordinates and elevations for side shots.

537 Program Steps
Necessary Accessories: Three Memory Modules
Documentation — $12.00 Cost of 6 cards — $7.50

01221-41 : Cut & Fill Calculation of Earthwork X-Sections

From a canal or road x-section reduces, from inclinometer angles and slope distances measured at right - angles from the center-line, the cut and fill required to excavate to a required formation level and width with known batter slope. Co-ords also output for plotting natural section on theoretical section.

381 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

01224-41 : Earthwork Quantities

This program computes and accumulates excavation and/or fill quantities by the average end area method, with optional prismoidal correction function. Required information; cross section coordinates and the interval between cross sections.

198 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01320-41 : Coördinate Geometry System

CGS1 — A complete system for coördinate geometry calculations. Stores unlimited size files of N/E coördinates on cards. Computes traverses, inverses, intersections areas, curve data, field angle traverse. Use for subdivision design, highway allignment, wherever lines and curves are used to obtain coördinates.

1445 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C, Card Reader and Printer
Documentation — $25.00 Cost of 25 cards — $31.25

01406-41 : State Plane Coordinates

A comprehensive software package for dealing with state plane coordinates. Given lat. & long. finds x- and y-coordinates, and vice versa. Converts coordinates directly from one zone to another. Finds mapping angles and scale factors. Also determines distances, arc-chord corrections, grid and geodetic azimuths between any two points. The unique configuration of this 5-program package allows great flexibility without requiring frequent switches of programs or data. All four coordinate systems used in the U.S. can be handled, including the Alaska-1 projection.

1575 Program Steps
Necessary Accessories: Quad Memory Module (although three Modules will suffice with a small sacrifice of flexibility), card reader. Printer is optional.
Documentation — $20.00 Cost of 14 cards — $17.50

01409-41 : Slope Stakes

Provides the "x" and "y" coordinates for the intersection of a given slope ratio with existing ground line and the slope distance from same to center line. Applicable to both construction and design stages. Required: ground line coordinates; slope ratio; and grade structure dimensions.

106 Program Steps
Necessary Accessories: Printer desirable
Documentation — $8.00 Cost of 1 card — $1.25

01458-41 : Coordinate Geometry I

Point # file system for coordinates. Allows entry of coords prior to or during calculations for flexibility. Alpha prompting and formatted output with or without printer. Includes Trav, Sideshots, Inv, Radial Stakeout and 3 intersections.

626 Program Steps
Necessary Accessories: Three memory modules. Printer optional.
Documentation — $14.00 Cost of 6 cards — $7.50

01504-41 : Reduction of Measured Distances for Temp Tape Length & Slope

This program stores tape length correction values for one or more tapes, recalls these tapes by serial numbers and by inputting field distance, temperature and zenith angle, solves for horizontal distances. For ease in use, all user steps are fully prompted.

132 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01513-41 : Volumetric Calculation for Inventory by Contour Point Survey

This program uses measured triangular horizontal distances and vertical depths to calculate volumes.

381 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

01660-41 : Geodesic Arc Length, Azimuth

Input latitude and longitude of two points and get distance, azimuth, and back azimuth based on the reference ellipsoid of your choice. Uses the Andoyer-Lambert formulas with second order flattening term as derived by Thomas.

308 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01679-41 : Reverse Curves Between Two Parallel Lines

Given a distance between two parallel lines, and the degree of curvature for two simple curves, calculates the simple curve data. The two curves need not have the same degree of curvature.

175 Program Steps
Necessary Accessories: 1 Memory Module (or HP-41CV), Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

01695-41 : Star Position Prediction

Given latitude, right ascension declination and local siderial time this program computes the azimuth and zenith distance to the celestial body. Designed for surveyors taking stellar observations. A subroutine for repeated predictions is provided as are results formating routine for use with printer.

222 Program Steps
Necessary Accessories: 1 Memory Module (Printer optional)
Documentation — $12.00 Cost of 2 cards — $2.50

01706-41 : Spirals

This program calculates field data for spirals and offset spirals. It enables the user to set on any point on the spiral (or offset) and sight any other point or sight tangent. Options: (1) Chaining from (successive stations) or (one station and moving ahead when desired), (2) Auto-stationing.

269 Program Steps
Necessary Accessories: 1 Memory Module (Printer useful)
Documentation — $12.00 Cost of 3 cards — $3.75

01743-41 : Surveying Conversions

Designed for New Zealand and other countries which have gone from imperial to metric units. This program gives conversions to and from links acres and other units used in the commonwealth. Note that feet and inches are not catered for. Full use of alphanumerics is made.

170 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

01766-41 : Area and Center of Gravity by Coordinate Geometry

This program calculates the center of gravity (both X and Y coordinates) and area in square units of any traverse or area when the coordinates of all points are known. The program can be used to determine the C.G. of flat plates and centroids of earthwork sections.

98 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01835-41 : Statics of Cables

Given the horizontal and vertical distances between two bearings, specific weight and maximum sag of a two-point-suspended cable, this program solves for size, angles, and components of all forces, position of max. sag and length of cable. Positions of any sag and sag at any position may be calculated. Includes plotting, routine.

263 Program Steps
Necessary Accessories: One memory module, Math Pac I. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01934-41 : Bearing Turner

Given a beginning bearing, program will solve for new bearing after each successive deflection is entered. Labels output N/S bea E/W. Faster than a traverse when distances and coordinates are not needed.

91 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01945-41 : UC-Universal Horizontal Curve Any Combination of Spirals

This 2 package program solves 5 types of horizontal curves: Type 00 Equal length spirals Type 01 Spiraled on near end only Type 02 Spiraled on far end only Type 03 Different length spiral on each end Type 04 No spirals After solving curve, a second program prints curve stations in station format (e.g., 123 + 45.67).

1103 Program Steps
Necessary Accessories: Quad Memory Module (Printer is recommended for first program and necessary for second program)

Documentation — $16.00 Cost of 11 cards — $13.75

01975-41 : Traverse Area Boundary Survey (Tabs)

This program will calculate the area and closure of a lot, traverse the boundary by BRG/DIST, coord or any combination thereof, calculates the arc, radius, delta and tangent lengths of a curve along the boundary line.

457 Program Steps
Necessary Accessories: One Memory Module and Card Reader

Documentation — $12.00 Cost of 4 cards — $5.00

02060-41 : Earthwork Quantities by Borrow Pit Method

DCOMP is a comprehensive program used to analyze earthwork quantities by the borrow-pit method. Use of the cassette drive is required and allows for virtually unlimited data storage capabilities. Using DCOMP, earthwork analysis becomes a simple and manageable task. Alternative situations can easily be tested and grade adjustments rapidly checked. English units are used. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC.

701 Program Steps
Necessary Accessories: Cassette Drive, HP-IL Module, Printer, HP-41CV or 41C with Quad Memory Module

Documentation — $14.00

02191-41 : US-Horizontal Curve With Unequal Length Spirals

Solves horizontal curve with different length spiral on each end. This program can use "PCURSTA", User's Library program number 01945C.

310 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02211-41 : Road Grade Computer

Program computes stations and elevations for symmetrical and unsymmetrical vertical curves and also for straight grades. For vertical curves, program will compute turning point station and elevation. Will solve for station elevation or if a station interval distance is inputed, program will automatically output successive stations and elevations until end or pvt. station is output. Data is output in standard form: STA=12+56.67 not 1256.67!

207 Program Steps
Necessary Accessories: One memory module. Card Reader and Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02223-41 : New Zealand Map Grid Computations

The NZMG is a specialized projection developed especially for mapping New Zealand with minimum distortions. This program inter-computes between latitude and longitude and Northings and Eastings. A separate routine has been included for card reader data input. Copies of two relavant technical papers are provided.

351 Program Steps
Necessary Accessories: Two memory modules. Card Reader optional.

Documentation — $14.00 Cost of 6 cards — $7.50

02256-41 : Horizontal Curve Layout by PC Deflection & Short Chord Meth.

Given the following: radius, delta, PC station, road width and offset distance. Output: (1) Centerline curve data (radius, delta, arc, tangent, Pc. & Pt. station). (2) Curve deflection data - at a given station or automatically, given an interval distance until pt. station is outputed. (3) Centerline short chord distance between stations and left and right of centerline - if road width and offset distance are inputed.

220 Program Steps
Necessary Accessories: One memory module. Card Reader and Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02261-41 : Predetermine Area - Trapezoid Lot Solutions

The area of a land parcel must be divided so that a trapezoid of desired area can be solved, by sliding one of the parallel sides. The required data is as follows: Base side horizontal distance; Interior angles at each end of the base side; the needed area to be enclosed by the trapezoid lot. Program will work only on trapezoid lots! The side opposited base side must be parallel to the base side.

93 Program Steps
Necessary Accessories: Card Reader and Printer optional.

Documentation — $8.00 Cost of 1 card — $1.25

02273-41 : Spiralled Curve

Solves horizontal spiralled curve. Curve based on arc definition. Only inputs are deflection, degree of curvature, and length of spiral. This program can use "Pcursta", Users' Library 01945-41, to print curve stations.

232 Program Steps
Necessary Accessories: One memory module. Printer recommended.

Documentation — $12.00 Cost of 3 cards — $3.75

02287-41 : Fix Area Solution - Closing Back To Beginning Point

Given a predetermined area to be contained by a traverse, program will traverse around a boundary and compute closing bearings and distances needed to contain this predetermined area. Program will not traverse a curve boundary but segment area can be handled by program. Program will handle a curve if long chord distance and chord bearing is known.

133 Program Steps
Necessary Accessories: Card Reader and Printer optional.

Documentation — $12.00 Cost of 1 card — $1.25

02311-41 : 3W Leveling With HP-41 Used For Data Storage

With this program, the HP-41 is used for storage of data obtained in the field during a 3W level survey, checks gross erroneous readings and data can be viewed before storage. The second part prints the data and computes the elevations, distances and total distance.

261 Program Steps
Necessary Accessories: One memory module, Card Reader and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

02313-41 : Taquimetric Survey For Compass Theodolites

These programs were developed for taquimetric surveys with compass theodolites. The HP-41C is used for data storage in the field and in the office. Calculates; Azimuth, difference in level, real distance and coordinates without reentering the data manually for each phase of calculations. This system is perfectly usable for other theodolites with a clamp on compass, if it has the necessary distance wires.

419 Program Steps
Necessary Accessories: Minimum of one memory module. Card Reader and Printer optional.

Documentation — $14.00 Cost of 8 cards — $10.00

02319-41 : Automatic Point Storage With the 41 Survey Pac

Program provides point storage to the traverse, inverse, and sideshot program (pages 10-29), in the HP-41 Survey Pac. A maximum of 110 point coordinates can be stored. Allows inverse between points in memory without reentering coordinates. A compass/Crandell Rule Adjustment program is included. Adjustment program, automatically recalls, adjust, restore, and output finish traverse - without needing input. HP-41 Survey Pac Module must be used!

568 Program Steps
Necessary Accessories: HP-41 with Quad Memory, 41 Survey Pac. Card Reader and Printer optional.

Documentation — $14.00 Cost of 5 cards — $6.25

02341-41 : Vertical Curve Alignment

This program solves problems related to alignment of any vertical curve by equation of parabola. For easy book keeping the program computes and displays station, height of curve and tagent offset.

186 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 2 cards — $2.50

02405-41 : Universal Transverse Mercator Zone to Zone Transformations

This program transforms coordinates and azimuths from one universal transverse mercator (UTM) grid zone to an adjacent one. It complements computations done on Department of the Army (DA) Forms 4212 and 4259 (UTM zone to zone grid and azimuth transformations). DA Technical Manual 5-241-2 must be used for some of the program input data.

169 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02424-41 : Curve Spiraled on One End Only

Solves horizontal curve with spiral on one end only. Curve based on arc definition. This program can use "PCURSTA", Library #01945C, to print curve stations.

196 Program Steps
Necessary Accessories: One memory module. Printer recommended.

Documentation — $12.00 Cost of 2 cards — $2.50

02429-41 : Unsymmetrical Verticle Curves

This program calculates station and elevation data for unequal tangent verticle curves and equal tangent curves. Required variables are length of each tangent, beginning and ending grades and either PC STA & Elev or PI STA & Elev.

473 Program Steps
Necessary Accessories: Three memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

02430-41 : Traverse Angle Balance Made Easy

Balance traverse angles for closed traverse or line traverse closing on a known point. Can use angles left or right or deflection angles. Input reference bearing, closing bearing if different from reference and angles. Output of total angular error, error per setup and adjusted or unadjusted bearings or azimuths. Input is fully prompted for. Allows you to review all angles input and change any angle at any time.

320 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02446-41 : Map Check One

Given a traverse consisting of bearings and horizontal distances - program will solve for the following: Linear error of closure; Total error of North's and East's; Closure precision; Total traverse distance; Area in square feet and acres; Closing bearing and distance to beginning point. Also, program will solve for missing side of a closed traverse. In addition, program will remove a traverse side input incorrectly - without having to start over!

220 Program Steps
Necessary Accessories: One memory module. Printer and Card Reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02454-41 : Redfern's Mercator Computation

Using Redfern's formulae, this program converts latitude and longitude to northings and eastings (and vice-versa) on any transverse mercator projection on any spheroid. Examples are given on how to store projection details of commonly used projections in the program. Examples are given using Southern Hemisphere data only.

709 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 15 cards — $18.75

02476-41 : Simple Curve Solver

Given any two of the following: Radius or degree of curve, (arc definition), delta, arc length or tangent. Program will solve for the following: Radius, degree of curve, delta, arc length, long chord, tangent, and segment area (in square feet).

132 Program Steps
Necessary Accessories: Card Reader and Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

02559-41 : Surveyor's Star Almanac

Using the Star Alamanc in the Navigation Module this program takes the number of a star from the *Star Almanac for Land Surveyors* and, if the module, returns the right ascension and declination for further use.

169 Program Steps
Necessary Accessories: Navigation Module

Documentation — $12.00 Cost of 2 cards — $2.50

02562-41 : Calculations on the Australian Map Grid

This program reduces observed quantities using calculations appropriate to the Australian Map Grid to first order accuracy. Output is Northing and Easting of final point.

249 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02569-41 : Profile — 2 Elements

Produces printout that reflects relationship of computed grade and given surface elevations. Plotting is at 1/2" intervals on a fixed "X" scale of 1" = 100'. Provides choice of: Begining and Ending stations; "Y" scale; "X" axis and Begining Grade elevations; and Percent of Grade. Prompts for all input. Related Programs 01224-41, 01409-41.

244 Program Steps
Necessary Accessories: One or more memory modules and printer. Card Reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02592-41 : Survey Pac Supplement - Point Storage For Trav and Inter

The Survey Pac is a powerful tool for coordinate geometry, however it is lacking one significant feature: a means to store and retreive coordinate points. This program supplements the Survey Pac with revised trav. and Inter. routines that are integrated with point storage, retrieval, and manipulation routines. Points may be stored to memory or to magnetic cards. With Quad memory module approximately 70 points may be stored in the HP-41.

623 Program Steps
Necessary Accessories: Survey Pac, three memory modules. Printer and Card Reader optional.

Documentation — $14.00 Cost of 6 cards — $7.50

02678-41 : Northing and Easting to Latitude, Longitude and Grid Convergence

Input Northing and Easting AMG coördinates and output will be latitude, longitude and grid convergence.

320 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

02679-41 : Northing and Easting to Azimuths and Distance

This program uses inputs of Northing and Easting of two points to calculate forward, reverse azimuths and distance between them.

226 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02712-41 : Reduction of Steel Band Measurements

This program reduces observed steel band measurements to horizontal distances. The corrections applied are: temperature, tension (or pull), sag (for any number of bays), and slope. Units are SI units. Any other band can be used, if its coefficient of linear expansion and its cross-sectional area are known.

198 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02765-41 : Universal Table Generator Max-Min-Zero-Plot

This program is used to create numerical tables from the vast unlimited simple to complex $f(x)$ equations that lie within the interval of convergence (I.O.C.) $x_1 \leq x \leq x_2$. This program also will locate points and their corresponding maximum, minimum and even zero $f(x) = 0$ values in the order of their occurrences in a given $f(x)$; do plottings of $f(x)$ equations. A "must" program for structural/stress engineers who deal with points of maximum design values; mathematicians. Ten examples included!

268 Program Steps
Necessary Accessories: HP-41C/CV peripheral printer; quad module optional depending upon the registers used in the secondary program.

Documentation — $12.00 Cost of 8 cards — $10.00

02796-41 : Stadia Reduction and Elevation Adjustment

Given the stadia interval, vertical angle, height of instrument and rod reading, the reduction program calculates horizontal distances, differences in elevations and elevations. The adjustment program, if used in conjunction with the reduction program, requires little or no input. When used alone, beginning elevation, horizontal distances, and differences in elevations are required as input.

295 Program Steps
Necessary Accessories: One memory module. Additional modules required as number of points increase.

Documentation — $12.00 Cost of 3 cards — $3.75

02829-41 : Radius Design

This program solves for a curb line radius at a specified radial distance from an intersection of two tangent centerlines. Roadway widths need not be the same. Also computes the side distances from the intersection to the beginning of curves on the centerlines. A subroutine may be used to change the radius to an even foot if desired, and all data is recomputed automatically. The subroutine may be used to solve a typical curb return intersection problem without the main body of the program.

227 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02841-41 : Archeological Electrical Resistance Survey

The program is for field use. It provides for entering each resistance measurement (with error correction) and completes the set of measurements by adding time, date, and name. It prints a data table and records data on cards. It plots raw data and/or "filtered data" to improve field interpretation of survey.

367 Program Steps
Necessary Accessories: X-Functions module, Time Module, Card Reader and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

02869-41 : Latitude and Longitude to Northing and Easting

This program converts geographical coördinates, latitude and longitude, to A.M.G. coördinates, northing and easting.

206 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02952-41 : Ft, In, 1/16ths Right Triangle and Arithmetic

This program allows entry of dimensions in feet, inches, and sixteenths of an inch (FIS), and addition, subtraction, multiplication, and division using RPN logic. Also, right triangles are solved in FIS given any two sides, or an angle and a side. Format for FIS is aa.bbcc, where aa equals feet, bb equals inches (to 99), and cc equals sixteenths of an inch (to 99).

208 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02953-41 : Level Reduction With Optional Adjustment

This program will reduce observations in a level traverse and, at the user's request, will store and then adjust the RL's of the change points only, not any intermediate shots. Intermediate shots are output immediately after input, while the change points are numbered in the final output.

145 Program Steps
Necessary Accessories: Memory Modules = INT(1 + (n + 4)/64)
Documentation — $12.00 Cost of 2 cards — $2.50

02960-41 : Coordinate Inverse Traverse

Coordinate inverse traverse calculates bearing and distance between two coordinated points. It stores the final of the two points so as to be used for calculating the bearing and distance to the next point without re-input of coordinates. It also calculates the area of the figure (only meaningful for closed traverses).

124 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

03033-41 : Great Circle Distance/Bearing

This program computes the great circle distance and true bearings between two points on the earth given the coordinates. Conversely, given a point on the earth, and the distance and bearing to a second point, the program calculates the latitude/longitude of the second point and the bearing from the second point to the first.

254 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

03065-41 : Earthwork Directly From Topo or Cross Section Surveys

This program calculates cut and fill quantities from a topographic map having existing and proposed contours or from cross section surveys which use the same cross sections and base line for both existing and proposed grades. This program eliminates the need to plot and plainimeter cross sections, and will handle a job of any size.

691 Program Steps
Necessary Accessories: Four memory modules or quad memory. Printer optional.
Documentation — $14.00 Cost of 7 cards — $8.75

03072-41 : Segmental Spiral

Calculates data for a connecting spiral between two curves. Unlike Barnett's solution (equivalent spiral angle), this program examines the connecting spiral as a part or segment (hence the name) of a larger simple spiral, tangential at one end (Dc=0), the larger radius (smaller Dc) at a distance 'l' and the smaller radius (larger Dc) at a further distance 'La' (the connecting spiral length). Imperial or Metric options.

270 Program Steps
Necessary Accessories: Printer recommended
Documentation — $12.00 Cost of 2 cards — $2.50

03104-41 : Volume by Average End Area Method

Program assumes a survey or design exists with cross-sections described by distance/elevation co-ordinate pairs and a section stationing. At each section the program prompts for the stationing then for successive distance/ elevation pairs. Output is station label, section area, volume output is station label, section area, volume increment (between sections) and final volume.

131 Program Steps
Necessary Accessories: Thermal Printer optional
Documentation — $8.00 Cost of 2 cards — $2.50

03132-41 : Single or Compound Curve Offsets

This program can be used for intersection design utilizing either a single or a compound curve. Road widths, taper angles, various radii and offsets are taken into consideration for different skews. Minimum and maximum offsets from the intersection can be calculated for compound curves.

382 Program Steps
Necessary Accessories: HP-41C would require one memory module. Card reader and printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

03136-41 : Cogo Plus

This program will store and recall coordinates by point number in large data files on the cassette. The usual file size is 500 coordinate points. This is a designer's program and consists of three main parts: Traverse, Intersection, and Horizontal Curve Solutions. The HP Survey Pac Manual and keyboard overlays can be used. Bearings are printed in the same format as used on plans and plats. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC.

1183 Program Steps
Necessary Accessories: HP-41CV, IL Module, Cassette Drive, HP 82162A Printer
Documentation — $16.00

03141-41 : Vertical Design Extended

Program calculates levels at regular intervals, with the possibility to calculate at those intervals up to 10 sidepoints. Input is the chainage, curvelength and height for the points of intersection. No of PI's dependent on SIZE of extended memory. Options: design line only, crossfall or camber, 10 points per chainage max.

467 Program Steps
Necessary Accessories: A minimum of two memory modules, Extended Functions module and printer
Documentation — $12.00 Cost of 5 cards — $6.25

03213-41 : Reduction of Steel Band Measurements (2nd Version)

This program reduces observed steel band measurements to horizontal distances. The corrections applied are: temperature, tension (or pull), sag (for any number of bays), and slope. Units are SI units. A non-steel band can be used, if its coefficient of linear expansion and its cross-sectional area are known.

202 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03230-41 : Vertical Design

This program calculates levels at regular intervals, with the possibility to calculate at those intervals up to ten sidepoints. Input is the chainage, curvelength and height for maximum 63 points of intersection. Data can be recorded on and reloaded from cards. Options: design line only; crossfall or camber; ten points per chainage maximum.

514 Program Steps
Necessary Accessories: Four memory modules or quad memory module.
Documentation — $12.00 Cost of 5 cards — $6.25

03270-41 : Area Calculation From Coordinates with Distance Control

This program calculates the area of a polygon under the input of the corner's coordinates. Further the distance between two coordinates becomes calculated.

94 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03291-41 : Set/Offset Curves From Centerline B.C., Direct

This program provides calculations for offset points on circular curves, direct from the centerline B.C. Deflection angles and long chords are calculated for centerline. Offsets for left and right sides calculated automatically. Angles are displayed in azimuth form, (clockwise reading circle). Ideal for staking offset lines on curbs, sewers, storm drains, and radial lot corners.

250 Program Steps
Necessary Accessories: One memory module for HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

03302-41 : Layout Program for Curves, Simple Spirals, Segment Spirals

This program calculates the layout data for a circular curve, a simple spiral, or a segmental (connecting) spiral. Layout may be from either end, using any setup, backsight, and foresight station. Output consists of the deflection and chord from the setup and the chord from the previous foresight. Degree of curve or radius input accepted. Stationing is in standard format (ie: 12+34.567). Auto-increment of foresight data output is included.

413 Program Steps
Necessary Accessories: One memory module. Printer is recommended.

Documentation — $12.00 Cost of 3 cards — $3.75

03513-41 : Universal Transverse Mercator to Geographic Conversions

This program will convert both ways between Geographic and Universal Transverse Mercator systems. The program is set up to use the Clark Spheroid of 1886 (USA System), but constants are included for the International Spheroid (Europe) and formulae are included to generate constants for other systems (e.g. Bessel Spheroid).

287 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

03536-41 : Coordinate Plotting (Manual)

With a minimum of materials and a HP-41, the user can quickly plot coordinates with very high precision at any scale. Program prompts for input, computes map dimensions (optional) and outputs plotting information. All output is labeled and easy to comprehend. A printer is not needed but is most useful.

282 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

03551-41 : GLO Modified Single Proportion

Using their own coördinate system, a surveyor inputs coordinates reflecting "record" General Land Office (GLO) bearings and distances. It is assumed that there are are "good" corners at both ends. The program computes the proportionate latitudes and departures and the resulting new coördinates according to the method of "modified single proportionate measurement" as described in the *Manual of Survey Instructions, 1973*, Pages 137-138.

249 Program Steps
Necessary Accessories: None. Printer is helpful.

Documentation — $12.00 Cost of 3 cards — $3.75

03558-41 : GLO Simple Double Proportion

Using his own coördinate system, the surveyor can easily input General Land Office (GLO) information and determine the coordinates of the "missing" corner. This program conforms to the method of "double proportionate measurement" as set forth in the *Manual of Survey Instructions, 1973*, Pg. 134.

122 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

03592-41 : GLO Single Proportion

Using his own coördinate system, the surveyor can easily input GLO (General Land Office) information and determine the coördinates of the "missing" corner. This program conforms to the method of "single proportionate measurement" as set forth in the *Manual of Survey Instructions, 1973*.

87 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

B802 Surveying
Aerial or Photogrammatic

B804 Surveying
Cadastral

03500-41 : Offsets From Random Traverse To True Line In Field

This program calculates north and east coordinates along with perpendicular offsets from true line, plus horizontal distance, azimuth, and angle right to end of line from each new traverse point while in the field. This program also has two subroutines that can be used independently to reduce doubled horizontal angles and average direct and indirect zenith angles in the field.

196 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

B806 Surveying
Control

03279-41 : Super Curve: Horizontal Curve With Any Combination of Spiral

This program solves horizontal curve geometry with any combination of spirals. Stationing is output in standard format (ie: 123 + 45.678). Coordinates can be solved for all of the transition points as well as for any point on the alignment, defined by station. Increment for auto-output of stationing and coordinates pairs is included. Imperial or Metric inputs for curvature accepted.

688 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 6 cards — $7.50

03302-41 : Layout Program for Curves, Simple Spirals, Segment Spirals

This program calculates the layout data for a circular curve, a simple spiral, or a segmental (connecting) spiral. Layout may be from either end, using any setup, backsight, and foresight station. Output consists of the deflection and chord from the setup and the chord from the previous foresight. Degree of curve or radius input accepted. Stationing is in standard format (ie: 12+34.567). Auto-increment of foresight data output is included.

413 Program Steps
Necessary Accessories: One memory module. Printer is recommended.

Documentation — $12.00 Cost of 3 cards — $3.75

03437-41 : Section Breakdown

This program allows the user to breakdown a section of land by the *Manual of Instructions for the Survey of the Public Lands of the United States (1973) Rules*. The user is required to enter the four section corners of a section by coördinates and any quarter corners found. Missing quarter corners and center of the section are found along with any sixteenth corners desired. This program is a real time saver for office or field.

362 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

B808 Surveying Topographical

01497-41 : Grade Staking

This program assists the surveyor or contractor in the measuring of "Ground Elevations" (real or assumed). The "Invert Elevations" (flow line of drain lines or the finish grades or excavation projects) and the difference (cut or fill).

492 Program Steps
Necessary Accessories: 2 Memory Modules; Printer is optional.

Documentation — $12.00 Cost of 5 cards — $6.25

01701-41 : Circular Curve Layout for Base Line or Offset Line

This program provides calculations for circular curve field layout. The program will provide the following data: stations, deltas, right deflections, left deflections and chord distances for either base line or offset line. Data is computed on either an interval or point solution with the end station computed also.

245 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01702-41 : Topographic Surveying

This program calculates horizontal distance and elevation from the three stadia wire readings; using any vertical angle mode (direct or inverted). It also incorporates a stadia check by comparing half stadia to full stadia; calculates tape topo, x-sections in percent or degrees and vertical angle profiles.

104 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01884-41 : Slopestake Set and Check

This program provides control over all possible variables in setting or checking slopestakes, including ditch data, and cutslopes and fillslopes. Output is actual cut or fill from stake to grade, and actual horizontal distance from stake to centerline, compared to calculated horizontal distance based on template data and stake location.

100 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01892-41 : Clarke's Mid-Latitude Geodetic Formulae

Given latitude and longitude of a point and either the latitude and longitude of another or an azimuth and distance to another, this program will calculate the missing information. Over distances of up to 150 km the results are to geodetic accuracy. Any spheroid can be used, 'International' data supplied.

446 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 4 cards — $5.00

02180-41 : EDM Topog Reduction

Reduces EDM topography from angle/distance to station and offset left/right relative to a centerline or baseline. EDM can be on CL or on a point either left or right of CL. Backsight can be ahead or back, or to the point from which EDM is located from CL.

127 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02223-41 : New Zealand Map Grid Computations

The NZMG is a specialized projection developed especially for mapping New Zealand with minimum distortions. This program inter-computes between latitude and longitude and Northings and Eastings. A separate routine has been included for card reader data input. Copies of two relavant technical papers are provided.

351 Program Steps
Necessary Accessories: Two memory modules. Card Reader optional.

Documentation — $14.00 Cost of 6 cards — $7.50

02417-41 : Horizontal Curve — Spiraled or Simple

Solves horizontal curve — either spiraled or simple. Curve based on arc definition. Simple curve may be defined by degree or radius. This program can use "PCURSTA", Users' Library 01945-41, to print curve stations.

293 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

02959-41 : Intersection

This program is used in map reading to determine an unknown point in the UTM grid coordinate system given the location of two known points and the azimuths from those points to the unknown point.

114 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03103-41 : Distance

This program is used in map reading to determine the distance between two points on a map given their grid coordinates in the UTM (Universal Transverse Mercator) grid coordinate system.

50 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03140-41 : Resection

This program is used in map reading to determine the location of an unknown point in the UTM (Universal Transverse Mercator) grid coordinate system given the grid coordinates of two known points and the azimuths from the unknown point to those 2 points.

108 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03202-41 : EDM (Electronic Distance Meter)

When used with a total station, this program computes horizontal distance, height of instrument, elevation of point, station, and distance out from centerline station. Instrument may be on centerline or a parallel offset line either right or left of centerline. Backsight may be ahead or back. Zenith and horizontal angles are input as read from the instrument.

215 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

03292-41 : Parallel Spiral Curve Offset Chain Distance Corrections

This program is written to calculate chaining distance corrections for parallel spiral curves. The results are that the offset points are at right angles to any coresponding point on the centerline spiral. Ie: Offset hub stakes for paving grades and alignment.

48 Program Steps
Necessary Accessories: Printer optional.

Documentation — $8.00 Cost of 1 card — $1.25

03300-41 : Azimuth

This program is used in map reading to determine an azimuth between two points on a map given their grid coordinates in the UTM (Universal Transverse Mercator) grid coordinate system.

53 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03434-41 : Least Squares Circle Fitting

This program allows one to estimate from n points, the center's coördinates (x_c, y_c) of the circle and the radius (R) which fulfill the least squares principle. Also, it is possible to force the circle to go through by specific points.

277 Program Steps
Necessary Accessories: Math module.

Documentation — $12.00 Cost of 3 cards — $3.75

SOLVE and INTEGRATE

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BUSINESS and FINANCE

D000	**Business and Finance**	D350	Inventory Control
D050	Accounting	D400	Leasing
D052	General Accounting	D450	Lending/Savings
D054	Payroll Accounting	D500	Marketing Sales
D100	Cost Analysis Estimation	D550	Personal Finance
D150	Forcasting/Planning	D600	Real Estate
D200	General Investment Analysis	D650	Securities
D250	Industrial Production	D700	Taxes
D300	Insurance/Retirement		

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included in 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

D000 BUSINESS AND FINANCE

00432-41 : Foreign Currency Converter

This program consists of 2 related routines that enable a) conversions between any 2 of 52 stored currencies; b) conversion from 1 to all 51 other currencies; and also c) interconversion between any foreign currency and your home currency. Features convenient entry and error recovery.

223 Program Steps
Necessary Accessories: Two Memory Modules (3 preferable). Card Reader optional.

Documentation — $12.00 Cost of 7 cards — $8.75

00550-41 : Open to Buy/Monthly Sales Fcst

The average retailers activity of sales and purchases for annual period is built from any one of: (1) annual sales, (2) total net purchases @ LCD or (3) by product area, with or without % of total purchases in that product area, for the brand known. Output in terms of: total sales, laid down cost of goods sold in total & by product area, resulting gross profit, forecast sales and open to buy (monthly based on industry/known average).

358 Program Steps
Necessary Accessories: Card Reader, Printer and Two Memory Modules.

Documentation — $12.00 Cost of 7 cards — $8.75

00649-41 : Consumer Price Index

This program can be used to compute the consumer price index. The Laspeyres, Paasche, Marshall-Edgeworth, and Fisher's ideal indices are provided. These indices can be used to infer whether increases or decreases have occurred in consumer welfare. The number of items in the market-basket is not limited.

75 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00664-41 : Cash Register

Converts 41C into a personalized electronic cash register which prints store name, location, and sales-person's name (up to four salespersons). Other functions include: error, overring, and reading operations. Numerous tests minimize operator error. Unique single button operation frees operator's hands, computes tax automatically.

221 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00835-41 : Standard Business Functions

This program provides one-button addition with item count, automatic repeat, and prints all entries double wide. This program also provides for constant multiplication, and calculates per-cent of totals like the HP-38C. Another routine calculates the unknown if any two of cost, selling price, or % margin are entered.

112 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

00907-41 : Economic Analysis of Energy Conservation Investments

Program is designed to help make decisions about energy conservation investments such as insulation, new furnace, or solar collector. It is based on simple present value formulas and "life cycle" cost analysis. The algorithm also uses the rate of escalation of energy costs.

122 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01103-41 : Compound Interest Tables

This program is for those people who like to or must use interest tables but hate to search through pages of factors. By giving the calculator the interest rate and number of periods it will calculate the factors for F/P (future value given present value), P/F, A/F, A/P, F/A, P/A, A/G, and P/G.

102 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01124-41 : Decision

Program sets up and solves a decision matrix. Up to 9 separate options can be evaluated against any number of criteria to select the best option. The method breaks up any large decision into a series of small decisions.

189 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01285-41 : Time Plan

This program is designed to allow the user to schedule activities for the day, week, or month. Each activity is assigned a weight which specifies its priority. After each addition or deletion, the list of items is re-prioritised with the heaviest weighted item appearing first. The program is designed to be used only without the printer attached.

200 Program Steps
Necessary Accessories: HP-41CV or Memory Modules may be required and Card Reader.

Documentation — $12.00 Cost of 2 cards — $2.50

01609-41 : National Economy

This program implements the Keynesian model of the national economy with three sectors: Business, Consumers, and Government. Input is any subset of primary parameters and state variables, output is any of the remaining ones. Some of the secondary variables may also be calculated.

200 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01813-41 : Multicomponent System Manufacturing Cost with Tabular Output

Program permits calculation of manufacturing costs for mixtures of up to thirty-plus components from raw material cost, composition, processing cost and packaging cost inputs. Program affords printed table (printer available). A shorter program without printout capability is also provided.

474 Program Steps
Necessary Accessories: Printer & quad module desirable, but a 6 component mixture can still be handled with 2 memory modules. The shorter program will handle up to 11 components with only 1 memory module (no printout).

Documentation — $14.00 Cost of 5 cards — $6.25

01976-41 : Shop Prices Coding

Even though the products in your shop have prices, you may not want those prices to be generally known. What better way to control this information than to have a price code that only you can decipher. This can be easily done. Enter the price into the calculator and you will see it in code. If you enter the code you will obtain the price. The user can transform prices up to $999,999.99. This program uses only 3 storage registers.

172 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02169-41 : Automated Tally Sheet With "What If?" Capabilities

"Tally" is a how-to program, demonstrating how to develop a program for the HP-41 (with XFCN MOD) that will accept almost two dozen inputs from a tally sheet, process the data and display the intermediate and final results. Beyond this, any or all initial inputs may be changed (the results are recomputed automatically), and either all results may be viewed or selected results may be recalled using the line numbers from the tally sheet. A concrete example from the commercial roofing business is used.

375 Program Steps
Necessary Accessories: Two memory modules + Extended Function/Extended memory module

Documentation — $12.00 Cost of 4 cards — $5.00

02177-41 : Wats Feasibility Analysis

Analyze your organization's phone bill to see which WATS band would best suite your needs. Program shows number of calls, average call length, total hours, cost and cost/hour for each of 7 complete instructions to customize program for your state's WATS bands.

887 Program Steps
Necessary Accessories: Quad Memory or 41CV, X-Functions Module, Printer

Documentation — $14.00 Cost of 13 cards — $16.25

02196-41 : Statistical Budgets

In the business practice there is a permanent truth: 'actual costs never coincide with budget costs'. In fact there is a zero probability that both costs may be equal. Many facts generate the difference and are more convenient to handle the concept of work/project cost as a variable instead of an absolute value. This program takes advantage of this concept and permits a very practical 'most probable cost' determination.

103 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 1 card — $1.25

02348-41 : Cash Register

This totally automatic cash register provides categories for taxable and non-taxable merchandise, prescriptions, cigarettes, and alcohol. Provisions are also made for vendor coupons and percent discounts on taxable merchandise and prescriptions, as well as calculation of sales tax. Separate categories are used for cash, checks, and bank cards, and overrings, refunded sales, and voided sales are also facilitated. A cumulative total is kept and may be displayed at any time.

360 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

02492-41 : Cargo Insurance Valuation and Premium

Most marine and other cargo insurance is based on a percentage of the CIF value of the shipment, usually 110%. As this includes the insurance premium itself as well as the other costs, calculating the insurance valuation and premiums can be time consuming and, for those not familiar with it, confusing. This program will automatically perform all the required calculations and provide the total CIF value, valuation for insurance purposes, marine risk premium, war risk premium, and the total premium. The program also calculates brokers discounts and commissions.

199 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02495-41 : Cost Estimator

Attention cost estimators! A customized program just for you. This user- friendly program computes direct and indirect costs related to labor, materials, equipment, small tools, subcontractors and suppliers. Subcontractor and prime contractor costs may be computed individually or collectively. Two operational modes allow the user to apply pre-set or inputed rates for overhead, G & A, and profit. Included also are sales and payroll taxes, insurance, fringes, straight time, overtime, bond, and weighted profit guideline routines.

706 Program Steps
Necessary Accessories: HP-41CV, IL-Printer, Extended Functions/Memory Module

Documentation — $16.00 Cost of 10 cards — $12.50

02577-41 : Standard Ad Units and Advertisement Sizes

With an input of the column width of a newspaper in picas, the space between the columns, and the depth of an ad in any unit, the program calculates the width of the advertisement in inches and picas for a given number of columns and advises which Standard Ad Unit (SAU) number it fits or if the ad is nonstandard. If the ad is slightly smaller than an SAU size, display indicates that it will float. Other indicators are if the ad will fit a tabloid and if the size is only for a 6-column broadsheet. Included is an advertisers' and printers' measure converter interchangeable between picas, lines, ciceros, inches, and millimeters.

582 Program Steps
Necessary Accessories: Two memory modules. Printer optional.

Documentation — $12.00 Cost of 6 cards — $7.50

02613-41 : Spread Sheet

This program allows the user to input collected data and manipulate it to produce any user defined output. A maximum of 20 input/output data columns are accommodated. It permits checking and correcting with whatever frequency the user defines. The user must write sub-programs to describe the output desired (register math).

241 Program Steps
Necessary Accessories: Additional memory modules and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

03153-41 : Spreadsheet/Cashflow Program

Program provides a small spreadsheet for the HP-41C with up to 40 rows and up to 9 columns (limited to about 150 elements), with capability for a comprehensive analysis of a cash-flow profile generated by the spreadsheet (including graphical presentations). A spreadsheet can be stored indefinitely in Extended Memory or can be transferred to magnetic cards.

867 Program Steps
Necessary Accessories: HP-41C and Quad memory. Full capabilities need Extended Functions module. Printer and Card Reader desirable.

Documentation — $16.00 Cost of 10 cards — $12.50

03317-41 : Gunning's Verbal Fog Index

In a text sample, easy words, difficult words, and sentence terminators are tallied by pressing user assigned keys which give a tone feedback to pace data entry. After the first sentence terminator beyond the minimum sample of 100 words, the Fog Index is displayed and, optionally, average sentence length and percentage of difficult words. The index approximates USA high school grade level required to understand the text.

51 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

D050 Accounting

00319-41 : Installment Sales Method

One way to account for payments due at some future time when it isn't certain that the payments will be received is the installment sales method. This program yields the information necessary for a small business to account for uncertain future payments.

106 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

00395-41 : Time Tally by Category

This utility program allows the accumulation of times spent in various portions of a project or mission. The input consists of a start time and a series of project category stop times, as they occur in sequence. Total effective time and category total times are output. It is easy to use.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00396-41 : Account Posting & Summarizing

This program can be used either monthly or at year-end to post accounts, total accounts, and prepare a summary for income and expense accounts. It is designed for an individual or small business as an aid in the preparation of itemized deductions for income tax purposes.

356 Program Steps
Necessary Accessories: Two Memory Modules, Card Reader and Printer.

Documentation — $12.00 Cost of 5 cards — $6.25

00640-41 : Estimation of Cost — Stochastic Model

This program estimates the whole cost of a job, using the unit cost of the activities as a random variable. To calculate the expected value, three estimates of the unit cost of each activity will be made; the minimum unit cost, the more probable unit cost, and the maximum unit cost. Optionally, the confidence interval and several probability values can be calculated.

372 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

00759-41 : Wage Packet Organizer

For small businesses that pay weekly or monthly cash wage packets, this program will split the wage bill (by employee) into various user specified denominations, then print out a summary (i.e. No of $10 bills, no of 1 cent pieces, etc). Also gives a balancing figure suitable for any currency operating on a decimal basis.

178 Program Steps
Necessary Accessories: One Memory Module and Card Reader

Documentation — $12.00 Cost of 2 cards — $2.50

00777-41 : General Ledger

This program prints a list of all debit and credit journal entries for the month giving not only the amount but also the account name. After all entries have been made, a detailed income statement and balance sheet may be printed with net income (net loss) calculated and printed.

224 Program Steps
Necessary Accessories: One Memory Module, Printer and Card Reader

Documentation — $12.00 Cost of 3 cards — $3.75

00978-41 : 41C Labor Bugets/Distribution for Architects & Engineers

Speeds preparation of and revisions to task/labor worksheets as required by the AIA Cost Based Compensation System. An aid for negotiating professional fees for many government projects. Can also be used to perform a labor distribution from timecards for hourly employees.

145 Program Steps
Necessary Accessories: Memory Modules, one for each 32 tasks necessary. Printer optional.

Documentation — $8.00 Cost of 2 cards — $2.50

00981-41 : Tabulator

Simplifies standard crossfooting by requiring each entry to be keyed only once. Summary includes row totals, column totals, row and column proportions, and grand total. Printer recommended for verification of input data.

163 Program Steps
Necessary Accessories: Printer recommended for verification of input data.

Documentation — $12.00 Cost of 2 cards — $2.50

01007-41 : Tabulator Chain Prompted Improved (Revision A)

Improved tabulator based on 00179-41 with clean prompts and output titles. Now upon completion of all entries you are prompted to use (R/S) for display of the grand total (Tot=), the % row and column data is labeled R%1.= and C%1.= etc., and after every data entry you may view the last input with correction key.

232 Program Steps
Necessary Accessories: May Require Modules Depending on the Number of rows and columns.

Documentation — $8.00 Cost of 2 cards — $2.50

01094-41 : New York Executor Commissions — 1981

This program calculates executors' commissions as allowed under N.Y. Surrogate's Court Procedure Act Sec. 307 as amended 7/27/81. It properly allocates same between principal and income. There is also a routine handle restrictions placed on multiple executors. As an aid, the program prompts for input.

325 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01138-41 : Accounts Receivable

Program accumulates accounts receivable into data registers by invoice. It sums both yearly invoices and unpaid invoices. Paid invoices are removed from the data registers and deducted from the unpaid balance. It will also display or print sums and invoices.

169 Program Steps
Necessary Accessories: One Memory Module and Card Reader. Printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

01399-41 : Ledger, NPV

Ledger performs a wide range of manipulations with numbers, as specified by user. It can determine cash flows under any assumptions for up to 20 time periods. NPV computes the net present value of variable cash flows and determines the internal rate of return.

206 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV (ledger can function with 3 Memory Modules, NPV can function with one Memory Module). Math Pac desirable as it allows use of shorter NPV version.

Documentation — $14.00 Cost of 7 cards — $8.75

01404-41 : Hourly Analysis Costing

This program is useful for item area costing, in analysis work. After the hourly $ rate is entered, the hours spent in each area (from an analysis sheet) can be entered and the resulting cost is displayed. A printer is optional. The program lends itself for subroutine use.

72 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01547-41 : Personal Financial Balance Sheet

This program produces one's personal balance sheet, printing all current assets, fixed assets, liabilities and net worth. The change from last year and the per cent of the net worth in current assets. Items are totalized in each category until entering zero. Program then proceeds to the next group.

129 Program Steps
Necessary Accessories: Printer convenient, not necessary. Balance sheet form provided in lieu of printer.

Documentation — $12.00 Cost of 2 cards — $2.50

01555-41 : Cost of Sales and Inventory for Small Shop

Computes cost of goods sold and new inventory for small shop, keeping record of cost per item and inventory units. Accepts 40 different items per run. To work with more than 40, it is necessary to run the program as many times as multiples of 40 items you have.

72 Program Steps
Necessary Accessories: 2 Memory Modules, Card Reader (Printer optional)

Documentation — $8.00 Cost of 1 card — $1.25

01559-41 : Standard Variances

The commonly used main Standard Variances for Cost or Management Accounting all in one Program. Variances are available for (i) Sales and Trading, giving Price, Volume and Cost; (ii) Production, giving Volume and Material Use; and (iii) Material Price.

489 Program Steps
Necessary Accessories: 2 Modules. Printer Desirable.

Documentation — $12.00 Cost of 5 cards — $6.25

02200-41 : Budget Managing and Projecting System

B-MAPS is a Cassette Drive based system that automatically and totally manages a User-defined file system that perfectly matches his budget estate. The budget estate can be composed of up to twenty accounts including multiple checking, saving, loans, and stocks. Interest accruements, loan amortizations, direct deposits/withdrawals, and stock purchases can be handled as single or repeating time events. "What-if" projections can be made without losing the base budget estate. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

1356 Program Steps
Necessary Accessories: Quad Module (or CV), Extended Functions Module, Cassette Drive. Printer highly recommended.

Documentation — $16.00

02307-41 : Accounts Receivable

This accounts receivable program will keep track of up to 71 entries. Each account is identified by a six letter name. The data payment is due and the amount are stored. The program can record the accounts on magnetic cards, print out the accounts (total or partial), update (all or partial), add new accounts, delete accounts, or review accounts (all or partial).

312 Program Steps
Necessary Accessories: Card Reader and Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02386-41 : General Ledger

Complete Accounting records within the General Ledger; Facility for Budgets on Revenue Accounts; All Account Titles at User's discretion; Coding structure allows User to have sub-totals on printouts; Full Journal entry facility; Extraction of Accounts by Income Statement (with or without Budgets and Variances) and Balance Sheet. Additional program gives Sub-ledgers.

868 Program Steps
Necessary Accessories: 41CV or 41C with Quad Module; Extended Functions Module (HP82180A) and at least one Extended Memory Module (HP82181A); Printer; Cassette Drive

Documentation — $20.00 Cost of 15 cards — $18.75

02935-41 : Debtors Ageing Analysis

This program analyzes a list of outstanding sales invoices or a list of debtor balances according to their relative ages to the current data. Results are output onto printer in columnar format with summary of totals for each period analysed. The weighted average number of days the debts are outstanding or debtor turnover rate will also be calculated.

154 Program Steps
Necessary Accessories: Time Module and Printer

Documentation — $12.00 Cost of 2 cards — $2.50

03143-41 : Accounts Simplified for Small Organizations

Accounting Simplified can handle about 400 entries per period (not necessarily year) in not over 37 accounts. Monthly a printed list shows total in each account and also gain/loss and date. To trace transactions a printed list of accounts shows the amount of each entry and its identifying check number or date. A routine is included for start-up. Rules for simplified accounting are given.

576 Program Steps
Necessary Accessories: X-memory modules. Printer, Cassette Drive, and HP-41CX or HP-41CV with X-functions and two

Documentation — $14.00 Cost of 7 cards — $8.75

03445-41 : Dollar Unit Sample Selection With Extended Sample Option

This program helps to select monetary items (checks, receipts, receivable balances, etc.) for audit, based on their dollar value. This avoids the problems associated with dealing with items of different sizes. The program uses the confidence level and the basic precision (accuracy) of the required results in order to randomly select a set of samples. Note that no assumption as to the pattern or distribution of errors among the items is required.

81 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 1 card — $1.25

D052 Accounting General

01483-41 : General Ledger

General Ledger is a double entry accounting system consisting of an initializing program set (IGL) and a final program set (GL). It will document a line description, balanced entry and a posting summary. Two entry posting is simplified; various checks on data are made before posting.

Necessary Accessories: 2 Memory Modules for the HP-41C, Peripheral Printer, Card Reader

Documentation — $12.00 Cost of 4 cards — $5.00

01907-41 : Multiple File Bookkeeper

Program allows user to store various bookkeeping files. Records in file are defined by character string (12 or less) and corresponding dollar value (sign indicates asset or deficit). Records can easily be added, updated or deleted. The entire file is neatly printed with total assets and deficits as well as grand total.

235 Program Steps
Necessary Accessories: Extended Function Module, Printer, Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02656-41 : Rounding Percentage

"Rounding Percentage" (RP) calculates for nn amounts the percentage of the total corresponding to the sum of those amounts. Each percentage is duly rounded, so that the percentages will always sum up exactly 100%. The resulting percentages for each amount can be displayed without, or with up to 6 decimal positions.

273 Program Steps
Necessary Accessories: One memory module and an X-Functions module

Documentation — $12.00 Cost of 3 cards — $3.75

03035-41 : Ledger

This ledger program provides you with a simple, neat and concise list of your revenues and expenditures. Just simply input the name of the person or firm the transaction was with, the date, and the amount of money involved. Then accumulate all the information on magnetic cards. Simply load the information back into the calculator and a hard copy of your transactions, with a statement about gross revenue will be made out to you.

178 Program Steps
Necessary Accessories: One memory module, card reader and printer.

Documentation — $12.00 Cost of 3 cards — $3.75

D054 Accounting Payroll

02999-41 : Timecard Calculator

This program calculates total regular and overtime hours based on time-in and time-out inputs from a punched timecard. Either 40+ per week or 8+ per day may be considered overtime. Error key may be used for last set of time-ins and time-outs. Totals may be printed with or without a name of up to twenty-four letters.

150 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

03046-41 : Cash Payroll Denominations and Totals

The program determines the needed denominations to make cash payroll per department, totals each department and gives grand total of all department payroll.

172 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

D100 Cost Analysis Estimation

00769-41 : Act Financial Needs Analysis: for Dependent Students

May enter whole dollar amounts as prompted for, and receive an almost immediate analysis of student's financial need. Program illustrates one way that the HP-41C can be programmed to handle information from lengthy forms.

390 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00888-41 : Act Financial Analysis: Independent Student

This program, like the one for analysis of financial need of the dependent student, is based on the worksheet for 1981–82 for manual calculations of the self supporting student's educational assistance needs. The worksheet may be found in the A.C.T. Handbook for Financial Aid Administrators (p.23). The program prompts for data by line number and may display or suppress intermediate results.

311 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01520-41 : Lighting Power Budget

This program calculates (and documents with printer) the allowable energy budget for building lighting in accordance with the Illuminating Engineering Society's Recommended Lighting Power Budget Determination Procedure, EMS-1. Also seen as a part of the ASHRAE Standard 90-75R.

588 Program Steps
Necessary Accessories: 3 Memory Modules for the HP-41C. Printer and Card Reader recommended, but not required.

Documentation — $14.00 Cost of 7 cards — $8.75

02439-41 : Cost Estimator With Electronic Spreadsheet Characteristics

With the HP-41C/V (or Quad memory module) this program will accommodate 72 items in a typical cost estimating spread sheet. The user enters # of units, and cost per unit for each item of material and the time per unit for labor as well as the average labor charge per hour. The program computes and stores these figures for future recall or change. A running subtotal is maintained at all times. Changes to input data may be made at any time during the program.

283 Program Steps
Necessary Accessories: Extended Functions/Extended Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02492-41 : Cargo Insurance Valuation and Premium

Most marine and other cargo insurance is based on a percentage of the CIF value of the shipment, usually 110%. As this includes the insurance premium itself as well as the other costs, calculating the insurance valuation and premiums can be time consuming and, for those not familiar with it, confusing. This program will automatically perform all the required calculations and provide the total CIF value, valuation for insurance purposes, marine risk premium, war risk premium, and the total premium. The program also calculates brokers discounts and commissions.

199 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02656-41 : Rounding Percentage

"Rounding Percentage" (RP) calculates for nn amounts the percentage of the total corresponding to the sum of those amounts. Each percentage is duly rounded, so that the percentages will always sum up exactly 100%. The resulting percentages for each amount can be displayed without, or with up to 6 decimal positions.

273 Program Steps
Necessary Accessories: One memory module and an X-Functions module

Documentation — $12.00 Cost of 3 cards — $3.75

02812-41 : Assignment Problem For Minimizing Costs

The assignment problem consists of having a set of jobs, a set of facilities to do each job, and a set of costs for each job-facility pair. The objective of this program is to assign one job to each facility in such a way as to achieve the minimum possible total cost.

417 Program Steps
Necessary Accessories: Minimum of two memory modules

Documentation — $14.00 Cost of 4 cards — $5.00

03153-41 : Spreadsheet/Cashflow Program

Program provides a small spreadsheet for the HP-41C with up to 40 rows and up to 9 columns (limited to about 150 elements), with capability for a comprehensive analysis of a cash-flow profile generated by the spreadsheet (including graphical presentations). A spreadsheet can be stored indefinitely in Extended Memory or can be transferred to magnetic cards.

867 Program Steps
Necessary Accessories: HP-41C and Quad memory. Full capabilities need Extended Functions module. Printer and Card Reader desirable.

Documentation — $16.00 Cost of 10 cards — $12.50

D150 Forcasting/Planning

00320-41 : Simplex Algorithm

Solves classical linear programmes using the simplex 2-phase method for maximize and minimize cases. User formulates the problem according to inequality constraints and on objective function for which rules are given. Program does the rest. Can handle up to 10 constraints and/or 10 variables. Program performs pivotal transformations and outputs optimum solution (if it exists), max/min z valve, shadow prices. Options include printout of matrix each iteration, editing capability, auto size check, fast execution.

401 Program Steps
Necessary Accessories: Two Memory Modules Minimum, Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

00572-41 : Dynamic Programming to Solve a Markou Process Model

It is possible to use the technique of dynamic programming to study the short run, transient behavior of a Markou process. The solution depends on the initial state. If a machine is in state 1 (in adjustment) on day 1, a person may wish to know the expected profit.

86 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00592-41 : Queueing Models

For simple queueing models (multi or single-server) this program computes mean queue and system length, mean queue and system wait. Also computes the following probabilities: all servers idle, one server idle, system busy. In addition to above, for finite queue lengths effective lambda is computed.

321 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 1 card — $1.25

00915-41 : Project Selection/Decision Funding Model

This program automates some rules of thumb for solving projection/funding problems where partial resource allocation is not allowed. This program will work with up to four resource constraints for each project version. It calculates the relative merit of a project version and selects that project over others.

186 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01051-41 : Decisions Under Risk & Bayes Theorem for Business Types

When asked "what should we do?" the manager can now answer with more than the whimsical "You should decide!" armed with "MGR" and the 41-C, the manager can answer such questions as... should we hire outside consultants? How much are they really worth? Should I work or goof off today? Does God exist? What's the Dow Jones average been doing this week? Should we drill or take seismic tests? All is answered on the basis of probability theory including Bayes' theorem. Program features fast and easy data entry and correction and complete explanation of everthing.

429 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 4 cards — $5.00

01102-41 : Macro-Economic Model

Player guides the model economy by setting values for five important economic variables. Program outputs 14 other variables and the player's performance is measured at the end of each period by a popularity rating. Model illustrates basic principles of Macro-Economic theory and provides example which can be adjusted, modified or replaced.

261 Program Steps
Necessary Accessories: One Memory Module and Card Reader

Documentation — $12.00 Cost of 3 cards — $3.75

01119-41 : Lamsecon: Local Authority Maintenance and Services Economics

This is a special set of eight programmes for budgeting and cost control of routine expenditures occurring throughout the fiscal year. Although developed for local government maintenance and service activities, the programmes can be used for, or adapted to, any situation in which expenditures tend towards generally predictable patterns from year to year. All programmes are self-prompting and produce compact, easy-to-read print-outs of the relevant data.

1272 Program Steps
Necessary Accessories: Quad Memory or HP-41CV and Card Reader

Documentation — $25.00 Cost of 8 cards — $10.00

01137-41 : Maximum Entropy Priors for Bayes' Theorem

This program will allow the user to overcome one of the serious objections to Bayesian Statistical Decision Theory. With some Calculus, some Algebra and the Program Mgr3 contained herein, the user will be able to generate probability estimates for an event that both encode all that the user knows about the event while, at the same time, remain unprejudiced about whatever is unknown. (Maximum-entropy, prior, conditional probabilities).

125 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01169-41 : Decision Support: Evaluation Parameter Weighting

This decision support program uses an Analytic Hierarchy Process (SAATY, Mcgraw Hill, 1980) to determine the relative ranking of up to nine system or component evaluation parameters. The subjective comparison of all combinations of pairs of parameters is converted into a reasonably objective decimal weighting for subsequent use in system/component selection.

291 Program Steps
Necessary Accessories: Three Memory Modules. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

01184-41 : Pavecon: Plant and Vehicle Economics

This is a special set of seven programmes for plant and vehicle fleet budgeting and cost control. The programmes establish hire rates for all classes of plant and vehicles, provide details for replacement planning and analyse actual operating costs to provide cross-checks of base data. All programmes are self-prompting and produce compact, easily-comprehended print-outs of all relevant data.

1151 Program Steps
Necessary Accessories: Quad Memory or HP-41CV, Card Reader and Printer
Documentation — $25.00 Cost of 13 cards — $16.25

01217-41 : Array Math

This program allows row/column math using a user defined data array. Inputs are number of rows and columns, and initial data. Operations are constant()row_b = row_c, and row_a()row_b = row_c where () denotes one of the following operations: +, −, ×, ÷, b^a, log, ln, 10^b, e^b, $1/b$, hms, hr, hms+, hms-, int, and frc. Row "shift", row or col "sum" or "product" operations are also available. A "data write" and "data read" sequence is included for use with the card reader. Row and column listings can be produced if a printer is attached.

476 Program Steps
Necessary Accessories: Two Memory Modules for max. array of 36 elements, three modules for 100 elements and four modules or a Quad Memory Module for 164 elements. A Printer and Card Reader are helpful.
Documentation — $12.00 Cost of 6 cards — $7.50

01309-41 : Critical Path Method for Project Planning & Scheduling

This program uses the critical path method to calculate project duration, the activities which govern the project length, and the degree of freedom in scheduling the non-critical activities. All input data for each activity is stored in a single data register, and all output data for each activity is stored in only two data registers. This results in seven numbers being stored in only three data registers. Maximum problem size is 63 activities.

475 Program Steps
Necessary Accessories: Two Memory Modules minimum and Printer.
Documentation — $12.00 Cost of 4 cards — $5.00

01364-41 : Production Monitor and Record Accumulator: Week, Month, Quarter and Year

Enter the number of units produced and the amount of time (h.mmss) it took to produce them and the program will add 1 to the number-of-jobs register. This data is accumulated in a buffer. The program displays the units per hour for a moment and then returns to the units input prompt. You periodically dump the buffer into week, month, quarter, and year registers for subsequent review. The highest and lowest units per hour are also retained. Completely prompted and has a delete-last-entry function.

266 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader
Documentation — $20.00 Cost of 3 cards — $3.75

01456-41 : Automated Spread-Sheet

This program is a financial planning tool. It provides most of the basic functions needed for the creation and manipulation of rows of data, and allows for user-written routines to supplement those built in. It provides print-outs in either row or column form. Each row of data has an alphanumeric label.

333 Program Steps
Necessary Accessories: One Memory Module. Card Reader and Printer essential for print-outs.
Documentation — $14.00 Cost of 3 cards — $3.75

01561-41 : Inflate

This program inflates or deflates dollar values from any year to any other year. Can be used for any period from 1950-1990. Inflation factors are stored on Data Cards. This program is extremely useful in projecting future price/costs or in determining the impact of inflation.

110 Program Steps
Necessary Accessories: Quad Memory and Card Reader
Documentation — $12.00 Cost of 4 cards — $5.00

01585-41 : Simple Linear Regression

This program solves a variety of least squares and simple linear regression problems for statistics students and managers. Given one independent and one dependent variable, it will accept historical data then solve for the sum of squares, intercept, slope, variance, forecast values of Y, confidence intervals, and hypothesis tests.

211 Program Steps
Necessary Accessories: 1 Memory Module may be necessary.
Documentation — $12.00 Cost of 2 cards — $2.50

01713-41 : Bayesian Theory

Package provides an understanding of Bayesian probability theory and routines to solve problems that can be solved using Bayesian theory. Useful for forecasting, based on incoming data.

1094 Program Steps
Necessary Accessories: 2 Memory Modules and Program 01051-41
Documentation — $20.00 Cost of 10 cards — $12.50

01765-41 : Bayes's Theorem/7 Var. Interchangeable Solution for 2 Events

For the minimal case of two events, this program will compute the solutions for some of the variables in the standard forms of BAYES THEOREM when given the other variables. As a bonus, a program to compute the binomial distribution is included to facilitate working one of the samples. The main program shows one way to handle many interrelated variables (7) in an interchangeable fashion.

243 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01868-41 : Cash Flow Analysis

Generates and prints up to 19 cash flows for analysis considering expansion rates of sales, salaries and sundry expenses that can be manipulated. Calculations include positive or negative interest rates according to the nature of accumulated cash flow. After taxes analysis is included. Many "what if" possibilities are included for input and calculations.

441 Program Steps
Necessary Accessories: 3 Memory modules and printer.
Documentation — $14.00 Cost of 5 cards — $6.25

01925-41 : Energy Cash Flow

Program gives information about the affordability of an energy related investment. This program uses many input variables (several are optional) to create a more accurate model of the cost and return on an energy investment than is possible with simple breakeven analysis. One of the major advantages of Energy Cash Flow is that results appear in dollars on an annual basis so answers are meaningful to the typical investor. The program automatically uses the general inflation rate to adjust dollar amounts back to base year value. This program is available in the Solar Engineering Solutions Book.

425 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

02114-41 : Integrated Cost/Task Schedule

Given the irregular time periods and costs of various overlapping tasks, this program solves for each period's incremental cost and the cumulative cost. Operates with (high resolution histograms) or without the printer. Options include rounding scheme and overall cost multipliers. Ideal for cost-scheduling the simple or complicated jobs.

870 Program Steps
Necessary Accessories: Quad Memory Module if using HP-41C; (Printer is optional)

Documentation — $16.00 Cost of 8 cards — $10.00

02185-41 : M/M/S Queue Characteristics

Selected steady state characteristics are calculated for the multiple server queue with Poisson arrivals and exponential service rates (M/M/S). Calculated characteristics are: traffic intensity, expected queue and system lengths, expected times in queue and system, probability of idle servers, probability of waiting for service, and probability that system length is between any two given numbers. Highly readable printed output is produced. An option is programmed for use without a printer and instructions provided to eliminate the print related.

497 Program Steps
Necessary Accessories: Two memory modules; Printer (82162A) optional. No modules if program is reduced (instructions provided) to eliminate print portions.

Documentation — $12.00 Cost of 5 cards — $6.25

02200-41 : Budget Managing and Projecting System

B-MAPS is a Cassette Drive based system that automatically and totally manages a User-defined file system that perfectly matches his budget estate. The budget estate can be composed of up to twenty accounts including multiple checking, saving, loans, and stocks. Interest accruements, loan amortizations, direct deposits/withdrawals, and stock purchases can be handled as single or repeating time events. "What-if" projections can be made without losing the base budget estate. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

1356 Program Steps
Necessary Accessories: Quad Module (or CV), Extended Functions Module, Cassette Drive. Printer highly recommended.

Documentation — $16.00

02277-41 : Cash Budget Worksheet

You have a checking account and a money-market fund. Your objective is to keep a minimum amount of cash in your checking account and to transfer all surplus cash to the interest-earning fund. Use the special worksheet (supplied) to forecast your checking account's balance for the next seven weeks. Then perform a "what-if?" analysis to find the best timing of cash transfers into and out of your checking account.

148 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02315-41 : Critical Path Analysis

This program scans forward and backwards through activities of a project time scheduling plan and determines the critical path activities and the critical path duration. The method employed is the Precedence Diagramming Method (PIM).

260 Program Steps
Necessary Accessories: At least two memory modules

Documentation — $12.00 Cost of 3 cards — $3.75

02334-41 : Data Table Processing

This program enables the construction of a two-dimensional worksheet of alpha or numeric entries. Routines enable insertion, change, or inspection of any single entry, row, column, or the entire table. User can specify "what if" calculations which will then be performed on all or part of the table. At home, the program can help with budget planning. In the lab, it will process raw data into useful numbers with ease.

213 Program Steps
Necessary Accessories: Minimum of one memory module. Card Reader and Extended Functions Module optional.

Documentation — $12.00 Cost of 6 cards — $7.50

02357-41 : Smooth Routine

This program "smooths" irregular data (such as month-to-month sales) without distorting fine structure (such as seasonal influences). Especially useful for plotting business data to observe trends.

122 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02442-41 : Schedule By Constraints

For a set of events, this program finds the logically consistent sequence, given a matrix showing which events must necessarily precede others. The program returns the ordered list of events, and it leaves the ordered matrix in the registers. One memory module will accommodate 16 events; 2, 28 events; 3, 35 events; and 4, 40 events.

361 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02455-41 : Long Term Financing

This program will help you project your companies long term financing requirements. Input data are income, assets, dividends and various other cost. A valuable and fast tool for analysing consequences of different schedules and decisions.

226 Program Steps
Necessary Accessories: One memory module. Printer recommended.

Documentation — $12.00 Cost of 3 cards — $3.75

02561-41 : Learning Curve For Manufacturing

Calculates manufacturing cost variables based on the learning curve suitable for production planning and marketing. Input any three known parameters and the fourth can be calculated as well as the average cost of any number of units between any two limits set by the user. Program uses a simple to use technique and provides several checks against careless input. Can be used with printer and HP-IL video interface.

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02739-41 : Sustainable Growth Rate Model

Given a firm's profit margin, dividend payout ratio, debt to equity ratio, current assets to sales ratio, fixed assets to sales ratio, and the expected inflation rate, this program computes the firm's sustainable growth rate (in nominal and real terms) that is consistent with these parameters. Given any six, computes seventh.

221 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02930-41 : Critical Path Method

This program finds the critical path, early and late starts, and slack times for a project of jobs, given the prerequisites and duration of each job. Once a project is created, it remains in extended memory. Facilities for changing the durations are provided on subsequent runs, and files for more than one project may exist simultaneously in extended memory.

422 Program Steps
Necessary Accessories: Extended Functions Memory Module and One memory module

Documentation — $12.00 Cost of 4 cards — $5.00

02949-41 : Schedule by Constraints With Extended Memory

For a set of events, this program finds the logically consistent sequence, given a matrix showing which events must necessarily precede others. The ordered list of events is returned, and the ordered matrix remains in a file in extended memory. By using extended memory for the matrix, the program is considerably shorter than 02442-41, Schedule by Constraints, and a larger number of events may be handled.

220 Program Steps
Necessary Accessories: Extended Functions memory module

Documentation — $12.00 Cost of 2 cards — $2.50

03026-41 : Critical Path Method With Progress

This program finds the critical path, early and late starts, finishes, and slack times for a project of jobs in progress. The user enters the information for the completed jobs and those in progress, and the data for the future jobs is calculated. The user may also manually schedule starting times for future jobs. Once a project is created, it remains in extended memory. Facilities for updating the progress of the project are also provided.

532 Program Steps
Necessary Accessories: Two memory modules and Extended Functions Memory Module

Documentation — $12.00 Cost of 5 cards — $6.25

03027-41 : Critical Path Method With Costs

This program finds the critical path, early and late starts, and slack times for a project of jobs. Each job has two associated costs: initial for the first time unit, and operating for every time unit. These costs are tallied by time unit for the entire project. The user may also manually schedule starting times. Once a project is created, it remains in extended memory. Facilities for changing single parameters on subsequent runs are provided.

638 Program Steps
Necessary Accessories: Two memory modules and Extended Functions/Memory Module

Documentation — $14.00 Cost of 6 cards — $7.50

03134-41 : Project Planning and Scheduling (PERT Method)

This program uses PERT methods to calculate the project length and schedule statistics (early start, late start, total float & free float) for each of the activities comprising the project. Extended memory is used to store the activity data. An editing capability allows the user to review or change this data to update the schedule as activities are completed or slippages occur. Maximum project size is 108 activities, more with additional extended memory modules. A utility program is included to transfer project files to/ from cards.

647 Program Steps
Necessary Accessories: One memory Module (minimum), Printer, and Extended Functions Module

Documentation — $14.00 Cost of 5 cards — $6.25

03150-41 : Simplex Method For Linear Programming

This program uses the simplex method to solve linear programming problems, finding either the minimum or the maximum. If a solution exists, the volumes, surpluses, inputed costs, slack, and the limit are all displayed. Besides inequalities, the program has facilities to also deal with equalities. The only limit on the number of variables or constraints is the amount of available memory. All inputs and outputs are individually labeled, making the program easy to use.

739 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

03153-41 : Spreadsheet/Cashflow Program

Program provides a small spreadsheet for the HP-41C with up to 40 rows and up to 9 columns (limited to about 150 elements), with capability for a comprehensive analysis of a cash-flow profile generated by the spreadsheet (including graphical presentations). A spreadsheet can be stored indefinitely in Extended Memory or can be transferred to magnetic cards.

867 Program Steps
Necessary Accessories: HP-41C and Quad memory. Full capabilities need Extended Functions module. Printer and Card Reader desirable.

Documentation — $16.00 Cost of 10 cards — $12.50

03161-41 : HP 82143A Bar Graphs

This program constructs non-contiguous bar graphs with bars having positive or negative values. Negative value bars are printed down from a zero X axis. Y axis values may be selected with any minimum value and any positive maximum value. Features include labeling options for bar values and bar titles. Good for comparing multiple sets of data or graphically displaying such quantities as temperature, market prices, sales, income, etc.

168 Program Steps
Necessary Accessories: Extended Functions/Memory Module, HP-82143A Printer

Documentation — $12.00 Cost of 2 cards — $2.50

03474-41 : Internal Rate of Return for Series

This program calculates the annual equivalent internal rate of return for a series of transactions made on specified dates with an option for an annual schedule. Up to eighty transactions can be entered, corrections can be made, and the data input can be listed. Optional uses are 1) solving for the internal rate of return results, printed to the nearest 0.01 percent, and 2) listing the present values vs. discount rate at user selected intervals of the rate.

357 Program Steps
Necessary Accessories: Quad memory module; printer (HP 82143A or equivalent).

Documentation — $12.00 Cost of 4 cards — $5.00

D200 General Investment Analysis

00373-41 : Net Present Value

Given the periodic cash flows an investment generates, this program computes the NPV of the investment's cash flows. Last cash flow entered is saved for easy error correction. Program gives prompts for next step and positive NPV, and is largely self-instructing.

91 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00411-41 : Markowitz Portfolio Selection

Given the expected return and proportion of each stock within a portfolio, and the covariances of returns among the stocks, this program calculates the portfolio's expected return and standard deviation of returns using a Markowitz algorithm. Great for graduate level business courses in investments where this kind of data is available.

265 Program Steps
Necessary Accessories: Minimum of one Memory Module. More modules needed for larger problems.
Documentation — $12.00 Cost of 3 cards — $3.75

00412-41 : Balance Sheet/Statement Analysis

Using financial statement information this program prints out balance sheet and income statement to confirm information then calculates 2 score (Altman Formula) to predict, within 80% probability if the firm will be in business 2 years from statement date, liquidation value, cash flow to debt ratio, return on both investment and assets employed.

392 Program Steps
Necessary Accessories: Card Reader, Printer and two Memory Modules.
Documentation — $12.00 Cost of 6 cards — $7.50

00413-41 : Financial Evaluation 'Fin-Eva'

Utilizing information from balance sheet/statement analysis various ratio's are calculated for indication of short term solvency (ie current ratio, acid test, absolute liquidity, W.C. To total assets and cash flow and cash flow to debt), long term solvency (ie debt to equity, earnings before interest, taxes and special management bonuses to interest, taxes and management bonuses), and various profitability add efficiency (turnover) ratios.

230 Program Steps
Necessary Accessories: Card Reader, Printer and two Memory Modules.
Documentation — $12.00 Cost of 4 cards — $5.00

00549-41 : Annual Growth Rate of Investments (Discounted Cash Flow)

Data is entered once only, as prompted, to determine with 99.99% accuracy, the annual growth rate (discounted cash flow rate of return) of any investment — stocks, bonds, other tangibles etc. and combinations — or unlimited cash flow stream. This is a fully automatic version of 00817-67, requiring only data and R/S entry. One memory module minimum. 2nd module necessary only if large amount of data is to be processed.

315 Program Steps
Necessary Accessories: One Memory Module minimum — 2 Memory Modules if large amount of data is to be processed.
Documentation — $12.00 Cost of 4 cards — $5.00

00580-41 : Financial Calculations — Efficient Version

This program solves for an unknown component of an even cash flow. Payments are made at the end of each compounding period. This program is essentially identical in operation to the Standard Pac Financial Calculations Program. It cuts the memory requirement by 6 registers through heavy use of the stack.

190 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01118-41 : Foreign and Bullion Gold Coin Analysis for Investor/Dealer

This program, following "Numismatic News" market format, computes and lists bullion value, buy & sell prices, % buy and % sell for any gold spot price/oz. A coin data table is used and can be changed or updated with built-in program table routines by the user.

395 Program Steps
Necessary Accessories: Quad Memory Module, Card Reader and Printer.
Documentation — $14.00 Cost of 1 card — $1.25

01188-41 : Rate of Return

An iterative approximation method is employed with annual cost analysis to arrive at the rate of return for an income expansion project. Three cases are solved: investment > salvage, investment = salvage, and investment < salvage.

173 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 3 cards — $3.75

01378-41 : Non-Uniform Cash Flow Analysis

Enter a series of projected cash flows only once. User can then easily check and correct the entries, calculate the net present value, the internal rate of return, and the future value, of all or just part of the cash flow series and for different interest rates and initial investments.

292 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01525-41 : Payback Time

This program calculates straight and escalated payback times, return on investment, and net cash flow for any energy-saving system or strategy involving an initial expenditure that produces subsequent yearly dollar savings. The effects of inflation, interest rates, operating and maintenance costs, and resale value (or value added) are included.

388 Program Steps
Necessary Accessories: 2 Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

01564-41 : Life Cycle Cost Analysis

The program calculates the present value for comparing alternatives in any energy system selection. The useful life, first year maintenance and energy costs, escalation rate of maintenance and energy, replacement cost, and time value of money are considered.

176 Program Steps
Necessary Accessories: Printer
Documentation — $12.00 Cost of 3 cards — $3.75

01630-41 : Internal Rate of Return

This program calculates the Internal Rate of Return (Discount Rate of Return or Yield) for up to 40 cash flows on the basic HP-41C. Each additional memory module adds 64 more cash flows. This program is an improved version of 00194C both in printed output and in the ability to back up and change previous entries.

74 Program Steps
Necessary Accessories: None. Printer optional.
Documentation — $8.00 Cost of 1 card — $1.25

01857-41 : Financial Institutions Analysis

With the data of averaged Balances and Profit & Loss Statements of two or more (infinite) periods, it analyzes and/or simulates with 50 outputs for each two periods the key variables determining the performance of a Financial Institution: Return, Net Income, Losses, Debt, Others, and their relationships.

535 Program Steps
Necessary Accessories: Quad Memory Module. Card Reader and Printer Desirable.

Documentation — $14.00 Cost of 7 cards — $8.75

01894-41 : Joint Venture Financing

Investment is recovered by a two part levy on sales; 1st levy period runs until capital plus compound interest is recovered; 2nd stage usually equals first levy period, alternatively user can specify 1st or 2nd periods. Program calculates levies, 1st levy period, money and real internal rates of return.

715 Program Steps
Necessary Accessories: Three memory modules.

Documentation — $14.00 Cost of 7 cards — $8.75

01926-41 : Financial Report Analyzer

Using information from a company's financial report (& the latest stock price), this program provides 33 calculations a potential investor needs but are not always readily available. Output includes P/E ratio, net sales change, operating margin of profit, net profit ratio, operating cost ratio, return on equity, earnings per share, primary earnings per share, fully diluted earnings per share, dividends per share, payout ratio, net book value per share, stock ratio, net asset value per bond, bond ratio, bond interest coverage, net asset value per preferred share, preferred dividend inventory turnover, leverage, and comparisons.

733 Program Steps
Necessary Accessories: HP-41C requires Quad Memory Module; both models require Extended Functions/ Memory Module.

Documentation — $16.00 Cost of 9 cards — $11.25

02200-41 : Budget Managing and Projecting System

B-MAPS is a Cassette Drive based system that automatically and totally manages a User-defined file system that perfectly matches his budget estate. The budget estate can be composed of up to twenty accounts including multiple checking, saving, loans, and stocks. Interest accruements, loan amortizations, direct deposits/withdrawals, and stock purchases can be handled as single or repeating time events. "What-if" projections can be made without losing the base budget estate. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

1356 Program Steps
Necessary Accessories: Quad Module (or CV), Extended Functions Module, Cassette Drive. Printer highly recommended.

Documentation — $16.00

02250-41 : Actual Rate of Return

Given the dollar amount of income, number of days in month, beginning balance of investment, and daily changes in the amount of the investment, computes the annual rate of return compounded daily for one month. Use to analyze and compare cash flow strategies, MMF's and other investments.

268 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02491-41 : Financial Calculations

This program solves a variety of problems involving money, time, and interest. Assumes payments are at the end of the compounding period. One key operations "R/S" is used to enter and calculate financial parameters.

186 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02509-41 : Capital Budgeting

This program computes the present value, after taxes and depreciation, of a series of cash flows created by the acquisition of an asset. This result can then be used as a measure of the profitability of a project.

189 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02759-41 : Uniform Gradient Series Financial Calculations

This program calculates the present value, future value, annual value, interest rate, number of periods, or the gradient value of a uniformly increasing or decreasing series (for example 100, 125, 150, 175, 200 is a uniform increasing series with 25 being the gradient value), given 3 of the other terms. This program calculates series with gradient values directly; but can be used for series which are not gradient.

188 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03149-41 : Decision Data For Stock Investments in a Company

Given updated files, program produces a one page report on common data and two page decision data reports on each company. They include selected ratios, eight pair of 5-yr and 10-yr simple linear regressions and two multiple linear regressions, growth rates for calculated dependent variables, projections, stock sale price and price earning ratio at end of year 5 required to earn specified before tax return.

5052 Program Steps
Necessary Accessories: Functions/Memory module, and 2 HP Extended Memory Modules. Digital cassette drive, HP82905B Printer, HP-IL Module, HP Extended

Documentation — $25.00

03153-41 : Spreadsheet/Cashflow Program

Program provides a small spreadsheet for the HP-41C with up to 40 rows and up to 9 columns (limited to about 150 elements), with capability for a comprehensive analysis of a cash-flow profile generated by the spreadsheet (including graphical presentations). A spreadsheet can be stored indefinitely in Extended Memory or can be transferred to magnetic cards.

867 Program Steps
Necessary Accessories: HP-41C and Quad memory. Full capabilities need Extended Functions module. Printer and Card Reader desirable.

Documentation — $16.00 Cost of 10 cards — $12.50

03320-41 : Unknown Interest Solver and Table of Interest Factors

This program calculates any of the eight compund interest factors (F/P, P/F, A/F, F/A, A/P, P/A, A/G, P/G), given the interest, period, and the known present worth or any other value as such. Also, the program uses the SOLVE routine in the Math Pac and determines the unknown interest rate of any number of functions (N) added together. The program uses (3*N)+15 registers. The program prompts for proper size.

308 Program Steps
Necessary Accessories: Math Pac (Copy of Solve & *FN routines in active memory).

Documentation — $12.00 Cost of 3 cards — $3.75

03476-41 : Financial and Discount Calculations

This program solves any variable in ten cash flow equivalence comparisons, eight with discrete flows using either discrete or continuous compounding, and two using continuous flow with continuous compounding. Equivalence variables are present value P, future value F, uniform discrete annuity A, gradient G, exponential growth annuity Ae, and uniform continuous flow annuity Ac. Rate variables are interest I, growth rate J, for number periods N. As an example, (F/P i,n) can be solved for any variable.

613 Program Steps
Necessary Accessories: Quad memory module, HP 82104A Card Reader; HP 82143A Printer is optional.

Documentation — $12.00 Cost of 7 cards — $8.75

D250 Industrial Production

00314-41 : Work Sampling

Measures the proportion of a worker's time spent in up to ten activities by means of a randomly timed beep. Provides an estimate of the accuracy of the results.

74 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00540-41 : Direct Material & Labor Variance Analysis

This program computes the following four variances used particularly in a standard cost accounting situation: 1. Material price variance. 2. Material usage variance. 3. Labor rate variance. 4. Labor efficiency variance.

80 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00857-41 : Scaling-Up Equipment Costs

Cost of scaled-up chemical equipments and plants may be estimated if cost data at some other capacity levels are available. Scale-up factors for some typical equipments are built into the program, but user may use his own if available. Program provides interchangeable solutions for cost of a, capacity of a, cost of b, capacity of b and scale-up factor.

140 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01144-41 : Flowshop Scheduling: Optimize N Jobs on M Machines

This program determines the optimum (least total time) schedule for n jobs requiring sequential processing on m machines or other production facilities.

191 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01344-41 : Glulam Board Footage

Calculates board footage for Glulam lists. BF is used as a unit of measure for raw material purchase, plant productivity, product pricing and construction productivity, therefore this program could aid designers, contractors, wholesalers and manufacturers. Shows item entered, unit and item BF, BF summary by width, grand total BF, total weight and number of pieces.

Necessary Accessories: One Memory Module. Printer helpful.

Documentation — $12.00 Cost of 3 cards — $3.75

02561-41 : Learning Curve For Manufacturing

Calculates manufacturing cost variables based on the learning curve suitable for production planning and marketing. Input any three known parameters and the fourth can be calculated as well as the average cost of any number of units between any two limits set by the user. Program uses a simple to use technique and provides several checks against careless input. Can be used with printer and HP-IL video interface.

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

D300 Insurance/Retirement

00487-41 : Permanent Insurance and Term Rider Mix

Given face amount of insurance required, for purchase by given total annual premium, this program will compute respective face amounts and premiums of permanent insurance and of term rider in required mix. Will show all permanent insurance if premium is sufficient, or, conversely, all term if premium insufficient for mix. Printer useful, but not necessary.

102 Program Steps
Necessary Accessories: Printer useful.

Documentation — $8.00 Cost of 2 cards — $2.50

00488-41 : Premium Calculation

After entering rate per thousand and cash value at 65 per thousand, one keystroke will calculate premium from face amount or face amount from premium; R/S will display cash value at 65 and monthly income at 65. computes for any of the most commonly used grading and fractional premium calculation systems.

Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00489-41 : Capital Need Analysis

Automatically computes all information reqired for income analysis and total income analysis pages of standard capital need analysis worksheets used by most insurance companies. Allows user to choose any interest assumption and any income objective.

205 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00491-41 : Custom Premium Calculation 1

Given rate per thousand, one keystroke computes premium in all modes from face amount, or face amount from premium; also computes cash value and monthly income at 65. Agent may "customize" for any company that calculates fractional premiums as multiples of total annual premium including policy fee, if any.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00492-41 : Simple Programming

This program performs the Classical Life insurance programming process, comparing the client's present assets with his goals and then computing the additional liquidity needed to achieve those goals; all without the need for settlement option tables, compound interest tables, or laborious calculation.

Necessary Accessories: One Memory Module. Printer useful.

Documentation — $12.00 Cost of 3 cards — $3.75

00522-41 : Cost of Paying Premiums More Frequently Than Annually

This program is a very powerful tool for soliciting annual payment of insurance premiums. Requiring only two inputs, the annual premium and the fractional premium, (semi-annual, quarterly, or monthly), the program solves for the annual percentage rate, (A.P.R.) and the effective annual interest. Printer very useful but not necessary.

108 Program Steps
Necessary Accessories: Printer useful.

Documentation — $12.00 Cost of 1 card — $1.25

00523-41 : Custom Premium Calculation 2

One keystroke computes premium in all modes from face amount, or face amount from premium; also computes cash value and monthly income @ 65. Agent may "customize" for any company that calculates fractional premiums as multiples of annual premium without policy fee, and then adds fractional premium policy fee.

213 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00604-41 : Group Annuity Surrender Charges

Termination or surrender values under the "guaranteed investment" group annuity contract offered by the "SM" insurance company are determined by bond yields in the market at the time of computation ("m") compared to SM's rate under the contract ("i"), using a formula stipulated in the contract. The program computes the % surrender charges for any desired ranges of "m" and "i", so that the effect of changes in either rate can be measured. printer, card reader necessary.

Necessary Accessories: Printer and Card Reader

Documentation — $8.00 Cost of 1 card — $1.25

01656-41 : Vanishing Premium

This program uses dividend accumulations under a participating whole life policy to make the annual premium seemingly "vanish". Dividends and cash values are arranged in memory by duration (loading program included). Program determines minimum number of years for premium payment, then summarizes.

169 Program Steps
Necessary Accessories: 1 Memory Module, Card Reader

Documentation — $12.00 Cost of 3 cards — $3.75

02181-41 : Profit Sharing Allocation

This program provides the allocations of an integrated or non-integrated profit-sharing or money purchase pension plan. It is useful in the preparation of Form 5302 for filing with the Internal Revenue Service and for plan design, especially in determining the proper or best integration level for a particular participant group. This program will handle up to 25 above integration level participants and the remainder of the participants as a group as found on Form 5302.

203 Program Steps
Necessary Accessories: One memory module. Card Reader and Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02492-41 : Cargo Insurance Valuation and Premium

Most marine and other cargo insurance is based on a percentage of the CIF value of the shipment, usually 110%. As this includes the insurance premium itself as well as the other costs, calculating the insurance valuation and premiums can be time consuming and, for those not familiar with it, confusing. This program will automatically perform all the required calculations and provide the total CIF value, valuation for insurance purposes, marine risk premium, war risk premium, and the total premium. The program also calculates brokers discounts and commissions.

199 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02505-41 : File Management

This program collects and displays budgetary parameters of a set of "stocks" and is able to follow up to 20 current rates for each stock. By using FIFO concept entered current rates are displayed. In addition, it calculates and displays partial and grand totals. Efficient use of the HP-41C stack and YAST two work registers results in a maximal data storage capability.

322 Program Steps
Necessary Accessories: 2-4 memory modules. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02948-41 : Retirement Planning

This program illustrates both guaranteed and current interest rates on cash values for fixed (or continuous) deposits paid to a qualified retirement plan such as IRA, SEP-IRA, Keough, pension, profit sharing and TSA. It can also be used for non-qualified plans such as annuities and deferred compensation. Input includes client name, company and product name, expense factors, monthly income factors (ages 60 to 70).

527 Program Steps
Necessary Accessories: Extended Function Module and Printer

Documentation — $14.00 Cost of 9 cards — $11.25

03369-41 : Retirement With Inflation

This program computes the savings required to finance a retirement that keeps pace with rising costs caused by inflation. The following are calculated: starting income at some future time, size of the savings fund, monthly deposits required to finance the Plan, monthly withdrawals during retirement. The user inputs: desired income, number of years before and after retirement, percent interest after taxes, percent inflation.

274 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 4 cards — $5.00

D350 Inventory Control

00571-41 : The Scrap Decision

If you have an inventory of scrap items or surplus items in your inventory, this program can help you decide when it is time to sell it. You will get the message "hold" or "sell" depending on the factors.

41 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00861-41 : Economic Production Quantity

This program outputs 8 variables relating to production quantities, batch sizes, inventory levels, production run times, etc. as they relate to costs.

122 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01461-41 : Stock Control

Program allows complete control of up to 154 stock items using the weighted average method. Fully formatted, printed audit trails/reports provide hard copy of all transactions. Operations supported: purchases, sales, returns in/out, file maintenance, qty/cost queries, COGS, cost of stock, stock report, reorder report, printer enable/disable, data card updating-dumping-loading. Data validation with error routines are included. Requires 152 registers and includes extensive documentation plus users guide.

456 Program Steps
Necessary Accessories: Two Memory Modules, Card Reader and Printer

Documentation — $14.00 Cost of 6 cards — $7.50

01555-41 : Cost of Sales and Inventory for Small Shop

Computes cost of goods sold and new inventory for small shop, keeping record of cost per item and inventory units. Accepts 40 different items per run. To work with more than 40, it is necessary to run the program as many times as multiples of 40 items you have.

72 Program Steps
Necessary Accessories: 2 Memory Modules, Card Reader (Printer optional)

Documentation — $8.00 Cost of 1 card — $1.25

01942-41 : Wine Cellar Store and Printout

This program keeps an inventory of a wine cellar on magnetic cards. The name, vintage, number of bottles of each wine, and price per bottle are all kept using only two registers per entry. Single bottles or entire entries may be added or deleted by means of alpha labelled subroutines. The second part of the program makes a complete print-out of the inventory and also computes and prints the total number of bottles and total cost.

185 Program Steps
Necessary Accessories: At least 1 Memory Module, Extended Functions Module, Card Reader and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

02253-41 : Inventory

The program enables you to handle all the data which you need to make your inventory. You can create a file on tape where you can store all your articles, search one, change one, delete one, make input of the actual quantity of articles you have and to print a list where you can see: article number, article name, cost price, sales price, profit, quantity, new quantity, number of sold articles and articles you must order. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

620 Program Steps
Necessary Accessories: HP-41CV; X-Function Module; X-Memory Modules optional; Cassette Drive; HP82905B Matrix Printer.

Documentation — $12.00

D400 Leasing

01423-41 : Network Cost Analysis

This program computes the cost of AT&T voice-grade private line circuits and may be used to evaluate alternative network configurations. The user inputs city pairs and the number of circuits. The program automatically determines distance and selects the appropriate rate schedule. Cumulative monthly costs, mileages and circuits are stored.

375 Program Steps
Necessary Accessories: 2 Memory Modules

Documentation — $14.00 Cost of 10 cards — $12.50

01971-41 : Advance Skips and Residual

This program solves for the periodic payment amount necessary to achieve a desired yield when advance rentals, residual value (purchase option) and skip payments must be taken into consideration in the structure of the transaction. Some, all or none of the above variables may be present.

178 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02440-41 : Pre-Paid Loans

From the world of banking comes a real use for the calendar functions contained in the Time Module. The program computes interest and penalty charges to a "constant-payment" loan. Subroutines increment a calendar by any number of whole months, generate the date of the last day of the month, eliminate Sat/Sun from computations, etc. (The powerful Time Module can be used for more than process control and timing the Boston Marathon).

485 Program Steps
Necessary Accessories: Two memory modules and Time Module. Printer useful.

Documentation — $14.00 Cost of 5 cards — $6.25

02742-41 : Flexible Leasing Plans Using The Ratio Method

This leasing program addresses leasing companies. It provides an original and direct method for leasing plans calculation allowing the user to set up any kind of plan - degressive, flat, progressive - and to check it with the amortization schedule.

190 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

D450 Lending/Savings

00376-41 : Top-Row Financial Functions with Odd-Days Interest

Performs n, i, pv, pmt, and fv calculations with a partial ("odd") period at the beginning. Allows beginning/end-of-month payments and simple/compound partial first period.

409 Program Steps
Necessary Accessories: One Plug-in RAM Module.

Documentation — $12.00 Cost of 4 cards — $5.00

00414-41 : Simple Interest Calculator

This program computes for the 4th variable (PV, I, Days, Int, FV) in a simple interest problem given 3 of the others. Program is for 360 days but very easily can be modified to 365. May be used with Calendar Program in 41C Standard Applications. Display indicates whether data has been input or computed.

124 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00416-41 : Future Value Calculations 1

Program calculates future value of payments stream at one, two or three interest rates.

87 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 1 card — $1.25

00418-41 : Present Value Calculations 1

Program calculates present value of a stream of payments at one, two or three interest rates.

106 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 1 card — $1.25

00493-41 : Accumulated Interest and Remaining Balance on Loan

Interest payments for tax deductions (and other purposes) for any period or block of periods can be obtained immediately, without iteration on any loan or mortgage. Input is prompted in logical order and the printout is equally clear. User has choice of detailed schedule for each payment after printout of period summary.

203 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

00926-41 : Loans with Interest Free and Specified Skip Payments

Compute uniform payments to a loan where some of the intial payments are interest free and other payments may be skipped. Data may be entered as called for or they may be entered using top row keys allowing for "what-if" solutions. Begin/end solutions are computed easily.

288 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01173-41 : Prime Rate Interest Calculations

This program creates an interest schedule adjusted for additions or payments of principal for one or more months, where interest is based on the prime rate. Prime rate data can be stored and read from cards.

474 Program Steps
Necessary Accessories: At least two Memory Modules. Printer suggested. Card Reader optional.
Documentation — $12.00 Cost of 5 cards — $6.25

01350-41 : Rule of 78

This program not only calculates the unearned interest (rebate) and the remaining principal due (balance); but it will also calculate the periodic interest paid for each period, (year; month; week; day) for the full term of the contract.

108 Program Steps
Necessary Accessories: Printer helpful.
Documentation — $12.00 Cost of 2 cards — $2.50

01628-41 : Advanced Fiduciary Deposit Net Income Calculations

Calculates the interest on a fiduciary deposit, the commission charge and net capital. This advanced program includes instructions to calculate commission, taking account of the currency deposited, the size of the deposit and minimum charges, without further input from the user. Program provides for 4 different currencies but can be expanded.

228 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01629-41 : Basic Fiduciary Deposit Net Income Calculations

Calculates the interest on a fiduciary deposit, the commission charge and the net capital on maturity. Program prompts for deposit and maturity dates, deposit, interest rate, commission rate and minimum commission charge. Number of days between dates based on the 'Bank Calendar' 360 day years. Facility for complete resume.

142 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01659-41 : Account Balance with Daily Compounding

Computes the balance and accumulated interest on any savings-type account where the interest rate is compounded daily (on a 360 or 365-day basis) and deposits and withdrawals are made at irregular intervals. Provision is made to alter interest rate should this change during the period.

169 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01820-41 : U.K. National Loan Fund Interest Computations

Program calculates interest and capital repayments under either of the 3 repayment methods by which funds may be obtained from the Government i.e., repayment on maturity, annuity loan repayment, equal installment of principal loan repayment. Based on twice yearly repayment dates of 22nd June and December.

392 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

01882-41 : Building Society Paid-Up Share Account Interest Calculations

Calculates interest due on paid-up share accounts with U.K. building society institutions. Provides a choice of three interest bases adopted by societies. Where a Financial Decisions Module is not available, a Memory Module may be used instead in conjunction with the subroutine included in the program listing.

227 Program Steps
Necessary Accessories: Financial I Module or Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01938-41 : Equivalent Rates

This program computes the equivalence between different rate of interest (360 or 365 basis) and compares the different financial operations. It computes: annual nominal rate, annual discount rate, annual effective rate and monthly effective rate.

157 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01964-41 : Calculations of Loans

This program computes each loan payment as well as the sum you pay in interest and in principal. The duration of the loan and the amortization period may change. In the amortization period, you may have contracts of different rates and of different duration. The program prompts for data based on monthly amortization and effective interest rate.

198 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

02317-41 : HP Top Row Financial Keys With Sign Convention

This program duplicates the five top row financial keys of current HP financial calculators (HP-92, 37E, 38E). The program uses the cash flow sign convention as well as the special store or solve capability of each of the financial keys. The "BEGIN/END", "12x", "12/", "CLF" (Clear Financial registers), "LSTF" (LiST Financial registers) toggles, and a "print/no print" option are all available.

239 Program Steps
Necessary Accessories: One memory module. Print optional.
Documentation — $14.00 Cost of 2 cards — $2.50

02380-41 : Payment

This program calculates mortgage payment, remaining balance, and gives an amortization schedule for a conventional balance, and gives an amortization schedule for a conventional fixed rate mortgage. Prompts for years, interest rate, and amount borrowed, then returns payment amount. The program then prompts for dates. Will give total interest and total principal paid between two user specified dates.

214 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02440-41 : Pre-Paid Loans

From the world of banking comes a real use for the calendar functions contained in the Time Module. The program computes interest and penalty charges to a "constant-payment" loan. Subroutines increment a calendar by any number of whole months, generate the date of the last day of the month, eliminate Sat/Sun from computations, etc. (The powerful Time Module can be used for more than process control and timing the Boston Marathon).

485 Program Steps
Necessary Accessories: Two memory modules and Time Module. Printer useful.

Documentation — $14.00 Cost of 5 cards — $6.25

03127-41 : Amortization Schedule With Pay-Ahead Option

This program is helpful to persons wishing to pay ahead on their mortgage principle. The program assumes monthly payments are made, then prompts for an optional principle payment each month. The program is set up on a yearly basis, so the user has complete control of output. COMP mode allows users to vary interest rates, terms, and amounts borrowed to see the effect on the monthly payment.

384 Program Steps
Necessary Accessories: Two memory modules and X-Functions. Printer desirable.

Documentation — $14.00 Cost of 4 cards — $5.00

D500 Marketing Sales

00315-41 : Gross Profit Margin

This program computes gross profit margin, selling price or cost, according to the formula: GPM(%) = 100(S.P. Cost)/S.P.

65 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00330-41 : Lubricant Prices — Read

This program makes use of data previously loaded into memory by "Lubricant Prices — Load" (Program 00331-41) or read from a magnetic card written by that program as a complete lubricants 'price list'. Prices can be calculated for 8 different sized oil packages and 5 for grease. Railage / grid differentials can be added and discounts calculated. Display / print routines operate automatically. Fully prompted inputs and labelled outputs.

Necessary Accessories: One Memory Module (for the HP-41C), Card Reader. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00331-41 : Lubricant Prices — Load

This program uses "Base B" encoding to pack lubricant prices, identified by 3 digit code, into data storage — 3 per register — for subsequent reading by a separate reading program, "Lubricant Prices — Read" (Program 00330-41). Features: 1) sequential loading (93 values); 2) review/change individual values; 5) resume sequential loading at any user designated point. Default is after final entry. Automatic print routine when printer connected. All inputs fully prompted and outputs fully labelled.

Necessary Accessories: One Memory Module for the HP-41C. Card Reader and Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00616-41 : Queueing Theory for a Small Sales Outlet

Input the number of customers expected per hour, the number one salesperson can serve in an hour, and the number of salespeople. Then the program predicts the queue length, time in queue, number of customers present, and total time spent waiting and being served.

124 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00668-41 : Sales Tax Computer

This program computes the sales tax on any dollar amount input. It will also list (or print) a sales tax schedule, starting with any amount. For example: $1.50 to $1.61 = $0.10 tax. Also $1.62 to $1.76 = $0.11 tax.

Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

00957-41 : "Amway" Order Form Calculator

This program is designed to assist its user in quickly and accurately filling out an "Amway" distributor order form.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01858-41 : Electric Rate Analysis I

General purpose electric rate analysis program to compare two rates. Can handle up to a five block energy rate, a monthly customer charge, and a monthly minimum charge for each of two rates. Output options include single point kWh comparison or table of kWh versus charges in user selectable increments of kWh.

669 Program Steps
Necessary Accessories: 3 Memory Modules and Printer

Documentation — $14.00 Cost of 7 cards — $8.75

01981-41 : Import Calculation

Calculates cost and sales price out of FOB or CIF price, units/ctn., weight, freight-rate, duty and other costs. This program is a fast and valuable tool for use on your desk or on visits to fairs and suppliers. Operates with or without printer.

229 Program Steps
Necessary Accessories: 1 Memory Module; (Printer is optional)

Documentation — $12.00 Cost of 4 cards — $5.00

01983-41 : Electric Rate Analysis II

General purpose electric rate analysis program to compare two rates. Supports Hopkinson and Wright type demand rates with up to five energy blocks, up to three demand blocks, a customer charge, and monthly minimum. The two rates need not be the same type. Both rates and the results of comparisons are printed.

734 Program Steps
Necessary Accessories: Three Memory Modules or Quad Memory Module, and Printer

Documentation — $14.00 Cost of 7 cards — $8.75

02561-41 : Learning Curve For Manufacturing

Calculates manufacturing cost variables based on the learning curve suitable for production planning and marketing. Input any three known parameters and the fourth can be calculated as well as the average cost of any number of units between any two limits set by the user. Program uses a simple to use technique and provides several checks against careless input. Can be used with printer and HP-IL video interface.

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02855-41 : Mail Order Analysis

Here is a program that allows you to analyze the results and keep records of a mail order campaign. With an input of the appropriate parameters, you get a neatly tabulated printout including total mailing cost, percent return, cost per order, total fulfillment cost and profit or loss. Provision is made to allow you to compare the results of different mailing lists from different sources and each list is given a suitable heading automatically for later identification.

307 Program Steps
Necessary Accessories: One memory module. HP-IL; Extended Functions Module; HP 82162A Printer.

Documentation — $12.00 Cost of 4 cards — $5.00

02972-41 : Street Consumption Research

Program permits the user to keep simultaneous tallies of up to 3 kinds of events through 3 keys (e.g., C = Any adult, D = Cigar Smoker, E = Cigarette smoker passing by), and can record up to 5 groups of such tallies, each with prompted survey location (6 characters max.), date, beginning and end time. Applicable to street consumers passing demarcation line across sidewalk, or types of litter along a block.

112 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02980-41 : Breakeven Analysis

BRKEVN presents an interchangeable solution for any of the 5 variables in the breakeven analysis problem. It differs from program HP Solutions Book "Business Stat/Marketing, Sales": top-row keys are used to represent the 5 variables: fixed cost, variable cost, price, units, profit. Integral units are used; the breakeven point may thus be bracketed by the number of units on either side of the breakeven point.

126 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03042-41 : Chlorophyll Content From Absorption Spectra in 80% Acetone

The program converts optical density reading of chlorophyll extracts in 80% acetone, obtained using a spectrophotometer into total chloropylll, chlorophyll a, chlorophyll b and the ratio of a/b for micro g/cm^2 or micro g/gm of original tissue using equations of Arnon (1949). Full alpha prompts are used and options include provision for sloping baseline, labelling of each sample (if printer present) and calculation of total chlorophyll from 652 nm OD values as a check on accuracy.

182 Program Steps
Necessary Accessories: Printer desirable

Documentation — $8.00 Cost of 3 cards — $3.75

03043-41 : Chlorophyll Content From Absorbtion Spectra in DMF

This program uses the equations of Moran (1982) to convert optical density (OD) values from chlorophyll extracts in dimethylformamide (DMF) obtained using a spectrophotometer, into chlorophyll contents expressed as either microgram/gm or microgram/gm^2. The program includes full alpha prompting. Optional features include provision for a sloping baseline, labelling each sample (if printer present) and calculation of protochlorophyll content from OD values at 625 nm.

255 Program Steps
Necessary Accessories: Printer desirable

Documentation — $8.00 Cost of 3 cards — $3.75

03229-41 : Questionaire or Interview Response Tabulation 99x260x5

Frequencies of responses are accumulated for up to 99 questionaires of up to 260 questions, each with up to 5 possible answers or no response. Output is 6 counts per question separated within one display or sequential display of percentages. Also for recording structured interview response without paperwork.

180 Program Steps
Necessary Accessories: None. HP-41C may require extra memory modules.

Documentation — $12.00 Cost of 2 cards — $2.50

D550 Personal Finance

00372-41 : Gasoline Consumption Analysis

This program enables a vehicle operator to keep a tank-by tank record of gasoline consumption and cost. A record is kept on magnetic data card and updated each tankful. A summary program will display/print totals to date of volume, distance and cash. It also displays/prints averages over the period concerned of consumption, cost per unit volume and cost per unit distance. Duplicate routines - metric/English. Automatic print routine. Fully prompted inputs and labelled outputs.

340 Program Steps
Necessary Accessories: Card Reader. Printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

00375-41 : Print Checkbook Listing

Tabulates and prints checkbook balances and items (checks or deposits) from checkbook listing or bank reconciliation statement. Arranges by column and prints check number, deposit date, "c" or "d" as appropriate, amount of check or deposit, and balance (positive or negative).

142 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

00551-41 : Bank Statement Validation

Validates monthly bank statement with check book entries. Simplified input thru printer/display prompting. Identifies each transaction, whether on bank statement or in check book, and prints all data on each deposit, canceled check, voided check, check service charge, miscellaneous charge and interest paid. Recaps all transactions to show what bank balance should be and what current check book balance is. Can be used for recapitulation of any financial records using serialized vouchers or receipts.

351 Program Steps
Necessary Accessories: Two Memory Modules and a Printer.

Documentation — $12.00 Cost of 5 cards — $6.25

00908-41 : Reconcile "N.O.W." Checking Account (Interest Checking)

This program allows the user to reconcile his "N.O.W." (negotiable order of withdrawal) interest checking acccount quickly and completely. A full record is printed of all transactions: checks, deposits, now interest, now charges, void checks. Complete use is made of the HP-41C's alphanumeric capabilities.

88 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 2 cards — $2.50

00919-41 : Electric Bill and Budget Analysis

This program will analyze electric bills and budgeted amount for this expense. Gives total kwh, total expense, balance of budgeted amount, monthly average for budget balance for the remaining months in year, kwh per month used, average expense per month, and cost per kwh for the accumulated months.

75 Program Steps
Necessary Accessories: Card Reader useful

Documentation — $8.00 Cost of 1 card — $1.25

00987-41 : Telephone Bill

This program divides the telephone bill according to how many roommates there are. Keeps a running account of the bills for the year. Writes it out neatly. Compares the bill to the previous month, keeps track of average cost.

419 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 7 cards — $8.75

01006-41 : Interest Checking Verification with Daily Compounding

Fully prompted-chained xeq. with illegal entry protection for date and entry omission guards. Enter interest rate, date and dollar amount of deposit or withdrawal as prompted and you see n of days flashed followed by the balance then automatically returned for next date entry. The balance, n, t.n, interest paid and t.i paid are displayed upon request any time. Delete last transaction available. Based on 365 daily compounding.

247 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01128-41 : Budget Shopper

This program is for the budget conscious shopper, it prompts for, then sequentially stores a shopping list. At the store it prompts the shopper, accepts quantity and price information on each item and displays a running sum of purchases. Back at home, the printer prints an itemized list of purchases.

185 Program Steps
Necessary Accessories: One Memory Module or more and Printer.

Documentation — $12.00 Cost of 2 cards — $2.50

01313-41 : Checkbook Recordkeeper

Enter your checks on the HP-41C as you write them. It calculates your balance and lists checks and deposits. When you receive your bank statement, enter the returned checks and the HP checks your bank's balance and keeps a record of checks still out. Lists are kept on magnetic cards.

369 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader.

Documentation — $12.00 Cost of 4 cards — $5.00

01351-41 : Checkbook Tracker — 1

This program will turn your 41C into a checkbook tracker and error finder. Equipped to handle checks written or those voided, deposits made and service charges, with the balance shown after each transaction. This program includes a printout of all transactions and has a special feature which allows you to make a mistake and recover it in one simple and easy move. The mistake recovery feature is invaluable.

236 Program Steps
Necessary Accessories: One Memory Module, Card Reader and Printer

Documentation — $12.00 Cost of 3 cards — $3.75

01354-41 : Management of 2 Simultaneous Bank Accounts

Manages the administration of two separate bank accounts, allowing movements from one to the other. Keeps owner's and bank's balance separate and keeps track of orders entered in owner's books until they are entered in the bank's balance. Checks stored data and announces disturbances in error messages.

475 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 5 cards — $6.25

01405-41 : Auto Log for Gas and Maintenance

Program determines the average MPG between each fill-up and records the date, miles accumulated, total cost, and cost per gallon at each fill-up. A conversion routine is included for cost per litre cases. Also included is conditional testing for oil, filter, and spark plug changes. Data can be stored on a card or in available registers.

107 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV. Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

01492-41 : BEOG/PELL Grant Eligibility Index for the 1981–1982 School Year

Compute the eligibility index for all 5 cases of students without the use of any additional tables or computations. Gives the user U.S. Dept of Education approved processing capability for computing financial aid eligibility. Program features: comes complete with specially designed forms to use that allow students to submit data that will match the program's input. Allows for playing what-if? If you are not interested, just tell your local financial aid officer that you can do "hand computations" of any Pell Grant in under 5 minutes. That should raise a brow or two.

633 Program Steps
Necessary Accessories: 3 Memory Modules

Documentation — $14.00 Cost of 7 cards — $8.75

01510-41 : Personal Budget

A comprehensive personal budgeting program including: (a) 73 income and expense accounts; (b) automatic updating of checking, savings, cash, loan and charge account balances; (c) printed and dated journal for all transactions (d) year-to-date, monthly average and budget reports.

830 Program Steps
Necessary Accessories: Quad Memory Module, Printer and Card Reader.

Documentation — $14.00 Cost of 12 cards — $15.00

01547-41 : Personal Financial Balance Sheet

This program produces one's personal balance sheet, printing all current assets, fixed assets, liabilities and net worth. The change from last year and the per cent of the net worth in current assets. Items are totalized in each category until entering zero. Program then proceeds to the next group.

129 Program Steps
Necessary Accessories: Printer convenient, not necessary. Balance sheet form provided in lieu of printer.

Documentation — $12.00 Cost of 2 cards — $2.50

01580-41 : Checkbook Made Easy

Balances checkbook and reconciles statement with minimum input. Balance prompts for deposit date and amount; displays sequential check numbers and prompts for amounts. Statement reconciliation prompts for deposits received and bank charge; outstanding checks, displayed by number and amount, are reconciled by a Y/N type response.

166 Program Steps
Necessary Accessories: 1 Memory Module, Card Reader (Printer optional).

Documentation — $12.00 Cost of 2 cards — $2.50

01620-41 : Checkbook Reconciler

Let your 41C reconcile your checking account. Enter your checks and deposits into the 41C. When they clear, just enter it's number, the 41C tells you what your bank statement and checkbook balance should show. It records outstanding checks, deposits and balance on a magnetic card for future use.

177 Program Steps
Necessary Accessories: One Memory Module, Card Reader

Documentation — $12.00 Cost of 2 cards — $2.50

01634-41 : Expense Account w/Summary

An expense report which keeps a record of each entry into categories of lodging, meals, guest meals, car rental, car expense, taxi, telephone, gratuities, cleaning, supplies, and other by prompting for each item by day. The summary lists expenses by day, category, and item including totals for each.

346 Program Steps
Necessary Accessories: Card Reader 82104A, Printer 82143A

Documentation — $12.00 Cost of 6 cards — $7.50

01850-41 : Credit Card - Extended Functions/Memory

This program creates and maintains credit card information–card name and number, amount charged, credit limit and expiration date–in an Extended Memory ASCII file. The program demonstrates the use of ASCII files and many new Extended ALPHA functions.

285 Program Steps
Necessary Accessories: Extended Functions/Memory module, at least one Memory Module.

Documentation — $12.00 Cost of 3 cards — $3.75

01889-41 : Splitting the Bill–the Ultimate in Dining Convenience

Your workmates will be convinced of the HP-41's power and versatility after lunch with the Bill Splitter. Referring to a maximum of six persons by their initials, HP calculates individual totals, tax, tip, built-in gratuities, change due, and the denominations to ask for it in for easy distribution to each member of the party. Easy information review. Special subroutines eliminate round-off error. R/S in totaling procedure is not required due to automatic execution. Programmed alpha instructions assure super simplified execution.

521 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

01907-41 : Multiple File Bookkeeper

Program allows user to store various bookkeeping files. Records in file are defined by character string (12 or less) and corresponding dollar value (sign indicates asset or deficit). Records can easily be added, updated or deleted. The entire file is neatly printed with total assets and deficits as well as grand total.

235 Program Steps
Necessary Accessories: Extended Function Module, Printer, Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01915-41 : Uniform Methodology: Dependent Student Financial Need 81/82

This is a two program package that uses information gleaned from a specially designed form, the financial status of a college student may be evaluated and the appropriate financial assistance computed. Program is U.S. DOE approved as a processing capability for financial aid analysis, field tested for 6 months. Very compatible with ACT analysis, and can save up to 30 minutes of 'hand computation'. Updates for 82/83 school year will be provided by author as they become known. Two programs handle dependent and independent students.

551 Program Steps
Necessary Accessories: None

Documentation — $16.00 Cost of 10 cards — $12.50

02200-41 : Budget Managing and Projecting System

B-MAPS is a Cassette Drive based system that automatically and totally manages a User-defined file system that perfectly matches his budget estate. The budget estate can be composed of up to twenty accounts including multiple checking, saving, loans, and stocks. Interest accruements, loan amortizations, direct deposits/withdrawals, and stock purchases can be handled as single or repeating time events. "What-if" projections can be made without losing the base budget estate. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

1356 Program Steps
Necessary Accessories: Quad Module (or CV), Extended Functions Module, Cassette Drive. Printer highly recommended.

Documentation — $16.00

02276-41 : Mileage

This program is designed to tabulate one's monthly fuel usage, calculate the mileage for each tank of gas, and summarize one's fuel usage for the month. The program prompts for all inputs. Partial fuel fill ups can be input also. Miles may be input directly from an odometer or trip meter.

219 Program Steps
Necessary Accessories: Printer and one memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02277-41 : Cash Budget Worksheet

You have a checking account and a money-market fund. Your objective is to keep a minimum amount of cash in your checking account and to transfer all surplus cash to the interest-earning fund. Use the special worksheet (supplied) to forecast your checking account's balance for the next seven weeks. Then perform a "what-if?" analysis to find the best timing of cash transfers into and out of your checking account.

148 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02283-41 : Easy Shopper

A user friendly grocery shopping aid that not only keeps a running grand total, but automatically adds the sales tax and displays a running grand total. It shows you how much of your budget you have left, deducting how much will go to the sales tax. It also offers a comparison sequence, very friendly, that not only tells you the best buy, but also how much you would save, including tax, for best product. Typed instructions.

199 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02294-41 : The Gas Card

A lotta program in a little card for those persons who would like to easily compute their miles per gallon with each fillup and readily know if it's better or worse than average. This friendly setup is all on one magnetic card. The program is on one side and the running total data is on the other. A liter-to-gallon conversion is built in and the instructions are typed. It's simple and very handy.

91 Program Steps
Necessary Accessories: Card Reader

Documentation — $12.00 Cost of 2 cards — $2.50

02334-41 : Data Table Processing

This program enables the construction of a two-dimensional worksheet of alpha or numeric entries. Routines enable insertion, change, or inspection of any single entry, row, column, or the entire table. User can specify "what if" calculations which will then be performed on all or part of the table. At home, the program can help with budget planning. In the lab, it will process raw data into useful numbers with ease.

213 Program Steps
Necessary Accessories: Minimum of one memory module. Card Reader and Extended Functions Module optional.

Documentation — $12.00 Cost of 6 cards — $7.50

02347-41 : Verify Your Interest Checking Statement

Fully chain prompted with illegal entry protection and last entry delete. Start by entering the current year, interest rate, each deposit/debit with its date and you can easily check out your monthly interest checking statement. The data collected is balance, interest paid for each entry, number of days for each entry, total interest paid, and total number of days for the overall period.

28 Program Steps
Necessary Accessories: One memory module, Time Module and Extended Functions Module

Documentation — $12.00 Cost of 2 cards — $2.50

02354-41 : Gasuse-Heating Gas Use Rate Analyzer and Cost Projector

Program calculates heating gas use and tracks cost through a heating season. Output variables include useage rate (undred cubic feet per degree day) and projected seasonal cost assuming average and actual winter severity. Provision is made for data entry, correction, card storage, and printout in several formats. Contains synthetic code.

426 Program Steps
Necessary Accessories: Two memory modules. Card Reader and Printer helpful.

Documentation — $12.00 Cost of 4 cards — $5.00

02400-41 : Checkbook - Extended Memory

This program uses an ASCII file in extended memory instead of Card Reader to store checks and deposits. Each check or deposit is entered with a number, date, ALPHA description, and amount. Two balances are kept: bank balance and checkbook balance. Upon clearing the bank, only the number is needed to change the bank balance and delete the transaction. Facilities also include voiding checks, displaying balances, and displaying specified transactions.

284 Program Steps
Necessary Accessories: Extended Functions Memory Module. One memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

02413-41 : HOME - Household Organizer and Manager or Expenditures Prog

This program allows the user to record expenditures in one of thirty categories. Monthly category totals and grand total may be stored on a card. Month cards may be summed and stored on a year-to-date card. Extensive error checking and correcting included. Category titles may be changed easily.

387 Program Steps
Necessary Accessories: Three memory modules. Card Reader optional.

Documentation — $14.00 Cost of 5 cards — $6.25

02489-41 : Grocery Shopper Helper

Next trip, take your HP-41C grocery shopping with you and calculate your total cost just like the checkout clerk does. With entry system for taxable and nontaxable entries, your HP-41C will quickly compute an on going total spent with the tax added by the percent per dollar. You can even choose to have the HP-41C tell you how much under or over budget. Complete with quantity prompt and all calculations shown for added convenience.

143 Program Steps
Necessary Accessories: None. Card Reader useful.

Documentation — $12.00 Cost of 2 cards — $2.50

02560-41 : Statistical Analysis of Automobile Use by Kalman Filter

This program applies a sophisticated statistical test based on the "Kalman Filter" to let you know when a change in gas mileage is too large to be a chance occurrence. The method is recursive, so that it doesn't need to use your car's past mileage history, conserving storage.

255 Program Steps
Necessary Accessories: One memory module. Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02616-41 : Consumer Price Index 1925-1983 With Quarterly Values

The CPI-W ("Urban Wage Earners and Clerical Workers"). Stores 240 quarterly values - 84% of them exactly, 16% within 1/4% accuracy so as to reproduce all these quarterly values and the exact official annual values. Seven seconds - a new quarter; 30 seconds - a new year. Gives ratios between any selected base year or quarter calculations. Indispensible as for personal property replacement valuation. Prompted and labelled, mistake resistent and updatable to 1990.

463 Program Steps
Necessary Accessories: Three memory modules. Card reader optional.

Documentation — $12.00 Cost of 7 cards — $8.75

02922-41 : Monthly Bill Reminder

An ASCII file in Extended Memory will help you keep track of your monthly bills: date due, description, amount, and if they have been paid. Total bills due and paid are calculated. With an HP-IL printer attached, a neat four-column tabulation of bill data along with totals is provided. If a Time Module control alarm is set, the calculator will review the file each night and alert you the next day should any bills come due.

304 Program Steps
Necessary Accessories: One Memory Module with HP-41C, Extended Functions Module, Time Module, or HP-41CX. HP-82162A Printer is optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03070-41 : Auto

This program should aid one over the negotiations for a new car with the salesperson. The calculator will keep a running total of the "window" price (with and without sales tax) and the dealer cost. Seperate discount rates can be applied to the base and accessory prices. A printout can be called for to summarize all cost and discounts.

195 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

03088-41 : Home Budget

Simple, straightforward program to track expected/actual home budget. Program uses thermal printer to print income, debits, and balance. Change amounts and the new balance is printed. Program is set up for two semi- monthly paychecks, but can be easily used for weekly or monthly budgeting. Accommodates up to 25 debit items and four income items.

262 Program Steps
Necessary Accessories: Thermal Printer and "permanent" data storage medium (mag cards, extended functions, or cassette drive)
Documentation — $12.00 Cost of 8 cards — $10.00

03089-41 : Individual Retirement Arrangement (IRA) Withdrawal Planning

Program assumes two funds (ie. one IRA account and one non IRA account). A withdrawal strategy for an IRA account depends on tax rates, living expenses, initial amounts, interest rates, and inflation rates. These factors can be varied to determine how they affect the life and value of both funds. A 1982 joint tax rate table is internally generated; or a manual tax rate input is prompted. Non penalized withdrawals are assumed.

359 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

03547-41 : U. S./Canada Relations

Along the U.S./Canada border, many communities face the same problems. Among them are the exchange of currency and the conversion of the English System of measurement to the Metric System of measurement. Many people on both sides of the border do not understand and are easily confused by these conversions. This program computes currency exchange both ways, relative gasoline prices both ways, miles per gallon, kilometers per litre, litres/gallons, miles/kilometers, kilograms/pounds.

181 Program Steps
Necessary Accessories: One memory module (HP-41C).
Documentation — $12.00 Cost of 3 cards — $3.75

D600 Real Estate

00370-41 : Building Area Conversion, Net to Gross

This program converts individual net areas to individual gross areas proportionally based on the net area percentage of the total net area. Program prompts for all required input. Maximum number of spaces which can be analyzed 252 (4 Memory Modules). 60 spaces possible with one Memory Module.

184 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00672-41 : Depreciation Present Value (PV) Factor

Program calculates present value (pv) factor of depreciation for declining balance (200%, 150%, 125%), straight line and sum-of-the-year digits methods. Pv factor may then be utilized for computing present value of depreciation.

98 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01126-41 : Real Estate Investment Analysis After-Tax Cash Flows & IRR%

Given purchase price, rent, tax bracket, mortgage terms - up to two mortgages, appreciation, holding period, etc., program produces before and after tax income for each year, sales proceeds net of capital gains taxes and depreciation recapture, and the after tax internal rate of return.

394 Program Steps
Necessary Accessories: Two Memory Modules. Card Reader and Printer helpful. Finance Pac or Standard Application Pac.
Documentation — $12.00 Cost of 4 cards — $5.00

01202-41 : Warehouse Rent/Sale Arithmetic

This program is handy at negotiation time. "N" months ahead for n year of any term it can highlight the effect of inflation on lease or sale proposals, or not, while figuring dollars per square foot, monthly and annual rental, the effect of vacancy, capitalization, and rental return on cost.

212 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01480-41 : Real Estate Agent's Finance Advisor for Purchasers

This program assists in counseling prospective purchasers in the various facets of real estate finance and mortgaging. It will calculate down payment, mortgage balance, closing cost estimates, payments, tax advantages and other data for conventional, VA, FHA and FHA Graduated Payment mortgages at any interest rate. This program can qualify any purchaser for a mortgage as per government and lending institution procedures. It determines the maximum house a buyer can qualify for under each type of mortgage.

942 Program Steps
Necessary Accessories: Quad Module. Printer and Card Reader helpful.
Documentation — $16.00 Cost of 11 cards — $13.75

01515-41 : Monthly Payment Amortization (Monpay) (Max Loan)

This program will determine a maximum loan available for a given monthly principal and interest payment. For a given loan a month by month listing of outstanding balance, interest and principle will be shown along with annual and total interest.

242 Program Steps
Necessary Accessories: 1 Memory Module. Card Reader and Printer desirable.
Documentation — $12.00 Cost of 6 cards — $7.50

01630-41 : Internal Rate of Return

This program calculates the Internal Rate of Return (Discount Rate of Return or Yield) for up to 40 cash flows on the basic HP-41C. Each additional memory module adds 64 more cash flows. This program is an improved version of 00194C both in printed output and in the ability to back up and change previous entries.

74 Program Steps
Necessary Accessories: None. Printer optional.
Documentation — $8.00 Cost of 1 card — $1.25

01631-41 : Installment Sale of Property Tax Differential

This program is intended to calculate the tax differential to the seller on an installment sale versus an outright, i.e., lump sum sale of a piece of property.

239 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01958-41 : Mortgage Analysis

This program computes the Net Present Value, after tax, of a home mortgage over the borrowers expected holding period. It takes into account varying down payments, interest rates, points, and rates of return for investors.

503 Program Steps
Necessary Accessories: Quad Memory Module, Real Estate Module; (Printer is helpful)

Documentation — $14.00 Cost of 9 cards — $11.25

02156-41 : Contract Payment Schedule Print-Out

Program prints pertinent information and data of real estate contracts with month by month, year by year listing of payments, amount of interest, amount paid on principal and current balance. Prints yearly totals of same. Automatic amortization. Equally useful to real estate agents and individuals with contracts.

248 Program Steps
Necessary Accessories: One Memory Module, HP-IL, HP-82161A Thermal Printer; (Video Interface and Monitor are useful).

Documentation — $12.00 Cost of 4 cards — $5.00

02508-41 : Subdivision Evaluation

Based on eight items of input data, program calculates any of the five major variables in a project evaluation, namely N, number of units, L, cost of raw land, %P, the developer's profit as % of sales, P, Selling price of a unit, and H, on-site construction cost of a unit. It then flashes a review of all the inputs selected, and displays a financial statement of the project.

498 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

02647-41 : Mortgage Loan Service

Computes mortgage loan payments. Maintains loan status card which is updated with each payment. Permits variable interest rate and balloon payment at the end of the repayment period. Permits overpayments, exact payments, underpayments and no payments. Provides interest paid over a given period.

236 Program Steps
Necessary Accessories: Printer and card reader.

Documentation — $12.00 Cost of 3 cards — $3.75

03127-41 : Amortization Schedule With Pay-Ahead Option

This program is helpful to persons wishing to pay ahead on their mortgage principle. The program assumes monthly payments are made, then prompts for an optional principle payment each month. The program is set up on a yearly basis, so the user has complete control of output. COMP mode allows users to vary interest rates, terms, and amounts borrowed to see the effect on the monthly payment.

384 Program Steps
Necessary Accessories: Two memory modules and X-Functions. Printer desirable.

Documentation — $14.00 Cost of 4 cards — $5.00

D650 Securities

00417-41 : Stock Portfolio

This program lists the symbol or six letter abbreviation of up to 64 different securities together with the number of shares and the dollar price. The sub-totals and grand total are also displayed. Inserting annual dividends instead of prices gives sub-totals and grand totals of dividends.

180 Program Steps
Necessary Accessories: Card Reader, Printer and two Memory Modules.

Documentation — $12.00 Cost of 2 cards — $2.50

00449-41 : Buy and Sell Stock Market Timing

Anticipates Bull and Bear markets using readily available (Wall Street Journal) short sales information of "insiders" activities. This is not a "hot tip" approach but one used by canny investors who have achieved remarkable success at predicting shifts of 10% or more in stock prices. Printer optional.

78 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

00456-41 : Point and Figure Charting Aid

Evaluates price action of stock, providing printer output of up/down column chart entries, including buy and sell signals.

357 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00643-41 : Call Option Value

The value of a call option is calculated using the Black-Scholes model, and the calculated value is compared with the option premium. While the Black-Scholes model has been implemented in several programmable calculators this program is tailored to the HP-41C, and uses many of the 41C unique features. Simple program modification is required to use after May, 1981. Program calculates time to option expiration using only the present date. Other required inputs are: (1) underlying stock price, (2) underlying stock rate of return, (3) market risk-free rate, and (4) option exercise price.

352 Program Steps
Necessary Accessories: Two Memory Modules and 82143A Printer

Documentation — $12.00 Cost of 4 cards — $5.00

00800-41 : Stocks

This program is designed to be used as an organizational tool when tabulating stock portfolios. The program prompts for all necessary inputs and prints (on the HP-41C printer) a complex list of each stock, any free cash holdings, the total income from all stocks, and the total current market value of stocks.

154 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 3 cards — $3.75

01134-41 : Record Keeping and Analysis System for Investments

Program system maintains investments record including user convenience information. Permits segmenting larger portfolios. Output options: Printer or display; portfolio totals only or also data for each item; cost or value. Value mode shows short- or long-term appreciation for each item and entire portfolio. Information easily updated.

192 Program Steps
Necessary Accessories: Card Reader and Printer

Documentation — $14.00 Cost of 7 cards — $8.75

01460-41 : Data Correlation

Two short programs load and update data cards which are used in pairs, as desired, in a main program to calculate the correlation function between the two loaded data sets, for any number of intervals up to 30.

180 Program Steps
Necessary Accessories: One Memory Module (for the HP-41C), and Card Reader.

Documentation — $12.00 Cost of 3 cards — $3.75

01563-41 : Bond

This program computes the yield-to-maturity of a bond given the price, coupon rate (payable semiannually), and the years to maturity. Or the program will determine the present value of a bond with a given coupon rate (semi-annual coupons), the years-to-maturity, and the desired yield.

184 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01666-41 : Profit Sharing Stock File and Transaction Record

Three programs are included to create a file on magnetic cards and to update the file, to summarize the total cost and worth for each stock, and to print out a summary of stock purchase transactions and dividend payments. These programs are suited for those plans that do not include payment of broker fees by the plan participant.

318 Program Steps
Necessary Accessories: One Memory Module, Printer, Card Reader

Documentation — $12.00 Cost of 4 cards — $5.00

01685-41 : Charles Schwab Commissions

Calculates commissions charged by Charles Schwab and Co., Inc. on stock ($56,000 or less principal amount) and options ($6,000 or less principal amount) transactions. Reflects rates in effect as of March, 1982.

107 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01688-41 : T Bills

Given treasury bill face value and maturity in months plus either premium or treasury discount rate, this program calculates treasury rate or premium, equivalent coupon rate, and for 12 month bills, the corresponding all savers certificate rate. The program rejects invalid inputs and adjusts for leap year calculations.

143 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01718-41 : OBV (On Balance Volume)

This program calculates Granville's "On Balance Volume" for any stock after adjusting for the market's influence. It stores up to 90 OBVs and the highs and lows. After five highs and lows, it displays each succeeding new one. A record of all data can be printed.

139 Program Steps
Necessary Accessories: 3 Memory Modules, Printer, Card Reader

Documentation — $12.00 Cost of 3 cards — $3.75

01720-41 : Stock Plot

This program will plot a graph of a weekly input of stock prices. The X axis will be labelled by the date of the month.

99 Program Steps
Necessary Accessories: HP82143A Printer

Documentation — $8.00 Cost of 1 card — $1.25

01987-41 : Option Straddle Calculation

This program permits the computation and odds of break even and twenty-five percent profit achievement on the purchase of Straddles (simultaneous purchase of equal quantities of Calls and Puts). Probabilities are based on volatility and days remaining before expiration. Commissions are figured in complete with profits.

153 Program Steps
Necessary Accessories: 1 Memory Module, Printer

Documentation — $12.00 Cost of 2 cards — $2.50

01995-41 : Charles Schwab and Co., Inc. Stock Commissions

This program calculates the Commission charged by Charles Schwab & Co., Inc. on stock transactions. Inputs are number of shares and stock price. Reflects rates in effect as of March 1982.

85 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02013-41 : Stocks File and Evaluation

Program maintains a file of stocks. File can be expanded, updated listed and sorted. Sort routine looks for stocks with losses and stocks which have reached the target selling price.

380 Program Steps
Necessary Accessories: Printer, Card Reader and at least 2 Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

02027-41 : Option Write - Cash

Annualized rate of return is computed on the sale of options on any quantity of stock. Complete prompting is given for all entries, and commissions are figured in on the purchase (and possible sale) of the stock and the options. Outputs are annualized rate of return IF the option is exercised and annualized rate of return IF the option is NOT exercised. Program assumes a 360 day year.

63 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02395-41 : Extended Stock

Extended Stock uses the features and storage of the HP Extended Functions/ Memory Module to facilitate portfolio value calculations. It enables users to create extended memory files containing stock names and numbers of shares owned. The user can add or delete entries, list the contents of any of the files, or display or print each stock's value at current prices and the total worth of the stocks.

118 Program Steps
Necessary Accessories: Extended Functions/Memory Module (Printer is recommended).

Documentation — $12.00 Cost of 2 cards — $2.50

02900-41 : Fixed Interest Valuation

Calculates the market value and accrued interest of fixed interest securities, for half yearly, quarterly or annual interest payments; interest in advance or arrears; when maturity is on, or not on, an interest anniversary data; cum or ex next interest payment.

308 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02901-41 : Commercial Bills

Calculates the present or future value, number of days or interest discount) rate of commercial bills or other instruments using a straight line discounting formula.

84 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

02923-41 : Rights Issue Calculations

Calculates ex issue, rights, cum issue prices or dilution factors for rights issues of shares.

90 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

02954-41 : Earnings Per Share

Calculates fully diluted earnings per share, incorporating provision for convertible notes, specified preference shares and share issue during period.

100 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

03130-41 : IORISK

This program performs a technical analysis of a stock, using the method presented by Michael Zahorchak in "The Art of Low-Risk Investing". The method compares the 5-, 15- and 40-week moving averages of the stock's price to find buy, sell, and hold signals.

288 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03268-41 : Real Interest of Bonds

This program calculates the real interest of bonds, taking into account the quotation, the nominal interest and the remaining term.

117 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03514-41 : Return From Securities

This program computes the percent return on any stock you own. Key in: a- the cost (basis), b-number of shares presently held, c-newest price, d-commission if sold, e-approximate tax liability. Key in all dividends received, the number of quarters owned. The program displays percent return on investment and the percent of the basis.

111 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 1 card — $1.25

D700 Taxes

00541-41 : Payroll with Federal and Illinois State Tax

Computes biweekly payroll deductions for income tax (state and federal), social security, pension, tax shelter annuity (or IRA), savings and misc. under October, 1981 tax reform act. Pension can be eliminated by selecting certain labels. There is no need for separate programs for married or singles. It's all in this one program. Added advantage - by using enclosed tax table, user can change program from bi-weekly to weekly, semi-monthly or monthly. Program can be updated by changing social security % or tax tables as needed, or by using local state % instead of Illinois %.

349 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

00569-41 : Withholding Tax Federal + New York State

Given gross pay calculates amount of federal withholding tax, FICA and New York state withholding taxes. Provides net pay and total deductions. Also disability (NY). Works on weekly payroll.

266 Program Steps
Necessary Accessories: One Memory Module
Documentation — $8.00 Cost of 3 cards — $3.75

00585-41 : Payroll Returns

This program makes it easy to prepare, or as in my case, to review payroll tax returns prepared by staff members. It computes and prints out by line number all the information needed to complete the Federal Form 941, Georgia Forms ESA-4 and G1.

Necessary Accessories: Card Reader and Printer
Documentation — $12.00 Cost of 3 cards — $3.75

00817-41 : Maximum 50% Tax Test for Personal Service Income

This program allows the user to promptly determine if the benefits of form 4726 can be utilized. Form 4726 is the maximum tax on personal service income and may result in a lower tax than regularly computed. Income averaging may need to be checked, also, since you can only use one that gives greatest savings.

87 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01097-41 : 1980 Tax Tables, Tax Rate Schedules, and Income Averaging

This program is an adaptation and combination of three well-written programs for individual taxes contributed by the staff of the HP Users' Library. It takes full advantage of the huge capacity of the HP-41C as well as its decision-making ability. It makes searching through tax tables and schedules totally unnecessary.

Necessary Accessories: Three Memory Modules. Printer and Quad Memory Module recommended.
Documentation — $12.00 Cost of 8 cards — $10.00

01183-41 : Federal Corporate Income Taxes 1981 to 1983

For calendar and non-calendar year corporations figure income taxes on positive and negative amounts, leaves tax in x register, taxable amount in y register. Uses only stack for calendar year corporations, very fast. Useful tool or subroutine.

145 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01251-41 : 1040C Business Expenses

The first of three programs, on two cards, accumulates business expenses into accounts (registers) the number of which match the line numbers on the 1040C form. Monthly and yearly lump sums are kept. It will display or print sums and expenses. The second, on two cards, matches the first but also keeps monthly accounts. The last, on two cards, prints sums and expenses by name.

462 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader. Printer optional.
Documentation — $14.00 Cost of 8 cards — $10.00

01489-41 : 1981 Taxes Including Income Averaging, Maximum Tax, Minimum Tax and Alternative Tax

This program solves for all tax states and does the calculations and provides answers for the following schedules: G-Income Averaging, 4726-Maxtax, 4625 and 6251 Minimum and Alternative Minimum Tax, Schedule D- Alternative Tax Computation, incremental tax rate.

Necessary Accessories: None
Documentation — $14.00 Cost of 8 cards — $10.00

01502-41 : Economic Recovery Act of 1981 Accelerated Depreciation Table

This program calculates the depreciation schedule and remaining book value for assets, as set forth in the accelerated depreciation schedules of the 1981 Economic Recovery Act. Input includes asset value, year the asset is placed in service and whether the asset is used for research and development.

186 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01937-41 : Accelerated Cost Recovery System

Calculates depreciation expense, accumulated depreciation and remaining book value for "recovery" property placed in service after Dec. 31, 1980 and before Jan. 1, 1985. This program reflects the accelerated cost recovery system (ACRS) promulgated under the Economic Recovery Tax Act of 1981.

244 Program Steps
Necessary Accessories: One Memory Module; (Printer & Card Reader are optional)

Documentation — $12.00 Cost of 3 cards — $3.75

02131-41 : IRS Interest Computation

This program uses IRS rules to compute interest on a tax deficiency (or tax refund) for any period from 1/1/70 - 6/30/83. A subroutine will update for later developments. The program also computes a simple interest rate to help comparisons of alternative courses of action.

262 Program Steps
Necessary Accessories: Two Memory Modules; (Printer is optional)

Documentation — $12.00 Cost of 3 cards — $3.75

SOLVE and INTEGRATE

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DIVERSIONS

F100 Games
F102 Games — Board and Table
F104 Games — Games of Chance
F106 Games — Word and Number

F200 Hobbies
F202 Hobbies — Aerobics
F204 Hobbies — Amateur Radio
F206 Hobbies — Biorythms

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

F000 DIVERSIONS

00542-41 : Road Computer

The HP41C figures, dist., time, speed over an interval of auto travel. Then it computes the average speed overall preceding intervals as well as the time and distance to go and, finally, e.t.a.. You initialize the 41C by interactively keying in the distance of a proposed trip, the odometer reading and the time of day. During the trip, you update the calculator by entering only successive odom readings and times.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01070-41 : Vacation Trip Planner

This program provides a very useful tool in the preparation for any lengthy trip, be it a vacation or business trip. It outputs a neatly formatted listing of beginning intermediate, and end points of an itinerary including incremental time and mileage as well as accumulative time and mileage between points.

223 Program Steps
Necessary Accessories: One Memory Module for the HP-41C. HP82143A Printer.

Documentation — $12.00 Cost of 2 cards — $2.50

02887-41 : The Complete Bowling League Secretary Card Based Data System

A complete bowling league secretary using card based data storage. A set of six programs for the complete automation of the duties of the league secretary. Keeps team and individual stats including highest game/series bowled as well as the league record highs scratch or handicapped for men, women, and teams. Computes average and handicaps. Will print the weekly standings after sorting team standings.

795 Program Steps
Necessary Accessories: Full memory, Card Reader, Ext. Funct. Module, Ext. Memory Module, Printer and HP-IL Loop

Documentation — $25.00 Cost of 20 cards — $25.00

02903-41 : Travel Computer

Program calculates: miles driven, percent of trip covered, miles to go, time elapsed, average m.p.h., e.t.a. (time and date), MPG, fuel needed to finish trip, and finally, cost to finish trip at present fuel economy. You initialize your H.P. at the beginning of the trip with the miles to destination, your odometer reading, and the average cost of fuel. Anytime during the trip, simply input odometer reading and fuel used.

140 Program Steps
Necessary Accessories: Time module

Documentation — $12.00 Cost of 2 cards — $2.50

03071-41 : Demo of Unique HP-41C Features

This program shows off the unique features of the HP-41C calculator. The beeper, alphanumeric display capabilities, annunciators, scrolling, and flying goose are demonstrated. A "billboard display" refers to other highlights such as user-defined keys, peripherals, and Users' Library. A great way to show your HP-41C to a friend!

116 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03109-41 : Trip Record

Enter highway number, mileage between cities, and cities as you choose your trip route from a map. Enter automobile operational data (MPG), (MPH), (Gas Cost in $/Gal.) after trip has been routed. Output includes input data plus accumulated mileage and miles to go are printed following each city on strip chart.

175 Program Steps
Necessary Accessories: Two memory modules, printer and card reader

Documentation — $8.00 Cost of 3 cards — $3.75

F100 Games

00309-41 : Musical Reverse

"Musical Reverse" is a game program. The object is to order a random sequence starting from the left. The tone function of the 41C provides the "music" as the digits are sorted.

97 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00311-41 : Crack the Vault

A bank vault, containing millions of dollars, has been accidentally locked. You must open it quickly or lose your job. Can you do it?

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00332-41 : Contract Bridge Scorer

The program shows the score above and below the line for each side in a rubber of bridge. Totals for each side are also displayed.

432 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C. Card Reader and Printer.

Documentation — $12.00 Cost of 5 cards — $6.25

00345-41 : Canasta Scorekeeper for Four Teams

This program keeps score for up to 4 players individually or up to 8 players on teams of 2. It will automatically prompt you for all the parts of base such as red 3's, red Canastas, black Canastas, and going out; then it calculates your total base for the hand. After the input of the base, points left in the hand, and points count on the board, it will give the total scores and calculate the required meld for the next hand.

Necessary Accessories: Two Memory Modules for the HP-41C. Printer optional.

Documentation — $14.00 Cost of 4 cards — $5.00

00346-41 : Spades Scorekeeper

This program automatically keeps score for a game of Spades with two teams playing. Program will print complete details of each hand if Printer is used.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00354-41 : The 41C Dealer

This program is a dealer of a standard deck of 52 cards without replacement. After all 52 cards have been dealt it will shuffle automatically or it can be shuffled at any time manually. Cards are named Ace/Heart; 7/Diamond; Queen/Club; etc.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00362-41 : Paper Rock Scissors

Here's one to amuse the kid in you. Play "Paper, Rock, Scissors" against the HP-41C. When the 41C signals "ready" you may make your guess. The 41C then displays your guess along with its predetermined (but hidden) guess; displays whether there is a tie, a win or a loss; accumulates a score and recycles for the next turn.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00384-41 : Hearts Scorekeeper (With Output Labeling)

This program allows you to maintain the scores of up to six players, individually or with partners. After the scoring for each hand is completed, the display tells you whether to pass the cards to the right, left, across, or not at all.

169 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00401-41 : Last Year at Marienbad

A card game for two players. The player taking the last card loses. This program makes considerable use of the HP-41C's alphanumeric and audio capabilities.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00402-41 : Redpawl Thacket — A Problem in Logic

Redpawl Thacket is a town where the inhabitants tell the truth, lie, answer by alternately lying or telling the truth, or just answer randomly. Your task is to determine from the answers you receive who is who! Information will either be supplied randomly or you may set the questions and decide whom to ask. This program is based on 02580-97 and 04059-97, but uses all of the 41C advanced capabilities.

316 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00479-41 : Petals Around the Rose

The 41C "rolls" 5 dice (watch'em dance across the display!). You are to guess the number of "Petals Around the Rose". The 41C will tell you if your guess is right or wrong. It will give one hint, after 10 incorrect guesses. And, after 3 correct guesses in a row, it will dub you a "Knight or Lady" of the Rose.

145 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00480-41 : The Black Holes and Calcutter

A Celestial Navigation problem: the 41C randomly generates up to 5 "black holes" in the first quadrant of space. The Calcutter (a Galactic Survey Ship) is equipped with sub-space drive. It's task is to fly to the outer edge of the "galaxy" and return to base without getting trapped by a black hole.

Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00495-41 : Orbital Lander — HP Solution with Printer and Modified End

Program logic is from HP Games Solutions Book (Program 00216-41), but is modified to run faster and with less stops and less paper when used with the printer. The feedback after impact is also more friendly.

332 Program Steps
Necessary Accessories: Printer, one Memory Module.

Documentation — $12.00 Cost of 3 cards — $3.75

00496-41 : Moon Orbiter

You, as pilot of a Moon Orbiter, have your chances for surviving a lunar landing greatly increased by being able to examine a printout of your simulated trials. You can then try to correct your mistakes. A safe landing is still extremely challenging. Can be used for parties as icebreaker!

294 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00497-41 : Cannibals and Missionaries

An adaptation of a classic puzzle from the HP-29C Games Book: 3 Missionaries and 3 All-Consuming Cannibals. Get them all across the river without mishap. The 41C's alpha display is used to help keep track of how many C's and M's make it successfully to the opposite bank of a river and to inform the user when a goof is made.

111 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00547-41 : Hunt the Wumpus

This program allows you to hunt the fearsome wumpus in his network of caves. Each turn, you may move, or shoot a crooked arrow at the wumpus. Watch out for bottomless pits and superbats and don't bump the wumpus–he may eat you up! Alpha messages improve on existing programs.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 5 cards — $6.25

00597-41 : Hot-Air Balloon

The object of the game is to safely land the hot-air balloon near the center of a small clearing surrounded by trees. The direction of the wind changes with altitude, and thus the horizontal position of the balloon is controlled by varying its altitude, by adjusting the amount of hot air it contains. There is only a limited amount of fuel for heating the air, but sandbags can be dropped for emergency ascent.

167 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00633-41 : Invaders

This is a calculator game similar to the popular space invaders game at arcades. An "enemy" will flash at a random place on the display. The object is to accurately estimate the number of blank spaces before the "enemy" (between 0 and 9). If the "enemy" is hit he will blow up. If missed, he has a 50/50 chance of blowing up 1 of your 3 bases.

127 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00714-41 : Golf

In this game of golf, you choose your own handicap, design your course, select and swing your club, and hope your ball escapes the woods. Hole number, yardage, par, and distance to the woods are output for one to four golfers.

612 Program Steps
Necessary Accessories: Three Memory Modules and Printer

Documentation — $14.00 Cost of 7 cards — $8.75

00715-41 : Bingo Generator

41C bingo generator will give bingo calls randomly without repetition either singly or in a series of calls. Output per example I22, G53, B12, N45 etc. Also able to give a complete review of all numbers called.

204 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00733-41 : Music and Memory

This program tests your musical ear and your memory! The calculator plays a tone. Guess it right, and the old tone, as well as the new one, will be played. Special features include: scoring, help routine, and three skill levels!

121 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00734-41 : Wand Scatter

This program is an adaption of 00219-41 — Scatter (Games Solution Book), in which the player has to find up to 9 atoms hidden in a box by probing with rays and watching the reflections. The program is now played with the optical wand and the bar code layout for the search and destroy game in the Wand Owner's Manual, making the game both simpler and more enjoyable.

Necessary Accessories: One Memory Module, Wand and Wand Owners Manual.

Documentation — $12.00 Cost of 2 cards — $2.50

00758-41 : Golf

This program allows for 1 or 2 players, you choose your handicaps, the club you want to use and the swing. Your HP-41C designs the course by a random number generator. Shot distance and distance to hole, and whether you have hit into the rough or not are displayed. After each hole your score and after 18 holes the totals for the round are displayed.

321 Program Steps
Necessary Accessories: One Memory Module and Printer. Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00783-41 : Hunt the Wumpus - II

Somewhere in 20 interconnected caves is a cave with a wumpus, two caves with pits, and two with super-bats. Hunter must search caves, alert for danger warnings, find and shoot the wumpus. This is an enhanced version of 00213-41 which is easier to play (illegal moves not possible), adds sound effects, keeps score, permits replay of preceding game, and when used with printer will keep a log of the hunters travels. One memory module necessary.

320 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00784-41 : Chicago Bridge

The program scores and totals the results of the four hands of Chicago which is a scoring variation of contract bridge wherein four hands complete a set or game.

Necessary Accessories: Two Memory Modules, Card Reader and Printer.

Documentation — $12.00 Cost of 6 cards — $7.50

00797-41 : Tennis

Play tennis against your 41C where you can vary your position and have two types of shots.

510 Program Steps
Necessary Accessories: optional. Three Memory Modules (if part of wording cut out only two Modules). Printer

Documentation — $12.00 Cost of 7 cards — $8.75

00866-41 : Wompus

The sneaky wompus lurks in one of 20 caverns. You must kill him before he kills you. Tunnels connecting caverns change each time game is played. The wompus may move when shot at, but he leaves tracks. Sleep only when you must as goblins may carry you off while you snooze! Best part of program are the fights you have with wompus.

343 Program Steps
Necessary Accessories: Two Memory Modules. Card Reader helpful.

Documentation — $12.00 Cost of 6 cards — $7.50

00900-41 : The Caves

"The Caves" is an adventure game in which the player moves about a series of 67 interconnected caves to pick up nine items to total 1200 without dying from various hazards. If you like games, mazes and puzzles with magic you will love "The Caves".

578 Program Steps
Necessary Accessories: Four Memory Modules or One Quad Memory Module

Documentation — $14.00 Cost of 8 cards — $10.00

00924-41 : Scorekeeper

Using the HP-41C's alphanumeric capabilities, this program tallies the score of 1 to 5 players for a variety of games. Reviews all or individual scores including number of points on last turn. Ideal for Pinochle, (it remembers the bid), Scrabble, (it has a built-in variable length timer), and others.

266 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00964-41 : Microtrek

Microtek is a calculator version of the popular space war games available on large computers and some microcomputers. It is played by two people who each command a ship. Commands included are: 0-locate enemy ship, 1-fade, 2-appear, 3-warp speed, 4-scan local space, 5-fire phasors, 6-fire torpedo, 7-ship status check. Play proceeds on a 10x10 universe until one ship is destroyed.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00965-41 : Civil War Simulation

Change the facts of history! Recreate the civil war battles, based on actual facts, and possibly have the south win the war. All factors are interrelated and while the result may be the same as actually happened - it is up to you!

862 Program Steps
Necessary Accessories: Four Memory Modules (or Quad Memory Module) and Card Reader necessary. Printer desirable.

Documentation — $14.00 Cost of 11 cards — $13.75

00971-41 : Labyrinth-Adventure

Explore an underground maze and bring out the three treasures before the beast finds you. Random number initialization provides innumerable mazes for variety and repeatability. Your score depends on retrieving as much treasure in the fewest moves. Names and scores of the top four players are maintained.

515 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

00977-41 : 41C Truck

This program simulates an eighteen wheeler. You must deliver your shipment within ten hours or be charged a penalty. Smokies and obstructions slow your progress causing you to change between three roads. If you are caught for speeding, you are fined; or charged for repairs if you crash.

Necessary Accessories: Three Memory Modules. Card Reader optional.

Documentation — $14.00 Cost of 8 cards — $10.00

00986-41 : Simon (With 6 Levels of Play and Score Keeping)

This program simulates play on the electronic game, "Simon". It features six different playing levels, and keeps records of perfect, very good, good, fair, and average games played. A perfect game consists of repeating all eight digits in the correct sequence. Complete use is made of the HP-41C's alpha-numeric capabilities.

Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01005-41 : Sum

This program uses a random number generator to place a number on the screen. You can choose how many digits (from 1 to 10) you want the number of. Then you must key in the value of the sum of all digits of the number, separately. You will have about five seconds to answer (this period can be modified) then the calculator will tell you if it is right or wrong (also with sounds).

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01022-41 : Space War

This program simulates a battle between spaceships found in various sectors of a 10 element space. Player either fires into a sector in an attempt to destroy the "Vader Rader" ship, or maneuvers to avoid attacking raders.

193 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01076-41 : LJ Adventure

You've played the Adventure programs on a computer, now you can play them on your HP-41. Each adventure is stored in data memory, and the Support/Interpreter program using this data shows your surroundings, the items there, and the results of your actions. It is the eyes, ears, and hands of your character. This package contains the Support/Interpreter program, with documentation on how the program works, and how to write your own adventures (which I invite you to submit) and the adventure LJADV "Terrorist Dam #1".

553 Program Steps
Necessary Accessories: Three Memory Modules or a Quad Memory Module and a Card Reader.

Documentation — $14.00 Cost of 14 cards — $17.50

01088-41 : Football

You play a game of Football against the calculator. There are six plays to choose from. No other equipment is necessary - the calculator keeps track of and displays all information. The length of the game is controlled by the number of plays you allot at the beginning.

494 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

01096-41 : Slow-Music Maker

By this program, slow music is fast produced out of numbers stored in data registers. Those knowing how it is produced can use this for programming slow tunes compatible with the system. Those who don't can play the game of entering arbitrary numbers and adventuring what music it produces.

61 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01136-41 : Tennis

"Tennis" has 2 basic functions: it counts for you all the points during any match of Tennis and prints them at the same time on a nice list, so that you can obtain a complete documentation about the match, including really all the points, services, etc. "Tennis" can be used for all imaginable matches of Tennis: single or double, with tiebreak or without. You can even define the rules of the match. "Tennis" is presented in 2 blocks of routines; the first block allows you to define, record, print the rules and all the useful informations about the 2 players (or team, in double), and to open the printed list of the match. The 2nd block counts points and prints match actions.

Necessary Accessories: None

Documentation — $16.00 Cost of 19 cards — $23.75

01159-41 : Darts: 301 Opponent Simulator

This program simulates 301 darts with strategy, throwing, and scoring. The features are: (1) the skill of the calculator can be easily changed; (2) the program displays the points that individual darts make; (3) the program occasionally displays that a dart has bounced off.

418 Program Steps
Necessary Accessories: One Memory Module

Documentation — $14.00 Cost of 4 cards — $5.00

01227-41 : Rubik's Cube Solver

This program will solve the puzzle of Rubik's Cube from any position. The program usually completes a random cube in 5-10 minutes and usually in under 125 moves. All you do is enter the state of your cube when prompted and your HP-41 will do the rest. You are told what to do by using an adapted version of Singmaster's Notation. The program is quite long and has been split into four parts. Extra instructions are supplied for those who have all four ports needed for memory modules.

1553 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV, Card Reader or Wand. Printer useful.

Documentation — $20.00 Cost of 15 cards — $18.75

01229-41 : Nicomachus

This program asks you to guess a number between one and a hundred. It then asks you three questions about the number. From the answers it determines the number you were thinking of.

195 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

01247-41 : The Count of Derg

A simulation of the management of a country. Some necessary information comes with experience. Other facts, more or less correct, are supplied. Includes land management, plagues, floods, weather, climate, magic, warfare, death and taxes. Game duration is indefinite. Good performance is survival of 25 years. Works with or without printer.

629 Program Steps
Necessary Accessories: Two Memory Modules. Printer optional.

Documentation — $14.00 Cost of 5 cards — $6.25

01310-41 : Starbattles

Starbattles has three enemy ships attacking Earth. Earth is defended by four earthships with a total of six torpedoes. The object of the game is to find the three enemy ships in a 4 x 4 space quadrant before losing all four earthships.

208 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

01318-41 : Full Poker–5 Card Draw

You play a fully automatic game of five card-draw poker with full prompting for all phases of antes, betting, drawing, raising, staying, etc. The calculator, against whom you play, can be assigned as aggressive a personality as you wish. This is a full simulation, including bluffing capability. To boot, the calculator doesn't cheat.

945 Program Steps
Necessary Accessories: Three Memory Modules and Card Reader
Documentation — $14.00 Cost of 9 cards — $11.25

01321-41 : Advanced Star Trek

HP-41C version of 00369-97, non-print and print. Non-print has sector / course / weapons angles computor. Printer version has practice firing range. Both star trek programs identical. Functions include: course control; advanced sensor system; adjustable shields; phasers; photon torpedoes; transporter / tractor beam (for Nubian freighter): three enemy ships: corbomite maneuver (with self-destruct); computer with non-print version gives: course to middle of "mission sector", plots course to any coordinates, and gives weapons firing angles, target practice with print version simulates firing on enemy vessel. The game is played in a 3-dimensionl cube.

1085 Program Steps
Necessary Accessories: Three or four Memory Modules for the HP-41C.
Documentation — $20.00 Cost of 20 cards — $25.00

01329-41 : Games Totals Keeper

A game by name tally of up to three games for up to eight players, retaining and displaying the scratch and handicap scores, by player, by team, and by game, as well as the comparsion of line opponent to line opponent.

Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

01346-41 : Rally

"Rally" is a fast-paced, action-packed car race run on public roads in which you compete against yourself or friends. Realistic obstacles require you to make split-second decisions in your race against the clock. If you disobey traffic laws as you 'drive' to win, the "***Police***" are just one of the many surprises the HP-41 has waiting for you.

570 Program Steps
Necessary Accessories: Three Memory Modules. Card Reader helpful.
Documentation — $14.00 Cost of 7 cards — $8.75

01363-41 : Magic Cube Simulator

Program duplicates moves of a magic cube and displays results of each face. This allows the user to test a series of moves before execution on a cube. The program does not solve the cube. Alpha display only is used and no provisions are made for printing.

Necessary Accessories: Two Memory Modules. Card Reader helpful.
Documentation — $12.00 Cost of 6 cards — $7.50

01395-41 : Alpha Rotate

A puzzle!! Not quite Rubik's Cube, but never the less, a challenge. The object is to alphabetize the letters "a" – "p" on a 4 x 4 playing board. The letters, arranged randomly at the beginning of the game, are maneuvered on the board by rotating blocks of four letters clockwise one position. One special move, allowed only once each game, exchanges any two letters. At any point in a game the playing board may be recorded on a data card. Playing boards may also be generated and recorded. An alternate version for the Wand is also included.

274 Program Steps
Necessary Accessories: One Memory Module (for the HP-41C) and Printer. Card Reader and Wand optional.
Documentation — $12.00 Cost of 3 cards — $3.75

01472-41 : Camel

Your objective is to travel 200 miles across the desert while evading a tribe of pygmy cannibals. You have one quart of water which may be replenished at an oasis or by another traveller. All types of hazards may be encountered during your journey. (Warning: This game is addictive).

358 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 6 cards — $7.50

01481-41 : Rubber Bridge Scorekeeper

This very friendly program calculates and accumulates the score on any possible combination of hands and stores the details of the bid and tricks made, including honors for each hand played (maximum 68) for review at any time. It also keeps track of the number of hands played and the deal.

579 Program Steps
Necessary Accessories: 3 Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

01514-41 : Space

Space is an attempt to bring the popular video game Space Invaders to 41C users. It displays one row of an infinite number of Invaders at a time. After you have finished off one row of Invaders, a Deathship scrolls across the display. If you miss this Deathship it will enter the earth's atmosphere and disintegrate the earth with its powerful weapons.

400 Program Steps
Necessary Accessories: 2 Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

01551-41 : Labyrinth

Guided by a compass, a single player tries to escape a maze by finding all the randomly hidden parts of a magical loadstone wand. Teleporting trolls hamper progress, but the explorer can blast and jump walls and blast trolls. Up to 10 by 10 cell maze with 41CV. Two programs.

962 Program Steps
Necessary Accessories: 3 Memory Modules minimum, Card reader.
Documentation — $14.00 Cost of 8 cards — $10.00

01642-41 : Game of Rhythms

Since the HP-41 displays the status of flags 0-4, this program uses that characteristic to generate a game that exercises the sense of rhythm. This game has 4 levels of difficulty, and was found very interesting by the great majority of the people that played it.

126 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01735-41 : Barrage

You are in a battle tank chasing an enemy tank. You are given information on distance and windspeeds and you must destroy him before he destroys you. Will you be damaged and disabled, or can you destroy the enemy. There are different levels of play and no accessories are required.

167 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01739-41 : Stock Market Tycoon

You have five years (20 quarters) to turn $100,000 into a fortune, and become a Stock Market Tycoon. You can buy and sell 10 different stocks for cash or on credit. You will endure inflation or recession, enjoy bull markets or suffer bear markets.

388 Program Steps
Necessary Accessories: 2 Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

01784-41 : Treasure Quest

Treasure Quest takes the traveler on a trip through highlands and caverns. The goal of the traveler is to gather and return to safe storage all treasures scattered throughout this fixed world. There are numerous hazards to be encountered, most favoring experience over luck. The 41C's alpha capability is used to give the traveler a vivid picture of his surroundings. When the game ends automatically, the score is presented for that game.

819 Program Steps
Necessary Accessories: Quad Module
Documentation — $14.00 Cost of 10 cards — $12.50

01851-41 : Quiz Controller

You have seen quizzes on T.V., now you can compete in your home. Program has three modes: single person competing against television competitors; two people competing with a third as quizmaster. The calculator is the Buzzers, keeps score and can ask questions.

232 Program Steps
Necessary Accessories: 1 Memory Module. Card Reader if the HP-41 is to be quizmaster.
Documentation — $12.00 Cost of 5 cards — $6.25

01969-41 : Axman

The AXMAN goes to the barnyard to get a chicken for dinner but he comes up against one smart chicken. You are the AXMAN and you have six moves to WHACK the chicken or he will get away. A fast moving game requiring thought and planning. Running score displayed.

433 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

01977-41 : Baseball Fever

From the national anthem to the final out – in extra innings if necessary – this unbelievably complete, yet easy-to-play game of strategy and chance includes balls, strikes, all hit-types, fouls, double plays and errors. Two players press keys to pitch, swing, take, bunt, steal and obtain additional game related informaton. Improper response loops make user errors impossible.

857 Program Steps
Necessary Accessories: 4 Memory Modules
Documentation — $14.00 Cost of 10 cards — $12.50

01979-41 : "Reflex": A Game of Speed and Precision for Two Players

The calculator rolls 2 dice at random. Players watch for 7, 11 or doubles. First player to hit his key scores a point. But don't flinch! If roll was not a 7, 11 or double, flinching player loses a point. Tones tell of flinches and announce who was first.

94 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02074-41 : Clay Pigeon Shooting

As in real clay pigeon shooting, the popular French sport, you wait a certain time (different for each shooting) and then shoot at the pigeon flying through the display. You destroy it only if you fired with the correct angle. Two levels of difficulty, two speeds for pigeon.

117 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02092-41 : Kingdom

You are the ruler of a kingdom. Your task is to manage that kingdom for as long as possible. Each year you decide how much corn to plant and how much to use for food. Beware of variable harvests and assassination attempts.

176 Program Steps
Necessary Accessories: One Memory Module; (or HP-41CV)
Documentation — $12.00 Cost of 2 cards — $2.50

02102-41 : Invisible Enemy

To search and destroy 3 enemy spaceships, guided only by tones from your sonar. Be careful not to get hit or crash onto the boundaries of confined space. Two options, 10 levels of difficulties. Requires clear mind, fast reaction and good hearing.

288 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

02104-41 : Gnort

Hidden in a maze of twenty caves is a dreaded Gnort, a fierce Wumpus, and four other dangers. You, the hunter, must move through the maze and kill both the Wumpus and Gnort without yourself being killed.

307 Program Steps
Necessary Accessories: One Memory Module or HP-41CV
Documentation — $12.00 Cost of 3 cards — $3.75

02119-41 : Scorekeeper

Keeps score for any game for up to 6 players. Gives a tone signifying end of turn after a user-specified time limit, with a warning tone a user-specified interval before loss of turn. Displays score of all players any time, with salutory BEEP for current winner.

142 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

02146-41 : Numeric Mastermind

This program is a version of the famous game. The HP-41 generates a random 4 digit number. You have 10 opportunities before the HP-41 tells you the secret code. The number of black and white pegs are shown simultaneously. The program is complete with beeps and tones. Test time is fast.

171 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02153-41 : Starwars

You are Luke Skywalker. This program gives you the opportunity to recreate his daring and dangerous mission that destroyed the Empire's Deathstar, thus saving the goodguys at the Rebel base. It's the time pressure, do or die excitement of a tactical dogfight, with full graphics displays, audio effects and running AVIEWs.

510 Program Steps
Necessary Accessories: 3 Memory Modules, or Quad, or 41CV.
Documentation — $12.00 Cost of 6 cards — $7.50

02165-41 : Invaders 2

Instead of one alien, up to ten appear randomly on display. Zap aliens by "firing" at display locations. Hit aliens to gain points. If you miss you lose points, aliens gain points. Eight waves of aliens. Features vivid alpha graphics, "MARCHING" alien attack message.

190 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02235-41 : Bowl: A Football Game For the HP-41

This is the "Cadillac" of calculator football games. Play football against another player or against the HP-41. The HP-41 is a smart opponent and difficult to beat. Current down, yards to go and field position, as well as probability are factors in the HP-41's play selection. The two-player game is a gripping contest of strategy and nerves.

971 Program Steps
Necessary Accessories: Quad memory or HP-41CV. Card Reader or Wand are recommended.

Documentation — $14.00 Cost of 10 cards — $12.50

02254-41 : Gunner

You have one gun to defend yourself. Tanks advance, one at a time with increasing velocity, and you have to set and angles to destroy the tanks. They only move while the projectile is in the air. If you do not destroy a tank, it will run over you.

88 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02271-41 : Badmen at Crooked Tree

The town of Crooked Tree is about to be invaded by a gang of badmen. You have been appointed sheriff (because of your reputation as a dead shot). You and your two sixshooters are all that stands between them and disaster. Vivid graphics.

260 Program Steps
Necessary Accessories: 2 memory modules. Card Reader optional. If Card Reader or Wand is not available - Extended Functions module is needed.

Documentation — $12.00 Cost of 4 cards — $5.00

02296-41 : Microtrek II

Microtrek is a calculator version of the popular space war game available for many computer systems. The program is designed for two to four players who battle each other, rather than against a computer enemy. Play proceeds on 50 x 50 grid indefinitely or high score wins or give each player a total time limit.

80 Program Steps
Necessary Accessories: Two memory modules

Documentation — $8.00 Cost of 1 card — $1.25

02370-41 : Laser Blast

The player faces a variety of enemy spaceships and attempts to score points by blasting them with his laser guns before they blast him. The HP-41 simulates the radar screen of a patroling spaceship by identifying the type of enemy and tracking it as it approaches.

198 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

02382-41 : Highways

Before you take a vacation, give this game a whirl. It has all the fun of traveling the highways ...full motels, flat tires, fender-benders and other joys of traveling by auto. You have 50 different highways to travel on and rack up as many miles as possible before getting wiped out. Included is a separate utility program so you can configure your own highway system. It will also allow you to store and recall up to 6 integers (from 1 to 255) in each register for as many registers as you may want.

324 Program Steps
Necessary Accessories: Two memory modules and Extended Function Memory Module

Documentation — $12.00 Cost of 7 cards — $8.75

02389-41 : Hobbit Adventure

Somewhere nearby is a colossal cave where others have found fortunes in jewels and gold. You command the calculator to search for these treasures. This is a mini version of the program found on many large computers.

407 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 7 cards — $8.75

02396-41 : Shiphunting

This program makes your HP-41C into a serious shiphunting rival. You must shoot off ships, which a random number generator places into a 10x10 grid. The generator provides for an always different ship arrangement of the calculator, if you start the program with a different number. After three misses the calculator shoots off your ships (three tactics available). After three misses of him it's your turn again.

796 Program Steps
Necessary Accessories: Four memory modules or Quad ROM

Documentation — $14.00 Cost of 7 cards — $8.75

02428-41 : Golf Score Up to 4 Players

This program keeps the score of 1 to 4 people playing Golf. You can also view and change the score on any hole. At any moment it can calculate the number of strokes played. After 18 holes you get the score without handicap and the score with handicap. The 4 players are totally independent.

229 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 3 cards — $3.75

02435-41 : Treasure Island

This is an adventure game program. You are on an island looking for treasure. The map of the island is different each time you play the game. Try to find the treasure before you starve. You have to take care about a lot of things: natives, sharks, deep well, hurricanes, etc.

289 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02436-41 : Super NIM

You play a game of NIM against the HP-41. Number of piles is limited to 53 but that is more than you'll ever need. The nice thing about this program is: the machine plays very fast, a few seconds per move. The machine will nearly always win; it doesn't make mistakes.

223 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02447-41 : Shoot-out at the OK Corral

A video displayed graphic of the OK Corral is the background for a shoot-out between Wyatt Earp and Blinky, the last two remaining from the famous shoot-out. You are Wyatt and you have an unusual way of aiming your trusty Peacemaker. Can you get Blinky before he gets you?

726 Program Steps
Necessary Accessories: Quad memory module, Extended Functions module, HP-IL module, video interface and a monitor or TV.

Documentation — $12.00 Cost of 9 cards — $11.25

02528-41 : Gin Rummy Scorekeeper

Keeps score for two Gin Rummy players. Has Hollywood and spades-doubling options. Uses any game count, box or gin bonuses. Automatically doubles for Schneider. Displays games scores after each hand. Can display game scores, or total scores and net differences at any time. Saves cumulative running scores. User friendly.

240 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02540-41 : Tank Battle

Your are the commander of a tank and must defend yourself against enemy tanks. Your tank may fire upon the enemy and move in any direction, but you are destroyed if the enemy gets too close. The enemy tanks come one at a time at random velocities and move both while the shots are in the air and while you are deciding. They always home in on your position.

177 Program Steps
Necessary Accessories: Time module

Documentation — $12.00 Cost of 2 cards — $2.50

02572-41 : Solitaire

Plays a complete game of Solitaire. All aspects of the card game Solitaire are simulated by the program, including placing KINGS on empty columns of the playing board, and moving whole sets of cards from one column to another. If you have ever tried to play Solitaire in a moving car or airplane (and had your playing cards sloshed about), you will realize why this program is indispensible.

562 Program Steps
Necessary Accessories: Quad RAM. Printer helpful.

Documentation — $12.00 Cost of 6 cards — $7.50

02608-41 : Mine Field

This program simulates a mine field where the objective of the game is to pass a package across the field and make it safely back. Points are awarded, and there is a difficult level when the player passes 100 points.

264 Program Steps
Necessary Accessories: Extended Functions module

Documentation — $12.00 Cost of 3 cards — $3.75

02609-41 : Pac Man

This program plays a game similar to Pac Man, the coin-op game. The object is to eat the power cell and consume the enemy for points. An additional Pac Man is awarded if you eat all of the ghosts. It also is programmed to randomly play itself.

423 Program Steps
Necessary Accessories: One memory module and Extended Functions module

Documentation — $12.00 Cost of 4 cards — $5.00

02716-41 : Pyramid of Thirteen

Play the card game "Pyramid of Thirteen". You are given a "Pyramid" of cards which you must remove two at a time to deplete the pyramid, and thus win. You may only remove cards if nothing lies on top of the cards, and the cards sum 13 (i.e. 3 hearts + 10 clubs = 13). Thankfully, execution is fast for a card game. If you can shorten one register from program, program will fit into ONE memory module.

238 Program Steps
Necessary Accessories: Two memory modules. Printer and card reader helpful.

Documentation — $12.00 Cost of 3 cards — $3.75

02747-41 : Baseball Simulation

This program simulates a baseball game with lineups of real players. Program includes section on making data cards of players based on their lifetime statistics. Once data cards are made, the starting lineups are entered in for each team and the game starts.

519 Program Steps
Necessary Accessories: Three memory modules, printer and card reader

Documentation — $14.00 Cost of 9 cards — $11.25

02762-41 : X Function Star Trek

This version of Star Trek includes quadrant charting, scans of individual quadrants each containing 100 sectors, photons, phasers, tractor beams, shields, and bases. Scanner shows positions of phasers, Klingons and Enterprise. Course computer is not needed as course changes are given as delta x and delta y. Works well on printer with no modifications.

811 Program Steps
Necessary Accessories: Quad Memory and Extended Functions Modules

Documentation — $14.00 Cost of 8 cards — $10.00

02879-41 : Scorekeeper With Player Ranking

Keeps score for any game for up to 10 players plus counting the number of rounds played. Displays last entry and total score when scores are entered or upon demand, at any time. Winner and player ranking may be obtained any time during or after the game, sorting time approx. 9 seconds.

197 Program Steps
Necessary Accessories: One memory module and Extended Functions Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02886-41 : Flight

This program simulates a complete aircraft flight beginning with taking-off from a 10000 ft long runway. The aim is to land at a similar airfield in fog by using Instrument Landing System which is synthetically created in the display. The pilot has the chance to retract gear in order to decrease drag force and reduce fuel consumption.

610 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 7 cards — $8.75

02888-41 : Hobbit

In this adventure game program you are a Hobbit thief entering a maze. Your task is to find (and steal) the mighty Orb of Zot (which is somewhere in the maze masked as a warp) and to kill as many demons as possible (number of demons in the level of game you select). To fight with demons you must have an amulet. But don't use amulets too much - their energy supply is limited. If you stay too long, Wizard will return and eat you!

422 Program Steps
Necessary Accessories: Three memory modules. Card Reader optional.

Documentation — $12.00 Cost of 5 cards — $6.25

02890-41 : Laser Battle

This program plays a laser battle game. The object is to build a laser cannon to destroy a group of invaders. You have many options including moving the laser cannon and sending a scout to use the invaders' laser cannon on them. There is even a bonus round.

333 Program Steps
Necessary Accessories: Two memory modules and Extended Functions Module

Documentation — $12.00 Cost of 5 cards — $6.25

02891-41 : Skier

This game is good for testing one's quickness and perception. The object is to pass thru two poles as often as the player can within a time limit of one hundred units.

206 Program Steps
Necessary Accessories: Extended Functions Module and Time Module

Documentation — $12.00 Cost of 2 cards — $2.50

02894-41 : Random Card Generator

This program duplicates a deck of cards. When executed, it places a random card in the alpha register. This program is helpful for card games where the card value and suit are needed.

292 Program Steps
Necessary Accessories: One memory module

Documentation — $8.00 Cost of 1 card — $1.25

02895-41 : Driver

This program plays a directional, reflex, and memory game. The object is to save lives by driving your lazer-proof vehicle and using it to shield people from an alien being with a vaporizer gun. Points are awarded, and there even is a bonus round where you can get additional points and additional lives.

225 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02908-41 : Bowling Scorekeeper

This program calculates bowling scores for 1 to 4 players. It was especially designed for random playing, so that player 1 does not have to precede player 2, player 2 does not have to precede player 3, etc. It even allows the scorekeeper to switch players between balls.

285 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02963-41 : Tic-Tac-Toe

This is probably the shortest tic-tac-toe program you are going to see: under 300 bytes. Still, it plays perfectly - HP-41 will apply all the tricks to win if you make a single mistake. I was so sure that the player cannot win that I did not include an "I LOSE" prompt!

142 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02970-41 : Extended Star Trek

This is a greatly expanded version of program #41-01321. All the features of Advanced Star Trek, non-print version, are included, plus far more detailed alpha text and adjustable game level. New routines include: intruder alert, ion storm/meteor field, evasive and attack maneuvers, implosion and more.

2001 Program Steps
Necessary Accessories: Quad Memory Module, Extended Functions Module and one Extended Memory Module

Documentation — $25.00 Cost of 27 cards — $33.75

03015-41 : Treasure Search

This program, with its "arcade-like displays", plays an interesting search game. The object is to get to a treasure box. But be careful; the treasure has three guards to protect it, and it's booby trapped. As the player, each man that you send out in search of the treasure is armed with five bombs which can eliminate all three of the guards. Since this program uses the display as a game board, no paper and pen is needed.

492 Program Steps
Necessary Accessories: Extended Functions Module

Documentation — $12.00 Cost of 5 cards — $6.25

03078-41 : The Skeet Shooter

The Skeet Shooter is an easy to learn, yet challenging, game of skill and chance for one to five players. The action begins by a momentary, random view of one of the nine target/target boundaries that are placed at a random display location. Points are earned by quickly deciding which boundary the target resides in, (left, right, or center), and by pressing the appropriate key within the very short time that the target is displayed.

450 Program Steps
Necessary Accessories: Quad memory module and Extended Functions module

Documentation — $12.00 Cost of 6 cards — $7.50

03147-41 : Escape

You are a secret agent on the fifth floor of a five story building. Surrounded by armed men, you must jump over enemy fire, shoot at the enemies, and use your martial art skills so that you can get out of the building. This program makes use of the alpha register which makes it comparable to a regular coin-op game. It's loads of fun and full of excitement.

697 Program Steps
Necessary Accessories: Extended Functions module

Documentation — $12.00 Cost of 6 cards — $7.50

03171-41 : Game of Life

This is a program for Conway's "Game of Life". It generates subsequent generations of organisms on a 10x10 grid. The organisms die or reproduce according to a simple rule. The program is very quick, it needs only 2 and a half minutes to print one generation.

206 Program Steps
Necessary Accessories: Memory Module and Printer

Documentation — $12.00 Cost of 2 cards — $2.50

03172-41 : Senso

The program generates a succession of tones which becomes longer and longer from round to round. The player must play the tones in the same order in which the calculator had played the tones. At the beginning of the game the player can choose the number of different tones which are used.

115 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03269-41 : Tank-Hunting 2

The calculator generates an object which wants to destroy your base. Three different objects can be generated: Tank, Super-Tank, and Missile. Your job is to destroy these objects.

371 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 4 cards — $5.00

03401-41 : Super Detective

There has been a robbery! A very expensive diamond was stolen from a nine room museum. Five people were wandering around the museum and you may question them about what they were doing, and they will tell you which room they were in at that time, who they were with and who they saw. The problem is that sometimes they might lie (especially the real thief). You must find out who the guilty suspect is and at what time he stole the diamond.

661 Program Steps
Necessary Accessories: Quad memory module.

Documentation — $14.00 Cost of 7 cards — $8.75

03402-41 : Super Reverse and XOR

This package consists of two programs: Super Reverse and XOR. Although based on completely different algorithms, these programs have one thing in common; the HP-41 will teach you to play and, while doing so, will win many times. Prove that humans are superior to computers when playing games of logic.

323 Program Steps
Necessary Accessories: One memory module for Super Reverse for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

03404-41 : Psycho Logic

This program is a difficult game of skill and concentration which will work on improving your IQ. You start at Level One, having a chance to graduate to Level Five after some years (or decades) of hard work. After that you can read the explanation on how to add new levels and make the game even harder.

194 Program Steps
Necessary Accessories: Two memory modules; card reader recommended.

Documentation — $12.00 Cost of 3 cards — $3.75

03418-41 : Mystery

This is an intriguing game of deduction which is loosely based on a popular board game. When your calculator tells you that someone has been killed at 'Badd Manor', it's up to you to determine "whodunnit?", "how?" and "where?", by a process of elemination. But don't make too many accusations, or you're next! This is an easy game to understand and play, but never too easy to win.

343 Program Steps
Necessary Accessories: Extended Functions/Memory Module, one memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

F102 Games Board and Table

00361-41 : Wizard of Pinball

This program simulates the play of some of the new electronic games, including 2x, 3x and 5x outbonus, point advancing kickout holes, thumper bumpers, spinner gate, star rollovers, lane rollovers, alpha-targets, drop targets, free ball, one to four players, 5 ball games, hi-score bonus, 3 free game thresholds, full alpha-display on scoring and sounds. 'Bookkeeping' routine keeps track of cash spent on games ("25 cents" per game). Flippers included.

534 Program Steps
Necessary Accessories: Minimum of 3 Memory Modules for the HP-41C.

Documentation — $14.00 Cost of 8 cards — $10.00

00363-41 : The Step Game

You and the HP engage in a strategic blocking battle. The one who can't move loses. As the challenger, you move first. This game may look like child's play but look out — the HP thinks several steps ahead. Your display becomes a TV screen to monitor your movements.

145 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $8.00 Cost of 3 cards — $3.75

00403-41 : Torpedo

This game simulates an enemy torpedo attack on your ship. Complete with sounds and HP graphics. Defend yourself by blasting mines you have in the torpedo's path. Just like those electronic arcade games with game over indicator and scorekeeper built in. Variable levels of difficulty.

136 Program Steps
Necessary Accessories: Card Reader and additional Memory Module.

Documentation — $12.00 Cost of 3 cards — $3.75

00485-41 : Game of the Generals

This program simulates a strategic army game in which the object is to capture the opponent's flag. You and the HP command armies of seven officers, a flag and a spy. You arrange your forces before the encounter. Higher rank defeats lower rank. The spy can kill all other ranks except the private, who kills the spy. Any other piece can capture the opponent's flag, but a flag against a flag is a draw.

235 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00515-41 : Pathfinder

This program consists of finding a hidden path from a known starting point to a known ending point in a 5 x 5 grid. The object is to trace the secret path in the minimum number of excess (penalty) steps beyond the path length. Clues may be bought for the price of a number of penalty steps. The pathfinder may not make the minimum number of steps but he proves he is a shrewd buyer and user of information.

202 Program Steps
Necessary Accessories: At Least One Memory Module

Documentation — $12.00 Cost of 5 cards — $6.25

00539-41 : Search and Destroy (without Wand)

"Search and Destroy" is a destroyer vs. submarine game typical of grid search games. Full use is made of the 41C's alphanumeric capabilities. This game was adapted and improved from the "Wand Owner's Manual". The wand is not used in this version. All of the suspense and intrigue of a destroyer captain is at your fingertips! This program also displays and records your best and worst games played.

Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00570-41 : Monopoly

This program is an adaptation for the HP-41C of program 01816-97 by Bruce G. Hansen. With this program, it makes the game more fun and efficient since you don't have to keep loading the cards as per his instructions. The HP-41C is a great banker and board position-keeper. The program does not follow all the standard rules of "Monopoly" — there are approximately ten differences.

420 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader.

Documentation — $12.00 Cost of 4 cards — $5.00

00582-41 : Black Box

This program is based on the game of "Black Box" (Parker Bros). Five marbles are hidden inside the black box by one of the players or by the HP-41C. A player sends "rays" into the box from various points. These rays may hit a marble or change direction if it comes close. Alphanumeric clues are displayed. From these clues you try to find the hidden marbles. The game is for one or two players.

359 Program Steps
Necessary Accessories: One Memory Module and Card Reader.

Documentation — $12.00 Cost of 3 cards — $3.75

00594-41 : Bell Fruit 41

This program simulates a Mills brand slot machine in payoffs and duplicates the same odds that any combination will occur. The display gives different alpha characters and audible tones for each fruit. Winnings are shown in display with fanfare. The pot can be reviewed and seed changed at any time.

146 Program Steps
Necessary Accessories: Card Reader

Documentation — $12.00 Cost of 2 cards — $2.50

00629-41 : Game of the Generals (Advanced Version)

For the more advanced GG player. Has a secret play option, so you don't know what killed you. Doesn't permit illegal reentries of previously eliminated ranks. Ranks eliminated feature, so you can replay. Card reader, two memory modules necessary.

339 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader.

Documentation — $12.00 Cost of 5 cards — $6.25

00654-41 : Othello for Two Players

This program allows two people to play Othello on the 41C, with the calculator keeping track of the board and score. A formatted board is printed after every move along with the score and prompting for the next move.

338 Program Steps
Necessary Accessories: Two Memory Modules and Printer.

Documentation — $12.00 Cost of 4 cards — $5.00

00655-41 : Space War-Interactive

You are the captain of a spacecraft in the far reaches of the universe. Your mission is to destroy as many of the enemy as possible, without being destroyed yourself. To accomplish this, you shoot at the enemy spacecraft (fighters, battleships, and freighters) as they move rapidly across the display.

213 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00663-41 : Maze: Construction and Play

This program produces a random maze ten by ten squares. The program first makes a path through the maze, then the program completes the maze. The second part of the program interprets the data and allows the player to try to make their way through the maze. You can only see one square at a time.

359 Program Steps
Necessary Accessories: One Memory Module.

Documentation — $12.00 Cost of 3 cards — $3.75

00671-41 : Wargamer's Dice

This program emulates the rolling of 4, 6, 8, 10, 12, 20, 100 and x-sided dice used in wargames and fantasy role-playing games. Various display options are provided, and if a printer is attached a record of all die rolls is produced.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00685-41 : Ancient Sumeria

As the despot ruling ancient Summeria, you must buy or sell land, feed the population, and plant sufficient crops each year without being impeached. Program includes full alphanumeric prompting, labelled output and a scoring routine to rate your reign.

314 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00694-41 : Towers of Hanoi

You must move up to nine disks of increasing size from the far left tower to the far right tower with the aid of only one intermediate tower. Be careful not to place a large disk on a smaller one. This game is about 2000 years old but it can still infuriate the player in its complexity of strategy.

104 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00735-41 : Mastermind

This program allows you to play mastermind on the calculator alone, without the aide of scratch paper or a board! you can "scroll" through your past guesses at anytime during the game. Completely portable - goes anywhere. more challenging than playing this game on a board. Six colors; four digits (expandable). One memory module. (two if you wish to expand colors and digits).

262 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00740-41 : Sumer

You reign over the country of Sumer. In your 10 year term, you must deal in land, facing the problems of famine and population growth. Your future decisions will depend on the decisions of the present. This program uses some of the 41C advanced features, and includes full alpha prompting.

501 Program Steps
Necessary Accessories: Two Memory Modules. Card Reader suggested. Works reasonably on Printer.

Documentation — $12.00 Cost of 5 cards — $6.25

00765-41 : Bermuda Triangle

This program plays the Milton Bradley game "Bermuda Triangle" against any number of players. Calculator will move its ships between ports trying to avoid the sinister mystery cloud and collect money for freight moved. It's you against the calculator.

Necessary Accessories: One Memory Module and Milton Bradley game "Bermuda Triangle".

Documentation — $12.00 Cost of 4 cards — $5.00

00785-41 : Orbital Rendezvous with Lunar Command Module

You are in control of the lunar module and must dock with the command module orbiting above. Sound easy? Your lM horizontal thrusters are crippled, forcing you to control orbital speed by changing only your altitude above the moon.

197 Program Steps
Necessary Accessories: One Memory Module (None with alterations noted).

Documentation — $12.00 Cost of 3 cards — $3.75

00791-41 : Multiple Black Box

1 or 2 players find 4 or 5 balls hidden on 8x8 board using rays. Balls hidden by players or calculator. Calculator establishes two identical boards so two players can compare their skill. Calculator bluffs so running time per play provides no clues. Calculator keeps running scores for players.

Necessary Accessories: Three Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

00796-41 : True Battleship

This program replaces one player in the original battleship game in two seas of 10×10 with (4,3,2,1) ship(s) (1,2,3,4) square(s) big. It places its ships and plays against you. Works faster with card reader.

719 Program Steps
Necessary Accessories: Three Memory Modules. Card Reader optional.

Documentation — $12.00 Cost of 7 cards — $8.75

00803-41 : Football Super III

Most advanced, complete football program ever. Play 3 ways: against another player, against the HP-41C, or the HP-41C plays against itself. Several run, pass, kick, and defensive plays. Down, yardline, etc., shown automatically in very convenient display. Halftime and "sudden-death" overtime. Occasional spectacular runbacks. "Two-minute" warning. Improved play-odds. *fantastic*

710 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $14.00 Cost of 9 cards — $11.25

00808-41 : Star Gate

You are the pilot of an interplanetary spaceship and must make it thru the star gate. To aid you in your flight are funnelling anti-gravity boundaries. However, there are three deadly black holes you must stay away from. Has time warp consequence for going too fast, and adjustable difficulty.

347 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00820-41 : 10 x 10 Life

In this game, organisms exist as cells in a 10 x 10 grid and survive, die, or reproduce according to a simple set of genetic rules. Each generation is calculated in an average of 1 1/2 minutes, with a 3 1/2 minute maximum. Program can move organism to prevent it growing off edges. The program can be run without a memory module by deleting the editing functions.

198 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

00828-41 : Puzzle of Fifteen

The puzzle of fifteen is a game played on a four by four board. The object of this game is to get 15 squares, each square having the number 1 through 15, in consecutive order. For example, to win the first row must be 1 2 3 4, the second 5 6 7 8, etc.

132 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00877-41 : Space Hunt

In this game you hunt for a hidden spaceship in a user-defined grid. You can choose between a 2 or 3 dimensional game, and a ship that moves or is stationary. You enter the coordinates of each missile shot and the distance missed is displayed. When you hit the ship you are rated according to the number of missiles used.

156 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00903-41 : Reversi

This program allows you to play a game of Reversi against the 41C. You can select who moves first and the opening. The 41C can play for you, even against itself. If a printer is present, the board is printed. Good playing level & quite fast.

291 Program Steps
Necessary Accessories: Three Memory Modules. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00929-41 : Chess 5 x 5

This program challenges you to play chess against the 41C in a 5 x 5 board, each player having king, queen, bishop, knight, rook, and 5 pawns. All standard rules are implemented, including pawn promotion. Printer present. 5 minutes per move. Good level.

515 Program Steps
Necessary Accessories: 3 Memory Modules (for the HP-41C) and Card Reader. Printer optional.

Documentation — $12.00 Cost of 7 cards — $8.75

00948-41 : Tic Tac Toe

Here is your favorite quick and fun game of skill and technique, tic tac toe against your 41C. This program not only lets you play tic tac toe with the 41C but makes it a challenge to beat your wise old machine. The 41C becomes an almost unbeatable player. There are a few ways to win, but they are hard to find and they cannot always be used twice. This is guaranteed fun and you'll spend hours trying to win just once.

Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00949-41 : Deluxe Battleship

It's you against the computer in a fight to the finish, as each of you try to be the first to destroy the others five ships. You had better be careful, because the computer never duplicates a move.

186 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01220-41 : Wars — A Version of Star Trek

Within a universe; you, the captain of a starship must destroy all your enemies before their reinforcements arrive. Beware of space storms and black holes. Experience dangerous living. Occasionally a time gate has to be negotiated. Maintain the ship's shields or be destroyed. Try to obtain a rating of 100.

953 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV. Card Reader helpful.

Documentation — $14.00 Cost of 9 cards — $11.25

01228-41 : Simulation of Rubik's Magic Cube Including a Complete Solution Algorithm

This program is a simulation of Rubik's magic cube. It contains A.O. A complete solution algorithm. A distorted cube may be entered and a sequence of moves is computed to restore the cube. The order of a sequence of moves can be computed.

830 Program Steps
Necessary Accessories: Three Memory Modules (for the HP-41C) and Printer

Documentation — $14.00 Cost of 7 cards — $8.75

01342-41 : Rubik Cube Solution

Rubik's magic cube has taken the world by storm recently. This program solves the famous cube from any position. The user enters the initial colours of the faces and the HP-41c proceeds to solve the cube using three subroutines. The output is a series of instructions informing which face should be rotated. The program is fully illustrated and the notation used is explained so that it will now be simple to solve the cube. This solution will not break any world records as it is relatively slow. An appendix to this program has been added so that those with the HP-IL Digital Cassette drive can now use it. Changes to run pgm on cassette drive are documented.

1217 Program Steps
Necessary Accessories: HP-41CV or Quad RAM, Card Reader (if cassette drive used, this is only needed for initial entry). Printer optional.

Documentation — $16.00 Cost of 14 cards — $17.50

01349-41 : Checkers

A game of Checkers in which the player tries to beat the computer.

519 Program Steps
Necessary Accessories: Checker Board and playing pieces.

Documentation — $12.00 Cost of 5 cards — $6.25

01477-41 : FLIPO

"FLIPO", an adaptation of OTHELLO, features: You or machine plays first disc. Variable machine openers. Three playing modes: No printer, printer ON, printer OFF (change at will during game). Review last 2 plays and board (any mode). With handicapping, five playing levels. Optimized for execution time: 15-30 minutes per game.

Necessary Accessories: 3 Memory Modules. Printer is optional.

Documentation — $14.00 Cost of 5 cards — $6.25

01617-41 : Space Cleaner

You are the Commander of a Nuclear Powered Reconnointer Space Ship (NPRSS). The NPRSS is the cleaner of the vast galaxy. Within the galaxy somewhere, among the stars, lie some sinister meteors, known throughout space as interstellar danger, and liable for important space ship's damages. Your mission, as Commander of the NPRSS, is to detect and destroy all the meteors you find on your way.

574 Program Steps
Necessary Accessories: 3 Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

01640-41 : Space War

You must destroy the alglogs before running out of energy. Careless use of weaponry can result in destruction of your base as well as alglogs.

420 Program Steps
Necessary Accessories: 2 Memory Modules

Documentation — $12.00 Cost of 2 cards — $2.50

01654-41 : Checkers

This program plays a competitive game of checkers. Output includes a complete checker board, updated after every round. Other features include move time limit with warnings, Kinging, multiple jumps, stalemate and default. The computer move logic also features random choice from moves of equal computed point value, simulating an unpredictable human opponent.

972 Program Steps
Necessary Accessories: Quad Memory Module, Printer

Documentation — $14.00 Cost of 8 cards — $10.00

01763-41 : Swords and Sorcery

Off you go into the forest to find the dungeon and rescue the princess. Pick up gold, girls, and magic swords along the way, but beware the trolls, satyrs and other terrors. Find the dungeon, fight the guard, and maybe you're rich enough to marry the princess.

559 Program Steps
Necessary Accessories: Quad Memory (Printer optional)

Documentation — $12.00 Cost of 9 cards — $11.25

01924-41 : Bullseye

Program allows two players to throw darts at a simulated target with 10, 20, 30 and 40 point zones and total misses possible. Players take turns throwing in one of three different methods: fast overarm, controlled overarm or underarm trying to reach the 200 point objective before the other player.

147 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01980-41 : Attack

Be the pilot of a bomber out to destroy the enemy! You're stuck above the clouds but your printer displays clues returned from each smart bomb dropped and scans the battlefield upon request. Skill is judged by the number of bombs required and the time used (with option time module).

422 Program Steps
Necessary Accessories: Printer; 2 Memory Modules if using the 41C

Documentation — $12.00 Cost of 4 cards — $5.00

01994-41 : King of Sumer

As King of Sumer, you must make decisions essential to the survival of your country; how many peasants to feed, how much land to plant, how much land to buy or sell, and how much research to fund. Each year you can be plagued by epidemics, floods, fires, etc.

330 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02038-41 : Cribbage Board

Your calculator now becomes a cribbage board, complete with prompts and tones. Program pegs points during the play, scores hand and crib, keeps track of who deals, total game scores, and checks for win and lurch. A must for the cribbage enthusiast. Will the versatility of the 41 never cease?

292 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02041-41 : Caroms or French Billiards

Caroms is a three ball billiards game. The aim is to hit both object balls with the cueball. The program accurately calculates direct, angled and richochet hits, where no classical physics can. The analysis of an entire 3-deep-stack game is in the palm of your hand.

177 Program Steps
Necessary Accessories: Quad Memory Module or 41CV; (Card Reader is optional)

Documentation — $20.00 Cost of 2 cards — $2.50

02101-41 : Super Spades Scorer

Super Spades Scorer keeps score for up to 52 individuals playing spades. Program uses indirect addressing to economize registers. Size needed is given by (N+6), where N is the number of players. Features include automatic highest bid sorting, number of bids left, and immediate score and/or bid of any player.

196 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02167-41 : Sniper

You are separated from your platoon with five rounds of ammunition and four grenades. You see around you a row of trees and one enemy personell. What will you do? What will he do? The enemy person is controlled by the calculator. Is he stronger? Who will survive?

675 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 6 cards — $7.50

02182-41 : Gin Score Keeper

This program is designed to keep score for a GIN card game. Player names up to six characters are allowed, and players are identified by name. It scores a normal three-game set, with the first player reaching 100 points loses.

222 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02240-41 : The Eight Queens Problem

This program solves "the eight queens problem": as to place eight queens on a chessboard in such a way that no queen attacks another. This program finds 92 distinct solutions that will be shown on display. The program computes 8 times more positions than a similar program.

279 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

02327-41 : Domino

This program simulates a game of domino between you and your eitchpee. There are four levels of difficulty. After a seed has been inputed your eitchpee generates and distributes the 28 stones as follows: 7 for you and her, and 14 that constitute the stock from which either you or her will take a stone when either you or her cannot play. Note it is impossible to cheat because the dominoes you play have to be introduced during pauses. The program is provided with many alphanumerical comments indicating to you what's happening, what you have to do, and when you have to do it so that anyone who doesn't know the game immediately familiarizes with it.

523 Program Steps
Necessary Accessories: Three memory modules
Documentation — $14.00 Cost of 5 cards — $6.25

02378-41 : True Battleship Challenger

This program replaces one player and challenges you in the Battleship game. It places its ships in different ways with different seeds and then plays against you in an "intelligent" form. A dramatic reduction in memory space occupied (compared with similar programs) was achieved by use of alpha registers as transitory storage numeric registers and/or counters. Documentation set is 14 pages and describes how to replace card reader instructions.

482 Program Steps
Necessary Accessories: Two memory modules. Card Reader optional.
Documentation — $12.00 Cost of 5 cards — $6.25

02396-41 : Shiphunting

This program makes your HP-41C into a serious shiphunting rival. You must shoot off ships, which a random number generator places into a 10x10 grid. The generator provides for an always different ship arrangement of the calculator, if you start the program with a different number. After three misses the calculator shoots off your ships (three tactics available). After three misses of him it's your turn again.

796 Program Steps
Necessary Accessories: Four memory modules or Quad ROM
Documentation — $14.00 Cost of 7 cards — $8.75

02421-41 : Star Track

A strategy game for two players, (you and the calculator) in which each player in turn moves one marker along the path on a point on the star. The player who is last to move a marker into the center is winner. The calculator plays well, but can be beat.

147 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02433-41 : Battleships

Challenge your battle strategy with this rapid-fire, war game. HP-41 selects the enemy positions. Isolate and destroy its concealed troopship, sub and battleship, on a ten-by-ten board supplied with the program. HP-41 bleeps out the hits and misses. Your skill and strategy alone will determine your score.

605 Program Steps
Necessary Accessories: Two memory modules
Documentation — $14.00 Cost of 5 cards — $6.25

02435-41 : Treasure Island

This is an adventure game program. You are on an island looking for treasure. The map of the island is different each time you play the game. Try to find the treasure before you starve. You have to take care about a lot of things: natives, sharks, deep well, hurricanes, etc.

289 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02478-41 : The Dungeon Master

"The Dungeon Master" frees its human counterpart from worrying about wandering monsters, adventurer rest periods and experience, DM initiative rolls, and all other time and dice-related aspects of "Dungeons and Dragons". This enables the DM, with the help of the enclosed adventure log sheet, to run a game easily and quickly.

168 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02488-41 : Challenge Tic-Tac-Toe

Can you take the challenge? Can you beat the HP-41C in a simple game of Tic-Tac-Toe? This program takes over where Tic-Tac-Toe (00948-41) left off. Here we try to even the odds in your favor and you still can't win! The HP-41C does all the menial tasks, so all your concentrations can be on the game. There are three board graphics options, first and second player options and more, but the Wise Old Machine is still unbeatable!

502 Program Steps
Necessary Accessories: Two memory modules and printer. Card Reader optional.
Documentation — $12.00 Cost of 5 cards — $6.25

02532-41 : Panzerblitz Attack Results System

PARS is a great aid in speeding up play and removes the drudgery of looking thru combat charts. It is designed for Avalon Hill's Panzerblitz Wargame. By reading in data cards and input of a few parameters, PARS will output adjusted attacker:defender ratio and die modifications needed to resolve combat.

285 Program Steps
Necessary Accessories: Quad module for the HP-41C. Card Reader optional.
Documentation — $12.00 Cost of 12 cards — $15.00

02536-41 : Polyhedral Dice

This program simulates rolling the standard polyhedral dice used in most war games and role-playing games. It includes four-sided, six-sided, eight-sided, ten-sided, twelve-sided, twenty-sided, and percentile dice. Multiple rolls of each die and also user specified limits are possible.

133 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02557-41 : Adventure

Solve riddles, combat fierce opponents, and dodge traps with artifacts found during your journeys! All this is found in ADVENTURE, a game that gives you total control over your destiny. ADVENTURE has several highlights: It is modular, I/O is separate to allow adaption to other Mass-Storage devices, and full instructions are given on how to create your own scenerios. Don't worry, though. A complete Dungeon Complex is provided for your enjoyment.

537 Program Steps
Necessary Accessories: Quad RAM. Card Reader optional.
Documentation — $14.00 Cost of 17 cards — $21.25

02595-41 : BOGA

The boga is hiding on a grid that you can change the size of, up to 20 by 20. You are to try to find the boga before he finds you. You can choose any starting position for yourself, and will be given clues as to the boga's position as you search him out. You must be quick however, because the boga has a very good nose and can sniff you out pretty fast!

338 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 4 cards — $5.00

02603-41 : 3-D Tic Tac Toe

This program is a good opponent in a game of three dimension Tic Tac Toe. It plays pretty fast. It will always win when it has the first move and in some other cases. Allowing all these, it is short: fits on two magnetic cards.

221 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

02615-41 : Pole Position

Challenge other drivers at the arena as you pilot your car past a race track's many obstacles. You have two degrees of steering in either direction, have full speed control (accelerate, decelerate, brake, shift gears), and can swerve obstacles. All decisions must be made in one second - making POLE POSITION a true action game. Multiple sound effects (including "funeral dirge") and visual displays provided. For those shaky drivers, relax - there's even a PANIC button.

517 Program Steps
Necessary Accessories: Three memory modules
Documentation — $12.00 Cost of 7 cards — $8.75

02664-41 : Arena of Death

You are randomly placed in the 15 x 15 playing field of the arena of death. In the arena with you will be find blocked squares, 22 relocation squares, 4 each of tar pits, wall bombs and hide shields, a super trap, and of course, the objective. Sound easy? Well wait until the monster and bird start chasing after you! You had better be quick with your laser blaster or you'll soon be dead! A real challenging game. Makes full use of alphanumeric and tone capabilities.

891 Program Steps
Necessary Accessories: Quad memory module
Documentation — $14.00 Cost of 9 cards — $11.25

02710-41 : Queen

In this game you will start by placing a chess queen (one only), in any one of the squares on a chess board in the top row or right-hand column. Then the calculator and you will take turns moving the queen only left, down or diagonally down to the left. The object of the game is to be the first one to move the queen to the lower left-hand corner square.

247 Program Steps
Necessary Accessories: One Chess queen and Chess board
Documentation — $12.00 Cost of 3 cards — $3.75

02718-41 : RAT — An Adventure Game

This program is an exciting duel of wits between you and the computer (the "Rat") using "Artifical Intelligence" to control the rats moves.

272 Program Steps
Necessary Accessories: Two memory modules for the HP-41C.
Documentation — $12.00 Cost of 5 cards — $6.25

02743-41 : Football Simulation

This program simulates an actual game of football. Two players take turns directing an offensive series. Play choices are run, pass, punt, and field goal attempt. A built in "timer" will automatically end game after 60 "minutes". "Minutes" remaining may be recalled just before a play is run. Scores 7 for touchdown, 3 for field goal, and 2 for safety.

506 Program Steps
Necessary Accessories: Two memory modules. Card reader and printer desirable
Documentation — $12.00 Cost of 7 cards — $8.75

02824-41 : Life (15 x 15)

This program simulates the game of Life with 225 cells arranged in a 15 by 15 matrix. A cell continues living with 2 or 3 neighbors or is born with 3 neighbors. Any other number causes the cell to die or remain dead. The program also includes routines for individually creating or killing cells, displaying the matrix with labels, and moving the organism relative to the edges of the matrix.

296 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

02864-41 : Submarine Hunt

You are the captain of a destroyer with orders to seek out and destroy enemy submarines. The destroyer manuevers on a 10 x 10 grid and searches for the submarine via sonar. The closer you are to the submarine when you drop your depth charge the greater the chance you have of sinking it. However, if you are inept, the submarine might torpedo you. Two levels of play are available.

282 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 4 cards — $5.00

02892-41 : Gold Rush

The object of this game is to find ten bags of gold hidden on a site of 81 squares. You are allowed an indefinite number of turns, but with few turns and correct choices as to where the bags of gold are hidden, you will receive a higher percentage score. With a printer, this program prints a 9x9 playing board.

434 Program Steps
Necessary Accessories: Two memory modules. Extended Functions Module
Documentation — $12.00 Cost of 4 cards — $5.00

02955-41 : Think a Dot

This program simulates the one person game "Think a Dot". The user can choose any initial or end position. If he/she can't find the solution the calculator will do that for the user. Two algorithms are presented for this purpose. First probably finds (not always) the shortest solution, but requires more execution time. The second algorithm requires less time but the solution is not optimal.

459 Program Steps
Necessary Accessories: Two memory modules, X-Functions Module, X-Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

03037-41 : Formula One Grand Prix

Up to five contestants race on one of 11 different tracks available. Players take turns inputting direction and acceleration. Calculator updates the velocity/position of each racer and checks for collision. The road-hog colliding with another racer or leaving the track is penalized by having to go back to his start position. The crashed-into racer is penalized by having his velocity reduced to zero. The calculator indicates the ID codes of the racers that cross the finish line, as well as the end of the race when they all have crossed it. The program works with or without a printer. An X-Function version is provided for those who have the X-function module.

792 Program Steps
Necessary Accessories: Quad Memory (for the HP-41C) (+ X-Function Module)
Documentation — $20.00 Cost of 7 cards — $8.75

03051-41 : Traveller Character / Planet Generator with Trade Classifications

This program will: 1) Generate a random universal personality profile for Traveller* PC's or NPC's, 2) Generate a random universal planetary profile, determining Starport type thru low level, tech level as well as the types of bases (if any) present as per rules, 3) Determine the generated planet's trade classification including "Terra-Prime" and "Terra-Norm", 4) roll 1d6, 5) roll 2d6 and sum, 6) roll 2d6 and combine. *Traveller is a trademark of Games Designer Workshop.

558 Program Steps
Necessary Accessories: Two memory modules

Documentation — $14.00 Cost of 5 cards — $6.25

03052-41 : Electronic Dice Plus

Die rolling for RPG's and Wargames. Includes d3, d4, d6, d8, d10, d12, d16, d20, d30, dx(I-X), percentile die, roll y number of dx, count the number of times dx is rolled, roll a number between x and y inclusive and generate a bell curve averaged number between the numbers in x and y inclusive. And, especially for Advanced Dungeons and Dragons*: initiative rolls for player/monster, indoor encounter distance and outdoor encounter distance. *Advanced Dungeons and Dragons is a trademark of TSR.

202 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03146-41 : The Caves (Revisited...)

"The Caves (Revisited...)", a 266 register long program, is an adventure game in which the player moves about a series of 68 (0 to 67) interconnected caves to pick up nine items to total 1200 points without dying from the various hazards, which can be avoided thanks to some special items. It is based on James R. Surber's "THE CAVES" (00900-41).

616 Program Steps
Necessary Accessories: Four memory modules or equivalent

Documentation — $16.00 Cost of 7 cards — $8.75

03173-41 : Queen

At the beginning of the game the player must position the queen on the 8. row and/or 8. column of the chessboard. Now the calculator moves the queen only to the left, down or diagonally to the left. After this you can do the same. The player who moves the queen first to the square in the first row and first column has won the game.

274 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03216-41 : The Game of Isola

Play a game of Isola against Mac. Your task is to try to isolate Mac's pawn. In each move you can move your pawn on any of the neighbour squares and destroy any of the remaining squares. The same goes for Mac. If your pawn cannot move - Mac wins. Otherwise, if you manage to isolate Mac's pawn - you win. But this is not going to happen too often!

182 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03280-41 : Graph Chess

This seven part program displays or stores chess games in progress suitable for: mailing, chess club, problemist, duplication. Included are: Promotion, En-passant, two editors, multiple entry of moves; automated board set, capture, turn, castling, or manual board set. Separate move and data register blocks make for easy mailing. Block decreases in size per capture. Instructions contain: piece code, location, conversion map in, square number, algebric, descriptive notations.

754 Program Steps
Necessary Accessories: One memory module and printer. Card reader, extended memory optional.

Documentation — $16.00 Cost of 9 cards — $11.25

03308-41 : Magic Card

In this game, the HP-41C(V) is a conjurer. Ask one of your friends to draw a card (no jokers). Before the HP-41C(V) can guess the cards, it has to have some information first. It is very simple to give the correct answers. You convert the drawn card into a value of binary code. When all six questions have been answered, the HPC(V) converts the flags to the value and color of the cards.

113 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

F104 Games
Games of Chance

00313-41 : Acey–Ducey

The HP-41C "deals" two cards to you from an unlimited deck. You then place a bet on whether you belive the third card will fall in between the first two. If it does, you win your bet. Otherwise, you lose. There is a standoff if the first two cards are the same.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00385-41 : Blackjack Test Strategy 2 (With Output Labeling)

Empirically test your favorite Blackjack playing strategy using casino rules, number of decks of your choice, and desired bet. Rules, number of decks of your choice, and desired bet. Input each win, loss, push, blackjack, or double win/loss as you play. The HP-41C will display the following summary (labeled) at the end: number of wins/losses, etc. longest string of wins, losses, total number of hands, total $, percent won. Also: optional betting feature.

250 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00419-41 : Five Player Acey Deucey

This program allows up to 5 people to play "Acey-Deucey", a game where given 2 cards, a player bets whether a third card is "in between" the other two in value. (e.g., a 7 is in between a 4 and a Queen.) Options include: calling Aces high or low, splitting pairs, maximum bet limits.

Documentation — $12.00 Cost of 4 cards — $5.00

00478-41 : Craps

Program simulates the popular Dice game. Player is provided an initial sum of money. Successful bettors can break the bank while losers go broke! Calculator rolls dice; 7 or 11 win; 2, 3 or 12 lose. Other numbers (players point) must be rolled before a seven to win.

123 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00484-41 : Slot Machine

This program is an upgraded version of the HP-67 program "Bell-Fruit" Slot Machine (00218-97). The program has been modified for use on the 41C and incorporates more features, such as: a permanent bank, continuous record of the number of plays and payoff/jackpot notification on winning plays.

144 Program Steps
Necessary Accessories: Card Reader
Documentation — $12.00 Cost of 3 cards — $3.75

00533-41 : Money Cards

This program exactly duplicates the "Money Cards" portion of the "Card Sharks" television game show. A player bets all or part of his money on whether he thinks the next card will be higher or lower. In addition, the program keeps track of the number of games played, lowest amount won, highest amount won, and average amount won. Complete use of alphanumeric capabilities of HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

00537-41 : Moon Lander Simulation

An adaption of the moon lander program for the HP-33E, has an initialize key, fuel key, present status key and responds to key entry without using R/S key.

Documentation — $8.00 Cost of 1 card — $1.25

00618-41 : Keno House Percentage

This program can be used by a casino to calculate their theoretical percentage winnings or by a player to determine the best casino to play. (i.e.) the lower the house percentage, the better the return to the player. Assumes twenty numbers drawn from a set of eighty. Printer optional.

Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 1 card — $1.25

00665-41 : Blackjack Competitor

Blackjack competitor challenges the user to a realistic game of blackjack, comparable to that played in professional casinos. Player options include pair splitting, doubling down, and insuring. The program simulates a pair of real decks. Displays are meaningful but not wordy.

359 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 5 cards — $6.25

00922-41 : Russian Roulette

This program simulates a game of Russian roulette. Any number can play. The calculator is a revolver loaded with one bullet and five empty chambers. you spin the chamber and pull the trigger. You win if you play ten times and are still alive.

Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

00985-41 : "4-5-6" (Dice Game)

This program simulates the play of "4-5-6", a dice game that allows one player to act as banker and the others to place even-money bets on their throws of three dice. A natural may win, but craps always loses! Full use is made of the HP-41C's flags and alpha-numeric capabilities. Up to 5 people may play.

388 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01040-41 : Roulette

A sophisticated and complete roulette package which provides for one or more of all legal betting positions to be selected. Number of players restricted only by memory capacity. Program designed for use with 2 memory modules. However, amendments included to allow reduced version to operate with only one memory module.

383 Program Steps
Necessary Accessories: At least one Memory Module
Documentation — $12.00 Cost of 5 cards — $6.25

01519-41 : Complete Blackjack

Blow your bankroll with this totally accurate simulation of Nevada-style Blackjack. Supercedes all previous Blackjack programs. Allows multiple pair-splitting and doubling-down. The dealer (41C) checks all your bets and decisions for legality. Impossible to cheat, impossible to make an honest mistake and scramble the game. Fun and safe for all ages and incomes.

591 Program Steps
Necessary Accessories: 3 Memory Modules. Printer optional.
Documentation — $12.00 Cost of 6 cards — $7.50

01716-41 : 1 to 10 Spot Keno

Plays 1 to 10 Spot Keno. Player selects # of spots and # of games. Payoffs are typical of Nevada Casinos. Program prompts for players selections and keeps track of all totals. If printer is attached prints out numbers drawn and all totals in a very neat format. Program is quite fast (approx. 2 min. per game - less without printer).

401 Program Steps
Necessary Accessories: 3 Memory Modules. Printer not necessary but helpful.
Documentation — $12.00 Cost of 4 cards — $5.00

01826-41 : ESP Tester and Trainer

"ESP" generates an undisplayed, psuedo-ramdom target number. The user must use extrasensory perception (ESP) to guess them more frequently than chance. The program gives immediate feedback of target identity to allow learning what psychological conditions go with success, and automatically tabulates run results. Use it with or without a printer.

123 Program Steps
Necessary Accessories: 1 memory module; printer helpful, not necessary.
Documentation — $12.00 Cost of 2 cards — $2.50

01951-41 : Auto Rallie

This is an Auto Rallie in which you get to choose the car. But the better the car, the more gas it uses. You can even blow your engine.

130 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02008-41 : Poker — 5 Card Draw

You play an honest game of five card draw poker against the calculator. The calculator will show the card value and its suit in an alphanumeric presentation as: 2 OF CLUBS, 13 OF SPADES, etc. and will also identify each hand as: STRAIGHT, ONE PAIR, etc.

1056 Program Steps
Necessary Accessories: Card Reader and a Quad Memory Module
Documentation — $14.00 Cost of 9 cards — $11.25

02022-41 : Skunk

The object of the game is to reach a predetermined score by rolling dice and adding up their value. Dice can be passed at anytime and points saved. If a one is rolled on either dice, all points for that round are lost. If two ones are rolled, all points are lost.

150 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02023-41 : Knobs

This program simulates the game of KNOBS. This is a game of chance in which two or more players score points by rolling various scoring combinations with dice. This program allows the 41 to take part in the game as an active player, if desired.

588 Program Steps
Necessary Accessories: At least two Memory Modules are necessary.
Documentation — $12.00 Cost of 5 cards — $6.25

02045-41 : Axman Video

A video game with graphic playing board displayed. The Axman goes to the barnyard to get a chicken for dinner but he comes up against one smart chicken. You are the Axman and you have six moves to WHACK the chicken or he gets away. All moves and scores displayed.

843 Program Steps
Necessary Accessories: Quad Memory Module, HP-IL Module, Video Interface, Monitor or TV.
Documentation — $14.00 Cost of 10 cards — $12.50

02046-41 : Jaws, The Electronic Shark

Go for a swim in shark-infested waters as you take a dare to accumulate points. Then jump in again to double or triple your score. Just don't stay in swimming too long or you'll lose all the points for your turn, and become dinner for Jaws. 1 or 2 players may participate.

168 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02069-41 : Derby

This program simulates a horse race with ten horses. Up to four players may bet, and the pari-mutuel system is used to award returns. The player may bet on win, place, or show, and the odds may be displayed. The program is fully automatic.

299 Program Steps
Necessary Accessories: Two Memory Modules or equivalent memory
Documentation — $12.00 Cost of 3 cards — $3.75

02097-41 : Super Yahtzee

A fully automated version for up to 4 players. Entries are reduced to a minimum. HP-41 does not participate in the game but checks all entries for validity, keeps score and prints each throw (special characters) as well as score-tables.

702 Program Steps
Necessary Accessories: HP-41CV; or HP-41C with Quad RAM; Printer
Documentation — $12.00 Cost of 8 cards — $10.00

02099-41 : Labyrinth Adventure Deluxe

Major additions to 00971-41: A measured, limited air supply; random magic words for special entry/exit; unattended move sequences; checkpoint feature allows instant restoration of a previous game state; better magic wand usage; better scoring; more open mazes; faster execution; names, scores of top four players maintained.

872 Program Steps
Necessary Accessories: Four Memory Modules or One Quad Memory Module for the HP-41C.
Documentation — $14.00 Cost of 8 cards — $10.00

02100-41 : Yahtzee

This program simulates 5 dice for playing the Japanese game - YAHTZEE.

125 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02416-41 : Advanced Las Vegas Blackjack, With Rules of Play Options

This program simulates Las Vegas Style Blackjack with one player (you) against the dealer (HP-41). All standard rules are incorporated and the program is initialized for a particular casino's rules on pair splitting, doubling down, surrender, if dealer hits soft, number of decks, and betting limits. Insurance is always offered. The player can count aces as 1 or 11 and the hand is played until 21 is exceeded. Input data and plays are checked; if illegal an error message is displayed, the play is not executed, and the previous conditions resumed.

795 Program Steps
Necessary Accessories: Four memory modules. Time Modules optional.
Documentation — $14.00 Cost of 9 cards — $11.25

02610-41 : Swap Poker

This program plays a two player game of Roll Your Own Poker. It utilizes an efficient random card generator and a security system which prevents your opponent from viewing and altering your hand. It also has betting, raising, calling, checking, and forfeiting features.

608 Program Steps
Necessary Accessories: Extended Functions Module
Documentation — $14.00 Cost of 8 cards — $10.00

02745-41 : Mini Slot Machine

This game simulates a slot machine. It allows variable bets and winnings.

168 Program Steps
Necessary Accessories: One memory module
Documentation — $8.00 Cost of 2 cards — $2.50

02800-41 : Slot Machine Simulator

Enter a seed and initial bank, and wheels start spinning. Spinning wheels are shown by x's. Wheels stop spinning one at a time. Has 3 wheels of 16 symbols each for 40% combinations; pays off about 1 in 8 spins. Payoffs range from 3 to 1 up to 18 to 1.

202 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02845-41 : 7 Card Stud

This program plays a two player game of "Seven Card Stud". It uses the random card generator and a security system which prevents your opponent from viewing and altering your hand. It also allows for betting, calling, checking, folding, and raising.

719 Program Steps
Necessary Accessories: Three memory modules
Documentation — $14.00 Cost of 7 cards — $8.75

02846-41 : Draw Poker

This program plays a two player game of draw poker. You may choose up to five draws per game and can draw all five of your cards if you so desire. It also uses a unique security system which prevents your opponent from viewing and altering your hand.

547 Program Steps
Necessary Accessories: Three memory modules and Extended Functions Module

Documentation — $12.00 Cost of 6 cards — $7.50

02847-41 : Gin Poker

This program plays a two player game of gin rummy and poker. It utilizes an efficient random card distributor and a unique security system which prevents your opponent from viewing and altering your hand. It also allows for card rearranging, card swapping from discards, and card exchanging from the card deck.

593 Program Steps
Necessary Accessories: Three memory modules and Extended Functions/Memory module

Documentation — $14.00 Cost of 6 cards — $7.50

03014-41 : Seven Card Stud/Baseball Poker

This program plays a two player game of both seven card stud and baseball poker. It uses a security system to prevent your opponent from viewing your hand. It also allows betting, and it keeps track of the two players' banks and game pot.

818 Program Steps
Necessary Accessories: Extended Functions

Documentation — $14.00 Cost of 8 cards — $10.00

03038-41 : Casino Blackjack

This program was designed to simulate as closely as possible player vs dealer one-on-one blackjack. Play options include: Tournament style "face-off", choice of decks between 1 and 24.999 inclusive, insurance when offered by the dealer, down for double on 11/ on any, splitting pairs limited only to available size, shuffle deck(s) at any time and non-execution of errors.

737 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 7 cards — $8.75

03160-41 : Cards

This program generates two cards between two and ace. Now you can enter your bet and the calculator generates a third card. If it is between the first two cards you win the bet. If the difference between the first two cards is 2, 3 or 4 your bet will be multiplied with 10, 5 or 2 if you win.

241 Program Steps
Necessary Accessories: One memory module and printer

Documentation — $12.00 Cost of 3 cards — $3.75

03170-41 : Bug and Spiders

A bug is climbing in a cube and the player must try to lead the bug from one corner to the opposite corner of the cube. But spiders are sitting at five points in the cube and wait to eat the bug. If the player leads the bug to a point outside of the cube, he falls down and the game is over.

152 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03286-41 : Lotto Number Generator

This program will generate random numbers using the current time for 6 of 39, 6 of 40, or system games of lotto. For 6 of 39 and 6 of 40, the number of games has to be given, and for the system entry, the number of the system. The program can, if required, be rerun as many times as possible, without reloading. If no longer needed, it will automatically be removed from the program memory. No duplicate numbers per game.

199 Program Steps
Necessary Accessories: HP-41CX; printer is optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03290-41 : Wall Street — 1929

When beginning the game, you have an initial capital of $90,000.00 in twenty shares of nine kinds. Try to make a maximum profit in "n" days (specified by the user) by selling and buying shares. The shares quotation is determined every day and can be recalled at any moment. By selling and buying shares, you may earn cash money that you can reinvest in other shares. This program is printer compatible.

500 Program Steps
Necessary Accessories: Two memory modules; printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

F106 Games Word and Number

00344-41 : Twelve Letter Hangman

A two player game, the first player hides a word (up to 12 letters). The second player must guess the work with fewer than seven wrong guesses to avoid hanging.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00358-41 : Fire and Ice

Takes up what "Number Hunt" (00096-41) left out. More difficult too. HP stores a number it generates between 0 and 999. Your guess can leave you out among the ice packs or be scorchingly close to the correct number. Genius takes typically 8–10 tries to discover the number.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00405-41 : A Scorekeeper for the Game 'Scrabble'

This program scores the crossword game "Scrabble" for one to four players. Word value is accumulated as letters are input using assigned alpha keys. Keys also assigned to score premium words and end each players turn. At the end of each round, cumulative scores are printed if a printer is connected. "Scrabble" is a registered trademark of Selchow and Righter Co.

347 Program Steps
Necessary Accessories: One Memory Module for the HP-41C. Printer optional to print out scores.

Documentation — $12.00 Cost of 4 cards — $5.00

00436-41 : Mastermind — 9 Colors

A nine color version of the popular "Mastermind" game. Calculator selects the four color target, and the player tries to discover the target by successive trials with the calculator scoring each trial: number of correct colors in their correct locations and number of colors in the incorrect location.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00512-41 : Scramble

This program is designed for two people in which one competes with the other in attempting to decode a word whose letters are scrambled.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00513-41 : Word Guessing Game

This is a slightly shorter and more efficient version of the word guessing game program found in the Standard Applications Book. There is only one operating difference between the two programs. When you have guessed the word, this version does not leave the calculator in alpha mode.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00514-41 : Mastermind

Break the hidden code! User specifies code length of up to seven digits, and calculator picks a number of that length. Any digits may be used and repeated. Complete with audio-visual feedback. Lots of fun!

148 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00529-41 : Concentration

Five pairs of cards, i.e.,A,K,Q,J,T are dealt in random unknown order in the first ten positions of the display. You enter position numbers two at a time to try to find pairs. The 41C counts the number of pairs tried before all cards are matched.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00538-41 : Code Crack

Based on an award winning game, a 4 to 6 digit secret code (your option) is generated using 6 to 9 characters (your option). Guesses of the code are rated for the number of correct characters in position. This 41C version offers complete flexibility in fewer steps.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00591-41 : Copy-Me

Copy-Me is a calculator version of the electronic game "Simon", with sound and scoring. Game "A" generates one number, displaying one digit at a time plus another "hidden" digit each turn, to be repeated by the player. Game "B" generates a new number each turn with another hidden digit.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00600-41 : Mastermind

This is a friendly version of the classic game: replete with blinking alpha prompts, beeps, tunes. The calculator generates a random 4 digit, whole number. You are allowed 10 guesses before the calculator gives you the correct number. Prompts (hints) are given as black and white (pegs). The unique feature is the way in which the registers are used.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00646-41 : Star

This simple number guessing game generates a secret random number between 1 and 100, then asks you to guess the number. Each guess is rewarded based on how close your guess came to the secret number. 1 star-very far 7 stars-right next door.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00676-41 : Pick a Number

In this game both the user and the program pick a positive integer. The player with the lower number scores 1 point, unless the difference between the two numbers is one; in which case the player with the higher number scores 2 points. The program plays with its optimum strategy and is difficult to beat.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00762-41 : Super-Dooper Mastermind

Given a seed, the number of digits desired in a secret number, $0 \leq a < 10$, and the size of a given set of digits, $0 \leq b \leq 10$, the calculator generates a secret number, a, from the set, b. The player tries to guess the secret number in as few guesses as possible using clues presented by the program. all zeros, including leading zeros, and repeats are possible.

Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00818-41 : Simon

You must repeat the ever increasing sequence of numbers and tones. A fanfare sounds when you complete sequences whose lengths are multiple of the level entered. When you make a mistake or you don't answer the play ends with a march, then you can obtain the last and longest sequences.

206 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00845-41 : Word Guessing Game

This is an improved version of the HP-41C standard applications "Word Guessing Game". It may be played by two players: the first player inputs a six-letter word; the second player guesses various letters until he has completed the word. This program also features a solitaire version, which uses hidden words stored on data cards.

194 Program Steps
Necessary Accessories: One Memory Module and Card Reader

Documentation — $12.00 Cost of 9 cards — $11.25

00853-41 : Four Out

The object of the game is to get rid of a five-digit number in four moves so that the calculator will read zero. Each move consists of using a one- or two-digit number, not including zero, and an operation ($-$, $+$, $\times$, $\div$). You take turns with the 41C doing the same.

224 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00897-41 : Scorekeeper for Scrabble

In this program you key in the actual word played and it will count the value for each letter and multiply it by any bonus. You also can key in a 6 letter name for each player which will show at the beginning of his turn with his score until that point. This program will also give special bonus.

317 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00912-41 : Jargon

1-2 players enter guess-words (equations, jargon, etc.) to discover "word" of 2-6 symbols hidden by opponent or picked by calculator from 31 words read from magnetic card. Display number of matching letters and correct positions. Object: fewest guesses for maximum score. Displays score per round and average score for all rounds.

534 Program Steps
Necessary Accessories: Quad Memory Module

Documentation — $14.00 Cost of 10 cards — $12.50

00963-41 : Word Search Puzzle Printer

Search is a random alternative to the popular "word search" puzzles found in magazines, newspapers and puzzle books. The program generates a 12 x 12 array and a list of random "words." The words are actually random groups of characters running in any direction in a straight line within the array. Once printed, the user may test his or her powers of scanning and detection by searching for the "words" hidden in the puzzle.

Necessary Accessories: Two Memory Modules and Printer

Documentation — $8.00 Cost of 1 card — $1.25

00969-41 : Mastermind All x All

This is a new version of the classic game in which the answers are given as a comparison of each number of the code you input, with each number of the hidden code. Codes are of 5 number. You may input the numbers to be hidden, or the calculator will do it for you. Complete with prompts and beep.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00994-41 : Word Search Puzzle Generator

This program generates word search puzzles and prints them out for solution by the user. Within a puzzle's grid of letters, words may be found oriented vertically, horizontally, or diagonnally, either forward or reversed in direction. The only user inputs are a random seed and desired grid size.

127 Program Steps
Necessary Accessories: Printer.

Documentation — $8.00 Cost of 2 cards — $2.50

01000-41 : Word Guessing Game

The 1st player keys in the number of letters and a word (between 6 & 12 letters). The 2nd player chooses the display versions (fast/slow) and guesses various letters until he has completed the word.

201 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01013-41 : Mastermind-Short Version

This program plays the popular game of "Mastermind" with nine colors in four places. The number of black and white pegs are displayed simultaneously. A unique feature prevents more than one white or black peg from referring to the same peg in code or guess.

131 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01059-41 : Number Song

Have music while you work! This program composes pleasant random tunes that you can control by setting flags. You can use any of ten different beats. The program can also be used to test the frequency of digits generated by a random number generator.

216 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01060-41 : Perfect Mastermind

Program includes three exciting games. First is standard Mastermind; finding four numbers hidden by HP-41C. Secondly you, or your opponent, hide four numbers; HP-41C, playing perfectly, finds them with your guidance. Thirdly, you can watch HP-41C play against itself! 10 guesses and corresponding results are retained throughout.

464 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

01187-41 : Fishing Bears

5 dice show their faces. You are to guess the numbers of holes on a frozen lake, of bears sitting around, of fishes under the holes and of gulls flying across the lake.

Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01279-41 : Bizz-Buzz

"Bizz Buzz" is a children's number game. Playing this game encourages concentration, the learning of the multiplication tables, and competitive spirit. Besides all of the above, it's fun too! The object of the game is to count - in a special way - as high as you can, alternating between any number of players. Full use is made of the HP-41C's alphanumeric capabilities.

90 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01355-41 : Master Mind and Rubik's Cube in One

Execute Rubik-like moves in a secret or displayed code and display responds with master-mind-like information on the resulting code or with the resulting code itself. Restore standard code in as few possible moves. Four display types and three game options for a choice among 28 different games, from very easy to quite difficult. With optional anti-cheat lock.

647 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 6 cards — $7.50

01491-41 : Math Baseball

Math baseball is a two player game testing skills in mental arithmetic. Interest is kept up by keeping score as in a game of baseball. The action is in real time. The closer the response (guess) is to the correct answer, the better the hit. Several hits together score runs.

268 Program Steps
Necessary Accessories: Card Reader would be desirable to load in the program.

Documentation — $12.00 Cost of 3 cards — $3.75

01608-41 : Mastermind

This program plays Mastermind with You. You can choose how many digits, how many figures and if there are only different figures or not. The time of calculating is very short.

196 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01658-41 : Cryptograms

Creates cryptograms using either a calculator generated map, or a user-input map. Encodes and decodes alpha register using this. Most data is held in extended memory, except while generating map. Map may be cleared to hyphens. Individual letters may be specified for different mapping after map is completed. Maps may be stored on cards.

309 Program Steps
Necessary Accessories: 1 Memory Module, Extended Functions Module, (Printer/Card Reader optional)

Documentation — $12.00 Cost of 4 cards — $5.00

01664-41 : Risk

This program allows two players to play a "Russian Roulette" type game. Players take turns, secretly and strategically selecting numbers and receive or lose money until one player chooses the "lose $50". After the "lose $50" is chosen play starts again until someone reaches $350.

175 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

01680-41 : Hangman 12

Utilizing the full power of the XFunction Module, this 1 card version of the popular word game is fast and ultrasimple to use. The program can hide words up to 12 letters long, providing an extra challenge to even those dedicated word fans out there. Simple modifications allowing a Secret Word data base and other variations are included with the basic program.

124 Program Steps
Necessary Accessories: Extended Function Module

Documentation — $12.00 Cost of 2 cards — $2.50

01917-41 : The Actual Simon — 5 Colors

This program plays SIMON on the HP-41. The player must repeat random sequences for the number desired (you may choose from 1 to 200). The colors will be displayed with corresponding sounds. Repeat the sequence with corresponding keys for each color. When the sequence reaches the chosen length, the program ends.

193 Program Steps
Necessary Accessories: Each Additional Memory Module allows 63 more color choices. Mimimum One Memory Module (for a maximum of 63 different color choices).

Documentation — $12.00 Cost of 2 cards — $2.50

02054-41 : 23 Matches Generalized

23 Matches is a game where 2 players take turns removing matches from a pile of 23. At least one match and no more than three must be taken. The player taking the last match loses. This program plays the game with variable parameters.

128 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02155-41 : Cryptography on the HP-41C/CV

Given a keyword and seed number, this program encodes and decodes messages entered one letter at a time using the HP-41C alpha capabilities. Code virtually unbreakable if keys unknown. Uses modified keyword transposition algorithm. Keywords up to eight letters long.

335 Program Steps
Necessary Accessories: One Memory Module or HP-41CV

Documentation — $12.00 Cost of 4 cards — $5.00

02298-41 : The Lost Word

This word game is harder than master mind because you must find the hidden word: guessing a 6 letter word and the HP-41 will indicate only the number of letters in the right place. If you don't guess a 6 letter word the HP-41 will refuse it! Also time is running against you!

102 Program Steps
Necessary Accessories: X-Function and Time Module

Documentation — $8.00 Cost of 1 card — $1.25

02318-41 : Hangmath 1.0

Make learning fun with Hangmath, the educational game. A merger of math quizzes and the game of Hangman, Hangmath features changeable difficulty levels (from first grade to post-college): aural and visual special effects, complete error trapping, full user prompting, and the optional saving of all calculator status and registers. The program is designed to only produce integral solutions for all functions (range: 1 to 9801). Hangmath the educational program that makes learning fun for all ages.

393 Program Steps
Necessary Accessories: Two memory modules and an Extended Functions Module

Documentation — $12.00 Cost of 4 cards — $5.00

02331-41 : Turn About

This program plays a fun and enjoyable number guessing game. The object is to reach 1,000 points by guessing the amount of cycles needed to make a number's left hand side equal to its right hand side.

211 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 3 cards — $3.75

02365-41 : Noah's Ark

The flood has receded and the animals are ready to return to land from the Ark. But first they must be paired up. You, as Noah, are the only person who can do this. The animals are presently in crates. Opening two crates at a time, you must try to pair them up in as few tries as possible. A challenging, entertaining, and definitely addicting game that is also guaranteed to improve your memory.

218 Program Steps
Necessary Accessories: Memory module, Extended Functions module and Card Reader

Documentation — $12.00 Cost of 4 cards — $5.00

02404-41 : The Game of NIMB

Program simulates the game of NIMB. The HP-41 is your opponent. This program uses a mathematical algorithm as the basis for its logic. It is a modified version of the program written for the HP-34C included in the standard applications book.

61 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02458-41 : The Tower of Brahma

On the banks of the Ganges, in the City of Varanasi, there is a temple with a dome that marks the center of the Earth. Below the dome are three diamond rods, on one of which there are a number of disks of the finest gold, each disk being larger than the one above. This is the Tower of Brahma. Your task is to move the disks according to the Laws of Brahma to another of the rods, one by one, so you may reach nirvana. There are 33 levels of difficulty with theoretical completion times from 1 second to 272 years!

298 Program Steps
Necessary Accessories: One to three memory modules according to level of difficulty

Documentation — $12.00 Cost of 3 cards — $3.75

02466-41 : Math Flashcard — For Children and Adults

This program flashes addition, subtraction, multiplication, and division problems. For +, −, and ×, the 2 numbers can be from 1 to 3 digits each; for ÷, the quotient and divisor can be 1 or 2 digits each (calculates dividend from these). This allows for use as a child's tutor or an adult's "mind exerciser" or just for practice. Displays correct answer if incorrect. Calculates time taken per correct response (user inputs time at start and finish).

210 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02535-41 : Safe Cracker

In this game, you are a burglar and must open a safe. The combination is three random numbers between 1 and 99. As you enter the numbers you want the safe's dial to turn to, you will hear a number of clicks to let you know you are getting closer to the proper number. When you have found all three numbers, the safe will open. Makes full use of the HP's alphanumeric and tone capabilities.

390 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

02594-41 : Amina's Panel

This is a challenging puzzle that will keep your mind boggled for many hours. Amina's panel consists of ten digits, each of which may be incremented by unity. However, each digit has a dependent digit which will simultaneously increment by two. Your objective is to manipulate the digits in such a way that you can get a pre-specified combination. Good Luck.

93 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02601-41 : Advance Mastermind

Mastermind lovers, this is it! The most versatile game of Mastermind ever. Can you beat the randomly generated code of the HP-41C, which length can be 3 to 9 letters long and is composed of the letters A through J. Not only must you break the code, but can you beat the previously set high score, which is stored with the random seed on a data card. Programmed with printer compatibility, Advance Mastermind is OPTIONFULL!!!

450 Program Steps
Necessary Accessories: Two memory modules. Card reader and printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

02606-41 : Formula 999999

With five numbers, you may add, subtract, multiply, and divide to make a total of nine. Then you position that number in a six digit number to get as close to 999999 as possible.

351 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 4 cards — $5.00

02607-41 : Jumper

This program simulates a game of people jumping on trampolines. The object is to have the trampoline under the jumpers to prevent them from hitting the ground. There are a few interesting surprises in this game which will have you playing this game for hours.

324 Program Steps
Necessary Accessories: Extended Functions/Memory Module and one memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02614-41 : Code Uncoder

Have you ever considered joining an intelligence agency, becoming a private eye, a detective, or just improving your sensory memory? This game will boost up your power of concentration and develop your sensory and short term memory. The calculator generates an alphanumeric code which you have to quickly memorize, and later repeat the same. Game features: start at any level, automatic level advance, weighted scoring and much more.

163 Program Steps
Necessary Accessories: Extended Functions module

Documentation — $12.00 Cost of 2 cards — $2.50

02672-41 : Hangman — "Synthetic"

A word guessing game for two players. First player hides a word (up to ten letters). Second player guesses what letters are in it. Each wrong guess adds a piece to diagrams of gallows and man in display. Tenth wrong guess results in hanging: guesser loses. Calculator plays appropriate tune for win or loss. Non-standard characters are created by two synthetic text lines.

201 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02711-41 : Staircase

You can play the game of Staircase against the calculator with this program. You can choose the number of stairs (between 3 to 6) and the calculator randomly distributes the sticks on each stair. This program is very hard to beat.

240 Program Steps
Necessary Accessories: Memory module and X-functions module

Documentation — $12.00 Cost of 2 cards — $2.50

02744-41 : Memory Tester Game

This program tests your short term memory and can be played by two persons on a competitive basis. The calculator displays four numbers then asks you to reenter the four numbers in order. Points are given for the amount of correct numbers reentered. Simply reprogramming step 219 will determine the length of the numbers. It is currently programmed for 2-digits. By changing the 100 at step 219 to 1000 it will generate 3-digit numbers.

232 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02746-41 : Number Hunt

This is a number guess program. The calculator hides a whole number between 1 and 1,000. As you guess, the calculator tells you if you are over 10 high or low or under 10 high or low. After play, the calculator will tell you how you rated.

124 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02757-41 : Hangman

A word guessing game for two players. First player hides a word (up to ten letters). Second player guesses what letters are in it. Each wrong guess adds a piece of diagrams of gallows and man in display. Tenth wrong guess results in hanging; guesser loses. Calculator plays appropriate tune for win or loss. Non-standard characters for gallows and man are created by initial use of printer or card reader with data card.

238 Program Steps
Necessary Accessories: Memory module; printer or card reader for data card.

Documentation — $12.00 Cost of 3 cards — $3.75

02774-41 : Extended Functions Hangman

A word guessing game for two players. First player hides a word (up to ten letters). Second player guesses what letters are in it. Each wrong guess adds a piece to diagrams of gallows and man in display. Tenth wrong guess results in hanging; guesser loses. Calculator plays appropriate tune for win or loss.

222 Program Steps
Necessary Accessories: One memory module (for the HP-41C) and Extended Functions Module.

Documentation — $12.00 Cost of 2 cards — $2.50

02793-41 : Undercut

When describing this game in Scientific American magazine, Douglas Hofstadter mentioned that he had programmed a computer to play it. Now it can be played on the HP-41. The program is a learning program (more exciting than Hexapawn) which, instead of learning a winning strategy, tries to predict human behavior on the basis of past experience.

160 Program Steps
Necessary Accessories: Two memory modules.

Documentation — $12.00 Cost of 2 cards — $2.50

02844-41 : Mastermind — An Exact Simulation

This program is an exact simulation of the Mastermind game by Invicta. The HP-41 picks a 4 color hidden code and the user has 10 opportunities to duplicate the code. The code is picked from 6 possible colors represented by the first letter of the color. For added difficulty, a seventh color is possible. For an easier game, the user can request no repeating colors in the code. For each guess, the HP-41 responds with the number of whites and blacks, white corresponding to a correct color in the wrong position and black, correct color in the correct position.

203 Program Steps
Necessary Accessories: One memory module (for the HP-41C) and Extended Functions Module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02896-41 : Eliminator

This program plays a fast-paced number game. The object is to match digits with the calculator to prevent a 6 or 5 number string. If you're looking for a fun and challenging number game, this is the program for you.

241 Program Steps
Necessary Accessories: Extended Functions Module. One memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

02940-41 : Undercut

This is a number game to be played against the HP-41CV. Both players choose a number from one to five. If the difference is not exactly one, each number is added to each player's respective scores. Otherwise, the player with the lower number adds both to his score.

143 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02942-41 : Domino Grid Puzzle

This program generates a 7x8 board of domino numbers. Your task is to divide 56 numbers into 28 tiles, so that every domino tile is used. It even supplies you with a solution to the puzzle.

387 Program Steps
Necessary Accessories: Extended Functions Module and 2 Memory Modules

Documentation — $8.00 Cost of 7 cards — $8.75

02943-41 : Cannon

This program plays a fun and exciting war game. The object is to hide from enemy cannon fire. There are three different rounds and a few interesting features.

304 Program Steps
Necessary Accessories: Extended Functions module and one memory module

Documentation — $8.00 Cost of 3 cards — $3.75

02962-41 : Number Guessing Game

This program is both fun and educational, and with its varying levels of difficulty, it can be quite challenging. It is very user friendly, and anyone can play the game without ever refering to instructions. It also tells how many trials taken, and player can give up and see number. It is good for number concept for young children, as "TOO HIGH" and "TOO LOW" messages give number familiarity.

98 Program Steps
Necessary Accessories: Card reader helpful.

Documentation — $8.00 Cost of 2 cards — $2.50

03053-41 : Jumble Scrambler

Do you like to do jumbled words but run into tough ones more often than not? This program will help to eliminate that problem for up to six lettered words. The program will display all possible combinations of the letters for your perusal. Note - after the program data has been loaded the program may be cut down to 86 steps of 133 bytes.

172 Program Steps
Necessary Accessories: One memory module and Extended Functions/Extended Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

03054-41 : Jumble Electronic Scrachpad

This program will enable your calculator to take the place of a scratchpad for the rearrangement of letters or symbols of a jumbled word, up to twenty-two characters in length.

129 Program Steps
Necessary Accessories: Extended Functions/Extended Memory Module

Documentation — $8.00 Cost of 1 card — $1.25

03056-41 : Alpha Count

This program converts the letters "A" thru "Z" inclusive with their respective point values into a numerical sum. It is useful for the game Scrabble and other applications requiring a numerical value for a group of letters (up to 24 characters long). Only extended functions and the stack are used. No data registers used! Point values for each letter are stored in x-memory for future use.

80 Program Steps
Necessary Accessories: Extended Function/Memory Module or HP-41CX

Documentation — $8.00 Cost of 1 card — $1.25

03174-41 : 30 Chips

From 30 chips takes the player and the calculator alternating at least one, and maximum six. The player who takes the last chip has won the game.

81 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03175-41 : Grand Master Mind

This program plays the part of codemaker for Grand MasterMind by generating a secret code and giving three types of clues for the player's four-position guess. Each position consists of a one-digit integer and one-digit decimal. Clues are given for the correct pair in the right position, correct pair in the wrong position, and a correct integer or decimal in the right position. This version of MasterMind has the complication of using pairs of colors and shapes and using integers and decimals in the display. The object of the game is to correctly guess the four pairs in the hidden code in as few guesses as possible using the clues given by the computer.

553 Program Steps
Necessary Accessories: Two memory modules. Printer helpful.

Documentation — $14.00 Cost of 5 cards — $6.25

03339-41 : The Square Challenger

This program plays a number game where the object is to fill in 12 squares with an integer from 1 to 9 and have all the sums of the rows, columns, and diagonals equal to the totals located on the edges. If you have difficulty, the calculator will also aid you in solving the puzzle.

545 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 8 cards — $10.00

F200 Hobbies

00400-41 : Picture Framing

Given the dimensions of a picture, and the width of the framing material, program will compute the dimensions of the framed picture (allowing for width of blade cuts and dadoing on back side of frame to hold picture in) as well as the length of framing material to do the job. By trial and error, can be used to determine max frame from given length.

47 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 2 cards — $2.50

00486-41 : Numismatist's Coin Checker

This program helps the Numismatist (Coin Collector) to determine easily and accurately if a coin is in his collection or is needed. This program uses a unique system of storage and recovery so that data cards may contain up to 75 (or even more) individual listings for coins needed in your collection – year and mint code. Full use is made of HP-41C's alphanumeric capabilities.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00568-41 : Model Rocket Altitude Prediction

This program calculates the burnout altitude, burnout velocity, distance coasted, maximum altitude and coasting time for single stage model rockets. the inputs required are rocket weight, drag coefficient, maximum diameter, engine weight, propellant weight, thrust duration and average thrust. Estes engine data is supplied. Ten engines are preprogrammable.

206 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00940-41 : Rallye Navigation

Program performs rallye navigation calculations including (1) time at distance increments, (2) time at specified distance, (3) pauses and gains, (4) distance after specified time increment, (5) distance at specified time, (6) distance at specified official mileage. After most calculations, distance and time (decimal minutes) are displayed simultaneously with labels. Off-course recovery is provided.

122 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01117-41 : Running

This program consists of three separate subprograms useful to runners. Oxyint - estimates the oxygen intake of an individual, which is a gauge of minimum standard for everyday fitness. Pindix - calculates ponderal index and % body fat of an individual. Maratan - estimates the required time to complete a marathon given certain known variables.

330 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

01125-41 : NFL Quarterback Rating

Calculates quarterback rating according to National Football League formula - uses top row keys to input QB stats and provides one keystroke solution to NFL rating & several other percentage stats. Allows for updating during game. Handy for comparing quarterbacks, and settling Monday morning arguments.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01300-41 : Enduro

A time vs distance schedule is computed and printed for cross-country motorcycle events (use for rallies, etc also). Inputs include average speeds for each section, mileages to speed changes, total length of event; time and distance to stops and resets. Time, distance, and average speed are printed for each minute.

421 Program Steps
Necessary Accessories: Three Memory Modules or Quad Memory Module and Printer.

Documentation — $12.00 Cost of 4 cards — $5.00

01469-41 : One Down Automatic Golf Presses

This program solves the tedious problem of accurately figuring one down automatic Golf bets. It will compute the outcome of front nine or second nine bets and with a printer, you can make hard copy of each players scores, the outcome of the bets and who won the money.

282 Program Steps
Necessary Accessories: Card reader and printer helpful.

Documentation — $12.00 Cost of 4 cards — $5.00

01508-41 : Model Rocket Altitude and Speed Tracking

This program finds out how high and fast your rocket went. It also can keep in memory, the last five performances. It can be used to confirm the prediction given by the program, 00568-41.

158 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

01512-41 : Marathon Pace Calculation

This program calculates incremental paces from 5 mile splits and finish time for Marathon runners. In addition to paces between 5 mile points, overall pace, last 1+ mile pace and final 10 kilometer pace are calculated and displayed in alpha-numeric format.

129 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01540-41 : Gears

This program calculates bicycle gearing and shift sequences for bicycles with up to 3 front cogs and up to 7 rear cogs. The gears are output in descending order and the corresponding shift sequence is displayed as a ratio of F(N):R(N). Arbitrary changes can then be made to determine their effect.

284 Program Steps
Necessary Accessories: 1 additional Memory Module. Printer optional. Card Reader helpful.

Documentation — $12.00 Cost of 3 cards — $3.75

01554-41 : Model Rocket Altitude Tracking Data Reduction

Calculates the altitude attained by a model rocket from two station tracking system data. Program uses both Vertical Midpoint (old NAR standard) and Geodesic data reduction methods.

191 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01588-41 : League Bowling Statistics and Set Up

This program automatically computes and maintains averages, number of games, and total pins for all participants in a bowling league consisting of any number of teams. The program is entirely self-prompting and will reduce the weekly drudgery of the league statistician. Provisions exist for substitutes, absent bowlers, changes and corrections.

310 Program Steps
Necessary Accessories: 1 Memory Module. Card Reader, Printer suggested.

Documentation — $12.00 Cost of 4 cards — $5.00

01638-41 : Musical Transposition

This program transposes musical notes from one major key to another so that the resulting note has the correct interval from its new tonic.

176 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01668-41 : Tape Deck Counter to Time Converter

Convert non-linear reading of a tape deck counter to running time or time to counter no.'s. This program has been reworked from 01573-97 for the 41C and provides complete chain prompting that leads you to all inputs and labels all outputs.

131 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01691-41 : Auto-Banner

This program is incredibly fast and easy to use. The user simply keys in an alpha string, the 41C does the rest. 106 of the 127 special characters are also supported by keying in the character's ACCHR number and executing the function XTOA to add the character to the ALPHA string.

105 Program Steps
Necessary Accessories: 1 82106A Memory Module, 82180A X-Functions Module, Printer

Documentation — $12.00 Cost of 5 cards — $6.25

01769-41 : Closed Box Loudspeaker Design for Hobbyists

Program enables the hobbyist to demonstrate the characteristics of a given driver in various sized enclosures. Parameters computed are "F3" (cut-off frequence) and "QTC" (bass characteristics).

82 Program Steps

Documentation — $8.00 Cost of 1 card — $1.25

01816-41 : Gears

Figure out the gear ratios for bikes, such as touring bikes, for maximum gear efficiency.

92 Program Steps
Necessary Accessories: Bicycle Gear Set

Documentation — $8.00 Cost of 1 card — $1.25

01848-41 : Citizens Band 40 Channel Frequency Conversion and List

This program provides easy conversion between citizen's band channels and their respective frequencies. It will also show or print a list of all 40 channels and their frequencies. Useful for those monitoring CB with a programmable scanner, someone buying or sorting crystals, or a technician adjusting a transceiver's frequency.

158 Program Steps
Necessary Accessories: None, but a printer enhances operation.

Documentation — $12.00 Cost of 2 cards — $2.50

01861-41 : Improve Your Tapecounter

Supply a few facts about your Tape-Recorder and your Tape in use. Then, knowing the reading of the Tape-Counter, your HP-41 gives the remaining amount of playtime. And winding or rewinding X min and Y sec from any spot on the Tape is from now on made very easy by this program.

168 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01901-41 : Morse Code, XFN/XMEM Module Trainer

This program demonstrates some of the many powerful functions of the XFN/XMEM Module: #82180A. As a morse code training device, the program accepts alpha messages, massages the messages and produces audible code at the rate of approximately 6.5 words/min. Tone 8=DAH; Tone P (synthetic tone 120)=DIH.

504 Program Steps
Necessary Accessories: Extended Function Module; 2 Memory Modules; Card Reader or Wand

Documentation — $12.00 Cost of 6 cards — $7.50

01903-41 : Judgment in Gymnastic Competitions

This program does the mathematical job of the chief judge of a gymnastic competition. From the notes of the judges the program computes the basic and the average score and checks if the difference is correct. It sorts the scores of the gymnasts with their corresponding number. Any score can be reviewed or changed and then resorted. Progam works for 1 to 5 judges. It respects I.G.F. rules. Program contains synthetic functions.

359 Program Steps
Necessary Accessories: knowledge of synthetic functions. 1 Memory Module; Card Reader, Wand or other Mass Storage Device or

Documentation — $12.00 Cost of 3 cards — $3.75

01922-41 : VCR Playing Time Calculator

This program will calculate the running time remaining on any VHS brand cassette, without the need for the VCR (Video Cassette Recorder) counter. (Requires the running times of items taped to be known.) This program converts and displays times in any of the three standard VHS speeds (SP, LP, and SLP or EP).

254 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01942-41 : Wine Cellar Store and Printout

This program keeps an inventory of a wine cellar on magnetic cards. The name, vintage, number of bottles of each wine, and price per bottle are all kept using only two registers per entry. Single bottles or entire entries may be added or deleted by means of alpha labelled subroutines. The second part of the program makes a complete print-out of the inventory and also computes and prints the total number of bottles and total cost.

185 Program Steps
Necessary Accessories: At least 1 Memory Module, Extended Functions Module, Card Reader and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

02043-41 : Time Recorder for Dungeons and Dragons

This program records time (incremented by the user in segments, rounds and turns). It also records twenty pending events and their time of occurance. When the present time surpasses the recorder time it displays the six letter "warning" entered by the user.

185 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02044-41 : Randomized Gem Rolling for Dungeons and Dragons

This program "rolls" and determines the type of gem found. You may specify the value of the gem or have it done randomly. You also may specify how many will be rolled. Printout is available if printer is used.

351 Program Steps
Necessary Accessories: Two Memory Modules; (Printer is desirable)

Documentation — $12.00 Cost of 6 cards — $7.50

02094-41 : Enigma

This program will allow the coding of a message, 24 characters at a time. By replacing each character with an ASCII character between 19 and 111. Without the key (seed) the code is practically unbreakable. The program will similarly allow the decoding of a message, line by line. The output is only sensible if the lines are decoded in the same order as they are encoded.

122 Program Steps
Necessary Accessories: 82161A Digital Cassette Drive, Printer and Extended Functions Module

Documentation — $12.00 Cost of 2 cards — $2.50

02190-41 : Model Railroader's Helper

This program provides size, speed and grade calculation for ho scale railroading. Conversions are provided for full scale ft-in to ho scale inches and back and scale miles per hour. The program also calculates and measures track grades to aid in layout construction and planning. Easily modified for any scale.

158 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02210-41 : Signs — A Fast and Versatile Banner Program

With this program, signs are printed at the rate of six 9-row characters per minute (more than 80 percent of maximum print rate). 56 banner characters are accessible from the Alpha keyboard. Five prompts allow selection from 7 print modes: Half-/Full-Height; Normal/Inverse; Align/Random; Self-/Common-Fill, i.e., a matching, else a common fill-character chosen by the user.

824 Program Steps
Necessary Accessories: Quad Memory, Extended Functions Module, HP 82143A or 82162A Printer

Documentation — $14.00 Cost of 9 cards — $11.25

02330-41 : Golf Caddy and Scorer

Take your HP-41 with you on the golf course, letting it manage all the scoring for up to four golfers. This program gives the total scores, handicap scores and par situations, after a round, and can also give each player's separate score on any one of the 18 holes.

233 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

02473-41 : Alpha Aspects

This program will calculate the FEAW and CFM counts, the major aspects and the angle (orb.) from an exact aspect. It will display the aspects found with alpha characters. Example: SEX: JUP SAT, TRI: MARS MOON, OPO: ASC PLU, etc.

251 Program Steps
Necessary Accessories: One memory module and Card Reader. Printer useful.

Documentation — $12.00 Cost of 3 cards — $3.75

02507-41 : Arabic Alphabet

Using this program you can print Arabic letters in all of its configurations at the beginning, the middle and at the end of a word in a proportional spacing fashion (up to 50 letters a line on the HP 82162). You can access the subroutines in three ways, using global labels, local labels or number dependent function.

700 Program Steps
Necessary Accessories: Three memory modules and Printer

Documentation — $12.00 Cost of 7 cards — $8.75

02802-41 : Bowling Scoring For The Team Captain

Each night, enter the three scores of each bowler on the team and whether they lost a beer frame. Data is accumulated for the entire season. Outputs high team series and high team game. For each bowler, gives grand total pins, games bowled, average, high series, high game, beer frames lost. Can add new bowler at any time. Will print if printer present. Only one memory module required if the print routines are deleted. Keeps track of any number of substitutes.

413 Program Steps
Necessary Accessories: Two memory modules and Card Reader. Printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

02946-41 : Morse Code Transmission at Variable Speeds

With two sets of Tone combinations (for dits and dahs) and two execution speeds to select from, you can prepare machine-perfect Morse code sequences and transmit them at 5 to ¿20 words/min. With a full-capacity system (2 X-Mem. modules), up to 86 words may be transmitted uninterrupted. Fully subroutinable, with seven entry points for user's programs to access. Includes two application programs: Day-of-Week and Random Characters. Uses synthetic programming techniques to massage the system's return stack, but no knowledge of synthetics is needed to operate these programs.

817 Program Steps
Necessary Accessories: Quad Mem., Extended Functions modules. Optional: X-Mem. and Time Modules; printer (82143A or 82162A) or Video Interface w/HP-IL module. Card reader or wand required for loading the main program

Documentation — $20.00 Cost of 12 cards — $15.00

03413-41 : Calloway Golf Handicap System

The Calloway method of handicapping golf scores becomes a snap with this program. Enter the par only once, then compute either the nine or eighteen hole Calloway for as many golfers as desired. Output includes total strokes and total under the 2X par limit, the number of holes to subtract, the adjustment factor, and, of course, the final handicap and net scores.

240 Program Steps
Necessary Accessories: HP 82180A Extended Functions Module.

Documentation — $12.00 Cost of 3 cards — $3.75

F202 Hobbies
Aerobics

00744-41 : D=RT Calculations

This program solves a variety of problems involving distance, time and speed. Time is entered as hours, min, seconds and hundredths of seconds. distance in miles or km and speed in min/mile, min/km, or km/hr. It is particularly useful for orienteering, jogging, cycling, and racing, as well as any general d=rt problems.

145 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01023-41 : Athletic Endurance Equation

The endurance equation estimates the time required to run any distance from 1 to 26.2 miles based upon known performance at a single distance. It also provides comparison with "world class" standards and may also be used to compute equivalent requirements for swimming, bicycling, rollerskating, and race walking as alternative exercise.

243 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01024-41 : Step Test of Aerobic Capacity: U.S. Forest Service Method

This program determines aerobic capacity for men and women of all ages according to age, weight and pulse rate following a 5-minute "step" test. The program follows the method used by the U.S. Forest Service to measure physical fitness and to predict ability of men and women to sustain arduous work (such as fire line duty). The program also estimates the distance a subject is capable of "running" during a 15-minute period, based on the ability to take in, transport, and utilize oxygen.

345 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

01185-41 : Aerobic Points and Caloric Requirements for Running

Aerobics became the household word for fitness in the late 1960's. Exercise at least three times per week for a total of 30 points to "maintain satisfactory fitness" (the athlete may accumulate more than 400 points per week). This program calculates and accumulates points based on distance run and pace; and for calorie counters, it also estimates normal daily caloric requirements and calories consumed during exercise sessions.

213 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

02025-41 : USMC Male/Female Physical Fitness Test

A two program package to calculate the score and class for participants in the U.S. Marine Corps Physical Fitness Test (PFT). The programs prompt for participants age and the results of the physical test performed, check for the required minimums and assign a class based on score and age group. No charts or reference tables are required. One program scores females, the other scores males.

253 Program Steps
Necessary Accessories: One Memory Module

Documentation — $14.00 Cost of 5 cards — $6.25

03025-41 : Ten Kilometer Runner's Tally

Organizers of community running events may store up to 262 runner's initials, entry #s and finishing times. By use of extended memory and Text Editor, runner's initials are stored before the race. With Stopwatch mode times are stored in registers corresponding to entry number. After the race is complete results are printed out on a thermal printer in neat readable format. This is actually a package of 4 programs; 1) for entering initials, 2) for setting up stopwatch mode and storing respective finishing times into data registers, 3) for formatting and printing out the results, 4) appending program for adding initials of who decide to enter the race at last minute.

137 Program Steps
Necessary Accessories: HP-41C with Quad memory module, Extended Functions/Ex Memory module, Timer module and a thermal printer.

Documentation — $12.00 Cost of 3 cards — $3.75

03113-41 : Aerobics Point Counter

This program calculates and accumulates aerobic points earned for fitness exercises: running, cycling and swimming.

518 Program Steps
Necessary Accessories: Two memory modules and X-Function module. Printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

F204 Hobbies
Amateur Radio

01624-41 : Morse Code (Compiled Transmit, Single Character or Practice)

This program transmits code at a speed of 4-7 wpm. Single characters or groups of characters may be 'sent', or random practice code generated. Character entry is by pressing the appropriate alpha key(s). One long and one short tone of the same frequency is used. 'Synthetic' lines are 'tone 3' and 'tone Q'. No other synthetic functions required. Assignments are not necessary.

400 Program Steps
Necessary Accessories: 3 Memory Modules; Card Reader or Wand mandatory.

Documentation — $12.00 Cost of 6 cards — $7.50

02451-41 : Twilight Edge as Propagation Indicator

This program calculates the coordinates of the points which enable the user to draw the Twilight edge curve on a transparent sheet with time and latitude as axes. By superposing this sheet on a double map of the world, the user can see, at any given time of any day of the year, where and when sunrise and sunset are taking place through the world. This is a useful propagation indicator for radio amateurs.

86 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

02665-41 : Short Path Beam Heading

Most radio amateurs have rotor equipped directional antennas and rely on beam heading charts to find out in which direction the antenna has to be pointed. These charts are useful only for transmission from locations for which thery are drawn. This program calculates the exact heading of a beam transmission from any location to another place on earth. More sharpened is the beam width, more accurate has to be the heading of the antenna. The inputs are latitude and longitude of the user's location and of the location he wants to reach.

141 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 1 card — $1.25

02700-41 : Amateur Satellite Tracking

This program, uses the capabilities of the Time Module. Automatically calculates, at 2-minute intervals, the elevation and approximate bearing of a satellite in circular orbit. Input data includes station coordinates (2), satellite parameters (3), and data for the specific orbit (2). Once the data is entered, no other keystrokes are needed, and the program will continue to give the satellite's position until it goes out of range.

385 Program Steps
Necessary Accessories: One memory module and time module

Documentation — $12.00 Cost of 4 cards — $5.00

02836-41 : Synthetic Speed Morse Code

This non-compilling program can produce uniform code at about 20 words per minute. Modifications give various slower speeds. Code can be sent for messages in the alpha register or for unlimited length ASCII files. Full character set includes letters, numbers, and special symbols. The tones are synthetic, and a single other synthetic line is used.

144 Program Steps
Necessary Accessories: Fully configured main memory, X Functions capacity and I/O device useful.

Documentation — $12.00 Cost of 5 cards — $6.25

02946-41 : Morse Code Transmission at Variable Speeds

With two sets of Tone combinations (for dits and dahs) and two execution speeds to select from, you can prepare machine-perfect Morse code sequences and transmit them at 5 to ¿20 words/min. With a full-capacity system (2 X-Mem. modules), up to 86 words may be transmitted uninterrupted. Fully subroutinable, with seven entry points for user's programs to access. Includes two application programs: Day-of-Week and Random Characters. Uses synthetic programming techniques to massage the system's return stack, but no knowledge of synthetics is needed to operate these programs.

817 Program Steps
Necessary Accessories: Quad Mem., Extended Functions modules. Optional: X-Mem. and Time Modules; printer (82143A or 82162A) or Video Interface w/HP-IL module. Card reader or wand required for loading the main program

Documentation — $20.00 Cost of 12 cards — $15.00

F206 Hobbies
Biorythms

00310-41 : Biorhythms with Prompts

Written with prompts on HP-41C makes program much easier to use. Calculates point on cycle for physical (23), emotional (28), and intellectual (33-day) cycles for any date given birthdate. Easy to step ahead 1 day. Can handle fractional days. Display review key.

89 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00333-41 : Mass Produce Biorythms

Part 1: BIO prints Biorhythms for one month in an easy to read alphabetic format for up to 36 people. Part 2: update provides for additions to and deletions from the data base.

Necessary Accessories: Card Reader, Printer and three Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 5 cards — $6.25

00406-41 : Bio

For any number of selectable days or months, this program calculates and simultaneously prints out the three plot points (p=physical, e=emotional, i=intellectual) along with the corresponding day of the month.

746 Program Steps
Necessary Accessories: One Memory Module and Printer. Card Reader desirable.

Documentation — $12.00 Cost of 4 cards — $5.00

00795-41 : Precision Biorhythm Plot

This program uses the printer's SKPCOL to plot biorhythms with smooth curves. The date is printed along with the day of the week, all on one line per day. Also includes a modified calendar functions from the 41C standard applications, and numerical evaluations for biorhythm cycles on particular days.

548 Program Steps
Necessary Accessories: Two Memory Modules and Printer

Documentation — $12.00 Cost of 5 cards — $6.25

00952-41 : Bio-Compatibility

Using biorhythmic theory this program calculates compatibility of any two individuals. Output is shown as a percentage compatibility for each cycle (p,s,c) and average compatibility. Program is easy to use and includes date validation and printer output sub-routines which may be deleted to conserve memory.

214 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00961-41 : Biorhythms

Given the birthdate, and any date between 1901 and 2049, this program will calculate three bio-values. Physical, emotional and mental. Using advantages found in the HP-41C like alphanumeric display. Any input or output, each time comes with an alpha string explaining it.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01131-41 : Bioplotter

This program plots a given Person's biorhythms using a three variable simultaneous plotting routine. Input is straightforward and output is both pleasing and an excellent example of the flexibility of the HP-41C system. Unlike other multiple variable plotting routines, this one will print a line every 4-6 seconds.

310 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01371-41 : Biorhythm Plotting Routine

This program plots biorhythm curves for any month, given birthdate and the month to plot. Each cycle may be plotted separately or all three may be generated. Each plot is headed up with the person's name, the cycle being plotted (physical, sensitivity or cognitive), and the month and year.

197 Program Steps
Necessary Accessories: One memory module, Printer and Time Module

Documentation — $12.00 Cost of 2 cards — $2.50

01891-41 : Biorhythms & Compatibility for You or People in History

Calculates the biorhythm for anyone born since October 15, 1582, for any date up to September 10, 4320. Includes the compatibility test for any two people born in the same period. Display indicates whether person is in the negative or positive phase of each cycle, warns of critical and minicritical days. Date input/output can be American or European style. Time module makes operation extremely fast.

262 Program Steps
Necessary Accessories: 1 memory module, Time module; (Printer optional)

Documentation — $12.00 Cost of 3 cards — $3.75

02037-41 : Biorhythms and Coincidences

When the birth date is entered by the user, this program calculates the biorhythms for the Physical (P), Sensitive (S) and Cognitive (C). From the biodate it then calculates the biorhythms for the desired amount of days (the date is displayed!) and will tell the user the number of days and the date of a minimum, maximum or critical biorhythm for either the P, the S, the C, the P+S, the S+C, the P+C or the P+S+C. All dates are in the MM.DDYYYY format.

220 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02096-41 : Bioplot

This program simultaneously plots the three sinusoidal biorhythm curves in one attractive output. Each curve clearly identifies the biorhythmic cycle it represents and each day's values are dated. The subject's date of birth and the plot's starting date are also printed for convenience.

360 Program Steps
Necessary Accessories: One Memory Module, Printer

Documentation — $12.00 Cost of 3 cards — $3.75

02246-41 : Biorhythm Plot/Print

This program plots or prints the three biorhythm cycles for any number of days during any months from March 1900 to February 2100.

184 Program Steps
Necessary Accessories: 82143 Printer and one memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02761-41 : Calculations of Biorythms

Given the birthdate, and any date required after that particular date, the program will calculate the values for physical, emotional, intellectual, plus give the average of the three, and the number of days between the two dates.

129 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02792-41 : Advanced Bio-Pac

This is a program on biorhythms on which you can calculate the biorhythms for any given date. The criticals, maxima and minima for the three physical, sensitive and cognitive bio-cycles; the exact and approximate double and treble coincidences of these bio-cycles; the periods during which your bio-rhythms are, separately, two by two, or all three together, positive or negative. A NEXT function (for the next coincidences and bio-periods), a DOW function, and M.DY/D.MY function are also provided, as well as many alph- numerical comments. ADV.BIO-PAC comprises some synthetic functions that are very clearly explained (7 pages). Printer version is also provided.

1062 Program Steps
Necessary Accessories: Quad Ram & Printer

Documentation — $20.00 Cost of 19 cards — $23.75

02904-41 : Byor

This program allows the user to calculate biorythms of persons whose birthdates lie beyond the range of the time module and to view the results (slope, amplitude, days of the week, etc.) without number juggling. This program differs from others in its extreme ease of operation.

289 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

SOLVE and INTEGRATE

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EDUCATIONAL
MEDICAL ARTS & SCIENCES
PROBABILITY & STATISTICS
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H000 Educational (Programs that teach)
N000 Medical Arts and Sciences
N100 Anesthesia
N200 Blood Chemistry
N300 Cardiopulmonary Medicine
N400 Clinical Laboratory
N402 Clinical Laboratory — Radioimmune Assay
N500 Dentistry
N600 Nutrition
N700 Optometry
N800 Pharmacology
N802 Pharmacology — Drug Dosage
N900 Pharmacology — Toxicology

R000 Probability and Statistics
R100 Analysis of Variance
R200 Curve Fit/Regression/Correlation
R300 General Statistics
R400 Non-Parametric Inference
R500 Parametric Inference
R600 Probability
R700 Probability Distribution
R800 Quality Assurance/Reliability
V000 Social Sciences
V100 Economics
V200 Educational
V300 Psychology

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

H000 EDUCATIONAL
Programs that teach

00369-41 : Grade Point Averager Plus

A two part program: with the first part being a standard program to figure gpa on a 4 point grading system. The second part is unique. It can use the results of the first part, or operate independently. It prompts for "GPA now", "hours earned up to now", "how many hours do you have left in a typical degree program?", "What GPA do you want to have at the end (in order to graduate Cum Laude, etc)?" It computes the GPA you must earn between now and then and then tells you how many hours of A, B, C, D grades you must acheive to get this GPA. Card Reader optional.

147 Program Steps
Necessary Accessories: Card Reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00381-41 : Logic Through a Looking Glass

New version of "Logic 2". This version follows the same logic (flowchart) as the earlier version, but has been revised to incorporate the optional use of a printer and to embody more efficient RPN coding (especially in the use of labels). The program is designed to aid the student of classical logic in the solution of syllogisms. Of interest to the logician, will be the use of a 3-valued logic system which 'solves' the syllogisms.

281 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00573-41 : Math-1 Elementary Arithmetic Teacher

Math teacher for children K–2nd. Presents addition and subtraction problem of 1 to 4 digits in which carrying and borrowing are not required. Key inputs simplified for use by children. Tones reward correct answer. Problem resubmitted for partial credit if missed on first try, if second incorrect correct answer given.

143 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00625-41 : Typing Tutor

This program helps the novice touch typist get familiar with his typewriter keyboard. User selects the portion of keyboard he wishes to memorize. HP gives letters and asks what finger is used to press that key. User answers and HP comments and rates user. Adaptable to different keyboards.

Necessary Accessories: Two Memory Modules and Card Reader

Documentation — $12.00 Cost of 5 cards — $6.25

01014-41 : Two Language Dictionary

This program translates words of one language to a second and viceversa. The program incorporates automatic feed-in of words and review of same. Each magnetic card will hold four maximum 12-letter words and eight maximum 6-letter words of the first language and their corresponding translations.

102 Program Steps
Necessary Accessories: Card Reader necessary if storage of data in cards is desired.

Documentation — $8.00 Cost of 1 card — $1.25

01783-41 : Typing Tutor

Do you get lost when typing in words with the 41C keyboard? Can you type 50 words per minute on a QWERTY keyboard and find yourself lucky to type 50 letters in the same time? The purpose of this program is to provide typing practice by flashing each letter in a random order and asking you to match it as quickly as possible. The stopwatch of the Time Module is used to let the user know how long it takes.

137 Program Steps
Necessary Accessories: 41C Time Module

Documentation — $8.00 Cost of 2 cards — $2.50

01788-41 : Coord Transformation: Drill/Practice or Test Questions

Physics Instructors: Take Note. Program Pt1 will give you one more way to use your HP-41. Crankout Test Questions and Keys (no 2 questions alike). "Students" may use the calculator for Drill and Practice in Spherical/ Cartesian Coord. Transformations (3 Dimensional) and have the answer checked on the spot. (Good practice for taking Physics from Instructors who do not allow Programable Calculators during tests). A summary of Program Development is a Bonus: So you can design your own programs along the same lines.

245 Program Steps
Necessary Accessories: Extended Function Module + 1 Memory Module, Printer; Time Module Optional Program is Printer Compatible (without or with and/or On-Off).

Documentation — $12.00 Cost of 3 cards — $3.75

01905-41 : Thermal Equilibrium:A

Fourth program in a series for first-term physics students (instructors). This program produces interchangeable solutions for one of six quantities when a hot body is submerged in water or ice. The program considers 7 different cases. Centigrade, MKS units are used. Quantities are prompted for: "ECHOED" (Displayed). The unknown is solved for automatically.

281 Program Steps
Necessary Accessories: One Memory Module and Extended Function Module

Documentation — $12.00 Cost of 3 cards — $3.75

02029-41 : Collisions: Conservation of Linear Momentum

Third program in the "Physics Teacher" series uses a slightly different approach to yield interchangeable solutions between eleven variables, including the coefficient of restitution, when two bodies collide centrally with each other. Both elastic and inelastic collisions are solvable.

346 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02105-41 : Scientific Notation Problems

This program prints out multiplication and division problems in scientific notation format, stores the problems and answers in an ASCII file in Extended Memory and prints out the problems with answers from the ASCII file. The problems are numbered.

367 Program Steps
Necessary Accessories: HP-41C and Two Memory Modules or HP-41CV, Extended Function Memory Module, and any Printer.

Documentation — $12.00 Cost of 4 cards — $5.00

02108-41 : Arithmetic Teacher 2

This program uses Don Malm's random number routine to generate two random numbers for the operands in multiplication, division, addition and subtraction problems. Elementary students can vary the maximum numbers for each of the operands and learn math tables. A seed prompt is included and a prompt for more problems is used. "YES" branches to more problems; "NO" branches to "END OF PROBLEMS".

226 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

02225-41 : Periodic Table Tutor ("MD")

Test your knowledge of the atomic numbers and symbols of the elements. Ten perfect responses earn you a fanfare.

420 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 4 cards — $5.00

02318-41 : Hangmath 1.0

Make learning fun with Hangmath, the educational game. A merger of math quizzes and the game of Hangman, Hangmath features changeable difficulty levels (from first grade to post-college): aural and visual special effects, complete error trapping, full user prompting, and the optional saving of all calculator status and registers. The program is designed to only produce integral solutions for all functions (range: 1 to 9801). Hangmath the educational program that makes learning fun for all ages.

393 Program Steps
Necessary Accessories: Two memory modules and an Extended Functions Module
Documentation — $12.00 Cost of 4 cards — $5.00

02466-41 : Math Flashcard — For Children and Adults

This program flashes addition, subtraction, multiplication, and division problems. For +, −, and ×, the 2 numbers can be from 1 to 3 digits each; for ÷, the quotient and divisor can be 1 or 2 digits each (calculates dividend from these). This allows for use as a child's tutor or an adult's "mind exerciser" or just for practice. Displays correct answer if incorrect. Calculates time taken per correct response (user inputs time at start and finish).

210 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02628-41 : Cai-Scientific Notation

This program, based on the Arithmetic Teacher, poses 10 multiplication or division problems in exponential (scientific) notation format. A new method of generating both positive and negative numbers is used. Correct answer is given after two wrong answers. A prompt is given for more problems to be done. Program can work with or without a printer. Printer can be attached, but off.

365 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $12.00 Cost of 5 cards — $6.25

03154-41 : Morse Simulator (Learning Routines)

This program, made up of three learning routines, simulates a Morse Transceiver. Up to 44 different characters (A thru Z, 0 thru 9, and eight punctuational symbols) can be generated, i.e. toned and optionally displayed. This program uses standard tones but can be optimized and made to better comply with the international morse code conventions by replacing them by synthetic ones. All the synthetic functions, the use of which is OPTIONAL, are clearly explained (8 pages).

380 Program Steps
Necessary Accessories: Two memory modules, Extended Functions module. Card Reader optional.
Documentation — $14.00 Cost of 4 cards — $5.00

03289-41 : Convert Numbers to Engish Words

Key in a number and the computer types out the number in words. For example, input is 2258, the display will read two, two, five, eight.

203 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

N000 MEDICAL ARTS & SCIENCES

00421-41 : Tissue Blood Flow

This program solves equations associated with a thermodynamic technique for measuring regional tissue blood flow and heat transfer characteristics.

238 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00548-41 : Cerebrospinal Fluid

This program calculates factors in cerebrospinal (csf) dynamics including csf formation and reabsorption rates, molecular clearances, permeability coefficients and distribution volumes for a large molecule and/or any 1 or 2 smaller molecules. Calculations can be made in any order and only data not already entered or calculated are requested for subsequent calculations.

Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

00578-41 : Respiration

This program is designed to provide the calculations and unit conversions used in respiratory physiology. In using different equations, only data which have not already been entered will be requested. For a single day and/or experiment, some values will remain constant and only new values for gas volumes, ventilations, VO_2's, VCO_2's, R's and gas partial pressures are needed. Equations solved by this program are commonly used in medical teaching and respiratory research.

577 Program Steps
Necessary Accessories: Three Memory Modules
Documentation — $12.00 Cost of 6 cards — $7.50

00662-41 : Obstetrical Ultrasound

This program performs a variety of calculations which arise in diagnostic ultrasound evaluation of pregnant patients. These include prediction of delivery date based on last menses or fetal biparital diameter, current gestational age, evaluation of fetal head growth between examinations, and detection of intrauterine growth retardation by assessment of total intrauterine volume.

600 Program Steps
Necessary Accessories: Three Memory Modules. Card Reader and Printer optional.
Documentation — $12.00 Cost of 7 cards — $8.75

00730-41 : Dose Commitment Factor Inhale

Organ radiological dose commitments are computed for inhalation of insoluble radionuclides. Dcf values accumulated for 1, 5, 10, 20, and 50 year intervals. Uptakes are net to lung for up to one year. USNRC age groups for organ masses and single compartment retention theory are used. Program prompts for input data.

271 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00755-41 : Human Heat Stress

This program calculates a "heat stress index" a nominal exposure time and ambient relative humidity as well as total and percent heat loads due to thermal convection, radiation and metabolism, based on dry bulb, wet bulb and globe temperatures, air velocity and work rate values for either metric or english units. Although human comfort and safety in acute heat stress depend on many other factors also, these calculations are useful guidelines for developing effective countermeasures against heat strain.

349 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

00757-41 : Dose Commitment Factor Ingest

Organ radiological dose commitments are computed for ingestion of soluble/insoluble radionuclides and inhalation of soluble nuclides. Dcf values are obtained for 1,5,10,20, and 50 year intervals. Uptakes are net to organ. USNRC age groupings and single compartment retention are used. program prompts for input data.

248 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00909-41 : Renal Function Tests

This program calculates parameters of normal and pathological renal function including test molecular clearance, filtration, reabsorption, fractional reabsorption, excretion, fractional excretion, net transport and extraction, and glomerular filtration, renal (and effective renal) plasma and blood flows, as well as other physiological values which are useful in both clinical and research applications. Data and calculations are stored for solution of equations which can be made in any order. Data needs to be entered only once.

624 Program Steps
Necessary Accessories: Three Memory Modules
Documentation — $14.00 Cost of 6 cards — $7.50

00993-41 : Dose Conversion Factors for GI Tract and Noble Gases to Lung

Program estimates radiological dose to lower large intestine from ingested or inhaled radionuclides and by noble gases to lung. USNRC GI tract clearance and lung capacity parameters are internally contained. Program prompts for input data as needed.

88 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01030-41 : Acid-Base Factors for Blood and Brain Interstitial Fluid

This program calculates ph, hydrogen ion concentration, carbon dioxide partial pressure and bicarbonate concentration in arterial and venous blood and brain interstitial fluid for mammals at a body temperature of 37 degrees centigrade. These calculations can be made in any order. Once data have been entered for any calculation, they need not be entered again for other calculations requiring the same information.

699 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 7 cards — $8.75

01194-41 : Heights vs Desirable Weights for Adult Males and Females

This program is based on the National Acedemy of Sciences' Table, "Desirable Weights for Heights and Ranges for Adult Males and Females". Given male or female, light, medium for heavy frames and heights, the program outputs the desirable weight. Instructions are very simple since one only needs to answer to the prompts.

112 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01288-41 : Aqueous Flow Simulation

Using prompted values for the aqueous inflow and outflow facility coefficients, the program calculates a series of values of aqueous flow for incremented values of the pressure-difference (p sub in - p sub out) required to move aqueous through the eye. The relationship is also plotted using the printer-plot.

100 Program Steps
Necessary Accessories: Printer and Card Reader
Documentation — $8.00 Cost of 1 card — $1.25

01652-41 : Tumor Volume and Statistics

Calculates spherical or cylindrical volume, depending upon width/length ratio of two vernier caliper measurements. Individual tumors numbered and the volume displayed. Mean, S.D., SEM, % CV displayed for each group. The first group may be designated a control and the % control of the mean and SEM of subsequent groups is then calculated. Errors deleted. Fully prompted.

161 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01731-41 : DOSE

The I.C.R.P. Multi-Compartment Respiratory Tract Model is used to predict doses to organs from radionuclide depositions in the nasopharyngeal, tracheobronchial, and pulmonary regions. For gastrointestinal tract doses, the four-segment model is used. Ingestion is included for user convenience. Infant, child, teen, and adult doses are displayed for arbitrary uptake and exposure time episodes.

668 Program Steps
Necessary Accessories: 3 Memory Modules
Documentation — $14.00 Cost of 6 cards — $7.50

01997-41 : U.S. Air Force & Marine Corps Percent Body Fat

The U.S. Air Force and U.S. Marine Corps formulas for determining percent body fat are used to determine a desired body weight and maximum allowable body weight. 90% confidence limits about the estimate of percent body fat are provided. The Seltzer obesity index is calculated for men as well as a maximum weight for health.

499 Program Steps
Necessary Accessories: None if programs are used one at a time
Documentation — $14.00 Cost of 8 cards — $10.00

02035-41 : Framingham Risk Equation

This program predicts the probability of developing cardiovascular disease over 8 years in asymptomatic adults ages 35-74 according to sex, age, cholesterol, systolic blood pressure, smoking history, left ventricular hypertrophy and glucose intolerance. This risk is compared to average risk of that age and to a hypothetical minimum risk. A cardiovascular equivalent age is estimated.

388 Program Steps
Necessary Accessories: One Memory Module; (Printer is optional)
Documentation — $12.00 Cost of 3 cards — $3.75

02148-41 : Resting Membrane Potentials

Calculates Nernst and Goldman (GHK) equations for Na^+, K^+, and Cl^-. User inputs any change in membrane permeability to or concentrations of these ions. (Program "knows" textbook values). Very useful in helping one understand the role of permeabilities and concentrations in developing a potential across a semi-permeable membrane.

140 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02163-41 : Physical Growth Percentiles

Calculates new physical growth percentile curves prepared by National Center for Health Statistics for infants aged birth - 36 months. NCHS percentiles can be used to identify potential health and nutritional problems. Displays percentile distributions for length, body weight, and head circumference for age, and body weight for length.

285 Program Steps
Necessary Accessories: Three Memory Modules and Card Reader
Documentation — $14.00 Cost of 25 cards — $31.25

02236-41 : Flow 2

This program calculates data related to a recently introduced method for measuring tissue blood flow (Adams, T. et al., Am. J. Physiol. 238: H-682-H696, 1980), but is different from HP program 00421-41 in that it determines tissue perfusion directly from measured coordinate data. It is more useful than HP program 00421-41 for "on-line" calculations during an experiment.

288 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02401-41 : Countercurrent Multiplication in the Kidney

A model of countercurrent multiplication by Henle's loops in kidney is organized into three units suitable for independent study by students and for demonstration by instructors. Variables: Loop length, pump rate, vasa recta blood flow, and tubular flow. Video and/or thermal printer is optional.

920 Program Steps
Necessary Accessories: Quad Memory Module. Thermal Printer and Video Interface optional.
Documentation — $16.00 Cost of 10 cards — $12.50

02511-41 : Blood-Type Matching

Given the distribution of the eight blood types within a given population, this program will find the number and percentages of eligible donors and recipients for each blood type.

201 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02537-41 : Hearing Loss Rating

This program calculates hearing losses in db and by percentage, given the audiometer readings in db at four frequencies. These are 500, 1000, 2000 and 3000 cycles per second. The age of the subject and the four frequencies are entered into the calculator (frequencies in db loss). The calculator then calculates the gross loss of hearing acuity in db and percentage. It then calculates the net loss by subtracting the presbycusis factor which is based on the subject's age. This is done for each ear and then the combined loss is calculated.

375 Program Steps
Necessary Accessories: 41C with Quad Module or 41CV. Card Reader and Printer optional.
Documentation — $12.00 Cost of 9 cards — $11.25

02639-41 : Blood-Type Matching

A, B and RH. of an individual is typed by the presence or absence of the three antigens the percentages of blood-type matches found in a given population. The blood This program examines a simple model of blood-type matching and generates

224 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

03258-41 : Menstruation Calendar

This program calculates, under the input of the longest period, the shortest period and the last menstruation date, the fertile days and the date of the next menstruation using the Knaus-Ogino method.

225 Program Steps
Necessary Accessories: One memory module, card reader.
Documentation — $12.00 Cost of 2 cards — $2.50

N100 Anesthesia

01036-41 : Cardiac Anesthesia Utility

The program provides calculation used in cardiovascular anesthesiology. These include all parameters derived from thermodilution pulmonary artery catheter measurement; temperature correction of blood gases; shunt calculation; infusion rates for drugs. The program plots activated clotting time curves and calculates protamine doses.

833 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 9 cards — $11.25

02226-41 : Evaporative Water Loss

This program calculates calibration data, unit conversions and integration functions for a newly developed technique designed to measure water evaporation rates from a controlled surface, water storage within a mass, and the total amount of water evaporated for a defined time period either as an exponential or a mathematically undefined dehydration process. Measurements are made non-invasively from either living or dead animal tissue or from inanimate materials.

495 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 6 cards — $7.50

03390-41 : Human Heat Stress II

This program calculates "Wet Bulb Globe Temperature" (WBGT) with or without radiant heating, a mean metabolic heat load and a mean WBGT for successive periods of work and heat stress, respectively, and predicts required ratios of work and rest for "safe exposures" to a specified thermal environment for specific levels of metabolic heat production. It supplements the program entitled, "Human Heat Stress", (00755-41), which calculates a "Heat Stress Index". Used together, they provide useful information about environmental heat stress as well as guidelines for its amelioration.

551 Program Steps
Necessary Accessories: Three memory modules.
Documentation — $14.00 Cost of 5 cards — $6.25

N200 Blood Chemistry

00999-41 : Determination of Whole Serum Complement Activity (CH50)

Measurement of whole serum hemolytic complement is a widely used immunological parameter useful in the diagnosis of certain diseases and in the quantitation of antigen-antibody interactions. This program computes the complement activity in terms of conventional ch50 units.

165 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

02040-41 : Acidity and Oxygen Contents of Blood

Two programs using the same prompting routine. Program #1 computes saturated and normal oxygen contents of blood. Program #2 computes hydrogencarbonate ion concentration, base excess and ions of dissociated CO_2. Both programs output CO_2 partial pressure and pH at 37°C. The program uses the "IN" and "OUT" subroutines piinted in *Key Notes* V5 No.1.

177 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02481-41 : Temperature Corrections for Blood pH, pK, H^+, HCO_3^+, PCO_2 and CO_2

This program is designed to calculate temperature corrections for blood pH, pK, hydrogen ion and bicarbonate concentrations, blood partial pressure of carbon dioxide (CO_2) and a CO_2 solubility coefficient for plasma using either metric or English units. Input variables are body and measuring electrode temperature, measured pH and CO_2 partial pressure.

411 Program Steps
Necessary Accessories: Three memory modules for the HP-41C.

Documentation — $12.00 Cost of 6 cards — $7.50

N300 Cardiopulmonary Medicine

00350-41 : Bedside Hemodynamic Data

This is an interactive program which asks the user for basic patient data from arterial, central venous, and pulmonary artery catheters. It then provides a list of derived values including cardiac index, stroke index, stroke work indices, vascular resistances, and body surface area.

204 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01401-41 : Clinical Cardiopulmonary Calculations for Critical Care

Program calculates one or all of the following critical care indices from pulmonary and hemodynamic data: cardiac index: pulmonary and systemic vascular resistance; ventricular stroke and minute work; body surface area; alveolar-arterial O2 - gradient; physiologic shunt and tissue O2 extraction rate. All data input prompted for and output labelled.

567 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $12.00 Cost of 7 cards — $8.75

01988-41 : Risk

A program which allows the practicing flight surgeon to screen asymptomatic aviators for risk of aeromedically significant coronary artery disease.

115 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02117-41 : Routine ECG Determinations "ECG"

Program calculates basic ECG scalar values: 1) QRS mean frontal plane axis, 2) heart rate and R-R interval, 3) P-R interval and 4) Q-T and Q-Tc intervals. Program requires input of height in millimeters of both positive and negative deflections of the QRS complex in leads I and III and width in millimeters of P-R, R-R and Q-T intervals.

103 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02763-41 : Scalar EKG "EKG"

Program calculates and evaluates P, QRS, T and G mean frontal plane axis; 2) QRS-T and QRS-G angles; 3) heart rate and 4) P-R, R-R, Q-T and Q-Tc intervals. Just by entering values in millimeters of height and width of deflections and of duration of intervals. All you need is a metric ruler! The program will tell you if the scalar values are normal or abnormal and when abnormal values are found which type of abnormality it is.

622 Program Steps
Necessary Accessories: HP-41CV or equivalent memory accessories

Documentation — $14.00 Cost of 8 cards — $10.00

02973-41 : Comprehensive Acid-Base Analysis "AB"

This program computes all acid-base parameters and gives the appropriate diagnosis for a given set of values. It also calculates the amount of acid or base needed for appropriate correction of abnormal values and computes the anion gap. The program requests input of any two of the five acid-base parameters (pH, CH^+, PCO_2, TCO_2 and $[HCO_3^-]$), plus body temperature in centigrade, hemoglobin in g/dl, weight in kg and $[Na^+]$, $[K^+]$ and $[Cl^-]$ in mEq/L. The program will adjust values for any given body temperature.

613 Program Steps
Necessary Accessories: HP-41CV or equivalent memory accessories.

Documentation — $14.00 Cost of 9 cards — $11.25

N400 Clinical Laboratory

01583-41 : Aqueous Facility Tonography

Program calculates the ophthalmological aqueous facility coefficient (c) using Goldmann applanation, ocular rigidity and up to 20 Schiotz values measured along the tonography curve. The results are averaged and error estimated by the standard deviation and also the correlation coefficient of the curve.

244 Program Steps
Necessary Accessories: 82143A Printer; 82104A Card-Reader; Quad Memory (or 2 Memory Modules)

Documentation — $12.00 Cost of 3 cards — $3.75

01779-41 : The Workload of the Anatomic Pathologists

By keying in each day's last Surgical Pathology accession number, and the name/code of the Pathologist responsible for that day, one can easily determine each Pathologist's workload for any period of time, the total number of cases submitted, the number of days in that period, and the average number of cases per day.

226 Program Steps
Necessary Accessories: HP-41C/CV with Card Reader and Printer

Documentation — $12.00 Cost of 3 cards — $3.75

N402 Clinical Laboratory Radioimmune Assay

02147-41 : Four-Parameter Logistic Curve Fitting and Description

The program fits up to 20 data pairs to the four-parameter logistic equation $Y = (A - D)/(1 + (X/C)^B) + D$ using iterative weighting to adjust the parameters until a convergence is achieved. The program then describes the pairs used in terms of "best" parameters, and can also describe any proper unknowns in terms of these. The program can be used to fit many types of binding data.

654 Program Steps
Necessary Accessories: Three 64 Register Memory Modules or Quad Memory Module for the HP-41C.

Documentation — $14.00 Cost of 6 cards — $7.50

02344-41 : Radioimmunoassay

This program will, through modular sequences of code, permit the entry, plotting and interpolation of counts in a radioimmumoassay. Up to approximately 50 points can be entered, corrected, analysed and plotted by an adaptation of the full size mathematical model (not an abbreviated less precise form) developed by Rodbard and Lewald. With full memory configuration, up to approximately 200 unknown counts can be entered, corrected and analysed on one run. A possibility of return to 'old curves' is also included.

1258 Program Steps
Necessary Accessories: One memory module. Card Reader optional.

Documentation — $25.00 Cost of 13 cards — $16.25

02513-41 : Weighted Logit-Logria Method

Calculates a smoothly weighted logit-log regression where weights are largest around the ED50 and decrease progressively outward. Programs use B or F and factors in dilutions for unknowns. Any number of standards, unknowns and replicates may be used. Output includes % NSB, % Bo, B/Bo, R, RMS, slope, Y intercept, ED50 (and their standard errors), unknown concentrations, % CV (if replicates) and % error of curve. Fully prompted.

527 Program Steps
Necessary Accessories: Two memory modules. Printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

N500 Dentistry

01200-41 : Moyer's Space Analysis 75%

Now the general Dentist or Pedodontist can quickly and easily evaluate "space problems" in the early mixed dentition without resorting to long charts and tedious arithmetic. Moyer's space analysis at the 75% level is calculated in the program within ± 0.2 mm per arch. Mesial shift (leeway space) for both maxillary and mandibular arch is an additional option!

115 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 3 cards — $3.75

N600 Nutrition

00316-41 : Diet Planning

Most diet plans only count calories for a fixed-calorie input, regardless of an individual's caloric requirements. This program estimates an individual's basal metabolism from height, weight, age and sex. Then required calories/day for maintaining (or changing) weight are estimated using hours/day spent at each of five activity levels. This program is based on HP-97 program 01074-97.

171 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00494-41 : Diet Control for -

A personalized (hyphen in title replaced by name) printout of a diet's caloric requirements for weight maintenance, gain or loss according to sex, height, weight, age: in metric or english units considering persons' daily activities. Great for social gatherings: fund raising booths, health clinics, ice breaker (social).

307 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

03092-41 : Weight Control and Calorie Calculations

Program calculates one's ideal weight based on sex, height and frame (wrist size). Also, calculates calories/day required to maintain ideal weight for moderately active person (normal). Program prompts for food (items) and amounts to provide total calorie intake; also prompts for daily activities to determine calories expended. Program concludes by noting if using will gain or lose (at what rate) weight.

401 Program Steps
Necessary Accessories: 82143A Peripheral Printer

Documentation — $12.00 Cost of 5 cards — $6.25

03538-41 : Daily and Weekly Human Weight Loss/Gain

This program estimates rates of weight loss or gain either for each day or for each week based on a person's age, weight, height, sex, daily caloric intake, and duration of different types of daily activities. Calculations are made in either English or metric units.

348 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 4 cards — $5.00

N700 Optometry

01605-41 : Intraocular-Implant Lens-Power

This program calculates the dioptric power of the intraocular implant used after cataract surgery from keratometric and ultrasonic data. It also plots the change of power required as the position of the implant varies up to seven millimetres from the corneal surface.

92 Program Steps
Necessary Accessories: 82104A Card Reader; 82143A Printer.

Documentation — $8.00 Cost of 1 card — $1.25

03263-41 : Depth of Field RR #1

This program calculates depth of field based on a circle of confusion on the negative of 1/1000 of the focal length.

49 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

N800 Pharmacology

03144-41 : I.V. Label-Generating Programs

The programs (handheld computer programs for generating labels for selected I.V. (intervaneous) admixtures) were developed based on a hospital pharmacy model preparing large and/or small-volume I.V. admixtures for anywhere from zero to 42 patients daily. The program's objectives are to 1) reduce the time spent and errors occurring in the typing of labels; 2) supplement existing manual systems, and 3) serve as a back-up for existing computerized systems.

936 Program Steps
Necessary Accessories: A manual system for maintaining I.V. profiles; Printer; Card Reader; Maximum Memory

Documentation — $25.00 Cost of 35 cards — $43.75

N802 Pharmacology Drug Dosage

01633-41 : Conversion of Drug Infusion

Converts drug infusion rate from micrograms/kilogram/min to cubic centimeters/hour given the drug concentration in micrograms/cubic centimeter.

76 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

01878-41 : Pharmacokinetic Parameters from Serum Drug Concentrations

This program determines Vd and/or Ke for any drug in any patient from SDC's taken during any of four dosing schemes. Steady state concentrations are projected. It can be used with others designed to prospectively estimate parameters or design dosage regimens.

715 Program Steps
Necessary Accessories: Quad Module (or HP-41CV) and Card Reader

Documentation — $16.00 Cost of 8 cards — $10.00

01902-41 : Infusion Drug Dosage Table

Given patient's weight, drug name and solution strength this program prints the input data and a table with drip rate in microdrops per minute and corresponding drug dose in micrograms per kilogram per minute. The usual dosage ranges are also listed for Dopamine, Epinephrine, Lidocaine, and Nitroprusside, however, any drug name can be used.

179 Program Steps
Necessary Accessories: 24 column printer, one memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02075-41 : Pediatric Emergency Drug List

This program prints a list of 23 drugs and individual doses calculated for the patient's weight. The list is preceeded by the input data which consists of a patient identification number and body weight in kilograms.

232 Program Steps
Necessary Accessories: 24 Column Printer, Two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

03546-41 : Lean Body Weight, Fat Weight & Percent Body Fat Calculations

This program is designed to calculate for human lean body weight, fat weight and percent body fat using both skin fold thickness, body and extremity diameter and girth measurement. Calculations are made selectively for any one or all of six different equations and are compared to data from under water weighing then available. Relative errors are calculated for each estimate.

663 Program Steps
Necessary Accessories: None.

Documentation — $14.00 Cost of 7 cards — $8.75

N900 Pharmacology Toxicology

03152-41 : Dairy Ration to Meet Energy, Protein and Mineral Needs

This program calculates the amounts of grain, forage, protein, calcium and phosphorous needed to meet a cow's nutritional requirements based on her milk production, its fat content and her body weight. Data and calculations can be in either English or metric units. Feed data need to be entered only once for a series of calculations for different animals using the same nutrient and mineral sources.

632 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 7 cards — $8.75

R000 PROBABILITY & STATISTICS

00644-41 : Error Propagation (4-Function)

This program propagates errors through the four basic arithmetic functions (+, −, ×, ÷).

118 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00651-41 : Mean, Standard Deviation, T-Statistics and T-Distribution

This is a master program capable of handling mean, standard deviation, t-statistics and t-distribution. Subroutines may be used individually or together. Fully utilizing the alpha-prompting features of the 41C one need not bother with many cards or understand the mnemonics.

276 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00682-41 : Multi-Channel Queues

This program computes the mean waiting times and queue lengths for gi/g/c infinite capacity queues when the first two moments of the inter arrival and service times are known. For certain cases the solutions are approximate but are generally more representative of general systems than m/m/c models.

182 Program Steps
Necessary Accessories: Printer useful.

Documentation — $12.00 Cost of 2 cards — $2.50

01116-41 : Mann-Whitney Statistic

This program calculates fully automatically the Mann-Whitney statistic on two independent samples of equal and unequal sizes. In contrast to a similar, already existing program (No. 00094-41), this program itself assigns the ranks of all values from both samples. Error corrector for erroneous input data is provided.

300 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 3 cards — $3.75

01428-41 : Statistic Calculator for the Blind

This software converts the HP-41 into a keyboard programmable statistics calculator for the blind.

835 Program Steps
Necessary Accessories: 4 Memory Modules

Documentation — $14.00 Cost of 9 cards — $11.25

01582-41 : Markov Chain, Discrete Time

Given a tally matrix of order 8 or less, this program calculates the transition probability matrix, the initial vector and, through the procedure known as "powering the matrix", solves for the limiting steady-state.

254 Program Steps
Necessary Accessories: 3 Memory Modules

Documentation — $12.00 Cost of 3 cards — $3.75

01968-41 : Permutations and Combinations with Extended Limits

This program finds the number of permutations or combinations with the added feature of extended limits. If the answer is within the calculator's limits, this program will find it.

83 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02297-41 : Golf Score For 1

This program keeps the score of one player. You can also recall the score in any hole and modify it if you want. You only need the HP-41 without any memory module. After 18 holes the program gives you the score without handicap and the score with handicap.

91 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02305-41 : Error Calculations

This program performs arithmetic operations on numbers with uncertainties. A user manipulable pseudo-stack is created so that complicated expressions can be evaluated. Ideal for students.

139 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02306-41 : Duncan's Multiple Range Test For Equal / Unequal Replications

Performs Duncan's Multiple Range Test to separate differences among treatments where Analysis of Variance has previously shown a significant difference exists between treatment means. Will perform Kramer's adaptation to unequal subclass numbers (reps). Up to twenty mean values may be compared. Prompts for all input data.

162 Program Steps
Necessary Accessories: Printer and two memory modules

Documentation — $12.00 Cost of 2 cards — $2.50

02967-41 : Exponencial Curve Fit

This program calculates the equation (as accurately as possible) of p data points ($p > 1$). It allows error recovery and x and y predictions (given x or y). Equation in the form $y = ae^{bx}$.

133 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02968-41 : Linear Regression

This program calculates the equation (approx) of n data points ($n > 0$). It can correct errors and predict y given x and x given y. Equation in form $y = mx + b$. It calculates R^2 (error) too.

128 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03028-41 : Logarithmic Curve Fit

This program fits a set of data points (> 0) to a roughly logarithmic curve of form $y = a + b/nx$ and finds the coefficient of regression (R^2). It predicts $\hat{x}$ from y and $\hat{y}$ from x. Full use of alphanumeric capabilities and local labels.

132 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03044-41 : K LSD Test For Significant Difference Comparisons of Means

This program calculates a k-LSD interval to use in comparing significant differences between means. It uses alpha prompts for mean comparison parameters and for the input of t values from k-LSD tables. The program is a comparison program for the "Analysis of Variance with Factorial and Transforming Options" (ANOV).

163 Program Steps
Necessary Accessories: Full memory with ANOV program. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03045-41 : Analysis of Variance With Factorial and Transforming Options

Analysis can be as a one way factorial (up to 76 treatments) or a two-way factorial (up to 8x9), data can be as replicates or blocks and can also be transformed (arcsine, square root, log). Full alpha prompting occurs for analysis conditions and data inputs. Besides outputs of F values, degrees of freedom and error mean squares, the averages of all treatments are also calculated and displayed. A companion program "K LSD TEST" will calculate significant differences between means using the k LSD rule.

740 Program Steps
Necessary Accessories: Full memory. Printer optional.

Documentation — $14.00 Cost of 7 cards — $8.75

03062-41 : Combinational and Variational Calculations

This program can find the N combinations of a number M or the N variations of a number M, and it doesn't matter the limit ($x \leq 69$) of the FACT function in the calculator.

31 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03080-41 : LIN6R

Using only six registers, LIN6R delivers the linear regression coefficients, linear estimates of both x and y, the coefficient of determination and the correlation coefficient. Modular in design, this program can easily be shortened to include only those functions you need. It also permits interchanging the dependent and independent variables (without re-entering any data) and subsequent recalculation of any coefficients and estimates.

132 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

R100 Analysis of Variance

00088-41 : Kruskal-Wallis Statistic

The Kruskal-Wallis statistic can be used to test if independent random samples come from an identical continuous population.

75 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

00780-41 : Anova and All Significance Tests of Simple Regression

This program calculates simple regression parameters, correlation coefficient, all entries of analysis of variance table (anova), coefficient of determination, unbiased standard error of the estimate and t value of significance tests for regression parameters and correlation coefficient. the program is important for judging the precision of the fitted model to the sample data.

185 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00839-41 : Two Way Analysis of Variance and Row Column Tabulator

Unlike the 97 Stat Pac program, this requires data entry only once by row and generates the anova table much quicker with reduced probability of keystroke errors. Also, instructions are integral part of the program and it is much easier to use. A sub-routine may be used for row-column sum tabulator also.

202 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00960-41 : Two Way Analysis of Variance with Interactions

Calculates and labels data for construction of a complete two way analysis of variance. The number of rows and columns is limited only by available memory. The number of replications is unlimited. Probability of F is also calculated. Data points are only entered once.

507 Program Steps
Necessary Accessories: Three Memory Modules and Printer
Documentation — $12.00 Cost of 5 cards — $6.25

01176-41 : Analysis of Variance of 2^N Full Factorial Designs

This is a generalized program for the analysis of 2^N full factorial experiments. ($N = 2$ to 5) error is estimated from higher order effects selected by the user. The program calculates mean effects, sums of squares, and f-ratios. Nonsignificant effects can be set to zero, and predicted values calculated. Entirely self prompting.

425 Program Steps
Necessary Accessories: Three Memory Modules and Printer
Documentation — $12.00 Cost of 6 cards — $7.50

01473-41 : 1,2,3 Way ANOVA with Multiple Range Test (Scheffe)

One-, two- or three-way ANOVAs, without or with replication (equal or unequal) giving averages for groups and ordering from highest to lowest averages. Multiple range comparisons, using Scheffe's test, between two contrast sets calculate critical and observed S-values which are used to determine significance of differences between sets.

766 Program Steps
Necessary Accessories: Quad Module and Printer (for Multiple Range test).
Documentation — $14.00 Cost of 7 cards — $8.75

01557-41 : Two Way Analysis of Variance with Replicates

This program permits the complete ANOVA table to be generated for up to 13 by 13 classes with equal numbers of replicates. Data may be corrected during entry and program clearly prompts for all input. 3 by 3 ANOVA is solvable with only one memory module.

412 Program Steps
Necessary Accessories: At least 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01579-41 : 1, 2 or 3 Way ANOVA

One-, two- or three-way ANOVAs, without or with replication (equal or unequal), are calculated by the unweighted means method modified to employ exact total sum squares. Use with printer (gives ANOVA Table) or without printer (ANOVA values displayed). Specify factors and levels in factors. Optional printout of input values.

600 Program Steps
Necessary Accessories: be run without printer. 3 Memory Modules or Quad Memory. If 4 Memory Modules are used program must
Documentation — $12.00 Cost of 6 cards — $7.50

02305-41 : Error Calculations

This program performs arithmetic operations on numbers with uncertainties. A user manipulable pseudo-stack is created so that complicated expressions can be evaluated. Ideal for students.

139 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

02632-41 : One and Two Way Analysis of Variance

1) One way analysis: the program determines whether observed differences among a sample means can be attributed to chance or whether they are indicative of actual differences among the corresponding population means. The complete Anova table is generated. 2): Two way analysis: the program analyses the total variability of a set of data into components which can be attributed to different sources of variation. It tests the row and column effects independently and generates the Anova table for the case such that (a) each cell has only one observation and (b) the row and column effects do not interact.

191 Program Steps
Necessary Accessories: Printer Optional
Documentation — $12.00 Cost of 2 cards — $2.50

02994-41 : 2-Way ANOVA No Repititions with Row and Column Statistics (Avg, S, Min, Max, R)

Basically a 2-way ANOVA with no reps, this program features a full range of descriptive statistics (mean, sdev, min, max, range) for each row (up to 13) and column (no. unlimited) plus a rapid data entry/correction routine and ANOVA table complete with components of variance.

744 Program Steps
Necessary Accessories: Quad Memory Module and printer
Documentation — $14.00 Cost of 7 cards — $8.75

03045-41 : Analysis of Variance With Factorial and Transforming Options

Analysis can be as a one way factorial (up to 76 treatments) or a two-way factorial (up to 8x9), data can be as replicates or blocks and can also be transformed (arcsine, square root, log). Full alpha prompting occurs for analysis conditions and data inputs. Besides outputs of F values, degrees of freedom and error mean squares, the averages of all treatments are also calculated and displayed. A companion program "K LSD TEST" will calculate significant differences between means using the k LSD rule.

740 Program Steps
Necessary Accessories: Full memory. Printer optional.
Documentation — $14.00 Cost of 7 cards — $8.75

03397-41 : Treatment Component Sum of Squares

Planned component comparisons of treatments offers a powerful method to evaluate specific effects of treatment components. This program uses comparison coeficients to calculate sum of squares for treatment components. These can be used to calculate F-values of each component for a more detailed analysis of variance. It is convenient, though not essential, if the comparisons are orthogonal, (i.e. independent).

85 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03415-41 : Analysis of the Latin Square Design

This program performs a complete analysis of variance of the Latin Square Design. There may be up to ten treatments (and each square repeated up to eight times). Data entry is quick and simple, and errors are easily erased with the touch of a button. Output includes all sums of squares, their degrees of freedom, the appropriate mean squares, and "F"-values for rows, columns and treatments.

278 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03450-41 : ANOVA: Split-Plot and Split-Split-Plot Designs

The Split-Plot and the Split-Split-Plot designs are frequently used for factorial experiments in which factor combinations cannot be handled alike or when increased precision is desired in estimating certain effects. By simply entering the levels of each factor, number of replicates and the observations, the program produces a complete Anova table. The program prompts for all input data and labels all output.

526 Program Steps
Necessary Accessories: None.
Documentation — $14.00 Cost of 4 cards — $5.00

03552-41 : Plot and Block Size in Field Experiments

Using the results of an analysis of variance data set from a randomized-block experiment a researcher, who wants to conduct a similiar experiment on the same area, may determine if experimental precision can be improved by altering the plot size or if the set up can be economized without substantially reducing the precision.

69 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25

03575-41 : Anova: The Split-Block

This program generates a complete analysis of variance table for the split-block experimental design given: a) the number of the main plots, b) the number of strip, or ribbon plots, c) the number of blocks or replicates, and d) the observation values. Observations are prompted for by block-main treatment-ribbon treatment.

363 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 3 cards — $3.75

R200 Curve Fit/Regression/Correlation

00341-41 : Modified Crescent Curve Fitting

Program fits $y = a + be^{-kx}$, given scattered sets of (x, y) pairs. Uses an iterative procedure.

193 Program Steps
Necessary Accessories: Two Memory Modules (for the HP-41C) and Card Reader
Documentation — $12.00 Cost of 2 cards — $2.50

00389-41 : Two-Variable Multi-Regression

This may be a program you long awaited. It deals with 2 variables b=f(a) related with 3 coefficients. You can fit them as z=a+bx+cy, you decide if z, x, y are functions of a or b, in addition to the type of transformation (ln, sqrt, 1/x...etc). It is equivalent to many programs that consider one case.

330 Program Steps
Necessary Accessories: Card Reader, two Memory Modules.
Documentation — $12.00 Cost of 3 cards — $3.75

00397-41 : Piloted Linear Regression

If you are looking for a versatile linear regression package that allows you to choose up to nine types of equations to fit your data (x,y) that you enter once, then you have the correct address! Yes, you can select to fit with only the equations that interest you and discard the rest. Projections are available for each type of curve.

469 Program Steps
Necessary Accessories: Card Reader and three Memory Modules.
Documentation — $12.00 Cost of 5 cards — $6.25

00398-41 : Polynomial Curve Fitting

This program fits data to second, third and fourth degree equations. Equally space points are required. Program prompts for all inputs are included making this program easy to use. One Memory Module required.

414 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00423-41 : Simple Linear Regression and Correlation

This program is designed for the person who uses regression and correlation frequently. It is short enough to remain in program memory at all times. Outputs are the regression equation, x & y predictions and the correlation coefficient.

88 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00424-41 : Moving Range

Given the number of points in the moving range (n), and the data points, this program computes an n-point moving range. The number of points (n) is variable even after it has been entered.

103 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00438-41 : Linear Regression Package 1

This program uses the large memory of the HP-41C as well as alphanumeric capabilities to enable you to store the original data (up to 45 points) then decide if and what the transformation for x and/or y will be. Projections are available. Prints of a table for y, y(hat) and their difference. Also calculate sum of the deviations squared, standard errors of the slope, intercept and coefficient of determination.

279 Program Steps
Necessary Accessories: Card Reader, Printer and two Memory Modules.
Documentation — $12.00 Cost of 3 cards — $3.75

00471-41 : $y = cx^a + dx^b$ Least Squares Regression

This program determines the coefficients of the equation $y = cx^a + dx^b$ for a set of data points (x_i, y_i) where a, b are any user-suppled real numbers. x_i's should be greater than zero.

107 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00473-41 : Linear Regression Package 2

This program enables you to store several variables, then select any two for a linearized regression. User has flexible capbilities to transform the variables involved in regression. Projections are available. Memory mapping is provided by the program.

333 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

00477-41 : Curve Fitting – with Automatic Type Selection

This program will determine the type of curve (linear, exponential, logarithmic, or power curve) which best fits given data. It then determines the parameters of that curve or of a user-selected curve type, all without any re-entry of data.

281 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00555-41 : Multiple Linear Regression

This program will convince you that your calculator is a serious rival to the fancy computer, since you can, using Math 1 module, carry out a multiple linear regression of up to nine variables (independent). Projections are also available.

156 Program Steps
Necessary Accessories: Card Reader, Math 1 and Memory Modules.

Documentation — $8.00 Cost of 2 cards — $2.50

00556-41 : Polynomial Regression

Add more power to your Math 1 ROM module, by using this program that inserts the summation registers for a polynomial regression, in the proper locations, making use of the rom subroutines, and solving for the polynomial coefficients. Projections of x on y are possible.

Necessary Accessories: Card Reader, Math 1 Module and Memory Modules.

Documentation — $8.00 Cost of 2 cards — $2.50

00557-41 : Linear Regression Package 4

If you insist on careful examination of a linear regression, then this is your program: the program calculates standard errors for slope, intercept, y(hat) and coeff. of correlation. Projections are available. Student t value is calculated for null hypothesis h0: b=b1, h0: a=b0. (a=intercept, b=slope).

Necessary Accessories: Card Reader

Documentation — $12.00 Cost of 2 cards — $2.50

00558-41 : P.D.F. Fitting 1

Choosy about the best pdf that fits your frequency data? Then this program is a must if you deal with normal, log-normal, beta, gamma, Cauchy and Erlang pdf. Let the program select the best of the above that fits your data. Projections and individual pdf use, are also possible. May the best curve win!

Necessary Accessories: Two or Three Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

00567-41 : Linear Regression Package 3

This is the poor man's regression package, with no memory modules. The user fits a linearized regression in which each of the variables involved can undergo several sequences of transformations. Projections are available. Versatile in fitting rather unusual forms.

216 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00609-41 : Fitting Polynomials of Degree M to Data

Polynomials are fitted in the least squares sense to input data using orthogonal polynomials rather than matrix methods. This is more accurate and efficient for large M. Spacing of data points may be arbitrary. For N data points the number of memory modules required is $1 + \mathrm{INT}((38 + 3m + 2n)/64)$.

361 Program Steps
Necessary Accessories: Memory Modules

Documentation — $12.00 Cost of 3 cards — $3.75

00622-41 : Linear Regression Package 5

Three programs in one? Yes, this program stores (x,y) data and allows you to perform (1) linearized regression $g(y)=a+bf(x)$, (2) multiple regression $g(y)=a+bf(x)+ch(x)$, (3)shift from case (1) to (2) by inserting h(x) (done by program), no data re-entry needed. You can cover a wide variety of equations. Projections are available.

348 Program Steps
Necessary Accessories: One or Two Memory Modules

Documentation — $12.00 Cost of 3 cards — $3.75

00623-41 : Linear Regression Package 6

If you have ever tried to calculate trends on weekly, monthly, annual or any periods, then you know the frustration involved. Let this program help you enter your data once and build up from lower periods to higher, while you can obtain regression results at any moment. Also used for multi-trend data. Transformations are possible. At least one memory module necessary, printer (option).

253 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00624-41 : P.D.F. Fitting 2

Having doubts about which probability distribution function best fits your data? This program deals with normal, log-normal, beta, gamma, Cauchy and Erlang PDF, and tells you the best function.

326 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader.

Documentation — $12.00 Cost of 3 cards — $3.75

00741-41 : Multiple Regression 1

Based on the simplest case of multiple regression, the user can fit 2 or 3 variables with 3 coefficients. Efficient transformations, ability to rename the variables, calculations of various confidence intervals, performing student t-test on coefficients and projections with confidence intervals are the main program features. Program can evaluate student t, no prompting for t is needed.

490 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

00792-41 : Parabolic Curve Fit

This program computes the constants of a generalized parabola opening in the positive x direction which is displaced from the x and y axis given 3 sets of data points on the curve. This program can be used to compute other values of x and y once the equation for the parabola has been determined.

212 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00822-41 : Correlation Coefficient Statistics

Given correlation coefficient (r) and sample size (n) calculates 95% confidence interval for (r). Given two correlation coefficients and their respective sample sizes, determines if the coefficients are different at 0.05 level.

142 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00826-41 : Stat-Pac Data Libraries

Using the card reader one can store, recall, add, and subtract entire groups of data for the 41C Stat-Pac's multiple-polynomial regression program. There is also a routine to recompute the information matrix after the regression parameters have been computed so that additional data points can be entered in the model.

161 Program Steps
Necessary Accessories: Memory Module, Card Reader and Stat Pac ROM

Documentation — $12.00 Cost of 1 card — $1.25

00860-41 : Least Squares Polynomial Curve Fit

Will fit a polynomial of any degree to data points giving the best fit in the least squares sense. By using the PVT subroutine in the Math Module this program requires only 125 lines. Projections computed.

125 Program Steps
Necessary Accessories: Math Module and Memory Modules as required

Documentation — $8.00 Cost of 1 card — $1.25

00917-41 : Linear Regression Confidence Intervals

Given a linear regression line, this program will calculate: 1) Given x, calculate the confidence interval for average y. 2) Given x, calculate the prediction interval for y. 3) Given y, calculate the confidence interval for x. 4) Given a series of points (x,y) calculates linear regression.

307 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00943-41 : Curve Fit-Best Fit-Nine Curves

Selects the best fit of nine curves without modifying or destroying data. Data may be added or subtracted at any time for additional calculations. Individual curves may be selected and fit. Any curves may be easily plotted. Prints curve parameters, curve formula, coefficients of determination and correlation, mean, standard deviation and standard error of estimate.

601 Program Steps
Necessary Accessories: Three Memory Modules, Printer, Card Reader or Wand.

Documentation — $12.00 Cost of 6 cards — $7.50

00991-41 : Linear Standard Error

This program is used in conjunction with program sigma lin of the HP 41C Stat Pac to calculate the standard error of the slope and standard errors of estimated points. The standard errors can be transformed to confidence intervals (error bars) with tabulated values of student's 't'.

85 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01032-41 : Curve Fit and Plot-Best Fit-Up to 4th Degree Polynomial

Uniquely fit best of 4 polynomials up to fourth degree or randomly selects any one curve, including optional adjustment for degrees of freedom. Prints curve parameters, predicts Y hat and plots curve from entered data. Additions, subtractions, or corrections of data may be made before or after curve fitting.

605 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

01084-41 : Chebyshev Polynomial Curve Fit

Performs Chebyshev polynomial curve fit on a set of data, y1, y2, . . yn sampled at a uniform sampling rate in x. Polynomial fit order may be 2 to x. The program consists of two routines which may be overlaid or executed as subroutine and main program. Program uses recursive techniques and execution time is order dependent.

650 Program Steps
Necessary Accessories: At least two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01149-41 : Polynomial Curvefit

Least Square Polynomial Curve program for a 5th order or less. Input x(i) and y(i) pairs and the program will determine the polynomial coefficients that curve fits the data.

Necessary Accessories: Math Pac

Documentation — $12.00 Cost of 3 cards — $3.75

01203-41 : Linear Regression Y=MX+B With Standard Errors

This program calculates the regression coefficients for the fitting equation y=mx+8. Standard errors for the slope, intercept, x and y are calculated along with the coefficient of determination. As a user convenience, the program is printer compatable and the sigma registers need not be located at a fixed place in memory.

159 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01206-41 : Surface Regression 1

Use your Math Module with this program to fit a surface with (y,x1, x2) points. Projections and the correlation coefficient are available.

Necessary Accessories: Math Module and One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01208-41 : Surface Regression 2

Use your Math Module with this program to fit a surface with (y,x1, x2, x3) points. Projections and the correlation coefficient are available.

227 Program Steps
Necessary Accessories: Math Module and Quad Memory Module or HP-41CV

Documentation — $12.00 Cost of 2 cards — $2.50

01333-41 : Non-Linear Curve Fit Using Simplex Function Minimization

This program performs a least square fit to an arbitrary non-linear functions using the simplex function minimization technique of Nelder and Mead. The program prompts for all data and data editing is supported. One, two or three variables may be determined. All data is stored in memory.

446 Program Steps
Necessary Accessories: Three Memory Modules or program separation to conserve memory.

Documentation — $12.00 Cost of 4 cards — $5.00

01389-41 : Multi-Function Curvefit

Determines the coefficients of an equation, of up to 14 functions, that will curvefit the input data of up to 3 variables, x(i), y(i) and z(i), by the least square method. The program will also compute new values of the equation using the coefficients.

242 Program Steps
Necessary Accessories: Math 1 Pac

Documentation — $12.00 Cost of 3 cards — $3.75

01398-41 : Multiple and Polynomial Regression

For multiple regression equations up to nine independent variables or polynomial equations up to order nine, the program estimates coefficients, standard errors and t scores of coefficients, r square, standard error of estimate,and residual sum of squares. Provisions are included for correcting erroneous data entries, storage of the cross product matrix for future use, and projections based on the estimated coefficients.

668 Program Steps
Necessary Accessories: Quad Memory Module for HP-41CV and Math Pac

Documentation — $12.00 Cost of 5 cards — $6.25

01400-41 : Curve Fit & Automatic Plot Best Fit for Polynomials to 1

Uniquely selects the best fit of 11 polynomials, degrees 1 to 11 without destroying data. Data may be subtracted or added at any time. Single curves may be selected and fit. Any curve is easily plotted. Prints coefficients of curve, determination and correlation, standard deviation of y, and standard error of estimate.

354 Program Steps
Necessary Accessories: Three Memory Modules, Math Pac 1 Module, Printer, Card Reader or Wand

Documentation — $14.00 Cost of 3 cards — $3.75

01501-41 : Orthogonal Base Polynomial Fit.

The program fits polynomials of ascending degree (up to the 5th) through a set of input points. It also computes the according Student t - value, the correlation coefficient and sample standard deviation. The program is printer-compatible and allows for a PRPLOT run between computations of different degree polynomials. the program uses orthogonal bases set up in the polynomial vectorspace for reducing round off and subtractive cancellation.

315 Program Steps
Necessary Accessories: 2 Memory Modules
Documentation — $12.00 Cost of 2 cards — $2.50

01531-41 : Weighted Linear/Quadratic Regression with Standard Errors

This program performs a least-squares quadratic (parabolic) ($y = A + Bx + Cx^2$) regression. It also calculates the standard errors in A, B, and C along with the correlation coefficient (R^2) for the calculated line. The input values (x,y, and sigma if used) are saved. The user may also select a linear ($y = A + Bx$) regression with standard errors and R^2 using the same data used to obtain a quadratic fit. The input data can also be given an individual weight if desired. HP 67/97 keystrokes (287) are also given.

299 Program Steps
Necessary Accessories: 1 Memory Module.
Documentation — $12.00 Cost of 2 cards — $2.50

01533-41 : Regression, Slope, Intercept Comparison of 2 Straight Lines

This program computes and compares the slopes (b1, b2, b1 vs b2), intercepts (a1, a2, a1 vs a2) and regression coefficients (R1, R2, R1 vs R2) for two least squares fit for a straight line regression model. Additions or deletions to either group may be made. Degrees of freedom (DF) and T (or Z) values are indicated.

299 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01575-41 : Quadratic Curve Fit

Program conditions x, y data to fit a curve of form $y = ax^2 + bx + c$ to data points with the sum of the squares of the deviations minimized. Program is an HP-41 adaptation of HP-25 programs by Curtis Adams and Phillip Wasson.

212 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01578-41 : Linear-Exponential Curve Fit

This program fits x and y data points to a curve of the form Y=Ax/Bx and is a useful model in the biological sciences - in describing the interaction of parasites and white blood cells, and may be useful in dose-response and response-time curves. Provides R2,a,b,x-Ymax, Ymax.

138 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01637-41 : Finding Best Curve Fit Among Twelve Equations

Given a number of data pairs, this program fits twelve different equations to data by the method of least squares. Comparing the correlation coefficients obtained, program finds the best fit. The parameters of the twelve equations can be displayed (a, b and r2) and the user can make projections for any of the equations.

805 Program Steps
Necessary Accessories: 3 Memory Modules
Documentation — $12.00 Cost of 6 cards — $7.50

01742-41 : Lin + Nine Transform Equation Fits CVFIT10

"CVFIT10" allows the user to fit, with one data set pass, up to ten equations: LIN, 1/X LIN, 1/Y LIN, 1/X 1/Y LIN, LN, 1/Y LN, EXP, 1/X EXP, PWR and LOG LOG. Numbers less than or equal to 0 may be entered. The program may be used as a subroutine.

547 Program Steps
Necessary Accessories: Quad Module
Documentation — $12.00 Cost of 6 cards — $7.50

01782-41 : Polynomial Curve Fitting

Fits data to up to a thirteenth degree polynomial. Points need not be equally spaced. Uses linear or logarithmic scales. All inputs and outputs are prompted for easy use. Data can be edited if input incorrectly. Uses least squares method. Math pac required.

215 Program Steps
Necessary Accessories: Math Pac, 1 to 4 Memory Modules
Documentation — $12.00 Cost of 2 cards — $2.50

01972-41 : User Selected Curve Fitting

Directed by a user devised control program, the basic program will fit equally or unequally spaced data to a variety of curves defined by equations in the general form Y = AX1 + BX2 + CX3 + DX4 + EX5. Twelve sample Control and Evaluation programs are included. Program does not compute coefficient of determination or provide a means for data correction.

346 Program Steps
Necessary Accessories: One Memory Module for the basic program and any one of the Control and Evaluation programs.
Documentation — $16.00 Cost of 10 cards — $12.50

01974-41 : Curve Fitting with Predictions for X and Y

Here's a program that starts where the Stat Pac leaves off when it comes to curve fitting – and you do not need the Stat Pac! You can fit linear, logarithmic, exponential, and power curves and make predictions for both X and Y easily and quickly.

220 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02078-41 : Matrix Least Squares for Linear Models

This program uses matrix least squares to fit linear models to data stored on a cassette. The output consists of the parameter estimates, an ANOVA table, correlation coefficients for the parameters and the model, Fisher F-tests for goodness of fit and lack of fit, and the variance/covariance matrix. Confidence limits for the parameters can be determined by input of the appropriate F value also. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE CASSETTE/HP-IL DISC.

1023 Program Steps
Necessary Accessories: Quad Memory Module (HP-41C only); Extended Functions/Memory Module, HP-IL Interface, 82161A Cassette, any printer
Documentation — $16.00

02120-41 : Correlation Matrix Storage

This program is an adjunct to program PARTIAL. It is used in lieu of program RMATRIX when only the correlation coefficients are known or when it is more convenient to enter the correlations instead of the data. It prompts for and stores sample size and correlations in the appropriate registers.

82 Program Steps
Necessary Accessories: One Memory Module (in order to use program PARTIAL)
Documentation — $8.00 Cost of 1 card — $1.25

02121-41 : Correlation Matrix

Purposes of program RMATRIX: 1) To compute, display, provide random access to, and to prepare for program PARTIAL a correlation matrix from data (19 x 19 matrix max.). 2) To compute, display, and provide random access to the means and sample standard deviations for data used to generate above correlation matrix.

312 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

02122-41 : Partial Correlation

Computes partial correlations up to the 13th-order involving any of the variables in zero-order matrix entered by RMATRIX or STO MAT. User directs order in which variables are controlled, and intermediate partials are displayed. Degrees of freedom and t-statistic (for last partial) are also provided.

344 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

02132-41 : Curve Fit for 12 Different Functions

The program stores x-y data pairs, gives the chance to correct them and to store them on magnetic cards and tries to fit 12 different functions, using transformations and linear regression. If a transformation is senseless the function is let out. Entry with magnetic stored data is possible. This is an improved version of a German program.

290 Program Steps
Necessary Accessories: One Memory Module, Card Reader; (Printer is useful)
Documentation — $12.00 Cost of 3 cards — $3.75

02136-41 : Universal Curve Fit

This four part program might have been titled "The Thinking Man's Curve Fit". It will indeed fit any function which the user programs to an arbitrarily spaced X,Y data set. However, the user may have to supply a rather good initial approximate function which the program will then optimize.

1061 Program Steps
Necessary Accessories: PPC ROM, Extended Functions Module; (Printer is desirable)
Documentation — $16.00 Cost of 10 cards — $12.50

02233-41 : Polynomial Interpolation With the Divideo Difference Table

This program will interpolate a polynomial of maximum degree 19 (Quad or 41CV) with the divided difference table computed from the initial points. Every term of the table is computed/displayed and the polynomial is found rapidly in its Newton form. Any starting point can be changed and polynomial thus recomputed/evaluated.

271 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02270-41 : Auto Regressive Power Spectra, Yule-Walker Method

Computes the Power Spectral Density of a time function using the Levinson- Durbin Algorithm to solve the Yule Walker equations. Solution makes use of recursive relations involving the Autocorrelation function. Method is more efficient then Fourier Transform for small sample sizes. The Akaike Final Prediction Error is calculated to aid in order selection.

614 Program Steps
Necessary Accessories: Extended Functions Module. Quad memory or 4 memory modules for the HP-41C.
Documentation — $12.00 Cost of 5 cards — $6.25

02393-41 : Linear Regression with Standard Deviations

Computes slope, intercept, correlation, and standard deviations of the slope, intercept, and Y-values. Has efficient routines to add, change, and delete data pairs. Gives new Y for X, and new X for Y. Compresses each data pair into one register, so X and Y values must be positive, less than 1000.

268 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

02438-41 : Non-Linear Error For Curve Fit

In Aviation Engineering, data is sometimes "fit" to a straight line with the goodness of fit determined by the criterion of "non-linear-error". This program will accept data as prompted for; compute the best straight line to fit the data and compute the NLE. Original data is preserved and may be added to, deleted from, printed out, stored, etc.

260 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 3 cards — $3.75

02650-41 : Spearmans Rank Correlation Coefficient

N pairs of (x,y) data are ranked by this program which then calculates the Spearman rank correlation coefficient as a measure of the association between the variables.

157 Program Steps
Necessary Accessories: At least one memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02765-41 : Universal Table Generator Max-Min-Zero-Plot

This program is used to create numerical tables from the vast unlimited simple to complex $f(x)$ equations that lie within the interval of convergence (I.O.C.) $x_1 \leq x \leq x_2$. This program also will locate points and their corresponding maximum, minimum and even zero $f(x) = 0$ values in the order of their occurrences in a given $f(x)$; do plottings of $f(x)$ equations. A "must" program for structural/stress engineers who deal with points of maximum design values; mathematicians. Ten examples included!

268 Program Steps
Necessary Accessories: HP-41C/CV peripheral printer; quad module optional depending upon the registers used in the secondary program.
Documentation — $12.00 Cost of 8 cards — $10.00

02933-41 : Linear Regression Through a Single Point

The best straight line is often desired to pass through a known point (e.g. Young's Modulus of iron with 0.00% chromium added is approximately 30×10^6 psi.) The least squares approximation may not pass through the desired point. This program compensates the slope and y-intercept to pass the best straight line through the desired point using either a least squares fit -or- a least distances fit.

177 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02967-41 : Exponencial Curve Fit

This program calculates the equation (as accurately as possible) of p data points ($p > 1$). It allows error recovery and x and y predictions (given x or y). Equation in the form $y = ae^{bx}$.

133 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02968-41 : Linear Regression

This program calculates the equation (approx) of n data points ($n > 0$). It can correct errors and predict y given x and x given y. Equation in form $y = mx + b$. It calculates R^2 (error) too.

128 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03006-41 : Power Curve Fit

This program fits a set of data points (> 0) to a power curve. It also finds the coefficient of regression, and calculates x-estimate from y and y-estimate from x. It makes full use of alphanumeric capabilities and local labels.

130 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03012-41 : Least Squares Polynomial Regression

Up to 14 points may be interpolated by this program, using the least squares method. Given N, the program asks sequentially for N 2-dimensional points, computes and stores elements for N+1 simultaneous equations, and then outputs coefficients of the N degree regression polynomial. Via an entry point, may be called as a subroutine by another program. Projections of X computed, either by keyboard or by program. Compact (uses PVT routine in Math Pac I), printer compatible, requires $N^2 + 2N + 15$ registers.

173 Program Steps
Necessary Accessories: Math Pac, Memory Modules as needed
Documentation — $12.00 Cost of 2 cards — $2.50

03028-41 : Logarithmic Curve Fit

This program fits a set of data points (> 0) to a roughly logarithmic curve of form $y = a + b/nx$ and finds the coefficient of regression (R^2). It predicts $\hat{x}$ from y and $\hat{y}$ from x. Full use of alphanumeric capabilities and local labels.

132 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03080-41 : LIN6R

Using only six registers, LIN6R delivers the linear regression coefficients, linear estimates of both x and y, the coefficient of determination and the correlation coefficient. Modular in design, this program can easily be shortened to include only those functions you need. It also permits interchanging the dependent and independent variables (without re-entering any data) and subsequent recalculation of any coefficients and estimates.

132 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03098-41 : 2D Curve Fitting

After entering two or three data points (the third one the certitude coefficient of the first two data points), this program allows you to fit 7 types of curves: LIN ($Y = a + bX$), INV I ($Y = a + b/X$), INV II ($1/Y = a + bX$), INV III ($1/Y = a + b/X$), LOG ($Y = a + b \ln X$), EXP ($Y = ae^{bX}$), PWR ($Y = aX^b$), all corrections being possible. The program also computes the correlation coefficient (R^2) and the residual variance (SR) which is used when computing estimated X and Y. Furthermore, you can list the various sums. The program is provided with numerous ALPHA messages for user-friendliness.

463 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $8.00 Cost of 4 cards — $5.00

03334-41 : Curve Fitting With Confidence Intervals

This program fits a set of x,y, data pairs to any of four selected curves; straight line, exponential, log, and power curves. The program also estimates the mean and the upper and lower bounds for a confidence interval selected by the user, plus regression coefficient. Limits are for 3 to 50 data pairs, and for some curves, only positive values may be used. Entered data and results are printed.

534 Program Steps
Necessary Accessories: Printer; (HP 82143A Peripheral Printer)
Documentation — $12.00 Cost of 5 cards — $6.25

03337-41 : Linear Least Square Fit With Confidence Limits Plot

This program accepts a set of data pairs and performs the linear least square fit to the data. Then the data set is plotted, the least square fit line drawn, and the selected upper and lower confidence interval curves are drawn as well. Axes are labeled, the plot is titled, and the equation is printed with slope, intercept, and their respective standard deviations and the confidence interval used.

303 Program Steps
Necessary Accessories: Module; HP-IL compatible printer such as an HP-7470. HP-82180A Extended Functions, HP-82184A Plotter Module, HP-82160A HP-IL
Documentation — $14.00 Cost of 3 cards — $3.75

03342-41 : Two-Independent : One-Dependent Variable Linear Regression

Multiple Linear Regression is used to fit data trios (X1, X2, Y) to a linear model. Both equation models and coefficients are displayed for the entire model as well as the individual interactions: Y vs X1, Y vs X2, X1 vs X2. Data may be added or removed at any time to obtain a new fit. Program requires 98 registers total memory: 71 program/27 data.

300 Program Steps
Necessary Accessories: One Memory Module, Quad Module or HP-41CV/CX. Printer helpful but not required.
Documentation — $12.00 Cost of 3 cards — $3.75

03412-41 : Robust Linear Regression Analysis

This program performs a linear regression analysis and then repeats the regression, weighting each data point in the manner you prescribe to effectively weight "outliers" less than points fitting the line better. Weighting routines are included which will, 1) reject outliers completely (weight 0) while retaining all other points (weight 1) or, 2) weight each point inversly to its distance off the line (three options included). The fit is repeated until maximum regression coefficient is obtained.

220 Program Steps
Necessary Accessories: None; printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

03434-41 : Least Squares Circle Fitting

This program allows one to estimate from n points, the center's coördinates (x_c, y_c) of the circle and the radius (R) which fulfill the least squares principle. Also, it is possible to force the circle to go through by specific points.

277 Program Steps
Necessary Accessories: Math module.
Documentation — $12.00 Cost of 3 cards — $3.75

03440-41 : Kendall's Independence Test

A popular nonparametric competitor of Spearman's Rank Correlation, Kendall's Test For Independence not only tests for association, but also provides a coefficient of correlation (Kendall's Tau, T). A table is included for up to 40 data pairs at 5 levels of significance, and the program determines a large sample aproximation which uses the upper tail probabilities for the standard normal distribution. Appropriate hypotheses tests are explained in the documentation.

238 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 2 cards — $2.50

03451-41 : PNLN

This program uses data-based moments to compute X, Y coordinates of the curve N*P.D.F. for univariate normal or log-normal distribution, given N, mean X(or mean ln X), variance of X (or of ln X)–all outputs of STATS– and desired lower limit, upper limit and increment of X. Coordinates may be plotted on the same sheet and use the same scale as the histogram of observed measurements.

119 Program Steps
Necessary Accessories: Two memory modules.
Documentation — $12.00 Cost of 2 cards — $2.50

03455-41 : PBEGA

This program derives exponential parameters A, B by the method of moments and computes X, Y coordinates on curve N*P.D.F. when user specifies either a beta or a gamma P.D.F. and N, minimum, mean, maximum, variance (all output by STATS), along with desired upper plotting limit (gamma only) and desired increment of X. Coordinates may be plotted on same sheet and use the same scale as the histogram of observed measurements.

291 Program Steps
Necessary Accessories: Two memory modules.
Documentation — $12.00 Cost of 3 cards — $3.75

03456-41 : STATS

This program provides for input, checking, correction, sorting and processing of N unsorted variables, or for processing of N sorted variables. The sort is an insertion sort, preserving order among ties. Processing includes computation of variance, mean, minimum, maximum, and four intervening measurements bounding percentiles. Other programs need these statistics to derive location and shape parameters used in computing X, Y coordinates for appropriate normal, log-normal, beta, gamma, and Weibull p.d.f.'s.

234 Program Steps
Necessary Accessories: Extended functions module, two memory modules.
Documentation — $12.00 Cost of 3 cards — $3.75

03508-41 : PWEIB: Parameters & Coordinates of Data-Based Weibull Dist

This program derives exponential parameters A, B from data percentile and computes X, Y coordinates of the curve N*P.D.F. for univariate Weibull distribution, given N, four percentiles, lower plotting limit for X, upper plotting limit for X, and the desired increment for X. The X, Y coordinates may be plotted on the same sheet and use the same scale as the histogram of observed measurements. Inputs can be obtained for output of STATS (03456-41).

104 Program Steps
Necessary Accessories: HP-41CX or HP-41C with two memory modules.
Documentation — $12.00 Cost of 2 cards — $2.50

03555-41 : Short Least Mean Square Quadratic Curve Fit

Matrix methods are used to provide a least mean square curve fit of a quadratic ($y = a_0 + a_1x + a_2x^2$). Inputs are NPTS of data pairs in the form x_i, y_i. Output are the three curve fit coefficients, the regression mean sum of squares, the value of the F test (F2, NPTS-3), and the coefficient of correllation. Matrix manipulation is performed using the HP Advantage Pac.

161 Program Steps
Necessary Accessories: One memory module, HP-41 Advantage Pac.
Documentation — $12.00 Cost of 2 cards — $2.50

R300 General Statistics

00088-41 : Kruskal-Wallis Statistic

The Kruskal-Wallis statistic can be used to test if independent random samples come from an identical continuous population.

75 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25

00399-41 : Two-Tailed Student T-Distribution

Involved in statistical tests and tired of using tables for t-distribution? Let the powerful HP-41C do the job for you! The first program sets up the equation for a specific probability of error, while the second prompts for the D.F. To give you T. The latter can be merged or used with another program.

121 Program Steps
Necessary Accessories: Card Reader
Documentation — $12.00 Cost of 2 cards — $2.50

00425-41 : Survey Tabulation Aid

Given a survey questionnaire with #q questions and up to 4 alternative responses per question, this program tabulates up to 99 responses per alternative. Last response is stored for instant error correction. Convenient review and data analysis features.

216 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00458-41 : Statistical Means

This program computes arithmetic, geometric, harmonic and generalized means. Data need be entered only once.

Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00602-41 : Data Transformation

This program performs 4 types of data transformation: logarithmic; arcsin; reciprocal; and square-root. Special cases of the logarithmic, square-root and reciprocal tranformations are included.

116 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00620-41 : Median for Grouped Data

Calculates median for data arrayed in a frequency distribution. Program prompts for total number of observations and frequency values entered in ascending sequence. Upon reaching median frequency, program calculates median.

Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00669-41 : Ten Bin Histogram with Alphanumeric Labeling

This program will sort data into up-to ten equal width bins between user-specified upper and lower units. It will then display or print the output using the HP-41C's alphanumeric capabilities. Output will be: b#=ll/uu f=n, where ll and uu are lower/upper width of bin, f is frequency. if printer is attached (optional), "bar chart" will be neatly displayed.

287 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

00794-41 : Youden Paired Sample Analysis

The Youden paired sample analysis is used for analysis of data from collaborative studies where the information contributed by replicates is obtained from pairs of closely similar samples. Sums of squares are computed by the most efficient single pass method.

103 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00844-41 : Means (Statistics)

This program solves for the arithmetic mean, geometric mean, harmonic mean, rootmean square, standard deviation, mean deviation, coefficient of variation, and z-statistic. All outputs are clearly labeled by use of the 41-C's alphanumeric capabilities.

209 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00889-41 : Percentiles and Percentile Ranks

This program calculates the percentile scores and/or percentile ranks of data in the form of a frequency distribution. Percentile scores and percentile ranks may also be calculated using the normal distribution, given the mean and standard deviation of a set of data.

288 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

00934-41 : Random Particle Distribution

The error associated with sampling from a particulate system is due to particle segregation and random particle distribution. For a well-blended (determinate error assumed zero) binary system where the particles are spheres of equal sizes, this program calculates the sampling error in terms of standard deviation of element, e, present in both species and expresses the error as a function of proportion of the two species, conception of e in the two species, sample size, particle volume and densities.

95 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00942-41 : Chi-Square Test for Independence on MxN Contingency Table

Computes the chi-square statistic from a contingency table. This program is restricted only by the memory capacity available: it needs $28 + MN + M + N + 9$ registers,where M =rows and N =columns. A 'size' test is incorporated and the program is easily modified to include the Yate's correction in a 2x2 contingency table.

108 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01109-41 : Log-Normal Distribution Percentiles

Given a mean and standard deviation of a set of data, this program will calculate the log-normal distribution percentile value of any percentile (Pth percentile) requested. The Skewness and Kurtosis of the log-normal distribution will also be calculated for the sample.

212 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01249-41 : Gini Coefficient of Concentration

Consider a variable x measured over a set of areal units where the proportionate share of the total x associated with each unit is known. This spatial distribution is to be compared with another, a hypothetical distribution of x in which every areal unit has equal share of the total.

277 Program Steps
Necessary Accessories: Memory Modules $= 1 + \mathrm{INT}(12 + 2n)/64)$
Documentation — $12.00 Cost of 3 cards — $3.75

01250-41 : Exam Score Distribution

This program provides a rapid method to determine basic statistics, distribution, and plot of distribution of examination scores. The exam scores expressed as percentages is required.

211 Program Steps
Necessary Accessories: Printer
Documentation — $12.00 Cost of 3 cards — $3.75

01331-41 : High Resolution Histogram Plot with Statistics Tbl. Printout

Programs features: *up to 183 user defined cells with Quad memory. *Overflow and underflow cells. *Grouped and ungrouped data capabilities. *Input verification and editing. *Intermediate analysis. *Automatic frequency scaling. *Cell label formatting. *Statistics with mean, SDEV, skewness, kurtosis, % frequency. *Presentable histogram and table printouts. *Regbar routine (patterned after Regplot).

897 Program Steps
Necessary Accessories: Minimum of three Memory Modules and Printer
Documentation — $14.00 Cost of 8 cards — $10.00

01407-41 : Partial Correlation Coefficient

This program permits the calculation of any partial correlation coefficient up to third-order for five variables, x1, x2, x3, x4, x5, where any one of the variables could be the dependent variable. The calculation is based on the correlation matrix.

186 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01440-41 : Statistical Comparison of Epidemiologic Data

This program prompts for and collects categorical data for two subject populations. The data is placed into two blocks of data registers, which may be recorded on cards for later use. The grogram then lists the categorical data by parameter (N, the number of cases and %, the percent incidence) for each cohort. The program then compares the two cohorts for each parameter by either the Chi-square test or Fisher's Exact test (if any cell is 5 or less) and prints the resulting P value in the same registration as the previous listing of N and %.

622 Program Steps
Necessary Accessories: Quad Module, Card Reader and Printer.
Documentation — $12.00 Cost of 7 cards — $8.75

01639-41 : Basic Statistics

This program calculates mean, standard deviation, linear regression, projected x and y, and correlation coefficient for a set of points input using the summation key. The block of statistics registers may be located anywhere except using register 00. These functions for least-squares fit are very useful but are not in the 41C function library.

117 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01653-41 : Basic Statistics with Controls

A new basic statistics program which allows you to enter one or more control groups, calculate the average control value and determine the distribution of controls. Sample groups are then entered and the mean, S.D., SEM, % CV and mean and SEM % of control are calculated. Blanks subtracted. Errors deleted. Fully prompted.

188 Program Steps
Necessary Accessories: 1 Memory Module (Printer optional)

Documentation — $12.00 Cost of 2 cards — $2.50

01711-41 : Ten Class Histogram with Distribution Fit and Plotting

This program generates any number of 4 - 10 class histograms without destroying the data base. It will fit either a normal curve or a uniform distribution to the resultant histogram and allows the plotting of bar charts. Additionally, a chi-square goodness of fit coefficient is calculated.

603 Program Steps
Necessary Accessories: 82143A Printer; 82182 Time Module 82180A Extended Functions 82181A Extended Memory (depends on data file size)

Documentation — $12.00 Cost of 6 cards — $7.50

01885-41 : Buckets, a Data Collector by Category

"BUCKETS" allows easy collection and analysis of data that is associated with a category: rejects per part number, labor hours by department. This program allows that data entered with its category designation in one entry. General statistics include for all entries: total, mean, standard deviation, and sample size. For each category the output includes: category designation, total for entries, percent of category total to the total for all number of entries. If a printer is attached, output is well-formatted with decimal aligning and additionally a bar chart is available.

270 Program Steps
Necessary Accessories: One Memory Module Minimum

Documentation — $12.00 Cost of 4 cards — $5.00

01956-41 : Accurate Statistics

This program alleviates the problem of loss of significant digits associated with the SIGMA + and - functions. The program is designed to operate like the usual statistical keys for user convenience. Linear correlation and regression coefficients are obtained with a keystroke.

84 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01965-41 : Quasi-Independance & Ordered Categories in Contingency Table

The usual hypothesis of complete independance in bivariate contingency tables does not exhaust all possible hypotheses. Five models can be tested here on an RxC contingency table. Using an iterative procedure, four tests involving the ordering of categories are available. The usual independance hypothesis is also available. Structural zeros can be defined on cells of the table in each of the five models.

704 Program Steps
Necessary Accessories: Quad Memory Module and Card Reader

Documentation — $14.00 Cost of 8 cards — $10.00

02068-41 : Set Intersections and Venn Diagrams

Set intersections, displayed in venn diagrams, help you find and show causes and effects in a collection of data. The program handles as many as 128 different intersections of as many as 7 sets with counts as high as 999 for any intersection.

300 Program Steps
Necessary Accessories: Two memory modules. Printer and Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02130-41 : PANSOC-Package for Analysis of Statistics on Calculators

PANSOC is a package of 13 programs for the analysis of social sciences data. Large data sets can be analyzed. Multiple level cross-tabulations of variables, frequency listings and means can be produced. Programs to establish, label, edit, change and back-up data files are included. Records consisting of a maximum of 60 variables can be used. THIS PROGRAM MUST BE SOLD RECORDED ON TWO CASSETTES/HP-IL DISCS.

4325 Program Steps
Necessary Accessories: HP-41CV or HP-41 with Quad Module, HP-IL, Cassette Drive, Extended Functions Module, Extended Memory Modules; (Printer desirable with some programs).

Documentation — $25.00

02172-41 : Smooth

This program comprises 24 interrelated menu-driven programs which smooth data sets, such as time series data, of up to 80 values. SMOOTH includes six main smoothers, several subsidiary operations, and supporting programs for I/O. Application areas include all behavioral, natural, and social sciences, plus business, medicine, and economics.

657 Program Steps
Necessary Accessories: 41CV or Quad module needed. Card Reader and Printer suggested.

Documentation — $20.00 Cost of 6 cards — $7.50

02242-41 : Survival Analysis by the Actuarial Life-Table Method

This program enables one to construct actuarial survival curves by the life-table method. It uses input data in standard life-table format, and produces for each time interval cumulative survival probability and its standard error.

103 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02556-41 : Direct Age Adjusted Death Rate

Computes the direct age adjusted death, along with its corresponding sample variance and standard error. This method is based on C.L. Chiang's paper: "Standard Error of Age-Adjusted Death Rate", Vital Statistics - Special Reports, Volume 47, No. 9 (1961).

133 Program Steps
Necessary Accessories: Card Reader optional.

Documentation — $8.00 Cost of 2 cards — $2.50

02580-41 : Random Number Generator Test

It is very important to test whether the random number generator is satisfactory or not. This can be done with many aspects of a generated string of random numbers. Frequency and poker test are used in this program. Results can be printed or displayed.

201 Program Steps
Necessary Accessories: Memory module, X-Functions Module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02613-41 : Spread Sheet

This program allows the user to input collected data and manipulate it to produce any user defined output. A maximum of 20 input/output data columns are accommodated. It permits checking and correcting with whatever frequency the user defines. The user must write sub-programs to describe the output desired (register math).

241 Program Steps
Necessary Accessories: Additional memory modules and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

02799-41 : Geometric Mean With Standard Error

Calculates geometric mean and standard error for up to 300 numbers (using HP-41CV or Quad memory). The stack may be manipulated at will between inputs. I have included two versions of the program; one is more convenient to use with small sample sizes, the other for large samples.

71 Program Steps
Necessary Accessories: Memory modules for more than 44 samples

Documentation — $12.00 Cost of 2 cards — $2.50

02805-41 : Random Number Generator

Program routine generates a series of apparently random numbers between an upper and lower limit. Quantity of numbers produced is user controlled (999 maximum). The number series produced is easily changed with 3 "seed" numbers. Printer is nice but not required. Turns off when complete.

53 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

02921-41 : Data File Statistics

This program performs general statistics on all or part of a data file in extended memory. Input and output routines are implemented, and the program sorts in either ascending or descending order, calculates mean, standard deviation, median, and max and min values and range. It also searches for a particular value in the file or counts all the occurances within an interval. Using only one register for storage, the routines are easily adaptable for subroutines.

347 Program Steps
Necessary Accessories: One memory module and Extended Functions Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

03013-41 : Tally Opinionaires and Report Writer

This program facilitates tallying of options chosen by respondents to objective items, processes the data, and writes reports. Specifications: -Capacity? Up to 54 items. -Number of options per item? Up to six. -Subgroups possible? Yes, if X-Functions ROM exists. -Weight factors? Yes, either default or user-defined. -Reports? Fractional Distribution (with or without statistics), and t-Test for Two Means. The tally section uses 7 synthetic TONES, but alternate TONES are suggested so the program may be readily keyed in.

873 Program Steps
Necessary Accessories: Quad memory module; X-Functions module (only if respondents are separated into two or more subgroups). Printer helpful.

Documentation — $14.00 Cost of 8 cards — $10.00

03036-41 : Statistics for One Variable

For one variable, with or without replication, all corrections being possible, this program computes: the mean, the moments, the skewness and kurtosis, the standard deviations (for a population or a cross-section), the coefficient of variation, and finally, the histogram (for 1 to n intervals according to the user's choice) and the sums. The program works with or without a printer.

306 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03083-41 : Statistics For Two Variables

For two variables, with or without replications, all corrections being possible, this program computes for each of them, the moments, the skewness and kurtosis, the standard deviations (for a population and a cross-section) and the coefficient of variation. It also computes the covariances and the correlation coefficient as well as the sums of square, cubic, fourth-power data points and the sum of data points multiplication.

271 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03331-41 : Statistics For One or Two Variables

This program computes the arithmetic, geometric, harmonic and quadratic mean, as well as the standard deviation for one, (grouped data), or two variables. It also calculates the linear regression for the two variables and, on its basis, estimates values of x or y. In case of mistake, corrections are possible. All additions to the program are easily acheived.

246 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

03397-41 : Treatment Component Sum of Squares

Planned component comparisons of treatments offers a powerful method to evaluate specific effects of treatment components. This program uses comparison coeficients to calculate sum of squares for treatment components. These can be used to calculate F-values of each component for a more detailed analysis of variance. It is convenient, though not essential, if the comparisons are orthogonal, (i.e. independent).

85 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

R400 Non-Parametric Inference

00635-41 : Fisher Exact Test with Tochers Modification

The Fisher test determines whether subjects in two independent groups differ in their proportional representation of two mutually exclusive categories. Tocher's modification increases the power of the test, and provides an effective one-tailed test for data in a 2 x 2 table. This program computes the Fisher probability and, if applicable, the Tocher ratio. The ratio is tested for significance at a given alpha.

205 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00659-41 : Chi Squared Corrected for Continuity

For a 2 x 2 contingency table, gives chi squared corrected for continuity with it's significance level. Marginal totals output. Checks both the n and expected frequencies and advises if chi squared is invalid.

187 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00731-41 : Expected Frequency Validity Check of Chi Squared

Given a chi square contingency table with df > 1, max of 20 columns, program checks; for any number of rows, that less than 20% of the expected frequencies are less than 5. Self contained row and column input enunciators, along with row and column sum checking.

Documentation — $8.00 Cost of 1 card — $1.25

00988-41 : Chi-Square for Up to 100 Cells

Two-way chi-square analysis for up to 100 cells. Reads data in a single pass without the need to input marginal totals. Yate's correction can be optioned. Incorporates routine to correct input errors.

400 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

01055-41 : Chi-Square for General MxN Contingency Table

Calculates chi-square and degrees of freedom for mxn contingency table. Row and column totals, total sample size, and expected value in each cell are also calculated. m and n are bounded by $(m+1)(n+1) \leq 64\times$ number of memory modules in use. The statistics module and card reader are helpful but not necessary accessories.

233 Program Steps
Necessary Accessories: Statistics Module and Card Reader helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

01904-41 : Fisher's Exact Probability Test for 2x2 Contingency Tables

Program calculates Fisher's exact probability value for 2x2 contingency tables with automatic testing for extremes. Both marginal and grand totals may exceed 69 because fast algorithm for large factorials is used. Rearrangement of the table prior to testing is not necessary.

157 Program Steps
Necessary Accessories: None required. Printer optional.

Documentation — $8.00 Cost of 2 cards — $2.50

03296-41 : Assessing Significance in a Fourfold Table "2x2"

This program analyzes any statistical evidence presented in the form of a fourfold contingency table. It advises which test is the most appropriate for a given sample size and characteristic. It computes the Fisher-Irwin's Exact Test, the Pearson's Chi Square Test, the Yates' Chi Square, the Pearson's Z Square Test, and the Yate's Z Square test. It also evaluates statistical significance for any given alpha level. There is no need for rearrangement of rotation of data. Just enter it as you have it, the computer will do the test. This program can also be used to perform the median test.

739 Program Steps
Necessary Accessories: Requires HP-41CV or equivalent memory capacity.

Documentation — $14.00 Cost of 7 cards — $8.75

03323-41 : Kolmogorov-Smirnov Two-Sample Test

This program calculates D(max), the two-tailed maximum deviation between two cumulative frequencies, for up to 26 groups. If both total frequencies are not greater than 25, program calculates D(max) as an integer; of one or both total frequencies are greater than 25, the program calculates D(max) as a decimal fraction, and gives its significance limits.

234 Program Steps
Necessary Accessories: One memory module, Extended Functions Module.

Documentation — $12.00 Cost of 3 cards — $3.75

03419-41 : Nonparametric Multiple Comparison

This program compares several nonparametric distributions simultaneously by the Dwass and Gabriel procedure; sorting them into heterogenous and nonheterogenous sets. All distributions are required to be of the same size, and greater than eight. The program accomodates up to twenty distributions with up to twenty six groupings.

214 Program Steps
Necessary Accessories: Extended functions module; memory module (s).

Documentation — $12.00 Cost of 2 cards — $2.50

03420-41 : Combining Data From Fourfold Table "COM"

This program calculates measures of homogeneity and association using both the method which combines the logarithms of odds ratios and the Mantel- Haenszel method. For any number of 2x2 tables, the program calculates the Yates Chi square total, the Chi square homogeneity, the Chi square association and the mean odds ratio. It tests the null hypothesis for 1-tailed and 2-tailed probabilities without the need for looking at the Chi square distribution table.

508 Program Steps
Necessary Accessories: HP-41 CV or equivalent memory capacity; extended functions module.

Documentation — $14.00 Cost of 6 cards — $7.50

03440-41 : Kendall's Independence Test

A popular nonparametric competitor of Spearman's Rank Correlation, Kendall's Test For Independence not only tests for association, but also provides a coefficient of correlation (Kendall's Tau, T). A table is included for up to 40 data pairs at 5 levels of significance, and the program determines a large sample aproximation which uses the upper tail probabilities for the standard normal distribution. Appropriate hypotheses tests are explained in the documentation.

238 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

R500 Parametric Inference

00628-41 : Mann-Whitney Statistic

This program computes the Mann-Whitney test statistic on two independent samples of equal or unequal sizes. This test is designed for testing the null hypothesis of no difference between 2 populations. The program is an adaptation of HP-65 program Stat 1-35A.

84 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00650-41 : T for Three (Three-Way T Statistics)

This program will calculate the t statistic for three (3) cases: 1) the paired t statistic; 2) the t statistic for two means with equal variances; and 3) the t statistic for two means with unequal variances.

171 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01066-41 : Complete T Test

This program will calculate the t statistic for 1) one sample test for the mean, 2) difference between means with equal variances, 3) difference between means with unequal variances, and 4) paired t statistics. The data may be grouped or ungrouped. The program will also calculate student's t distribution.

361 Program Steps
Necessary Accessories: One Memory Module. Printer helpful.

Documentation — $12.00 Cost of 3 cards — $3.75

01770-41 : Poisson Sequential Probability Ratio Test

Given that a random variable X comes from a poisson distribution, this program sets up and performs a sequential probability ratio test of the simple hypothesis that X came from a distribution with parameter L0 versus the hypothesis that it came from a distribution with parameter L1.

122 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01914-41 : Binomial Sequential Probability Ratio Test

This program sets up and performs a sequential probability ratio test of the null hypothesis versus the alternative hypothesis for a random variable X from a binomial distribution.

136 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01918-41 : Arma (2,2) Time Series Model Generator

This program generates a time series from a (Box-Jenkins) ARMA(2,2) model. The user supplies parameters for the process. Actually any time series of the form ARMA(p, q) $0 \leq p \leq 2$, $0 \leq q \leq 2$ may be generated. The disturbance terms are normally distributed, generated by the Box-Muller transformation.

104 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02110-41 : Pareto Distribution

This program computes the maximum likelihood estimate of the parameter, C, of a Pareto distribution, given a sample. This program also evaluates the density, distribution and inverse distribution functions, and will generate Pareto-distributed random observations with parameter C.

146 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03285-41 : Fast Unpaired Pooled-T-Test Variances Assumed Equal "Pool T"

This program calculates the unpaired "t" test, the confidence interval of the difference between the means, and the critical "t" for any given alpha. It tests the null hypothesis for 1-tailed and 2-tailed probabilities. You enter grouped data as mean, SD and N, and provide the desired alpha and percent confidence level. The program will automatically compute the pooled T test and will give the probability decision without the need for looking at the "t" distribution table.

403 Program Steps
Necessary Accessories: HP-41CV or equivalent memory capacity; Extended functions module optional.

Documentation — $12.00 Cost of 5 cards — $6.25

03305-41 : Assessing Significance in Unpaired Small Samples (UNP-T)

This program assesses the significance of differences between means using the "t" test for unpaired data. The program accepts either grouped or ungrouped data. It first tests for homogeneity of variances using the "f" test and then it calculates the "t" statistics using either the Gossett Test or the Behrens-Fisher Test. The program calculates both the 1-Tailed and the 2-Tailed probabilities and the confidence interval of the difference between means. Full use of the alpha numeric capabilities makes this program easy to understand and use.

751 Program Steps
Necessary Accessories: HP-41CV or equivalent memory capacity. Extended functions module and printer are helpful.

Documentation — $14.00 Cost of 6 cards — $7.50

R600 Probability

00825-41 : Hypergeometric Distribution Sampling Probability

Given 1) lot size, 2) sample size, 3) lot defects, and 4) sample defects calculates probability of exactly p or p or less sample defects. Lot size must be less than 70.

141 Program Steps
Necessary Accessories: Card Reader and Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

00858-41 : The Random Division of an Interval or a Circle

If a straight line of length l is divided into n subintervals by (n-1) points chosen at random on the straight line or if a circle of circumference l is divided into n subintervals by n points chosen at random on the circle, then the probability pk that exactly k of the subintervals will exceed d in length can be calculated by the formula described in this program. The program uses the prompting features, not the local labels.

91 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01151-41 : Probability of Suit Distribution in Contract Bridge

This program calculates the % probability of the distribution of outstanding cards in a suit in the opponents' hands as a function of the number of cards from 2 to 13 in a bridge hand. It also calculates the % probability of being dealt a hand of specific suit distribution.

255 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01499-41 : Extended Range Factorial, Combination & Permutation

This program will figure the factorial of a number greater than 69. It is based on Stirling's approximation. Using this and/or Fact (depending on the values chosen) combination and permutation can be found with other parts of the program.

123 Program Steps

Documentation — $8.00 Cost of 1 card — $1.25

03392-41 : Large Numbers: Factorials, Combinations, and Binomials

This three program package calculates: a) factorials of small ($N < 69$) and large ($N > 69$) numbers in arithmatic or logarithmic form; these can be used (b) to calculate combinations and/or permutations, and these, in turn, for (c) binomials and/or cumulative binomials or large numbers.

201 Program Steps
Necessary Accessories: One memory module, extended module.

Documentation — $12.00 Cost of 3 cards — $3.75

R700 Probability Distribution

00457-41 : Weibull Distribution

This program solves $f(x)$, $Q(x)$ and x (for a given Q, $0 < Q < 1$) in the Weibull distribution. It is an adaptation of HP-65 Program Stat 1-17A.

72 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00469-41 : Logarithmic Normal Distribution

Given a random variable x whose logarithm is normally distributed with mean and variance supplied, this program computes the density function f(x) and the ff statistics: mean, median, mode and variance.

87 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00472-41 : Bivariate Normal Distribution

This program computes the values of the bivariate normal distribution of x and y given the means and standard deviations of their populations.

93 Program Steps

Documentation — $8.00 Cost of 1 card — $1.25

00626-41 : Binomial Distribution

This program evaluates the binomial density function for a given p and n. It also gives the mean and variance. The program is an adaptation of HP-65 program Stat 1-18A.

126 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00627-41 : Negative Binomial Distribution

This program evaluates the negative binomial density function for given p and r. It also gives the mean and variance. The program is an adaptation of HP-65 program Stat 1-19A.

118 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00743-41 : Poisson Distribution: Large Values of Mean

Given only the mean value, this program computes the probabilities that: (1) a certain integer, n, (2) any integer $\leq n$, and (3) any integer $> n$ will be observed. Only results for integers, n, between user-specified upper and lower bounds are printed. This program was designed to accept values of the mean greater than 230.

93 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

00806-41 : Multiform Random Number Series Generator

This program calculates uniformly, normally, or exponentially distributed numbers as well as random integers. Starting points may be defined by a user supplied "seed", making this program useful for games and many other purposes. The mean, standard deviation, and count of the numbers generated are kept automatically.

175 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00810-41 : Poisson Distribution

Given only the mean value, this program computes the probabilities that: (1) a certain integer, n, (2) any integer $\leq n$, and (3) any integer $> n$ will be observed. Only results for integers, n, between user-specified upper and lower bounds are printed.

93 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

00827-41 : F Distribution

Computes q(fr,r2) - right hand tail, and p (fv1,v2) - "degree of certainty" of the f distribution. Fully prompted input. Reliable output, regardless whether v1 and/or v2 are odd or even, large or small.

235 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01026-41 : Binomial Probability Distribution-Unlimited Parameters

This program computes, by binomial probability distribution, probability of x successes, and at most x successes, in n tries, given constant probability p of success on one try. Because of computational method, there is theoretically no limit on n or x.

110 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01063-41 : T and F-Distribution

This program calculates percentage points of the f-distribution, $q(f/v1, v2)$ and the t-distribution, $q(t/v)$. The density functions of the f-distribution, $f(f/v1, v2)$, and the t-distribution, $f(t/v)$, can also be calculated. There is a global function calculating $t(v/2)$ using only the stack. The program has been optimized for speed and is conservative in its use of data registers-needing only the stack and 9 data registers.

394 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01155-41 : Chi-Squared and Non-Central Chi-Squared Distr. Functions

When X is distributed as chi-squared with n_1 degrees of freedom, the program computes $\Pr(X \leq x)$ for any $x \geq 0$. When X is distributed as non-central chi-squared, with non-centrality parameter, m, and n_2 degrees of freedom the program computes $\Pr(X \leq x)$ for any $x \geq 0$. In each case the program computes the exact values of these probabilities (to 9 decimal places). Rather than using a polynomial approximation, infinite series expansions are employed.

120 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01190-41 : Linear Line Comparison, Analysis of Covariance & Student

Comparison of any two or all lines entered, intercept and t-distribution of any two. All lines entered can be tested by analysis of covariance (slope, elevation and regression). Each line will find x or y approximate, regression values and t-test of regression. Linear formula, statistical, or raw data entry.

709 Program Steps
Necessary Accessories: Three Memory Modules, expandable data - four Memory Modules. Printer optional.

Documentation — $20.00 Cost of 13 cards — $16.25

01214-41 : Likelihood Estimation of Parameters of Beta Distribution

This program solves for the maximum likelihood estimates of the parameters of a general beta probability density function (defined on the range a,b). The program will supply initial estimates of the parameters, or will take user-provided values. This program also provides the user with the digamma and trigamma functions.

280 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01230-41 : Beta Distribution

For the given parameters n and r of the beta distribution this program computes the PDF (probability density function) and the probability that x lies between limits a and b. The mean, variance and mode are also evaluated.

152 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01330-41 : Non-Central Beta Distribution

This program evaluates the non-central beta distribution, as well as the beta function, gamma function, poisson density, and incomplete beta function and ratio. Compatible with "Prplot" for printer plotting. May be used in conjunction with "solve" routine in Math module to obtain critical points of noncentral beta and f distributions.

432 Program Steps
Necessary Accessories: Two Memory Modules and Math Module
Documentation — $14.00 Cost of 4 cards — $5.00

01542-41 : PROB: t - and F - Distribution Probabilities

Given (1) a calculated t-value and its number of degrees of freedom (n), or (2) a calculated F-value and its two degrees of freedom (n1 for the numerator, n2 for the denominator), this program calculates the probability of not exceeding that value of t or F (with its associated degree(s) of freedom) by chance.

374 Program Steps
Necessary Accessories: Program Memory required is 498 bytes; size required is 011. 1 Memory Module is needed.
Documentation — $12.00 Cost of 3 cards — $3.75

01576-41 : F Distribution (All Cases)

Program computes the right hand tail of the F Distribution, i.e., $Q(F) = Pr(x > F)$ for all cases of degrees of freedom odd or even. Program automatically selects the case of degrees of freedom odd or even, i.e., (1) Df1 even (2) Df2 even, (3) smaller of Df1, Df2 if both even and (4) Df1, Df2 both odd. (41C rewrite of 00270-97), Stoll.

250 Program Steps
Necessary Accessories: 1 Memory Module or 41CV
Documentation — $12.00 Cost of 2 cards — $2.50

01648-41 : Stable Density Functions

This program evaluates stable density functions for parameters α and γ ($0 < \alpha < 1$, $|\gamma| < \alpha$ or $1 < \alpha < 2$, $|\gamma| < 2 - \alpha$). The program requires $x > 0$; $f(x; \alpha, -\gamma)$. Program uses the log of the Γ function instead of the Γ function.

197 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02036-41 : Chi Square & Fast T Distribution

A two program package. The first computes the right hand tail value of the chi-square distribution from 0 to x squared given the number of degrees of freedom. It is shorter and faster than a similar program in the STAT PAC module. The second computes the area (I-P) under the T distribution curve. Also, the right hand tail and the 2-tailed P values are provided. In this program, the upper value of DF is not limited to 141. Can be used as a subroutine.

186 Program Steps
Necessary Accessories: None (Printer optional)
Documentation — $12.00 Cost of 2 cards — $2.50

02109-41 : Generating a Sample From a Stable Distribution

This program generates a random sample from an arbitrary stable distribution with location parameter zero and scale parameter one. The characteristic (Alpha) and skewness (Beta) must be specified by the user.

243 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

02437-41 : Khrgian and Mazin Frequency Distribution

This program computes a table of frequencies and cumulative frequencies for integer values of X for the Khrgian and Mazin Frequency Distribution: $AX^2 \exp(-BX)$. Useful in atmospheric physics. Discrete values of X are also accommodated to save on interpolation.

114 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02850-41 : Cumulative Binomial Distribution

Computes the probability distribution for both the binomial and the cumulative binomial distributions. Allows for any probability for success between zero and one for up to and including sixty-nine trials.

47 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02957-41 : Sequential Analysis of Negative Binomial Distribution Data

Sequential analysis serves to classify populations rather than to provide estimates of population parameters. It is particularly applicable to surveys — most notably, agricultural pest surveys. Such surveys are the first line of attack in minimizing losses by destructive pests. Many pest populations fit a negative binomial distribution making sequential analysis widely applicable and very useful.

127 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02995-41 : Fit of Negative Binomial Distribution to Biological Data

Many biological phenomena closely follow a negative binomial distribution. For example, insect populations infesting a field or a forest compare closely to this distribution. This has made study of pest population distributions an important part of Integrated Pest Management programs for farmers, foresters and agricultural extension officers.

168 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03324-41 : Fit To and Sequential Analysis of Poisson Distribution Data

This program is extremely useful in integrated pest management. Insect counts, for instance, at low population densities will often follow a poisson distribution. Sequential analysis of this distribution can aid in rapid determination of the extent and severity of a crop pest infestation.

190 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03325-41 : Sequential Analysis of Binomial Distribution Data

This program is a powerful tool in helping to minimize losses caused by pests in agriculture and forestry. The binomial distribution is applicable when each observation of a damage survey is recorded merely as pests present or absent. Given four simple parameters, this program determines decision lines, operating characteristic curve and average sample number curve.

129 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03346-41 : Accurate Normal Distribution

This program finds the area under the normal curve accurate to eight places for a wide range of Z values. The answer is the area under the normal curve to the left of the inputted Z value.

57 Program Steps
Necessary Accessories: Card reader or bar code reader helpful.
Documentation — $8.00 Cost of 1 card — $1.25

03347-41 : Accurate Binomial Distribution

This program accurately finds the area and the accumulated area under the binomial distribution curve given the parameters x, N, and p. The answers are accurate to at least eight places.

50 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25

03362-41 : Fit To and Sequential Analysis of Normal Distribution Data

This program fits data to the normal distribution and determines sequential analysis parameters such as the decision line equations, operating characteristic curve and average sample number curve.

182 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03363-41 : Area Under the Normal Curve

This program very accurately calculates the area under the normal curve to the left of the given Z value. The results are accurate to at least eight places over a very wide range of Z values.

57 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25

R800 Quality Assurance/Reliability

00639-41 : Mtbf Calculation from Test Data

This program calculates mean time between failures at upper and lower confidence limits, given the total test hours or cycles, number of observed failures, and confidence interval wanted. Allowed confidence intervals are 90, 80, 60, and 50 percent. Included instructions allow modification for other confidence intervals.

89 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01260-41 : Sequential Sampling (Binomial, Unit Attribute)

This program computes the acceptance-rejection criteria, the operating characteristic, the average sample number, and the average outgoing quality as a function of the process average for attribute unit sequential sampling plans.

153 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01528-41 : Textile Yarn Skein Break Statistics

Given the desired yarn count, statistic, breaking load in pounds, and actual yarn count (cotton count), calculates actual break factor and break factor adjusted for desired count.

534 Program Steps
Necessary Accessories: Quad Memory Module, Printer, Card Reader
Documentation — $12.00 Cost of 16 cards — $20.00

01812-41 : Sample Size Determination - Single Sampling

This program provides sample size (n) and acceptance number (c) for a single sampling plan that will closely approximate given risks. The user specifies Alpha for an AQL (pl) and Beta for a RQL (p2). Any reasonable value for the risks and fraction defective may be used. The result, n, c, may be used to plot the associated OC Curve.

136 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01849-41 : Temperature Dependent Failure Rate Projections

Some failure mechanisms of electronic components are strongly dependent on temperature. This program makes it easy to enter the parameters and see the effects of changes and predict results under other conditions. It uses an Arrhenius model which is a well accepted way of relating failure ratio at different temperatures.

208 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02124-41 : Sample Test, Probability of Lot Acceptance

This program solves for the probability of acceptance of a lot with a given percentage of good units, based on the results of a test by attributes of a sample with a known size and known acceptance number. Hypergeometric and binomial distribution are presented to be selected by user.

107 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02183-41 : Component Reliability

This program develops component to full system reliability given circuit type (parallel/series) and mean time between failures or component reliability if known. It uses a building block technique.

128 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02199-41 : Process Capability Study: Data Collect, Store, and Histogram

Process capability studies can be performed on approximately seventy (70) dimensions simultaneously. The HP-41 that uses this program is assumed to be totally dedicated to this program. Data is collected in random order by part number, dimension, and date. Two data collection modes are provided: one for occasional user; one for experienced user. Data is easily edited and sorted into permanent files. Statistical analysis, histogram, and data listing are requested by part number and dimension. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC.

2295 Program Steps
Necessary Accessories: Quad-Memory, X-Function Module, Cassette Drive 82161A, Printer 82162A. Time Module optional but recommended.

Documentation — $20.00

02547-41 : Moving X, S and R Control Charts

This program determines the moving average, moving standard deviation and moving range for samples of size 105 or less; automatically computes control limits, and plots values with outliers identified by an "invalid symbol".

591 Program Steps
Necessary Accessories: Quad Memory Module. Card Reader. Printer.

Documentation — $14.00 Cost of 6 cards — $7.50

02805-41 : Random Number Generator

Program routine generates a series of apparently random numbers between an upper and lower limit. Quantity of numbers produced is user controlled (999 maximum). The number series produced is easily changed with 3 "seed" numbers. Printer is nice but not required. Turns off when complete.

53 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

02830-41 : X, S And R Control Charts

This program determines the average, standard deviation (root mean square) and range for samples of size 87 or less; automatically computes control limits, and plots values with outliers identified by an "invalid symbol."

667 Program Steps
Necessary Accessories: Quad memory module and printer

Documentation — $14.00 Cost of 7 cards — $8.75

02977-41 : Xbarr

This program is designed to calculate group averages and ranges then calculating the grand average. It will provide outputs of the upper and lower control limits for both the average and range sections of a control chart. It will also provide an estimate of + 3 sigma.

242 Program Steps
Necessary Accessories: One memory module for the HP-41C. Printer Optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03541-41 : Visman Sampling Program

Conventional Analysis of Variance (AOV) as applies to the control of precision and bias in measuring varietes requiring sample collection, sample preparation and analysis, or only part of these. A duplicate series of samples is used in a pilot test designed to provide estimates of material constants that characterize populations generally. From this information, a sampling plan with a preassigned accuracy is obtained for field/plant/lab purposes.

471 Program Steps
Necessary Accessories: Two memory modules with HP-41C. Card reader and printer are convenient.

Documentation — $12.00 Cost of 5 cards — $6.25

V000 SOCIAL SCIENCES

00503-41 : 41C Your Values

Using a list of 19 values that people commonly hold, the 41-C generates a 19x19 matrix of these values and asks you to make a choice of one over the others for a total of 171 choices. It then displays the values in the order of priority that you have assigned to them by your selections.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03229-41 : Questionaire or Interview Response Tabulation 99x260x5

Frequencies of responses are accumulated for up to 99 questionaires of up to 260 questions, each with up to 5 possible answers or no response. Output is 6 counts per question separated within one display or sequential display of percentages. Also for recording structured interview response without paperwork.

180 Program Steps
Necessary Accessories: None. HP-41C may require extra memory modules.

Documentation — $12.00 Cost of 2 cards — $2.50

V100 Economics

02269-41 : Four-Variable Dynamic Linear Model of US Economy

From quarterly government spending and change in money supply, and past values of some endogenous variables, the program computes and adds to its pipeline memory the current values of GNP, interest rate, investment, and consumption. Coefficients used are those of Pindyck and Rubinfeld for the period 1955-1 to 1971-4.

115 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02542-41 : Keynesian Macroeconomic Model

This program contains a Keynesian macroeconomic model of the goods and services market, complete with consumption, investment, government expenditures, taxes, and transfer payments, with both autonomous and income- dependent components. Calculations (assigned to keys) include: equilibrium and component outputs; change in output for a given component change; inflationary or deflationary gaps; changes in taxes, government expenditures, or both (balanced budget) to eliminate the gap; demand at a given output; and government deficit.

278 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02662-41 : Keynesian Macroeconomic Model With Monetary Sector

This program contains a Keynesian macroeconomic model complete with the goods and services and monetary sectors. The components consist of consumption, investment, government expenditures, taxes, transfer payments, and money supply with both autonomous and income- or interest-dependent factors. Functions, assigned to keys, include: interest rate, equilibrium and component outputs; change in rate or output for a component change; changing a single parameter; government deficit; inflationary or deflationary gap; and monetary and output demand.

357 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

V200 Education

00374-41 : Standard Curve Test Analysis

This program produces a test analysis using a standard distribution curve. Given the mean score, the standard deviation and the maximum possible number of points on a test, the program determines the lower limits for letter grades of A, B, C and D. The program also determines the lowest possible percentage for each letter grade and the average percentage test score. Printer optional.

136 Program Steps
Necessary Accessories: Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

00490-41 : Grade Point Averager with Optional Card File

This program will automatically compute a grade point average given a set of letter grades and the number of hours credit for each grade. At your option it will store the grades along with the date and the computed grade point average on a data card. Card-reading subroutine displays stored grades. Card reader is optional, the program will execute without it.

Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00769-41 : Act Financial Needs Analysis: for Dependent Students

May enter whole dollar amounts as prompted for, and receive an almost immediate analysis of student's financial need. Program illustrates one way that the HP-41C can be programmed to handle information from lengthy forms.

390 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

00770-41 : Beog Eligibility Index 1980–81

The 41C can calculate the 1980–81 eligibility index for "basic educational opportunity grants". The calculator asks 4 questions to determine which of 5 possible general cases to use. Data for each case is entered using top row keys. Once the data is entered, executing "R" will return E.I. in about 7 seconds. If you are working from the manual calculation sheets in the Beog handbook, then xeq "V" and see each of the line numbers and the amount to be entered on the worksheet.

Necessary Accessories: One Memory Module and Card Reader
Documentation — $12.00 Cost of 4 cards — $5.00

00888-41 : Act Financial Analysis: Independent Student

This program, like the one for analysis of financial need of the dependent student, is based on the worksheet for 1981–82 for manual calculations of the self supporting student's educational assistance needs. The worksheet may be found in the A.C.T. Handbook for Financial Aid Administrators (p.23). The program prompts for data by line number and may display or suppress intermediate results.

311 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00979-41 : 41C Class Roll with Weighted Cumulative Scores & Analyzer

Three part program enters, updates, and reviews class roll (twelve character names) keeping cumulative scores. Scores may be weighted. Size of roll depends on number of memory modules (1:17; 2:38; 3:69; 4:81). Roll and cumulative scores can be stored on magnetic cards. Will utilize printer, card reader if available.

220 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01434-41 : Typogenetics

This program can help to teach the principles of molecular genetics by the game Typogenetics in Douglas R. Hofstadter's "Godel, Escher, Bach: An Eternal Golden Braid." The tertiary structure of an enzyme coded for a strand is worked out. This enzyme then works on a strand. Find a self-replicating strand.

716 Program Steps
Necessary Accessories: 3 Memory Modules
Documentation — $12.00 Cost of 6 cards — $7.50

01694-41 : Symbolic Logic: Summary and Applications

Being a relatively complete treatment of elementary symbolic logic. Logical operators defined include AND, OR, NOT, IMPLCATION (if...then) EXPLICATION (only if), EQUIVALENCE (if and only if), EXCLUSIVE OR. The operators are based on the definitions of Lukaciewisz (RPN) and thus hold for one kind of three-valued logic. These same definitions will work for Boolean Logic when the base is 2. Thus the program may be used to simulate digital logic circuits. The user must write the progrms to simulate these circuits, but examples are given to show how to do this expeditiously.

186 Program Steps
Necessary Accessories: One Memory Module
Documentation — $16.00 Cost of 7 cards — $8.75

01730-41 : Can You Make the Grade?

Given letter grades + number of hrs of each grade, compute your Grade Point Average. THEN compute a cumulative GPA. FURTHER, given the Hrs-To-Go & the cumulative GPA desired at the end of the term, compute the GPA you must earn this term to achieve the desired cumulative GPA. NEXT, determine the minimal number of hrs of different letter grades you will need to earn this goal. If your goal exceeds the max. possible GPA, then compute what would be the max. cumulative GPA, if you earned straight A's (A+'s). FINALLY, do all of the above using either a grading system where A=4pts; B=3pts, etc. & a system where A+=4.33pts, B-=2.67pts, etc..

287 Program Steps
Necessary Accessories: 1 Memory Module and the Extended Function Module
Documentation — $12.00 Cost of 3 cards — $3.75

01771-41 : Grade Calculator

The program computes weighted standard scores for up to ten separate tests for any number of students. The output gives a precise rank ordering of all your students, using the criteria of the tests you specify and the weights you assign.

104 Program Steps
Necessary Accessories: 3 Memory Modules
Documentation — $8.00 Cost of 1 card — $1.25

01776-41 : Test Corrector

This program was designed to help teachers compute the grades of their tests. But more than that, the program illustrates a correction method particularly useful for several types of tests.

645 Program Steps
Necessary Accessories: 3 Memory Modules (Printer optional)
Documentation — $12.00 Cost of 6 cards — $7.50

02263-41 : Student Class Roll

This is a support program for the tabulation of student results program (grade). A data card file is prepared which contains the code for a group of students, the number of students and the students' names. Full editing and reviewing features are provided. A subroutine card (NIN) allows inter- program compatibility.

293 Program Steps
Necessary Accessories: Quad memory module and Card Reader
Documentation — $12.00 Cost of 4 cards — $5.00

02992-41 : Gunning Fog Index

The Gunning Fog Index determines the reading difficulty of prose by measuring the length of sentences and counting the number of long words. Results correspond to reading grade levels in U.S. schools, although the index can be used by writers of English from other countries.

51 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03098-41 : 2D Curve Fitting

After entering two or three data points (the third one the certitude coefficient of the first two data points), this program allows you to fit 7 types of curves: LIN ($Y = a + bX$), INV I ($Y = a + b/X$), INV II ($1/Y = a + bX$), INV III ($1/Y = a + b/X$), LOG ($Y = a + b\ln X$), EXP ($Y = ae^{bX}$), PWR ($Y = aX^b$), all corrections being possible. The program also computes the correlation coefficient (R^2) and the residual variance (SR) which is used when computing estimated X and Y. Furthermore, you can list the various sums. The program is provided with numerous ALPHA messages for user-friendliness.

463 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $8.00 Cost of 4 cards — $5.00

V300 Psychology

01826-41 : ESP Tester and Trainer

"ESP" generates an undisplayed, psuedo-ramdom target number. The user must use extrasensory perception (ESP) to guess them more frequently than chance. The program gives immediate feedback of target identity to allow learning what psychological conditions go with success, and automatically tabulates run results. Use it with or without a printer.

123 Program Steps
Necessary Accessories: 1 memory module; printer helpful, not necessary.

Documentation — $12.00 Cost of 2 cards — $2.50

02972-41 : Street Consumption Research

Program permits the user to keep simultaneous tallies of up to 3 kinds of events through 3 keys (e.g., C = Any adult, D = Cigar Smoker, E = Cigarette smoker passing by), and can record up to 5 groups of such tallies, each with prompted survey location (6 characters max.), date, beginning and end time. Applicable to street consumers passing demarcation line across sidewalk, or types of litter along a block.

112 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03229-41 : Questionaire or Interview Response Tabulation 99x260x5

Frequencies of responses are accumulated for up to 99 questionaires of up to 260 questions, each with up to 5 possible answers or no response. Output is 6 counts per question separated within one display or sequential display of percentages. Also for recording structured interview response without paperwork.

180 Program Steps
Necessary Accessories: None. HP-41C may require extra memory modules.

Documentation — $12.00 Cost of 2 cards — $2.50

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Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

J250 Chemical Engineering

00357-41 : Sedimentation Rates

A particle falling in fluid under gravity accelerates until drag force balances gravitational force, after which it continues to fall at a constant velocity known as the terminal velocity. This program solves for any one unknown, interchangeably, given the other five variables in Stoke's formula.

101 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00377-41 : Residence Time Distribution

This program package helps you to know how close your reactor is to the ideal PFTR or CSTR, follows the method of RTD calculations as presented by Levenspiel's "Chemical Reaction Engineering", a popular reference.

233 Program Steps
Necessary Accessories: Card Reader, Printer, two Memory Modules.
Documentation — $12.00 Cost of 2 cards — $2.50

00378-41 : Carbon Adsorber Design

Based on the surface reaction model for adsorption, the user can enter two types of breakthrough data and obtain the initial adsorptive capacity and reaction rate constant. In addition, the user can afterwards calculate any of the breakthrough concentration, time and bed height, given the other two.

195 Program Steps
Necessary Accessories: Card Reader
Documentation — $12.00 Cost of 2 cards — $2.50

00450-41 : Filtration N1

Here is a versatile program about Sand Filter beds. It calculates head loss of clean beds, during operation, during backwashing and a regression for a quadratic fitted model for head loss and time.

345 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00453-41 : Heat Exchanger Optimization I

This program determines the optimum cooling water flow rate in a condenser. The annual operative cost is also calculated.

148 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00461-41 : 41C Settling Velocities

This program mainly gives the settling velocities of particles in liquids, as in sedimentation or fluidization. Particle diameter or solid volume fraction can be alternatively solved for.

153 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00517-41 : K-Value Prediction

This program will predict the equilibrium k-values at a specific temperature and pressure for a pur component. The required pur component data are the critical temperature, critical pressure, and the accentric factor. The algorithm assumes both phases are ideal solutions but pure component non-idealities are accounted for.

223 Program Steps
Necessary Accessories: One Memory Module and Card Reader
Documentation — $12.00 Cost of 8 cards — $10.00

00519-41 : Thermodynamic Properties of Gas Mixtures

This program utilizes the Redlich-Kwong equation of state to calculate the following thermodynamic properties of a gas mixture: compressibility factor, enthalpy departure, entropy departure, fugacity coefficient of the mixture, fugacity coefficients of the mixture components, and the fugacity coefficients of the pure components at the temperature and pressure of the mix.

440 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 3 cards — $3.75

00559-41 : Absorption and Leaching 4

This program deals with counter-current absorption or leaching for unsaturated feed (or partially miscible solvents), and solute present in extract. You can calculate the number of stages, or stripping factor, or a list of component flowrates at each stage.

249 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00560-41 : Absorption and Leaching 3

Let this program help you in dealing with counter-current absorption or leaching for unsaturated feed (or partially miscible solvent) and pure extract. You can calculate the number of stages, or stripping factor, or a list of component flowrate for each stage.

214 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00561-41 : Absorption and Leaching 2

Let this program help you in counter-current absorption and leaching calculations for a saturated feed and solute present in extract. You can calculate the number of stages, or stripping factor, or a list of component flowrates for each stage.

204 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00562-41 : Absorption and Leaching 1

Let this program handle your calculations in counter-current absorption and leaching for saturated feed and pure extract. You can calculate the number of stages needed, or stripping factor, or a list of the component flowrates for each stage.

169 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00563-41 : Plate-and-Frame Filtration

Allow this program to process pilot plant plate-and-frame filtration data to get the parameters needed for scale-up calculation such as filter area or volume of filtrate.

Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00583-41 : Control Cooling Tower Run Off

This program can be used to solve the run off when water is circulated over a cooling tower.

Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00621-41 : Organic Pollution Loads on Streams

Allow yourself to relax while this program handles calculations of oxygen deficit in a polluted stream. Available is the oxygen deficit after a certain desired period, also the coefficients of deoxygenation and re-aeration from the maximum deficit data.

195 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00688-41 : Peng-Robinson Eqation of State PVT and Fugacity Data for Binaries

Given critical constants for a single component or a binary mixture, this program calculates pressure, volume, temperature, compressibility, and fugacity relationships based on the Peng-Robinson equation of state. Both vapor and liquid properties can be obtained. Two memory modules necessary.

574 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C.
Documentation — $12.00 Cost of 5 cards — $6.25

00710-41 : Low Pressure Gas Pipe Sizing

This program calculates pipe sizes for a gas under 1 PSIG with a .5 inch of water or less system pressure loss.

125 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00842-41 : Thermosiphon Reboiler — Heat Exchanger Rating

Given, geometry of the thermosiphon reboiler and physical properties of the fluids; the circulation rate, inside, outside and overall (U_c) heat transfer coefficients are calculated. U_c and U_d ($U_d = Q/A \times LMTD$) are used to calculate R_d (dirt factor). Based on R_d the program can be rerun changing only the exchanger geometry.

425 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C.
Documentation — $12.00 Cost of 4 cards — $5.00

00847-41 : Pressure Vessel Nozzle Losses for Gases

Program takes flow conditions of gas transmission applications and computes the density and actual flowrate, displays them and then takes vessel diameter and nozzle diameter and computes and displays flow velocities, ρV^2, expansion and contraction pressure losses in inches water. For losses $< 10\%$ of line pressure. K factors based on experimental results.

166 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

00891-41 : Vapor Pressure

Determine the vapor pressure of most substances, given the normal boiling point and either the specific gravity or critical properties. Results are accurate for water and most hydrocarbons for temperature between $T_c/4$ and T_c, including the sublimation pressure of ice between 32°F and − 130°F. Several formulas are used.

605 Program Steps
Necessary Accessories: Three Memory Modules for the HP-41C.
Documentation — $12.00 Cost of 8 cards — $10.00

00972-41 : Clausius-Clapeyron Equation

This program solves the integrated form of the Clausius-Clapeyron equation (assuming the heat of vaporization to be constant) for any of the variables (except R), when the remaining variables are given.

106 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01011-41 : Thermodynamic Properties of a Substance from Critical Data

Given critical data; P_c, T_c, V_c, Z_c, an equation for heat capacity and P, T, H, S, data for a reference state, program finds V, H, S data in the vapor phase (sat. or spht.). Further, program uses Watson's correlation for finding latent heats and then calculating H, S, data for saturated liquid. V data for liquid phase are accomplished using Rackett's equation.

392 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

01012-41 : Properties of Hydrocarbons

Physical properties of hydrocarbons can be predicted using boiling point and specific gravity. Prediction accuracy is reasonable over the boiling range of 100-850 degree F for the following properties: molecular weight, liquid density, liquid molar volume, critical temperature, critical pressure, critical volume, refractive index, heat of vaporization, ideal gas heat capacity and Van der Waal's constants.

322 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C.
Documentation — $12.00 Cost of 5 cards — $6.25

01028-41 : Equilib. Flash-Using Antoines Eq. to Calc. Equil. and Heat

Antoine's vapor pressure equation for each component (up to 5) is used to calculate the equilbrium ratio and latent heat for each component. This data is used in the Rachford-Rice equation, solved via a Newton convergence method. Results are: fraction vaporized, combined heat of vaporization, compositions of all streams.

244 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01041-41 : Flowpast Immersed Bodies

Given particle diameter, acceleration, fluid density, particle density, and viscosity this program will determine the appropriate settling range and solve for the terminal velocity. If viscosity is not known this program will solve for the viscosity.

298 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01045-41 : Dzip-Shortcut Multicomponent Distillation

Calculates minimum reflux ratio and minimum theoretical stages for a simple distillation column given a material balance and relative volatilities. Also calculates reflux ratio for a trayed column given stages and vice versa. Maximum 10 components.

270 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01053-41 : Specific Heats of Gases at One Atmosphere

This program provides the specific heats of 13 common gases in units of btu/mol and btu/lb when the temperature in degrees rankine or fahrenheit is given.

252 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01089-41 : Viscosity

A package of 4 programs: program 1-calculates low-pressure gas viscosity for polar and non-polar. In each case a second method for estimating the parameters is supplied. Program 2-calculates viscosity of polar and non-polar gases at high pressure. Program 3-uses the Orrick and Erbar Method to estimate liquid viscosity. Program 4-deals with liquid viscosities using Thomas' method. Data are part of programs.

152 Program Steps
Necessary Accessories: One Memory Module

Documentation — $14.00 Cost of 7 cards — $8.75

01099-41 : Combustion Calculations

Determine the efficiency of a boiler, the heat rate, the heat released, the air used, the flue gas composition, molecular weight and heat capacity, the SO_2 produced, the NO_X produced, and other information. Required input is fuel composition, stack gas temperature, excess air for combustion, and boiler power produced.

523 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 6 cards — $7.50

01101-41 : ASTM-TBP Distillation

This program converts an Atmospheric ASTM Distillation (D-158) to a TBP Distillation. A procedure similar to that found in the API data book is used with a revised Edmister correlation for 50% temperature. I/O in degrees F.

199 Program Steps
Necessary Accessories: One Memory Module and Card Reader

Documentation — $12.00 Cost of 3 cards — $3.75

01112-41 : Economic Pipe Diameter for Turbulent Flow

This program finds the economic pipe diameter for turbulent flow of Newtonian fluids in schedule 40 steel pipe, based on an equation which uses the concept of return on incremental investment. Conventional calculations were made with a chart given by Perry's Chemical Engineers' Handbook but the use of the calculator gives far more accuracy.

138 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01180-41 : Design & Rating of Absorbers, Including Packed-Column Design

Given inlet flows, key component compositions and packed column characteristics this program will calculate the number of transfer units (NTU), and the required column diameter of the absorber. The outlet gas composition can be calculated if the NTU is given. Also calculated are the minimum liquid flow and minimum NTU.

340 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01198-41 : Slurry Calculation Chart

This program generates a chart showing % solids by weight versus slurry (pulp) specific gravity, slurry (pulp) and water factors to convert short tons per hour of solids to gallons per minute of slurry (pulp) or water. The user controls the range of % solids printed and is prompted for the required input data.

146 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

01207-41 : Physical Property Estimation

Estimates of the critical constants, heat of vaporization, vapor pressure, acentric factor, liquid density, surface tension, and liquid and vapor-viscosity, heat capacity and thermal conductivity are calculated. Inputs required are molecular weight, normal boiling point and knowledge of structure. Other inputs are asked for and calculated if not known.

987 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV

Documentation — $16.00 Cost of 10 cards — $12.50

01244-41 : Heat Exchanger Calculations

Given any two, program calculates one of the following: outlet temperatures, exchanger heat transfer coefficient, or exchanger area. Temperature correction factor calculations are included for users choice of either 1) counter current, 2) 1 shell/2 tube passes, or 3) 2 shell/4 tube passes. Heat capacities may be calculated for both liquid and vapor phase hydrocarbons.

557 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 6 cards — $7.50

01294-41 : Cyclone Efficiency

This program is useful in estimating the dust collection efficiency of gas cyclones. Grade efficiencies for a range of ten particle diameters are calculated, tabulated, and plotted. Overall efficiency is calculated based on an input particle size distribution. Gas pressure drop for the cyclone is also calculated.

734 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV, Printer and Card Reader (Due to program length).

Documentation — $14.00 Cost of 9 cards — $11.25

01307-41 : Heating Values

Determine the heat given off by combustion of gas, liquid or solid fuels, given the fuel composition. The heating value of gas fuels is given in BTU/SCF, and for all fuels the gross and net heating values are given BTU/lb.

456 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01323-41 : Fluid Properties

Calus Gunn and Yamada. volume; #7 uses two methods to evaluate liquid molar densities - Tyn and Equation for the algebraic manipulations of pressure, temperature, and molar the Benedict-Webb-Rubin Equation of State #6 uses the complex Sugle-Lu algebraic manipulations of the pressure, temperature,and molar density with solves for any state parameter using the Barner-Adler Equation;#5 provides volume #3 solves for P,V or T using the Van Der Waals, Equation of State; #4 one routine to estimate critical temperature and other to estimate critical Seven programs #1 evaluates the critical properties of hydrocarbons, #2 uses

1228 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader.

Documentation — $20.00 Cost of 27 cards — $33.75

01334-41 : Equilibrium Constants for Gas Reactions

Determine heats of reaction and equilibrium constants for ideal gas reactions. Each of the reactions can be at a different temperature. Data required for each substance are the enthalpy and free energy of formation, and coëfficients to $C_p = a_1 + a_2K + a_3K^2 + a_4K^3$, where C_p is heat capacity and K is temperature in Kelvin. Data are shown for 60 substances.

648 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV and Card Reader. A Stat Pac or HP Library Program 01058-41 may be needed for new compound data.

Documentation — $14.00 Cost of 7 cards — $8.75

01391-41 : Baghouse

The program optimizes the size of a reverse air baghouse. It optimizes around either the gross, net or service air to cloth ratio. It then calculates the remaining air to cloth ratios and the dimensions of each compartment.

Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01493-41 : Analysis of Sieving Results

The size distribution of crystals grown in solution, such as in a large commercial crystallizer, can be approximated by an empirical equation: the results from sieving a sample of the crystal product can be manipulated to determine the constants of this equation. The normal size of sample for sieving is 100g; the program does not assume this; however, it will determine the size of sample from the sieve data.

216 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01511-41 : Pipe Heat Loss and Economics

This program calculates surface temperature and heat loss through bare or insulated pipe given operating and ambient temperature, physical dimensions and insulation properties. Two insulation layers may be input. An annual operating cost is calculated using 12 economic inputs. A discounted pay back period is calculated to evaluate insulation additions to bare or existing insulation.

582 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 6 cards — $7.50

01544-41 : Simple Batch Distillation for Two Components

This program solves several problems arising from the simple batch distillation of a binary solution. Seven different cases can be treated. Calculations are based on the relative volatility of the mixture and program helps in finding it from equilibrium data.

367 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01545-41 : Intelligent Problem-Solving of Heat Exchangers Calculations

This program solves problems concerning four types of heat exchangers: parallel flow, counter flow, one shell pass, two shell passes. Calculator prompts for all data and a zero is entered for each variable that program must evaluate. Program selects the solution method based on availability of data, shifting from LMTD approach to NTU approach when necessary and displaying messages on path followed or giving reasons for calculator impossibility to solve the problem.

857 Program Steps
Necessary Accessories: 3 Memory Modules

Documentation — $14.00 Cost of 7 cards — $8.75

01569-41 : Equilibrium Flash

Given the moles of up to 10 compounds and the K's (Y/X ratios), the program will compute the equilibrium phase compositions. Ideal K's are calculated if the critical properties and boiling points of the components are furnished. A rugged algorithm is used that always comes to a solution.

487 Program Steps
Necessary Accessories: 3 Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01570-41 : Comparison of Three Equations of State

Which is the best equation-of-state? This program allows the quick comparison of three of the best methods for predicting the PVT properties of a pure substance. Needed input is critical pressure and temperature, normal boiling point or acentric factor, and a temperature and volume at which the predicted pressure is desired.

683 Program Steps
Necessary Accessories: 2 Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

01600-41 : Viscosity of Gas Mixture at Low Density

This program computes the viscosity of a mixture of up to 92 (8 without memory modules) different gases. You must enter the following data for each gas: mole fraction, molecular weight and viscosity. The result is computed rapidly with the help of the Chapman-Enskog Theory.

139 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01627-41 : Horizontal Vessel Volume

Program calculates the volume of material in partially filled horizontal cylindrical vessels with flat heads, dished heads, elliptical heads or hemispherical heads. Also calculates the volume in a vertical cylindrical tank.

149 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01672-41 : Cooling Tower Estimates by Correlations Based on Real Data

This program uses several correlations for estimating the following parameters of cooling towers' sizing: tower volume, net weight, packing weight (for overseas export), operating weight (for foundation design), rated motor capacity (for electric power planning), number of cells, FOB price and tower height. Type of tower: crossflow induced draft type with variable pitch axial flow fan.

118 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01673-41 : Saturated Steam Pipe Design

Given the condition of a saturated steam (pressure or temperature) and given any two of the following: diameter (in meters), velocity of steam (in meters per hour) and flow rate (either in cubic meters per hour or kilograms per hour), this program will calculate the remaining variable, thus performing an adequate pipe design. Units for P must be atmospheres (absolute) and T must be in degrees centigrades.

195 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01674-41 : Combustor Flame Temperature

Program calculates the flame temperature for a boiler, furnace or other combustor. The required data for the program is composition of flue gas, lb. of flue gas per lb. of fuel, higher heating value of the fuel and the preheat temperature of the comburent plus fuel.

238 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C. Printer is optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01682-41 : Heat Loss or Gain by Insulated Pipe

This program calculates heat loss or gain by an insulated, and uninsulated, pipe and the temperature of the outside insulation wall. Data required are pipe diameter, insulation diameter, pipe temperature, air temperature and windspeed, surface emissivity of pipe and insulation, and thermal conductivity of the insulation.

270 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01693-41 : Thermodynamic Properties of Saturated & Superheated Steam

Calculate the thermodynamic properties, specific volume, enthalpy and entropy of saturated (liquid and vapor) and superheated steam given temperature and pressure. One equation of state, Martin's, is used over the entire range of T & P, down to VR=.59. The calculated properties are within the tolerances given by the International Skeleton Tables (Steam).

1047 Program Steps
Necessary Accessories: Quad Memory (Printer helpful)
Documentation — $16.00 Cost of 10 cards — $12.50

01715-41 : Fin Temperature and Heat Transfer Rate

This program solves the temperature at a given point on a rod or rectangular fin. It also solves the heat transfer rate. The program prompts the user for all variables, and works for all three fin cases: 1) Very long fins; 2) Fin with heat loss at the end; 3) Fin with insulated end. User needs subroutines for hyperbolic functions.

214 Program Steps
Necessary Accessories: 1 Memory Module. Math Pac or Hyperbolic functions
Documentation — $12.00 Cost of 2 cards — $2.50

01724-41 : Equilibrium K-Values

Determine equilibrium K-values (Y/X) for both ideal and non-ideal substances in ideal solutions. Required data are normal boiling point, critical temperature and pressure, and the temperature and pressure of [illegible]ubstance. The acentric factor is also calculated.

527 Program Steps
Necessary Accessories: 3 Memory Modules
Documentation — $12.00 Cost of 6 cards — $7.50

01794-41 : Size Packed Columns

Program will calculate either the column diameter or the pressure drop of a packed column using "NORTON's Generalized pressure drop Correlation".

210 Program Steps
Necessary Accessories: Printer not required (Desirable)
Documentation — $8.00 Cost of 3 cards — $3.75

01824-41 : Exchanger Film Coefficient

This program calculates the film coefficient of heat transfer of water flowing through the tubes of a shell-and-tube type heat exchanger. In addition, the program calculates the fluid velocity through the tubes given the number of tubes or the number of tubes given a maximum velocity limitation.

126 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01846-41 : Mole Fraction for N Components

This program calculates mole fractions for N components given weight and molecular weight. User controls the number of components and is prompted for the required input data. Output will be printed if the printer is attached. Once the molecular weights have been entered different weights may be easily calculated.

114 Program Steps
Necessary Accessories: Printer and Memory Modules are Optional.
Documentation — $8.00 Cost of 1 card — $1.25

01853-41 : Superheated Steam Pipe Design

Given pressure and temperature of a superheated steam, this program finds velocity, diameter of pipe or flow rate given any two of them. Also, given velocity, diameter and mass flow rate, pressure or temperature is found if any of the two are given.

318 Program Steps
Necessary Accessories: One memory module.
Documentation — $12.00 Cost of 4 cards — $5.00

01859-41 : Pipe-Sizing for Compressible Flow

This program is designed to solve a broad range of pipe-sizing problems for compressible flow. The program assumes that flow is isothermal, and that either the upstream pressure or the downstream pressure is known. The Mach number can be found at the inlet and, more importantly, at the outlet-where sonic velocity may limit the flow.

908 Program Steps
Necessary Accessories: Quad Module, Extended Function Module. Optional: Thermal Printer, Card Reader or Wand.
Documentation — $20.00 Cost of 12 cards — $15.00

01863-41 : C_p' from Tables

The program converts equations for C_p to real values. It has a built in size check and is set up to take "N" terms. The power of the "T" may be +, − or 0. It uses 2N+6 data registers. It will run on HP-41C with five terms in the equation.

154 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01923-41 : Hydrocyclone Efficiency

This program calculates the mean size and the Tromp value for each size fraction for use in determining the efficiency for each size fraction of a hydrocyclone.

399 Program Steps
Necessary Accessories: 2 Memory Modules, Printer optional
Documentation — $12.00 Cost of 4 cards — $5.00

01962-41 : Design and Rating of Packed Columns

Using equations fit to pressure drop curves published by the Norton Co., the design diameter for a packed column at flooding or six other user specified pressure drops is calculated. Given diameter the program will rate the column (calculate the pressure drop). Properties required are: densities, liquid viscosity, flow rates and packing type.

447 Program Steps
Necessary Accessories: 2 Memory Modules; (Printer is helpful)
Documentation — $14.00 Cost of 6 cards — $7.50

01990-41 : Tank Volumes in Partly Filled Tanks

Program will calculate gallons of liquids in partly filled tanks. Tanks can be conical, spherical, vertical cylindrical or horizontal cylindrical tanks. Horizontal tanks can have flat, dished or hemispherical heads. A table will be printed out with gallons per % of full or gallons per incremental height set by input.

614 Program Steps
Necessary Accessories: Printer
Documentation — $12.00 Cost of 6 cards — $7.50

02042-41 : Heat Exchanger Rating

The program calculates unknown temperatures, heat duty and LMTD correction factor in a counter/co-current shell and tube exchanger. Specific heats are calculated at fluid mean temperatures. Program can also handle constant temperature phase change. Has a built-in correlation for specific heats of hydrocarbon liquids.

319 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

02050-41 : Thermal Conductivities of Low Pressure Gas Mixtures

This program calculates the thermal conductivity of gas mixtures of any number of components. The Wassiljewa equation is used along with the Mason and Saxem modification. Further modification is made by the reference. Required input is mole fraction, molecular weight, T_c, P_c, pure component thermal conductivities and system temperature.

442 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

02052-41 : Viscosities of Gas Mixtures at Low Pressures

This program calculates the viscosity of gas mixtures of any number of components. Pure component viscosities are first calculated based on kinetic theory. The mixture algorithm is by Reid, et.al. coupled with the Wilke approximation. Required input is mole fractions, molecular weights, system temperature and readily available Lennard-Jones parameters.

282 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

02073-41 : Conversion From Wt. Fraction to Mole Fraction and Vice Versa

Using the molecular weight of each component, weight fractions can be converted to mole fractions or mole fractions to weight fractions. Components are normalized and ave mw calculated. Any number of components (to 135) can be accepted - the program will create registers as needed. The program can be rerun, if the same components are used, mw need not be reentered.

151 Program Steps
Necessary Accessories: Memory modules if more than 9 components. Extended Functions module optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02134-41 : Riedel-Plank-Miller Correlation for Vapor Pressures

This program uses a correlation for estimating the vapor pressure of a substance at a given temperature. Input data are the critical temperature and pressure, the normal boiling point and the temperature at which vapor pressure is desired. This correlation has a great degree of accuracy and its data requirement are not difficult to find.

103 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02143-41 : Chemical Phasical Property Data Bank

The eleven temperature correlated properties (with temperature limits), vapor pressure, surface tension, heats of vaporization and formation, liquid density and the liquid and vapor properties of thermal conductivity, viscosity and heat capacity and seven point properties are stored in a data bank (on HP-IL cassette) for 57 compounds. Printed output is in three formats. An input program allows all or some properties to be added on new compounds as well as updating existing compounds. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC.

1384 Program Steps
Necessary Accessories: HP-IL Cassette and Quad Memory Module; (Printer is optional)
Documentation — $20.00

02338-41 : Approximate Method of Real to Ideal Gas Conversion

This program produces delta H' and delta S' for the conversion of a real gas to an ideal gas. The program provides results that are valid, to a reasonable approzimation (excluding highly polar and associating molecules) if the reduced volume is greater than or equal to two.

106 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02339-41 : Pitzer and Redlich-Kwong Equations For a Real Gas

This program is set up to use TP or TV data and gives Z for a real gas. Pitzer is used with an acentric factor and V sub 4 greater than two. Redlick-Kwong is set up to find Z if V is known or unknown and the accentric factor is unknown.

208 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02352-41 : Corr. of Tie Line Data For Ternary Systems by Hand's Method

Given data of compositions for two tie lines in a ternary system, this program uses Hand's correlation for estimating several other tie lines, either in form of a table or as values for a specified point. Also, coordinates for the plait point can be found. A least squares fit is employed in this program.

291 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 5 cards — $6.25

02353-41 : Heat Tracing Requirements For Pipelines

This program estimates the number of heat tracers required for a pipe, with or without transfer cement, giving also other values of interest such as the surface temperature of insulated pipe, heat transferred, flowrate for heating fluid. An iterative solution is carried out for calculating the film heat-transfer coefficient to air.

189 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02356-41 : Packed Tower Hydraulic Design

This program solves a variety of problems involved in packed tower hydraulic design, which includes: tower diameter estimation tower pressure drop calculation gas flow rate calculation flooding gas flow rate calculation

328 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02444-41 : Airstream Energy Balances

Predicting the final temperature of two airstreams that mix, or exchange heat without mixing, involves an iterative procedure because both air and water-vapor enthalpies must be considered simultaneously. This program uses correlations for those enthalpies in order to solve such problems quickly. English units are used.

165 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02449-41 : Surface Tensions of Aqueous Organic Solutions

Given the surface tensions and molar volumes of the pure components at a given temperature (water and organic compound), this program estimates the surface tension for a solution of a given molar composition. The method of Tamura, Kurata and Ooani is employed here. Any composition greater than zero and less than one can be employed.

171 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02474-41 : Diameter Estimation of Vapor-Liquid Contacting Trays

Using a procedure based on Fair's correlation for entrainment flooding this program finds the tray diameter provided the following data are given: Mass flow and densities of vapor and liquid, surface tension of liquid, ratio of vapor hole area to tray active area, a flooding factor, a foaming factor and the tray spacing. Some default values are recommended for the data. The estimation works with bubble cap and sieve trays. Can be used with value trays also.

157 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02510-41 : Flash Composition Calculations

For an isothermal flash of a mixture of to ten components, the vapour to feed ratio, and vapour and liquid compositions are calculated. Equilibrium ratios for each component, and initial composition must be known.

117 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02522-41 : Sizing Calculations For Condensate-Return Lines

This program allows quickly sizing of return headers for flashing steam- condensate systems. It makes the following calculations: a) Calculates the amount of condensate flashed for any given condensate-return header pressure from 15 to 140 psia. Initial steam pressures may vary between 40 and 615 psia. b) Finds pressure drop (psi/100 ft of line) in return header c) Calculates velocity of the steam-condensate mixture and displays a warning message at velocities over 5000 ft/min.

152 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02524-41 : Equation of State: Beattie-Bridgeman

Calculates molar volume of any gas given the temperature, pressure and Beattie-Bridgeman constants. Uses Newton's method for an iterative solution. Based on ideal gas law for a first guess.

175 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02545-41 : Differential Pressure by Two-K Method

This program calculates the pressure drop due to friction loss of fluid flowing through pipe and fittings. The unique features of the program are that it prompts the user for all inputs including the quantity of programmed pipe fittings and it uses a direct solution correlation (covering laminar, transition and turbulent flow regimes) to calculate the Darcy friction factor. The program contains 'k' values for the pipe fittings eliminating the need to refer to literature.

340 Program Steps
Necessary Accessories: Two memory modules. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02578-41 : Saturation on pH - Calculation of Langelier & Ryzner Indices

To anticipate problems associated with the operation of cooling towers (i.e., scaling or corrosive behavior of the water), two indices are commonly used. These are the Langelier and Ryzner (aggressive) indices. The program will calculate values for both based on either a full or partial water analysis.

171 Program Steps
Necessary Accessories: One memory module. Card Reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02584-41 : PVT Calculations Using Soave-Redlich-Kwong Equation of State

This program provides interchangeable solutions for P, V and T of a pure substance using an enhanced version of the Redlich-Kwong equation of state. Any system of units may be employed but they must be consistent. Although solution for P is straightforward, solutions for V and T require iteration using Newton-Raphson's method. The molar volume for the liquid phase may be calculated also.

268 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02585-41 : Mathematical Modeling of a Catalytic Reformer of Methane

Given molar flows of methane and water vapor fed to a primary reformer and of air to a secondary reformer operating at a fixed temperature, this program finds the molar flow of all products and their percent composition. Each variable can be changed independently for evaluating its effect on the operation. The catalytic reforming of methane is the most important phase in the production of synthetic gas.

191 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02586-41 : Combinatorial Calculations on Separation Sequences

Given a process feed of R components to be separated into R products using sequences of single-feed, two-product separators using energy-separating agents, this program finds the number of possible sequences of separation, number of subgroups of adjacent components (that is, ordered in decreasing relative volatility) and the number of unique (not repeated) splits that are possible. The inverse problem can be also solved: Find R when any combination result is already known.

114 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02587-41 : Cost Estimation For Heat-Transfer Equipment

This program estimates the cost for heat-transfer equipment, namely the following: shell-tube heat exchangers, double-pipe heat exchangers, air coolers, furnaces and heaters. It is based in correlations made from data of Guthrie's Capital Cost Estimating. Use of cost indexes can update the cost to any time from 1968.

181 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02589-41 : Heat-Transfer Time in Jacketed Vessels: Isothermal Medium

For a process fluid being heated or cooled into a jacketed vessel with an isothermal heat-transfer medium this program provides interchangeable solutions for all the following: Mass of process fluid, initial temerature, final temperature, isothermal medium temperature, overall heat-transfer coefficient, heat-transfer area and heating time. Any one of these can be calculated if all others are known.

171 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02590-41 : General Material Balances Involving Binary Systems

Given any binary system in which n feeds are input ($n \leq 10$) which compositions and flows are known and m products are withdrawn ($m \leq 10$), also known, this program finds the flows of two unknowns: two feeds, two products or one feed and one product provided that their compositions are known. This is a common problem in binary separations in which some streams are known and only two independent material balance equations can be stated. The general procedure presented here allows for a flexible solution of those problems.

148 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

02611-41 : Bubble and Dew Point Temperature of an N Component Mixture

This program will readily calculate the bubble point and dew point of a mixture of n components. Antoine's vapor pressure constants must be entered for each compound (for calculation of the equilibrium ratio's, k). Using the extended function module size is automatically allocated. Program can also be run with manual allocation.

299 Program Steps
Necessary Accessories: One memory module. Extended Function Module optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02643-41 : Benedict-Webb-Rubin Equation of State For Mixtures

This program needs 116+ registers (one more for each component over five) and uses the Lorentz combination. This program will find volume, pressure, or temperature if the other two are known (note: will not work if have only one component). The program uses the 1/2 method of find volume and temperature. The program uses a printout to check the input of each set of constants.

401 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02644-41 : Z-Transformation

This program inverts from the Z domain back into the time domain. It gives the values of the function only at the sampling instants. This program uses the long division methods to get these values. The program has a size check and can be rerun at the end of the run to get the next set of values.

242 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02645-41 : Benedict-Webb-Brubin Equation of State

This program will find volume, pressure, or temperature if the other two are known. The program uses the 1/2 value method to find volume or temperature but uses the B-W-R equation to find pressure. Needs 73 registers in all.

226 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

02649-41 : Fitting Vapor Pressure Data to Antoine Equation/3 Constants

Given a set of data concerning vapor pressures at various temperatures, this program finds the constants of the equation of Antoine that best fit the data. A least-squares fit is made for two of the constants with the third fixed. Then, the third constant is changed by increments and the regression is performed again. The user specifies the initial, increment and final value of the third constant. The fit that presents the correlation coefficient nearest to unity is displayed as the answer.

181 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02699-41 : Estimation of Plate Efficiency

For finite-stage contactor columns where the overall column efficiencies are constant, O'Connell has correlated efficiency data on the basis of liquid viscosity and relative volatility. This program calculates efficiency for rectification columns with perforated or bubble cup trays. Efficiency is a function of relative volatility of the light key to the heavy key component times the average viscosity of the feed at the average column temp.

397 Program Steps
Necessary Accessories: Two memory modules. Extended Functions module and printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02715-41 : Metallurgical Balance

Given product weights and chemistry from a mineral separation, this program calculates the product weight percents, chemical distributions, and composite grade. The number of product streams is limited only by the number of available data registers. Printer and non-printer versions are provided. The printer version tabulates a neat, three-column listing.

112 Program Steps
Necessary Accessories: 82160A HP-IL module and 82162A Printer optional. Printer version requires at least one memory module.
Documentation — $12.00 Cost of 5 cards — $6.25

02730-41 : Slurry Calculations

Given any two of the following four variables: dry solids specific gravity, slurry specific gravity, percent solids by weight, or percent solids by volume, this program calculates the remaining two variables as well as the water to solids ratio, gallons of slurry per minute per ton of dry solids per hour, and cubic feet of slurry per minute per ton of dry solids per hour.

241 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02736-41 : Ion Exchange Breakthrough Curves

Program calculates breakthrough values for ion exchange resins, based on dimensionless distance and time. Also calculates the fraction of total capacity used. Values of the J function is also obtainable.

188 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02756-41 : System Curve (SYSCRV)

This program generates a pump discharge piping system curve which is necessary for sizing centrifugal pumps. The program prompts for all inputs required (including quantity of fittings and valves in the discharge line), labels and displays all results and displays a program function prompt. The program contains "k" values for various valves and fittings eliminating the need to refer to the literature. To implement full features of the program requires the HP-IL (82162A) printer.

622 Program Steps
Necessary Accessories: Quad memory module with HP-41C or HP-41CV. 82160A HP-IL Interface and 82162A HP-IL Printer optional.
Documentation — $14.00 Cost of 9 cards — $11.25

02773-41 : Vol Change in Horizontal, Vertical, Cyl., Spherical Vessel

Solves for change in volume in vertical, horizontal and spherical vessels with 2:1 elliptical, hemispherical and flat heads. Allows for volume correction factor entry. Very useful for process mass balance calculations and vessel volume determinations. Friendly and versatile.

211 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02817-41 : Wilson Equation: Activity Coefficients For Binary Solutions

This program finds the two parameters of Wilson's equation for binaries given the activity coefficients at one composition or those at infinite dilution. The solution involves a Newton-Raphson iteration. With the parameters found, any prediction of activity coefficient can be made. If the Wilson parameters are available, program aids in evaluation of infinite dilution activity coefficients or prediction of those corresponding to a given liquid composition.

305 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02820-41 : Gas Property Using Redlick Kwong Equation of State

The program computes the thermodynamic property P, T, V, H and S Given two properties of the fluid except the combination H and S. The program uses the Redlick-Kwong equation of state.

665 Program Steps
Necessary Accessories: Thermal and Transport Pac, Quad Memory Module
Documentation — $14.00 Cost of 7 cards — $8.75

02849-41 : Discounted Cash Flow

A procedure to establish a rate of return which can be applied to yearly cash flow so that the original investment is reduced to zero. The rate of return, by this method, is equivalent to the maximum interest rate (normally after taxes) at which money can be borrowed to finance a project. The program is set up for yearly inputs of cash flow at Startup and Shutdown of plant.

354 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02862-41 : Computing Ryznar and Langelier Indexes

This program computes Ryznar and Langelier indexes to estimate corrosive and scaling tendancies of water in a cooling tower. It estimates the amount of acid, sulfuric acid (66° Be), needed to make a no-difficulties water. The program only needs six inputs: $CaCO_3$, Ca, total dissolved solids and sulfate concentrations, temperature at the water cooling tower interface and cycles of concentration.

304 Program Steps
Necessary Accessories: Two memory modules and printer. Card reader optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02881-41 : Gaussian Error Function/Probability Integral: erf(Z)

The Gaussian Error Function is commonly used in heat and mass transfer problems. Usually, this information is only presented in tabular or graphical form. This program calculates the value of erf(Z) for the absolute value of Z between 2 and 0.015 using the trapezoid method. Values with magnitude greater than 2 may be entered but run time is quite long. This program is designed to serve as a called function (similar to SIN or LN).

75 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02885-41 : Cooling Tower

Program calculates a suggested air flowrate and number of transfer units for air-water cooling tower. Input requires: tower pressure, water flowrate, water inlet and outlet temperatures, and air wet-bulb temperature. When run with printer, enthalpy and enthalpy driving force are printed at 2-degree F water temperature intervals.

232 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02947-41 : Gasmix

This is an interactive program that determines heat contents of any number of gaseous mixtures having various mass flows at various temperatures. Each gaseous mixture can contain varying amounts of CO_2, CO, N_2, O_2, SO_2, and H_2O. Finally the total heat content and the temperature of the combined gases is determined.

330 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

03063-41 : Heating Rate Calculator

Program calculates heating or cooling time, power required or temperature of a body, given its mass, specific heat, initial temperature, and two of: time; power; end temperature. Will also stepwise iterate and solve for total time with inputs of varying specific heat over various temperature ranges. Prompts and answers have metric units displayed. Very user friendly.

144 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

03068-41 : Mixture Rules for Benedict Webb Rubin Equation

This program calculates pseudocritical constants of gas mixtures, namely, the pseudocritical temperature, pseudocritical pressure, pseudocritical specific volume, the mixture molecular weight, the pseudocritcal Pitzer Factor, and the gas constant of the mixture. The mixing rates are those recommended for use with the Benedict-Webb-Rubin equation, as modified by Lee and Kesler. The input required is component critical temperature, critical pressure, molecular weight, Pitzer Factor, and flowrate.

211 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $8.00 Cost of 2 cards — $2.50

03091-41 : Equilibrium Constant, Rate Coefficient, Vapor Pressure

Multipurpose program to calculate (a) equilibrium constant of chemical reaction from thermochemical data and temperature; (b) reaction rate coefficient from activation energy, temperature, and rate coefficient value at another temperature; (c) vapor pressure from molar heat of vaporization, temperature, and vapor pressure at another temperature. Program is based on Van't Hoff, Arrhenius, and Clausius-Clapeyron equations and accepts kJ/mol or kcal/mol as units for energy input values.

92 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03108-41 : Steady Shear Data Analy For Weissenberg R17 Rheogoneometer

A data analysis program for the weissenberg R17 Rheogoneometer in steady shear mode, cone and plate configuration. This program takes instrument constants and up to 20 sets of gearbox, torque, and normal force data and outputs either shear rate, shear stress, and viscosity or shear rate, viscosity and first normal stress difference, if normal force data is supplied. With minor modifications, the program can be adapted to other models such as the R16 and R18.

484 Program Steps
Necessary Accessories: HP 82143A Printer
Documentation — $12.00 Cost of 7 cards — $8.75

03148-41 : Thermal RC Calculator — Temperature of Mass Heated through a Conductor

Relaxation formula solves for time constant and temperature or elapsed time (given time or temperature) of a body of given mass and specific heat, being heated or cooled through a thermal conductor which is attached to a constant temperature heat sink. Length, area and thermal conductivity of the conductor are input, or will solve for length or area if the other parameters are input. Prompts and answers are labeled with metric units.

164 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03198-41 : PVT Data For Ideal and Real Multicomponent Mixtures

Using Redlich-Kwong equation of state, the program has been designed to compute P, V, n, R, T as unknowns for

- A pure idea gas and ideal-gas multicomponent solutions.
- A pure Redlich-Kwong gas.
- An ideal multicomponent (ideal) solution.
- A real (Redlich Kwong) multicomponent solution of up to 18 gaseous component (for P, V, T as unknowns only).

516 Program Steps
Necessary Accessories: Two memory modules minimum for the HP-41C.
Documentation — $14.00 Cost of 4 cards — $5.00

03199-41 : Bubble and Dew Point Calculations

Employing the Antoine equation, this program computes the bubble point temperature and pressure and the corresponding vapor composition. It also computes the dew point temperature and pressure and the corresponding condensate composition for ideal multi-component mixtures. The vapor pressure and temperature can be calculated for any substance. The user does not need to look up for constants.

408 Program Steps
Necessary Accessories: Two memory modules minimum for the HP-41C.
Documentation — $12.00 Cost of 4 cards — $5.00

03201-41 : Thermocouple Correction

Thermocouples in protruding wells used to measure fluid temperatures may need readings corrected due to heat conduction from the wall and heat transfer to the fluid. This program estimates the true temperature based on the physical properties of the system. If the heat transfer coefficient is not known, it is estimated for a cylindrical well in a horizontal position. Program may easily be modified for heat transfered coefficients of specific fluids or other geometries.

230 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03294-41 : Equilibrium Constant/Vapor Pressure Evaluation

This program calculates any of the following variables: K (equilibrium constant), increment of Enthalpy or temperature range when the others are given. The same occurs with the vapor pressure evaluation, the program calculates any of the following variables: P (vapor pressure), increment of Enthalpy or temperature range when the others are given.

78 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03364-41 : Temperature Profile

This program calculates the temperature as a function of time for some points of a solid (either cylindrical or plane face) which is put into contact with a substance with another temperature and/or is exposed to a constant heat flux on one of its faces.

326 Program Steps
Necessary Accessories: One memory module, Extended Functions/Memory Module.
Documentation — $12.00 Cost of 3 cards — $3.75

J252 Chemical Engineering Design (Optimization)

01778-41 : Shortcut Multicomponent Distillation Design

If the compositions of the feed, overhead, and bottoms streams are known and the relative volatilities are known, this program will calculate the minimum reflux ratio and the minimum number of stages. It will then calculate the number of stages or reflux ratio given one of the two. Uses Underwood and Fenske Equations with the Gilliland correlation.

326 Program Steps
Necessary Accessories: 2 Memory Modules (Printer is useful)
Documentation — $12.00 Cost of 3 cards — $3.75

01794-41 : Size Packed Columns

Program will calculate either the column diameter or the pressure drop of a packed column using "NORTON's Generalized pressure drop Correlation".

210 Program Steps
Necessary Accessories: Printer not required (Desirable)
Documentation — $8.00 Cost of 3 cards — $3.75

01838-41 : Chemical Process Equipment Cost Estimation

One mainline program, five instructional programs, and 25 equipment subroutines which will estimate chemical process equipment costs. Costs are estimated based on January 1982 data and is corrected for inflation using the Marshall and Swift Index published by Chemical Engineering Magazine biweekly. Programs are based on an article from that magazine. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC.

4911 Program Steps
Necessary Accessories: Cassette Drive and Printer, Quad Memory Module.
Documentation — $25.00

02083-41 : Multicomponent Distillation Column Design

Given feed rate and composition, heavy and light key specifications, Antoine vapor pressure constants and column pressure, Fenske's minimum trays and Underwood's minimum reflux are calculated. Using Gilliland's correlation the actual number of trays at a specified reflux is determined. Fair's equations calculate trayed column diameter at three tray spacings.

954 Program Steps
Necessary Accessories: Quad Memory Module
Documentation — $16.00 Cost of 8 cards — $10.00

02474-41 : Diameter Estimation of Vapor-Liquid Contacting Trays

Using a procedure based on Fair's correlation for entrainment flooding this program finds the tray diameter provided the following data are given: Mass flow and densities of vapor and liquid, surface tension of liquid, ratio of vapor hole area to tray active area, a flooding factor, a foaming factor and the tray spacing. Some default values are recommended for the data. The estimation works with bubble cap and sieve trays. Can be used with value trays also.

157 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02551-41 : Single Variable Max, or Min Finder

Using the Fibonacci Single Variable search method; the most efficient univariable search technique, this program finds the minimum or maximum of a function with a single minimum or maximum point within specified limits.

136 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02617-41 : Friction Loss in Pipes

This program computes pipe friction loss, velocity, and optimum diameter given ID, flow rate, viscosity, and density. Wide choice of most commonly used input units. Automatic density calculation for hydrocarbon liquids and ideal gas, conversion from nominal diameter to standard pipe ID for gases density change taken into account.

243 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02673-41 : Pressure Vessel Cost / Weight Estimate

This program estimates pressure vessel cost as a function of shell weight. It also calculates vessel volume, surface area and shell thickness. The program prompts for all inputs required including inside diameter, tangent length, design pressure, allowable stress and corrosion allowance. The program includes a routine to round up shell thickness to a standard manufactured plate thickness. The cost estimate is current because of use of the most recent Chemical Engineering Fabricated Equipment Index.

405 Program Steps
Necessary Accessories: Two memory modulesfor the HP-41C. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02699-41 : Estimation of Plate Efficiency

For finite-stage contactor columns where the overall column efficiencies are constant, O'Connell has correlated efficiency data on the basis of liquid viscosity and relative volatility. This program calculates efficiency for rectification columns with perforated or bubble cup trays. Efficiency is a function of relative volatility of the light key to the heavy key component times the average viscosity of the feed at the average column temp.

397 Program Steps
Necessary Accessories: Two memory modules. Extended Functions module and printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02815-41 : Univariate Search Function Maximum Finder

This program will find the maximum or minimum of a function by optimizing one variable at a time; then decreasing the amount the variables change, then optimizes each variable again. Using penalty functions (explained in the documentation) this program can also handle explicit and implicit constraints. Depending on the length of the function to be optimized, one memory module can handle up to about a 20-variable function.

119 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

02831-41 : Determination of Antoine's Constants I

The vapor pressure of a component is a unique property of the component and is a direct function of a temperature. Vapor pressure and temperature are commonly related by means of the Antoine equation. Program calculates Antoine's constants with Dreisbach method for pure components over a relatively narrow temperature range (usually not over 100 degrees C) and vapor pressure at desired temperature.

271 Program Steps
Necessary Accessories: X-Function module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02832-41 : Determination of Antoine Constants

The program calculates Antoine constants for pure components by algebraic means. You can also calculate temperature at a desired vapor pressure or vapor pressure at desired temperature. If you input vapor pressure data in mmHg or atm or bar or Pa, and temperature in degrees C or K, you can print out the results in desired units. This method is more accurate then method I.

397 Program Steps
Necessary Accessories: Two memory modules and X-Function module. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02905-41 : Multivariable Nonlinear Function Maximum Finder

Based on the "complex" method of M.J. Box, this sequential search program is effective in finding the global maximum of a nonlinear function, without requiring the derivative. The program randomly scatters an initial set of points throughout a feasible region (specified by the user) then moves the points toward the maximum value of the function. The program requires 0-6 hours depending on the function and the accuracy required.

608 Program Steps
Necessary Accessories: Three memory modules
Documentation — $14.00 Cost of 6 cards — $7.50

03074-41 : Runaway Criteria For a Fixed Bed Tubular Reactor

Program calculates runaway criteria for a tubular fixed bed reactor based on a pseudo-first-order chemical reaction and the one-dimensional pseudo- homogeneous model. It determines the runaway and non-runaway reactant partial pressure limits and maximum temperature increase for a given tube radius. For a given inlet partial pressure it determines the non-runaway tube radius.

228 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03077-41 : Linear Optimization

Using the simplex method of linear optimization, this program can minimize or maximize up to 10 linear equations. The program checks for unbounded and inconsistent equations and generates slack and artificial variables as required for $\geq$, $=$, or $\leq$ type equations. Documentation includes a subroutine to list the matrix at points in the program and instructions on how to adapt to run on the HP-41CV with an Extended Functions module.

579 Program Steps
Necessary Accessories: HP-41CX

Documentation — $14.00 Cost of 6 cards — $7.50

03105-41 : Optimum Path Finder

Using dynamic programming, this program will find a minimum or maximum path between two stages. The program handles up to 6 stages and 5 points per stage on a single run; the documentation explains how to break up a problem so it can be solved with several runs of the program. The program includes a subroutine which is used to correct data input errors.

530 Program Steps
Necessary Accessories: HP-41CV with Extended Functions module. Extended Memory modules helpful.

Documentation — $14.00 Cost of 5 cards — $6.25

03262-41 : Multicomponent Distillation Calculations

This program calculates mole fraction and number of moles of a component in a distillate and bottoms, percent recovery of light key in distillate and heavy key in bottoms, minimum number of theoretical plates, minimum reflux ratio, optimal reflux ratio, number of theoretical plates, and number of plates below and above feed plate. Given feed composition and relative volatilities, and the especified mole fractions of the keys in the distillate and bottoms. BAR CODE IS NOT AVAILABLE WITH THIS PROGRAM.

693 Program Steps
Necessary Accessories: Four memory modules or quad memory module and Math I module.

Documentation — $12.00 Cost of 6 cards — $7.50

J254 Chemical Engineering Process Control

01840-41 : State Observability of a Digital System

Application Pac. on the "L" matrix. Has a size check built in. matrix with a quad memory module. Is set up to use the Mathematics to produce the "L" matrix. The program can handle up to a 10 X 10 "A" This program uses the "A" & "D" matrices of the dynamic equation of a system

249 Program Steps
Necessary Accessories: One or more memory modules.

Documentation — $12.00 Cost of 2 cards — $2.50

02007-41 : Acid Gas Dewpoint

This program solves for the dewpoint of gases containing any one of the following acids: HBr, HCl, HNO_3, H_2SO_3, H_2SO_4. The input data is in the form of either partial pressure or volume % of the acid and water. The output is in the form of the dewpoint in degrees. If the printer is attached all inputs and outputs will be printed.

168 Program Steps
Necessary Accessories: One Memory Module (Printer optional)

Documentation — $12.00 Cost of 2 cards — $2.50

02021-41 : Control System State Controllability and Observability

This program uses the "A", "B" and "D" matrixes of a digital control system to produce the "Q" and "L" matrixes. It also checks if the matrix is singular or not. Needs at least one memory module but with a quad module it can do a 10 x 10 system.

303 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02113-41 : Activated Sludge Process Control Calculations

Converts laboratory data into useful units that are necessary to control an activated sludge system.

126 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02267-41 : State Controllable From Dynamic Equations

The dynamic equations of a linear digital control system in the form $x(k+1) = Ax(k) + Bu(k)$ is checked to see if it is state controllable or not. The Q matrix is displayed. Is set up to handle an $m \times n$ A matrix and 1 or more columns in the B matrix.

268 Program Steps
Necessary Accessories: One or more memory modules for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

02337-41 : Independent Equations From Complex Reaction Equations

This program is used to get independent equations from complex reaction equations. It works on both chemical reactions equilibra and control systems interaction equations. This program has a built in size check and needs one or more memory modules to do 5x5 or larger matrixes.

226 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02644-41 : Z-Transformation

This program inverts from the Z domain back into the time domain. It gives the values of the function only at the sampling instants. This program uses the long division methods to get these values. The program has a size check and can be rerun at the end of the run to get the next set of values.

242 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02767-41 : Simultaneous Nonlinear Equations

This program will find a set of roots, for up to three unknowns, in a present range. The program uses a modified 1/2 method of find the roots, so it is slow. The program is set up so you can spot an inflection point and go around it. Note: You must input the equations as a subroutine.

344 Program Steps
Necessary Accessories: One or more memory modules

Documentation — $12.00 Cost of 3 cards — $3.75

03057-41 : Flow Measurements With Pipe Elbow Taps

Pipe elbows with correctly installed pressure connections may be used to determine rate of flow by measuring the differential pressure created by the centrifugal forces occuring when fluid is flowing through the elbow. After entering all known parameters in metric units, program computes flow entering differential pressure or vice versa; it also computes necessary elbow radius entering both flow and differential pressure. Above computes may be made both for 45 degree and 22.5 degree taps position.

181 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

03118-41 : Control Valve Sizing Liquid, Gas and Steam

Program calculates the sizing coefficient (CV) for control valve. Metric or English, volumetric or weight units, in Liquid, gas or steam service, critical or subcritical flow, noise in gas and steam service when normal trim valves are used. If reducers are required, it calculates the "R" (Subcritical flow) or "CFR" (Critical Flow). The valve CV is recalculated considering these two factors. Flow velocity (liquid flow) or noise (steam and gas flow) are calculated. NO BAR CODE IS AVAILABLE WITH THIS PROGRAM.

Necessary Accessories: Quad memory module with HP-41C

Documentation — $14.00 Cost of 10 cards — $12.50

03589-41 : Actuator Selection for Single-seat Control Valves with Unbalanced Trim

This program will provide the user with maximum shutoff pressure, operating span in psi, and other parameters related to operation of single-seated control valves with unbalanced trim, and with flow tending to open. User furnishes input data on actuator effective area, spring rate, valve orifice diameter, and stem travel.

574 Program Steps
Necessary Accessories: Quad memory module (for HP-41C) and printer. Card reader is optional.

Documentation — $14.00 Cost of 9 cards — $11.25

03594-41 : Flow Area in Control Valves with Contoured Plugs

This program computes the truncated conical flow area between the seat and plug of control valves having contoured, or characterized plugs, for specified values of plug lift. Program is applicable to three different types of plug profile. User has the option of entering single values of plug lift, one at a time, or of entering total plug travel and number of equal increments of lift at which flow area is to be determined.

954 Program Steps
Necessary Accessories: Quad memory module, card reader, and printer

Documentation — $14.00 Cost of 9 cards — $11.25

J256 Chemical Engineering Stoichiometry

02115-41 : Stoichiometry of a Chemical Equation

This program determines the stoichiometric coefficients or any kind of chemical equation (Ox. — Red. ...). Most of the equations may be processed by the program. All intervening moleculas must be entered. They may be charged. This program is pretty simple to use, and very flexible. The results are integer and reduced.

260 Program Steps
Necessary Accessories: One Memory Module for the HP-41C, Math I ROM or "Matrix" Program

Documentation — $12.00 Cost of 2 cards — $2.50

02189-41 : Partial Pressure of HCL and Water Over Aqueous HCL

Program will calculate partial pressure of HCL and water over aqueous HCL. Temperature range is 0 to 110 degrees C. Concentration of HCL is from 2 to 39 wt %. With a Printer a single condition can be calculated or a table of pressures can be generated.

269 Program Steps
Necessary Accessories: Printer desirable

Documentation — $12.00 Cost of 3 cards — $3.75

02567-41 : General Chemistry I: Periodic Chart, Formula Weight and More

This program can solve four basic chemistry functions. It can: Use the Periodic Chart to find the Atomic Weight of an element: Calculate the Formula Weight of any given formula; Determine the Empirical Formula given the elements and their percent composition; Compute the Percent by Weight for any element in a given formula. An invaluable asset for chemist and college chemistry students.

498 Program Steps
Necessary Accessories: Three memory modules. Printer optional.

Documentation — $14.00 Cost of 7 cards — $8.75

02600-41 : General Chemistry II: Periodic Chart & Electron Configuration

This program uses the Periodic Table of Elements to find the Atomic Weight of a given element or to compute the Electron Configuration of that element. This program comes equipped with thirty of the most commonly noted elements of the chart, but can be easily expanded to encompass the entire list of elements. There is an automatic Stack Saver which assists User in avoiding stack data lost. Great for chemist and college chemistry students.

390 Program Steps
Necessary Accessories: Two memory modules. Printer applicable.

Documentation — $12.00 Cost of 5 cards — $6.25

02715-41 : Metallurgical Balance

Given product weights and chemistry from a mineral separation, this program calculates the product weight percents, chemical distributions, and composite grade. The number of product streams is limited only by the number of available data registers. Printer and non-printer versions are provided. The printer version tabulates a neat, three-column listing.

112 Program Steps
Necessary Accessories: 82160A HP-IL module and 82162A Printer optional. Printer version requires at least one memory module.

Documentation — $12.00 Cost of 5 cards — $6.25

J360 Electrical/Electronic Engineering

00328-41 : Resistor Color Code Chart

With input of any 3 or 4 band resistor colors this program will calculate the exact value of the resistor, also the high and low tolerance values.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00349-41 : Radar Range Multipath Calculations

This program solves for the effects of multipath between a radar source and target. Calculations include the time delay between the direct and reflected paths of the radar signal.

159 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00353-41 : Radar Receiver Matched Filter Design-Dolph Chebyshev

This program provides a basis for designing a radar FM pulse-compression receiver. Utilizing the Dolph-Chebyshev distribution function minimum values for target range resolution, spectrum bandwidth, and time sidelobes can be calculated to be used as standards in designing the linear FM radar receiver.

201 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00427-41 : Zonal Cavity Method Lighting Two to Four Lamp Flourescent

Program calculates the number of flourescent fixtures required in any size room using derived photometrics for medium quality flourescent troffers using the zonal cavity method. Printer may be used for documentation.

152 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00446-41 : Taylor Weighted Pulse - Compression Radar Receiver

This program calculates the Taylor Distribution weighting factors in a linear FM pulse-compression radar receiver. For a given peak sidelobe level and modulation frequency the pulse widening over the Dolph-Chebyshev response and minimum number of weighting factors are calculated.

Necessary Accessories: One Memory Module
Documentation — $8.00 Cost of 2 cards — $2.50

00459-41 : Electrical Transmission Line Calculations

Given sending voltage and sending end volt-amperes this program calculates receiving end voltage, receiving end volt-amperes, and line losses. As an option, given sending end voltage and receiving end volt amperes, it calculates receiving end voltage, sending end volt-amperes, and line losses. The program uses the medium length line model. Full vector mathematics are used in the calculations. The medium length line model usually provides satisfactory results for lines of up to about 150 miles in length.

218 Program Steps
Necessary Accessories: One Memory Module. Printer desirable.
Documentation — $12.00 Cost of 2 cards — $2.50

00546-41 : Coil Design Program

Calculates build, mean length of turn, wire length, weight, and resistance for multiple windings on a random-wound bobbin. Calculates wire table data for standard AWG 10 through 50 with single or heavy film insulation.

145 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00661-41 : Power Factor/Load Design

This program is used to calculate required load resistances and required inductance or capacitance values to obtain a specific power factor in AC power distribution systems.

99 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00716-41 : Symmetrical Components-Phasors Conversions

This program provides a simple and convenient means to convert between unsymmetrical (unbalanced) phasors and symmetrical components, thus removing some of the tedium related to 3-phase circuit calculations of unbalanced loading and fault analysis. Conversions can be made both ways. Output values are identified to reduce errors.

Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00798-41 : "NBW" Filter Function Noise Bandwidth Analysis

This program greatly eases the analysis of filter noise performance. It offers design flexibility by providing exact values for the effective noise bandwidth for first through fourth order polynomials of the form $g(s) = n(s)/d(s)$. After NWB is calculated the output noise level can be calculated by supplying the input broadband noise level.

189 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00849-41 : "Order" Butterworth and Chebyshev Filter Design

This program, given a set of four parameters will calculate the required filter order and calculate the required pole locations. Will handle high-pass and low-pass filters. Filter types can be Butterworth or Chebyshev. The input parameters are, passband and stopband attenuation and passband and stopband frequencies.

269 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00959-41 : Resistive Pads & Attenuators

This program solves for resistive values and minimum attenuation in db for all "l", symmetrical and asymmetrical "t", and "pi" configurations given: input impedance (zi), output impedance (zo) and attenuation desired (db). The program is self prompting and self directing for any of these described configurations. Rapid "t" and "pi" comparisons are also possible.

226 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00996-41 : Comparator Error Analysis for Successive Approx A/D Circuits

The voltage comparator error contribution in a analog-to-digital converter based on the successive approximation circuit technique is computed. comparator offset voltage, input current and gain error terms are computed in terms of system least significant bits (lsb) to yield a worst case and root-mean square error total.

138 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01078-41 : Transmission Line Sags, Weight Spans and Related Calculation

This program uses exact catenary equations to find conductor tensions, sags, weight spans, pull-off angles, and relative or absolute conductor elevations. Input required (English or Metric units) is conductor tension or sag, conductor weight per foot, elevation of attachment points, and distance between attachment points.

244 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01079-41 : Minimum Clearance Between Two Aerial Conductors

This program finds the minimum clearance between two aerial conductors in a given span or at a specified point in that span using exact catenary equations. It is especially useful for short spans having steep slopes. typical use is for conductor vertical to horizontal rolls and crossing clearances.

474 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

01150-41 : Temperature Rise by Resistance

This program solves for the average temperature rise in a copper winding from resistance measurements made after a heat run is terminated. Temperature rise is extrapolated back to the end of the heat run. Constants are included to convert program to aluminum conductors. Applications include motors, alternators, and transformers.

106 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01181-41 : Long Transmission Lines

This program is especially designed for calculation of electrical parameters of long transmission lines - over 150 miles, using hyperbolic functions of complex arguments. It can also be used for shorter lines, if greater accuracy is desired.

292 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 3 cards — $3.75

01225-41 : DB Loss Vs. Azimuth Misalignment

This program calculates and graphs the decibel loss due to azimuth misalignment of magnetic record-reproduce heads. The graph uses as points the calculated loss in decibels.

129 Program Steps
Necessary Accessories: One Memory Module, Printer and Card Reader

Documentation — $8.00 Cost of 4 cards — $5.00

01253-41 : Inductor Design with Combined D.C. and A.C. Currents

Program will completely design an inductor and "look up" the proper core given the inductance, D.C. current, A.C. current, frequency, and temperature rise. Program is entirely self prompting and only requires the user to enter the register data cards, when requested, and press R/S. Printout prints the core number, correct number of turns, gap length in inches, and the temperature rise. Program checks for skin effect, core saturation, excessive temperature rise.

486 Program Steps
Necessary Accessories: Four Memory Modules, Card Reader and Printer

Documentation — $12.00 Cost of 12 cards — $15.00

01255-41 : Digital Filter

FLT calculates the constants for a smooth lowpass finite impulse response digital filter. Such a filter may be used to smooth data tabulated at equal intervals.

305 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01256-41 : Load Growth - Least Square Fit Linear and Exponential Curves

This program uses the Least Square Regression Method to fit electric power loads to both linear and exponential curves. The trend line can then be used to determine the load growth of the area and to project future loads. Routines are included to compute adjustments for transfers. Intended for electric utility engineers, this is #2 of a 41C utility series.

402 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $14.00 Cost of 5 cards — $6.25

01268-41 : Conduit Sizing

This program will compute the minimum conduit size permitted by the 1981 National Electric Code as well as the percent full for a complete power and control system using A.W.G. size 1 thru 18 wire given the quantity and size of the wires to be used.

200 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01282-41 : Swerling Radar Cross Section Statistics

Computes the probability of detection for the four swerling statistics cases (as case chosen by operator) as a function for peak signal to average noise, and number of pulses integrated. Threshold is found at program start by trial and error for selected false alarm probability. Solution of incomplete gamma function is accomplished by Gauss Quadrature routine (included).

284 Program Steps
Necessary Accessories: Two Memory Modules and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

01340-41 : Phase Loop Analysis

This program provides transient response solutions to nonlinear phase-lock-loop differential equations. The nonlinearities include saturation, thresholding, and hysteresis. It also solves the linear case. By proper definition of terms, the program models servo systems of similar type.

313 Program Steps
Necessary Accessories: One Memory Module or Quad Memory Module. Printer highly desirable.

Documentation — $12.00 Cost of 3 cards — $3.75

01431-41 : Summing Amplifier Design and Analysis

Advanced program for design and analysis of operational-amplifier-implemented summing amplifiers with an arbitrary number of inverting and non-inverting inputs.

424 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01465-41 : Electric Transmission Line

This program will calculate the complex line currents, bus voltages, and losses on either a radial or a looped electric transmission line. The source voltage, impedance of each line section, and the load taken off the system at each bus are the required inputs. The program can also calculate the source voltage from a given end-of-line voltage. With three Memory Modules, 28 line sections and loads can be stored; with four or a Quad, 59 line sections and loads can be stored. Intended for electric utility engineers, this is number one of an HP-41 utility series.

609 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $14.00 Cost of 6 cards — $7.50

01466-41 : Complex Variable Operational Stack

This collection of subroutines maintains and manipulates a variable-length stack of complex variables, and provides capability for arithmetic operations on complex numbers. Especially suitable for A.C. circuit analysis.

208 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01487-41 : Wire Tables and Wire Use

Find diameter, fusing current, capacity, weight, cir. mils, of copper wire given AWG number. Also gives AWG and resistance for power, temperature, length and current. Finds wire area from AWG and turns, or will solve for turns, based on dimensions of winding area. Uses exponential method functions, full alpha labels and prompting for ease.

384 Program Steps
Necessary Accessories: Card Reader desirable, Quad Module for the HP-41C.

Documentation — $12.00 Cost of 5 cards — $6.25

01518-41 : Transistor Hybrid-Pi Model for Small Signal Amplifiers

Given the "h" parameters from a transistor data sheet, this program computes the hybrid-pi variables so that a linear model of the transistor can be drawn. The program prompts for all variables. All outputs will be printed if a printer is attached, printing the inputs is optional.

196 Program Steps
Necessary Accessories: One Memory Module (Printer optional).

Documentation — $12.00 Cost of 3 cards — $3.75

01520-41 : Lighting Power Budget

This program calculates (and documents with printer) the allowable energy budget for building lighting in accordance with the Illuminating Engineering Society's Recommended Lighting Power Budget Determination Procedure, EMS-1. Also seen as a part of the ASHRAE Standard 90-75R.

588 Program Steps
Necessary Accessories: 3 Memory Modules for the HP-41C. Printer and Card Reader recommended, but not required.

Documentation — $14.00 Cost of 7 cards — $8.75

01568-41 : Equivalent Sphere Illumination

This program can be used to determine Equivalent Sphere Illumination (ESI). ESI is a measure of visual display visibility. ESI is a function of display contrast, C, and background Luminance, Lb. It is calculated using the Relative Contrast Sensitivity (RCS) function of luminance. This program is most useful when recording field measurements of contrast.

288 Program Steps
Necessary Accessories: None, however, input variables can be obtained from field measurements using a photometer and Contrast/ESI Meter.

Documentation — $12.00 Cost of 3 cards — $3.75

01636-41 : VHF Radio Jamming

Program computes jam-to-signal ratios and communication ranges in a jammed or unjammed environment, using a smooth earth approximation. Input parameters include antenna heights and directional gains, transmitter power, frequency and bandwidth, required and tolerable signal-to-noise ratios, relative positions of the participants, and electrical constants of the earth. Program is arranged to facilitate evaluation of effects of changing input parameters.

201 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01686-41 : Voltage Wave-Form Analysis

This program provides a technique for analyzing voltage wave-form obtained from oscilloscope screen. The picture is divided into N equal parts and the Y value (voltage) of each segment is entered into calculator. Program computes effective (RMS) and average (AVR) values as well as Form and Crest factors.

100 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01703-41 : Loudspeaker Parameter Calculations

Program computes parameters of an unknown driver so that a box may be designed. Program requires measurements be made using a DVM, signal generator and a test box (to be made by user). Parameters supplied are: "FS", "Q", and "VAS".

102 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01769-41 : Closed Box Loudspeaker Design for Hobbyists

Program enables the hobbyist to demonstrate the characteristics of a given driver in various sized enclosures. Parameters computed are "F3" (cut-off frequence) and "QTC" (bass characteristics).

82 Program Steps

Documentation — $8.00 Cost of 1 card — $1.25

01777-41 : The Wire Calculator

Program simplifies wire sizing problems associated with aerospace electrical subsystem design and implementation. It solves for wire gauge, length, current, voltage drop, temperature and resistance. Basis is orbiter specification MB0150-048 (MIL-W-81381A) for nickel coated wire in sizes #26 thru #0 gauge. Provides for English or metric input/output data.

325 Program Steps
Necessary Accessories: 2 Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01984-41 : Bus Admittance Matrix of an Electric Power System

Computes the values of admittances between buses I-J, or the whole electric power system, given all the power lines parameters per unit length, number of buses and longitudes between buses. May be easily modified to be used as part of a load flow program. Number of buses should be < 23.

288 Program Steps
Necessary Accessories: Quad Memory Module for the HP-41C; (Card Reader and Printer optional)

Documentation — $12.00 Cost of 3 cards — $3.75

02031-41 : Oscilloscope Utility-Frequency to Timebase Conversion

End guesswork about timebase settings and/or frequency of observed waveform. Program converts user-input frequency to correct timebase settings (5, 2 or 1) X (100, 10, ..., or .001) (micro- or milli-seconds). Or user sets timebase and enters waveform "length" and program computes frequency and displays as Hz, KHz, or MHz. Saves time, reduces errors.

196 Program Steps
Necessary Accessories: None (Printer is optional)

Documentation — $12.00 Cost of 2 cards — $2.50

02034-41 : Skin Effect at High Power Frequencies with Litz Wire Option

This program calculates the effective increase in resistance of a cylindrical copper conductor at high power frequencies given the AWG and frequency. The option calculates the outside diameter of litz wire of the equivilent wire area along with the number of strands and the AWG of each strand.

167 Program Steps
Necessary Accessories: None; (Printer is optional)

Documentation — $12.00 Cost of 2 cards — $2.50

02065-41 : Approximates Bundle Diameter for Kapton Insulated Wire

Determines diameter and circumference of wire bundle. Basis is orbiter specification MB0150-0148 (MIL-W-81381A) for shielded and unshielded Kapton insulated nickel coated wire. 120 cable types/sizes from 1 to 7 conductors are included. Sizes range from either 0, 8, 12, or 16 through 26 gauge for various cable types.

295 Program Steps
Necessary Accessories: Three Memory Modules and Card Reader
Documentation — $12.00 Cost of 8 cards — $10.00

02086-41 : Truth Table - Combinational Circuits

Automatically plots the complete truth table (or just one particular state) for multiple-output digital circuits. Gates provided are inverter, 2-input AND, OR, XOR, NAND, NOR & XNOR. The number of inputs plus outputs is limited by available program and data registers. Maximum is 23.

146 Program Steps
Necessary Accessories: Printer is helpful.
Documentation — $12.00 Cost of 2 cards — $2.50

02241-41 : Sixth Order Vented — Box Design from Loudspeaker Parameters

Given the expected Q of the vented-box, and the Thiele / Small parameters of a loudspeaker driver, the program finds the box volume and tuning, auxiliary filter frequency and Q, the system cutoff frequency, and estimates the acoustic power output, for the three classes of sixth-order Thiele / Small / Benson alignments.

867 Program Steps
Necessary Accessories: Three memory modules for the HP-41C, and Printer.
Documentation — $14.00 Cost of 7 cards — $8.75

02285-41 : Power Factor Correction For Electrical Systems

This program calculates: (1) Capacitive KVAR to improve the power factor in electrical systems. (2) The capacitive KVAR for induction motors, according to HP. RPM, and starting torque. After KVAR standard values (from Mfg's Catalogs) are chosen the program solves for the resulting values of capacitor current, total combined current, power factor, KVA and minimum wire ampacity for capacitor connection.

205 Program Steps
Necessary Accessories: One memory module. Card Reader and Printer helpful.
Documentation — $12.00 Cost of 2 cards — $2.50

02379-41 : Three-Phase Cable Computer

This program permits an easy and fast method to determine cable's size in three-phase power systems. Both aerial and buried installations are covered, in four-pole, three single-pole lied and separated cables both in copper and aluminum constructions and for types to 1,100V. Program length is 665 bytes (95) registers), is recorded in three full cards plus a data card.

301 Program Steps
Necessary Accessories: One memory module and Card Reader. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02422-41 : Resistor Color Code Interpreter

This program prompts the user for two letter band colors, checks each band for validity, display all bands after last prompt, allow the user to easily edit any band, calculate the resistor value in proper alpha units, and display tolerance value. The user may view or edit the bands at any time after the last band has been entered.

255 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02425-41 : Stabilizer With Zener Diode or Gas Diode

This program computes the stability factor, output resistance, limiter resistance and maximum input voltage variation for specific parameters of this circuit.

135 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02426-41 : Voltage Multiplier

This program enables you to calculate the output voltage and ripple of a n section multiplier. Also, you can obtain the multiplier component value to have a predeterminate output voltage and ripple.

185 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02469-41 : Two Port Parameters Convertion

or more two-port networks. to find the new parameter matrix of a two port network formed by other two inverse transmission, h and g. The direct application is in the procedure most common two port parameters matrix. They are z, y, direct transmission, This program will compute any of the thirty (30) conversions between the

771 Program Steps
Necessary Accessories: Four memory modules
Documentation — $12.00 Cost of 6 cards — $7.50

02493-41 : Noise Figure Calculations

Program calculates noise figures for receivers and amplifiers using various types of noise generators. It also determines effective noise temperature (TR) and RMG noise voltage (MV/MHZ Bandwidth).

217 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02519-41 : Frequency/Plot Control

When called by a master program, this program requests inputs and furnishes frequencies (additive or multiplicative sequence) for calculation, controls storing of data as calculated, and controls plotting based on requested plot limits and axis. Other independent variables, such as time, may be substituted for frequency.

76 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

02520-41 : Op Amp Circuit Analysis

Calculates response of general op amp feedback amplifier, inverting or noninverting. Gives feedback factor, loop gain, error factor, and gain. Does not account for forward transmission through feedback impedance — usually negligible error. Much faster than matrix method. Requires Library program 02519-41 for frequency selection and plot control.

290 Program Steps
Necessary Accessories: 2 memory modules for the HP-41C. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02605-41 : Lighting Calculation-Pt by Pt Method For Single Fixture

This program calculates the initial footcandle level at a point on a horizontal or vertical surface from a single fixture using the point-by- point method as described by the IES Handbook. Also included is a useful program (subroutine) for interpolating data from a candlepower distribution curve.

128 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02667-41 : Lighting Calculation Point by Point For Multiple Fixtures

This program calculates the initial footcandle level at a point on a horizontal or vertical surface from a matrix of up to 16 luminaires using the Point by Point method as described in the IES Handbook. Program contains an interpolation routine for deriving data from a candlepower distribution curve.

231 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02688-41 : Difference Amplifier

This program computes the output voltage and the gain of difference amplifier in all this configuration: Input: Output: Input: Output: difference difference asymmetric asymmetric asymmetric difference common difference difference asymmetric

163 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02691-41 : Odd-Order Harmonics

The program calculates the maximum amplitude (peak value) and angle of phase of odd-order harmonics (up to the 11th), present in periodic multiple-curves, when given the ordinate values corresponding to twelve equally-spaced subdivisions of a positive semiperiod of the curve. Content of the stack register X (display) present before the execution, is preserved and displayed at the end of the run.

324 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02706-41 : Two Attenuators Circuits

This program computes the phase angle, gain, and center frequency or R.C. product of two attenuators circuits: Wien-Robinson Bridge and Double T Filter.

91 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02735-41 : Resistor Value to Color Code

This program will give you the colors on the first 3 bands for any resistor between .01 ohm and 99,000,000,000 ohms when the ohmic value of the resistor is input. Anything outside of these values is not a valid input for a color coded resistor and therefore will be rejected and also request a new value.

159 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

02769-41 : Transfer Function Analysis For Electronic Filters "MPPOLY"

MPPOLY, given a transfer function of a circuit ($T(S) = Poly : a/Poly : b$) and the operating frequency will find the output magnitude in volts and dB and the phase in degrees. Given a magnitude or phase, MPPOLY will find the frequency. Poly:a and Poly:b can be up to ninth degree polynomials.

465 Program Steps
Necessary Accessories: Three memory modules and Math Pac
Documentation — $12.00 Cost of 5 cards — $6.25

02816-41 : Delta-Y Transformations

Program transforms a Delta configuration to its Y equivalent and vice versa. Inputs and outputs may be either impedances or admittances in polar or rectangular form. These combinations make the program useful in 32 transformation cases! Program uses the HP-41C's alphanumeric capability to label inputs and outputs for each case.

277 Program Steps
Necessary Accessories: Math Pac ROM; X-Functions; One memory module for the HP-41C.
Documentation — $14.00 Cost of 3 cards — $3.75

02842-41 : What if? Predicting the Impact of Changes on Cost of ICs

An integrated circuit cost prediction algorithm discussed in Semiconductor International is expanded to predict (1) cost after reliability testing ICs; (2) sensitivity of cost to the thirteen variables in the equation; and (3) perform "what if?" analysis for IC design and process changes. An HP-41C program is given which calculates cost and sensitivity for given die size, process type and package type, and performs "what if?" analysis usually done on electronic spreadsheets. Two ICs are followed from prototype design decisions to a mature product cost reduction decision.

Necessary Accessories: Quad memory equivalent. Additional code is discussed which requires the X-Functions module and X-Memory module. Printer optional.
Documentation — $20.00 Cost of 16 cards — $20.00

02897-41 : Voltage Conversions For Sine Waves

Given any one of the four possible sine wave voltage types: average, RMS (effective), peak, or peak to peak this program will calculate the remaining three values using the appropriate conversion value.

147 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02950-41 : Symmetrical Component or Phase Calculations

This program converts three unbalanced vectors Va, Vb, Vc (Voltage, current or vectorlike impedance and admittance) into zero-, positive- and negative sequence symmetrical components Vasub0, Vasub1, Vasub2 or inverse. Vectors may be expressed either in polar (Magnitude V at angle theta) or Complex a+jb forms and converted from one form to another.

118 Program Steps
Necessary Accessories: Program is designed to be used with or without a printer
Documentation — $12.00 Cost of 3 cards — $3.75

02965-41 : Arithmetic Operations of Electrical Quantities

This program calculates: $+$, $-$, $\times$, $\div$, $1/x$, x^2, $x^{1/2}$, y^x for complex electrical quantities in rectangular and/or polar form. The result may be flag controlled by an outside program for chain calculations or converted between rectangular, polar and exponential form. Functions active in USER mode, automatically assigned to their own keys and uses no storage registers.

142 Program Steps
Necessary Accessories: Card reader optional
Documentation — $12.00 Cost of 2 cards — $2.50

02993-41 : Amplifier With Small Signal in the Low Frequency Transistor

With this program you can compute the performances of a low frequency transistor amplifier, gains and impedances, for different values of the components.

300 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

03040-41 : MTI Radar Response-Blind Speeds

The program computes the response in DB, of a radar with up to 15 discrete pulse repetition intervals (PRI's). The response is limited between 0 and -20 DB., since blindspeeds are primarily of interest. With printer formatted output as well as a plot is output. Minimum doppler velocity, maximum doppler velocity and increment between are user choices. Provision is made for extending formatted output and plots in doppler velocity.

221 Program Steps
Necessary Accessories: Full Memory

Documentation — $12.00 Cost of 3 cards — $3.75

03049-41 : Filter Approximations

This program gives you the Butterworth and Chebyshev functions for any low-pass, high-pass and band-reject filter approximation. You just need to know the pass-band frequencies, the maximum attenuation and the order; if you don't know the order, you should know the stop-band frequencies and the minimum attenuation. If for the requirements you have, the theorical order is, let say, n=2.1 this program can find (as an option) the second order approximation but the poles are calculated with n=2.1; this is a special technique used in the program. Full alphanumeric capabilities are used.

323 Program Steps
Necessary Accessories: One memory module and Math Pac

Documentation — $12.00 Cost of 3 cards — $3.75

03099-41 : Frequency Dependent Rejection Plused

Frequency dependent rejection (FDR), one of the terms used in calculating the interference-to-noise ratio, is an important consideration in many EMC analyses. FDR denotes the attenuation to off-tuned signals imposed by the combination of receiver selectivity and the fall-off of the emission spectrum of signals. This program may be used to estimate FDR when the interference signal consists of low-duty-cycle pulses, such as those emitted by ordinary radar systems.

105 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

03106-41 : Radar Range Equation (RRE)

Radar range problems involve eight variables including emitter power (P), antenna gain (G), frequency of operation (f), target cross section (J), noise temperature (T), distance in meters (R), receiver bandwidth (B), and receiver signal-to-noise ratio (S/N). This program allows the user to determine any one of the eight variables when the remaining seven are known.

159 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

03112-41 : Comparator Characteristics

Program can generate values for the comparator characteristics (Inverting and Non-inverting comparators) given the values of RI, RF, V ref, VZ1 and VZ2 or it can generate the original values, given the characteristics Vo+, Vo-, UTP and LTP.

365 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

03139-41 : Radar Displayed Pulse Count 'RDPC'

This program is used to estimate the electromagnetic compatibility (EMC) of a specified radar at a selected site. It utilizes an accepted performance criterion as the basis for assessing the EMC of the prospective radar installation. The radar characteristics and electromagnetic environment are analyzed to determine the pulse interference (displayed pulse counts... DPC on the PPI display). The DPC is then compared to the performance degradation threshold (DPC=100 pulses per scan) to determine compatibility.

178 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03200-41 : Temperature Drift of Resistances

Given the thermal coefficient of a resistor and the temperature variation, this program will calculate the resistance drift of the resistor. If you don't know the thermal coefficient rated to the temperature you want, the program extrapolates it from the nominal coefficient supplied by the manufacturer rated to any temperature. Also, if you want to know the thermal coefficient for the temperature variation or the nominal resistor value for a specified resistance drift the program will find it.

63 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03206-41 : Butterworth Filters

This program gives you the Butterworth function for any low-pass, high-pass, band-pass and band-reject filter approximation. You just need to know the pass-band frequencies, the maximum attenuation and the order; if you don't know the order, you should know the stop-band frequencies and the maximum attenuation. If for the requirements you have, the theoretical order is, N=4.1, this program can find (as an option) the fourth order approximation but the poles are calculated with N=4.1; this is a special technique used in the program. The full alphanumeric capabilities of the calculator are used.

256 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

03222-41 : Voltage Plot of Sin/Cos Source

This program allows the user to define a sinusoidal A.C. voltage source in terms of amplitude, phase angle, etc., for the purpose of plotting the voltage as a function of time. The program also allows for a D.C. source or constant to be present with the A.C. source. The program gives the user several options of outputs including parameters of the wave such as frequency, period, RMS(effective) voltage, and others.

254 Program Steps
Necessary Accessories: 82106A Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

03231-41 : Chebyshev Filters

This program gives the Chebyshev function for any low-pass, high-pass, band-pass and band-reject filter approximation. You supply the pass-band frequencies, maximum attenuation and the order. If order is unknown, you should know the stop-band frequencies and the minimum attenuation. If, for your requirements, the theoretical order is, N=5.1; this program can find (as an option) the fifth order approximation, but the poles are calculated with N=5.1; this is a special technique used in this program. The full alphanumeric capabilities of the calculator are used.

269 Program Steps
Necessary Accessories: One memory module and Math Pac.

Documentation — $12.00 Cost of 2 cards — $2.50

03234-41 : Multiple-Input (Feedforward) Biquad Filter Design

This program computes element values for any of the six standard Multi-Input (Feedforward) Biquad filters, namely, Low-Pass, High-Pass, Band-Pass, Band-Reject (Notch, Low-Pass Notch or High-Pass Notch), All-Pass and Gain-Equalizer. Inputs are capacitance C, gain K, pole-frequency WO, pole-quality factor Q, and zero frequency WZ or zero-quality factor QZ (if required). The program then prints out a list of elements which form the required filter.

113 Program Steps
Necessary Accessories: None, printer is optional.
Documentation — $12.00 Cost of 2 cards — $2.50

03247-41 : Phasor Operations for AC Circuit Analysis

This program adds, subtracts, multiplies, and divides phasors of the form R/O using the same keystrokes as operations with conventional numbers. If key assignments are used, string operations are possible. Nested operations, however, are not possible.

67 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03298-41 : Land Mobile Area Propagation Model

This program provides propagation estimates for land mobile service in 140-900 Mh3 range, using an adaptation of the Longley-Rice and Okamura models.

220 Program Steps
Necessary Accessories: 82162A Thermal Printer is desireable.
Documentation — $12.00 Cost of 3 cards — $3.75

03301-41 : Intermodulation Analysis

This program computes potential intermodulation products between n transmitters for m receivers, for a specified bandwidth centered on each receive frequency, and to a specified intermodulation order.

255 Program Steps
Necessary Accessories: 82162A Thermal Printer
Documentation — $12.00 Cost of 3 cards — $3.75

03353-41 : Numerical Inversion of the Laplace Transform

Transform Functions can be accommodated. programmed into the main program. Non-linear and transcendental Laplace given Laplace Transform Function. The Laplace Transform Function must be This program numerically calculates the Inverse Laplace Transform of a

87 Program Steps
Necessary Accessories: Printer; card reader is helpful.
Documentation — $12.00 Cost of 2 cards — $2.50

03373-41 : One Hop Microwave System Analysis

This program uses transmitter power, frequency and waveguide loss to compute signal levels through a one hop microwave link. Receiver input signal level is displayed in dbm, as is the signal level at each interface point in the system (ie. transmit dish output ERP at the beginning of the free space path). After initialization, program modules can be called from other programs to determine various system gains and losses as subroutines. Manufacturers data on waveguide loss characteristics required.

92 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 2 cards — $2.50

03391-41 : Zener Suppressed Voltmeter

Conventional mechanical suppression of the zero on a linear electrical measuring instrument requires: a)springs of a high aspect ratio; b)complete disassembly of and reclocking of springs; c)elimination of the normal zero corrector; d)possible cramping of the upper end of the scale. With this technique anyone can suppress the standard meter by simply following the program. Usually, the few network components can be mounted within the meter or on a deck connected to the rear terminals.

97 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03523-41 : Three Phase Current Calculations

When calculating three phase load on a circuit, the individual single phase loads must be converted to an equivalent three phase load, then added to the three phase load (if any).

127 Program Steps
Necessary Accessories: HP-41CX or equivalent required.
Documentation — $8.00 Cost of 2 cards — $2.50

J362 Electrical/Electronic Engineering Antennas

00632-41 : Distance on Earth's Surface Per FCC Rules

This program calculates the distance between two points on the earth's surface per FCC rules. Optional input prompting. Flag controllable decimal degree or d. MSS input format. Extremely useful for determining the distance to possible interfering broadcasting stations.

77 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00840-41 : Path Plot & Reflection Point

The path plot program (PP) plots the propagation path and Fresnel curve for a smooth earth condition or for conditions of uniform roughness. With a slight modification, the program can be used with diffraction paths. The reflection point program (r) determines the point of reflection as well as the incident and reflection angles for smooth earth conditions. This program utilized an indirect address routine and is 70 steps shorter than previously published programs. (see "Path Profiling with a Programmable Calculator" Lenkurt Demodulator, March/April, 1979). Linear graph paper necessary.

150 Program Steps
Necessary Accessories: Linear Graph paper necessary
Documentation — $12.00 Cost of 2 cards — $2.50

00873-41 : Tropospheric Scatter

The tropo program predicts the propagation loss of a radio wave in the tropospheric scatter mode. The program evaluates losses (or gains) due to elevation angles, determines antenna gain and beamwidth, and then calculates basic tropo loss and the aperture-to-coupling loss, based on beamwidth and effective distance. Topographic maps necessary.

132 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00923-41 : Polarization Loss

The polarization loss between two antennas of an elliptically polarized radiation pattern is calculated from the given axial ratios of the two antennas. This applies to the 4 cases of maximum and minimum loss and the same and opposite sense of polarization.

104 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01085-41 : Smooth Earth Diffraction

The Smooth Earth Diffraction (SED) program predicts the radio propagation loss relative to free space for smooth earth conditions or conditions of uniform roughness, of a path slightly beyond the radio horizon. This program uses a simplified method, developed by Vogler (1964), for the Standard Van Der Pol-Bremmer Diffraction Theory, as modified by Norton (1941). The program has a self check for validity.

356 Program Steps
Necessary Accessories: Two Memory Modules and data on Effective Earth Radius; (Extended Function Module is desirable)
Documentation — $14.00 Cost of 6 cards — $7.50

01223-41 : Effective Earth Radius

Given longitude and latitude, the program will compute the surface refractivity referred to mean sea level. Given the antenna height above mean sea level, the program computes: 1) the adjusted surface refractivity, 2) the refractivity gradient, 3) the true earth radius using Clarke's Spheroid of 1866, 4) the ratio of effective earth radius to true earth radius, k, and 5) the effective earth radius.

506 Program Steps
Necessary Accessories: Three Memory Modules and Topographical Maps or Altimeter
Documentation — $14.00 Cost of 14 cards — $17.50

01383-41 : Microwave Path Analysis

Analyzes path and link parameters for line-of-sight radio link: 1) obstacle clearance in terms of fraction of first fresnel zone, or number of Fresnel zones. 2) free space loss. 3) RF transmission line loss, given length and type. 4) received carrier intensity, given transmit power and parabolic antenna diameters.

169 Program Steps
Necessary Accessories: Card Reader desirable
Documentation — $12.00 Cost of 2 cards — $2.50

01385-41 : Cosine on a Pedestal Antenna Gain

This program computes the gain as a function of angle from boresite for a one dimensional antenna with a cosine on a pedestal aperture distribution. Beamwidth and pedestal height are selectable. Output is formatted when used with printer.

203 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01387-41 : Taylor Weighted Circular Antenna Gain

Computes gain of a circular antenna with a taylor weighting aperture distribution, as a function of angle with respect to boresite. User inputs antenna diameter, frequency of radiation and desired sidelobe level. When used with printer output is formatted.

418 Program Steps
Necessary Accessories: Two Memory Modules. Printer and Card Reader desirable.
Documentation — $12.00 Cost of 5 cards — $6.25

01825-41 : Rectangular Phased Array of Short Dipoles Gain Pattern

Computes the pattern gain of a rectangular phased array of short dipoles. User inputs number of elements, spacing, beam position, desired aperture weighting (uniform, Hamming, or Hanning) and azimuth cut. Gain is computed over a selected elevation angle range with desired increment. Plot available with extended Function module.

417 Program Steps
Necessary Accessories: 2 Memory Modules. Printer and Extended Function Module desirable.
Documentation — $12.00 Cost of 4 cards — $5.00

02017-41 : Path Losses in Land Mobile Radio Systems

This program solves A) Path losses calculation; B) Link calculation in land mobile radio systems for three kinds of terrains: small/medium city, large city, suburban or open areas.

758 Program Steps
Necessary Accessories: 2 Memory Modules and Card Reader
Documentation — $12.00 Cost of 4 cards — $5.00

02358-41 : Taylor Excitation Function For Linear Antenna

This program calculates the Taylor distribution across a linear antenna. This would be useful, for example, in calculating an antenna's radiation pattern in the near field or fresnel region for which simple analytic expressions do not exist and the fundamental antenna integral must be used. Inputs to the program are sidelobe level, number of constant sidelobes, source length to wavelength ratio, and position on source for which excitation value is desired.

139 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

02398-41 : Short Dipole over Ground Plane

This program calculates the far-field E- and H-plane radiation patterns of a short dipole antenna in close proximity to a ground plane. The interaction between the radiation and the ground plane is modelled using Fresnel plane wave reflection coefficients. The dipole may be either perpendicular or parallel to the ground plane.

304 Program Steps
Necessary Accessories: One Memory Module (41C only) and Library program #01931c required. Printer is optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02415-41 : Radar Equation

This program calculates any one of the variables in the radar equation given values for all the other variables. The program also calculates the single look probability of detection for both scintillating and non-scintillating targets. Slant range to ground and to airborne target can be calculated. There is also a subroutine to evaluate the effect of rain and other attenuating media on detection range.

570 Program Steps
Necessary Accessories: Two memory modules
Documentation — $14.00 Cost of 4 cards — $5.00

02453-41 : Geosycronous Satellite Pointing Calculation

Calculates azimuth and elevation of geosycronous satellites within a specified satellite longitudinal range. When a printer is attached, a plot of the satellites azimuth vs elevation can be generated. This plot is extremely useful when evaluating an earth station location. Local horizon elevations may be drawn by the user over the plot and antenna shading problems easily identified. Satellite pointing information may be printed in convenient table form also.

357 Program Steps
Necessary Accessories: One memory module. Printer helpful.
Documentation — $12.00 Cost of 14 cards — $17.50

02468-41 : Linear Array Directivity

This program calculates the directivity of an antenna consisting of a linear array of isotropic radiators as a function of look angle. The element positions and excitations (amplitude and phase) can be completely arbitrary; the spacings and excitations need not be uniform.

148 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02497-41 : Transducer Array Shading by the Dolph-Chebyshev Method

Chebyshev polynomials. Chebyshev method for shading an array, a practical application using needed to optimize an underwater transducer array beam pattern by the Dolph- This program leads the user through the calculation of the parameters

300 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02517-41 : Radio Point to Point Path Data Calculation

This program is designed to solve radio point to point path. Useful equations are used to compute attenuation vs clearance $A_0 = f(c/c.6; M)$ made by author himself. Computes distance, azimuths, free space loss, antenna system, profile, attenuation vs path by equations and received signal level at received port for engineering path completely.

515 Program Steps
Necessary Accessories: Two memory modules for the HP-41C. Card Reader convenient.
Documentation — $12.00 Cost of 5 cards — $6.25

02629-41 : Radar Tracking Systems Simulation

This program simulates the simpler dynamic processes associated with a radar target tracking system and their affects on signal to noise ratio. The gain functions of both the transmitting and receiving antennas an the target trajectory function are specified (and created) by the user. Other inputs include radar equation parameters and the two antennas second-order dynamical parameters for both vertical and horizontal motion. Output of the program is signal to noise ratio vs time–with or without printout.

452 Program Steps
Necessary Accessories: Three memory modules minimum and printer
Documentation — $12.00 Cost of 5 cards — $6.25

02818-41 : Gain Pattern, Principal Planes For H-Plane Sectoral Horn

The program calculates gain of an H Plane Sectoral horn for both principal planes (E & H). Inputs include waveguide and horn dimensions as well as radio frequency. Output is gain in both principal planes as a function of polar angle theta (THT). Printer output is formatted and may be specified without a printer the output may be designated to be point by point. Graphical output is also available with a printer and extended functions/ memory.

509 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 5 cards — $6.25

02825-41 : Aperture Diffraction and Antenna Patterns

This program calculates the radiation (power) pattern of an aperture in a planar screen from the known fields over the aperture. Program is applicable to plane-wave diffraction or radiation by an aperture antenna. Program results can also be applied to radiation by an antenna excited by a physical current distribution.

194 Program Steps
Necessary Accessories: One memory module. Card reader strongly recommended.
Documentation — $14.00 Cost of 7 cards — $8.75

02951-41 : VHF/UHF Path Data Calculation by Bullington and Rice Methods

This program is designed to solve mobil-base and base-base VHF/UHF radio path using K. Bullington and P.L. Rice methods. Computes: distance to horizon, losses by: earth curvature, D1D2D3 beyond line of sight, plane earth, free space, knife edge and rounded obstacle, trees and actual net gain at receiver port. Prompts for all important parameters involved in a well engineering system. Stores them in X-Module for review purpose.

709 Program Steps
Necessary Accessories: Two memory modules and X-Module. Card Reader convenient.
Documentation — $14.00 Cost of 7 cards — $8.75

03073-41 : Antenna Gain Off-Mainbeam

This program is useful as an approximation of off-axis antenna gain when actual pattern measurements are not available. The range of applicability is for antennas with mainbeam gains between 0 and 70 dBi. Given the mainbeam gain of an antenna, the program predicts the gain in any direction in terms of the angle between the mainbeam axis and the direction considered.

65 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

03099-41 : Frequency Dependent Rejection Plused

Frequency dependent rejection (FDR), one of the terms used in calculating the interference-to-noise ratio, is an important consideration in many EMC analyses. FDR denotes the attenuation to off-tuned signals imposed by the combination of receiver selectivity and the fall-off of the emission spectrum of signals. This program may be used to estimate FDR when the interference signal consists of low-duty-cycle pulses, such as those emitted by ordinary radar systems.

105 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

03106-41 : Radar Range Equation (RRE)

Radar range problems involve eight variables including emitter power (P), antenna gain (G), frequency of operation (f), target cross section (J), noise temperature (T), distance in meters (R), receiver bandwidth (B), and receiver signal-to-noise ratio (S/N). This program allows the user to determine any one of the eight variables when the remaining seven are known.

159 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

03139-41 : Radar Displayed Pulse Count 'RDPC'

This program is used to estimate the electromagnetic compatibility (EMC) of a specified radar at a selected site. It utilizes an accepted performance criterion as the basis for assessing the EMC of the prospective radar installation. The radar characteristics and electromagnetic environment are analyzed to determine the pulse interference (displayed pulse counts... DPC on the PPI display). The DPC is then compared to the performance degradation threshold (DPC=100 pulses per scan) to determine compatibility.

178 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

03241-41 : Azimuth and Elevation for Satellite Antennas

This program uses the antenna site latitude and longitude and the assigned orbital position of the satellite to compute the pointing elevation and azimuth angles for the earth station antenna. Also available, if desired, are the satellite elevation above the local horizontal plane and the slant range from the satellite to the earth station.

60 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03373-41 : One Hop Microwave System Analysis

This program uses transmitter power, frequency and waveguide loss to compute signal levels through a one hop microwave link. Receiver input signal level is displayed in dbm, as is the signal level at each interface point in the system (ie. transmit dish output ERP at the beginning of the free space path). After initialization, program modules can be called from other programs to determine various system gains and losses as subroutines. Manufacturers data on waveguide loss characteristics required.

92 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 2 cards — $2.50

03398-41 : Tilt and Angular Limits of a Phased Array

The tilt angle of a phased array antenna is computed by requiring equalization of angular coverage. This program inputs the angle of the array face from true north, the desired range of azimuth and desired elevation limits. The output is tilt angle and array scan limits in spherical coordinates and sine space.

146 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

J364 Electrical/Electronic Engineering Circuits

00325-41 : Amplifier Bode Plot and Solve

Given the midband open loop gain and the high and low frequency poles of an amplifier, this program will output the open loop gain and phase for any desired frequency. The program will also indicate stability directly by solving for the unit gain cross over frequency and displaying the phase at that frequency.

151 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00348-41 : Monostable Multivibrators

This program calculates the parameters of IC's 74121, 74122, 74123, 9600, 9601 and 555 in the monostable mode and of IC 555 in the astable mode. Given any two of the following parameters; r, c, and t, it calculates the third variable, signalling if it is beyond the operating range of the specific IC. For the astable mode it calculates the 4th variable given 3 of the following ra, rb, c and f.

273 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00368-41 : Logic I:800 Lean, Digital Circuit

This version of a digital circuit analyzer can handle (simulate) circuits with up to nine (inputs) (possibly more with extended memory). The program is unique in that it will also do symbolic logic (even multi-valued valued logic provided "and" = min(x,y); "or" = max(x,y)). It can thus be used to test the validity of logical arguments. The program is written so that the user may write, and key in, the simulation routine in an almost direct fashion.

112 Program Steps
Necessary Accessories: One Memory Module. Card Reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00410-41 : Zener Supply Design

This program calculates components values and power rating of a zener supply, in a 41C alphanumerical language. It saves time better than the current available programs.

45 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00415-41 : Pi and T-network Calculator with Plot Option

Calculates normalized reactances for pi- and t-networks. Inputs are source and load normalized impedances (either series or parallel). Outputs are series/parallel equivalents of source and load; values of jx2, jx3, jx4, jx5 for selected network; relative power response of network, with plot option.

334 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

00434-41 : Ohms Law with Dbm

Program will display labeled output of any of the four basic units, ie: volts, amps, ohms or watts, given any two values. It also converts watts to DBM, and DBM to watts. Converting DBM to watts automatically stores 50 ohms for voltage calculation. 82104A Card Reader is useful, but is not necessary.

192 Program Steps
Necessary Accessories: Card Reader useful but not necessary.

Documentation — $12.00 Cost of 2 cards — $2.50

00526-41 : Reactance Chart Nine Equations

The reactance chart provides a means of determining the missing values when any two values are known in any of nine resonance related equations. Frequency, inductance, capacitance, inductive reactance and capacitive reactance are used for output as well as input terms. Automatic selection of the proper equation is provided. When a computation is made, data is automatically stored so that subsequent computations can be made without reentry. Input and output data are alpha labeled.

233 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00545-41 : 555 Timer Astable

The pulse widths, frequency, duty cycle, timing resistors or timing capacitor may be calculated for the 555 timer, in 41C alphanumerical language (save time).

118 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00596-41 : "ANAP" Active Network Analysis Program

This program will calculate the transfer function, pole-zero locations, q(n) and f(n) of a six element op-amp feedback network. The network can consist of r's or c's and takes into account the non-ideal nature of the op-amp. The program allows for easy modification of op-amp or feedback parameters. Two memory modules necessary, printer optional.

475 Program Steps
Necessary Accessories: Two Memory Modules. Printer optional.

Documentation — $12.00 Cost of 5 cards — $6.25

00683-41 : Schmitt Trigger Design

Assists in design of two transistor Schmitt trigger circuit. Inputs are voltage thresholds, supply voltage, transistor type and load resistance. outputs resistance values and power dissipated by the load. All inputs are prompted and all outputs are labeled. Output valves loop continuously until interrupted.

118 Program Steps
Necessary Accessories: One Memory Module
Documentation — $8.00 Cost of 2 cards — $2.50

00686-41 : Combined Ohms and Power Laws, Parallels, Resistance and Resistor

Given any two of the four variables (P, V, I, R) remaining two values are displayed. Program also calculates the parallel resistance required given the total resistance and available resistance or two parallel resistances. Will also calculate max. and min. values of a given resistance with the tolerance given as either a colour or a number. All routines use clear prompts and labels with error display and auto RTN.

328 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

00742-41 : Audio Pads

This program will compute resistor values for audio pads of types h, t, o, and pi. The program will work for any impedence including unequal input and output values.

144 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00778-41 : LM381 Optimized Low Noise Preamp Design

This program allows lM381 dual preamplifier designs to be optimized for low noise. Input current density and high frequency roll-off are optimized. All inputs are prompted, all outputs are labelled and one or more parameters may be changed without re-entering all data.

173 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00799-41 : "Bode" Plot of Second Order Over 3rd Order Transfer Function

This program will plot the gain and phase of a second order over third order transfer function. The program is unique in that both gain and phase are plotted simultaneously by the printer (by use of a two variable plotting routine). Can be used with 00596-41.

260 Program Steps
Necessary Accessories: One Memory Module and Printer
Documentation — $12.00 Cost of 3 cards — $3.75

00854-41 : Closed Loop Power Supply

This program calculates the passive components of a closed loop power supply. In case of impossibility (initial conditions bad) the machine announces this with its alphanumeric capability.

210 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01018-41 : Network Match

Program computes component reactances of selected network. For lowpass, highpass, with minimum or selected q. Source and load parallel impedance are inputs to compute one or all networks (l, t, pi) and solutions. Bandpass may be selected by q. Series/parallel impedance conversion is provided.

226 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01033-41 : Bridged Tee Pad and Equalizer Design

Design, evaluate bridged-tee pads and dip equalizers. Equalizers may be single or stepped (variable) loss similar to Altec 9017,9013. Evaluate for in and out impedance,actual loss. Resistor values converted to 5% values from calculated values. Error may be plotted. Changes for non printer uses included.

890 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 8 cards — $10.00

01054-41 : Series-Parallel Rlc Transient Response

This program calculates the transient response of series and parallel rlc circuits. Given the component values, this program determines the type of damping and calculates all values required for the general equations given, the voltage or current given time, maximum values, setting time, and plots voltage or current.

573 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 6 cards — $7.50

01222-41 : Resonant Circuits

Easily determine the impedance, resistance, reactance, q, bandwidth, frequency, inductance, and capacitance of a series, parallel, or parallel resonant circuit with a shunt resistor, using this program. The alphanumerics of the HP-41C is utilized completely, for example, 80 PF will be displayed as such instead of 80 E-12.

404 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01341-41 : Resistive Pads

This program calculates the minimum loss between any two impedances. For unequal impedances an l-type minimum loss pad can be calculated. For equal and unequal impedances a t-pad or pi-pad can be calculated for values of loss greater than the minimum loss. Balances pad easily worked out from values given.

153 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01441-41 : Reduction of Circuit Diagram to Matrix Eigenvalue Problem

For a circuit of n nodes ($n \leq 10$), this program finds the matrix of order less than or equal to n, whose eigenvalues are (optionally) the poles or the zeros of the circuit. Allowed elements are: resistors, capacitors and voltage controlled current sources.

666 Program Steps
Necessary Accessories: At least 2 Memory Modules for the HP-41C. Card Reader helpful.
Documentation — $14.00 Cost of 8 cards — $10.00

01476-41 : Superheterodyne Tracking

This program permits ease and fast computation of tuning circuit constants employed in superhet's receivers. Several alternatives are considered in the program to cover padded oscillator circuits, padded or non-padded signal ciruits, plus an auxiliary method to determine tracking and tuning points. Program occupies 112 registers, recorded on 3 cards; documentation is 23 pages including examples.

338 Program Steps
Necessary Accessories: One Memory Module; Printer is optional
Documentation — $12.00 Cost of 3 cards — $3.75

01518-41 : Transistor Hybrid-Pi Model for Small Signal Amplifiers

Given the "h" parameters from a transistor data sheet, this program computes the hybrid-pi variables so that a linear model of the transistor can be drawn. The program prompts for all variables. All outputs will be printed if a printer is attached, printing the inputs is optional.

196 Program Steps
Necessary Accessories: One Memory Module (Printer optional).
Documentation — $12.00 Cost of 3 cards — $3.75

01526-41 : General Network Reduction Program

This program analyzes networks of up to 80 elements. Network elements allowed are resistors, capacitors, inductors, reactors, rigid voltage and current sources in any serial or parallel combination. Output functions are voltages, currents or impedances in any branch of the network. Either amplitude or phase transfer functions can be plotted.

442 Program Steps
Necessary Accessories: 4 Memory Modules for 80 network elements, printer if plots are desired.
Documentation — $14.00 Cost of 5 cards — $6.25

01572-41 : RC Circuit Table

Program prompts for input of resistance in ohms, capacitance in farads, the frequency range of interest and the steps of that range. The calculator will then generate a formatted table of the frequencies, the output voltage (as a percent of input voltage) and the phase angle between output voltage and input voltage.

111 Program Steps
Necessary Accessories: Printer
Documentation — $12.00 Cost of 2 cards — $2.50

01574-41 : PI-Network Impedance Matching

Program outputs the components of a PI-Network, lossless between two resistive impedances. Program prompts for the entry of impedance, #21 and #22, the operating frequency, f, and the desired system, Q.

118 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01577-41 : L-Pad Minimum Loss

Program outputs the L-Pad resistors R_1 and R_2 along with the system loss in decibels. Prompts are provided for the entry of the two impedances Z_1 and Z_2, required by the program.

86 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01612-41 : True Active Filter Design

This program calculates active filters with real available capacitors instead of ideal - non available - capacitors. In such a case, just the ripplefactor alpha has to be calculated, depending on the ratio C2/C5, which means Q(1/alpha) is changed (improved). The ratio C2/C5 is related to the low pass calculation.

236 Program Steps
Necessary Accessories: 1 Memory Module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01645-41 : Real - H, Y, and Z Parameter Transistor Characteristics

This program permits conversion between any real h, y or z - parameter matrix and/or common emitter, base, or collector circuit configuration. Given source and load resistances, the program calculates: input resistance, output resistance, insertion power gain, transducer power gain, available power gain, device voltage gain, system voltage gain and current gain.

473 Program Steps
Necessary Accessories: 2 Memory Modules for the HP-41C, Printer optional
Documentation — $12.00 Cost of 5 cards — $6.25

01655-41 : Copper Wire Gage Calculations

This automatically running program determines what copper wire gage # (14 AWG to 700 MCM) to use for electrical feeder and branch circuits. Its output satisfies the 1981 National Electrical Code. There are 5 data cards provided which allows user to choose between 25 different wire insolations.

267 Program Steps
Necessary Accessories: Quad or 1 Memory Module and Card Reader (Printer optional)
Documentation — $12.00 Cost of 8 cards — $10.00

01728-41 : Basic Electronics 01 — OHM's Law

This program provides interchangeable solutions with labeling for common OHM's Law equations involving voltage, current, resistance, power, charge, time, energy, conductance, and quantity of electrons.

238 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01792-41 : Ohm's Law and Power, for Design and Repair

Volts, ohms, amps and watts. Given any two, this program immediately finds the other two. Features include: Display rounding and labeling; a save option; simple re-use of any value. With printer, optional, prints double wide in blocks of four.

186 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01831-41 : Logic, a Simulation Program for Digital Logic Circuits

This program simulates the operation of a Digital Logic Circuit by operating on the input states given by the user to produce the corresponding circuit output states. The circuit may consist of up to forty to fifty logical gates of various types and have up to ten inputs and ten outputs.

635 Program Steps
Necessary Accessories: None
Documentation — $16.00 Cost of 6 cards — $7.50

01883-41 : Delta to Y, Y to Delta Conversion for Complex Impedances

Given the three complex impedances of a Delta or "Y" load, this program will calculate the equivalent impedances of the other type load. The complex impedances must be of the form (R + jX). The program prompts for all inputs.

183 Program Steps
Necessary Accessories: Printer is optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01897-41 : Series RL, RC, RLC Circuit Parameters

This program computes the following series-circuit parameters: RL circuit; inductive reactance, impedance, phase angle, RC circuit capacitive reactance, impedance, phase-angle, RLC circuit capacitive reactance, inductive reactance, impedance, phase ange, resonant frequency, and magnification factor, Q. All required data prompted for with alpha. All outputs labelled with alpha.

149 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01909-41 : CAD1 - Time Domain Analysis for Nonlinear Networks

This calculator-aided design program can perform DC or Time Domain analysis for arbitrary networks. Components allowed are linear L, C, R, independent current/voltage sources, current or voltage controlled current sources and user defined nonlinear devices. Modified companion models and Newton-Raphson algorithm are used. Outputs are all the node voltages.

649 Program Steps
Necessary Accessories: Minimum One Memory Module, Printer Helpful
Documentation — $12.00 Cost of 6 cards — $7.50

02003-41 : Short Circuit Calculation for 1 to 9 Buses

The program evaluates the three phase symmetrical short circuit currents for a power distribution system. It is capable of handling either radial or network systems for up to 9 buses. Inputs include bus voltages, available short circuit KVA, transformer ratings and impedances, cable reactances and resistances, motor horsepower and reactances.

446 Program Steps
Necessary Accessories: Three Memory Modules, and Printer
Documentation — $12.00 Cost of 5 cards — $6.25

02139-41 : Three-Phase Distribution Networks

This program is a powerful tool to resolve three-phase four-pole cables power distribution systems frequently used in lighting, public services, parks, industries and many other applications, permitting the user an easy and very fast computation of cable size to be employed to fulfill voltage drop specification at extreme loads. Program analyzes copper and aluminum buried installations and for 380V/50HZ or 220V/60HZ.

194 Program Steps
Necessary Accessories: One Memory Module; (Printer is optional)
Documentation — $12.00 Cost of 2 cards — $2.50

02291-41 : Wire Size Calculation - Millivolt Drop

This program calculates the voltage drop of any D.C. circuit and determines the gauge of (A.W.G.) stranded wire recommended for that circuit. Temperature, wire length, total number of connections, total number of terminations, and current draw of the load are prompted for and considered in the wire gauge selection.

192 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02377-41 : Bandspread For Comm. Receivers

This program permits an easy and very fast computation of constants involved in bandspreading of timing circuits for communication's receivers. Program occupies only 31 registers (215) bytes), is 109 lines long and is recorded in one full cord.

109 Program Steps
Necessary Accessories: Printer optional.
Documentation — $8.00 Cost of 1 card — $1.25

02406-41 : Ideal Diode Equation

This program solves the volt-ampere characteristic of an ideal diode at room temperature. The forward voltage is calculated in terms of its forward current, reverse saturation current, and equivalent series d-c bulk resistance of a diode without knowing the doping levels.

82 Program Steps
Necessary Accessories: Card Reader and Printer optional
Documentation — $12.00 Cost of 1 card — $1.25

02410-41 : Long Period Monostable

This program will calculate the output pulse width or the components of a CMOS monostable circuit. This circuit, based on the CD 4060, has an output range of 40 seconds to 250 hours. The program works with or without printer.

125 Program Steps
Necessary Accessories: Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02414-41 : n Complex Simultaneous Equations

Program will solve a system of n simultaneous equations with complex coefficients. Will solve for n=2 with one additional memory module, n=4 with two, n=5 with three, and n=7 with four or a Quad memory module. Tips included for using the Math Pac ROM to perform the same task. Also, tips included for using the Extended Functions module to decrease memory requirements.

364 Program Steps
Necessary Accessories: One memory module. Quad for 7 equations.
Documentation — $12.00 Cost of 3 cards — $3.75

02486-41 : Time Constants of RC Circuits

Program calculates TC- time constant, R- resistance, C- capacitance, NTC- number of time constants, t- time period, curve percent from the universal time constant chart, EC- capacitor voltage at charge and discharge, ER- resistor voltage at charge or discharge, and I- current at charge or discharge. Alpha prompts are used in the input and alpha labels used in the output.

273 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02487-41 : Time Constants of LR Circuits

Program calculates TC- time constant, L- inductance, C- Capacitance, NTC- number of time constants, t- time period, curve percent from the universal time constant chart, i- current @ maximum @ build up and decay, ER- resistor voltage @ build up and decay, EL- inductor voltage. Alpha prompts are used in the input and alpha labels used in the output.

283 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

02500-41 : Delta to y, y to Delta Conversion With Complex Impedances

This program changes the load configuration from delta to y or vice verse. The program prompts for all impedances that must be of the form R+jx.

141 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02640-41 : Transistor Parameter Conversion

Since manufactures' data sheets often provide the low-frequency hybrids parameters of a TRA in only one configuration (CE, CB, or CC). It may be necessary to convert the H-parameters from one configuration to another. This program will perform these conversions for you.

234 Program Steps
Necessary Accessories: One memory module. Printer and overlay helpful.
Documentation — $12.00 Cost of 2 cards — $2.50

02690-41 : Reflectometer Calculators

This program solves different conversion and calculations commonly used in microwaves/rf coaxial systems, such as: reflection coefficient, standing wave ratio (SWR), return loss and mismatch loss.

165 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02706-41 : Two Attenuators Circuits

This program computes the phase angle, gain, and center frequency or R.C. product of two attenuators circuits: Wien-Robinson Bridge and Double T Filter.

91 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02899-41 : Small Signal Transistor Amplifier Gain (BJT)

This program will calculate the voltage, current, and power gain for a small-signal transistor BJT amplifier. Configurations are common emitter, common base, and common collector. The calculations are valid for midfrequency only.

256 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03002-41 : Fast Delta to X and Y to Delta Complex Conversions

Given the three complex impedances of a Delta or Y load, this program rapidly calculates the equivalent impedances of the other type load. The complex impedances can be in rectangular or in polar form. The program prompts for all inputs.

152 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03055-41 : Trial-and-Error Resistor Paralleling, 8-Position, Feature

Eight keys correspond to resistor trial positions for loading and checking the inserted values; 5 others: insert "infinity" individually, insert-check a reference "desired value", calculate the exact next resistor that produces the D.V., calculate % error from the D.V., calculate resultant resistance, and reset the program. Works with ±, zero, and infinity, readout ENG 7E±99, fully prompted and labelled, speed sluggish but acceptable, makes any-precision, any-value resistors effectively from a very restricted stock.

240 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03200-41 : Temperature Drift of Resistances

Given the thermal coefficient of a resistor and the temperature variation, this program will calculate the resistance drift of the resistor. If you don't know the thermal coefficient rated to the temperature you want, the program extrapolates it from the nominal coefficient supplied by the manufacturer rated to any temperature. Also, if you want to know the thermal coefficient for the temperature variation or the nominal resistor value for a specified resistance drift the program will find it.

63 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03236-41 : Maximum Number of Rectangles in a Circle

Input diameter of circle, the rectangle's X and Y dimensions as prompted and the program computes four possible arrays, selecting the one that yields maximum number of die you may expect on your wafer, and the row and column count. The program also computes the best die array and count for step and repeat reticle for normal optical systems and Ultratech Steppers. Program is fully prompted.

411 Program Steps
Necessary Accessories: HP-41CV with Extended Function or HP-41CX

Documentation — $12.00 Cost of 3 cards — $3.75

03266-41 : Linear Circuits Response

Given a linear circuit, defined by the Laplace transform of the transference function (frequency domain) $H(p) = N(p)/D(p)$, where $N(p)$ and $D(p)$ are polynomials in p, and given an excitation function of any type, defined by the user, this program computes, prints and plots (or displays, if printer is not used) the response in the time domain. To do it, the program computes the numerical inverse Laplace transform, and the convolution integral with the user defined function.

477 Program Steps
Necessary Accessories: Quad memory module or HP-41CV; Extended Function module; one or more Extended Memory modules. HP-IL Module and HP82162A Printer are optional, but useful.

Documentation — $12.00 Cost of 4 cards — $5.00

03274-41 : Cauer Element Solutions

Program "CAU B" computes the values of elements in the Cauer-Ladder Electrical Network from the given Z(s) impedance or Y(s) admittance function. The same program will produce element values for two different networks according to their classification as "direct" frequency or "inverse" frequency types. The greatest order (N) is nine as the program is written.

77 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03275-41 : Cauer Network Functions

"CAU F" computes the coëfficients of the impedance (or admittance) function from the list of element values given for a Cauer-Ladder Network. This program is the reverse of "CAU B" program where element values are computed from the given function. Both of these programs share a common basic computational feature which operates upon terms interwoven into a stack. The greatest order (n) is nine as the program is written.

75 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03348-41 : Foster Network Elements

This dual program solves for the network element values in Foster Reactance Networks of either "Z" or "Y" types. Input data asks for finite pole and zero frequencies plus the particular frequency and the corresponding scale value of impedance or admittance at that frequency.

223 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

03378-41 : Bode Gain-Phase Calculations

This program employs data of the real component (gain or attenuation) to compute values of the imaginary component (phase) for network response functions. The real component is approximated by straight line sections between data points; the slopes of these sections and then incremental changes in slopes are used in the method presented by H. W. Bode.

245 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03391-41 : Zener Suppressed Voltmeter

Conventional mechanical suppression of the zero on a linear electrical measuring instrument requires: a)springs of a high aspect ratio; b)complete disassembly of and reclocking of springs; c)elimination of the normal zero corrector; d)possible cramping of the upper end of the scale. With this technique anyone can suppress the standard meter by simply following the program. Usually, the few network components can be mounted within the meter or on a deck connected to the rear terminals.

97 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03396-41 : Foster Network Elements R-C & R-L

This program computes element values when given the impedance (or admittance) function data. The input requires the number and frequencies of real nonzero zeros, the number and frequencies of poles, the magnitude of Z (or Y) at some particular frequency. The program will work any of the four types possible with R-C or R-L elements. Full identification and value are given for each network element. Absent elements are noted with values of ZERO or INF. to mark their special case.

295 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

03457-41 : Low Pass To Band Pass Transformations

Poles are selected upon the complex s plane so that they would produce a Low Pass F(s) response of desired shape and with bandwidth B as normalized to 1 unit scale. The program LP BP transforms each s plane pole to a paif of z plane poles so that the Band Pass F(z) response will have corresponding bandwidth B relative to 1 unit center frequency. The program then multiplies by some selected Scaling Frequency ws to place these Band Pass poles at the proper frequencies. Results are offered in rectangular or polar forms. The program also computes coefficients in the quadratic function form.

96 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25

03570-41 : Polynomial Frequency Response

This program computes frequency response from the polynomial form F (s) = P (s) / Q (s) as level (db.) and phase (degrees). The program also finds an Inverse Solution for frequency (wx) corresponding to some response level (Lx) by an Approximation Process.

251 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 3 cards — $3.75

J366 Electrical/Electronic Engineering Computers

02784-41 : Combinational Logic Analysis

Program finds a minterm expansion of a given 2 to 5 input combinational logic network consisting of AND gates, OR gates, exclusive OR gates and inverters. The minterm expansion is easily translated to a truth table.

108 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

J368 Electrical/Electronic Engineering Dynamic Systems

00543-41 : Root Locus Plot Construction

This program constructs the root loci of a transfer function with any combination of up to 21 poles and zeroes, real or complex. Program yields loci asymptotes and centroid, departure/arrival angles for all poles/zeroes, breakaway points for real axis loci, and intermediate locus points with corresponding k values.

496 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

00587-41 : Bode Plots

This program solves for the data needed to plot the frequency response (bode plot) of a given linear transfer function (magnitude ratio in decibels, and phase shift in degrees for each automatically indexed frequency-rad/sec). Transfer functions beyond eleventh order as well as nonminimum phase factors can be accomodated.

240 Program Steps
Necessary Accessories: One Memory Module and Printer
Documentation — $12.00 Cost of 2 cards — $2.50

00761-41 : Transient Response Analysis

Using the bilinear transform this program will solve for the time-domain response of any transfer function of the form $g(s) = n(s)/d(s)$ with up to fifth order numerator and denominator. Inputs can be a step, ramp or pulse and outputs consist of time, E(in) and E(out), can be used with 00596-41.

557 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C. Printer optional.
Documentation — $12.00 Cost of 5 cards — $6.25

00946-41 : Bode Analysis: Phase and Gain Crossover Frequencies

Given a transfer function gh(s), program finds magnitude and phase angle for any frequency without entering data more than once. Calculator can generate by itself a table for ten values of w. Also it finds the phase and gain crossover frequencies given a guess interval by the user.

546 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 7 cards — $8.75

01080-41 : Inverse Laplace Transform Solutions of Differential Equation

This program solves a variety of problems involving linear time-invariant differential equations up to 91 or higher order. The ability to evaluate F(S) for any S could be used to help find roots, aid in root locus plots, plot frequency response, etc. This program is easy to use and understand, especially with the prompting provided for coefficient entry and the ease of obtaining the residues or function of time components.

236 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01189-41 : Digital Filter

Design digital filters for digital control systems or synthesize digital simulations of analog systems. This program computes the digital equivalent of any 1st or 2nd degree continuous transfer function and then computes the frequency response and time response's of the digital form. Any degree possible by cascading elements. Complete prompting.

360 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01196-41 : Bode Plot of a General Transfer Function

This program plots and performs computations of the frequency response of a general mth order by nth order transfer function. It can plot up to about 75 points, compute break frequencies automatically, calculate gain and phase margins automatically, and offer direct comparison of two plots (useful in system compensation).

526 Program Steps
Necessary Accessories: Two Memory Modules. Quad Memory Module and Printer recommended.
Documentation — $14.00 Cost of 5 cards — $6.25

01261-41 : Multiloop Nyquist

Compute the nyquist response of a multiloop feedback control system. The number of loops and the degree of the transfer functions is limited only by the number of registers available. Continuous or sampled data systems may be analyzed.

300 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01418-41 : CONSIM

Control loop and process simulation. Process is user definable: up to 3rd order, gain, noise factor and deadtime. Controller can be P+I, PID, P+I Smith Predictor or PID Smith Predictor uses Dahlin tuning model. (Gain and 1st order time constant).

638 Program Steps
Necessary Accessories: Quad Memory Module and Printer.
Documentation — $14.00 Cost of 8 cards — $10.00

01681-41 : Four Degree of Freedom Spring Constants

A linear arrangement of five springs fixed at opposite ends and interconnected by four masses will have four resonant frequencies. This program calculates four of the five spring constants given the values of the masses, resonant frequencies, and one of the end spring constants. It then computes the eigenvectors. This program could be useful in evaluating the physical structure of a mechanical system using frequency response measurements.

601 Program Steps
Necessary Accessories: 1 Memory Module, Printer optional
Documentation — $12.00 Cost of 5 cards — $6.25

01793-41 : Root Locus Solver

This program finds real and complex roots of a closed loop system for user specified gain. Gain is easily changed to trace a locus. New trial roots readily find different loci. Storage is organized for any order. Twelfth order with twelve zeros requires only one memory module.

276 Program Steps
Necessary Accessories: One memory module.
Documentation — $12.00 Cost of 2 cards — $2.50

01916-41 : Multiloop Feedback Analysis

This program will reduce a multiloop feedback system consisting of up to 9 transfer functions to a single transfer function and will output the system characteristic equation. The user may define both closed loop and open loop (Nyquist) transfer functions and obtain their frequency responses (Continuous or discrete systems).

550 Program Steps
Necessary Accessories: 2 Memory Modules (more are necessary for large problems)
Documentation — $14.00 Cost of 5 cards — $6.25

01933-41 : Freq Response and Bode of a N Poles N Zeros Transfert FX

This progam gives the phase and magnitude (normal and in decibel), response of a transfert function with up to 279 poles and zeros (quad module). You don't have to re-enter the coefficients since they are stored. Integral control and phase lead compensation are easily performed. Recorded on only 1 card.

143 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02033-41 : Cascaded Noise Figure 2nd/3rd Order Intercept Point Analysis

This program provides noise figure, noise temperature, 2nd and 3rd order intercept points and intermod levels (both coherent & RSS) of a system with up to 50 stored elements. Friendly edits allow easy review/edit of stored values, easy add or delete of any element or temporary evaluation of any portion of the system.

612 Program Steps
Necessary Accessories: HP41CV or Quad Memory Module
Documentation — $14.00 Cost of 7 cards — $8.75

02231-41 : Third Order Ricatti Equation

This program determines the optimal feedback coefficients to minimize a performance index for a third order regulator. The algebraic matrix Ricatti equation is solved by a convergent iterative method. The system state equations must be transformed to phase-variable form for solution. The program is restricted to single-input systems.

206 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02237-41 : Fourth-Order Ricatti Equation

The optimal feedback gains to minimize a quadratic performance index for a fourth order regulator are determined by this program. The state equations for the system must be transformed to phase-variable form. The matrix Ricatti equation is solved using a convergent iterative method. The program is restricted to single-input systems.

280 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02840-41 : Convolution

Given the impulse response for a system and an input waveform, this program determines the output waveform by using the convolution integral. This integral is evaluated using the trapezoidal rule.

101 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02937-41 : True Frequency Response For a General Transfer Function

This program computes the true frequency response of any transfer function given as the quotient of two polynomials Q(s)/P(s) of any order or as the product of any number of complex and real poles and zeros placed on any part of the s-plane, there is no limitations on it. The program outputs the gain in decibels and the phase or the real and imaginary parts for a Nyquist diagram.

267 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

03266-41 : Linear Circuits Response

Given a linear circuit, defined by the Laplace transform of the transference function (frequency domain) H(p) = N(p)/D(p), where N(p) and D(p) are polynomials in p, and given an excitation function of any type, defined by the user, this program computes, prints and plots (or displays, if printer is not used) the response in the time domain. To do it, the program computes the numerical inverse Laplace transform, and the convolution integral with the user defined function.

477 Program Steps
Necessary Accessories: Quad memory module or HP-41CV; Extended Function module; one or more Extended Memory modules. HP-IL Module and HP82162A Printer are optional, but useful.

Documentation — $12.00 Cost of 4 cards — $5.00

J370 Electrical/Electronic Engineering Fields and Waves

00753-41 : Electro-Magnetic Wavelength Calculations

Program calculates the wavelength of a frequency or the frequency of a wavelength. Inputs and outputs are expressed directly in: hz., khz., mhz., ghz., inches, feet, mm, cm, or meters. Program will also do metric length conversions using a 9 digit conversion factor.

264 Program Steps
Necessary Accessories: One Memory Module. Printer and Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00913-41 : High Resolution Plot of Harmonics of Pulses

This program calculates and plots for given data: Pulselength, pauselength, amplitude, 1st wanted harmonic, Y min. and Y max. The highest for the plot admissable harmonic is calculated and stored as X maximum. In the case the plot exceeds Y maximum, instead of the plotmark — which is not a recognizable value — the numerical value is printed at the right hand side of the plot.

484 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C. Printer and Card Reader optional.

Documentation — $12.00 Cost of 4 cards — $5.00

01197-41 : Microstrip Design

Given substrate dielectric constant, substrate thickness in mils, desired characteristic impedance, and the frequency in GHZ, this program computes W/H and the length of a quarter wave of microstrip transmission line. Hammerstad's Equations are used to calculate W/H, and Getsinger's Equation optionally corrects line length for dispersion.

249 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01226-41 : Wavprop-VHF/UHF Free-Space/Plane-Earth Wave Propagation

Replaced nomographs used for free-space and plane-earth VHF/UHF field-strength, distance and terminal voltage calculations program prompts inputs not previously entered, when required. Features include view, change input parameters anytime. Plane-earth results automatically checked not to exceed free-space values. Extensive subroutine usage minimizes memory requirements.

281 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01386-41 : Resonance Region Radar Cross Section of Thin Wires

Program computes monostatic radar cross section of perfectly conducting thin wires in the resonance region. Input consists of wire length and radius, radiation frequency, and polarization angle. Output is RCS over the desired range of incidence angles at the desired increment of incidence angle. User has option of obtaining average RCS.

465 Program Steps
Necessary Accessories: One Memory Module and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

01796-41 : Cylinder Radar Cross Section

This program calculates the bistatic radar cross section of a totally reflecting, nonabsorbing circular cylinder for a plane wave incident perpendicular to the cylinder axis. The polarization can be at any specified angle to the cylinder axis. Restrictions on the cylinder size and radiation wavelength are minimal.

379 Program Steps
Necessary Accessories: One memory module required.

Documentation — $12.00 Cost of 3 cards — $3.75

01870-41 : Strip Transmission Line Design

This program designs and analyzes strip transmission lines using S.B. Cohn's formulas. Given the ground plane spacing, strip thickness and desired impedance it iterates to find the strip width. Alternatively, the impedance for a given strip width may be calculated. (This program should not be confused with the microstrip programs).

213 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01895-41 : Sphere Radar Cross Section

This program calculates the bistatic radar cross section of a sphere. The index of refraction must be real-valued, but it is otherwise unrestricted. There are also no restrictions on the object's size or radiation wavelength.

384 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01931-41 : Fresnel Reflection Coefficients

This program calculates the Fresnel amplitude reflection coefficients for an electromagnetic wave incident on an interface separating two media. Both states of polarization are considered and the relative index of reflection can be complex.

141 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02012-41 : Rayleigh Scattering Spheroid Radar Cross Section

This program calculates the (Bistatic) radar cross section (RCS) for a spheroidal particle with size and refractive index much smaller than the radar wavelenght. Another restriction is that the polarization must be parallel to the spheroid's axis of symmetry. The index of refraction may be complex.

126 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02028-41 : Cylindrical Waveguide

This program calculates the electric and magnetic field components in a cylindrical waveguide. Inputs to the program are: mode desired by user, position at which fields are to be calculated, radiation frequency, electrical properties of propagation medium, cylinder size and the mode cut-off frequency parameter.

354 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

02111-41 : Spectrum Analysis by the Maximum Entropy Method

The maximum entropy method (MEM) is a frequency estimation enhancement technique which provides accurate frequency. Measurements where the usual periodogram or discrete power spectrum (computed by the FFT) fails to yield frequency measurements.

508 Program Steps
Necessary Accessories: Quad Memory Module is recommended, however, 3 Singles will work.

Documentation — $12.00 Cost of 5 cards — $6.25

02187-41 : Listing of Data of Harmonics of Pulses

Program calculates for given parameters - pulselength, pauselength, amplitude and highest wanted harmonic - following data: Harmonic number, amplitude of the harmonic and phase-angle phi and lists them in the same order.

242 Program Steps
Necessary Accessories: One memory module, and Printer. Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02198-41 : Propagation Path Loss

This program calculates the mean path loss between two antennas over irregular terrain (land or water). The user is prompted for all data and data tables are provided. The user can also calculate the path loss not exceeded between 10% and 90% of the time and plot the loss as a function of distance if a printer is available. For frequencies of 20 MHz or higher.

2914 Program Steps
Necessary Accessories: HP-41CV. Card Reader or Digital Cassette Drive recommended

Documentation — $25.00 Cost of 28 cards — $35.00

02227-41 : Sphere Radar Cross Section

This program calculates the Radar Cross Section (RCS) of a metal sphere, commonly used for calibration, by the (exact) Mie Series solution algorithm by Bechtel, iterating on frequency. If a printer is used, a nicely formatted 2-column table of frequency and RCS data (dBSM) will be printed.

398 Program Steps
Necessary Accessories: Two memory modules. Printer desirable.

Documentation — $12.00 Cost of 4 cards — $5.00

02230-41 : Multi-Access Rural Telephone System Intermodulation Products

This program computes and displays full intermodulation products in schemes of 7*8 channels that are possible in a radio multifrequence rural telephone system. It additionally computes and displays 3rd and 5th IMP with two and three transmitters. Note: Program takes a very long time to generate output.

359 Program Steps
Necessary Accessories: Two memory modules. Card Reader optional.

Documentation — $14.00 Cost of 4 cards — $5.00

02397-41 : Dielectric Sheet Electromagnetic Wave Transmission

This program calculates the efficiency at which a planar sheet of dielectric material transmits electromagnetic energy contained in a plane wave incident on the sheet. Attenuation effects in the dielectric and phase effects are also considered.

350 Program Steps
Necessary Accessories: One Memory Module and Library program number 01931-41.

Documentation — $12.00 Cost of 4 cards — $5.00

02618-41 : Dielectric Sheet E-M Wave Reflection Efficiency

This program calculates the ratio between the electromagnetic power reflected from a planar sheet of dielectric material and the power that is carried in a plane electromagnetic wave incident on the sheet. Multiple reflections inside the sheet and the associated attenuation and phase effects are included.

321 Program Steps
Necessary Accessories: One memory module and Library program 01931-41. Library program 02397-41 recommended.

Documentation — $12.00 Cost of 4 cards — $5.00

02825-41 : Aperture Diffraction and Antenna Patterns

This program calculates the radiation (power) pattern of an aperture in a planar screen from the known fields over the aperture. Program is applicable to plane-wave diffraction or radiation by an aperture antenna. Program results can also be applied to radiation by an antenna excited by a physical current distribution.

194 Program Steps
Necessary Accessories: One memory module. Card reader strongly recommended.

Documentation — $14.00 Cost of 7 cards — $8.75

03373-41 : One Hop Microwave System Analysis

This program uses transmitter power, frequency and waveguide loss to compute signal levels through a one hop microwave link. Receiver input signal level is displayed in dbm, as is the signal level at each interface point in the system (ie. transmit dish output ERP at the beginning of the free space path). After initialization, program modules can be called from other programs to determine various system gains and losses as subroutines. Manufacturers data on waveguide loss characteristics required.

92 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 2 cards — $2.50

03417-41 : Acoustic Design

A "what if" program; menu driven, fully readdressable, input protected and crashproof, for use in the design and/or modification of microphone- loudspeaker systems and/or their acoustic environments. Given room dimensions or area/volume figures and reverberation time or surface absorption coefficients, the program constructs a mathematical model of a room into which any sound source may be inserted, and its performance analyzed as to presence, clarity, and level at any given distance.

822 Program Steps
Necessary Accessories: None.

Documentation — $14.00 Cost of 9 cards — $11.25

J372 Electrical/Electronic Engineering Transmission Lines

01761-41 : Transmission Line Simulator

This program simulates an electrical transmission line by inputting impressed voltage, initial voltages, line impedances, element time length, problem length, and line losses per element. The calculated voltages are stepped from one line element to the next while being modified to simulate line losses and impedance mismatch. Up to 85 elements can be simulated with a quad memory with any number of time steps desired.

270 Program Steps
Necessary Accessories: Printer, Quad Memory

Documentation — $12.00 Cost of 5 cards — $6.25

02252-41 : Frequency Coordination For Broadcast Auxiliary Microwave

A comprehensive series of programs utilizing the HP-41 computer system. Programs provide for: data searching, viewing/updating of files, and interference calculations for microwave frequencies. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

Necessary Accessories: 82160A, Ext. Mem 82181A, Optional: AutoStart 41-15042. 82161A Cassette, 82143A or 82162A Printer, 82180A Ext. Func., HP-IL Module

Documentation — $25.00

02880-41 : Transmission Lines: Line Inductance & Line Capacitance Calc

This program will compute the transmission lines impedances in single or three phase of single circuit with one conductor or multiconductors (bundle-conductors) lines. The impedance calculation includes line inductance [H/M] and inductive reactance [ohm.mile], line capacitance [F/M] and capacitive reactance [ohm.mile], with or without earth effect taken into consideration. This program also takes care of the common tranmission line arrangements.

338 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03244-41 : Transmission Lines Calculations — Lumped Parameters

This program will compute the phasors values of J sending, power angle, I sending, and load angle. The given parameters are; J receiving (as reference), I receiving or MVA rating or MW rating and power factor (minus sign for lagging and plus sign for leading), and the characteristic of the transmission lines Y and Z values. This program is applicable for PI and T circuit representation of the transmission lines. The voltages are given in line-line voltages.

203 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03579-41 : Reel Sizes and Capacities for Wire and Cable

This program will calculate the amount of round cable a given reel size can hold. The cable diameter, flange diameter, traverse width, and drum diameter are the required inputs. A safety factor incorporated into the program provides a clearance equal to two inches, or one cable diameter, whichever is the larger. It is helpful when writing or checking cable specifications for power utility or industrial applications.

170 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

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CIVIL ENGINEERING

J300 Civil Engineering
J302 Civil Engineering — Environmental Engineering
J304 Civil Engineering — Hydraulics
J306 Civil Engineering — Soil Mechanics
J308 Civil Engineering — Structural Engineering
J310 Civil Engineering — Transportation
J312 Civil Engineering — Urban Planning

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

J300 Civil Engineering

00451-41 : Mwall/Masonry Shear Wall Design

This program uses evaluation based on static equilibrium of sum(fv)=0, sum(m)=0 to analyze a reinforced masonry shear wall. All data is imput by indirect control and the proper alpha prompts. The solution is automatically printed, if the printer is attached.

213 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

00454-41 : Circon/Circular Concrete Column Biaxial Bending

"Circon" computes the ultimate capacity for a circular concrete section subject to a given moment about two perpendicular axes, and given axial load. The section may have up to 62 reinforcing bars placed in either a circular or square pattern. The method of analysis is based on ultimate strength design following A.C.I. 318-77.

599 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 6 cards — $7.50

00460-41 : 41C Rectangular Corner Walls Calculations

Performs structural calculations on rectangular reservoir walls near corners. This program splits vertical and horizontal loads previously determined by calculating elastic deflections in both directions, and processes them in order to get reactions and bending moments using any consistent system of units.

289 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00466-41 : Drilled in Concrete Piers-Sands

Program computes estimated drilled-in concrete pier capacity in predominantly sand type soils. Labeled output includes shaft and base resistance, ultimate and allowable pier load for diameters of 12 through 42 inch varying by 6 inch increments. One, two or three varying soil stratas are considered.

233 Program Steps
Necessary Accessories: Printer
Documentation — $12.00 Cost of 2 cards — $2.50

00468-41 : Cable

This program solves a variety of problems involving cables suspended between two points at the same elevation. Solutions are based on the assumption of uniform load per unit of horizontal projection; leading to the parabolic form of cable so often substituted for the true catenary form.

157 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00516-41 : Earthwork and Paving Estimations

This program calculates import and export earth and keeps a running total of cubic yards along with asphalt and aggregate base rock tonnages. Calculates amounts of sand, baserock, asphalt and earth needed. Three construction options are included: paving areas, building pads and landscaped or dirt areas.

290 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

00575-41 : "Tiltup" Tilt-Up Wall Design

A program for the design of tilt-up concrete walls using the strength design method, with tilt-up walls the presence of lateral loads and high eccentricities, together with the influence of variable inertia, and effects of deflections, presents a complex problem. By the use of numerical methods and the HP-41C this program provides a ready solution.

281 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

00589-41 : Composite Section Properties

Computes location of neutral axis, moment of inertia, radius of gyration and cross section area for any section comprised of an unlimited number of the following shapes: cylinders (hollow or solid), rectangles (parallel to reference datum) and shapes, which are shapes about which area, moment of inertia and location of centroid are known (e.g. Structural shapes).

129 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00603-41 : Cantilevered Retaining Walls

This program finds the required footing width and key depth to satisfy the soil bearing requirements for a given wall height and soil data. It then calculates factored moments and shears at three places on the wall, and at four places on the footing.

750 Program Steps
Necessary Accessories: One Memory Module and Card Reader
Documentation — $12.00 Cost of 6 cards — $7.50

00652-41 : Constant Head Permeability

This program calculates the permeability from a constant head permeability test. The variables in the formula are shown automatically, these may be input by pressing the value then the corresponding key. Q must be entered last as this computes the permeability. To review values press corresponding top row key.

100 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00674-41 : Sieve Analysis and Soil Moisture Content

This program calculates cumulative percent retained, percent finer, and sample loss given total sample weight and weight retained on each screen. It also calculates weight of water, weight of dry soil, and percent moisture given wet and dry sample weights and dish weight.

120 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00678-41 : Deflections by Area Moment

Using previously established moments and their respective locations along a beam this program will calculate the deflection and slope of user controllable points to the elastic curve of the given beam. For beams with less than 21 points of input no modules are required.

158 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00704-41 : Deflection of Beam with Variable Section

This program finds and plots the deflection of a beam of varying cross section by two successive graphical integrations of the M/EI diagram. The beam must be supported at two points, but may overhang both or either support.

233 Program Steps
Necessary Accessories: One Memory Module and Printer
Documentation — $12.00 Cost of 2 cards — $2.50

00746-41 : Structural Excavation and Comp-Active Backfill for Pipes

This program computes quantities for structual excavation and compactive backfill for cross drains or side drains according to Idaho specifications as shown on standard drawing D12. User is allowed to choose trench widths or specify defined maximums.

204 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00781-41 : Percent Passing for Aggregate Production Control

This program solves for the percent of aggregate passing the following screen sizes: 1 in., 3/4 in, 1/2 in, 3/8 in, no. 4, no. 8, no. 16, no. 30, no. 40, no. 50, no. 100 and no. 200. The above are both fine and coarse screen sizes that are commonly used by various highway departments to control aggregate production. Required input, are wet and dry sample weights and the accum. Weight on the desired screens.

168 Program Steps
Necessary Accessories: One Memory Module
Documentation — $8.00 Cost of 2 cards — $2.50

00782-41 : 36 Beams

Six loading cases (concentrated load, moment, externally created angular or transverse deformation, partially uniform or triangular load) and six ends restrain (t for theta, y for deflection, m and v, moment and shear; a and b the ends, restrain are (listed are zero): (ta,tb,ya,yb); (ya,ma,yb,tb); (ya,yb,ma,mb); (ma,va,yb,tb); (ta,va,tb,yb); (ta,va,yb,mb) for constant beam. Memory module may be necessary for complex cases.

515 Program Steps
Necessary Accessories: Memory Modules may be necessary for complex cases.
Documentation — $12.00 Cost of 4 cards — $5.00

00789-41 : Determination of Reactions in a Continuous Beam

This program calculates the reactions in a continuous beam with point/s (single or multiple) or uniform (partial or full) loads or a combination of these loadings. There is no limit to the number of spans. Only six data registers are used for storage.

150 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00831-41 : Principal Stresses at a Point (Three Dimensional Case)

This program finds the normal and shearing principal stresses at a point given the stress tensor components at that point. The method of solution is explicit in form, thereby eliminating excessive execution time required for the solution of the invarient cubic equation.

198 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00837-41 : Monorail Moments Under Moving Load

A continuous beam, up to 7 spans, is run by a moving load. It gives, beginning with first span, and progressing automatically to remainder spans, the left support moment (l.m.), the right support moment (r.m.), and the positive moment under the load, at each point, according to pre-set interval.

262 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00878-41 : Bearing Pile

Program calculates the bearing capacity of a single pile using Janbus' formula. Based on the effort used to drive the pile into the soil. Program calculates ultimate capacity for steel, wood, and concrete piles.

184 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00902-41 : Continuous Beams Through Fixed Points

Calculates continuous beams, 2 to 7 spans, plus 2 cantilevers. Each span assumes different length and inertia, uniformly distributed load, and unlimited amount of concentrated loads. Accordingly, suits well to any type of load distribution, even not functionally defined, since it can be discretized as thinly as necessary.

339 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 3 cards — $3.75

00914-41 : Bending Moment Plotting

Calculates a bending moment diagram plot for a simply-supported beam, cantilever, propped cantilever, or fixed-end beam. Eight load types can be superimposed for any required bad input. The number of points for plotting is selected by the user. Program prompts for input. Any consistent units can be used.

509 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

00930-41 : Efficient Utilization of Fumigating Sheet

Fumigation is often performed in a tarpaulin-covered stack. For a given tarpaulin the treatment volume depends on the manner of stacking. This program calculates the dimensions of the stack yielding maximum volume that can be covered for a given tarpaulin or the dimensions of the tarpaulin required to fully cover a given stack. Instructions are fully integrated into the program and one only needs to answer the prompts after "stack" is exq'd.

Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00931-41 : Effective Orifice Area for Pressure Relief Device

R the API-ASME formula, applicable to selection of pressure relief devices designed to protect tanks containing volatile liquids. The formula relates pressure, molecular weight and vapor temperature. With prompting features, the usage directions are an integral part of the program, also featured is a routine whereby those variables remaining unchanged from the previous calculations need not be re-entered.

165 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00932-41 : Volume of Air at High Temperature and Pressures

For air at high temperatures and pressure, this program provides interchangeable solutions for the equation relating specific volume, pressure and temperature. One inputs the variable prompted for, followed by (R/S). If the variable prompted for is the unknown, one simply pushes (R/S). After all three variables are handled in this manner, the program determines which variable is the unknown and solves for it.

84 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00933-41 : Cost of Pumping

This program provides interchangeable solutions for the equation relating cost of pumping the liquid to cost of power, dynamic head, specific gravity, efficiency of motor & pump. The alphanumeric capabilities of the 41C fully utilized, instructions are built into the program and one only needs to enter the variables prompted for. For repeat cases where some variables remain unchanged, provisions are made so they need not be re-entered.

93 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00937-41 : Practical Signal Timing

This program computes "practical" cycle intervals (level of service "c" or "e") for fixed time traffic signals, for any number of phases. Amber times, vehicle green times, pedestrian green times, volume to capacity ratio and an estimate of the number of vehicles which could pass through the intersection, for each phase, during the design hour, for the given cycle length.

452 Program Steps
Necessary Accessories: Two Memory Modules. Card Reader and Printer optional.

Documentation — $14.00 Cost of 5 cards — $6.25

00939-41 : Steel Baseplate Design Program-Columns w/or w/o Base Moments

The program calculates the bolt tension and steel plate thickness of steel column baseplate using criteria in the AISC Steel Construction Manuals - 8th Edition. It also solves base plates with applied moments using a method presented in a recent AISC Engineering Journal. Another companion program is available for use with a printer.

232 Program Steps
Necessary Accessories: One Memory Module and Card Reader

Documentation — $14.00 Cost of 5 cards — $6.25

00950-41 : Section Properties of Structural Members

This program calculates section properties of plane areas that can be represented as a composite of elements having standard shapes or having predetermined properties. The seven standard shapes have been chosen so that most number cross-sections in structural practice can be represented as a composite of the standard shapes.

674 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 6 cards — $7.50

01009-41 : Beam with Varying Moment of Inertia, Stiffness, Fixed-End Moments, Carry-Over Factors

For a beam of any variation of moment of inertia and any loading, program computes stiffness, fixed-end moments and carry over factors.

237 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01029-41 : Strum1 — Structural Miscellaneous Programs

"STRUM1" is a combination of 5 structural programs 1.) A.C.I. 318-77 approximate moments 2.) A.C.I. 318-77 rebar development 3.) rigidity of walls and piers 4.) moment magnification factor for concrete columns 5.) earthquake forces and shears using the static method of the 1979 uniform building code. All on seven cards and are user controled, auto exec.

676 Program Steps
Necessary Accessories: Three Memory Modules. Card Reader and Printer optional.

Documentation — $14.00 Cost of 7 cards — $8.75

01044-41 : Superbeam

Calculates reactions, shear and bending moment at any point, locates points of zero shear, plots shear and bending moment diagrams for any beam with two reactions, cantilever spans at ends if desired. Addressing routine packs all load data into lowest numbered registers maximizing register usage. Up to 22 point loads or moments, or 11 trapezoidal or 15 uniformly distributed loads, or combinations.

666 Program Steps
Necessary Accessories: Three Memory Modules and Printer

Documentation — $14.00 Cost of 6 cards — $7.50

01047-41 : Truss Joint Stresses

Equations of equilibrium are applied to a section taken around a statically-determinant truss joint. Stresses in the truss members are obtained by solving simultaneous equations. The resulting stresses are optionally resolved into x-y components for each member.

169 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01081-41 : Piles Under Rigid Block

Determines piles reactions where a pile cluster supports a concrete rigid block that is subject to a generalized loading, i.e. 3 component forces rx ry rz and 3 component moments mx my mz.

161 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01083-41 : Stationing

This program will calculate and print the stationing points for a straight line or a curve line. Also, given the proper curve information the (highside) outside and (lowside) inside curve distances can be calculated from centerline stationing or the reverse is true.

141 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01122-41 : Column Loads - S.I. and Imperial Units

Program prompts for the level number, area, dead loading, live loading, and extra dead load. Live loads are reduced with one of two formulas inputs and compute column loads are printed, input for next lower level are prompted – pressing R/S will repeat value of previous level. Output is complete, self contained.

190 Program Steps
Necessary Accessories: One Memory Module and Printer

Documentation — $12.00 Cost of 6 cards — $7.50

01123-41 : LSD Steel Beams S.I. and Imperial

Limit states design of steel beams subjected to one of 5 loading types. Live and dead loads are kept separate. Required I is calculated based on greater of live load or total load deflection limits which are set by the user. Output is complete and self contained.

427 Program Steps
Necessary Accessories: Two Memory Modules and Printer

Documentation — $14.00 Cost of 9 cards — $11.25

01130-41 : Wood Design

This program can solve a variety of problems involving a simply supported wood (or other homogeneous material) beam under a uniform load. Calculations include determining horizontal shear, flexural stress and deflection, or when allowable values of the preceding are known, the program can calculate the minimum beam depth for a given width, maximum span length, or maximum uniform load.

332 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01154-41 : Retaining Wall Loads

Program calculates the resultant force against a wall generated by both the soil itself and uniformly applied surcharge load. Surcharge can be of any width and can be applied at any distance from the wall. Either active or passive soil pressure can be specified. Printer is not used.

399 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

01161-41 : 3-Axis Weight, Cg, and Inertia

This program calculates the total weight, center of gravity, mass moments of inertia, and principal axis angles given a 3-dimensional set of mass elements whose weight, center of gravity, and centroidal inertias are known.

224 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

01168-41 : Slope Stability Analysis

This program initially computes the factor of safety for Slope Stability Analysis using the ordinary method of slices (OMS). This value is then used to compute the factor of safety using Bishop's Method. The program prompts for all necessary input and tells you what to do next.

460 Program Steps
Necessary Accessories: One Memory Module for 19 slices - Two Memory Modules for 35 slices.

Documentation — $12.00 Cost of 5 cards — $6.25

01174-41 : Buttress Design

Cut slopes in bedrock having an adverse direction of bedding (dip out of slope) are commonly stabilized through the construction of a fill material buttress. Soil parameters and slope dimensions are inputted, and the buttress dimensions are sized to prohibit translational failure parallel to planes of bedding.

1006 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV.

Documentation — $14.00 Cost of 9 cards — $11.25

01232-41 : Beam on Elastic Continuous Support

This program computes moment, shear and soil stress by Bleich's Method for finity length beams transforming real beam in an infinite equivalent beam with the aggregate of four fictitious loads.

592 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

01242-41 : Modified Berggren Equation: Dept HS of Freeze or Thaw

This program uses the modified Berggren Equation for calculating the depths of freeze or thaw in a multi-layered soil system. Primarily, it is used to determine the required depth of non-frost-susceptible material to prevent thermal degradation or disruption in permafrost or seasonal frost zones.

396 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01248-41 : Concrete Beam Design & Analysis Rectangular

This program will handle strength design and analysis of concrete beams. Using the ultimate strength design in accordance of 1971 ACI code. This program will design the beam with special provision for the deflection problem and will check the ACI code after every design.

476 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01263-41 : Standard Penetration Test Adjustment for Soil Overburden

The number of blows required to drive a "split-spoon" standard penetration test sampler are adjusted for overburden pressure by this program. Two methods which give comparable results are available to the user.

118 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01295-41 : Bases

This program solves a great number of problems of isolated bases (centered load bases), of reinforced concrete, square or rectangular bases in partition wall, with different sides (eccentric load) determines the side dimensions, and moments in both directions, area, and minimum height for the maximum tension for concrete.

194 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01308-41 : Moving Wheel Loads

This program solves for maximum moment, quarter point moment, end shears and column reactions for moving wheel loads over simple spans; includes provision for uniform load.

422 Program Steps
Necessary Accessories: Two Memory Modules (for more than 16 wheel loads 3 or 4 or required).

Documentation — $12.00 Cost of 4 cards — $5.00

01309-41 : Critical Path Method for Project Planning & Scheduling

This program uses the critical path method to calculate project duration, the activities which govern the project length, and the degree of freedom in scheduling the non-critical activities. All input data for each activity is stored in a single data register, and all output data for each activity is stored in only two data registers. This results in seven numbers being stored in only three data registers. Maximum problem size is 63 activities.

475 Program Steps
Necessary Accessories: Two Memory Modules minimum and Printer.

Documentation — $12.00 Cost of 4 cards — $5.00

01315-41 : Fixed Beam Plot of Shear and Bending Moment Diagrams

This program will plot shear and bending moment diagrams for a beam fixed at both ends and loaded with any combination of full uniform and linear loads as well as point loads. It will also yield numerical values of shear and moment at any point along the beam. Stored on 4 cards (3 programs).

278 Program Steps
Necessary Accessories: Printer and Two Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 4 cards — $5.00

01339-41 : Curved Beam Loaded Normal to the Plane of Curvature

This program allows the user to compute the transverse shear, bending moment, twisting moment, deflection, bending slope and roll slope at up to 14 points along a curved beam loaded normal to the plane of curvature and having clamped ends. The applied loading may consist of any and all combinations of point load, point moment and point torque as well as distributed load and torque. Loading conditions are combined by superposition.

751 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 6 cards — $7.50

01348-41 : Septic Tank Volume and Absorption Field

This program computes the minimum septic tank size and length of absorption field trench. Required input includes gallons of sewage per day or number of bedrooms, percolation rate, and the desired trench width.

266 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01358-41 : Reinforced Square Footing

Given the allowable bearing pressure, column dimensions, ultimate and service loads, this program will calculate the required footing size and thickness and the required area of reinforcing steel. Given the bar size, the required number of reinforcing bars, a development length check and the bar spacing is calculated.

292 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01361-41 : Earth Dams and Cut Slopes Stability and Safety

With given cross section (defined by coordinate system) and soil parameters, program computes all line intersections with various arcs, and includes a search pattern for the critical arc and lowest factor of safety. Printed output includes coordinates of critical arc, resisting forces, driving forces, and factor of safety.

629 Program Steps
Necessary Accessories: Printer and three Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

01367-41 : Frame Analysis 3-6 Bays 2 Story

Computes joint moments for 2 story, 3 to 6 bay frame, subjected to either vertical or lateral forces. Columns may be pinned or fixed at base. Frame and loading may be unsymmetrical and program prints balancing forces for sideways correction. Program prompts, vertical load F.E.M.'s and lateral forces.

1622 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV, Card Reader, Printer and 16 Cards. Rechargeable Battery Pack recommended.

Documentation — $20.00 Cost of 16 cards — $20.00

01376-41 : Barometric Levelling

Program computes elevation differences (in Metres) between base station and other unknown elevation stations. Barometer readings may be directly in metres or in millibars. Both the single barometer method of linear interpolation of base pressure as well as the two barometer method of known base pressure may be used. Temperature effects are considered.

122 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01411-41 : Welded WF Section Properties

This program calculates the gross and net section properties for a welded wide flange plate girder with equal width flanges, but unequal flange thicknesses.

288 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01414-41 : LCN for Flexible Pavements

This program calculates Load Classification Number (LCN) for single, dual, tandem and dual-tandem sets of wheels (gear) operating on flexible pavement. LCN relates the loading characteristics of a vehicle gear with the load-bearing properties of a pavement. Specifically, it is used to classify airfield pavements and the aircraft operating on them. It is used throughout the world as one method of determining if a large commercial aircraft may operate at an airfield, based on pavement strength considerations.

225 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01416-41 : Beam/Column Design

This system will design a beam-column in accordance to the 1980 AISC Specifications. The program is written so that only the design forces and member data need be entered. All preliminary calculations to determine whether or not the proposed beam will be acceptable are conducted by the calculator.

717 Program Steps
Necessary Accessories: 3 Memory Modules; Card Reader and Printer Optional.

Documentation — $14.00 Cost of 7 cards — $8.75

01417-41 : Frame Analysis

This program will determine the member forces of a two story two bay rigid frame. The frame may be subject to two different loading configurations. The program will determine axial forces, shears and end moments for each member of the frame, for each load case.

1414 Program Steps
Necessary Accessories: Card Reader

Documentation — $20.00 Cost of 16 cards — $20.00

01455-41 : Beams: Simply Supported, Cantilever and Fixed at Both Ends

This program calculates for each of the beams mentioned in the title, the support reactions and the static functions (shear, moment, slope and deflection) on the whole beam length. The loads may be distributed loads, point loads and moments. The distance between two successive points in what are computed the static functions is equal with the lowest value between d.max (imposed by user) and di (the spacing between two successive load's points). If a printer is connected, it also plots the computed function.

511 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01468-41 : Bishop Slope Stability Analysis

This program solves the equation for the Bishop's Simplified Method of slope stability analysis. Allowing the operator to consider a system with up to three soils and up to ten lines in the profile being considered (soil unit boundaries count as lines in the profile).

471 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01470-41 : Water System Cost Estimation 4in Through 12in Mains

For water systems designs using main sizes 12 in. diameter through 4 in. diameter gives construction cost estimate (budget purposes) to include water mains, date valves, fire hydrants, services, and blow-offs. Excellent for subdivisions. Easily modified for unit costs. Print-out lists items with costs and total cost.

589 Program Steps
Necessary Accessories: HP-IL Printer preferable or std. Printer, Card Reader, Quad RAM memory

Documentation — $14.00 Cost of 8 cards — $10.00

01495-41 : Distribution Factor Calculation

This program computes all distribution factors required for continuous frame analysis. It is adapted for use with single story or multistory structures and the ends of the first and last spans may also be fixed or pinned.

292 Program Steps
Necessary Accessories: "Structural Analysis" application module.
Documentation — $12.00 Cost of 3 cards — $3.75

01496-41 : "Conbeam" (Flex. Strength of R.C. and Bonded P.S.C. Beams)

Calculates flexural strength of various concrete beam sections reinforced with any combination of bonded prestressed and unprestressed tension reinforcement and compression reinforcement. Unprestressed tension reinforcement may be either reinforcing bar or same steel as used for prestressed reinforcement. Complete stress-strain curve for reinforcing bar may be specified if desired.

885 Program Steps
Necessary Accessories: Card Reader, Printer, Quad Memory Module
Documentation — $14.00 Cost of 8 cards — $10.00

01509-41 : Timber Design - 1977 NDS (WD7 7)

Solves Unity Equations for combined stresses using 1977 NDS. Tension members (net section), laterally unsupported beams and columns. Calculates shear stress in notched or unnotched beams. Automatic input of allowable stresses for any grade material. Wet conditions, repetitive use and load duration factors as needed. Versatile, fast, easy to use.

476 Program Steps
Necessary Accessories: 3 Memory Modules required. Printer optional.
Documentation — $16.00 Cost of 12 cards — $15.00

01532-41 : Preliminary Design Conditions Program

This program can be useful to architects and engineers. With input of gross building area and perimeter, the program computes preliminary design of mechanical space conditions and planning information for three types of buildings. System requirements for Electrical and Mechanical areas and loads are then given.

237 Program Steps
Necessary Accessories: 1 Memory Module, Printer (Printer required for program as listed– modification required for exclusion)
Documentation — $12.00 Cost of 4 cards — $5.00

01538-41 : Beam Program with Stirrup Design-Simple 2

This program computes end reactions, maximum shear stress and maximum bending moment in a beam under any combination of loading. It designs stirrups required in concrete beams and displays stirrup spacing. In addition, it can calculate deflection, slope, shear and moment at any point in a beam.

692 Program Steps
Necessary Accessories: 3 Memory Modules and Structural Analysis Pac
Documentation — $12.00 Cost of 6 cards — $7.50

01541-41 : Continuous Beam - Support Moments, Reactions & Int. Moments

Calculates support moments, reactions and interior moments for continuous beams of up to 7 spans and 2 cantilevers. End supports can be simple or fixed. Uniform load and any number of concentrated loads can be input for each span. Moment of inertia is input for each span.

570 Program Steps
Necessary Accessories: 3 Memory Modules, Printer optional.
Documentation — $14.00 Cost of 6 cards — $7.50

01565-41 : Mound

This program solves 8 parameters for the Wisconsin Type 3 Mound Septic System given the loading rate, soil percolation rate, % slope at site, absorption area width and length.

188 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01657-41 : Unified Soil Classification

A soil sample is classified by the Unified Soil Classification System, when given standard soil data. Such as percent passing U.S. standard sieves, units, both plastic and liquid and so forth.

222 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01690-41 : Moment Resistant Column Anchor Bolt Tension

Program solves for the anchor bolt tension that results from a large moment applied at the base of a column which has one or two line(s) of bolts resisting the overturning moment.

216 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01700-41 : Roadway Illumination Design

This program computes information necessary for roadway illumination design. The illuminaire spacing or average maintained foot-candles are computed from the given data. The coefficient of utilization can be computed from the mast-arm overhang and luminaire mounting height.

132 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01712-41 : CPM - An HP-41CV Implementation

This program solves an Event-Oriented Critical Path Method network problem. Limited by the 41-CV's memory size, the program can handle up to 20 activities or events. However, by adopting the "Divide-and-Conquer" rule, this program is capable of solving networks with unlimited amount of activities.

242 Program Steps
Necessary Accessories: 4 Memory Modules
Documentation — $14.00 Cost of 3 cards — $3.75

01732-41 : Rock Permeability by Constant/Falling Head Tests

This program is designed to calculate the permeability of rock using either the constant or falling head test. If an 82143A Printer is in use input and output data will be printed, if not results will be displayed.

183 Program Steps
Necessary Accessories: 1 Memory Module (Card Reader and 82143A Printer optional)
Documentation — $12.00 Cost of 2 cards — $2.50

01738-41 : Grade Computer

This program computes the elevations for five separate points across a desired roadway section. These elevations may be computed for any station or on any predetermined interval at any depth from finished grade. The program does not require symmetrical sections and allows the user to vary the widths, crownslopes and curb elevations for the left and right sides of the section, independent of each other.

502 Program Steps
Necessary Accessories: 2 (or more) Memory Modules and Card Reader. Printer suggested
Documentation — $12.00 Cost of 4 cards — $5.00

01748-41 : Strains and the Ellipse of Elasticity

One of the most beautiful theories on frames' deformations was created by Culmann, and it stands paramount among others, for being able to predict displacements without considering internal effects. This program is based on it and allows the finding of structurals' displacements at sections produced by any vector force acting at any point.

318 Program Steps
Necessary Accessories: 2 Memory Modules for the HP-41C.
Documentation — $12.00 Cost of 6 cards — $7.50

01768-41 : Superelevated Roadway Design with Elevations

Calculates roadway centerline and shoulder elevations for superelevated roadway curves rotated about the centerline. The program can be used in conjunction with the HP Surveying Module; however, the required subroutines are supplied for storage in RAM. In addition to solving for various combinations of horizontal and vertical alignments, the program provides checks of several primary design parameters.

638 Program Steps
Necessary Accessories: 3 Memory Modules. Printer optional; Card Reader helpful. Only 2 Memory Modules are required if the HP Surveying Module is used.
Documentation — $14.00 Cost of 7 cards — $8.75

01817-41 : Percent Rehandle

This program solves for the percent of rehandled material associated with surface mining of up to 4 horizontally-bedded ore horizons by excavating overburden and partings with a dragline that uncovers ore in two passes.

1126 Program Steps
Necessary Accessories: Printer (Optional)
Documentation — $20.00 Cost of 9 cards — $11.25

01952-41 : Crane/Outrigger Reactions and Stability

This program computes outrigger float reactions or wheel tandem reactions for a truck crane, and internally checks stability for specified lift loads, horizontal boom angle, and operating radius. A valuable program for those concerned with truck crane installations such as construction sites, piers and docks. A warning "tipping" is displayed if instability is detected.

473 Program Steps
Necessary Accessories: Two Memory Modules or HP-41CV; (Printer is optional)
Documentation — $12.00 Cost of 5 cards — $6.25

02014-41 : Ultimate Strength Beam

Design and analysis of rectangular reinforced concrete sections for flexure and shear, with or without compression and/or shear reinforcement, in accordance with all requirements of the Ultimate Strength Design method of ACI 318-77. Design portion of program provides rational methods for determining required section sizes and reinforcing configurations.

1096 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV and 82143A Printer
Documentation — $14.00 Cost of 10 cards — $12.50

02081-41 : Design of Fillet Welds

Given the forces and moments acting at the centroid of a fillet weld and the dimensions of the weld, this program calculates the load/unit length of weld and the size of weld required to sustain the load without getting overstressed for ten most commonly used weld connections.

419 Program Steps
Necessary Accessories: One Memory Module
Documentation — $14.00 Cost of 3 cards — $3.75

02090-41 : Analysis of Pin-Jointed 2-D Frames

Computes the forces in 2-D frames by the pin-joint method of resolving known forces acting on the joint. Unique data entry system saves node computations so data is only entered once. Frames of any size handled by overwriting when memory is full. HP-41CV saves 66 nodes at one time.

182 Program Steps
Necessary Accessories: One Memory Module; (Printer is optional)
Documentation — $12.00 Cost of 2 cards — $2.50

02247-41 : Moment Distribution Around a Box Frame

This program was written to handle the frequently encountered situation in which four walls support each other by distributing loads horizontally rather than vertically. It distributes moment around a box shaped frame after fixed end moments and member geometry are input. Output are the final moments at each end of each member.

212 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02248-41 : Beam Design

This program can be used to pick and size a beam according to AISC specs. Eighth edition having the following requirements. Types of loads: 1) Distributed 2) Concentrated or 3) Implied moments. Types of connections: 1) Simply supported 2) Fixed one end supported on other or 3) Fixed both ends.

949 Program Steps
Necessary Accessories: 41CV or 41C W/Quad module, Card Reader. Printer optional.
Documentation — $14.00 Cost of 8 cards — $10.00

02262-41 : One Way Slabs in Reinforced Concrete

The program computes the design load, design bending-moment, bending moment capasity, area of tensile reinforcement for continuous, simply supported and cantilevered one-way slabs. All computation is in "Ultimate Limit State" and is based on "Simplified Computation of Moments".

239 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02272-41 : Rectangular Tied Concrete Column Interaction Curve Data

Given concrete strength, column size, reinforcing sizes, and reinforcing distribution, this program solves the C.R.S.I. "Universal Strength Design Formulas for Rectangular Tied Columns" for critical points on the load/ moment interaction curve.

1020 Program Steps
Necessary Accessories: Quad memory module. Printer optional.
Documentation — $14.00 Cost of 9 cards — $11.25

02279-41 : Finite Length Beam on Elastic Foundation-Concentrated Loads

This program solves for the bending moment, shear, and foundation reaction at all points desired along a finite-length free-free beam on an elastic foundation, subjected to one or more concentrated loads applied at one or more locations along the beam. Any set of consistent units may be used. Less program storage is required compared to more elaborate programs which consider unusual loading the boundary conditions.

210 Program Steps
Necessary Accessories: One memory module or equivalent
Documentation — $12.00 Cost of 2 cards — $2.50

02300-41 : Complexly Loaded Reinforced Concrete Retaining Wall Design

The program will design and analyze concrete retaining walls loaded by two backfill earth types, all on toe, raised water table and surcharging in addition to moments, shears, and axial loads applied at the top of the wall. In design, program outputs required footing dimensions and internal forces necessary for concrete design. In analysis stability is assured and forces calculated. Ultimate strength design method is used IAW ACI 318-77. Completely interactive.

873 Program Steps
Necessary Accessories: Three memory modules. Card Reader helpful.

Documentation — $14.00 Cost of 7 cards — $8.75

02320-41 : Moments and Shears For Simple Spans With AASHTO Live Loads

Program computes moments or shears at a specified point for AASHTO live loading on a simple span. Program will handle H or HS truck configurations (including alternate lane loading) for 20-44 loading or a multiple thereof as provided in AASHTO. If a Printer is attached, a plot of the moment or shear envelope can be generated.

618 Program Steps
Necessary Accessories: Two memory modules; printer required.

Documentation — $14.00 Cost of 6 cards — $7.50

02335-41 : Foundation Design

This program designs spread footing foundations and computes the factor of safety against overturning and the bearing pressures for any combination of vertical, horizontal load or moment. A 'friendly' input and attractive formatted output warn the user of excesses with beeps and instructions or produce a satisfactory solution.

266 Program Steps
Necessary Accessories: One memory module, card reader and printer

Documentation — $12.00 Cost of 3 cards — $3.75

02340-41 : "Axbend" Steel Axial-Bending Interaction Equations

This program solves the AISC combined axial-bending equations 1.6-1a and 1.6-1b or 1.6-2 for 1 or 2 axes, and static or seismic loading conditions. Inputs are the member properties, the end restraint factors and the loads on the member.

431 Program Steps
Necessary Accessories: Two memory modules or equivalent. Card Reader and Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02432-41 : U.B.C. Embedment Depth For Poles

This program solves for the required footing depth using the 1979 Uniform Building Code method as outlined in section 2907(f). The soil bearing pressure and load parameters are input using local labels, then the user enters the desired pole diameter. Either constrained or non-constrained poles can be designed.

140 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02452-41 : Simply Supported and Cantilevered Steel Beams

The program computes the design load, design bending moment and design strength of simply supported and cantilevered steelbeams in both "Ultimate Limit State" and "Ultimate Seviceability State". It also suggests which profile to use and computes the static bending and result stress in the beam chosen. Calculations done according to Norwegian Standard, NS 3473.

470 Program Steps
Necessary Accessories: Quad RAM or three memory modules

Documentation — $14.00 Cost of 10 cards — $12.50

02470-41 : Bolt Prying Action in Steel Connections

This program uses elastic theory as presented in the AISC Manual of Steel Construction, 8th edition to determine the effects of bolt prying on steel connections with bolts in tension. It returns the bolt force and fitting thickness required based on load and connection geometry. Fully user interactive and prompted and output is clearly labeled.

150 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02621-41 : Benkelman Beam Rebound Analysis

This program calculates the Benkelman Beam rebound and Benkelman Beam rebound corrected to the standard temperature of 70 degrees F. The test is a procedure for the determination of the static Benkelman Beam rebound at a point on a flexible pavement under a standardized axle load, tire size, tire spacing, and tire pressure. Standard deviation and mean value are also given for all data. This program is a real time saver.

317 Program Steps
Necessary Accessories: Three memory modules or HP-41CV, and printer. Card reader helpful.

Documentation — $12.00 Cost of 4 cards — $5.00

02668-41 : Ultimate Bearing Capacity of a Pile From SPT

Program calculates (quickly) the ultimate bearing capacity of a pile from S.P.T. results. It uses Decourt/Quaresma' formula (SI units) which won the international evaluation contest for determination of the ultimate bearing capacity of a pile on the Esopt II — European Symposium of Penetration Test — Amsterdam, Holland (May/1982) — valid for precast, strauss and franki concrete piles.

258 Program Steps
Necessary Accessories: One memory module for the HP-41C. Card Reader and Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02671-41 : Tube Column Design

This program aids in design of tube steel columns subjected to combined axial and bending loads using the modified formulas on page 3-9 of the AISC Manual of Steel Construction. Member section properties are input by hand or by using data cards. Results of the formulas are displayed so they can be compared to the AISC load tables to select column sizes.

460 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 5 cards — $6.25

02674-41 : Design of Commonly Used Beams

Input of load, length of beam, E, I, and location of load, program will solve for the maximum deflection, maximum moment, and both reactions. Program will solve for twelve commonly used load conditions. Charts for E, I, and equations are included.

722 Program Steps
Necessary Accessories: Two memory modules

Documentation — $14.00 Cost of 6 cards — $7.50

02740-41 : Column Solver

Using the 1978 A.I.S.C. Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, COLSOL: provides a ready solution for the analysis of structural steel columns of W, I or H shaped cross sections. Axial loading or combined axial plus bending about x and/or y axes.

642 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 6 cards — $7.50

02741-41 : Prestressed Beam "PREBM"

The program determines the ultimate flexural strength of bonded prestressed or partially prestressed concrete sections of general form. The calculations make use of the actual stress-strain properties of the prestressing steel and in general result in less conservative more accurate values for flexural strength than EQ. 18-3, A.C.I. Concrete Code.

689 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 6 cards — $7.50

02751-41 : 2Axcon Concrete Column/Biaxial Bending

2AXCON computes the ultimate capacity for a given concrete section, subject to a given axial compression load and moments about two perpendicular axes. The concrete section is either square or rectangular with up to 54 reinforcing bars. The method of analysis is based on ultimate strength design, following ACI-1977 Reinforced Concrete Building Code requirements.

621 Program Steps
Necessary Accessories: Quad memory module or HP-41CV. Printer desirable.

Documentation — $14.00 Cost of 7 cards — $8.75

02758-41 : Concrete Foundation Bolt Design

Program will calculate the bolt load for eight commonly used bolt patterns. Input of external forces and bolt radius or pattern, program will give the necessary data to select the proper diameter from the chart provided, when securing heavy machinery or cranes to concrete foundations.

218 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02854-41 : Feasibility of Small Hydroelectric Power Sites

This program carries out a general feasibility analysis of small hydroelectric power sites. Calculations include installed capacity, annual energy, cost, and revenue for small run-of-the river sites. Sites are assigned to one of five lists depending upon potential power.

123 Program Steps
Necessary Accessories: One memory module and a printer

Documentation — $12.00 Cost of 2 cards — $2.50

02878-41 : Long Continuous Beam (Up to 18 Spans)

Program calculates moments on supports in continuous beams for the following type of load: concentrated (any amount); uniformly distributed on all the span length or on a particular portion (any amount); triangular (two per span). Depending on the complexity of the case could solve up to 18 spans plus two cantilever. Friendly for changing any data to solve other similar cases (it keeps datas).

673 Program Steps
Necessary Accessories: Two memory modules for the HP-41C and printer

Documentation — $14.00 Cost of 6 cards — $7.50

02898-41 : Grade Computer II

This program carries the grades for two independent grade lines. The program then uses these two grade lines to compute grades for five separate points across a desired road section, as well as for a point directly above or below each grade control line, for a given typical section. The program does not require symmetrical sections and allows the user to vary the road width, superelevation, points where the grades are to be computed, intervals, and the depth below finished grade.

487 Program Steps
Necessary Accessories: Two memory modules for the HP-41C. Card reader and printer optional.

Documentation — $14.00 Cost of 5 cards — $6.25

02910-41 : End Supported Beams

Program solves loaded beam condition (partial uniform load) #14, Table III, from Formulas for Stress and Strain Handbook. Input of beam dimensions and loading conditions, program will solve for reactions, shear, moment, and deflection.

387 Program Steps
Necessary Accessories: One memory module. Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02912-41 : Floating Floor Calculations

The program calculates the static deflection, load and total number of isolation pads required for a user specified floating floor, and checks the low pass filter cut-off frequency for the mechanical system versus the excitation frequency on the floating floor.

195 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02918-41 : Design of Concrete Foundation Blocks

Input of external forces, soil density, and internal friction factor, program will solve for concrete foundation blocks commonly used to support heavy machinery. Charts for soil bearing capacity and internal friction factor are included.

127 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02919-41 : Curb Return Design

This program calculates quarter delta elevations along the arc length of a curb return, by use of the Plane Method using equal tangents.

190 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

02936-41 : AASHTO Tee Pier Analysis

This program will analyze a single column bridge pier (fixed, expansion, or monolithic) in accordance with 1977 AASHTO Specifications (including interims thru 1983). Output consists of axial load, longitudinal and transverse moments (Groups 1 thru 7) at base of column (service or load factor). Will also analyze spread or pile supported footing.

711 Program Steps
Necessary Accessories: Three memory modules or Quad Chip. Printer optional.

Documentation — $16.00 Cost of 7 cards — $8.75

02978-41 : Ring Loaded Symmetric to a Transverse Axis

This program solves for the bending moment, axial force and shear at any angular location around a circular ring subjected to a loading symmetric to a transverse axis. The loading consists of pairs of concentrated forces applied normal to the ring at any set of angular locations, and of resisting tangential shear resultants applied symmetrically along the circumference.

247 Program Steps
Necessary Accessories: One memory module or equivalent

Documentation — $12.00 Cost of 2 cards — $2.50

02981-41 : Design of Structural Sections For Flexible Pavement

Program calculates the structural layer thicknesses for asphalt concrete, aggregate base and aggregate subbase using the California Method for flexible pavement design.

121 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03048-41 : Eccentrically Loaded Column Base Plate

This program will analyze an eccentrically loaded column base plate. The output consists of the limit of compression, gross tension in the bolts, design bolt tension (incl. shear transfered thru failure plane), compressive stress in concrete, and the required plate thickness.

439 Program Steps
Necessary Accessories: Two memory modules. Printer optional.

Documentation — $14.00 Cost of 4 cards — $5.00

03097-41 : Rigidity and UBC Shear Distribution Structural Analysis

This super program calculates center of rigidity, sum of rigidities along xx and yy, rotational stiffness, relative rigidities and respective direct shears, torsional rigidities and respective torsional shears per U.B.C. (Uniform Bldg Code). Maximizing register usage, with a quad module, up to 67 elements may be handled by this program, more than enough for any super- structure or even power plant. The output comes in an automated clean cut tabular form. A 'must' for Structural/Stress Engineers!

552 Program Steps
Necessary Accessories: Quad module or equivalent (HP-41CX). Printer/plotter optional.

Documentation — $14.00 Cost of 6 cards — $7.50

03115-41 : A.A.S.H.T.O. Simple Beam Live Load Analysis

Computes maximum shear, maximum moment with simultaneous shear (ideal for prestressed girder design) at any point in a simple beam as per A.A.S.H.T.O. HS-15 (44) or HS-20 (44) live load (including impact). Truck, lane and Alternate Military loadings are considered. Features: (1) absolute max shear/moment (2) envelope plotting.

664 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 7 cards — $8.75

03120-41 : Masonry Lintel Design (Lintel)

This program uses the Working Stress Method to analyze a given masonry lintel. Material properties, reinforcing, applied moment and shear, and whether special inspection is used, are the inputs used in determining the maximum allowable bending moment for the section. Actual bending stresses, shear stress, and bond stress are also calculated. If shear reinforcing is required, the program will calculated the required spacing for the user's given stirrup size. U-stirrup size. U-stirrup and hook options also given.

1073 Program Steps
Necessary Accessories: HP-41C; 82170A Quad memory module; 82162A or 82143A Printer

Documentation — $14.00 Cost of 9 cards — $11.25

03121-41 : Earthwork

This program is designed to compute the end area based on the coordinate end area method using cross section data taken at a station. The program displays or prints the end area and volume between stations. The program uses alpha prompts to input data and allows the data entered to be corrected.

468 Program Steps
Necessary Accessories: Three memory modules. Printer optional but suggested

Documentation — $12.00 Cost of 5 cards — $6.25

03203-41 : Loads on Pipe in Trench

Program calculates loads on pipes in trenches considering earth loads and live loads. Also calculates the maximum depth of cover for pipes in a trench, given the pipe supporting strength, type of soil and bedding condition.

159 Program Steps
Necessary Accessories: Extended functions module; printer would be helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

03214-41 : Isotropic Plate Bending Analysis

Program calculates deflection and bending moments in isotropic simply supported plates. Solution by method of Levy using single fourier series expansion. Bending moment solutions do not converge as rapidly as deflection solutions and require greater number of terms in series. Plates bending under uniformly distributed load are treated.

269 Program Steps
Necessary Accessories: HP-41 Math Pac or user-written subroutines for hyperbolic functions

Documentation — $12.00 Cost of 2 cards — $2.50

03220-41 : Compleat Composite Beam

Lightweight or regular weight concrete, with or without steel deck, computes stud capacity reductions for light-weight concrete and deck rib geometry. Shored or unshored, slab one or two sides. One huge data file with ASCII directory rile provides 20 second access to data for any of the 187 wide flange shapes. Handles cover plates and other elements welded to steel section. Shear requirements N1, N2. All section properties, steel and concrete stresses, all deflections. THIS PROGRAM MUST BE SOLD RECORDED ON 3.5 DISC OR CASSETTE ONLY.

Necessary Accessories: HP-41CV, HP-IL Module, Extended Functions Module, Extended Memory Module, Digital Cassette Drive, Printer

Documentation — $20.00

03240-41 : Center of Gravity and Moment of Inertia for Rotated Members

This program calculates I for any enclosed area or member rotated about its C.G. Given the coordinates of each corner, the program will calculate the X and Y of the area, then translate the coordinates relative to the C.G. and prompt the user for a rotation angle. The I of the rotated area will be calculated and another angle will be requested, thus numerous angles can be tested for maximum and minimum I's.

234 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03385-41 : Pull Chart

This program computes the distance that a given amount of material should be pulled or spread on the roadway, based on the number of courses and windrows to be used in construction of this section of roadway. When used in conjunction with a printer (HP 82143A) the program will generate and print the actual pull chart.

227 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

03410-41 : Analysis of Inverted V Bracings

This program computes the axial forces in the bracings due to horizontal shear which arises from wind, earthquake, belt tension, etc. Vertical and horizontal end reactions are also calculated. This program is useful for lateral analysis of steel towers and frames.

117 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03411-41 : Counter Weight Calculation for Luffing Machines

This program calculates the counter weight of luffing machines like stacker reclaimer, stacker, pylon scraper, reclaimer, etc. Counter weight is required for balancing the weight on either side of pivot point; a point of rotation. The program computes moments at pivot point due to luffing units of machine for various luffing conditions, considering pivot point as origin. These moment values are also useful for calculating hydraulic cyclinder pressures.

189 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03497-41 : Tall Slender Masonry Wall Design

This program will design load-bearing, reinforced tall, slender walls. The design is based on forces and moments determined by analysis. The procedure considers the effects of axial loads and deflection in the calculation of required moments. The design is in accordance with 'ICBO' Technical Report #4189 and section #2411 of the 1985 'Uniform Building Code'.

820 Program Steps
Necessary Accessories: HP-41CV or equivalent and printer.

Documentation — $14.00 Cost of 8 cards — $10.00

03543-41 : Sewer Cuts

This program calculates trench cuts in a pipe line between two points such as manholes in a sewer line. Cuts begin at 0'-4', and then are calculated in 2' increments to 18' depth. All data is printed in an attractive format. The program is user friendly and is excellent for cost estimating sewer lines or other buried lines whose installed cost varies with depth.

854 Program Steps
Necessary Accessories: Printer.

Documentation — $12.00 Cost of 10 cards — $12.50

03588-41 : Phillips Intercom Cable Length

Program calculates maximum lengths and voltage drops for power and sync lines for a Phillips M100 Intercom. the program will calculate for 24, 22, 20, or 18 gauge wire on a branch by branch bases and give the answers in meters or feet.

389 Program Steps
Necessary Accessories: Printer is optional

Documentation — $12.00 Cost of 6 cards — $7.50

03590-41 : APWA-COE Paver Programs Adapted for the HP-41

The following programs illustrate how pavement condition indexes are calculated. The availability of these programs for a handheld programmable calculator allow the field inspector to calculate a PCI for a given pavement and to facilitate completion of the pavement inspection forms. This booklet contains programs that calculate elements of a PCI for an asphalt or concrete SAMPLE UNIT. Note: Because the package consists of many small routines, barcode is not currently available.

Necessary Accessories: Printer is optional.

Documentation — $20.00 Cost of 6 cards — $7.50

J302 Civil Engineering Environmental Engineering

01604-41 : Newton's Method in up to 11 Variables

Uses routines in the math module to solve systems of equations using Newton's Method. Requires one, two or three memory modules depending on size of system of equations. (Solves one to eleven equations/unknowns).

210 Program Steps
Necessary Accessories: Math Module, Memory Modules as needed.

Documentation — $12.00 Cost of 2 cards — $2.50

02368-41 : Water Analyses: Charge and Conductivity Balance

Use this program to check the accuracy of chemical analyses of natural and waste waters. Program prompts for major ion concentrations, conductivity, and temperature. Program then calculates charge balance error and conductivity error. (Equivalent conductivities generated by program.) Input concentrations can be in mg/l or mM.

187 Program Steps
Necessary Accessories: None. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02734-41 : Horizontal and Vertical Displacements of Movement Markers

Field usable program calculates the horizontal distance and direction and vertical distance through which a marker moved, as on a glacier surface, or in unstable soils on a slope, during the time between two triangulation and vertical angle surveys. Simple program additions allow use of card reader for storing data of initial surveys for use during later surveys.

407 Program Steps
Necessary Accessories: Two memory modules. Card reader optional.

Documentation — $14.00 Cost of 5 cards — $6.25

02783-41 : Land Application of Municipal Sludge

LANDAPL determines application rates for sludge on agricultural land. Given sludge analysis, it selects which metal limits total application, and whether application rate is limited by nitrogen uptake or cadmium. It calculates the accumulation of organic nitrogen in soil in successive years, and corresponding decreases in allowable loading rate. It also calculates potassium and phosphorus from sludge available to crops.

484 Program Steps
Necessary Accessories: 3 Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

02839-41 : Mineral-Water Equilibria

Inputs are concentrations of 12 ions and pH. Program computes equilibria between free ions and 40 complexes and saturation indexes of 12 minerals. Easily expanded or modified.

677 Program Steps
Necessary Accessories: Three memory modules. Card reader optional.

Documentation — $14.00 Cost of 8 cards — $10.00

02868-41 : Wind Data Summary

Resultant (prevailing) wind direction, resultant run, resultant velocity, total run, mean velocity, and steadiness ratio are calculated for wind data obtained in the form of miles or kilometres of wind travel by eight cardinal and intercardinal directions for a time period of some hours (usually 24).

228 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 5 cards — $6.25

02882-41 : Residential Hot Air Furnace Selection

This program aids in the selection of new hot air furnaces for home heating. Fuels include natural gas, propane, and heating oil. The program estimates the annual costs of fuel and electrical power for the furnace air circulating fan. Using installed cost, it compares data with a second furnace and computes annual savings (or loss) and pay back period. When electrical power cost is included, some highly fuel efficient furnaces are not the best economic choice.

95 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02988-41 : Conduit Outlet Protection (Rip Rap)

This program finds the required length of the apron, the width of the outlet end of the apron and the maximum size of stone to be used. Given: pipe discharge "Q", pipe diameter and tail water depth above the invert of the culvert.

104 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03361-41 : Time of Concentration for Surface Water Run-Off

This program quickly calculates time of concentration in either Imperial Units or SI Units using the methods of Bransby-Williams and Kiepich. The input variables are the size, shape and topography of the rainfall catchment. Output is given as minutes.

64 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03400-41 : Coal Fired Boiler Efficiency

This program computes the Dry-Gas Loss, Moisture Loss, Moisture in Combustion Air Loss, Incomplete Combustion Loss, Radiation and Unaccounted for Loss and the Overall Gross Efficiency of a coal fired boiler from Ultimate and Flue Gas (Orsat) Analysis Data.

211 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

J304 Civil Engineering Hydraulics

00452-41 : Hazen-William's Equation for Flows, Head and Diameter

For a pipe of given length and friction factor "C", this program, using Hazen-William's Formula, will compute either flow, head or diameter–flow from head and diameter, head from flow and diameter, diameter from flow and head. Flow units can be CFS, MGD or GPM.

95 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00509-41 : Mannings Equation for Flow, Diameter, Slope and Depth

For a pipe with friction factor of "n", this program's Mannings's formula application will compute either flow, slope, diameter or depth ratio – any one from the other three. Flow units can be cfs or mgd.

171 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00528-41 : Hydraulic Properties for Irregular River Cross Sections

Program provides data needed for profile analysis or bridge backwater study. Divided flow permitted, n-1 subareas with unique roughness allowed, where n is the number of cross sections points, points are preserved properties may be computed at any number of elevations, output (by subarea) conveyance, a,p,r,t - alpha computed.

317 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00531-41 : Steady State Flow in a Prismatic Channel

For a given rectangular or tradezoidal channel section, this program, using Manning's formula, will compute either flow, slope or depth -any one from the other two. Flow units be either cubic-feet per second or acre-feet per day.

179 Program Steps
Necessary Accessories: One Memory Module

Documentation — $8.00 Cost of 2 cards — $2.50

00612-41 : High Head Flow in Hydraulically Short Culverts

Computer discharge for pipe culverts in high head, hydraulically short conditions, type 5 of the U.S. Geological Survey classification. Input is diameter, head and degree of beveling or rounding of entrance. Coefficient may be computed internally, entered directly or adjusted by a factor.

191 Program Steps
Necessary Accessories: One Memory Module

Documentation — $8.00 Cost of 2 cards — $2.50

00613-41 : Bridge Backwater Yarnell Equation

The Yarnell equation is an empirical formula which predicts bridge backwater as a function of bridge geometry, and downstream Froude number. It is applicable to subcritical flow through bridges and is used in the Corps of Engineers HEC-2 water surface profiles program. This program applies the equation and tests for applicability.

95 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00696-41 : Conjugate Depth for Hydraulic Jump

Program solves for conjugate depth of hydraulic jump in rectangular, trapezoidal, or triangular channels.

92 Program Steps
Necessary Accessories: One Memory Module

Documentation — $8.00 Cost of 2 cards — $2.50

00697-41 : Backwater Profile for Rect Trap or Triangular Channels

Solves for backwater curve for prismatic channels.

147 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00698-41 : Critical Depth of Rect Trap or Triangular Channels

Solves for critical depth of prismatic channels by use of root finder. "NEWT" program (included) or other root finder necessary.

47 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00699-41 : Open Channel Flow Triangular Rectangular Trapezoidal Channel

Solves for flow, depth, or slope given two of three values. Critical slope is also computed. Manning n, base width, and side slope required. Uses unique question - answer ability of HP41 so that user need not be concerned where data or answers are stored. Root finder "NEWT" included.

264 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

00705-41 : High Head Flow in Hydraulically Long Culverts-Pipes

A culvert may flow full without the outlet being submerged. (type 6 flow - USGS classification, type 2 - chow's) the piezometric head at the outlet varies with discharge (q). Input to this program is the head, culvert geometry and if the outflowing jet is supported or unsupported, output is the discharge. Loss coefficients are computed internally or may be input. the program also computes q if the outlet is submerged. (type 4 - USGS).

225 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00713-41 : Standard Step Backwater for Natural Channels from Card D

This program reads geometric data from cards, computes the geometric elements of the cross section and converges to a solution of the backwater calculation by Newton's method. Multiple water surface profiles may be calculated from one set of geometric data on cards.

276 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00793-41 : Field Packer Permeability Test Calculations

This program calculates field permeability from borehole packer test data.

115 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00802-41 : Trapezoidal Channel Design

Critical and normal depth; or normal width solved by iterative procedure. Also solves for critical and normal discharge, critical slope, Froude number, velocity, area and top width. Variables conveniently entered, viewed, or computed by using top ten keys. Programmed for the design engineer. For trapezoidal, rectangular, and triangular shapes.

261 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00885-41 : Hydraulic Design of Pipes and Channels

This program calculates velocity and discharge in pipes, (flowing full or part full), in open-flow channels, or determines the diameter or proportional depth of pipe for a known discharge, using the Colebrook-White equation, regarded as the most accurate basis for hydraulic design and experimentally confirmed over very wide range. Program 00656-41 can be very useful (Master Mind-Data Bureau).

368 Program Steps
Necessary Accessories: One Memory Module, Card Reader. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

01111-41 : Pipe Spillway Rating

Service spillways often consist of a riser and a pipe. When the pipe fills the driving head is the difference between the reservoir water surface and the hydraulic grade line at the exit. This program solves for either the discharge or the reservoir water surface elevation. SCS guidelines for loss coefficients are included in documentation.

102 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01213-41 : Pipeline Surge Analysis

This program is used for surge analysis of a pipeline system that consists of a centrifugal pump at the upstream end of the pipeline, and a time-controlled block valve at its downstream end. The program solves for the pressure and flow rate as functions of time at ten equidistant mileposts along the line. It also stores the maximum attained pressure at each milepost.

647 Program Steps
Necessary Accessories: Three Memory Modules. Printer optional.
Documentation — $14.00 Cost of 6 cards — $7.50

01262-41 : Series Pipe System

Computes total dynamic head in series system of pipes over a specified range of flows at a specified interval. Output can be plotted to construct system curve for pump selection. Will consider single or parallel well pumps, or single or parallel booster pumps. Units are feet, inches, gallons per minute. Will handle 14 pipes with one module, add 32 pipes for each additional module.

285 Program Steps
Necessary Accessories: At Least One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

01314-41 : Channel Slide Rule (CSR)

Solves all rectangular and trapezoidal channel flow problems. Has input for flow (CFS), depth (ft), bottom width (ft), velocity (fps), side slope (z), energy slope (%), Mannings value (n), and froude number (f). User specifies any 5 or more values; program solves for other values. Includes error codes.

832 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV
Documentation — $14.00 Cost of 8 cards — $10.00

01396-41 : Generalized Manning Equation for Open Channel Flow

Program accepts five known parameters and calculates unknown flow, or depth, or roughness, or slope for any symmetrical cross section (rectangular, trapezoidal, or triangular). Calculated parameter is stored for use in continuing calculations where effects of variation of one or more of original parameters may be observed.

165 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01397-41 : Hardy Cross (HDY +)

Performs the classic Hardy Cross procedure for multiple pipe looped systems. Utilizes Hazen-Williams equation for computing head losses. Inputs for each pipe are actual or nominal pipe diameter (inches), assumed flow and direction (GPM), pipe length (feet), and Hazen-Williams coefficient. Output can be used to determine elevation of hydraulic grade line and, if elevation is considered, pressure. No limit to number of pipes (nodes) in a loop or number of loops. Maximum number of pipes is 122 with Quad RAM but pipes shared are entered for each loop.

283 Program Steps
Necessary Accessories: Printer and Quad RAM (if Memory Modules are used deduct 32 pipes for each Module required).
Documentation — $12.00 Cost of 3 cards — $3.75

01486-41 : Saturated Steam Flow Through Pipe, Valves and Fittings

This is an interactive program inteded to be used by engineers and designers to size piping or calculate pressure drops for the flow of saturated steam. Viscosity, specific volume and equivalent length of sixteen types of bends and fittings are automatically calculated by the program.

353 Program Steps
Necessary Accessories: 1 Memory Module.
Documentation — $14.00 Cost of 4 cards — $5.00

01550-41 : Storm Water Detention Pond Design

Computes required detention volume and required pipe size or outflow rate for a gravity outflow basin. Or, required volume for a constant rate (pump) outlet. Volume of water flowing into basin found using Rational Formula. Calculus used to determine instantaneously changing outflow rate. Required volume is the difference between these.

203 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01590-41 : Restriction Orifices

Solve 3 types of problems: 1) If pressure drop remains constant will solve for bore given flow rate or vice-versa. For liquids/gases; 2) When the pressure drop varies with time (like pressurizing a vessel). Variables are bore, time, flow rate. Given one variable, it solves the other two. Gas only; 3) When orifice is used to both measure and restrict, solves for bore and differential pressure (flange taps). Gas only.

534 Program Steps
Necessary Accessories: 2 Memory Modules, Card Reader. Printer is optional.

Documentation — $12.00 Cost of 4 cards — $5.00

01671-41 : Pipe Flow / Part Full Pipe Flow Calculator

Two programs. The first solves for the missing variables given the value of any two of the flow variables (diameter, flow, velocity, or grade), using either the Hazen Williams or Mannings formula. The second solves for the ratio of flow depth to diameter or ratio of actual flow to full pipe flow given the other value. Flow velocity and velocity ratio for equivalent cleansing power are also found. Variable roughness coefficient is used. Units are metric. These programs can be used for sewer design.

238 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 6 cards — $7.50

01698-41 : Hydraulic Design of a Storm Water Pumping Station

This program routes a given storm hydrograph through an underground storm water pumping station. Flow may enter the pumping basin through any number of box and pipe culverts. Water is stored both within the basin and the connecting culverts. The water is then removed by a network of hydraulic pumps.

556 Program Steps
Necessary Accessories: Printer, 3 Memory Modules

Documentation — $14.00 Cost of 5 cards — $6.25

01764-41 : Orifice Calculations

Program will calculate either vapor or liquid flow for a measuring or a restriction orifice. If orifice diameter is known for either vapor or liquid, flow can be calculated.

401 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 4 cards — $5.00

01775-41 : Circular Pipe Friction Losses

This program calculates the friction losses in circular pipe, for water flow. The program contains a subroutine which calculates the Reynolds number.

121 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01795-41 : Time Needed to Empty a Tank

Program will calculate the time needed to drain a tank (4 type of tanks) using an open line (3 types of lines).

161 Program Steps
Necessary Accessories: Printer is optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01859-41 : Pipe-Sizing for Compressible Flow

This program is designed to solve a broad range of pipe-sizing problems for compressible flow. The program assumes that flow is isothermal, and that either the upstream pressure or the downstream pressure is known. The Mach number can be found at the inlet and, more importantly, at the outlet-where sonic velocity may limit the flow.

908 Program Steps
Necessary Accessories: Quad Module, Extended Function Module. Optional: Thermal Printer, Card Reader or Wand.

Documentation — $20.00 Cost of 12 cards — $15.00

01957-41 : Flow Computations for Various Open Channel Configurations

Computes flow given normal depth, or normal depth given flow, and critical depth for rectangular, triangular, trapezoidal, circular or parabolic channels. Standard output is normal depth, top width and flow. User may select additional outputs including area, wetted perimeter, hydraulic radius and/or average velocity. (S.I. or U.S. units).

554 Program Steps
Necessary Accessories: Three Memory Modules, Quad Memory Module or a CV; (Printer is optional)

Documentation — $14.00 Cost of 7 cards — $8.75

02005-41 : Flow Through Orifices for Incompressible Fluids

This program solves for orifice diameter if given flow or solves for flow if orifice diameter is given for incompressible fluids. If printer is attached complete printed output including project title, date, input and output data is given.

142 Program Steps
Necessary Accessories: Printer is optional

Documentation — $12.00 Cost of 2 cards — $2.50

02009-41 : Parallel Channel Flow

Calculates individual flow in two or three parallel channels and system pressure drop. Options include printer, SI or English units, Colebrook-White (Moody) friction correlation, and form-loss as $K = A + B(RE^C)$. Ideal for detailed/accurate analysis of systems with arbitrary channel geometry and subchannel flow within industrial equipment.

727 Program Steps
Necessary Accessories: Quad Memory Module if using 41C (Printer is optional)

Documentation — $16.00 Cost of 8 cards — $10.00

02161-41 : Control Valve Sizing

Sizes valve CV for liquids, gases and vapors even in cases involving reducers, choked flow and viscous liquids. Features any consistent set of units without altering program, prompts for data including engineering units checks and corrects for choked flow, reducers, transitional or laminar flow and calculates resulting aerodynamic and hydrodynamic noise.

799 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV; (Card Reader and/or Printer are optional).

Documentation — $20.00 Cost of 14 cards — $17.50

02201-41 : Calculation For Head Loss and Centrifugal Pump

This program is designed to determine the pressure drop within the transmission line and its equivalent length. It will also determine the friction and the velocity in the pipe line. Most importantly, a program that calculates the discharge pressure for the pump has been added. So that the user may calculate the head loss in the pipe line and calculate the pressure from the pump for a specific segment of the pipe line directly, or separately. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC.

848 Program Steps
Necessary Accessories: X-Function/Memory module, 82161A Digital Cassette Drive, 82162A Thermal Printer, Quad module or CV
Documentation — $14.00

02260-41 : Flow Meas. of V-Notched, Rectangular, or Cipolletti Weirs

Program calculates flow in CFS through a v-notched, rectangular or cipolletti sharp-crested weir. Parameters are height of flow and geometry of weir. Program also takes into account the number of end contractions for rectangular.

125 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02512-41 : Computation of Concrete Volume For Ductbank Encasement

This program computes the volume of concrete (cubic yards per 100 linear feet of ductbank) required to encase conduits in a ductbank. Required inputs by the user are the number of rows and columns of conduits in a typical ductbank cross section. The minimum seperation between conduits, the minimum concrete cover on all sides of the ductbank, and the size of each conduit separately.

218 Program Steps
Necessary Accessories: At least one memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02523-41 : Rectangular Throated Flume Flow Calculations

This program will solve for one unknown among the variables of flow, head, flume throat width and approach channel width, provided that the flume throat length is also known. The user can select imperial units or metric units operation and may also select an optional alarm mode which monitors certain limitations on the flume dimensions.

397 Program Steps
Necessary Accessories: One memory module
Documentation — $14.00 Cost of 4 cards — $5.00

02545-41 : Differential Pressure by Two-K Method

This program calculates the pressure drop due to friction loss of fluid flowing through pipe and fittings. The unique features of the program are that it prompts the user for all inputs including the quantity of programmed pipe fittings and it uses a direct solution correlation (covering laminar, transition and turbulent flow regimes) to calculate the Darcy friction factor. The program contains 'k' values for the pipe fittings eliminating the need to refer to literature.

340 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02546-41 : Orifice Calculations For Flow Measurements

HP-41C version of Library program 04704-97. Facilitates initial program entry and performing successive calculations without the continual card re-entry required in 04704-97. Solves ASME/ISO equations for square-edged, flat plate, concentric orifices, given two of the following: meter differential, flow rate, orifice hole diamter, the program calculates the third. Applicable for English, metric or S.I. units; liquid, gas or vapor service; flange, radius, vena contracta, corner or pipe taps, drain and/or vent hold correction; and various orifice material corrections.

1084 Program Steps
Necessary Accessories: Quad memory module (if HP-41C). Card Reader and Printer optional.
Documentation — $20.00 Cost of 10 cards — $12.50

02558-41 : Pipe Friction Loss

This program calculates the friction loss due to fluid flowing in a straight pipe. The unique feature of this program is that it uses a direct solution correlation to calculate the Darey friction factor. The correlation covers laminar, transition and turbulent flow regimes and should give much faster results than iterative methods without sacrificing accuracy.

133 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02564-41 : Liquid Metering Orifice Sizing

The program calculates the capacity, differential pressure, or bore size, and the flow coefficient for flange - tape orifices in liquid service.

463 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 5 cards — $6.25

02568-41 : Weir Plate Flow Calculations

This program will solve one unknown among the variables in the Francis equation for flow over a rectangular weir or the Cone equation for flow over a V-notch weir. The user can work in U.S. (cusecs and feet) or metric (cubic metre/hour and metres) units. As the equations are only valid over a limited range of weir dimensions, the user has the option of selecting an alarm mode which monitors these limits. Fully documented.

423 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02627-41 : Parshall Flume Flow Calculations

This program will solve for one unknown among the variables of flow, head and flume size (throat width) by using the Parshall equations. The user can work in Imperial units (cusecs and feet) or Metric units (cubic metres per hour and metres). There are five flow equations which are automatically selected according to flume size. The User has the option of selecting an alarm mode which monitors maximum and minimum conditions.

578 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $14.00 Cost of 6 cards — $7.50

02669-41 : Open Channel Flow Using Mannings Formula

Mannings formula for open channel flow. Solves for flow rate, normal depth, slope, or critical depth for rectangular, trapezoidal, or triangular shaped channels.

309 Program Steps
Necessary Accessories: One memory module for the HP-41C. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02756-41 : System Curve (SYSCRV)

This program generates a pump discharge piping system curve which is necessary for sizing centrifugal pumps. The program prompts for all inputs required (including quantity of fittings and valves in the discharge line), labels and displays all results and displays a program function prompt. The program contains "k" values for various valves and fittings eliminating the need to refer to the literature. To implement full features of the program requires the HP-IL (82162A) printer.

622 Program Steps
Necessary Accessories: Quad memory module with HP-41C or HP-41CV. 82160A HP-IL Interface and 82162A HP-IL Printer optional.

Documentation — $14.00 Cost of 9 cards — $11.25

02808-41 : Mannings Equation For Open Pipe Flow

Program solves open pipe flow using Manning's equation. Solve for flow rate, depth of flow, or slope of a sewer pipe flowing only partially full. Also solves for flow rate, diameter, and slope of the flowing full peak capacity of the pipe.

334 Program Steps
Necessary Accessories: One memory module. Printer is optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02837-41 : Open Channel Junction Structure Analysis

Program analyzes junctions, or transitions, of triangular, trapezoidal, and rectangular open channels with one or two side channels in confluence. Calculations are by common pressure plus momentum (P+M) iterative procedures. Input is prompted for and the program will output normal and critical depths if unknown for the two reaches of the main channel. Output includes up and downstream depths, velocities and energy grade lines, and specific force. Individual pressures and momentums can be recalled. Output includes notations of super- and subcritical flows, control up- or downstream, and the occurrence of an upstream hydraulic jump.

926 Program Steps
Necessary Accessories: Four memory modules. Printer recommended but not required because output stops at each answer.

Documentation — $14.00 Cost of 9 cards — $11.25

03086-41 : Natural Channel Standard Step Backwater and Hyd Properties

Program computes Standard Step Backwater and hydraulic properties for natural channels. Trial depths are computed by Newtons Method. Conveyance is computed and totaled for subsections of the cross section having a constant "n" value. Conveyance is recomputed for each trial depth. Also computes hydraulic properties for a single cross-section.

717 Program Steps
Necessary Accessories: Card reader, printer helpful.

Documentation — $14.00 Cost of 8 cards — $10.00

03087-41 : Circular and Trapezoidal Channel Water Surface Profile Comps

Determine water surface profiles in circular, trapezoidal, rectangular, or triangular channels using either the direct step or standard step method. Trapezoidal channels may have unequal side slopes and roughness (Manning's "n") can very from part to part of the cross-section. Friction losses are based on average friction slope, as determined by the Manning equation. Engineering or SI units. When using standard step method, transition, form and bend losses can be included. Normal and critical depth computations are included.

476 Program Steps
Necessary Accessories: One memory module. Printer recommended but optional.

Documentation — $20.00 Cost of 4 cards — $5.00

03093-41 : Manhole Invert Calculations

Program calculates the slope between the inverts of two manholes and checks/ corrects this slope against a given minimum slope. The program maintains 3 feet of earth cover above the crown of a given pipe size, calculates the pipe inverts at manholes based on the pipe's slope, and provides a 0.1 foot drop through all manholes for construction ease.

85 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03157-41 : Trapezoidal Open Channel Flow Program

This program uses Mannings equation to solve for the following parameters for trapezoidal, triangular and rectangular channel sections- Q, flowrate in cfs- V, velocity in fps-b, bottom width in ft.- d, depth of flow in fl.- b & d, bottom width and depth of flow in ft.- S, bed slope in ft/ft. The program also calculates the flow condition and most efficient section if desired.

929 Program Steps
Necessary Accessories: Four memory modules. Printer optional.

Documentation — $16.00 Cost of 8 cards — $10.00

03238-41 : Weir Flow

Q, C, L or H. This program computes all variables for the Weir Flow equation. Solves for

99 Program Steps
Necessary Accessories: Printer is optional.

Documentation — $8.00 Cost of 1 card — $1.25

03281-41 : Storm Sewer Collection System Design

This program will compute the required drainage structure size of a storm sewer collection system of any size, based on the rational method. The drainage structures can be open channels, box culverts, circular pipes and arch pipes. The computations are based on the Manning equation with a given "n" factor. The Newton method of computing an unknown factor is included.

635 Program Steps
Necessary Accessories: Quad ram; printer would be helpful.

Documentation — $20.00 Cost of 7 cards — $8.75

03465-41 : Round Culvert Headwater

This program computes inlet and outlet headwater for round culverts with standard inlet conditions. Procedure is based on "Hydraulic Charts For The Selection Of Highway Culverts" by FHWA and other publications. Culvert flow is divided into two types; inlet control and outlet control. Headwater is computed for each value. The higher headwater is then added to the invert elevation to determine the headwater elevation. Constants are stored on data cards for each standard inlet conditions.

492 Program Steps
Necessary Accessories: Card reader, printer.

Documentation — $12.00 Cost of 10 cards — $12.50

03468-41 : Natural Channel Flow

This program uses Manning's Formula to compute discharge, depth, conveyance, stage/discharge data and other hydraulic properties for an irregular cross section. Distances and elevations with up to three decimal places may be used.

660 Program Steps
Necessary Accessories: Card reader, printer.

Documentation — $14.00 Cost of 7 cards — $8.75

03469-41 : Box Culvert Headwater

This program computes inlet and outlet headwater for box culverts with standard inlet conditions. Procedure is based on "Hydraulic Charts For The Selection Of Highway Culverts" by FHWA and other publications. Culvert flow is divided into two types, inlet control and outlet control. Headwater is computed for each value. The higher headwater is then added to the invert elevation to determine the headwater elevation. Constants are stored on data cards for each standard inlet conditions.

400 Program Steps
Necessary Accessories: Card reader, printer.

Documentation — $14.00 Cost of 9 cards — $11.25

03542-41 : Water Forces

This program consists of three parts: (1) Calculates the pressure rise in a pipeline due to water hammer. (2) Calculates the resultant force and angle of action at a bend in a pipeline. (3) Calculates the required dimensions of a thrust block, reaction area required and concrete volume. The program is menu driven and very user friendly.

508 Program Steps
Necessary Accessories: Printer.

Documentation — $14.00 Cost of 8 cards — $10.00

03544-41 : Gravity Sewer Design

This program is menu-driven and user friendly. It aids in the design of a gravity sewer system. The following may be calculated: flow depth, velocity, velocity head, end invert elevation, incremential depths of trench cuts. The sewer system is examined from manhole to manhole. User is prompted for all data. All data and results are printed in an attractive format. Excellent design and cost estimating aid.

796 Program Steps
Necessary Accessories: Printer.

Documentation — $14.00 Cost of 9 cards — $11.25

J306 Civil Engineering Soil Mechanics

02064-41 : Wedge Failure Analysis

This program solves problems involving slope failure of a rock wedge without having to draw stereoplots. Will solve: dry slope with no tension crack, dry slope with tension crack, or slope with tension crack and water pressure. Gives factor of safety and results of calculation tables. Can include external forces.

736 Program Steps
Necessary Accessories: Four Memory Modules; (Card Reader is recommended)

Documentation — $14.00 Cost of 6 cards — $7.50

02084-41 : Earth Pressures of Cohesive or Cohesionless Soils

Using Rankine's Theory and the the Trial Wedge Method, this program computes: Ho, W, C, alpha max., Pa or Pp on cohesive or cohesionless soils. The calculator prompts for all data and the output is labeled for easy identification. Necessary input: ¡i (slope), height, internal friction angle, specific weight of soil, slope of wall, cohesive stress.

239 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02734-41 : Horizontal and Vertical Displacements of Movement Markers

Field usable program calculates the horizontal distance and direction and vertical distance through which a marker moved, as on a glacier surface, or in unstable soils on a slope, during the time between two triangulation and vertical angle surveys. Simple program additions allow use of card reader for storing data of initial surveys for use during later surveys.

407 Program Steps
Necessary Accessories: Two memory modules. Card reader optional.

Documentation — $14.00 Cost of 5 cards — $6.25

03066-41 : Bearing Capacity From Penetration Testing "BRG"

The program is based on a largely empirical but widely used relationship between "N" (the standard penetration test value) and the bearing capacity. The equations are essentially the Meyerhof equations with a depth correction factor as presented in Ref. 1. The program prompts for values of N, D & B (the footing width) and solves for the allowable bearing capacity in kips per sq. ft. A general plot of verticle stress beneath the footing is included as a guide.

134 Program Steps
Necessary Accessories: Printer and card reader optional

Documentation — $12.00 Cost of 2 cards — $2.50

J308 Civil Engineering Structural Engineering

01601-41 : Mining Calculation

Program calculates the pillar width for an underground coal mine. A pillar width is initially guessed, and the correct width calculated no matter how wrong the guess. The farther out the guess, the longer the computation time.

67 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01610-41 : Steel Strength Design

This program is a group of nine interactive programs which use a common data base to design beams, columns and beam-columns in steel. The programs are based on the strength design provisions contained in Part II of the AISC Specification.

755 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 9 cards — $11.25

01611-41 : Stirrups Placement in Concrete Beams with Uniform Load

This program helps place vertical stirrups in reinforced concrete beams with uniform load (ultimate) according to ACI 318-77 Code, in English units. It has a different approach than existing program 01892-97, "Concrete Beam Shear Reinforcing".

193 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C.

Documentation — $8.00 Cost of 2 cards — $2.50

01618-41 : Reinforced Concrete Beams

Program designs or reviews reinforced concrete beams. With known material strengths and dimensions, the minimum reinforcing steel area is computed for a given ultimate bending moment. For a beam of known properties, the ultimate bending moment is calculated.

93 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01741-41 : Cantilever/Suspended Span Beams

Program calculates all positive and negative moments, joint shears and reactions for lines of cantilever/suspended beams. User chooses L.L. variation factor, spacing of supports (columns), and of point load(s). User chooses from one to five point loads between supports. Output is complete and selfcontained. Useful for service load or limit states design, S.I. or imperial units.

1119 Program Steps
Necessary Accessories: Quad Module, Printer
Documentation — $14.00 Cost of 8 cards — $10.00

01835-41 : Statics of Cables

Given the horizontal and vertical distances between two bearings, specific weight and maximum sag of a two-point-suspended cable, this program solves for size, angles, and components of all forces, position of max. sag and length of cable. Positions of any sag and sag at any position may be calculated. Includes plotting, routine.

263 Program Steps
Necessary Accessories: One memory module, Math Pac I. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01875-41 : Beams on Elastic Foundation

Find deflection, slope, moment, shear or bearing (or a beam on an elastic foundation) due to triangular, uniform or concentrated load, moment, externally created angular or transversal deformation with free, fixed, simply supported or guided left or right end restraints. Size required is 31 + 2×number-of-loads.

825 Program Steps
Necessary Accessories: 3 Memory modules or quad memory for the HP-41C.
Documentation — $12.00 Cost of 7 cards — $8.75

01913-41 : Pile Group Analysis

This program computes the load on each pile in a group with applied load and moment, in any consistent system of units. The program is as useful for the design as for the revision of "as built" clusters with displaced piles. Rigid cap and elastic behavior of soil and piles are assumed.

127 Program Steps
Necessary Accessories: None up to 9 piles; extra memory needed from then on.
Documentation — $8.00 Cost of 1 card — $1.25

01992-41 : Foundation Bolt Design

This program calculates the maximum foundation loads for different, common bolt patterns. The program enables the engineer or designer to select suitable anchor bolts for his particular bolt pattern.

253 Program Steps
Necessary Accessories: 1 Memory module (Printer optional)
Documentation — $12.00 Cost of 3 cards — $3.75

02058-41 : AISC Structural Steel Column Design

This program analyzes structural steel W-shape columns which are acted upon by lateral moments, axial forces, or a combination of the two. The program is based upon the most recent American Institute of Steel Constructin standards. It contains several complex subroutines making an in-depth analysis possible.

900 Program Steps
Necessary Accessories: Four Memory Modules or Quad Memory Module; (Printer is optional)
Documentation — $16.00 Cost of 9 cards — $11.25

02062-41 : Critical Buckling Load for a Pin Ended Variable Sect Column

This program will determine the critical buckling load of a pin ended column having up to ten section changes.

383 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 3 cards — $3.75

02118-41 : Maximum Moment Under 18 Moving Loads

A loading train runs over a 2 to 7 spans continuous beam. The user names a support, and the program calculates the maximum bending moment that occurs there, situating the train. One to 18 loads.

443 Program Steps
Necessary Accessories: Three Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

02164-41 : Foundation Settlement Based on Consolidation Curves

Program computes the approximate total settlement beneath the center of shallow, uniformly loaded, continuous, rectangular, and round footings based on up to five consolidation curves. User inputs consolidation curve data, specifies flexible or rigid footing, bearing pressure, dimensions of footing, and either Boussinesq or Westergaard loading theory. Input data and calculation results are printed in detailed, labeled format.

721 Program Steps
Necessary Accessories: Four memory modules and Printer
Documentation — $16.00 Cost of 10 cards — $12.50

02178-41 : Maximum Absolute Positive Moment Under 18 Moving Loads

A 1 to 18 train load runs over a 1 to several continuous spans. User chooses 1 span and gets the output: 1) The maximum absolute positive moment; 2) The abscissa where it occurs; 3) Related position of the train (also available the left reaction). First part runs a single span, and second part takes into account two neighboring spans, decreasing previous moment.

407 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 6 cards — $7.50

02186-41 : Concrete Foundations For Lightning Fixtures Support Columns

This program permits an easy and fast computation of foundations employed to support steel column in lightning systems. Both 'round' and 'square' columns with symmetrical or not top loads are covered and general theory of this system is explained as part of a 21 page documentation set. Program is 622 bytes (89 registers) long, employs size 016 and is recorded in three cards.

298 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02202-41 : National Structure Inventory & Appraisal Sufficiency Rating

This program can be used to obtain a numerical rating of a bridge based on its structural adequacy and safety, serviceability and functional obsolescence, and essentiality for public use. The parameters used are the same for all states and approved by the American Association of State Highway and Transportation officials.

808 Program Steps
Necessary Accessories: Quad Memory Module; Extended Function/Memory Module
Documentation — $14.00 Cost of 7 cards — $8.75

02216-41 : Continuous Beam Analysis

Program analyzes continuous beams with constant I, one to ten spans. Input beam parameters, including fixed, free, or cantilevered ends, any combination of linear and concentrated loads. Program internally calculates reactions, fixed-end moments, distribution factors, outputs moments and shears at each support. Loadings and output fully documented.

809 Program Steps
Necessary Accessories: Quad Memory Module and Printer
Documentation — $14.00 Cost of 8 cards — $10.00

02218-41 : Fire Resistance of Protected Steel Columns

Program uses the American Iron and Steel Institutes' accepted methods for calculating the fire resistance of protected steel columns predicated on the ASTM E119 Fire Exposure Standard. Program handles wide flange, tubular and pipe columns protected with Gypsum Wallboard, cementitious or mineral fiber spray and regular or lightweight concrete encasement.

304 Program Steps
Necessary Accessories: One memory module or equivalent space
Documentation — $12.00 Cost of 4 cards — $5.00

02245-41 : Helicoidal Beams (Staies) Analysis

This program solves all redundants at midspan of a uniformly loaded helicoidal girder-beam fixed at its ends. After that, the program solves and plots sectional forces at any section demanded by user. Input data are: Radius of girder, depth, width, story height, angle between midspan's section and support and value of uniform load. Output are: section forces at any section between midspan and support.

491 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

02308-41 : Truss Deformation

Calculates vertical displacements of serial joints composing both above and below situated polygonal members of a loaded truss, thus obtaining the elastic line of deformation.

233 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 3 cards — $3.75

02374-41 : Porticos and Arches Calculation

For porticos and Arches with known left reactions from a loading, calculates at any section the normal force N, the transverse force VS and the bending moment M, allowing besides to find right reactions.

91 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02408-41 : Pile Group Analysis by Elastic Centre Method

This program determines forces in each pile in a system consisting of both vertical and raking piles.

294 Program Steps
Necessary Accessories: Quad memory module or HP-41CV. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02411-41 : Steel Tube/Pipe Column

Steel tube or pipe columns with axial loads in combination with biaxial bending are checked by the program in accordance with Part I of the 1978 AISC Specification. Output from the program includes the results from both stability and yield interaction formulas. Section property values must be provided by the user.

638 Program Steps
Necessary Accessories: Three memory modules
Documentation — $12.00 Cost of 7 cards — $8.75

02412-41 : Steel Wide Flange Column

Steel wide flange columns with axial loads in combination with biaxial bending are checked by the program in accordance with Part I of the 1978 AISC Specification. The program checks local buckling for both web and flange. Output includes results from both stability and yield interaction formulas. Section property values must be provided by the user.

723 Program Steps
Necessary Accessories: Three memory modules
Documentation — $14.00 Cost of 7 cards — $8.75

02420-41 : Masonry Wall Analysis

Analyzes a solid grouted concrete masonry wall for combined axial and bending loads in accordance with uniform building code criteria. Printer ouput highly annodated for use as final structural calculations.

297 Program Steps
Necessary Accessories: One memory module and Printer
Documentation — $12.00 Cost of 4 cards — $5.00

02423-41 : Gravity Wall Analysis

This program provides a rapid means for investigating stability or gravity walls. Analysis includes factor of safety for overturning and sliding. Check for location of resultant of forces is within middle one-third of wall. And report of minimum and maximum bearing pressure. Analysis includes consideration of variable backfill slope and passive pressure. Wall may include extended toe. Edit feature allows revision of selected parameters and reanalysis with minimal input.

509 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $14.00 Cost of 5 cards — $6.25

02452-41 : Simply Supported and Cantilevered Steel Beams

The program computes the design load, design bending moment and design strength of simply supported and cantilevered steelbeams in both "Ultimate Limit State" and "Ultimate Sevice-ability State". It also suggests which profile to use and computes the static bending and result stress in the beam chosen. Calculations done according to Norwegian Standard, NS 3473.

470 Program Steps
Necessary Accessories: Quad RAM or three memory modules
Documentation — $14.00 Cost of 10 cards — $12.50

02459-41 : AASHTO Prestressed Beams Type II, III, IV, V and VI

Program is specifically for design of composite prestressed AASHTO beam (type II, III, IV, V and VI) roadway bridges with HS 20-44 loading. Program computes losses, stresses at midspan and end of beam at release and final conditions, ultimate strength, cracking moment, beam shortening, D.L. deflection, residual camber, anchorage, and shear steel requirements at 20 th points in accordance with 1980 AASHTO code.

2030 Program Steps
Necessary Accessories: Quad memory module, Printer and Card Reader
Documentation — $25.00 Cost of 21 cards — $26.25

02467-41 : Moment of Inertia For Composite Areas

This program quickly and accurately computes composite moments of inertia and locations of center of gravity for any combination of rectangular or special sections.

113 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02471-41 : Reinforced Concrete Corbel and Bracket Design

This program designs steel reinforced concrete corbels and brackets in accordance with ACI 318-77. It selects based on user input of material properties, loads and basic geometry and outputs the least steel required and minimum steel depth needed. User interactive and fully prompted and labeled.

340 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02525-41 : Investigate Double Reinf. Beams

Program will investigate double or single reinforced concrete or masonry section by elastic design method. Given section dimensions, modular ratio, area and location of reinforcing, and bending moment; will display constants k, j, z and material stresses. Format follows design office procedure. Eliminates need for cumbersome design aids.

177 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02530-41 : Working Stress Design of Rectangular Concrete Beams

Program provides a quick and convenient means for working stress design of rectangular concrete beams with mild steel reinforcing. Program will accomodate compression reinforcement. Input consists of flc, fy, b, d, and As. Output consists of moments for tension and compression sides of beam and kd. All input is prompted and output is annotated.

202 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02563-41 : Ultimate Strength Design of Rectangular Concrete Beams

Program provides a quick and convenient means for ultimate strength design of rectangular reinforced concrete beams. For single layer reinforcement, program will solve for Mu given As or As given Mu. Given several layers of reinforcement program will solve for Mu using strain compatibility. Checks are included for As Min. and .75 Asb. Design is in accordance with AASHTO specifications.

577 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $14.00 Cost of 5 cards — $6.25

02593-41 : Flex 1

Designs single reinforced concrete or masonry section by elastic design method. Given section dimensions, modular ratio, bending moment, and allowable stresses, program computes steel area at which fc and then fs will be at respective allowables. With user selected area, displays k, fc, fs and respective stress ratios. Very useful with masonry where fc is very sensitive to As. Avoids need for cumbersome design aids in concrete investigations.

207 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

02598-41 : Predesign of Columns in a Building of N Stories

Given the stories number, load per area, concrete and steel strength, the contributor area and location of the column, this program finds the concrete area necessary for the column in each story and its dimensions.

149 Program Steps
Necessary Accessories: Printer desirable
Documentation — $12.00 Cost of 2 cards — $2.50

02599-41 : Alalysis of Plane Trusses of A Maximum of 136 Bars

Giving angles of unknown forces (maximum 2 forces in a joint), magnitudes and angles of known forces, this program calculates the compression or tension stresses for each bar.

149 Program Steps
Necessary Accessories: For 136 bars - a Quad module or HP-41CV required
Documentation — $12.00 Cost of 2 cards — $2.50

02612-41 : Section Properties - Composite Steel Box and Plate Girders

Governing specifications are AASHTO. routine is provided to facilitate checking of multiple similar sections. neutral axis, and section modulus about top and bottom of beam. An edit Output consists of location of neutral axis, moment of inertia about considering longitudinal stiffeners, re-bars, and holes in flanges. girders constructed of welded plates. Provisions are included for Program computes section properties for composite steel I girders or box

730 Program Steps
Necessary Accessories: Quad memory and printer
Documentation — $14.00 Cost of 8 cards — $10.00

02689-41 : Pile Footing Analysis - Axisymmetric Pile Locations

Program was developed to provide a quick means of determining the pile loads for an axisymmetric footing. Pile coordinates for only one quadrant need be entered, as the programs adds the piles required to achieve symmetry about the x and y axis. An edit feature allows the revision of a single parameter and reanalysis of the footing with minimal user input. Output consists of individual pile loads under given axial load and moments.

436 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $12.00 Cost of 5 cards — $6.25

02693-41 : Analysis of Plane Determinate Trusses With Vertical Loading

Given external loads and reactions, and truss joint coordinates, program calculates member lengths and axial loads for any configuration of plane pin-jointed determinate truss with up to 45 points. Program self-checks for summation of x and y forces = 0 at final joint. Loading may be changed without re-entering coordinates. Program uses unique "rotating" storage system for joint load components to conserve registers.

546 Program Steps
Necessary Accessories: Quad memory module. Printer optional.
Documentation — $12.00 Cost of 5 cards — $6.25

02694-41 : Optimum Flexural Design of Reinforced Concrete Slabs

Given concrete and steel stresses, ultimate bending moment, trial slab thickness, and minimum concrete cover for reinforcing, this program calculates minimum flexural and temperature reinforcing. If trial slab thickness is undersized as determined by stresses, the program increments slab thickness to obtain minimum concrete dimensions.

367 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02764-41 : Free-Standing Stairs (Fixed)

This program of analysing stairs having unsupported intermediate landings and subjected to symmetrical loading is presented for use by designers. The Stair shall terminate as a framework fixed at both ends. The structure is simplified to an indeterminate frame work and the analysis employs the principle of least work.

464 Program Steps
Necessary Accessories: Three memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02765-41 : Universal Table Generator Max-Min-Zero-Plot

This program is used to create numerical tables from the vast unlimited simple to complex $f(x)$ equations that lie within the interval of convergence (I.O.C.) $x_1 \leq x \leq x_2$. This program also will locate points and their corresponding maximum, minimum and even zero $f(x) = 0$ values in the order of their occurrences in a given $f(x)$; do plottings of $f(x)$ equations. A "must" program for structural/stress engineers who deal with points of maximum design values; mathematicians. Ten examples included!

268 Program Steps
Necessary Accessories: HP-41C/CV peripheral printer; quad module optional depending upon the registers used in the secondary program.

Documentation — $12.00 Cost of 8 cards — $10.00

02766-41 : Dynamic Analysis — UBC Earthquake Force

The program is based on dynamic analysis of such a system with five degree of freedom as a maximum possible. The system can be: Bode System (cantilever with no action as a frame) and Moment Resisting Frame. Combination of two boundary systems is possible acting with some of itselves rigidities. Period of vibration of building shall be determined following the method and equations made by E.E. Sigaldv.

837 Program Steps
Necessary Accessories: Quad memory module or HP-41CV and X-Functions module

Documentation — $14.00 Cost of 8 cards — $10.00

02827-41 : Geometric Solution to Bent Plate Framing Connections

This program can be used to solve the geometric solution to bent plate framing connections in structural steel structures. Very useful for structural steel detailers. All input/output in feet, inches and sixteenths. Fully prompting.

398 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

02828-41 : Partially Reinforced Masonry

The program analyzes partially reinforced hollow unit masonry walls for vertical loads and/or forces normal to the wall surface. The program will be of use in the design of hollow unit walls for structures in seismic zones 0 and 1 of the "Uniform Building Code". Comprehensive output compares actual stresses with allowable stresses to determine the adequacy of the wall in question.

579 Program Steps
Necessary Accessories: HP-41CV or equal. Extended Function Module, HP-IL Module and HP-IL Thermal Printer

Documentation — $14.00 Cost of 7 cards — $8.75

02833-41 : Design to Shear in Prestressed Concrete Beams

This program finds the steel reinforcement for shear stress in prestressed concrete beams. The cable of the beam can be rectilinear or curved. The necessary inputs are: Mechanical properties of section, live and dead loads, prestressed force and strength of the materials.

284 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02834-41 : Biaxial Bending Concrete Columns Simplified Analysis

This program analyzes rectangular columns under load and biaxial moments by Gouwen's Bending Simplified Theory. Given the section, steel, load and moments, the program determines if the section can resist or not.

568 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

02852-41 : Pipe Template

Program prints or displays coordinates for making a layout template for T or Y pipe connections; eccentric or concentric. Choice of decimal or fractional inch output. Template increments (degrees) are user determined. Alternate metric program listing included.

205 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02857-41 : Combined Stress

Combined stress program determines the state of stress on the principal planes or an arbitrary plane through an element in a body subjected to several simultaneous loadings. The general case of a two-dimensional stress is considered, with the body subjected to two normal stresses and a shear stress. Program will compute principal normal stresses, maximum shear stress or the state of stress on an aribitrary user defined plane.

183 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02858-41 : Steel Column Base Plate Design

Steel base plates are generally used under columns for distribution of column load over a sufficient area of the concrete pier or foundation. "BPLATE" calculates the base plate size, thickness and stresses in the concrete support for three column types (W-Shape, tubing, pipe) with or without moment and allows users to select preferable numbers while processing.

662 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 6 cards — $7.50

02870-41 : Lineal Distribution of Seismic Force on All Stories of a Building

For all seismic design it is necessary to obtain the horizontal forces in each story. Given the number of stories, the distributed load on each story, I, K, C, S and T Values as well as the areas and heights between stories, this program finds the forces acting in each story for seismic design purposes.

137 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02871-41 : Stiffness to Shear and Bending in Shear Walls

In elements working to shear is indispensible for stiffness calculations, to considerate the shear. Given the shear wall dimensions (L, h, B) this program finds the stiffness k, k', a, b, b' and t. The wall must be of constant section.

70 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02872-41 : Prestressed Concrete Beams Simplified Design

This program designs, according to simplified T.Y. Lin's theory, beams of Prestressed Concrete. The inputs are: dimensions of the beam, live load, beam's length, coating. The outputs are: Properties of the section, eccentricities, initial and final stresses on the upper and lower points of the beam.

262 Program Steps
Necessary Accessories: One memory module optional

Documentation — $12.00 Cost of 3 cards — $3.75

02873-41 : Whichever Form (Rectilinear) Composite Section Properties

This program finds the area A, centroid location C1 and C2, moment of inertia I, of whichever rectilinear form composite sections with or without holes (rectilinear) in a very easy manner.

96 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02875-41 : Design of Anchorage Zone in Prestressed Concrete Beams

This program computes the bending moments and the vertical reinforcement steel for the very important anchorage zone in prestressed concrete beams. The analysis considers vertical intervals indicated by the user. The program is based on Theory of Gergely and Sozen (illustrated by Khachaturian). The level loads number in the extreme of the beam can be near 50 with Quad Module.

306 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 3 cards — $3.75

02878-41 : Long Continuous Beam (Up to 18 Spans)

Program calculates moments on supports in continuous beams for the following type of load: concentrated (any amount); uniformly distributed on all the span length or on a particular portion (any amount); triangular (two per span). Depending on the complexity of the case could solve up to 18 spans plus two cantilever. Friendly for changing any data to solve other similar cases (it keeps datas).

673 Program Steps
Necessary Accessories: Two memory modules for the HP-41C and printer
Documentation — $14.00 Cost of 6 cards — $7.50

02925-41 : Punching Shear For Rectangular Structural Tubing

Analyzes punching shear and allowable loads for simple T, K and Y connections in rectangular tubular structures then determines the welding requirements for the joint. Based on AWS D1.1-82 Structural Welding Code, Section 10, Tubular Structures. Documentation includes logic, formulas and problem worksheet. Does not consider fatigue or yield line analysis.

804 Program Steps
Necessary Accessories: Quad Memory. Printer and Card Reader optional.
Documentation — $14.00 Cost of 8 cards — $10.00

02936-41 : AASHTO Tee Pier Analysis

This program will analyze a single column bridge pier (fixed, expansion, or monolithic) in accordance with 1977 AASHTO Specifications (including interims thru 1983). Output consists of axial load, longitudinal and transverse moments (Groups 1 thru 7) at base of column (service or load factor). Will also analyze spread or pile supported footing.

711 Program Steps
Necessary Accessories: Three memory modules or Quad Chip. Printer optional.
Documentation — $16.00 Cost of 7 cards — $8.75

02945-41 : Properties of Thin Cold Formed Steel Sections Coord Input

Program calculates centroid, second moment of area, product of inertia for selected axis of up to five straight sided cold formed steel sections of uniform thickness. Input the center line corner coordinates starting at the edge. Corner curvatures ignored. Accuracy can be improved by reducing the flanges by the fillet radius.

361 Program Steps
Necessary Accessories: Quad memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02958-41 : Steel Beam Web Opening Design

This program uses the elastic method to analyse and design steel beam web openings. The assumptions are: (1) Concrete doesn't take shear force. (2) Shear distributed by shear area to the top and bottom tees. Users are allowed to put and change stiffeners at three locations.

1020 Program Steps
Necessary Accessories: Four Memory Modules
Documentation — $14.00 Cost of 8 cards — $10.00

02964-41 : Rebars Calculation at Rectangular Concrete Sections

When a rectangular concrete section is given and the design moment is calculated, the tension reinforcements can be computed by the ultimate strength method and restricted by ACI code provisions. This program is written for this purpose.

149 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02971-41 : Structural Frame Analysis

The program analyzes a frame of up to six spans for dead load plus alternate and adjacent live load conditions. Included in the resulting printout are maximum and minimum moments for beams and columns, dead and total load beam reactions. The program can also be used for total load conditions only. The program is separated into two parts. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

1411 Program Steps
Necessary Accessories: HP-41CV or equivalent. Extended Functions Module, two Extended Memory Modules, HP-IL Module, Cassette Drive and Thermal Printer
Documentation — $14.00

02978-41 : Ring Loaded Symmetric to a Transverse Axis

This program solves for the bending moment, axial force and shear at any angular location around a circular ring subjected to a loading symmetric to a transverse axis. The loading consists of pairs of concentrated forces applied normal to the ring at any set of angular locations, and of resisting tangential shear resultants applied symmetrically along the circumference.

247 Program Steps
Necessary Accessories: One memory module or equivalent
Documentation — $12.00 Cost of 2 cards — $2.50

02989-41 : Composite Steel Beam and Concrete Slab

Has editing features for reviewing and changing inputs. number of stud anchors and concrete stress. Does not consider cover plates. formed section modulus and moment of inertia, location of nuetral axis, axis lies within the concrete slab. Provides design information on trans- construction. Considers partial composite action and condition where neutral Design of composite beam per AISC specifications for unshored and shored

495 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 5 cards — $6.25

03039-41 : 2-D Beam Analysis

Uses the Finite Element Method to compute displacements at nodes and forces in each beam element. Nodes can have fixed or elastic restraints to ground. Additional load cases permitted. Point loads or moments may be applied to nodes. Documentation shows how to convert distributed loads to equivalent nodal forces and moments. Elements must be colinear. 6 nodes, 5 elements maximum.

873 Program Steps
Necessary Accessories: HP-41CV or Quad Memory Module
Documentation — $16.00 Cost of 9 cards — $11.25

03048-41 : Eccentrically Loaded Column Base Plate

This program will analyze an eccentrically loaded column base plate. The output consists of the limit of compression, gross tension in the bolts, design bolt tension (incl. shear transfered thru failure plane), compressive stress in concrete, and the required plate thickness.

439 Program Steps
Necessary Accessories: Two memory modules. Printer optional.

Documentation — $14.00 Cost of 4 cards — $5.00

03097-41 : Rigidity and UBC Shear Distribution Structural Analysis

This super program calculates center of rigidity, sum of rigidities along xx and yy, rotational stiffness, relative rigidities and respective direct shears, torsional rigidities and respective torsional shears per U.B.C. (Uniform Bldg Code). Maximizing register usage, with a quad module, up to 67 elements may be handled by this program, more than enough for any super- structure or even power plant. The output comes in an automated clean cut tabular form. A 'must' for Structural/Stress Engineers!

552 Program Steps
Necessary Accessories: Quad module or equivalent (HP-41CX). Printer/plotter optional.

Documentation — $14.00 Cost of 6 cards — $7.50

03115-41 : A.A.S.H.T.O. Simple Beam Live Load Analysis

Computes maximum shear, maximum moment with simultaneous shear (ideal for prestressed girder design) at any point in a simple beam as per A.A.S.H.T.O. HS-15 (44) or HS-20 (44) live load (including impact). Truck, lane and Alternate Military loadings are considered. Features: (1) absolute max shear/moment (2) envelope plotting.

664 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 7 cards — $8.75

03117-41 : Glue-Laminated Beam Review - Straight Curved or Tapered Beam

This program makes possible the rapid investigation of symmetrical glue- laminated beams. The beams may be either straight, curved, tapered, or curved and tapered in profile. A routine within the program eliminates the necessity of consulting and interpolating in tables for beams of non-uniform depth.

199 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03128-41 : Concrete Deep Beam Analysis and Design

As the span-depth ration of a member without web reinforcement decreases, its shear strength increases above the shear causing diagonal tension cracking. To provide the adequate shear reinforcement, ACI 318-83 section 11.8 gives us a series of analysis method. This program is written for both analysis and design purposes.

365 Program Steps
Necessary Accessories: Two memory modules

Documentation — $14.00 Cost of 4 cards — $5.00

03133-41 : Ultrabeam

Analyzes continuous beams via the Finite Element Method. Beams may be determinate or indeterminate. Nodal displacements and element forces output. Maximum of 12 nodes/11 elements. Rigid or elastic restraints. Additional loadings without starting over. Documentation shows how to convert distributed loading to equivalent nodal forces and moments. Also does Axial/ Torsion analysis as separate case. Problem data easily saved and restarted from extended memory or optional magnetic cards.

1042 Program Steps
Necessary Accessories: Module. Card Reader optional. HP-41CV or Quad Memory, Extended Functions Module with one Extended Memory

Documentation — $16.00 Cost of 10 cards — $12.50

03163-41 : Steel Base Plate Design

"Steel Base Plate Design" ("BPL") reduces known design quantities to elementary stresses, calculates the allowable material stresses, and determines the minimum required plate thickness for a base plate subject to a given combination of applied forces. "BPL" provides the user with a rapid means of converging on an acceptable solution for virtually all geometrically concentric steel base plate design problems.

625 Program Steps
Necessary Accessories: None

Documentation — $20.00 Cost of 6 cards — $7.50

03164-41 : Concrete Beam Design/Review for Strength Design

This program aids in the design or review of reinforced concrete beams. When material strengths and beam dimensions are input the area of reinforcing steel for a balanced design is then displayed. The designer may then enter either the applied bending moment or the amount of reinforcing steel. Then the required area of reinforcing steel or the allowable bending moment is displayed along with the shear capacity. Computations are performed in compliance with ACI codes.

172 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03203-41 : Loads on Pipe in Trench

Program calculates loads on pipes in trenches considering earth loads and live loads. Also calculates the maximum depth of cover for pipes in a trench, given the pipe supporting strength, type of soil and bedding condition.

159 Program Steps
Necessary Accessories: Extended functions module; printer would be helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

03204-41 : Wind and Horizontal Loads on Porticos

Program calculates for the columns end moments in porticos when it is possible using a simplified and approximated calculation. This preceeding result may not be exact when it is confronted with the value to be exactly calculated by CROSS method.

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03214-41 : Isotropic Plate Bending Analysis

Program calculates deflection and bending moments in isotropic simply supported plates. Solution by method of Levy using single fourier series expansion. Bending moment solutions do not converge as rapidly as deflection solutions and require greater number of terms in series. Plates bending under uniformly distributed load are treated.

269 Program Steps
Necessary Accessories: HP-41 Math Pac or user-written subroutines for hyperbolic functions

Documentation — $12.00 Cost of 2 cards — $2.50

03215-41 : Uniformly Loaded Beam - Moment, Shear, Deflection Calc

After any computer beam analysis, one can usually get the output with end moments for each member. With this information, it is very convenient to have "UNIFBM" compute the moment, shear and reflection at any selected section along the uniformly loaded beam. It can also calculate the amount and location of the max. moment.

205 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03261-41 : Shells of Constant Strength

This program determines the shape of the shell of revolution such that the membrane stresses are of the same magnitude at every point on the shell. Plain concrete domes supporting their own weight without additional load are considered. Differential equations of stress resultants solved by numerical integration. Units must be consistent.

208 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03284-41 : Overturning Load on Combined Footings

This program calculates area, neutral axis, and moment of inertia of any number of combined footing areas and the total load and center of gravity of any number of point loads applied to the footing. When wind or siesmic overturning moment is entered, program will display soil bearing at desired points along the footing. Results displayed in three columns: vertical loads only; vertical plus overturning; and vertical minus overturning.

118 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03318-41 : Portal Frame

FRM-C: This program considers bending and axial and shear deformations. Castigliano's Theorem is used to find the three unknown: M1, FX1, and FY1. The 3x3 simultaneous equations are solved by the Gauss-Jordan Elemination Routine. Reactions are printed.

1960 Program Steps
Necessary Accessories: HP-41CV (or equivalent memory), card reader, printer.

Documentation — $16.00 Cost of 16 cards — $20.00

03349-41 : Structural Pac Supplement — Section Properties with Point Storage

This program extends the versatility of the Section Property program in the Structural Pac by adding the capability of saving the coordinate pairs in memory and traversing the section with point numbers rather than entering each coordinate. This facilitates changes in the section since only the revised coordinates need be re-entered for a new problem. Program also provides utilities to save and load coordinate pairs on magnetic cards and can read cards created by U/L program 02592-41.

524 Program Steps
Necessary Accessories: Structural Pac, two memory modules. Printer, card reader, U/L program 02592-41 optional.

Documentation — $14.00 Cost of 4 cards — $5.00

03365-41 : Retaining Wall Concrete Block

This program computes and designs retaining walls of any height using standard concrete block. Design includes concrete block sizes to use, steel reinforcing required, foundation design, soil pressure resultants, lateral resistance of soil, footing keys (if required), and footing reinforcing steel needed.

676 Program Steps
Necessary Accessories: Requires HP-41CX or equivalent memory capability.

Documentation — $12.00 Cost of 8 cards — $10.00

03438-41 : Steel Frame Drift

This program computes drift, column shears, and percentages of drift due to columns and girders at any storey of a moment resisting steel frame with lateral loads applied at girder levels. Input storey heights and shears above, at and below the storey in question, and moments of inertia of storey columns and of girders at top and bottom of storey. It assumes that points of contraflexure occur at midspan and midheight of girders and columns respectively except when columns are pinned at one end. Flexural deformations only are considered.

512 Program Steps
Necessary Accessories: None.

Documentation — $14.00 Cost of 3 cards — $3.75

03439-41 : Tapered Girder

For a tapered or trapeziodal girder with uniform load and any number of point loads, this program displays bending moment, depth, moment of inertia, section modulus, and bending stress at selected points on span. If stress is not acceptable, elements of profile may be revised. Reenter series of points sufficient to locate maximum stress. Special value where profile or loading is not symmetrical and lengthy hand calculations are required to locate point of maximum stress.

278 Program Steps
Necessary Accessories: Printer is optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03479-41 : Arch Buckling

This program computes uniform radial critical buckling load for fixed and hinged supported circular arches. The critical load for fixed arches is approximate, determined through the use of the Newton-Raphson Method. Input consists of material, structural section and arch geometry properties.

190 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 1 card — $1.25

03480-41 : Moment Distribution for Prismatic and/or Non-Prismatic Beams

Input distribution factors, carry over factors, cantilever and fixed end for any number of additional cycles to be computed. User keyboard moments at beam ends to obtain final moments at beam ends by moment distribution. Where all beams are prismatic, program automatically provides facilitates reviewing and changing of inputs. computed. Program computes a minimum of three balancing cycles, and provides for carry over factor of 0.5. With the HP-41CV up to thirteen spans can be

389 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

03497-41 : Tall Slender Masonry Wall Design

This program will design load-bearing, reinforced tall, slender walls. The design is based on forces and moments determined by analysis. The procedure considers the effects of axial loads and deflection in the calculation of required moments. The design is in accordance with 'ICBO' Technical Report #4189 and section #2411 of the 1985 'Uniform Building Code'.

820 Program Steps
Necessary Accessories: HP-41CV or equivalent and printer.

Documentation — $14.00 Cost of 8 cards — $10.00

03499-41 : Concrete Beam With Tension

Input concrete strength, reinforcing steel yield stress, width of section, tension and shear, to obtain required areas of flexural and shear reinforcing. Checks for minimum reinforcing and insures that the section is keyboard. depths of reinforcing steel (compressive and tensile) and ultimate moment, not under reinforced. Editing and reviewing of inputs is facilitated by user

496 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 4 cards — $5.00

03502-41 : "FR" Frame

This program computes the final moments for a two span and two level frame having a symmetrical inertia and geometry with various loading conditions.

1069 Program Steps
Necessary Accessories: Quad memory module.
Documentation — $14.00 Cost of 7 cards — $8.75

03520-41 : UBC Seismic Loading

Input z, i, k, s, storey tributary weights, heights and allowable drifts to obtain period of structure, seismic base shear and horizontal loading at each storey level. Period of structure may be input instead of storey drifts to obtain base shear and horizontal loading. With the HP-41CV, up to fifty stories can be accepted by the program. The program has provisions for editing and review which are facilitated by user keyboard.

381 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 3 cards — $3.75

03573-41 : Effective Length of Columns in Frames with Sidesway

Input moment of inertias and lengths of girders and columns at top and bottom of column to obtain Ga, Gb and column length factor K. User can input Ga and Gb values over those obtained by program or input them directly. Program also has provisions for reviewing and editing inputs.

285 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 3 cards — $3.75

J310 Civil Engineering Transportation

01699-41 : Traffic Counter

This program converts the HP-41C into a traffic counter capable of keeping track of twelve independent moves thru a typical intersection. The program divides the twelve moves into a four legged intersection, with each leg having three independent moves (left turn, thru move, right turn). On command, the tallys for the twelve moves are printed by the printer.

327 Program Steps
Necessary Accessories: 1 Memory Module and Printer
Documentation — $12.00 Cost of 4 cards — $5.00

01757-41 : Horizontal Curves: Widening and Safe Stopping-Sight Distance

This program computes required safe stopping-sight distance, actual stopping-sight distance, required curve widening and runout distance for curve widening tapers on roads with fixed radius horizontal curves for either a standard lowboy or log truck.

298 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

01940-41 : Maximum Truck Weight-Bridge Formula B

This program calculates the maximum gross weights for trucks on the Interstate Highway System allowed by the bridge formula (Table B), as specified by Federal Law.

88 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02238-41 : Estimation of Left-Turn Capacity

Quickly estimate the left-turn capacity of a signalized intersection, which does not have a left-turn phase, and either has or has not a left-turn bay. Variables input by user are only: number of approach lanes; opposing volume; cycle, green, and amber lengths. May require slight modification for other cities.

158 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02450-41 : Sizing or Electrical Conduit For Traffic Signal Design

In designing traffic signal systems, the correct diameters of many conduit need to be found quickly and error-free. This program helps overcome the limitations of using tables or formulae. It will provide the design diameter based on 26% or 40% fill factor, using wire gauges #4 through #14, and DLC wire.

153 Program Steps
Necessary Accessories: Printer useful
Documentation — $12.00 Cost of 2 cards — $2.50

02621-41 : Benkelman Beam Rebound Analysis

This program calculates the Benkelman Beam rebound and Benkelman Beam rebound corrected to the standard temperature of 70 degrees F. The test is a procedure for the determination of the static Benkelman Beam rebound at a point on a flexible pavement under a standardized axle load, tire size, tire spacing, and tire pressure. Standard deviation and mean value are also given for all data. This program is a real time saver.

317 Program Steps
Necessary Accessories: Three memory modules or HP-41CV, and printer. Card reader helpful.
Documentation — $12.00 Cost of 4 cards — $5.00

02981-41 : Design of Structural Sections For Flexible Pavement

Program calculates the structural layer thicknesses for asphalt concrete, aggregate base and aggregate subbase using the California Method for flexible pavement design.

121 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03385-41 : Pull Chart

This program computes the distance that a given amount of material should be pulled or spread on the roadway, based on the number of courses and windrows to be used in construction of this section of roadway. When used in conjunction with a printer (HP 82143A) the program will generate and print the actual pull chart.

227 Program Steps
Necessary Accessories: One memory module.
Documentation — $12.00 Cost of 3 cards — $3.75

03579-41 : Reel Sizes and Capacities for Wire and Cable

This program will calculate the amount of round cable a given reel size can hold. The cable diameter, flange diameter, traverse width, and drum diameter are the required inputs. A safety factor incorporated into the program provides a clearance equal to two inches, or one cable diameter, whichever is the larger. It is helpful when writing or checking cable specifications for power utility or industrial applications.

170 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

J312 Civil Engineering Urban Planning

01699-41 : Traffic Counter

This program converts the HP-41C into a traffic counter capable of keeping track of twelve independent moves thru a typical intersection. The program divides the twelve moves into a four legged intersection, with each leg having three independent moves (left turn, thru move, right turn). On command, the tallys for the twelve moves are printed by the printer.

327 Program Steps
Necessary Accessories: 1 Memory Module and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

02573-41 : Sun Angle

Program calculates solar altitude and azimuth anywhere on earth and corrects for distance from the standard time meridian. Altitude is measured from horizontal = 0 degree and vertical = 90 degree. Azimuth is output as a bearing on the L019 survey system (North = 180 degree) but may also be output for a NORTH = 0 degree system by omitting lines 146 + 148.

252 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02972-41 : Street Consumption Research

Program permits the user to keep simultaneous tallies of up to 3 kinds of events through 3 keys (e.g., C = Any adult, D = Cigar Smoker, E = Cigarette smoker passing by), and can record up to 5 groups of such tallies, each with prompted survey location (6 characters max.), date, beginning and end time. Applicable to street consumers passing demarcation line across sidewalk, or types of litter along a block.

112 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

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J754 Petroleum Engineering — Facilities
J756 Petroleum Engineering — Petrophysics
J758 Petroleum Engineering — Reservoir
J800 Solar Engineering

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

J000 ENGINEERING

00527-41 : Fracture Toughness Determination of Compact Specimen

Program calculates plane-strain fracture toughness value of a compact specimen as per ASTM specification E399. Input of test results is requested by its variable name. Program outputs average crack length, Pmax/pq, kq, invalid kq, kq=kic and rsc.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00725-41 : Verify Cable TV System Design

User may verify equipment locations in an existing cable tv system, cable and equipment specs are input. The user then inputs equipment locations and the program computes operating levels at that point. Program is compatible with different brands of equipment using data cards or loading manually. Works on trunk or distribution.

246 Program Steps
Necessary Accessories: One Memory Module. Printer and Card Reader optional.

Documentation — $12.00 Cost of 4 cards — $5.00

00867-41 : Project Status and Report

Program stores project cost data on cards, provides for update, and prints a project status report.

300 Program Steps
Necessary Accessories: Card Reader, Printer and Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

00938-41 : Simple Janbu Analysis for Mohr Coulomb Material

This program uses Janbu's simple solution for the calculation of the factor of safety of a slope in which failure follows a noncircular path. The program has a neat printout of the analysis if the 82143A printer is used, but is also designed to run without the printer.

290 Program Steps
Necessary Accessories: Card Reader, One Memory Module Minimum (allows 11 slices)

Documentation — $12.00 Cost of 3 cards — $3.75

01015-41 : Sound System Performance Predictions

Employing readily available base date, this program computes the most relevant performance criteria for supplied equipment in a given acoustic space. A technique is used to apply the effects of occupancy to establish the minimum occupancy required to render a marginally performing system effective in an otherwise unsuitable setting.

595 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $14.00 Cost of 7 cards — $8.75

01025-41 : Pitot Tube Velocity and Volume Conversion from Traverse

This program computes the velocity at each point of a pitot tube traverse as well as the density factor, average velocity,duct area, and volume at actual conditions; all corrected for barometric pressure and air temperature. Program is suitable for any number of traverse points, duct diameter, air temperature, or barometric pressure.

113 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01034-41 : Analysis of Laboratory Strength Test Data

This package is made up of nine interelated programs that deal with the analysis of data obtained from laboratory rock strength tests. Three programs take the Mohr-Coulomb failure criterion to determine angle of friction and cohesion. Three programs deal with non-linear failure analysis of intact or jointed rock. One program developes the Mohr envelope and one tabulates principal stresses. Programs can be run together without re-entry of data. Programs run with or without printer, a neat printout format is used. For those with only 3 memory modules, a shorter program is described.

857 Program Steps
Necessary Accessories: Three or more Memory Modules

Documentation — $16.00 Cost of 9 cards — $11.25

01035-41 : Simplified Bishop Analysis for Mohr Coulomb Material

This program uses Bishop's simplified method of slices solution for the calculation of the factor of safety of a slope in which failure follows a circular path. The program has a neat printout of the analysis if the 82143A printer is used but is also designed to run without the printer.

293 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01100-41 : Particulate Removal Cost

The costs are determined for cleaning particulate matter from stack gas by either electrostatic precipitators or fabric filters. Input includes cost parameters, gas flow rate, percent particulate removal, fabric air-to-cloth ration, and gas temperature. The Flyask resistivity, ESP plate area, bag life, and baghouse pressure drop are estimated.

Necessary Accessories: Quad Memory Module or HP-41CV. Printer helpful.

Documentation — $12.00 Cost of 8 cards — $10.00

01110-41 : Truck Weight Distribution

This program is useful in matching truck chassis specifications with body and payload requirements. A maximum of three loads may be entered. The program calculates the distribution of all loads to the front and rear axles and estimates the optimum wheel base for the loaded truck chassis.

160 Program Steps
Necessary Accessories: One Memory Module. Printer desirable.

Documentation — $12.00 Cost of 2 cards — $2.50

01166-41 : Automatic Design of Stairs

Program cues user for total rise in inches of stairway. It assumes a rise nearest to and less than 6 1/2 inches. It prints a series of stairs with each succeeding one having one less riser until the angle of the stair exceeds 50 degrees and cues to adjust total run and number of risers. Final stairway prints out.

93 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

01338-41 : Insulation Characteristics

This program solves for either the surface temperature of the thermal insulation, emissivity of the insulation surface, or the apparent k factor. Convective, radiative and total heat losses are calculated separately,not by subtraction or addition of two in combination to find the third. Heat losses are calculated in terms of BTU/sq. T. Hr, BTU/lin. T. Hr, and watts per meter squared.

473 Program Steps
Necessary Accessories: Three Memory Modules and Printer

Documentation — $14.00 Cost of 6 cards — $7.50

01403-41 : Cooling Load Calculations

This program is based on the cooling load calculation method as prepared by Ashrae under Contract #H-2303 and requires the use of tables that appear in the Ashrae Manual #Grp 158. In the form presented, this program will calculate the sensible heat load and latent load (due to people) for an area for three different hours of the day - i.e., (10) 10 A.M. (14) 2 P.M. (17) 5 P.M.

533 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV and Card Reader

Documentation — $12.00 Cost of 8 cards — $10.00

01439-41 : Root Locus Generation

This program will aid in the generation of root locus plots for control systems. The asymptote center, angles and departure angles can be computed to be drawn on the plot. Various points can be checked to see if they lay on the root locus.

314 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01451-41 : Vented Loudspeaker Box Tunings

Using data on the loudspeaker in question, this program solves for the "optimum" vented enclosure and permits the user to vary the tuning parameters to test alternate tunings. A 1/3-octave response listing is provided and, with the accessory printer, the frequency response is plotted.

660 Program Steps
Necessary Accessories: Quad Module. Peripheral printer optional.

Documentation — $14.00 Cost of 8 cards — $10.00

01601-41 : Mining Calculation

Program calculates the pillar width for an underground coal mine. A pillar width is initially guessed, and the correct width calculated no matter how wrong the guess. The farther out the guess, the longer the computation time.

67 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01696-41 : Rectangular Mode Program

Program computes the possible modes in all rectangular spaces for a given harmonic level. The program sorts the answers, and then prints the harmonic "bunching" effect prevalent in small rooms. Program can be used in metric or English measurements.

238 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

01697-41 : Pressure Vessel Design

The program determines the plate thickness or the max. allowable working pressure of pressure vessel. Vessel with three different types of head are considered, viz hemispherical, ellipsoidal and dished. Computation based on internal dimensions of vessel and conditions of the vessel.

233 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01799-41 : Laser Beam Variable Attenuator

Equations describing the input/output power transfer of a unique Laser Beam Variable Attenuator are solved. Power output as a function of setting, attenuator setting for a given output power, the radial irradiance profile at a given setting, and the power density along the optic axis can be solved.

313 Program Steps
Necessary Accessories: One Memory Module required for the HP-41c. Printer Desired.

Documentation — $14.00 Cost of 3 cards — $3.75

01801-41 : Mine Production Rate

The program determines the productivity rate in tons per foot of advance. Input are material density, pillar and entry dimensions and number of entries. Calculations are incremented through user selected mining heights.

119 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01880-41 : Coal Quality Weighted Averages

Computes weighted averages of user selected coal quality characteristics.

104 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01936-41 : Reverberation Time

Given the dimensions of the room, and the average absorption coefficient, the reverberaton time (RE 60db), given by the Sabine, Norris-Eyring, or Fitzroy equation is given. User decides which equation is applicable. Also, given the measured RT, the Norris-Eyring or Sabine absorption coefficient (average) is calculated.

119 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02152-41 : Conveyor Calculations

Allows for interchangeable solution of belt width, speed and peak capacity in tons per hour. The program then computes length, conveyor angle, gravity hp, friction hp, belt hp, motor hp, kw, tightside tension and PIW; given material density, change in elevation and K factor. Inclined, horizontal or decline conveyors may be evaluated.

447 Program Steps
Necessary Accessories: HP-41CV, Quad Ram and Two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

02217-41 : Continuous Miner Productivity

Program requires user-specific data pertaining to tons per foot of advance and average mine productivity per shift. Various entry configurations and ranges of cutting heights may be evaluated. Output is time in shifts and production in tons given length of entry and cutting height.

198 Program Steps
Necessary Accessories: One memory module and Printer

Documentation — $12.00 Cost of 2 cards — $2.50

02457-41 : US Standard Comparative Gauges

This program provides a handy reference for architects, engineers or steel fabrictors. It furnishes the gauge number for hot and cold rolled steel sheets. Input may be a decimal or a fraction. The program also furnishes a decimal or fractional equivalent for any known gauge. Gauges are from 00 to 30.

77 Program Steps
Necessary Accessories: One memory module. Card Reader optional.

Documentation — $8.00 Cost of 3 cards — $3.75

02640-41 : Transistor Parameter Conversion

Since manufactures' data sheets often provide the low-frequency hybrids parameters of a TRA in only one configuration (CE, CB, or CC). It may be necessary to convert the H-parameters from one configuration to another. This program will perform these conversions for you.

234 Program Steps
Necessary Accessories: One memory module. Printer and overlay helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

02813-41 : Helical Torsion Spring Design

Given the load, lever arm length, allowable bending stress, modulus of elasticity, deflection and coil I.D., this program calculates wire DIA, spring rate, length of active material, number of active coils, solid length of loaded and unloaded coils, loaded coil I.D. Angular location of arms, bending stress and weight of material in the active coils. It allows entry of standard wire sizes. It will adjust (at your discretion) either the coil diameter or the active material length to provide the proper arm relationship.

268 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 4 cards — $5.00

02827-41 : Geometric Solution to Bent Plate Framing Connections

This program can be used to solve the geometric solution to bent plate framing connections in structural steel structures. Very useful for structural steel detailers. All input/output in feet, inches and sixteenths. Fully prompting.

398 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

02911-41 : 2-D Shock Angles With Variable Specific Heats

This program will calculate the angle of an oblique planar shock wave given the turning angle and the Mach number in front of the shock wave. The program can also calculate the turning angle or the Mach number using values for the remaining two variables. The ratio of specific heats can be specified and the shock wave can be either strong or weak.

242 Program Steps
Necessary Accessories: Extended Functions optional

Documentation — $12.00 Cost of 2 cards — $2.50

02971-41 : Structural Frame Analysis

The program analyzes a frame of up to six spans for dead load plus alternate and adjacent live load conditions. Included in the resulting printout are maximum and minimum moments for beams and columns, dead and total load beam reactions. The program can also be used for total load conditions only. The program is separated into two parts. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK.

1411 Program Steps
Necessary Accessories: HP-41CV or equivalent. Extended Functions Module, two Extended Memory Modules, HP-IL Module, Cassette Drive and Thermal Printer

Documentation — $14.00

02976-41 : Weight and Moment Calculations

This program calculates the vertical, longitudinal and transverse centers of gravity for adding or removing weights from a boat. Number of entries is unlimited.

142 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03057-41 : Flow Measurements With Pipe Elbow Taps

Pipe elbows with correctly installed pressure connections may be used to determine rate of flow by measuring the differential pressure created by the centrifugal forces occuring when fluid is flowing through the elbow. After entering all known parameters in metric units, program computes flow entering differential pressure or vice versa; it also computes necessary elbow radius entering both flow and differential pressure. Above computes may be made both for 45 degree and 22.5 degree taps position.

181 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

03093-41 : Manhole Invert Calculations

Program calculates the slope between the inverts of two manholes and checks/ corrects this slope against a given minimum slope. The program maintains 3 feet of earth cover above the crown of a given pipe size, calculates the pipe inverts at manholes based on the pipe's slope, and provides a 0.1 foot drop through all manholes for construction ease.

85 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03099-41 : Frequency Dependent Rejection Plused

Frequency dependent rejection (FDR), one of the terms used in calculating the interference-to-noise ratio, is an important consideration in many EMC analyses. FDR denotes the attenuation to off-tuned signals imposed by the combination of receiver selectivity and the fall-off of the emission spectrum of signals. This program may be used to estimate FDR when the interference signal consists of low-duty-cycle pulses, such as those emitted by ordinary radar systems.

105 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

03106-41 : Radar Range Equation (RRE)

Radar range problems involve eight variables including emitter power (P), antenna gain (G), frequency of operation (f), target cross section (J), noise temperature (T), distance in meters (R), receiver bandwidth (B), and receiver signal-to-noise ratio (S/N). This program allows the user to determine any one of the eight variables when the remaining seven are known.

159 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

03139-41 : Radar Displayed Pulse Count 'RDPC'

This program is used to estimate the electromagnetic compatibility (EMC) of a specified radar at a selected site. It utilizes an accepted performance criterion as the basis for assessing the EMC of the prospective radar installation. The radar characteristics and electromagnetic environment are analyzed to determine the pulse interference (displayed pulse counts... DPC on the PPI display). The DPC is then compared to the performance degradation threshold (DPC=100 pulses per scan) to determine compatibility.

178 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03151-41 : Discontinuity Stress in Cylinders With Spherical Heads

This program solves for the discontinuity stress at any position in cylinders with partially spherical heads. It then goes on to solve for the positions and values of the maximum and minimum discontinuity stresses in the cylinders and sums them with membrane stresses.

458 Program Steps
Necessary Accessories: Quad memory module

Documentation — $12.00 Cost of 4 cards — $5.00

03214-41 : Isotropic Plate Bending Analysis

Program calculates deflection and bending moments in isotropic simply supported plates. Solution by method of Levy using single fourier series expansion. Bending moment solutions do not converge as rapidly as deflection solutions and require greater number of terms in series. Plates bending under uniformly distributed load are treated.

269 Program Steps
Necessary Accessories: HP-41 Math Pac or user-written subroutines for hyperbolic functions

Documentation — $12.00 Cost of 2 cards — $2.50

03293-41 : Drive Belt Calculations

This program will calculate the unknown value after having been given any three of the following four values: belt length, larger pulley diameter, small pulley diameter, center to center distance between pulleys.

169 Program Steps
Necessary Accessories: 00041-15029 Math Pac I (uses "SOL")
Documentation — $12.00 Cost of 2 cards — $2.50

03479-41 : Arch Buckling

This program computes uniform radial critical buckling load for fixed and hinged supported circular arches. The critical load for fixed arches is approximate, determined through the use of the Newton-Raphson Method. Input consists of material, structural section and arch geometry properties.

190 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 1 card — $1.25

J050 Aeronautics/Aerospace

00380-41 : Euler Angles from Direction Cosines

Calculates Euler angles from direction cosines for three sets of most commonly used order of rotations. This program is compatible with and can be used in conjunction with program 00382-41 'Direction Cosine Matrix'.

234 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

00382-41 : Direction Cosine Matrix

Calculates the direction cosine matrix for the most commonly used three sets of Euler angle rotations. This program is compatible with and can be used in conjunction with program 00380-41 'Euler Angles from Direction Cosines'.

282 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00429-41 : Potential Flow-Horseshoe Vortex (LVF3H)

This is one of a series of programs on line and surface singularities in potential flow. This program calculates the velocity induced at a point by a three-segment vortex filament called a Horseshoe Vortex. The Horseshoe Vortex is the basic element of the Vortex Lattice Method for calculating lift and induced drag on an aerodynamic body. Also includes "potential flow" subroutine.

Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00430-41 : Potential Flow - Linear Vortex Filament (LVF1)

This is one of a series of programs on line and surface singularities in potential flow. This program calculates the velocity induced at a point by a finite straight vortex filament, or the magnetic field induced at a point by a finite straight current filament. Also includes "potential flow" subroutine.

Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00506-41 : Aerodynamic Properties of a Finite Wing (Prandtl)

This program calculates the spanwise load distribution and associated aerodynamic coefficients for high-aspect ratio wings. A ten control-point, horseshoe-vortex approximation to Prandtl's lifting line theory is used. The program is restricted to symmetrically loaded unswept wings with linear taper and twist and to incompressible flow fields.

366 Program Steps
Necessary Accessories: Three Memory Module and One Math Module.
Documentation — $12.00 Cost of 4 cards — $5.00

00576-41 : Potential Flow-Linear Source Filament

This is one of a series of programs on line and surface singularities in potential flow (Lap $\phi = 0$, where ϕ is a scalar). This program calculates the velocity induced at a point by a finite straight source filament of constant strength.

277 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 4 cards — $5.00

00617-41 : Multi-Stage Boost Trajectory

Calculates trajectory state parameters as a function of time. Includes thrust vectoring and atmosphere model for drag and thrust. The drag coefficient is modeled as a five point, mach number table interpolation. The system of differential equations is integrated using a modified Euler algorithm.

498 Program Steps
Necessary Accessories: Two Memory Modules, Card Reader and Printer.
Documentation — $12.00 Cost of 6 cards — $7.50

00707-41 : Model Airplane Design - Radio Control Competition Patter

Thirty-five design parameters are calculated from empirically derived data coefficients and analytical relationships. The program is organized so that data coefficients for different types of model airplanes, e.g. Pylon racers, sport trainers, etc. may be maintained on separate data cards.

394 Program Steps
Necessary Accessories: Two Memory Modules, Card Reader and Printer.
Documentation — $12.00 Cost of 5 cards — $6.25

00737-41 : Potential Flow - Plane Source Quadrilateral (PSQ)

This program calculates the influence coefficients at a field point due to a plane source quadrilateral defined by four coplanar-points.

813 Program Steps
Necessary Accessories: Three Memory Modules
Documentation — $14.00 Cost of 6 cards — $7.50

00738-41 : Shock Flow

This program calculates the static pressure, density, temperature and speed of sound ratios across a normal shock. It also calculates the stagnation pressure ratio across a shock and the mach number downstream of the shock. This program does not require the use of any storage registers.

113 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00773-41 : Flow Parameters for a Given Mach Number

Given a mach number, this program will calculate P_0/P, T_0/T, D_0/D, A_0/A, and A^*/A for isentropic flow through air. The program does not use any storage registers.

52 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00787-41 : Compressible Flow Functions

This program calculates several mach functions for one-dimensional, isentropic compressible flow providing the mach number and the constant specific heat ratio.

79 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00830-41 : Compressible Flow Functions for Air

From given pressure-pair, the program computes the mach-number, area-ratio, temperature-ratio and density-ratio, thus eliminates the need of using handbooks, tables, and interpolation. If the temperature is known any locality, the local speed of sound, velocity (fps), and massflow rate per unit-area are also calculated.

120 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00997-41 : Bulk Density for Two Propellants

Provides interchangeable solutions for bulk density, mixture ratio (oxidizer-to-fuel), fuel density, and oxidizer density. Calculates unknown quantity given any three of the quantities.

188 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01056-41 : Airfoil Coordinate Interpolation

This program calculates contour coordinates at a desired location based upon straight line interpolation along element lines between two defined coordinate locations. The program is written as though airfoil contours are described, and the related terminology is used. The program provides for symmetrical or non-symmetrical coordinate data.

257 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01191-41 : Atmospheric Properties / Velocities / Aerodynamic Calculations

Minimal keystrokes solve for atmospheric properties, velocity relationships and aerodynamic force equation, based on 1962 U.S. Standard atmosphere. Solves for altitude, pressure, density, temperature and speed-of-sound; relates true, equivalent or calibrated airspeed and mach number, and solves for aerodynamic force, force coëfficient or velocity.

308 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01193-41 : Airfoil Calculations

This program provides airfoil ordinates and surface slopes for N.A.C.A. Four and five digit airfoil sections relative to both the N.A.C.A. chord and true chord lines. The program will provide ordinates for single abscissae or abscissae given by three inbuilt distributions.

930 Program Steps
Necessary Accessories: Three Memory Modules. Card Reader optional.

Documentation — $14.00 Cost of 8 cards — $10.00

01234-41 : Lift and Drag Coefficients for a Supersonic Rhombic Airfoil

This program calculates the coefficients of lift and drag for any Rhombic airfoil (symetric or asymetric), given its geometry and the supersonic flight conditions (mach number and angle of attack). By running the program at different angles of attack, the aerodynamic polar of the airfoil may be calculated.

391 Program Steps
Necessary Accessories: One Memory Module and Math Pac I

Documentation — $12.00 Cost of 4 cards — $5.00

01452-41 : Airplane Takeoff Field Length

Computes airplane engine-out balanced field length based on segment input data. This is an excellent preliminary design tool when winds, runway slope and thrust inclination angle can be neglected. All data is stored thus permitting easy reruns with similar conditions. Additional computations include all-engine field length, decision speed (V1), and optionally the air distance from liftoff to the obstacle height.

382 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01625-41 : Mass Properties Summation

This program combines the mass properties (i.e. Weight, Centers of Gravity, Moments and Products of Inertia) of any number parts into one composite part or assembly.

178 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01719-41 : Windmill Design

This program evaluates a horizontal axis windmill at specified conditions. Inputs are blade chord and twist angles. The program evaluates performance at each input point and numerically integrates this data to calculate output power. A second program mode allows the user to design for optimum blade twist, chord, and RPM.

443 Program Steps
Necessary Accessories: 2 Memory Modules

Documentation — $16.00 Cost of 5 cards — $6.25

01777-41 : The Wire Calculator

Program simplifies wire sizing problems associated with aerospace electrical subsystem design and implementation. It solves for wire gauge, length, current, voltage drop, temperature and resistance. Basis is orbiter specification MB0150-048 (MIL-W-81381A) for nickel coated wire in sizes #26 thru #0 gauge. Provides for English or metric input/output data.

325 Program Steps
Necessary Accessories: 2 Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01874-41 : Atmospheric Properties

Program computes the following properties of air as a function of altitude (up to 20000m): density, speed of sound ratio, pressure ratio, temperature ratio. Units, both in metric and in British system can be used.

217 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02000-41 : Solutions to Some Common Aeronautical Problems

These two programs help you with common aeronautical problems. The first provides an interchangeable solution for delta, weight and altitude. The second solves for either inlet mass flow ration or airflow (given the other). All inputs and outputs are labelled for friendly operation.

208 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

02049-41 : Aeronautical Calculations with a Tabular Polar

A two program package. Both use a tabular polar of the form CD=f (M,CL). The first makes the calculation of drag easy once the polar is stored. Inputs needed to compute drag are then flight conditions and gross weight. The second program iterates to find the mach number for minimum drag using the tabular polar. The linear interpolation used in these program is in subroutine form and can be easily separated for use by other programs.

494 Program Steps
Necessary Accessories: At least two Memory Modules for the HP-41C.

Documentation — $14.00 Cost of 14 cards — $17.50

02063-41 : Minimum Time or Fuel Paths to Climb

This program iterates to find the climb paths for minimum time or fuel. Tabular data for CD, thrust, and fuel flow are required. The linear interpolation used is in subroutine form and is unique in that it will handle two different variables stored in the same data register.

382 Program Steps
Necessary Accessories: HP-41CV or Quad Memory Module

Documentation — $12.00 Cost of 10 cards — $12.50

02145-41 : Aero

This program will compute Mach number, knots calibrated airspeed, knots equivalent airspeed, or knots true airspeed given pressure altitude, static air temperature and any one of the above four computed values. Calculations are accurate for subsonic and supersonic conditions up to a pressure altitude of 82,021 feet.

399 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

02188-41 : Specific Power Contour Calculator

Calculate specific power contours with your HP-41! This package consists of one driver program and three subroutines which are read when prompted to leave an amazing 226 registers for data. Card Reader functions are easily replaceable for cassette or extended memory usage. Tabular data for C0 and thrust are required.

639 Program Steps
Necessary Accessories: Quad Module, Card Reader and Printer

Documentation — $14.00 Cost of 15 cards — $18.75

02193-41 : Atmospheric Conditions

This program solves for temperature in Fahrenheit and Celsius, pressure in PSI and inches of mercury, density, speed of sound, density altitude and sigma using altitude and temperature conditions as input. This program accepts standard day, ISA + nn, and fixed temperature inputs.

130 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02257-41 : Airfoil Coordinate Data Generation

Given any chord length, this program calculates upper, lower, and mean camber line coordinates, maximum thickness, maximum camber, position of maximum camber, and stations along the chord for N.A.C.A. 4 and 5 digit series airfoils. Inputs are in percent chord, as per N.A.C.A. standards. Output is on the printer in tabular form with headings and/or titles. Data can be saved on two magnetic cards.

319 Program Steps
Necessary Accessories: Quad Module or HP-41CV, Printer, Card Reader helpful.

Documentation — $12.00 Cost of 4 cards — $5.00

02278-41 : Aeronautical Engineering Subroutines

This collection of seventeen subroutines simplifies the programming of common aircraft performance problems. Pressure ratio, temperature ratio, dynamic pressure, and speed of sound are all based on the standard atmosphere. Velocity conversions are provided for Mach number, equivalent airspeed, calibrated airspeed, and true airspeed. No data registers are required.

204 Program Steps
Necessary Accessories: One memory module for all routines at one time.

Documentation — $16.00 Cost of 14 cards — $17.50

02381-41 : Time, Fuel, and Distance to Climb

This program iterates on AOA and FPA to find the time, fuel, and distance throughout a scheduled climb. Tabular data for Co, thrust, and fuel flow are required. The linear interpolation subroutine used is unique in that it will handle two different variables stored in the same data register.

561 Program Steps
Necessary Accessories: Quad Module and Printer

Documentation — $12.00 Cost of 11 cards — $13.75

02602-41 : Rotor Basic Analysis "RCFT"

Thrust and torque (or power) are computed for a hovering helicopter rotor. Rectangular blades with linear twist and arbitrary aspect ratio are acceptable. Aerodynamic coefficients based on rotor disc area are displayed and, optionally, engineering units are displayed. Computation is based on combined momentum and strip analysis.

319 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 4 cards — $5.00

02911-41 : 2-D Shock Angles With Variable Specific Heats

This program will calculate the angle of an oblique planar shock wave given the turning angle and the Mach number in front of the shock wave. The program can also calculate the turning angle or the Mach number using values for the remaining two variables. The ratio of specific heats can be specified and the shock wave can be either strong or weak.

242 Program Steps
Necessary Accessories: Extended Functions optional

Documentation — $12.00 Cost of 2 cards — $2.50

03295-41 : Oblique Shock Properties

This program can calculate shock angle, deflection angle or inlet Mach No. starting from the known variables. It is also able to evaluate exit Mach. No., pressure, density, temperature ratios across the shock and the maximum deflection angle for a certain Mach No.

251 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

J100 Agricultural Engineering

02221-41 : Manifold Multiple Pipe Sizing

Program calculates headloss in PVC manifold supplying laterals in drip and micro-sprinkler systems using Darcy-Weisbach formulas. Changes pipe sizes when headloss gradient is equaled or exceeded. Equations and theory by J. Keller & G. Watters from Utah State University and Papers of ASAE and Rainbird "Trickle Irrigation Design" by J. Keller. Program also gives total cost, total HL and total GPM. Fully prompted.

275 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 4 cards — $5.00

J150 Architectural Engineering

01258-41 : Haul Truck Simulation

The haul truck simulation estimates travel time and fuel consumption for variable haul road conditions. Fleet requirements may be estimated with developed cycle times and production scheduling. Provides rapid method of determining effects of changes in mine design in truck/shovel operations.

353 Program Steps
Necessary Accessories: HP-41CV, Quad RAM or two Memory Modules. Printer desirable.
Documentation — $12.00 Cost of 4 cards — $5.00

01532-41 : Preliminary Design Conditions Program

This program can be useful to architects and engineers. With input of gross building area and perimeter, the program computes preliminary design of mechanical space conditions and planning information for three types of buildings. System requirements for Electrical and Mechanical areas and loads are then given.

237 Program Steps
Necessary Accessories: 1 Memory Module, Printer (Printer required for program as listed– modification required for exclusion)
Documentation — $12.00 Cost of 4 cards — $5.00

02752-41 : TKV$C-Naval Architecture

The volume, LCG & TCG of irregular shaped tanks or compartments are calculated using either Simpson's First or Second Rule. Both Rules require that the volume be divided into equal sized sections both horizontally and vertically. The number and size of the vertical sections do not need to be the same as the horizontal sections. Offsets of each transverse plane are inputed and the area of each transverse plane is displayed. After all transverse planes are inputed, the volumes and centers are calculated.

196 Program Steps
Necessary Accessories: 82104A Card Reader
Documentation — $12.00 Cost of 2 cards — $2.50

02753-41 : Simpson's Naval Architecture

This program calculates the area, longitudinal center of gravity and the transverse center of gravity of smooth irregular shaded areas using either Simpson's First or Second Rule. Simpson's First Rule may be used when the area to be calculated is divided into any even number of equally spaced sections. Simpson's Second Rule may be used when the number of equally spaced sections is a multiple of three.

113 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02754-41 : Marginal-Naval Architecture

This program will calculate the design weight margin, vertical moment, and composite vertical center when given the weight margin percent and the KG margin percent. First the displacement and the vertical center of gravity of lightship are inputed. Next the weight margin percent is inputed and the weight reservation for the margin is calculated. The KG margin percent is inputed and the delta vertical moment, the total vertical moment, and the composite VCG of the margin is calculated.

51 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03159-41 : Solar Angles, Solar Time, and Clear Day Solar Radiation

Program calculates solar angles, solar time, and clear day solar radiation intensities using techniques presented in ASHRAE Handbook of Fundamentals. Specifically, the program calculates the day of the year, declination, sunrise hour angle, day length, time of sunrise and sunset, equation of time, apparent solar time, solar altitude, solar azimuth, incident angle, normal beam solar radiation, diffuse sky solar radiation, ground reflected solar radiation, and total solar radiation. It automatically prompts for required input data.

751 Program Steps
Necessary Accessories: Quad memory module, Extended Functions memory module, Time module and Card Reader.
Documentation — $25.00 Cost of 17 cards — $21.25

J350 Drafting/Design

00501-41 : The Draftsman's Friend

Performs dimension arithmetic, working in feet, inches, 16ths of inches. Operations are add, repeat add, subtract, repeat subtract, multiply and divide by scalar or dimension. Also computes bevel dimensions: base rise and slope lengths, all in feet, inches, and 16ths of inches. These routines are especially useful for detailing of structural steel where bevel dimensions are used.

175 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00684-41 : Graph Prep II

Graph prep facilitates graph preparation. Graph size is arbitrary; scales are linear or logarithmic. Uses an arbitrary measurement scale or linear graph paper for layout. Computed measurements are arbitrarily rounded to correspond to marks or special points on the measurement scale for easy, quick plotting.

391 Program Steps
Necessary Accessories: One Memory Module
Documentation — $14.00 Cost of 4 cards — $5.00

00689-41 : Work Points

Finds location of the top and bottom work points of a diagonal brace.

120 Program Steps
Necessary Accessories: Card Reader and Printer helpful.
Documentation — $8.00 Cost of 1 card — $1.25

00962-41 : Perspective w/Translation and Rotation

This program computes the "x" and "y" coordinates for a correct perspective of any building or object. Inputs are known x,y and z coordinates of the physical object. Location of the object may be translated or rotated as desired. A scale factor for size adjustment may be used. Useful for architectural application.

149 Program Steps
Necessary Accessories: Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01107-41 : Spiral

This program will generate the information required to properly layout a spiral evenly within a given diameter. It was written as as aide in laying out spiral coils for the bottom of storage tanks.

130 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01120-41 : Architectural Perspective

Program calculates 2-point perspective views. Data may be input directly, or up to 239 data points may be stored in memory and/or written on magnetic cards. Data is grid-based; input and output grids may be dissimilar. Heights may be input as grid values or as elevations (in feet or meters).

269 Program Steps
Necessary Accessories: One Memory Module. Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

01133-41 : Graph Preparation

This program is useful in preparing graphs. Numbers are generated which are used to label the axis. The user is then prompted for x and y values which are converted to ordered pairs representing graph coordinates. These coordinates can then be plotted.

134 Program Steps
Necessary Accessories: Printer useful

Documentation — $12.00 Cost of 2 cards — $2.50

01267-41 : Stair Design

This fully prompted and labeled output, program for the HP-41C computes the design for stairs. Uniform building code values are used automatically, but may be changed. Output values are: no. of runs; rise dimensions; no. of risers; no. of treads; tread dimensions; and run length.

216 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

01335-41 : Draft

This program helps you in constructing drawings of three-dimensional objects, either in parallel view (projection drawing) or in central view (perspective drawing). The program works in a three-dimensional grid, and gives as output points in a two dimensional plane in the form of x/y coordinates. These coordinates you simply plot on your drawingpaper and draw the interconnecting lines or curves. The program is a system consisting of a set of functional program modules and a program monitor which controls the input and execution of a selectable sequence of modules.

308 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01558-41 : Angle Between Two Planes

This program calculates the acute angle between two planes formed by four points, two of which are common to both planes. The program calculates the angle θ using the x, y, z coördinates of the points and finds the distances between the points. In draftsman's terms this figures valley angles for any type of chute.

256 Program Steps
Necessary Accessories: 1 Memory Module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01876-41 : Round Building Room Areas & Dimensions

Round office buildings pose a difficult problem to architects and space planners dimensionally, especially in calculating sensitive "rentable area" for the developer. This program puts the calculus into the hands of the space planner to solve the problems that arise where the rectangular planning grid meets a curved wall.

96 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01887-41 : Spur Gear Dimensions and Cutting Data

Provides quick and accurate cutting data and drawing dimensions, both of which are required for detail drawings. Also handy for the machinist in setting up for gear production on various machine tools.

185 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02179-41 : Spiral Offsets and Deflections

Given the overall length of a highway spiral and the spiral angle, will find either tangent offsets, or deflection and distance, from the T.S/S.T. to any point on the spiral, or both.

136 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02215-41 : Sortcon

This program will take dimensions from a drawing, put them in numerical order (low to high) and convert them from inches to millimeters or millimeters to inches. Duplicate dimensions are ignored and only printed once on the printout. All columns have aligned decimal points. The printout is suitable for attachment to the drawing.

173 Program Steps
Necessary Accessories: Printer. Basic calculator will sort 7 numbers, add 64 numbers per memory module.

Documentation — $12.00 Cost of 2 cards — $2.50

02288-41 : Perspective Made Simple

Program features simple user method of obtaining coordinates of successive points for transfer to a perspective view, by entering the height or distance from reference planes and pressing one key in the case of rectangular objects. Even less work for preselected number of points around circles and ellipses. Tilting, Rotation and Declination.

223 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02342-41 : Perspective Drawing

This program provides a complete treatment for one-point perspective drawing. The viewing parameters specified are: view reference point, center of projection, view plane normal, orientation and scale of view plane. User may enter the coordinates of an object and draw it projection. He may also change any viewing parameter without re-entering all coordinates.

285 Program Steps
Necessary Accessories: One memory module. Printer helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

02383-41 : Live Capacity and Properties of Round Bins or Tanks

This program computes the live capacities in tons, cuft or usgal, of any size cone bottom bin or flat bottom tank, filled with granular material or water. Depending on the input it also computes the diameter, height and area of platework in square feet.

259 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02827-41 : Geometric Solution to Bent Plate Framing Connections

This program can be used to solve the geometric solution to bent plate framing connections in structural steel structures. Very useful for structural steel detailers. All input/output in feet, inches and sixteenths. Fully prompting.

398 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

02952-41 : Ft, In, 1/16ths Right Triangle and Arithmetic

This program allows entry of dimensions in feet, inches, and sixteenths of an inch (FIS), and addition, subtraction, multiplication, and division using RPN logic. Also, right triangles are solved in FIS given any two sides, or an angle and a side. Format for FIS is aa.bbcc, where aa equals feet, bb equals inches (to 99), and cc equals sixteenths of an inch (to 99).

208 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02996-41 : View Manipulation and Projection

This program allows the manipulation of a three-dimensional object so it may be viewed from any desirable angle. By supplying the 3-D lattice coordinates, the program provides 2-D coordinates to render the 3-D object's image on paper (or a screen).

76 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03132-41 : Single or Compound Curve Offsets

This program can be used for intersection design utilizing either a single or a compound curve. Road widths, taper angles, various radii and offsets are taken into consideration for different skews. Minimum and maximum offsets from the intersection can be calculated for compound curves.

382 Program Steps
Necessary Accessories: HP-41C would require one memory module. Card reader and printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

03516-41 : DIMS

This program facilitates addition and subtraction of fractions commonly used in SAE units; i.e., 2N where N=6 maximum. When entered in specified method, the fractional dimensions are added and the total is displayed in fractions. The program can be used for designing machined assemblies to check tolerance stack up, for checking detailed drawing, etc.

104 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25

03545-41 : Dovetail Slides

Given the height, angle, maximum width, and roll diameter, this program calculates the minimum width, dimension over rolls and dimension between rolls of any dovetail slide.

92 Program Steps
Necessary Accessories: None. Printer is helpful.
Documentation — $12.00 Cost of 1 card — $1.25

J400 Energy Conservation and Management

01520-41 : Lighting Power Budget

This program calculates (and documents with printer) the allowable energy budget for building lighting in accordance with the Illuminating Engineering Society's Recommended Lighting Power Budget Determination Procedure, EMS-1. Also seen as a part of the ASHRAE Standard 90-75R.

588 Program Steps
Necessary Accessories: 3 Memory Modules for the HP-41C. Printer and Card Reader recommended, but not required.
Documentation — $14.00 Cost of 7 cards — $8.75

01773-41 : Building Heat Loss Calculation

This program calculates building heat loss in BTU/hr., KW, and the heat transmission coefficient. The seasonal KWH is calculated using the degree day method. Also the seasonal KWH for a typical heat pump can be calculated. The above information is necessary to determine the size of heating systems for buildings. Some program line constants may need to be changed to suit the user's needs depending on geographic location.

166 Program Steps
Necessary Accessories: Card Reader and Printer helpful but not necessary.
Documentation — $12.00 Cost of 2 cards — $2.50

02868-41 : Wind Data Summary

Resultant (prevailing) wind direction, resultant run, resultant velocity, total run, mean velocity, and steadiness ratio are calculated for wind data obtained in the form of miles or kilometres of wind travel by eight cardinal and intercardinal directions for a time period of some hours (usually 24).

228 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 5 cards — $6.25

02882-41 : Residential Hot Air Furnace Selection

This program aids in the selection of new hot air furnaces for home heating. Fuels include natural gas, propane, and heating oil. The program estimates the annual costs of fuel and electrical power for the furnace air circulating fan. Using installed cost, it compares data with a second furnace and computes annual savings (or loss) and pay back period. When electrical power cost is included, some highly fuel efficient furnaces are not the best economic choice.

95 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

03159-41 : Solar Angles, Solar Time, and Clear Day Solar Radiation

Program calculates solar angles, solar time, and clear day solar radiation intensities using techniques presented in ASHRAE Handbook of Fundamentals. Specifically, the program calculates the day of the year, declination, sunrise hour angle, day length, time of sunrise and sunset, equation of time, apparent solar time, solar altitude, solar azimuth, incident angle, normal beam solar radiation, diffuse sky solar radiation, ground reflected solar radiation, and total solar radiation. It automatically prompts for required input data.

751 Program Steps
Necessary Accessories: Quad memory module, Extended Functions memory module, Time module and Card Reader.
Documentation — $25.00 Cost of 17 cards — $21.25

J500 Geotechnical Engineering

01830-41 : Plain Failure Analysis of Rock Slopes

This program calculates the factor of safety of a slope in which the potential failure plane is between the base of a tension crack and the toe of the slope. It allows input of various tension crack positions (B) and displays the factor of safety. If an optional Printer is used results for a series of B values will be tabulated and a plot of B against factor of safety will be printed.

411 Program Steps
Necessary Accessories: 2 Memory Modules: Printer Optional
Documentation — $12.00 Cost of 4 cards — $5.00

02030-41 : Basic Longwall Parameters

Generates longwall performance data through user selected ranges of seam height, web depth, face length and tons per shift. Output is in the form of production per shift, required shearer velocity, advance per shift and shifts to complete panel. Assumes DERD, snake at gates.

306 Program Steps
Necessary Accessories: One Memory Module; Printer
Documentation — $14.00 Cost of 4 cards — $5.00

03322-41 : Settlement of Clay Layer Due To Point Surface Loads

This program calculates vertical stresses in a homogeneous soil mass caused by one or more point loads on the surface. The information is then used to compute the settlement of a normally consolidated clay layer affected by these loads. A good approximation for spread footings that are small relative to the depth of analysis. Analysis of more than 28 loads requires additional memory modules.

229 Program Steps
Necessary Accessories: None required; additional memory optional.
Documentation — $12.00 Cost of 2 cards — $2.50

J550 Industrial Engineering

00712-41 : Timestudy - Machining

This program calculates machining time for manual and N/C lathes and milling machines, constant surface speed is utilized with maximum (input) rpm not exceeded. Horsepower is calculated as is diameter, sfpm, and rpm. Rapid traverse times are computed, index time is compiled.

324 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00895-41 : Radial Drill

Do you figure labor costs for radial drill work? Time study persons: this program calculates S.H.E. for drill operations. If the drill runs with an N.C. machine, it determines which is internal. Has drill, tap, ream, chamfer, upsweep, downsweep time calculations. Several brass, iron and steel hole standards built in.

482 Program Steps
Necessary Accessories: Three Memory Modules and Printer
Documentation — $14.00 Cost of 6 cards — $7.50

00916-41 : Time Study

Generates a clock to sequentially time and store up to nine elements of a repetitive operation over any number of cycles. Upon completion of study, elements will be averaged and summed, elements of study will then be displayed with appropriate labeling.

173 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01048-41 : Threading Infeeds-Constant Volume Metal Removal Rates

This program calculates the threadng infeeds necessary to single point cut a thread based upon the constant volume theory of metal removal. The program is for 60 degree "v" threads and prompts the user for: English/Metric, pitch, maximum first depth of cut, and maximum number of passes.

210 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01073-41 : Operation Study

Calculates standard labor hours from measured data including rating and allowances. Also input confidence limits and determine observations required to satisfy these conditions. From observed data, a production capacity analysis can be computed for a given period. Also a capacity analysis can be developed from other standards.

88 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01390-41 : Dieset

This program calculates with or without printer a dieset for wire drawing with reduction in area for each die unchanged or falling or rising. The reduction in area can be output in % or as logarithmical change (true strain).

160 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

01453-41 : Geometric Moving Average for Quarterly Forecasting

This program forecasts the production tonnage for the next four quarters or updates the new quarter value. It can be modified to forecast sale, prices and other values quarterly.

271 Program Steps
Necessary Accessories: Quad Module, Card Reader and Printer
Documentation — $12.00 Cost of 3 cards — $3.75

01896-41 : Queue

Fully integrated program enables the user to compute queueing Statistics for 6 different queue types. The program has been written in a modular manner so the user may delete seqments of the program which do not apply to his/her situation. This feature enables the user to run even the longest of the routines on an HP-41C with only 1 memory module! The types are as follows: Type A-Single server model with arbitrary service times, Type B-Multiserver model with Poisson arrivals & exponential service times, Type C-Basic single server model, Type D-Single server model with a finite queue, Type E-Models with a finite calling population, Type F-Single server model.

908 Program Steps
Necessary Accessories: 3 memory modules, card reader helpful.
Documentation — $16.00 Cost of 8 cards — $10.00

02107-41 : Sectional Cone Fabrication

Two programs that plot concentric and non-concentric cones on sheetmetal. Output can be decimal or fractional. Metal thickness is accounted for, and any section of the cone can be plotted. This is used for a square to round, with or without a radius corner. Compound terminating planes can also be used.

1718 Program Steps
Necessary Accessories: At least three Memory Modules, or a Quad Memory Module
Documentation — $25.00 Cost of 16 cards — $20.00

02376-41 : Developed Length Program

This program calculates the developed length for plates with any number of bends. The program will accept any units (inches, mm, etc.,) but the same units must be used for all dimensions of any part.

217 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02755-41 : Vessel Calibration

This program calculates the volume of any flat-end cylindrical vessel and calibrates for any desired increment whether the vessell is placed horizontally or vertically.

99 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02777-41 : Tube Bend Data Program

This program calculates tube bend data. Rotation angles are the total CCW rotation from the plane formed by the first bend as viewed from end "1". The number of bends allowed depends on available HP-41 memory. With one module, a tube with a maximum of 6 points may be calculated. For additional module, 16 more points may be added.

317 Program Steps
Necessary Accessories: One memory module required, two recommended.

Documentation — $12.00 Cost of 3 cards — $3.75

02852-41 : Pipe Template

Program prints or displays coordinates for making a layout template for T or Y pipe connections; eccentric or concentric. Choice of decimal or fractional inch output. Template increments (degrees) are user determined. Alternate metric program listing included.

205 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03522-41 : N.C. Punch Press: Straight Line

This program allows the N.C. programmer to calculate the feed increment for any size punch at any angle. The program keeps the distance between hits (feed rate) below 70% of the punch size. This ensures uniformity of cut and reduces uneven edges to a minimum.

102 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

03572-41 : Sheet Steel Gages and Weights

This program gives the thickness in inches of any gauge steel, from seven to thirty gauge, and computes the weight of any size piece of that gauge.

201 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 3 cards — $3.75

J552 Industrial Engineering Operations Research

02565-41 : Replacement Model

Program calculates the cost for individual replacement and group replacement cost for exchanging items that fail abruptly such as light bulbs and staff wastage.

192 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

J554 Industrial Engineering Production Control

01594-41 : Stock Roll Calculations

This program solves problems incurred when a material is continuously spiral wrapped around a core. It will solve for the remaining unknown when provided with any 3 of the following: a. Final diameter, b. Empty core diameter, c. Length of material, d. Material thickness. Materials consisting of 2 dissimilar thicknesses may be used.

160 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

J556 Industrial Engineering Quality Control

03272-41 : Laray Viscometer Data Interpretation

Laray viscometer weight/time data can be fit to any of three models; Power Law, Bingham, or Casson. It includes temperature compensation (with printer), a rod and collar factor. It can handle data from two, three, or four drop procedures, and can be used with or without a printer.

362 Program Steps
Necessary Accessories: HP-41C with two memory modules; card reader, printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

03567-41 : Brookfield Viscosity Calculator

If you have a Brookfield viscometer and are tired of using tables, this program is for you. It calculates the viscosity in centipoise, given the viscometer model (LV, RV, HA, or HB), spindle number, speed and dial reading.

89 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 3 cards — $3.75

J558 Industrial Engineering System Analysis

01823-41 : Reliability Evaluation

Program determines the total annual cost for evaluation purposes based on the systems reliability/availability, mean time between failures and time to repair.

106 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

J600 Mechanical Engineering

00431-41 : Rope Drum Capacity

This program calculates the length of cable that can be spooled onto a drum or reel. The program is valid for any size wire rope from 1/8" to 2.5".

82 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

00518-41 : Prssl Computes Stress in Cylindrical Pressure Vessel

Program solves Roark, Table xiii, Case 30: cylinder with flat head, uniform pressure. Calculation includes stresses at any location along cylinder due to pressure, moment, and joint shear. Maximum stress at centerline calculated in head due to pressure, moment, and joint shear.

308 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00702-41 : Gear Frequencies

This program calculates the mechanical vibration frequencies typically generated by a pair of gears. It is valid for spur, helical, and straight bevel gears and has been used occasionally for spiral bevels. Not all frequencies calculated are observed in every vibration signature.

144 Program Steps
Necessary Accessories: Printer
Documentation — $12.00 Cost of 2 cards — $2.50

00855-41 : Length of Paper in a Roll

Given any three of the length of paper in a roll, paper thickness, core diameter, and roll diameter, this program interchangeably solves for the unknown. Xeq "ROLL" begins to prompt for the variables. The known variables are keyed in, followed by (R/S). Prompt for the unknown is answered by (R/S), which the program solves for.

89 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00894-41 : Natural Frequencies of Uniform Beams

This program calculates the natural frequencies of uniform beams with various end conditions — pinned, fixed and free. Any number of nodal frequencies can be calculated starting with the lowest frequency.

87 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00898-41 : Sinusoidal Motion

For simple harmonic motion of a particle, this program calculates peak acceleration, peak velocity, or peak displacement given frequency and any one of the above. Acceleration is calculated in either G's or inches per second.

58 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00921-41 : Turbomachinery Calculations

Calculates turbine required flowrate, pump horsepower, turbine exit temperature, nozzle spouting velocity and turbine velocity ratio for a turbopump. Inputs are pump flowrate, pump and turbine efficiencies, density of pumped fluid, turbine drive-gas properties, and turbine pressure ratio.

165 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00936-41 : Duct Sizing - Static Regain

This program computes the pressure loss or regain for either a round or rectangular supply air duct system by the static regain methods employed in the 1972 Ashrae handbook of fundamentals.

211 Program Steps
Necessary Accessories: One Memory Module. Printer desirable.
Documentation — $12.00 Cost of 3 cards — $3.75

00944-41 : Duhamel's Integral for a Vibrating System

This program solves single degree of freedom vibrating systems having a complicated forcing function. The solution yields the displacement as a function of time along with the resulting force on the vibrating structure. the dynamic load factor can then be determined.

99 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00954-41 : Finite Element Heat Transfer

Using finite time intervals and finite elements, this program calculates thermal transient response and steady state temperature distribution. elements mass, initial temperatures, and all element interconnections are user defined. Options for conductive and/or radiative transfer included plus 2 user defined algorithms available.

319 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00975-41 : 41C Tube Bending Development

Given the formed part dimensions of a bar or tube centerline, the program will generate all data required for bending the tube. Input: cartesian co-ordinates of end points and bend intersections and bend radius. Output: straight & curved section lengths; total length bend angles; rotation between bends.

355 Program Steps
Necessary Accessories: Two Memory Modules and Printer
Documentation — $12.00 Cost of 3 cards — $3.75

00998-41 : Die Design for Powder Metallurgy

Program calculates: 1) the outside diameter required for a die, 2) the maximum pressing pressure for powder compaction in the die.

Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01019-41 : Swirl Velocity

This program uses a free vortex system to approximate the swirl velocity on a axial flow turbo-machine. The program starts at the hib radius and automatically proceeds up the blade in the radial direction, displaying the radius and swirl velocity. This program can also calculate the velocity at one specific point.

103 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01027-41 : Circular Segments and Sectors

The program determines the complete properties of a circular segment and sector when two parameters are known. Viz. area of segement and arc length; chord and arc length; height of segment and arc length; etc.

378 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01038-41 : Approximate Impeller Design for Centrifugal Pumps

Using only flowrate, head, rotational speed and npsha, impeller width, diameter and efficiency are approximated. Specific speed and suction specific speed are also output as intermediate parameters.

166 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01095-41 : Bearing Frequencies

This program calculates the vibration frequencies typically generated by rolling element bearings. It is applicable to Timken Bearing Data as well as ball and needle bearings. Many frequencies calculated may not be observed in a vibration signature. The program is for a rotating shaft and stationary housing.

290 Program Steps
Necessary Accessories: Printer

Documentation — $14.00 Cost of 4 cards — $5.00

01114-41 : Safety-Valve Steam-Flow Capacity

Given the diameter, lift and discharge coefficient of the valve, the saturated steam pressure and the superheat temperature above saturation temperature if the steam is superheated. The program outputs the area of the valve annulus, ideal flow through the valve and the actual flow through the valve. Program prompts for data and uses alphanumeric capability for output display.

80 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01140-41 : Air Volume Estimated Calculation by Iterative Method

This program can be used to compute air volume, air changes per hour, air handling unit entering conditions, apparatus dew point, temperature difference and reheating if required in Hvac systems.

376 Program Steps
Necessary Accessories: Two Memory Modules, Printer and Card Reader

Documentation — $12.00 Cost of 5 cards — $6.25

01143-41 : Rolling Mill Mass Balance Calculations

The temper of aluminum sheet is determined by the relationship between the annealing practice and the thickness of the sheet during annealing. Given thickness, thinness, percentage reduction, thick length, or thin length the unknowns of these variables can be calculated. This program permits rapid and non-confusing calculations where the percentage reduction is defined in the thickness to thinness direction and not the reverse (i.e., not a percentage increase).

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01171-41 : Pipe Stress

This program uses the ANSI Code Criterion Formula to calculate thermal stress in a multi-directional pipe run and compare it to a maximum allowable factor. It also does simple (one-directional) expansion.

230 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01211-41 : Circular Plate with Hole - Plate 1

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with a center hole considering the outside edge either simply supported or fixed and the inside edge free. The user may apply a uniform pressure load of any bandwidth, a ring load, or a combination of both anywhere on the plate.

815 Program Steps
Necessary Accessories: Three Memory Modules and Printer

Documentation — $14.00 Cost of 7 cards — $8.75

01212-41 : Circular Plate with Hole - Plate 2

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with a center hole considering the outside edge free and the inside edge either simply supported or fixed. The user may apply a uniform pressure load of any bandwidth, a ring load, or a combination of both anywhere on the plate.

1034 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV and Printer

Documentation — $14.00 Cost of 8 cards — $10.00

01215-41 : Bend Deductions/Allowances

Given material thickness, radius and degree of bend, this program calculates bend allowance, bend deduction, distance from outside mold line to block line, distance from outside mold line to bend line, and prints problem parameters and solutions when 82143A printer is attached.

214 Program Steps
Necessary Accessories: One Memory Module. Printer and Card Reader helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

01219-41 : Compression Spring Check

Given the wire diameter, mean diameter, free length & number of active coils, this program will check loads, load heights & stress levels for a compression spring. This program is written to be used with the spring design program, but can be used independently.

235 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

01239-41 : Gage Calculations

Given the basic diameter and tolerances of an axis or a hole, between 1 and 500 milimeters, program will determine all gages and master gages, following I.S.O. norm. The 700 values from tables are already stored in memory using a data pack.

633 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV and Card Reader. Printer optional.

Documentation — $12.00 Cost of 10 cards — $12.50

01259-41 : Safety Valve Nozzle Stress

Calculates safety valve nozzle stress to ensure installation is adequately designed for the reaction forces encountered during the opening of a safety valve.

355 Program Steps
Necessary Accessories: Two Memory Modules. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

01264-41 : Vaneturn Elbow Pressure Loss Calculations

This program calculates pressure loss in W.G. for vaned turn duct elbows in air conditioning or ventilation duct runs using curves and formulas from U.S. Navy design data sheet DDS 3801-2-D and DDS 3801-2-F. This program is applicable in all Navac and marine vessel HVAC calculations.

214 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01290-41 : Heat Transfer in Air

Calculates the equilibrium temperature of body dissipating heat in a free air ambient by means of convection and radiation. Includes subroutines which evaluate air properties as functions of temperature and pressure, useful in other heat transfer and air flow programs.

178 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01296-41 : Machining Time

This program calculates the standard time for five types of metal-cutting processes (I.E. turning, milling, drill/reaming, tapping, and c'drill/chamfering). The program automatically prompts alphanumerically for needed variables, which are explained fully in the documentation. Most useful for process engineering or industrial engineering. Very complete documentation.

314 Program Steps
Necessary Accessories: 188 Register capability. Printer optional.
Documentation — $12.00 Cost of 5 cards — $6.25

01311-41 : Stress Concentration

This program solves cases 1a and 1b of table 37 in Roark: elastic stress concentrations from two U notches in a member of rectangular section. The two loading conditions are axial tension and in plane bending.

298 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01312-41 : Compression Spring Design

Given the preload, final load, the inside (or outside) diameter that the spring is to fit on (or in) & the amount of deflection (or stroke), this program will calculate the required parameters for a compression spring.

289 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

01316-41 : Momentumline Plotting

This program calculates and prints the reactive forces and all necessary momentums to plot the momentumline of any girder on two points of support. The load can be any combination of point and equal distributed forces directed up as well as downwards.

194 Program Steps
Necessary Accessories: Printer
Documentation — $12.00 Cost of 2 cards — $2.50

01366-41 : Supply Grilles Selection for H Vac Systems

This program can be used to compute supply grilles for air distribution according to several variables and correction factors not so easy to do in conventional way (from tables).

454 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 5 cards — $6.25

01381-41 : Circular Plate - No Hole - Plate 0

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with no hole considering the outside edge either simply supported or fixed. The user may apply a uniform pressure load of any bandwidth, a ring load or a center load, or a combination of both anywhere on the plate.

873 Program Steps
Necessary Accessories: Three Memory Modules and Printer
Documentation — $14.00 Cost of 7 cards — $8.75

01382-41 : Circular Plate with Hole - Plate 3

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with a center hole considering the outside and inside edge either simply supported or fixed. The user may apply a uniform pressure load of any bandwidth, a ring load, or a combination of both anywhere on the plate.

1158 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV and Printer.
Documentation — $14.00 Cost of 10 cards — $12.50

01388-41 : Layout

This program calculates the necessary inputs to set up / program the Excellon MK-IVC and XL-3 printed circuit driller/routers. Board layup on flats is calculated as well as edge spacing, datum set points, and tooling hole coördinates. Program can be used with other punching, drilling, or routing equipment with small changes.

322 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C. Printer and Card Reader helpful.
Documentation — $12.00 Cost of 3 cards — $3.75

01394-41 : Section Properties - Single Axis

This program calculates the sectional properties (area, neutral axis, moment of inertia and section modulus) of a cross section composed of orthogonally arranged rectangles (plates). The height, width and location of each retangular component is entered until the entire section has been covered. Numerical integration approximation is also possible.

94 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

01420-41 : Bimet-Bimetallic Weld Stress and Deflection for Pipe Joints

Thermal expansion stress in bimetallic welds for pipe to pipe (same thickness or different thickness) or pipe to fixed end (vessel wall, etc). Full alpha-prompt input; automatic incremental -x listing and plot of stress, deflection if printer attached.

425 Program Steps
Necessary Accessories: 2 Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

01422-41 : Reflected Inertia and Flywheels

This program converts an actual system of shafts rotating at different speeds into an equivalent single rotor system directed either to the input (driving) or output (driven) shaft. Also included is the formula for calculating the energy stored by a flywheel given its rotational speed, coefficient of fluctuation and inertia.

323 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

01424-41 : General CAM Program

These programs (CAM 1 plus 4 Curves) compute the follower (or cutter) radial dimensions, offset or correction angles, when appropriate, velocities, accelerations and pressure angles of radial, offset or swing arm follower systems. The user may select from Cycloidal, Harmonic, Modtrap or Modsin cam curves, combined if desired, with constant velocities.

566 Program Steps
Necessary Accessories: Quad Memory, Card Reader. Printer optional.
Documentation — $14.00 Cost of 12 cards — $15.00

01429-41 : Single Plane Balance

This program provides weight (usually grams) and movements (degrees) information used in balancing rotating machinery (single plane).

Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01436-41 : High Pressure Gas Piping

This program calculates pipe sizes for gas above 1 PSIG with a 10% pressure loss, using the spitzglas formula.

147 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01443-41 : Diesel Fuel Spray Penetration

This program calculates six properties of a diesel engine fuel spray. Relative penetration is the most significant of these and is determined with and without swirl. This is the proportional distance the fuel spray tip has passed to the combustion chamber wall by the time combustion starts.

283 Program Steps
Necessary Accessories: 1 Memory Module or HP-41CV

Documentation — $12.00 Cost of 4 cards — $5.00

01471-41 : HVAC Duct Weight Calculator

This program calculates the weight per foot, weight per given span, and natural frequency for round or rectangular cross-sectional ductwork. All calculations are based upon SMACNA standard duct systems designed for 6" W.G. galvanized sheet metal construction.

236 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

01484-41 : Gear Measurement

Prompting for and converting data (three angular modes) in millimeters or inches, program calculates pitch diameter, base diameter, dimension over rolls, block dimension, diameter at contact point, roll angles and lead. It generates spacing table and calculates lead checker setting, involute and arcinvolute functions in main program or from keyboard.

531 Program Steps
Necessary Accessories: 2 Memory Modules (Card Reader Optional)

Documentation — $12.00 Cost of 5 cards — $6.25

01584-41 : CG and Composite Radius Gyration Calculations

This program calculates Center of Gravity in one, two, or three dimensions, or calculates a three dimensional composite Radius of Gyration given the weight, centroid, and individual radii of gyration of the component parts. Provisions are made to allow outside access to the output portion of the program.

207 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01621-41 : Frequencies and Mode Shapes for a General 3-DOF System

Natural frequencies and mode shapes for a general 3 mass and 6 spring system are determined. The natural frequencies and mode shapes are sorted in ascending order. To obtain the best numerical accuracy, three alternate mode shape solutions are evaluated.

580 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

01641-41 : Pipe Sizing (Hazen Williams)

This program calculates pipe size, velocity, pressure loss, and total pressure loss for a given set of parameters for either individual pipes or a system. Any fluid may be used if the "C" values are available.

218 Program Steps
Necessary Accessories: 1 Memory Module (Printer Desirable)

Documentation — $12.00 Cost of 3 cards — $3.75

01647-41 : Expansion Tank Selection

Expansion tanks with or without diaphragms are sized for operating temperatures between 100 and 400 F with the expansion tank connection at pump suction or discharge or with the expansion tank location at the top of the system. System volume is also calculated and displayed based on standard steel pipe flow.

303 Program Steps
Necessary Accessories: 2 Memory Modules or Quad Module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

01649-41 : Viscosity Corrections for Centrifugal Pumps

Centrifugal pump performance for viscous liquids is based on water performance corrected by factors from the Hydraulic Institute. These factors are a function of flow, head and viscosity, shown in figure 63 of the Hydraulic Institute Standards. This program uses curve fitted equations to replace figure 63. Also, given water performance, the viscous performance is calculated.

178 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01675-41 : Safety Valve Vent Stack

Program will give an approximation of safety valve vent stack ID and will then allow the user to verify that the vent stack is adequately designed. Vent stack anchor design information and piping design pressures are also outputed.

313 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01714-41 : Center Line to Center Line

The program will calculate the pitch length of a belt/chain or the center distance between the two pulleys/sprockets, given one of the unknowns and the two pitch diameters of the pulleys/sprockets.

138 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01736-41 : Transmitted Force

This program solves for the transmitted force in a spring, damping, vibration isolation system with a sinusoidal exiting force. If the transmitted force is known, the rotational speed is calculated. Phase angle, natural frequency of undamped oscillation, transmissibility and damping ratio are also calculated for both cases.

196 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01749-41 : Superheated and Saturated Steam Enthalphy

Program calculates the enthalpy of saturated or superheated steam given the pressure and temperature. Temperature of saturated steam is calculated from the program. Program results agree well with the Keenan and Keys steam tables.

192 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $8.00 Cost of 2 cards — $2.50

01750-41 : Smoke Stack Calculations

Program calculates stack height given stack draft or stack draft given stack height. Also, outputted is the stack diameter. The program calculates the data at sea level and at the elevation above sea level.

123 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01758-41 : Vibration Conversions and Guidelines

Machinery vibration problems involve displacement, velocity, acceleration and frequency. For systems having only one frequency of vibration, there is a unique relationship between these parameters. Knowing any two variables, the remaining two can be found. A relative severity is also determined.

186 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01791-41 : Belts

The program will calculate the pitch length of a belt/chain in a multiple pulley/sprocket drive system, given only the pitch diameters and the X-Y coordinates of the pulleys/sprockets.

222 Program Steps
Necessary Accessories: None. Documentation for use with X-Function Module also included.
Documentation — $12.00 Cost of 2 cards — $2.50

01828-41 : Mass

This program computes the mass, center of gravity, longitudinal moment of inertia and transverse moment of inertia of an arbitrary body of revolution.

301 Program Steps
Necessary Accessories: One Memory Module. Printer Helpful.
Documentation — $12.00 Cost of 3 cards — $3.75

01847-41 : Pipe Branch Reinforcement Calculation

This program provides a quick check to determine whether welded pipe branches are capable of sustaining internal design pressures in accordance with ANSI B31.1-1980, Code for Power Piping. The program also provides the user with error messages if inputs are made that violate certain code rules.

359 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

01862-41 : Tank Drainage Time

The program determines the time required to drain a vessel under the head of its own liquid. The vessel is a flat-end horizontal tank.

96 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01867-41 : Perforated Metals

The present program is applied in the manufacturing and marketing of Perforated Metals, according to standards and specifications given by the Industrial Perforators Association, from Milwaukee, Wisconsin, U.S.A.

278 Program Steps
Necessary Accessories: 1 Memory module, printer is optional.
Documentation — $12.00 Cost of 4 cards — $5.00

01890-41 : U Value

This program finds the required R-value (thermal resistance) of insulation necessary for a variety of walls, foundations and roofs. It also solves for an adjusted U-value (overall heat transmission coefficient) for stud walls. R-values for 32 various materials are furnished; and are addressed by name in lieu of register number.

113 Program Steps
Necessary Accessories: Memory Module (Printer helpful, not required)
Documentation — $12.00 Cost of 4 cards — $5.00

01948-41 : Belleville Washer Spring Design

This program computes the required loading and the stress produced for various deflections of a Belleville washer spring when its configurations are given. It will start with a deflection of 0.001 inch and increase in steps of 0.002 inch until the stress produced exceeds the allowable stress or until the spring has been pressed into a flat position.

328 Program Steps
Necessary Accessories: Printer and One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01953-41 : Volumes and Areas of Common Shapes

This is a set of two programs which will compute the volumes and areas of common shapes. One program will compute the volumes of a hemisphere, semiellipsoid of revolution, parabolic of revolution, cone and a pyramid. The other program computes semielliptical area, parabolic area, parabolic spandrel, general spandrel and circular sector.

165 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01954-41 : Mass, Polar and Moments of Inertia - Common Geometric Shapes

This is a set of three programs which will compute the Mass Moments, Moments and Polar Moments of inertia of common geometric shapes. The common shapes for mass moments are slender rod, thin rectangular plate, rectangular prism, thin disk, circular cylinder, circular cone and sphere for moments. The shapes are rectangle, triangle, circle, semicircle, quarter-circle and ellipse and for polar moments the shapes are rectangle, circle, semicircle, quarter-circle and ellipse.

436 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 5 cards — $6.25

01955-41 : Centroids of Common Shapes of Volumes, Areas and Lines

This is a set of three programs which compute centroids of common shapes of volumes, areas and lines. Common shapes for volumes are hemisphere, semiellipsoid of revolution, parabolic of revolution, cone and pyramid, common shapes of areas are triangular, quarter-circular, semicircular, quarter-elliptical, semielliptical, semiparabolic, parabolic, parabolic spandrel, general spandrel and circular. Common shapes of lines are quarter-circular arc, semicircular arc and arc of a circle.

337 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 4 cards — $5.00

01959-41 : Expansion Stresses in Plane Piping Configurations

Program calculates maximum bending stress, its locations and end reactions due to thermal expansion for any plane configuration consisting of a maximum fifteen legs. Required input consists of material and section properties and configuration geometry. Program assumes two rigid restraints at two ends. Average time for problem solution is one minute.

603 Program Steps
Necessary Accessories: 4 Memory Modules
Documentation — $12.00 Cost of 7 cards — $8.75

02004-41 : Metering Orifice Program for Flange Tap Square-Edged Orifice

This program solves the orifice equations for square edged, flat plate, concentric orifices. Given two of the following three variables the program calculates the third; Meter Differential, Mass Flowrate and Orifice Plate Hole diameter. The program is applicable in English, Metric and SI units. For Liquid, Gas and Steam service. Drain and/or vent hole provisions.

493 Program Steps
Necessary Accessories: Printer and Two Memory Modules

Documentation — $14.00 Cost of 4 cards — $5.00

02018-41 : Symmetrical and Unsymmetrical Leaf Spring Properties

This is a set of two programs. "Unsymmetrical Leaf Spring Properties" will output deflection from geometry, stress from load, and load rate after making simple measurements and inputting them to the program. "Symmetrical Leaf Spring Properties" will output deflection from geometry, stress from load, and load rate for symmetrical leaf springs. These programs were designed to enable the hobbiest/racer to locate suitable springs quickly and without special tools from salvage yards.

208 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02019-41 : Torsion Bar Analysis and Auto Clutch Calculations

This is a set of two programs. "Torsion Bar Analysis" enables the user to compute the torque capacity of a given automotive clutch, or compute the plate pressure rquired to transmit a given amount of torque. "Auto Clutch Calculations" enables the user to compute to torque capacity of a given automotive clutch, or compute the plate pressure required to transmit a given amount of torque.

166 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02020-41 : Lateral Acceleration & Aerodynamic Forces & Road Load Req

Set of two programs. "Lateral Acceleration" requires radius of turn and weight of car. Forces then computed by inputing either speed or time. Outputs are lateral acceleration as a percent of gravity and centrifugal force in pounds. Designed primarily for use with skid-pad, but, with close approximations can be made without. "Aerodynamic Forces and Road Load Requirements" will compute dimensionless aerodynamic drag affecting an auto, horsepower required to move car at said speed, and total drag affecting auto using coast down test described in Program Description 1. Used to evaluate changes in airdams, spoilers, etc.

162 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02066-41 : Cylindrical Tank Volumes (Horiz or Vert)

Program will calculate volume of a horizontal or vertical cylindrical tank, given the level in feet and inches. Volume can be in gallons (U.S.) or barrels (U.S. Petroleum). Program is very easy to use. Prompts for all inputs and labels all outputs.

111 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02161-41 : Control Valve Sizing

Sizes valve CV for liquids, gases and vapors even in cases involving reducers, choked flow and viscous liquids. Features any consistent set of units without altering program, prompts for data including engineering units checks and corrects for choked flow, reducers, transitional or laminar flow and calculates resulting aerodynamic and hydrodynamic noise.

799 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV; (Card Reader and/or Printer are optional).

Documentation — $20.00 Cost of 14 cards — $17.50

02228-41 : Random Vibration

This program calculates the resulting RMS' acceleration stress in a body subjected to random vibration. The parameters of the calculation range are entered by defining the frequency range zone by zone the acceleration spectral density of each zone and the slope. Undefined frequencies or spectral densities are deduced by the program by prompting for parameters of adjoining zones.

189 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02280-41 : ASME Equations 8, 9, 10, 11, Modification Program

Change in piping components such as adding couplings, replacing piping bends with welded elbows are very common during installation. It is very expensive to reanalyze such changes on large scale piping analysis programs. This program obviates the need for reanalysis when changes include stress itensification factors, pipe geometry and pressure.

120 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02295-41 : Nozzle Reinforcements Per ASME Sect. VIII

This program will calculate if nozzle reinforcement is required in a pressure vessel per ASME sect. VIII. If a pad is required it will calculate the minimum required dimensions of the pad, taking in account stick-thru, in- and outside weldsizes and the maximum allowable pad diameter.

375 Program Steps
Necessary Accessories: Printer optional but recommended

Documentation — $12.00 Cost of 4 cards — $5.00

02366-41 : Pressure Vessel Shell & Head Design Per ASME Sect VIII, Div1

Three programs will calculate the minimum required wall thickness of plate or pipe shells, semi-elliptical heads and flanged and dished heads. They will also calculate seamless wall thicknesses inside or outside the spherical portion of the heads. Stress reduction factors and pipe rolling tolerances are calculated when applicable. This program is designed to work with Reinforcement program Library 02295-41.

450 Program Steps
Necessary Accessories: Printer optional

Documentation — $14.00 Cost of 6 cards — $7.50

02384-41 : Critical Shaft Speed

Given distance between bearings, distance from bearing to rotor, rotor weight and shaft diameter, this program will compute the first critical speed for three arrangements with two bearings. 1) One rotor suspended, 2) Two rotors suspended and 3) One rotor overhung. Shafts weights are allowed for and either solid or hollow shafts can be used. Deflection due to motor belt pull will be used if motor H.P., motor R.P.M., motor pully diameter and pully overhang is entered.

266 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02477-41 : Properties For Solids of Revolution

This program will provide the user with surface area, weight, centroids, and both the traverse and axial mass moment of inertia for any homogeneous solid of revolution defined by an arbitrary cross section.

714 Program Steps
Necessary Accessories: Three memory modules. Printer optional.
Documentation — $12.00 Cost of 6 cards — $7.50

02570-41 : Shearing Force in Fixation Pieces (Screw revits pins etc)

This program calculates the resultant shearing force acting in a fixation piece (screw, rivets, pins, etc. ...) of a system with several pieces that is subject to external forces and moments. HP-41CV solves up to 135 pieces and HP-41C up to 7.

151 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02641-41 : Thermal Expansion of Parts

This program will calculate the increase or decrease in length or diameter, plus the increase or decrease in stress, for a part subjected to a difference in temperature. Thirteen different metals are labeled in the program, concerning their coeff. of expansion Rates. A chart is included for the modulus of elasticity and Poisson Ratio, when required.

137 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02653-41 : Rigid Body Inertial Properties

Program computes total weight (or mass), center-of-gravity coordinates and moments and products of inertia of an assembly composed of an arbitrary number of items. May be utilized in the design of spacecraft, airplanes, missiles, rockets, etc. Particularly useful in vibrations analysis.

258 Program Steps
Necessary Accessories: One memory module and printer
Documentation — $12.00 Cost of 3 cards — $3.75

02654-41 : Sum and Difference Frequencies

This program evaluates most of the typical sum and difference frequencies that may be generated by the interaction of a pair of frequencies when rubbing or waveform "clipping" occur. A harmonic order not greater than five is specified by the user.

209 Program Steps
Necessary Accessories: One memory module and printer (HP 82143A)
Documentation — $12.00 Cost of 3 cards — $3.75

02655-41 : Piping Losses Including Fittings and Values

This program is a must for persons responsible for the calculation of pressure losses in piping systems. The program calculates Reynolds number, friction factor, velocity and pressure loss. Values are assigned to keys for fittings, valves, etc. making the pressure loss calculation extremely easy. Program lines may be deleted if X-Function module not available.

537 Program Steps
Necessary Accessories: Three memory modules and Extended Functions module
Documentation — $14.00 Cost of 6 cards — $7.50

02673-41 : Pressure Vessel Cost / Weight Estimate

This program estimates pressure vessel cost as a function of shell weight. It also calculates vessel volume, surface area and shell thickness. The program prompts for all inputs required including inside diameter, tangent length, design pressure, allowable stress and corrosion allowance. The program includes a routine to round up shell thickness to a standard manufactured plate thickness. The cost estimate is current because of use of the most recent Chemical Engineering Fabricated Equipment Index.

405 Program Steps
Necessary Accessories: Two memory modulesfor the HP-41C. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02713-41 : Relief Valve Sizing — Gases and Vapors

The program calculates required orifice areas for safety relief valves in gas and vapor services. Formulae are incorporated to determine backpressure correction factors without the use of charts. Conventional, balanced bellows and pilot operated valves can be accommodated.

314 Program Steps
Necessary Accessories: Two memory modules (for the HP-41C) and 82143A printer.
Documentation — $12.00 Cost of 4 cards — $5.00

02714-41 : Heat Transfer Rate

Calculates the rate of heat transfer by convection, and radiation. Gives the rates of heat transfer due to the individual modes and the total heat transfer rate from a given surface exposed to free air. SI or US Customary units may be used. A practical, easy to use program.

125 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02738-41 : Belt Formulas Pulleys and Speeds

This program automatically prompts you for belt length or pulley speeds and sizes and if insufficient information is present will go through the prompting routine again. Will figure belt length open or crossed, belt speed in ft/per/sec; pulley sizes for required speeds, and speeds for required pulley sizes.

277 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02770-41 : ACME or Stub Thread Tolerance Diameters

This program calculates all maximum and minimum tolerance diameters for class 2, 3, 4 or 5 general purpose ACME or stub ACME external (screw) and internal (nut) threads. Diameters may range from 1/4" to 5" and pitches from 1/16" to 1/2". Cross section, thread shear areas and maximum and minimum thread clearance (backlash) are calculated.

476 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 5 cards — $6.25

02776-41 : Thermowell Design

In many temperature measuring systems a thermowell is required to provide a pressure tight system. This program enables the user to determine if a standard thermowell will withstand the temperature, pressure, velocity and vibration conditions of his specific fluid.

290 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 7 cards — $8.75

02852-41 : Pipe Template

Program prints or displays coordinates for making a layout template for T or Y pipe connections; eccentric or concentric. Choice of decimal or fractional inch output. Template increments (degrees) are user determined. Alternate metric program listing included.

205 Program Steps
Necessary Accessories: One memory module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02876-41 : Two Phase Frictional Pressure Drop

Program uses Dukler's method to calculate frictional pressure drop in two phase flow. Hugh Mark's hold-up relationship is used. Input requires flowrate, density and viscosity of liquid and vapor. Plus roughness factor and diameter of pipe. Run time is less than one minute.

333 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02882-41 : Residential Hot Air Furnace Selection

This program aids in the selection of new hot air furnaces for home heating. Fuels include natural gas, propane, and heating oil. The program estimates the annual costs of fuel and electrical power for the furnace air circulating fan. Using installed cost, it compares data with a second furnace and computes annual savings (or loss) and pay back period. When electrical power cost is included, some highly fuel efficient furnaces are not the best economic choice.

95 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02889-41 : Analysis of Plane Linkage Mechanisms

LYNX is a set of subprograms for the kinematic analysis of plane linkages. A user-written calling program is required. The geometric positions, velocities and accelerations of points on the linkage are obtained by vectorial methods. The calculations are repeatable for a full motion cycle. Four detailed examples are included.

634 Program Steps
Necessary Accessories: Three memory modules for complete program including examples Only one memory module is required for the basic program and data
Documentation — $14.00 Cost of 10 cards — $12.50

02932-41 : Wear Equation

This program will calculate the sixth variable for the other five values in the wear equation. It is useful for the design of machine components where an analytical approach to resisting wear is required.

78 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02938-41 : Rotor Total Mass and Moments of Inertia (S.I. Units)

The polar and diametral moments of inertia for a disk rotor plus its total mass are calculated by dividing the rotor up into concentric rings and summing the values for each ring. The required input data includes the material density, number of rings and the disk thickness at each radius.

196 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02952-41 : Ft, In, 1/16ths Right Triangle and Arithmetic

This program allows entry of dimensions in feet, inches, and sixteenths of an inch (FIS), and addition, subtraction, multiplication, and division using RPN logic. Also, right triangles are solved in FIS given any two sides, or an angle and a side. Format for FIS is aa.bbcc, where aa equals feet, bb equals inches (to 99), and cc equals sixteenths of an inch (to 99).

208 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02956-41 : Factor of Safety

This program calculates the factor of safety for two stress states: simple, normal and combined stress. When the load is steady a factor of safety is calculated for both ductile and brittle materials. For cyclic loading on shafts the maximum shear theory is used.

177 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02979-41 : Natural Gas Pipeline: Pressure and Temperature vs Length

Program incorporates Joule-Thomson effect to determine pressure-temperature- length relationship for long natural gas pipelines. Simplified Berthelot equation of state is used to obtain gas compressibility factor and Joule- Thomson coefficient. Input requires flowrate, specific gravity, heat capacity, initial pressure and temperature, pipe diameter and length, temperature of surroundings, and overall heat transfer coefficient between pipe and surroundings.

300 Program Steps
Necessary Accessories: Printer 82143A
Documentation — $12.00 Cost of 3 cards — $3.75

02982-41 : Elliptical-Stress

This program solves cases 10a and 10b of table 37 in Roark: Elastic stresses and stress concentrations from a central elliptical hole in a member of rectangular cross section. The two loading conditions are axial tension and in plane bending.

182 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02983-41 : Hole-Stress

This program solves for the elastic stresses and stress concentrations from an off-center hole in a member of rectangular cross section. The two loading conditions are axial tension and in plane bending. This is cases 8a and 8b of table 37 in Roark.

202 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02984-41 : Cone-Stress

This program solves for the membrane stresses and deformations in a cone filled with a liquid of known density. Solutions are available for both above and below the fluid level. The cone has a tangential edge support.

313 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

03031-41 : Belt Calculations

This program calculates the length of a belt between two pulleys, given the two diameters and the distance between them. It also calculates belt length for a cross engagement.

76 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

03063-41 : Heating Rate Calculator

Program calculates heating or cooling time, power required or temperature of a body, given its mass, specific heat, initial temperature, and two of: time; power; end temperature. Will also stepwise iterate and solve for total time with inputs of varying specific heat over various temperature ranges. Prompts and answers have metric units displayed. Very user friendly.

144 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03123-41 : Tank Volume, Spherical / Horizontal-Cylindrical Tanks Given Liquid Depth

Program generates tables of volumes of liquid in spherical horizontal cylindrical flat-ended and hemispherical-ended tanks in gallons or liters, given tank diameter, length and beginning and ending liquid depth and liquid level change increment in inches or centimeters. The author derived the equations for cylindrical tank volumes and, to his knowledge, there are no equivalent equations or programs.

320 Program Steps
Necessary Accessories: Extended Functions module or HP-41CX. Printer desirable but not necessary.

Documentation — $12.00 Cost of 4 cards — $5.00

03129-41 : Perforated Metals

The present program is applied in the manufacturing and marketing of Perforated Metals, according to standards and specifications given by the Industrial Perforators Association, from Milwaukee, Wisconsin, U.S.A.

276 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

03148-41 : Thermal RC Calculator — Temperature of Mass Heated through a Conductor

Relaxation formula solves for time constant and temperature or elapsed time (given time or temperature) of a body of given mass and specific heat, being heated or cooled through a thermal conductor which is attached to a constant temperature heat sink. Length, area and thermal conductivity of the conductor are input, or will solve for length or area if the other parameters are input. Prompts and answers are labeled with metric units.

164 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03158-41 : Vibrating Body Supports

In design or modification work, this program obtains the best support positions in order to uncouple the vibrational modes and, as much as possible, to isolate a vibrating body from another which should be steady and quiet. Examples: Supports for engine-clutch-gearbox complete assembly, in certain electrical assemblies, etc.

871 Program Steps
Necessary Accessories: Four memory modules or Quad memory module. Useful accessories would be: Card Reader; Printer (HP 82143A) or HP-IL Module and Printer (HP 82162A).

Documentation — $14.00 Cost of 9 cards — $11.25

03233-41 : Bolts in Shear: Version 3.2

This program calculates the shear forces on a group of up to ten fasteners. It allows adding, changing the position of, and deleting of fasteners in the group, changing of applied force parameters, reviewing of the fastener's and force's location, saving and loading of problems to/from data cards (with a card reader), and features a HELP routine. It is extremely versatile and is entirely menu driven. Video interfaces and printers are supported.

782 Program Steps
Necessary Accessories: Quad memory module, and card reader to access Save & Load features.

Documentation — $20.00 Cost of 8 cards — $10.00

03293-41 : Drive Belt Calculations

This program will calculate the unknown value after having been given any three of the following four values: belt length, larger pulley diameter, small pulley diameter, center to center distance between pulleys.

169 Program Steps
Necessary Accessories: 00041-15029 Math Pac I (uses "SOL")

Documentation — $12.00 Cost of 2 cards — $2.50

03333-41 : Wire Rope Incipient Scrub

This program calculates the angle at which rope scrub would occur on a grooved single layer winch. The four required inputs are rope diameter, rope diameter tolerance, winch tread diameter and groove pitch. The program assumes rope diameter includes half of the tolerance.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03379-41 : Single Stage Reciprocating Compressor Operating Curves

This program calculates data points for a Suction Pressure-ordinate vs. Discharge Pressure-absissa with curves of constant horsepower and constant capacity (thumb print curves). Ten separate single acting compressors or five double cating compressors.

496 Program Steps
Necessary Accessories: HP-41CX; Petroleum Fluids Pac.

Documentation — $12.00 Cost of 5 cards — $6.25

J602 Mechanical Engineering Automotive Engineering

01623-41 : Internal Combustion Engine Performance Calculations

This program solves eight equations that relate twenty performance parameters of internal combustion engines. The unknown variables in four of these equations can be defined by the user. Many variables are common to several equations: so once any variable has been input or calculated it does not have to be re-entered.

325 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01821-41 : Internal Combustion Engine Cycle Otto

This program calculates pressure and temperature at each point of an internal combustion engine cycle Otto; moreover calculates work, thermal efficiency, indicates mean effective pressure, indicates horsepower and torque. Input data are atmospherical pressure and room temperature, compression ratio, displacement or bore X stroke and RPM maximum. Units in English or Metric system.

505 Program Steps
Necessary Accessories: Two Memory Module

Documentation — $12.00 Cost of 5 cards — $6.25

02574-41 : Exhaust Design Criteria For Four Stroke Engines

This program calculates the length of individual cylinders exhaust pipes and their internal diameters up to the point where the individual pipes blend into a collector or a change in diameter is made. An internal diameter for the collector is also calculated. No storage registers are used, only the stack.

76 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

J604 Mechanical Engineering Design and Analysis

01623-41 : Internal Combustion Engine Performance Calculations

This program solves eight equations that relate twenty performance parameters of internal combustion engines. The unknown variables in four of these equations can be defined by the user. Many variables are common to several equations: so once any variable has been input or calculated it does not have to be re-entered.

325 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

01847-41 : Pipe Branch Reinforcement Calculation

This program provides a quick check to determine whether welded pipe branches are capable of sustaining internal design pressures in accordance with ANSI B31.1-1980, Code for Power Piping. The program also provides the user with error messages if inputs are made that violate certain code rules.

359 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02051-41 : Short Cylinder Analysis - Cylinder 3

This program will provide the user with radial displacement, slope, and stress solutions at any longitudinal location on a short cylinder with the left end free and the right end either simply supported, fixed, free or guided. In addition, CYLINDER 3 will consider cylinders infinite to the left and infinite in both directins. The user may apply a pressure load of any bandwidth, a ring load, a moment load, an axial load, or any combination of these loads anywhere on the cylinder.

1052 Program Steps
Necessary Accessories: Quad Memory Module and Printer
Documentation — $14.00 Cost of 10 cards — $12.50

02072-41 : Leaf Spring Design Calculations

This program is an aid for the designer of multi-leaf springs. With the input of eight design parameters, this program will produce an appropriate gage thickness, number of leaves, total stack thickness, final design stress, active spring weight and natural spring frequency.

334 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

02551-41 : Single Variable Max, or Min Finder

Using the Fibonacci Single Variable search method; the most efficient univariable search technique, this program finds the minimum or maximum of a function with a single minimum or maximum point within specified limits.

136 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

02731-41 : Press Fit of Thick-Walled Cylinders

The program calculates the interface pressure between two cylinders press-fitted together, given the radial interference of mating parts. It also provides another option to calculate the radial interference of two cylinders given their interface pressure. The program prompts for inside and outside radius of cylinders, their Poisson's ratio, and modulus of elasticity. The program allows the user to check and edit any of the entered data.

149 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02770-41 : ACME or Stub Thread Tolerance Diameters

This program calculates all maximum and minimum tolerance diameters for class 2, 3, 4 or 5 general purpose ACME or stub ACME external (screw) and internal (nut) threads. Diameters may range from 1/4" to 5" and pitches from 1/16" to 1/2". Cross section, thread shear areas and maximum and minimum thread clearance (backlash) are calculated.

476 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 5 cards — $6.25

02813-41 : Helical Torsion Spring Design

Given the load, lever arm length, allowable bending stress, modulus of elasticity, deflection and coil I.D., this program calculates wire DIA, spring rate, length of active material, number of active coils, solid length of loaded and unloaded coils, loaded coil I.D. Angular location of arms, bending stress and weight of material in the active coils. It allows entry of standard wire sizes. It will adjust (at your discretion) either the coil diameter or the active material length to provide the proper arm relationship.

268 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 4 cards — $5.00

02814-41 : Power Screw Calculations

This proram is useful in the design of screws to move loads. Knowing (or estimating) the screw nomenclature and the load to be moved, this program will calculate the torque required. It uses an interchangable solution thus if an available torque is known it will find the load that can be raised or lowered. Effects of thrust collars are included. Overhauling loads are detected. The efficiency of the system is also computed.

178 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02853-41 : Shaft

"SHAFT" computes a diameter for any circular shaft subjected to stationary bending and torsional moments. For inputs of moment, torque, corrected endurance limit, yield strength, and a factor of safety, "SHAFT" computes both a diameter based on fatigue failure, and a dimater based on failure due to yielding. The program will work for both English and Metric units. The program will also prompt for either English or metric units for inputs.

111 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02867-41 : Gasscrubber Design Calculation

This program will calculate the required ID of Gas-Liquid separating scrubber in a vertical configuration based on SCFM, gas specific gravity or weight, liquid specific gravity, temperature and pressure.

93 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 1 card — $1.25

02924-41 : Servometer Bellows Design

This program calculates the design equations for nickel bellows from The Servometer Corporation catalog. The inputs are the outside diameter, inside diameter, wall thickness, number of convolutions and length. The program calculates: spring rate, stroke, effective area, pressure rating, angle of bend, parallel offset displacement and maximum torque.

197 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02932-41 : Wear Equation

This program will calculate the sixth variable for the other five values in the wear equation. It is useful for the design of machine components where an analytical approach to resisting wear is required.

78 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03039-41 : 2-D Beam Analysis

Uses the Finite Element Method to compute displacements at nodes and forces in each beam element. Nodes can have fixed or elastic restraints to ground. Additional load cases permitted. Point loads or moments may be applied to nodes. Documentation shows how to convert distributed loads to equivalent nodal forces and moments. Elements must be colinear. 6 nodes, 5 elements maximum.

873 Program Steps
Necessary Accessories: HP-41CV or Quad Memory Module

Documentation — $16.00 Cost of 9 cards — $11.25

03123-41 : Tank Volume, Spherical / Horizontal-Cylindrical Tanks Given Liquid Depth

Program generates tables of volumes of liquid in spherical horizontal cylindrical flat-ended and hemispherical-ended tanks in gallons or liters, given tank diameter, length and beginning and ending liquid depth and liquid level change increment in inches or centimeters. The author derived the equations for cylindrical tank volumes and, to his knowledge, there are no equivalent equations or programs.

320 Program Steps
Necessary Accessories: Extended Functions module or HP-41CX. Printer desirable but not necessary.

Documentation — $12.00 Cost of 4 cards — $5.00

03133-41 : Ultrabeam

Analyzes continuous beams via the Finite Element Method. Beams may be determinate or indeterminate. Nodal displacements and element forces output. Maximum of 12 nodes/11 elements. Rigid or elastic restraints. Additional loadings without starting over. Documentation shows how to convert distributed loading to equivalent nodal forces and moments. Also does Axial/ Torsion analysis as separate case. Problem data easily saved and restarted from extended memory or optional magnetic cards.

1042 Program Steps
Necessary Accessories: Module. Card Reader optional. HP-41CV or Quad Memory, Extended Functions Module with one Extended Memory

Documentation — $16.00 Cost of 10 cards — $12.50

03155-41 : Centrifugal Pump Model

Centrifugal Pump Model (CPMOD) calculates the internal pressures, temperatures, leakage and thrust in a single stage overhung centrifugal pump. CPMOD can simulate these parameters for pumps with API flush plans 11 or 13.

798 Program Steps
Necessary Accessories: Quad memory module and Extended Function module

Documentation — $14.00 Cost of 11 cards — $13.75

03416-41 : Failure Theories (Brittle and Ductile)

This program calculates the most popular brittle and/or ductile failure theories. Coulomb-Mohr, modified-Mohr, maximum-normal, maximum-shear and distortion-energy theories are supported. Input is material properties and principal stresses or Mohr circle routine included will reduce applied stresses to principle stresses. The program may be shortened is a machine design pac is available.

246 Program Steps
Necessary Accessories: One memory module, printer.

Documentation — $12.00 Cost of 2 cards — $2.50

03549-41 : Circular Plate With Hole - Supported At Any Location

This program provides solutions for deflection, slope and bending stress in a flat circular plate of uniform thickness, with a central hole, which is supported by a single, ring-type support at any location, including the inner and outer edges. Applied loading may consist of a uniform pressure load of any width, a ring load, or a combination of these at any location on the plate.

1181 Program Steps
Necessary Accessories: Quad memory module (HP-41), and card reader.

Documentation — $14.00 Cost of 9 cards — $11.25

J606 Mechanical Engineering Dynamics of Physical Systems

02375-41 : Dynamic Analysis Subsidies

Determines the single degree of freedom self-frequency of vibration of a structure by Rayleigh's method, using a devised technique that includes a new process of curve fitting.

282 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02582-41 : Two-Plane Balancing

This program performs vector calculations to calculate corrections weights for single and 2-plane balancing, as well as vector addition for summation of several trial weights into a single correction weight. Input requirements are original unbalance and phase angle, as well as unbalance at either plane resulting from respective application of trial weights, and size and location of trial weights applied.

255 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

J608 Mechanical Engineering Energy Conversion Systems

01890-41 : U Value

This program finds the required R-value (thermal resistance) of insulation necessary for a variety of walls, foundations and roofs. It also solves for an adjusted U-value (overall heat transmission coefficient) for stud walls. R-values for 32 various materials are furnished; and are addressed by name in lieu of register number.

113 Program Steps
Necessary Accessories: Memory Module (Printer helpful, not required)

Documentation — $12.00 Cost of 4 cards — $5.00

02484-41 : GTHML

This program calculates the energy requirements and cost of energy to heat a structure with a ground water sourced heat pump. The program also calculates the amount and cost of conventional fuels (oil, gas, propane or electric) and compares their cost to the ground water sourced heat pump energy cost.

293 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03375-41 : Power Plant Condenser Hydraulic Horsepower Calculation

This program calculates the hydraulic horsepower for a power plant condenser. Inputs are: water temperature, water velocity, tube length, tube diameter, flow rate and cleanliness. One or two pass condensers can be analyzed.

179 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

J610 Mechanical Engineering Fluid Dynamics

01824-41 : Exchanger Film Coefficient

This program calculates the film coefficient of heat transfer of water flowing through the tubes of a shell-and-tube type heat exchanger. In addition, the program calculates the fluid velocity through the tubes given the number of tubes or the number of tubes given a maximum velocity limitation.

126 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01862-41 : Tank Drainage Time

The program determines the time required to drain a vessel under the head of its own liquid. The vessel is a flat-end horizontal tank.

96 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01991-41 : Critical Steam Flow

This program aids plant engineers and designers in determining saturated and superheated steam flow rates through open pipes. A typical problem would require finding the maximum steam flow that can pass through vents or determining boiler drum pressure for blowing turbine piping during preoperational cleaning.

133 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02009-41 : Parallel Channel Flow

Calculates individual flow in two or three parallel channels and system pressure drop. Options include printer, SI or English units, Colebrook-White (Moody) friction correlation, and form-loss as $K = A + B(RE^C)$. Ideal for detailed/accurate analysis of systems with arbitrary channel geometry and subchannel flow within industrial equipment.

727 Program Steps
Necessary Accessories: Quad Memory Module if using 41C (Printer is optional)

Documentation — $16.00 Cost of 8 cards — $10.00

02545-41 : Differential Pressure by Two-K Method

This program calculates the pressure drop due to friction loss of fluid flowing through pipe and fittings. The unique features of the program are that it prompts the user for all inputs including the quantity of programmed pipe fittings and it uses a direct solution correlation (covering laminar, transition and turbulent flow regimes) to calculate the Darcy friction factor. The program contains 'k' values for the pipe fittings eliminating the need to refer to literature.

340 Program Steps
Necessary Accessories: Two memory modules. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02546-41 : Orifice Calculations For Flow Measurements

HP-41C version of Library program 04704-97. Facilitates initial program entry and performing successive calculations without the continual card re-entry required in 04704-97. Solves ASME/ISO equations for square-edged, flat plate, concentric orifices, given two of the following: meter differential, flow rate, orifice hole diamter, the program calculates the third. Applicable for English, metric or S.I. units; liquid, gas or vapor service; flange, radius, vena contracta, corner or pipe taps, drain and/or vent hold correction; and various orifice material corrections.

1084 Program Steps
Necessary Accessories: Quad memory module (if HP-41C). Card Reader and Printer optional.

Documentation — $20.00 Cost of 10 cards — $12.50

02558-41 : Pipe Friction Loss

This program calculates the friction loss due to fluid flowing in a straight pipe. The unique feature of this program is that it uses a direct solution correlation to calculate the Darey friction factor. The correlation covers laminar, transition and turbulent flow regimes and should give much faster results than iterative methods without sacrificing accuracy.

133 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02756-41 : System Curve (SYSCRV)

This program generates a pump discharge piping system curve which is necessary for sizing centrifugal pumps. The program prompts for all inputs required (including quantity of fittings and valves in the discharge line), labels and displays all results and displays a program function prompt. The program contains "k" values for various valves and fittings eliminating the need to refer to the literature. To implement full features of the program requires the HP-IL (82162A) printer.

622 Program Steps
Necessary Accessories: Quad memory module with HP-41C or HP-41CV. 82160A HP-IL Interface and 82162A HP-IL Printer optional.

Documentation — $14.00 Cost of 9 cards — $11.25

02985-41 : Pressure Drop With Fully-Developed Flow

Pressure drop with fully-developed flow is a function of the fluid density, friction factor. Pipe diameter, pipe length and fluid velocity. Given any five of the above variables, this program will calculate the sixth variable.

91 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02986-41 : Flow Rate as a Function of Pressure Drop

Volumetric flowrate for fully-developed laminar flow in a horizontal pipe may be expressed as a function of pressure drop, pipe diameter, pipe length and the fluid viscosity. Given four of these values, the program calculates the fifth variable. A useful program for design of pipes where a constant pressure gradient can be expected.

78 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02987-41 : Head Loss in Turbulent Flow

Head loss in turbulent flow is a function of the friction factor, pipe length, pipe diameter, and fluid velocity. Given four of the five variables, this program calculates the fifth for major and minor head loss.

80 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03374-41 : Dimensional Analysis

This program computes the Buckingham Pi Theorem for solution of flow problems. Input is simply the variables involved in the analysis-the dimensions of 23 common Fluids Dynamics variables are stored in a file. Output is dimensionless variables. User controls output with choice of: 1) Force or Mass system for dimensions; 2) Independent variables when valid and; 3) Dependent variable power. Dimension file maintenance includes adding,deleting, and viewing variables. Program accommodates up to 24 variables per analysis.

766 Program Steps
Necessary Accessories: CV memory capability, X Functions module, Math I module.

Documentation — $16.00 Cost of 11 cards — $13.75

03501-41 : Proportional Or Servo Valves

Complex dynamic analysis of proportional control valves for optimum system performance without damaging pressure peaks. Computes piston position for lowest natural frequency, acceleration stabilization time, total volume of cap end and rod end, maximum velocity, acceleration, pressure, flow rate, line velocity and useable frequency.

329 Program Steps
Necessary Accessories: None. Printer is useful.

Documentation — $12.00 Cost of 4 cards — $5.00

J612 Mechanical Engineering Fuels and Lubricants

01787-41 : Fluid Flow through Square-Edge Orifice

Determine the flow of fluids through an orifice in a pipe, given the size of the orifice and the pipe, the pressure drop, and the fluid viscosity and density. The orifice diameter can be as high as 0.8 of the pipe diameter. Results are valid for viscous liquids as well as gases.

1082 Program Steps
Necessary Accessories: Quad Memory, X Functions, X Memory

Documentation — $20.00 Cost of 20 cards — $25.00

01996-41 : Internal Combustion Engine Fuels

This program calculates the balance of different types of hydrocarbon fuels for combustion engines. Also calculates air-fuel ratio, approximate heat combustion of fuel and weight of all combustion products for any one air excess. The inputs are fuel combustion (hydrocarbons only). Units in English or Metric system.

412 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

02546-41 : Orifice Calculations For Flow Measurements

HP-41C version of Library program 04704-97. Facilitates initial program entry and performing successive calculations without the continual card re-entry required in 04704-97. Solves ASME/ISO equations for square-edged, flat plate, concentric orifices, given two of the following: meter differential, flow rate, orifice hole diamter, the program calculates the third. Applicable for English, metric or S.I. units; liquid, gas or vapor service; flange, radius, vena contracta, corner or pipe taps, drain and/or vent hold correction; and various orifice material corrections.

1084 Program Steps
Necessary Accessories: Quad memory module (if HP-41C). Card Reader and Printer optional.

Documentation — $20.00 Cost of 10 cards — $12.50

03123-41 : Tank Volume, Spherical / Horizontal-Cylindrical Tanks Given Liquid Depth

Program generates tables of volumes of liquid in spherical horizontal cylindrical flat-ended and hemispherical-ended tanks in gallons or liters, given tank diameter, length and beginning and ending liquid depth and liquid level change increment in inches or centimeters. The author derived the equations for cylindrical tank volumes and, to his knowledge, there are no equivalent equations or programs.

320 Program Steps
Necessary Accessories: Extended Functions module or HP-41CX. Printer desirable but not necessary.

Documentation — $12.00 Cost of 4 cards — $5.00

J614 Mechanical Engineering Heating/Ventilating/Air Conditioning

01773-41 : Building Heat Loss Calculation

This program calculates building heat loss in BTU/hr., KW, and the heat transmission coefficient. The seasonal KWH is calculated using the degree day method. Also the seasonal KWH for a typical heat pump can be calculated. The above information is necessary to determine the size of heating systems for buildings. Some program line constants may need to be changed to suit the user's needs depending on geographic location.

166 Program Steps
Necessary Accessories: Card Reader and Printer helpful but not necessary.

Documentation — $12.00 Cost of 2 cards — $2.50

01811-41 : Plenum Temperature Calculation

This program solves the ceiling plenum temperature equations.

181 Program Steps
Necessary Accessories: 1 Memory module

Documentation — $8.00 Cost of 2 cards — $2.50

02244-41 : Heat Loss From Insulated Pipelines

Program calculates heat loss (watts/ft) for pipelines with up to four insulation layers of varying thickness and conductivities.

254 Program Steps
Necessary Accessories: One memory module and Printer.

Documentation — $12.00 Cost of 3 cards — $3.75

02394-41 : Ceiling Plenum Temperature

This program uses an iterative method to calculate the Plenum Temperature in a ceiling return air plenum, given the appropriate areas, U-values, and cooling load temperature differences (CLTD's). The program works for both heating and cooling, and for three system types: 1) Constant air volume, 2) Variable air volume, and 3) Fixed CFM known beforehand (e.g. computer room make-up air systems.) It also accepts as input a constant quantity of exhause air.

302 Program Steps
Necessary Accessories: One Memory Module (Printer is optional)

Documentation — $12.00 Cost of 3 cards — $3.75

02856-41 : Altitude Correction

This program solves for the constants in three common air conditioning psychrometric heat transfer equations, for any altitude from 0 to 10,000 feet above sea level. The only inputs required are the altitude, and the value of the constants at sea level.

177 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 1 card — $1.25

02861-41 : Thermal Insulation Effectiveness

This program calculates the necessary heating/cooling rate of a room in order to maintain a constant temperature against heat loss/gain via thermal conduction through a window(s) or other insulating boundary with up to three different insulating layers. This enables an evaluation of the effectiveness of using different window materials or of using arbitrarily spaced double- paned windows. The program would also have other, engineering applications.

280 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02882-41 : Residential Hot Air Furnace Selection

This program aids in the selection of new hot air furnaces for home heating. Fuels include natural gas, propane, and heating oil. The program estimates the annual costs of fuel and electrical power for the furnace air circulating fan. Using installed cost, it compares data with a second furnace and computes annual savings (or loss) and pay back period. When electrical power cost is included, some highly fuel efficient furnaces are not the best economic choice.

95 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03159-41 : Solar Angles, Solar Time, and Clear Day Solar Radiation

Program calculates solar angles, solar time, and clear day solar radiation intensities using techniques presented in ASHRAE Handbook of Fundamentals. Specifically, the program calculates the day of the year, declination, sunrise hour angle, day length, time of sunrise and sunset, equation of time, apparent solar time, solar altitude, solar azimuth, incident angle, normal beam solar radiation, diffuse sky solar radiation, ground reflected solar radiation, and total solar radiation. It automatically prompts for required input data.

751 Program Steps
Necessary Accessories: Quad memory module, Extended Functions memory module, Time module and Card Reader.

Documentation — $25.00 Cost of 17 cards — $21.25

03245-41 : Psychrometric Chart

This program computes moist air states at elevations from -2,000 feet to +32,000 feet. Any two inputs (except wet bulb + enthalpy) chosen from among dry bulb, wet bulb, dew point, enthalpy and/or relative humidity(in addition to altitude) yields a computation of all other properties, including boiling temperature, dry bulb, wet bulb, dew point, enthalpy, relative humidity, weight ratio in lb/lb and in grains/lb, vapor pressure, specific density and density altitude.

957 Program Steps
Necessary Accessories: Quad Memory Module

Documentation — $14.00 Cost of 10 cards — $12.50

J616 Mechanical Engineering Heat Transfer

01622-41 : Finite Difference Heat Transfer Two Dimensional

The relaxation method is used to solve conduction / convection heat transfer problems with or without heat generation. Four node types can be used. A maximum of 70 nodes are available. After node numbers and types are assigned, the finite difference equations are generated and solved by HP41C.

604 Program Steps
Necessary Accessories: Printer and Quad Memory Module for the HP-41C.

Documentation — $14.00 Cost of 8 cards — $10.00

01811-41 : Plenum Temperature Calculation

This program solves the ceiling plenum temperature equations.

181 Program Steps
Necessary Accessories: 1 Memory module

Documentation — $8.00 Cost of 2 cards — $2.50

01824-41 : Exchanger Film Coefficient

This program calculates the film coefficient of heat transfer of water flowing through the tubes of a shell-and-tube type heat exchanger. In addition, the program calculates the fluid velocity through the tubes given the number of tubes or the number of tubes given a maximum velocity limitation.

126 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02137-41 : Coldplate Heat Exchanger Performance

This program calculates the thermal and flow performance of coldplate-type air heat exchangers for formed or cast straight fins and cast pin fins. No empirical fin data is required. The program calculates all necessary areas and air physical properties on the basis of user supplied fin geometry and inlet temperature.

588 Program Steps
Necessary Accessories: Two Memory Modules; (Printer is optional but adds utility to program).

Documentation — $12.00 Cost of 5 cards — $6.25

02219-41 : Finned Heat Sink Thermal Resistance

This program calculates the thermal resistance and temperature rise for a straight fin heat sink under free convection conditions. The radiation treatment accounts correctly for fin shielding effects, and convection is calculated on the basis of a recent correlation developed specifically for this geometry, with all properties evaluated at the actual operating temperature.

640 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

02666-41 : Transient Conduction (Lumped Capacitance Method)

This program uses the lumped capacitance method (assumes that the temperature of the solid is spatially uniform at any instant) to solve transient conduction problems. The program calculates the thermal time constant, the time required for the specifed solid to reach a certain temperature when it experiences a sudden temperature change in its environment, and the total energy transfer during the process.

116 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02787-41 : Heat Loss: Radiation vs. Convection

Calculate the radiation and convection heat loss components of any object under study. Inputs may be in Metric or Imperial units. Outputs may be both SI, and Imperial units if desired. This formula and program reduce complex relationships to simpler, more practical working levels. Suitable for energy loss calculations, retrofit payback analysis, design analysis, and Infrared Thermographic Inspections.

218 Program Steps
Necessary Accessories: One memory module or 41CV.

Documentation — $12.00 Cost of 3 cards — $3.75

02804-41 : Heat Conduction by Fourier's Law

Program calculates any of the five variables: Q, the rate of heat flow; K, the thermal conductivity; A, the area normal to the heat flow; ΔT, the temperature difference across the conductor; L, the length of the conductor, given the other four. Prompts and answer labels are in Watts-Metric or BTU-English units. Converts between Watts and BTU/hr or W/cm x K and BTU/hr x ft x° F and BTU per hour per ft^2 per inch per °F.

246 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

02881-41 : Gaussian Error Function/Probability Integral: erf(Z)

The Gaussian Error Function is commonly used in heat and mass transfer problems. Usually, this information is only presented in tabular or graphical form. This program calculates the value of erf(Z) for the absolute value of Z between 2 and 0.015 using the trapezoid method. Values with magnitude greater than 2 may be entered but run time is quite long. This program is designed to serve as a called function (similar to SIN or LN).

75 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02926-41 : CLMTD For Heat Exchangers In Series

Program calculates the corrected log mean temperature difference (CLMTD) for Tema "E" shells arranged in series. Given the terminal temperatures and a minimum acceptable value for the correction factor (F) to the true countercurrent log mean temperature difference (LMTD), the program will calculate the necessary number of shells in series, the value of F, LMTD, and CLMTD.

298 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02991-41 : Effectiveness of Heat Exchangers

Given the thermal capacitance of the two fluids, and the number of transfer units (NTU), this program calculates the effectiveness of six different kinds of heat exchangers, namely the parallel-flow, counter-flow, shell-and- tube with one shell and any multiple of two tube passes, shell-and-tube with two shell passes and any multiple of four tube passes, single-pass cross flow with both fluids mixed, and single-pass cross flow with one fluid mixed and the other unmixed.

216 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03063-41 : Heating Rate Calculator

Program calculates heating or cooling time, power required or temperature of a body, given its mass, specific heat, initial temperature, and two of: time; power; end temperature. Will also stepwise iterate and solve for total time with inputs of varying specific heat over various temperature ranges. Prompts and answers have metric units displayed. Very user friendly.

144 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03111-41 : Finite-Difference Heat Transfer For Internal Turbulent Flow

Using a finite-difference algorithm this program calculates the discrete temperature distribution and the associated heat transfer rate for smooth circular tubes with steady water flow and constant surface temperature. Properties of saturated water in the 7 to 137 C temperature range are included. Required input data: water inlet temperature and mass-flow rate, pipe surface temperature and dimensions, grid spacing length, and desired iteration error, S.I. units only.

299 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03145-41 : Heatsink Selection and Performance Evaluation

Program calculates the expected performance of finned-type, vertically mounted heatsink with a single heat dissipating device mounted symmetrically using natural convection and radiation heat transfer modes. User can select desired steady-state device temperatures at specified heat dissipation rates for various styles of user or manufacturer defined heatsink geometeries. User can select variable ambient conditions, heatsink materials, finishes and surface conditions which may influence performance or determine degradation of performance when encountered.

1764 Program Steps
Necessary Accessories: Extended Functions/Memory module, two Extended memory modules, HP-IL Module and HP-IL Printer

Documentation — $20.00 Cost of 24 cards — $30.00

03148-41 : Thermal RC Calculator — Temperature of Mass Heated through a Conductor

Relaxation formula solves for time constant and temperature or elapsed time (given time or temperature) of a body of given mass and specific heat, being heated or cooled through a thermal conductor which is attached to a constant temperature heat sink. Length, area and thermal conductivity of the conductor are input, or will solve for length or area if the other parameters are input. Prompts and answers are labeled with metric units.

164 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03368-41 : Thermodynamics Assistant: Calculations Based on Steam Tables

Introductory thermodynamics classes often make great use of steam tables. This package of three subroutines automates the repetitive calculations most often used in reading the steam tables. Linear interpolation is provided for estimation of non-listed table values. The quality of a saturated mixture "X" can be calculated given vapor and fluid specific volumes, internal energy, enthalpy, or entropy. Conversely, the specific volume, internal energy, enthalpy, or entropy can be calculated given "X" and the specific fluid and vapor contributions.

68 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

J618 Mechanical Engineering Metallurgy and Materials

01603-41 : Data Analysis of Three Element Strain Gage Rosettes

This program performs the analysis of data from any three element strain gage rosettes mounted on a stressed model. The program will print or display the accompanying strains, stresses, principal stresses and principal directions with respect to a chosen X-Y coordinate system.

539 Program Steps
Necessary Accessories: 3 Memory Modules; Printer optional.
Documentation — $12.00 Cost of 6 cards — $7.50

02695-41 : Fillet Weld Effective Throat (TE)

Solves for the EFFECTIVE THROAT (TE) of skewed fillet welds of equal and unequal leg lengths. Compensates for gap within Code allowance. Based on Structural Welding Code, AWS D1.1. For angles less than 60 deg, the program deducts 1/8" from TE for partial penetration groove welds. Also used for TE of normal 90 deg fillets. Program easy to use.

101 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

02881-41 : Gaussian Error Function/Probability Integral: erf(Z)

The Gaussian Error Function is commonly used in heat and mass transfer problems. Usually, this information is only presented in tabular or graphical form. This program calculates the value of erf(Z) for the absolute value of Z between 2 and 0.015 using the trapezoid method. Values with magnitude greater than 2 may be entered but run time is quite long. This program is designed to serve as a called function (similar to SIN or LN).

75 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02931-41 : Pipe Properties

Given the size of steel pipe, the program calculates the pipe cross- sectional area, the area moment of inertia, the section modulus, the radius gyration, the weight per foot, the outside surface area, the inside surface area, the conduit area, and the weight of water per foot.

170 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03114-41 : Welding Bevel Calculations For Steel Plate and Pipe

This program provides solution of the weight of weld metal, outside bevel opening and inside bevel opening for the following types of bevel preparations on steel plate and pipe: 1. Single V, 2. Double V, 3. Compound Double V, 4. Compound Single V. English or Metric units are accommodated.

273 Program Steps
Necessary Accessories: HP-41C + one memory module or HP-41CV
Documentation — $12.00 Cost of 3 cards — $3.75

J650 Nuclear Engineering

J700 Ocean Engineering

J750 Petroleum Engineering

00356-41 : Viscosity Conversions

This program will convert between any two of the following viscosity units in either direction: a) Kinematic Centistokes (CST), b) Saybolt Seconds Universal (SSU) at any user-defined temperature, c) Redwood No. 1 seconds at 60°C (140°F), d) Redwood No. 2 Seconds, e) Saybolt Seconds Furol (SSF) at 50°C (122°F), f) Saybolt Seconds Furol (SSF) at 98°C (210°F), g) Engler Degrees (°E). 1 main routine and 6 subroutines load any or all-one for each unit. Fully prompted inputs and labelled outputs.

320 Program Steps
Necessary Accessories: Card Reader
Documentation — $12.00 Cost of 5 cards — $6.25

00379-41 : Lubricant Naked Ex-Plant Cost

Program uses one control routine and three subroutines to: 1) load formulations of lubricants into memory for subsequent writing onto magnetic data cards, details printed out. 2) load 27 raw material costs and densities into memory for writing onto magnetic cards, prints details. 3) from information in 1 and 2, calculates product naked ex-plant cost and composite density. All inputs fully prompted and outputs fully labelled and formatted.

Necessary Accessories: One Memory Module and Printer.
Documentation — $12.00 Cost of 7 cards — $8.75

00856-41 : Viscosity of Suspensions

For estimating the viscosity of a suspension of solids in a liquid for use in fluid-flow and heat-transfer calculation, Einstein's or Hatschek's equation may be used which relates the suspension viscosity to liquid viscosity and volume fraction of solids in suspension. With the alphanumeric capabilities of the 41C fully utilized, one only needs to input the variables prompted for to obtain interchangeable solutions for the three variables.

135 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01106-41 : Determination of Pressure Buildup from Injection

Areas such as waterflooding, saltwater injection, in-situ mining and waste disposal wells need to predict reservoir pressures in order to design injection systems. This program can predict the rate of pressure buildup at variable radii resulting from constant or variable injection from single or multiple wells.

201 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01165-41 : Drilling Fluid Volume

This program is of interest to drilling engineers. It calculates the downhole volume of drilling fluid in a well of any dimensions. Execution time improves with usage.

189 Program Steps
Necessary Accessories: Memory Modules as necessary
Documentation — $12.00 Cost of 2 cards — $2.50

01444-41 : Decline Curve Analysis

Program will calculate the two unknown variables for either exponential, harmonic, or hyperbolic production-decline curves. Two known variables must be supplied besides the initial production rate, one of which must be either final production rate or the fractional decline rate. Projection of annual production can also be calculated.

480 Program Steps
Necessary Accessories: Three Memory Modules
Documentation — $14.00 Cost of 5 cards — $6.25

01506-41 : Constant Percent Decline Analysis

Given any 3 of 5 unknowns, program will solve for other two. Variables are initial rate, final rate, cumulative production, decline, or production time. Newton's Iteration Method utilized to permit solution of est. initial rate of offset operator's well (for economic and performance evaluations on new drilling prospects) given present rate, cum. production to date and time on line (generally available). Previous programs would not solve all combinations of input.

371 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01602-41 : PEPL

This program solves for natural gas (.6 Sp.Grv.) flow thru pipelines, using the PEPL (Panhandle Pipeline) formula. Extensive use is made of labels and prompts to make execution very simple. Inputs and solutions can be in user's choice of miles or feet, and CFH or MCF/D.

244 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01651-41 : Shaly Sand Analysis

This program can be used to perform a rapid well-site analysis of shaly sand intervals in oil and gas wells. It calculates total effective porosity (corrected for gas effect) and water saturation in shaly hydrocarbon bearing intervals, using data available from the following open hole logs; Compensated Neutron, Formation Density, Induction and Gamma Ray.

254 Program Steps
Necessary Accessories: 1 Memory Module (Printer optional)

Documentation — $12.00 Cost of 3 cards — $3.75

01859-41 : Pipe-Sizing for Compressible Flow

This program is designed to solve a broad range of pipe-sizing problems for compressible flow. The program assumes that flow is isothermal, and that either the upstream pressure or the downstream pressure is known. The Mach number can be found at the inlet and, more importantly, at the outlet-where sonic velocity may limit the flow.

908 Program Steps
Necessary Accessories: Quad Module, Extended Function Module. Optional: Thermal Printer, Card Reader or Wand.

Documentation — $20.00 Cost of 12 cards — $15.00

02125-41 : Natural Gas Properties from Specific Gravity

Program calculates natural gas properties using specific gravity and non-hydrocarbon mole fractions. Properties provided are Z factor, P/Z, density, viscosity, and formation volume factor. Each property is addressable through a local label and program gives error message when correlations do not apply.

467 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

02128-41 : Air-Free Natural Gas Analysis from Composition

Knowing the composition of up to 14 components of a gas mixture, this program calculates: Percent free-nitrogen associated with the gas, Dry and saturated heating values, Gas gravity, Compressibility, Gallons per thousand cubic feet of gas, Pseudocritical pressure and temperature. Heating values and GPM are corrected for standard pressure and Tc and Pc are corrected for sour gas content. The program utilizes 1981 GPA factors for use in custody transfer and other applications.

841 Program Steps
Necessary Accessories: HP-82162A Printer, Quad Memory Module and Cassette Drive

Documentation — $14.00 Cost of 8 cards — $10.00

02142-41 : Buildup

This program calculates Horner-plot data from bottom-hole pressure measurements of a shut-in oil or gas well. The flow period prior to shut-in can be either single-rate or multi-rate. Reservoir properties are calculated.

582 Program Steps
Necessary Accessories: Three Memory Modules; (Printer is optional)

Documentation — $12.00 Cost of 7 cards — $8.75

02407-41 : Natural Gas Measurement Via Orfice Meter

Program calculates natural gas rate through an orifice meter given internal diameter of pipe, orifice size, upstream pressure, differential pressure, temperature, pressure base, temperature base and gas specific gravity.

205 Program Steps
Necessary Accessories: Petroleum Fluids Pac, three memory modules and Card Reader.

Documentation — $12.00 Cost of 14 cards — $17.50

02622-41 : Natural Gas Properties From Petroleum Fluids Pac

Program provides natural gas properties using the Petroleum Fluids Pac. Properties provided are z factor, p/z, density, viscosity, formation volume factor, pressure gradient, and isothermic compressibility. Each property is addressable via a local label and properties can be calculated from composition or from specific gravity.

226 Program Steps
Necessary Accessories: Two memory modules and Petroleum Fluids Pac.

Documentation — $12.00 Cost of 3 cards — $3.75

02728-41 : Complete Exponential Decline Curve Analysis

This program is really complete. It will solve for any two of the following variables given the other three: initial production rate (IPR), final production rate (FPR), total production (TP), decline rate (D), or time (T). The program is very friendly and easy to use, since all input is prompted and all output is labeled and highlighted for "solved" values.

218 Program Steps
Necessary Accessories: Card Reader or Wand and printer useful

Documentation — $12.00 Cost of 2 cards — $2.50

03386-41 : Natural Gas Well Testing Programs

This is a group of programs that perform the following calculations for natural gas wells: convert surface to bottom hole pressures using the Cullender and Smith method; calculate permeability and skin factor from multirate flow tests, and convert reading from circular gas measurement charts to pressures and times for Horner plots and performs the calculations to get permeability and skin factor from Horner plot information. Gas properties are computed from gas gravity. Provisions for the nonhydrocarbon components: CO_2, N_2, and H_2S. Units input and output may either be SI or English.

Necessary Accessories: Petroleum Fluids Pac, Extended Functions Module, one Extended Memory Module, printer; tape drive recommended.

Documentation — $25.00 Cost of 14 cards — $17.50

03444-41 : Plug

The plug flow technique is very efficient but it is limited to cementations of small volumes and where the mud in the hole is of low density. The technique calls for Reynold's numbers of 100 or less, no cement slurry retarders or thinners, and for the cement to be in contact with the mud (no spacer). It can be demonstrated in laboratory experiments that a thickened plug or ball of flocculated cement and mud is formed in the annulus which, when aided by bouyancy, pushes the mud from the hole.

96 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 3 cards — $3.75

J752 Petroleum Engineering Drilling

01815-41 : Calculating the Driller's Angles

Translates borehole angle measurement sensor outputs to coordinate frame of the drilling rig. Outputs inclination (drift), azimuth (hole direction), gravity tool face angle (rotation) and magnetic tool face angle.

178 Program Steps
Necessary Accessories: HP 82143A Printer
Documentation — $12.00 Cost of 3 cards — $3.75

02724-41 : Directional Well Survey - Radius of Curvature Method

This program is an amplification of the program of the same name written for the 67/97. This program will perform all of the functions of that program with the addition of Input Prompting and Output Labeling. The program calculates True Vertical Depth, Deviation in the North-South and East-West directions, the Horizontal Distance to TD, the Azimuth to the TD and the Dog-leg Severity for the last segment of the wellbore.

175 Program Steps
Necessary Accessories: Printer helpful
Documentation — $12.00 Cost of 2 cards — $2.50

J754 Petroleum Engineering Facilities

J756 Petroleum Engineering Petrophysics

J758 Petroleum Engineering Reservoir

03528-41 : Cumulative Water Influx

This program uses the Fetkovitch (1971) method to calculate cumulative water influx.

117 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 1 card — $1.25

J800 Solar Engineering

01162-41 : Solar Shading

This program can be used by Architects and Engineers for computing Sun altitude angle, azimuth angle, and shading from exterior devices, such as overhangs and fins. It can be used for designing exterior solar shading and also for calculating the shading effect for making heat load calculations.

273 Program Steps
Necessary Accessories: One Memory Module and Printer
Documentation — $12.00 Cost of 3 cards — $3.75

01238-41 : Heat Loss Calculations

Program computes heat loss of a home or building, including basements. Surface area, 'R' factor, temperature, air infiltration, etc, are alpha labeled inputs/outputs for easy program use. Inputs can be changed and results analyzed and documented, for best (highest) dollars/btu savings. A must for solar enthusiasts, contractors.

395 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 5 cards — $6.25

01503-41 : Solar Heating Savings Analysis

2 programs find building heat loss coefficient, heating load and estimation of the annual heat savings of a building using passive solar heating. Program 1, "Building Loss Coefficient", solves for heat loss, coefficient & heating load for a building and is used to obtain the Load Collector Ratio. Program 2, "Solar Savings Fraction", estimates annual heating savings on a monthly basis. Passive Solar Systems may be Direct Gain, Trombe Wall or Water Wall, all with or without night insulation.

368 Program Steps
Necessary Accessories: Printer, 1 memory module, card reader.
Documentation — $14.00 Cost of 12 cards — $15.00

01524-41 : Sunpath Diagrams

Sunpath calculates solar altitudes and azimuths for each daylit hour of the day, given date and site latitude. A blank chart is furnished for plotting sunpaths for each month. Illustrated procedures are given for using the results. Suntime converts from solar time to local standard time and vice versa.

596 Program Steps
Necessary Accessories: 2 Memory Modules for either Sunpath or Suntime, 3 Modules for both simultaneously.
Documentation — $14.00 Cost of 8 cards — $10.00

01546-41 : Photovoltaic System: Panel Peak Power and Battery Size

This program allows the user to determine a photovoltaic system needed to satisfy the energy requirements of a certain installation. The user is prompted for the monthly mean of daily radiation in MJ/m^2-day for every month of the year and for the monthly load in Wh. The program displays a set of pair of values. The first one is the peak power of the photovoltaic array in W, the second is the battery size in Wh. Each pair of values assures that the battery level will never fall below 30% of its maximum charge during a whole year.

110 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

01692-41 : Sun Shade

Architects, engineers and solar designers will find this program useful. It computes the shading from any type of shading device anywhere in the world. Time can be solar, standard or daylight saving. Sun positions and other solar parameters are computed. Two powerful design tools are introduced. S/L for fast shading calculations with ordinary arithmetic and a sunrise to sunset Shade Line.

624 Program Steps
Necessary Accessories: 3 Memory Modules, HP82143A Printer. Card Reader or Wand recommended.

Documentation — $16.00 Cost of 6 cards — $7.50

02140-41 : Complete Fanning (or Moody) Friction Factor Chart

This program completely duplicates the Fanning (or Moody, using the included modifications) Friction Factor Chart relating Friction Factor, Reynolds Number, and Relative Roughness Ratio. Given any 2 of the 3 factors above, the third factor will automatically be computed and the resulting flow type indicated (i.e., Turbulent, Transition or Laminar).

387 Program Steps
Necessary Accessories: One Memory Module or HP-41CV

Documentation — $12.00 Cost of 4 cards — $5.00

02192-41 : Solar Time To/From Local Time

Given local longitude, standard meridian, day and month this program will perform the conversion between local and solar time. Daylight savings time is considered.

122 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02737-41 : Life Cycle Cost

Given the real cost of borrowing money, the escalation rates of the cost of energy and maintenance, economic life, % depreciation, marginal tax rate, initial investment cost, first year energy and maintenance costs, this program will calculate the Net Present Value of any energy-consuming installation–known as the LIFE CYCLE COST. Effect of changes in any of the main parameters can be quickly evaluated in order to perform a sensitivity analysis. Full prompting of all input and labeling of output values is available. Automatic printing mode when printer in use.

289 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 4 cards — $5.00

03159-41 : Solar Angles, Solar Time, and Clear Day Solar Radiation

Program calculates solar angles, solar time, and clear day solar radiation intensities using techniques presented in ASHRAE Handbook of Fundamentals. Specifically, the program calculates the day of the year, declination, sunrise hour angle, day length, time of sunrise and sunset, equation of time, apparent solar time, solar altitude, solar azimuth, incident angle, normal beam solar radiation, diffuse sky solar radiation, ground reflected solar radiation, and total solar radiation. It automatically prompts for required input data.

751 Program Steps
Necessary Accessories: Quad memory module, Extended Functions memory module, Time module and Card Reader.

Documentation — $25.00 Cost of 17 cards — $21.25

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L602 Symbolic Mathematics — Algebra
L650 Trigonometry/Analytic Geometry

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

L000 MATHEMATICS

00337-41 : Missing Number Division

This program helps the user improve his/her division. Problems are displayed in one of three formats: 1) z/y=?, 2) z/?=x, 3) ?/y=x. You can change the level of difficulty by changing the maximum number (of x, y). This program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities.

166 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00338-41 : Missing Number Subtraction

This program helps the user improve his/her subtraction. Problems are displayed in one of three formats: 1) z-y=?, 2) z-?=x, 3) ?-y=z. You can change the level of difficulty by changing the maximum number (of x, y). this program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities.

166 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00339-41 : Missing Number Multiplication

This program helps the user improve his/her multiplication. Problems are displayed in one of three formats: 1) x*y=?, 2) x*?=z, 3) ?*y=z. You can change the level of difficulty by changing the maximum number (of x, y). this program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities.

166 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00340-41 : Missing Number Addition

This program helps the user improve his/her addition. Problems are displayed in one of three formats: 1) x+y=?, 2) x+?=z, and 3) ?+y=z. You can change the level of difficulty by changing the maximum number (of x,y). This program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities.

166 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00387-41 : Fractions

This program will add, subtract, multiply, and reduce fractions or convert them to mixed numbers. It will also compute the greatest common divisor or the least common multiple or convert any decimal number to a reduced fraction.

126 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00564-41 : Function Scanner

Curious about the maxima, minima and roots of a function? then you are in good company, because this program helps you to scan for the above in a region designated by user. For each class of loci either rough guesses or more accurate values can be obtained.

202 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00565-41 : Special Root Finder 1

Tired of trying to obtain roots of s-shaped and other non-smooth functions, and ending up in a wild goose chase? This program will make it easy on you. You can plot your function and choose two guesses that define your region of interest. The algorithms involved will monitor divergence and make corrective action. Printer enables function plotting.

122 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

00566-41 : Root Finding by Richmond's Method

Looking for a fast root finder? Try the Richmond algorithm, superior to Newton's method. You will save in the number of iterations. With some changes you can use it as a subroutine. First and second derivatives, used in algorithm, are evaluated by divided difference.

70 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00642-41 : Solution to All Roots of an Equation Over an Interval

This program will solve for all roots of an equation over a given interval, the program when connected to a printer can be left unattended and will generate error messages as required, then continue on to the next root. Will also work without a printer by displaying the error messages. Will work with or without a printer.

124 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01020-41 : Prime Factorization

This program will prime factor any integer 2 less than-equal to n less than 1,000,000,000. The program will display up to 9 prime factors of n. A prime test subroutine is also used which can exist by itself as a separate program.

149 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01303-41 : Network of Minimal Length

Given the number of vertices and either the coordinates for each vertice or the distances between them, this program finds the shortest network. The used algorithm will deliver the shortest interconnection without the need of examining all possibilities and in a running time proportional to the square of the number of vertices. Four independent input options are available for the user's convenience. Output is a single array representing the edges of the minimal tree. Two innovations, a digital ruler and a digital protractor, provides owners of the wand with two fast and general input options. A description is given of how to build the tools.

319 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 3 cards — $3.75

01306-41 : Systems of Nonlinear Equations

The program solves a system of n(1-13) simulataneous nonlinear equations in n unknowns by an iterative second order method. It can be used as a subroutine also.

284 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01374-41 : Non-Linear, Multi-Variable Newton-Raphson Technique

The maximum capability of the program is ten non-linear equations. It offers a choice between finite or central difference schemes for the evaluation of the partial derivatives and then uses a Gauss-Jordan row elimination scheme incorporating partial pivoting to solve the resulting system of linear equations.

592 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV. Printer optional. Card Reader convenient.

Documentation — $25.00 Cost of 13 cards — $16.25

01410-41 : Variable Root Finder (VRF)

This program solves for the unknown parameter in any equation with any number of known parameters. However, any of the parameters can be solved for without rewriting the program. The selection of the parameter to be solved for is done while the program is running at the time that the known parameters are entered.

113 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01412-41 : Monitored Solution to F(X)=0 on an Interval

This program is a modification of the "SOLVE" routine in the Math Pac which furnishes indexed displays of the succession of trial values of the variable and of the function as well as the number of iterations. Performs with printer attached and on, attached and off, or unattached.

259 Program Steps
Necessary Accessories: 1 Memory Module.

Documentation — $12.00 Cost of 2 cards — $2.50

01413-41 : Function Tabulator

Calculates and stores a grid of values of any user-defined function capable of being plotted by "PRPLOT" routine, in a form that can be used for subsequent more rapid and repeated plotting. Calculation of maximum and minimum tabulated y values included. Fully prompted.

392 Program Steps
Necessary Accessories: 2 or more Memory Modules for tabulation of up to 35 x values. Printer for plotting.

Documentation — $12.00 Cost of 4 cards — $5.00

01427-41 : Ingredients for a Batch

Given quantities of ingredients that make up a batch: 1) the quantities required for another batch are calculated and stored, 2) the relative percentages of ingredients may be obtained, 3) the input data may be retrieved.

109 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01438-41 : CIN

This program approximately calculates the line-integral of a user-definable complex-valued function f along an also user-definable parameterized curve in the complex plane. This parametrization depends on a real parameter s, assuming values between sL and sR. The curve (contour) may be open or closed and the number of its subdivisions may be specified.

88 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01529-41 : Function Table Printer

This program uses the accumulation function of the printer to print a table of values for a function calculated by another program written by the user. It is very useful to print tables of values not available in mathematical handbooks.

128 Program Steps
Necessary Accessories: 1 Memory Module and Printer. Card Reader useful.

Documentation — $12.00 Cost of 2 cards — $2.50

01744-41 : Printerless Plotting Routine

This program plots a function you program in, on the display of the calculator. The program asks for minimum and maximum values of X, and the number of points to be plotted. X and Y values are listed, minimum and maximum values of Y are displayed, and Y is plotted.

134 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01911-41 : Fractional Arithmetic

This program calculates with fractions. It also allows user to convert a decimal number into a fraction. For example the following calculation can be made: $1/4 + 5/6 \times (0,1875 + 8/7)$ Result: 913/672.

292 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02006-41 : Calculation of Limits

This program computes the limit of a function F(x) when x tends to a real or infinite limit. This program computes that limit with a good compromise between the precision and the time, it sometimes sacrifices the latter to find the limit. With all types of subtleties, this program is able to compute almost all the limits. N.B.1: the limit may be equal to the infinite. N.B.2: this program has been tested for many limits.

379 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $14.00 Cost of 3 cards — $3.75

02286-41 : Tanscendental Equation Solver

A translation of the fortran routine ZEROIN to solve F(X) = 0, combining the certainty of the bisection method and the speed of secant interpolation. This program can be either used interactively or called by other programs.

180 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02321-41 : Quartic, Cubic, and Quadratic Equations

This program calculates and displays all roots, both real and complex, of any quartic, cubic, or quadratic equation. Because it uses equations instead of iteration techniques, the roots are calculated faster and automatically accurate within the limits of the calculator. No initial guesses are necessary.

428 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02324-41 : Foot-Inch Pound-Ounce Arithmetic

This program adds, subtracts, multiplies by a constant, and divides by a constant for numbers in the foot-inch and pound-ounce forms. Division of square feet by linear feet, and multiplication of linear feet are possible. Conversions to and from linear decimal feet, square decimal feet, and decimal pounds, as well as to and from meters are provided.

133 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02325-41 : Babbage Difference Engine

This program simulates the Babbage Difference Engine and finds values for integer x values of an nth degree polynomial given any n+1 points with succesive x-values. This program is capable of handling any polynomial with real coefficients of degree 1 or higher. The polynomial does not have to be programmed, and no program changes ever have to be made.

122 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02346-41 : Newton-Raphson Solution to F(x)=0; Newton's Method

Program looks for individual roots to a global label function using the iterative Newton Raphson Technique. Successive approximations are displayed (or printed). Program is short! Fits on one side of a program card. May also be used as a subprogram by another program. Minimal user interaction. Derivative is calculated by a slope formula.

62 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02350-41 : Cone, Cylinder, and Sphere Computations

This program calculates: lateral and surface area, volume, and slant height of cones; lateral and surface area, volume, and slant height of frustums; lateral and surface area, and volume of cylinders; surface area and volume of spheres; surface area and volume of a zone and segment; surface area of a line; and volume of a sector. All inputs are prompted for, and all outputs are labelled. No storage registers are used.

232 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02460-41 : Fast and Sure Root Finder

This root finder is a powerful combination of the secant and bisection methods. Using their respective advantages, the program assures fast convergence (guaranteed) on an interval of a general function f(x)=0. Helpful to solve all the periodic function and the functions with many zeros.

140 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02475-41 : The Gamma Function and Related Functions

This program and its subroutines provides for calculation of the Gamma Function, the Incomplete Gamma Function, the Beta Function, and the group of related functions known as the Psi Function (Digamma Function) and the Polygamma Functions. Each function may be accessed separately and their modular structure permit easy adaptation as subroutines for other programs.

687 Program Steps
Necessary Accessories: Three memory modules

Documentation — $14.00 Cost of 7 cards — $8.75

02503-41 : Gram-Schmidt Orthogonalization

Given a set of m independent vectors in n-dimensional space this program reduces them to an equivalent set of m orthogonal vectors using the Gram-Schmidt process.

201 Program Steps
Necessary Accessories: Memory modules as according to total reg = (m+1)n+57

Documentation — $8.00 Cost of 2 cards — $2.50

02504-41 : N-Dimensional Vector Operation

This program performs various operations on two vectors, U & V, in n-dimensional space. These operations are: p-norm, scalar multiplication, U-V, U+V, U.V (dot product), and if n=3 UxV (cross product).

192 Program Steps
Necessary Accessories: Memory modules required if n is greater than 3.

Documentation — $12.00 Cost of 2 cards — $2.50

02683-41 : Normal and Log-Normal Distributions

This program can calculate from a normal or log-normal distribution the values of: geometric mean, median, standard deviation and performs a second degree least squares fit to cumulative-percent-less-than versus x curve.

220 Program Steps
Necessary Accessories: One memory module. Card reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02698-41 : Transitive Closure

This program transforms a given matrix M into its transitive completion M+.M is the square Boolean matrix with maximal rank of 175. Some error correction and editing routines are added. Program runs quite long, so some current status informations are shown in the display. The routine for nice printing is included but printer is not necessary for running this program. Warshalls algorithm is used in this program.

473 Program Steps
Necessary Accessories: Two memory modules, X-Functions module and X-memory module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02794-41 : Prime

This program checks whether an odd number is prime or not and generates a series of prime numbers starting from 2, or from any number.

80 Program Steps
Necessary Accessories: None, but a printer would be very useful.

Documentation — $8.00 Cost of 2 cards — $2.50

02843-41 : Solutions For a System of Two Non-Linear Equations

Given a system of two non-linear equations in two unknowns, this program finds the values of the unknowns using the Newton-Raphson's iterative procedure for nonlinear systems. The equations are entered as subroutines and the user must provide an initial guess for the unknowns. The display pauses after each iteration for showing the progress of convergence.

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02966-41 : Inverse Gamma Function

Given gamma(x) in the range of 2 to 9E99, this program calculates the inverse, or x, to four decimal places. If x is an integer, subtract one to get the inverse factorial. Taking only 24 registers of program memory, it requires no data storage registers and allows recovery of the input value.

59 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02969-41 : Complex Quadratic Equation

This program find the real or complex roots of a quadratic equation of the form $Ax^2 + Bx + C = 0$, for real or complex values of A, B, C.

51 Program Steps
Necessary Accessories: Mathematics Pac

Documentation — $8.00 Cost of 1 card — $1.25

03029-41 : Area of n Sided Polygon

This program finds the area of an n-sided figure ($n \geq 3$). n can be up to 147 with an HP-41CV, CX or C with Quad memory module.

79 Program Steps
Necessary Accessories: Extended Functions Module — if unavailable program code may be altered to eliminate its necessity.

Documentation — $8.00 Cost of 1 card — $1.25

03047-41 : Right Triangles and Bevels

A program for the solution for the right-triangles and their corresponding bevels.

211 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 3 cards — $3.75

03058-41 : Overdetermined Systems

Program solves an overdetermined simultaneous system of linear equations with least squares method; every equation can have up to four unknowns and number of equations must be equal or greater than four. If whole memory is available in HP-41C, program can compute up to fifteen equations with two memory modules, up to twenty seven equations with three memory modules and up to thirty seven equations with four memory modules. Connecting a printer, program prints also all useful data.

328 Program Steps
Necessary Accessories: Up to four memory modules, Ext. Func/mem module 82180A; to print data: HP-IL mod. 82160A and printer 82162A.

Documentation — $12.00 Cost of 3 cards — $3.75

03082-41 : Test-Figure-Program

This program calculates the test figure of a number using the Module-11- Algorithm.

60 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03084-41 : Vector Calculator

This program simulates the RPN system of calculations but with 3-D vector operations. The simulated four-register stack has three numbers per stack register. This allows for 3-D vector addition, subtraction, scalar multiplication, unit-vector, angle between vectors, cross product, and dot product. The regular RPN functions $x <> y$, CHS, R↑, RDN, STO, RCL, and LASTX have extended capabilities for 3-D.

288 Program Steps
Necessary Accessories: Extended Function module

Documentation — $12.00 Cost of 3 cards — $3.75

03259-41 : Bernoulli and Euler Numbers and Polynomials

Bernoulli and Euler numbers are generated using recursion formula given X, BN(X) and/or EN(X) calculated. Program description includes useful information for applying BN, EN for series and asymptotic expansions, Euler-Maclaurin expansions, etc.

90 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

03554-41 : Vectors

This program quickly solves dot and cross products, adds and subtracts two vectors, finds the angle between two vectors, and converts vectors to and from polar and rectangular forms. This is a great program for students and useful for dynamics, statics and physics.

229 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 1 card — $1.25

L050 Complex Variables

00695-41 : Complex RPN

Allows complex number manipulation in either polar or rectangular form using standard RPN with a 4-register stack. Functions include ENTER, +, −, ×, ÷, X<>Y, RDN, RUP, LASTX, CLX, CLST, CLRG, 1/X, X^2, and STO and RCL (5 registers). Internal routines control stack lift and drop allowing easy interface to a complex operations program (e^z, SIN Z, etc).

336 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01098-41 : Solution to Simultaneous Equations with Complex Variable

This program solves a system of simultaneous equations with complex variables, using Gaussian reduction. A fully enhanced HP-41C will be able to solve up to 10 equations. Routines for data entry and recall are included, as well as printout routines if a printer is connected to the system.

326 Program Steps
Necessary Accessories: One Memory Module for up to 3 equations.

Documentation — $12.00 Cost of 3 cards — $3.75

01231-41 : N-Complex Simultaneous Linear Equations

A system of n linear simultaneous equations with complex coefficients is solved. The utilization of the "PVT" subroutine in the Math Module enables the program to be under 200 lines. The program prompts for the coefficient matrix and column vector in rectangular or polar form.

298 Program Steps
Necessary Accessories: Math Module and 1 + Int (N(N+1)/16) Memory Modules

Documentation — $8.00 Cost of 2 cards — $2.50

01325-41 : An RPN Language for Complex Variable Problems

An RPN programming language for complex variable calculations. Includes complex analogues of all stack manipulation, storage, recall operations and numeric functions including hyperbolic functions. Works in rectangular or any polar mode. Compiler, test program and operations manual included containing programs and examples for complex Newton-Raphson Method and Simpson's Rule.

Necessary Accessories: Minimum of three Memory Modules. Card Reader and Printer useful.

Documentation — $20.00 Cost of 10 cards — $12.50

01360-41 : Complex RPN for Complex Number Treatment

This 394 steps (767 bytes) program contains 35 complex functions including a 4-level operational stack with all usual stack-manipulations, up to 100 complex storage registers (with 4 memory modules inserted), all four basic arithmetic operations, several mathematical and all exponential, trigonometric and hyperbolic functions with their inverses. With all functions assigned to the appropriate keys in user-mode your HP-41C (complex) lets you handle complex numbers with all the comfort of the RPN-logic as easy as real numbers.

394 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

01539-41 : Complex Root Finder with Deflation

This program finds the roots of an equation, whether real or complex. The program is unique in that one may supply an initial guess and get a root, or one may use the root deflation feature and have the program automatically find a user-specified number of roots.

391 Program Steps
Necessary Accessories: 2 Memory Modules are required
Documentation — $12.00 Cost of 3 cards — $3.75

01898-41 : Simultaneous Equations and Math for Complex Numbers

Solves simultaneous equations involving real or complex numbers. Useful in circuit analysis. Also performs +, −, ×, ÷ of complex numbers using RPN. The length of the stack depends upon the available memory space. Input may be in rectangular or polar form for either program.

363 Program Steps
Necessary Accessories: 1 Memory Module for 3 unknowns, 2 Memory Modules for 6 unknowns, 3 Memory Modules for 8 unknowns.
Documentation — $12.00 Cost of 3 cards — $3.75

02239-41 : Root N and Complex Root of a Complex Number

This program calculates the root N and the complex root of a complex number. The inputs and outputs of the first problem are available in rectangular and trigonometric form. The N roots are computed. Quick execution time.

143 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02323-41 : Numerical Complex Functions

This short (148 bytes) program calculates the following functions for rectangular complex numbers: +, −, ×, ÷, $1/z$, z^w, $z^{1/2}$, z^2, $\log(z)$, 10^z, $\ln(z)$, and $\exp(z)$. Each function may be executed from its normal position on the keyboard. Since each routine is independent and uses no storage registers, it may be called by another program if a global label is added.

123 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02369-41 : Advanced Complex Operations

This program utilizes the complex functions provided in the Math Pac to provide the following functions of the complex variable z: cscz, secz, cotz, sinhz, coshz, tanhz, cschz, sechz, cothz, asinz, acosz, atanz, acscz, asecz, acotz, asinhz, acoshz, atanhz, acschz, asechz, and acothz. The program uses the same format as the Complex Operations program provided with the Math Pac.

255 Program Steps
Necessary Accessories: One memory module and the Math Pac
Documentation — $12.00 Cost of 3 cards — $3.75

02414-41 : n Complex Simultaneous Equations

Program will solve a system of n simultaneous equations with complex coefficients. Will solve for n=2 with one additional memory module, n=4 with two, n=5 with three, and n=7 with four or a Quad memory module. Tips included for using the Math Pac ROM to perform the same task. Also, tips included for using the Extended Functions module to decrease memory requirements.

364 Program Steps
Necessary Accessories: One memory module. Quad for 7 equations.
Documentation — $12.00 Cost of 3 cards — $3.75

02544-41 : Trigonometric Complex Functions

For complex numbers in rectangular form, this program calculates the following trigonometric functions: sin z, asin z, cos z, acos z, tan z, atan z, sinh z, asinh z, cosh z, acosh z, tanh z, atanh z, and their reciprocal functions. Each function is automatically assigned to a keyboard location and uses no storage registers.

230 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02619-41 : 13 Complex Number Operations

This program performs 13 common complex number operations. It requires only one data register, saves the last complex number entered, works in polar or rectangular mode, and has an option for input prompts. The prompts and polar/rectangular mode are flag controlled so that the routines can be called by an outside program.

248 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02914-41 : Complex Polynomial Evaluation

Given any complex or real X value, this program evaluates any polynomial of nth degree with complex or real coefficients. The program runs very fast because it uses the Horner's method of evaluation.

67 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02917-41 : The Complex Quartic Equation

The program may be used as a subroutine for a "MULLER" iteration program when it tends to a complex root and runs very fast because there is a full use of the stack so the required SIZE is minimum.

67 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02920-41 : Complex Matrix

This program solves Complex Number Determinants 2x2 through 4x4 and Complex Simultaneous Linear Equations 2x2 through 8x8.

942 Program Steps
Necessary Accessories: Memory module/Extended Functions Memory Module
Documentation — $14.00 Cost of 7 cards — $8.75

02969-41 : Complex Quadratic Equation

This program find the real or complex roots of a quadratic equation of the form $Ax^2 + Bx + C = 0$, for real or complex values of A, B, C.

51 Program Steps
Necessary Accessories: Mathematics Pac
Documentation — $8.00 Cost of 1 card — $1.25

02997-41 : Complex 41

This program converts your calculator into a complex one allowing you to handle four complex numbers in an automatic complex stack defined by the program and you are not limited to work in one mode (polar or rectangular) the program allows you to work on both simultaneously. The program provides you the following functions: +, −, ×, ÷, $xy/(x+y)$, $1/x$, y^x, x^n, $x^{1/n}$, $\log_n$, n^x, $\ln(x)$, $\exp(x)$, $\sin(x)$, $\cos(x)$, $\tan(x)$, $\sinh(x)$, $\cosh(x)$, $\tanh(x)$ and their inverses, VIEW, STO, RCL, ENTER, RDN, CLX and X<>Y. All these functions are subroutines that work fast and accordingly with the complex stack. You can get out of the program and return without altering the stack and see both parts of the complex number simultaneously in the display.

445 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

03205-41 : Sequential Multiplication of Real/Complex Matrices

Given the matrices A(mxn) and B(nxp), this program calculates the multiplication matrix C(mxp), A x B = C. The values m, n and p are the rows x columns value of the matrices. This program shows the solution as an option and prompts for another matrix and computes the sequential multiplication with the last solution performing in this way the sequential product of any number of matrices. The matrix elements can be real or complex.

293 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

L100 Conversions

00464-41 : Feet Inches and Fractions Conversions and Operations

Dimensions entered in feet, inches and a fraction of an inch are converted to decimal feet. Any operations (+, −, ×, ÷, trig etc,) can then be performed. Answer can be converted back to feet, inches and a fraction (reduced). Contents of the stack are preserved after each conversion.

Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00467-41 : Roman Numerals to Hindu-Arabic Numbers

This program converts Roman Numerals to Hindu-Arabic Numbers. Full use is made of the HP-41c's alpha-numeric capabilities.

93 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00647-41 : Roman & Arabic Numeral Conversions

This program converts conventional numbers to their equivalent in Roman numerals. The year 1981, for example, is represented as MCMIXXXI. It also converts Roman numerals to Arabic.

100 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00721-41 : Metric

Converts metric to english units, or english to metric units, for fifteen different measures. Includes mass, length, area, volume, fluid measure, and temperature.

133 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

00750-41 : Length Conversions

This program is a rewrite for the HP41C of an HP67 program written by D. Kemper. The original was published in 65 Notes, V3 N9 P28. The program converts between 28 units of length measurement in the Anglo-American, metric and astronomical systems of measurement. The rewrite eases 41C operation.

163 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00751-41 : Volume Conversions

This program is a rewrite for the HP 41C of an HP 67 program written by D. Kemper. The original was published in 65 Notes, V3N10P20. The program converts between 28 units of measurement in the English, American and metric systems. The rewrite eases 41C operation.

143 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00752-41 : Mass, Weight and Force Conversions

This program is a rewrite for the HP41C of an HP67 program by D. Kemper, the original was published in 65 Notes, V3 N9 P25. The program converts between 28 units of weight, mass and force in the english, metric, troy and s.i. systems. The rewrite eases operation on the 41C compared to the original.

142 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00809-41 : Metric Conversion

This application will convert any number entered to its metric equivalent. It will also convert almost any unit of measurement into equivalent units of common measurement. This program can be used by anyone dealing with both common American units and metric numbers.

760 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00848-41 : Hexadecimal - Decimal Conversions

This program converts positive integers between the hexadecimal and decimal number systems. Two versions of this program are included. Version 1 requires no accessories. It can convert decimal integers up to 268,435,455 and hexadecimal integers up to FFFFFF. Version 2 requires the Extended Functions/Memory Module. It can convert integers of 10 or less decimal digits. It is also smaller and faster than version 1. Both programs offer considerable improvements over the version given in the HP-41 Applications Manual.

92 Program Steps
Necessary Accessories: Version 2: Extended Functions/Memory Module Version 1: None
Documentation — $8.00 Cost of 2 cards — $2.50

00896-41 : Hex/Dec Conversion

This program allows the user to convert decimal numbers to hexadecimal and hexadecimal numbers to decimal. Full use is made of the HP-41C's alphanumeric capabilities.

196 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00935-41 : Metric/English Conversions

If you have been looking for a metric conversion program, you need look no farther. This program contains 36 popular conversions, and gram. Conversions for volumes, temperature, weights and velocity are provided. This program contains all of the conversions (except from USG to/from MPG) that are featured on the TI metric converter calculator.

108 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01002-41 : Transpose Music

This program solves the large problem of transposing music from one key to another.

106 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01064-41 : Extended Unit Management

This program provides sophisticated error detection and additional functions for the "Unit Management System" contained within the HP-41C Thermal & Transport Science Pac. Features include: detection of inhomogeneous unit entries, detection of unknown or improperly spelled unit names, and a user-defined extension list of units.

458 Program Steps
Necessary Accessories: Reqires HP-41CV or equivalent Memory Modules.

Documentation — $12.00 Cost of 5 cards — $6.25

01087-41 : Base Conversions

This program converts to and from any base b, $2 \leq b \leq 10$.

111 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01336-41 : U.S. British Metric Conversions

Are you not tired of trying to search a conversion through multiple programs? Here is the program. From length, area, volume, speed, weight temperature and pressure you will be able to go from any combination of U.S., British and metric units in any direction: U.S. to British, U.S. to metric, British to metric and all reversed conversions. As a new conversion addition,the miles per gallon calculations we all do may now be converted to liters per 100 kilometers.

617 Program Steps
Necessary Accessories: Three Memory Modules or One Quad Memory Module for the HP-41C

Documentation — $12.00 Cost of 6 cards — $7.50

01478-41 : Decimal to Vulgar Fraction Converter

This program converts decimal numbers including integers to vulgar fractions. For numbers containing integer, two different display forms are available. The stack and registers R01 through R10 will remain unaltered.

100 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01626-41 : Dimension Addition

This program accepts any quantity of different dimensions in the format of feet, inches, and fractions of an inch for fractions through 32nds, adds them together and displays the total sum of all dimensions in the same format of feet, inches, and fractions of an inch.

198 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01650-41 : Speed Conversions

This program provides for fast, easy conversions of the following speed units: miles/hour, knots, feet/min., feet/sec., meters/sec., kilometers/hour. Any one is converted to any other with a single keystroke. Outputs are labeled.

105 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01845-41 : Decimals to Fractional Inches

Converts the decimal of feet or inches to inches and/or fraction of an inch. 0.662 feet converted to 7 and 15/32 inch or 0.464 inch to 15/32 of an inch. Also solves for the error between the input and the answer (output).

87 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01871-41 : 108 Weights & Measures

Converts interchangeably between 108 weights and measures: 25 measures of length; 15 of mass (weight); 24 of capacity or volume; 16 of surface measure; 6 of energy; 5 of force; 7 of power, and 10 of pressure. Units include American, British, metric, Systeme International (S.I.), and American and Continental advertising and printers' measures. Rejects nonsense conversions.

613 Program Steps
Necessary Accessories: Quad Module. Card Reader or Wand highly recommended.

Documentation — $14.00 Cost of 11 cards — $13.75

01929-41 : Five Way Temperature Conversions

Converts iterchangeably between the five temperature measuring systems: Celsius, Fahrenheit, Kelvin, Rankine and Reaumur. Rejects nonsense temperatures (less than 0 Kelvins). Uses a linear regression formula for speed with accuracy.

82 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01986-41 : Temperature Conversions

This program calculates the following temperature conversions: 1) Celsius to Fahrenheit; 2) Celsius to Kelvin; 3) Celsius to Rankine; 4) Fahrenheit to Kelvin; 5) Fahrenheit to Rankine; 6) Kelvin to Rankine. It contains full alpha prompting for input and output. Each conversion is independent of the others.

141 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02010-41 : Base Conversions

This program performs base conversions of a positive integer from one base N_1 to another base N_2 ($2 \leq N_1, N_2 \leq 16$), base 10 to base N and base N to base 10 ($2 \leq N \leq 16$).

229 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02129-41 : Old English Currency and Troy-Weight Conversions

For devotees of British economic history, this program converts between pounds-shilling-pence (in alpha) and each one of these (in X), and between ounces-pennyweights-grains (in alpha) and each one of these (in X), the pence and grain parts being displayed as integers followed by proper fractions.

201 Program Steps
Necessary Accessories: One Memory Module, Extended Function Module

Documentation — $12.00 Cost of 2 cards — $2.50

02193-41 : Atmospheric Conditions

This program solves for temperature in Fahrenheit and Celsius, pressure in PSI and inches of mercury, density, speed of sound, density altitude and sigma using altitude and temperature conditions as input. This program accepts standard day, ISA + nn, and fixed temperature inputs.

130 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02324-41 : Foot-Inch Pound-Ounce Arithmetic

This program adds, subtracts, multiplies by a constant, and divides by a constant for numbers in the foot-inch and pound-ounce forms. Division of square feet by linear feet, and multiplication of linear feet are possible. Conversions to and from linear decimal feet, square decimal feet, and decimal pounds, as well as to and from meters are provided.

133 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02457-41 : US Standard Comparative Gauges

This program provides a handy reference for architects, engineers or steel fabrictors. It furnishes the gauge number for hot and cold rolled steel sheets. Input may be a decimal or a fraction. The program also furnishes a decimal or fractional equivalent for any known gauge. Gauges are from 00 to 30.

77 Program Steps
Necessary Accessories: One memory module. Card Reader optional.

Documentation — $8.00 Cost of 3 cards — $3.75

02490-41 : Conversions: Metric/English Plus Temperature and More

This program will convert Metric Units to their equivalent English units and vice versa. In addition to the 98 Metric/English conversions and 84 metric/metric conversions plus 3 temperature conversions for a grand total of 201 dual conversions plus 3. All of this without the loss of any keyboard functions or user functions and the use of only 3 storage registers. Big things come in small programs.

188 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02499-41 : Ultimate Base Conversions

This program converts numbers from an arbitrary base to another with three major features: 1) converts signed integers 2) of up to 24 digits (using alpha) 3) conversion bases nge from 2 to 36 (to 73 with printer). Uses letters A-Z (for bases < 37) as "digits". Ready to be used as a promptless subroutine or as a prompting program. Needs no data registers (but the stack plus alpha) nor extended memory. Uses no synthetic programming.

162 Program Steps
Necessary Accessories: Extended Functions module

Documentation — $12.00 Cost of 3 cards — $3.75

02583-41 : Base Conversions To and From Base 10 to 2 Through 37

This program converts base 10 numerals into any specified base ranging from 2 to 37. It also takes any specified base between 2 and 37 inclusive and will convert it into base 10.

79 Program Steps
Necessary Accessories: Extended Function Module

Documentation — $8.00 Cost of 1 card — $1.25

02732-41 : Conv of Number Including Fraction of Any Base to Decimal

This program will convert any number with fraction part in any base C to its equivalent value in base 10 (decimal number). The base value C must be an integer in the range $2 \leq C \leq 9$.

104 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02952-41 : Ft, In, 1/16ths Right Triangle and Arithmetic

This program allows entry of dimensions in feet, inches, and sixteenths of an inch (FIS), and addition, subtraction, multiplication, and division using RPN logic. Also, right triangles are solved in FIS given any two sides, or an angle and a side. Format for FIS is aa.bbcc, where aa equals feet, bb equals inches (to 99), and cc equals sixteenths of an inch (to 99).

208 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03085-41 : Metric Unit Conversions

This program converts metric (S.I.) units to their more common British or American counterpart and visa versa. The conversions considered in the program are: centimetres-inches; meters-feet; kilometres-miles; kilograms- pounds; lites-U.S. gallons; degrees centigrade-degrees fahrenheit and kilojoules-B.T.U.'s. The program was also structured in such a way that it is very easy to add other desired conversion routines.

86 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03208-41 : Exponential Conversion

Similar in nature to the SCI and ENG format, this program allows complete control of the display format. Any number can be converted to any desired exponent with corresponding mantissa. Great for conversion from one metric unit to another (as this cannot be done with the ENG function). Efficient formatting, excellent readability makes this program simple to use and extremely useful.

110 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03329-41 : Base Conversions Extended

This program converts any positive integer in any base (2 to 16) to any other integer in bases 2 to 16. Numbers up to 24 digits in base 2. Maximum range in base 16: 2540BE3FF or 9999999999 in base 10. This is a short, accurate and fast routine.

158 Program Steps
Necessary Accessories: Extended Functions Module

Documentation — $12.00 Cost of 2 cards — $2.50

L150 Differential Equations

00391-41 : Differential Equation Systems

Solves systems of differential equations by memory fourth order Runge Kutta method. Requires at least one Memory Module. The maximum size of the system depends on the equations, but with simple equations and four modules would be about 40.

281 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00422-41 : Runge-Kutta Integrator for One to Six First Order Equations

A general purpose integrator for solving a system of first order differential equations with initial boundary values. Code automatically sizes program, input prompting, and output for one to six simultaneous differential equations. The integrator uses a 4th order Runge-Kutta formula.

191 Program Steps
Necessary Accessories: One Memory Module and Printer.

Documentation — $12.00 Cost of 2 cards — $2.50

00444-41 : Solving Ode by Runge-Kutta-Gill Method

Tired of growing errors during the solution of a first order ode? Maybe the Runge-Kutta-Gill method will help you to march with more confidence! Selective periodic printing is also available, to obtain a list of fewer, less confusing, results.

133 Program Steps
Necessary Accessories: Card Reader

Documentation — $8.00 Cost of 1 card — $1.25

00500-41 : Solution to System of 2 Ode's Using Rk4

The program provides iterative solutions to a set of two first order differential equations given initial conditions. Program uses Runge-Kutta fourth-order formula.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00554-41 : N Simultaneous Ode's

Involved in a simulation? Make this program your loyal companion. It can handle up to 10 simultaneous ordinary differential equations. The latter must be keyed-in by the user.

140 Program Steps
Necessary Accessories: Card Reader, Printer and One Memory Module.

Documentation — $12.00 Cost of 2 cards — $2.50

00843-41 : Derivative

This program determines the first and second derivative of a given function.

59 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01240-41 : An Efficient Ode Solver

An implementation of a new, highly efficient algorithm based on a "partially-corrected euler" advance, which is second order accurate in the step size using only one function evaluation per step. The step size is doubled and the answer extrapolated to yield third order accuracy and a global error estimate.

117 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01522-41 : Adams-Moulton Method

This program integrates a differential equation by the Adams-Moulton predictor-corrector method. The Adams Moulton method is faster than the popular Runge-Kutta, and just as accurate. The Quartic Runge-Kutta is used to prime the Adams-Moulton.

137 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02138-41 : 4th Order Runge-Kutta Method to Solve First Order Differential Equations

Given a first order differential equation $y' = f'(x, y)$ and a data pair (x_0, y_0), other points (x_n, y_n) $(n = 1, 2, 3, \ldots)$ are calculated by the use of the 4th order Runge-Kutta method.

103 Program Steps
Necessary Accessories: Printer is useful.

Documentation — $8.00 Cost of 1 card — $1.25

02197-41 : Simultaneous 1st Order Difeq

Program solves one to nine simultaneous first order differential equations by 4th order Runge-Kutta method. User can choose interval of change of X as well as the number of steps to that X.

291 Program Steps
Necessary Accessories: Program requires at least two memory modules. Printer is optional.

Documentation — $12.00 Cost of 5 cards — $6.25

02316-41 : Differential Equations 1 Order: Euler, R-k 2, Taylor 2nd Ord

This program solves differential equations of the first order using the three fast methods: Euler, Runge-Kutta of the second order and Taylor of the second order. With the same entries you can switch from one method to the other.

108 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02771-41 : Differentiation

Program differentiates polynomials that are in a factored form. The function can have up to three factor groups with up to three terms in each group. The input consists of the number of factor groups, power and number of terms in each group, and the coefficient and power for each term. Program saves the trouble of multiplying out lengthy differentiated polynomials and also calculates the value of the function and its derivative at any point.

554 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

03024-41 : Romberg Method of Differentiation

This program gives an approximation of the derivative, at a certain point, of any function. $dy/dx = f'(x)$ is calculated at x_0 using the Romberg method.

113 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03210-41 : Numerical Solutions to Initial and Boundary Value Problems

Up to fourth order Initial Value Problem is solved as a system using Standard Runge-Kutta starter, Adams-Bashforth predictor, and Adams-Moulton corrector. Two types of Boundary Value Problems are solved using shooting method. Type one, initial value is known and initial slope is unknown. Type two, initial value is unknown and initial slope is known. User must write subroutine for derivatives.

735 Program Steps
Necessary Accessories: Quad memory/CV/CX, patience and fresh batteries!

Documentation — $14.00 Cost of 8 cards — $10.00

03406-41 : Derivative Calculations

This program calculates the relative maximum and minimum points and inflection points as well as roots on a specified closed interval. The program can be left running and will display any points located as they are found. When the program stops, one can review all the located information.

300 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

L152 Differential Equations Finite Differential

L154 Differential Equations Finite Element

L200 Extended Precision

00475-41 : Proof Entered Sums

This program proofs entry of dollars or numbers (positive or negative) to be summed. A portion of the program can be used as a subroutine for general input proofing by double entry.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00850-41 : Extended Range Arithmetic

For those problems that typically give "out of range" on the 41C now can crunch away. The following functions are operable: $1/x$, y^x, SQRT, x^2, log, ln, 10^x, e^x, +, −, ×, ÷, X<>Y, CLX, RDN, CLST, LASTX, ENTER. The functions may be assigned to appropriate keys, so that the 41C will function almost as it normally does.

248 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

00901-41 : Ridiculously Compleat Factorial

Let the HP41C compute the "complete" expression for factorial of numbers, e.g. 99!; 100! (158 digits).

92 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01068-41 : Powers of Two

This program will calculate 2^n exactly for n a positive integer. The maximum value of n allowed is 9829, if you have four memory modules or equivalent. Without any memory modules, 1325 is the maximum.

77 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02103-41 : 20-Digit RPN

This program establishes a double-precision, extended-range RPN stack for floating point arithematics. Each number is represented by a 20-digit mantissa plus a 10-digit exponent. Operations include +, −, ×, ÷, ENTER, STO, RCL, X<>Y, RDN, LASTX and VIEW.

500 Program Steps
Necessary Accessories: Two Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 4 cards — $5.00

02312-41 : Long Division

This program can divide two numbers and gives the answer accurate to 9.9999999 to the power of 99 decimal places. The program can also be used to find the reciprocal of a number to the similiar accuracy.

53 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02604-41 : Extended Precision Multiplication

This program is designed to help you multiplying big numbers. The word "big" is, of course, relative — you can multiply number A with m digits and number B with n digits providing $m < 90$ and $n < 270$ which is probably more than you'll even need. If needed, you can modify the program to handle even bigger numbers if additional memory modules are provided. Input and output are very nicely designed. Printer is nice to print results but not a must.

138 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $8.00 Cost of 2 cards — $2.50

L250 Integration

00351-41 : Area Under Curve

If you are tired of not being able to use Simpson's Rule for numerical integration, because your data does not lie on equal interval, then this program is just for you! It uses Lagrangian Interpolation to yield an easily integrated equation. With simple changes, you can also use it as a subroutine or merge it with another program.

99 Program Steps
Necessary Accessories: Card Reader

Documentation — $8.00 Cost of 1 card — $1.25

00360-41 : 96 Point Gauss-Legendre Integration

This program will compute approximations for integrals over finite or infinite intervals by the 96 point Gauss-Lengendre Quadrature method. (The programs are able to be called as subroutines as well) the function must be explicitly known. (typical accuracy: 8–9 figures.)

132 Program Steps
Necessary Accessories: Card Reader and two Memory Modules.

Documentation — $12.00 Cost of 5 cards — $6.25

00443-41 : Integration by Simpson's Rule/Plot of Function

This program will perform integration by Simpson's rule for any explicitly known function or set of discrete points. The program allows for easy changes in: integration limits, number of iterations and collects all of the data required to produce a one "keystroke" plot of the function.

131 Program Steps
Necessary Accessories: Printer for plotting.

Documentation — $12.00 Cost of 2 cards — $2.50

00445-41 : Double Riemann Sum

The program computes double riemann sums over bounded domains; developed for classroom instructional use. A boundary consists of the zeros of some user-specified functions, which may be given in polar form. Tones are employed so that one can "hear" the shape of the domain.

127 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00507-41 : Modified Trapezoidal Integration

This program evaluates integrals of analytic functions using a sequence of changes of variable of integration, followed by trapezoidal integration. A desired accuracy can be achieved with significantly fewer integrand evaluations than with other integration techniques. Thus, the program is particularly useful for integrands whose evaluation is time-comsuming.

57 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00610-41 : Double Integration by Gaussian Quadrature

Approximations to double integrals are found using Gaussian quadrature methods. The limits of the inner integral may be constants or functions. The number of grid points, N, is chosen by the user. The required number of memory modules is INT ((39+2N)/64).

122 Program Steps
Necessary Accessories: Memory Modules. Card Reader useful.

Documentation — $8.00 Cost of 1 card — $1.25

00611-41 : Integration: Gaussian, Laguerre, and Hermite

Approximations to integrals over finite or infinite intervals are found using Gaussian quadrature methods. Integrals of the Laguerre and Hermite types are also approximated using appropriate weighting factors. The number of grid points, n, is arbitrary. The required number of memory modules is INT((45+2n)/64).

161 Program Steps
Necessary Accessories: Memory Modules. Card Reader useful.

Documentation — $8.00 Cost of 2 cards — $2.50

00756-41 : Numerical Quadrature of Unequally Spaced Ordinates W/SMO

Program averages the integrals, between a pair of adjacent ordinates, found by Simpson's rule modified for non-uniform spacing, of the quadratic curves through the pair and alternately the preceding and succeeding point, and sums the average.

87 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01065-41 : Romberg Integration

This program uses the full Romberg method to numerically approximate the integral of any user-supplied function. The display setting can be used to determine the accuracy (and the running time). An entry point is provided for use as a subroutine.

95 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01237-41 : Integration to Infinite

Program "ITI" performs integration from zero to infinite, of integrands finite at zero and convergent stronger than x^{-2} at infinite. Also shown is use of program "ITI" for less convergent integrands and for integration, to plus infinite, from nonzero and from minus infinite.

62 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01291-41 : Min

"Min" minimizes a function f(xi) where xi is a vector of 2 or 3 variables. The returned values are f at a local minimum and the values xi at that minimum. Min is particularly useful in fitting data to non-linear equations in a least squares sense.

479 Program Steps
Necessary Accessories: HP-41CV or Quad Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01305-41 : Double Lobatto Quadrature

This program calculates double or single integrals using the 5-point Lobatto Quadrature Formula on subintervals of the integration variable(s). The user specifies the integrands and inner integral limits, using arbitrary nonsingular functions, and the maximum subinterval length(s). The outer integrand may be any function of the inner integral.

156 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01733-41 : Numerical Integration

This program performs numerical integration using either Simpson's rule or the trapazoidal rule. The integrand may be an explicit function or may be specified at a discrete set of equally spaced points. For the discrete case, the user will be prompted for the function values. The program can be called as a subroutine, is compact, and uses only 7 data registers.

94 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01960-41 : Adaptive Quadrature

Given a function f(x), this program will integrate it using an adaptive Simpson's method to concentrate on the rough regions. Up to 24 levels of recursion synthetically provided. The user provides an error tolerance.

314 Program Steps
Necessary Accessories: Extended Functions/Memory Module, at least One Memory Module. A Card Reader or Wand is needed to load the program.

Documentation — $12.00 Cost of 3 cards — $3.75

02349-41 : Numerical Integration - Polar and Rectangular

This program finds the area between two curves or under one curve in a finite interval given either points at equally-spaced intervals or the equations in polar or rectangular form. For rectangular equations, the user has a choice of: Trapezoidal Rule, Simpson's Rule, Durand's Rule, or Weddle's Rule. For polar equations, there is one method, using sectors of circles.

199 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02648-41 : Direct Integration of Polynomials

The program calculates the value of the integral of any polynomial up to degree 10. The method of integration is the direct antiderivative of the polynomial. The program prompts for the boundaries of integration and the maximum degree of the function, then any number of coefficients can be entered arbitrarily. The values of boundaries and the degree can be modified without having to reenter the coefficients or reintegration.

189 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02998-41 : Gauss Quadrature

This program will compute approximations for integrals over finite or infinite intervals by the sixpoint Gauss-Legendre quadrature method.

110 Program Steps
Necessary Accessories: Math Pac (by a slight modification - included - you can avoid having the Math Pac as a necessary accessory).

Documentation — $12.00 Cost of 2 cards — $2.50

03032-41 : Fourth-Order Newton-Cotes Integration

The N-th order Newton-Cotes formula uses an N-th order polynomial to approximate a function. The Trapezoidal rule and Simpson's rule are the first- and second-order Newton-Cotes formulas, respectively. This program uses the fourth-order Newton-Cotes rule, also known as Boole's rule, to numerically integrate functions which are either known explicitly or at a discrete number of evenly spaced points. This formula provides better convergence than either the Trapezoidal rule or Simpson's rule.

79 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03101-41 : Single, Double and Triple Simpson / Trapezoidal Integration

Single, double and triple integrals of an explicitly known function may be numerically approximated by this program, using either Simpson's rule or the trapezoidal rule. Inputs are: an integrand function; domain bounds (constants, or functions themselves); numbers of sample points, which control accuracy. Program design and functions similar to Math Pac INTG routine. Running time optimized.

245 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

03448-41 : Maths

This program is a powerful tool for evaluating integrals, and finding roots of equations (zeros of functions). The integrals, both continuous and discrete, are found using Simpson's method. The Solve routine uses a combination of the Regula Falsi method and a Sign Search method to obtain its results. Both routines are fairly general, so most of the normally encountered functions should be fully covered.

460 Program Steps
Necessary Accessories: Two memory modules.

Documentation — $14.00 Cost of 4 cards — $5.00

L300 Interpolation

00367-41 : Table Look-up Using Lagranian Interpolating Polynomial

This program is designed for use as a subroutine to interpolate in tables of x-y pairs. The degree of the interpolating polynomial (n) can vary from zero to one less than the number of x-y pairs. This allows use in tables of a step function, such as inflation factor versus year, or tables of a continuous function, such as drag coefficient versus mach number. More than one table can be addressed by the routine, and a different value of "n" can be used for each table look up.

115 Program Steps
Necessary Accessories: Additional Memory Modules are required to store more than 18 X-Y pairs.

Documentation — $12.00 Cost of 1 card — $1.25

00590-41 : Birkhoff Interpolation Using Function and Derivatives

Finds and stores the generalized divided differences of a set of arbitrarily spaced ordinates and any derivatives known at any of them, so that the corresponding interpolation polynomial may be evaluated for any x. The degree of the polynomial can be increased by adding more points or derivatives, while retaining earlier results, and the resulting convergence of successive interpolates watched.

99 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00631-41 : Shovelton & Karup-King Interpolation Formulae

Interpolates by either Shovelton's osculatory six-point formula or Karup-King's osculatory four-point formula. The values are printed and are stored for computation, printing and review of the first through fourth difference.

572 Program Steps
Necessary Accessories: Printer, three Memory Modules.

Documentation — $12.00 Cost of 5 cards — $6.25

00679-41 : Interpolation and Numerical Integration by Akima's Local

Applies Akima's process to finding a set of local interpolating polynomials that best fit the curve that would be drawn through a set of arbitrarily spaced points by eye, and also integrates the result. Introduces no false extremes or inflections.

162 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00879-41 : Cubic Spline

This program calculates at first the four coefficients of the cubic polynomial passing through any four non-collinear assigned points; then prompts for an input x-value and determines the related interpolated y-value allowing the user to calculate as many interpolated values as required. The four coefficient of the cubic spline are left, at the end of the program execution, in four memory registers, in order to be used, eventually, by a subsequent routine to calculate first and second derivative and the radius of curvature at any given point.

136 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01317-41 : XYZ Tabular Data Entry and Linear Interpolation System

Eliminate the drudgery of organizing, storing, and linearly interpolating (x,y,z) table data! This program does it all with full prompting by your variable names and simulated subscripts. Branches provide data viewing and editing as well as reading and writing of data cards. Bonus - mini version included for even bigger tables.

319 Program Steps
Necessary Accessories: One Memory Module

Documentation — $14.00 Cost of 5 cards — $6.25

01365-41 : Spline Interpolation for Discrete Data

The spline function $s(x)$ is a piecewise polynomial function of degree ≤ 3. $s(x)$ and its derivatives of order 1 and 2 are continuous everywhere ("smoothness"). Calculation of $s(x)$ with $n \leq 34$ data points. The function and the data points are plotted automatically using different symbols for (x_k, y_k) and interpolated points. A curve discussion is made (maxima, minima and turning points are found) and the integral of the spline at any boundaries within the total interval is given.

995 Program Steps
Necessary Accessories: Minimal number of program registers needed for execution: 125 (Main program + largest subroutine).

Documentation — $14.00 Cost of 10 cards — $12.50

01408-41 : 1D and 2D Table Lookup

Table lookup with linear interpolation on 1d and 2d tables. May be used alone or as subroutine. Multiple tables allowed in memory. Easy to use as it mimics standard HP-41 functions: stack preserved with x replaced by f(x) or f(x,y). (229 lines) table storage routine also provided (264 lines).

493 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 5 cards — $6.25

01433-41 : Table Look-Up Using the Lagrange Interpolating Polynomial

This program is designed as a stand-alone program which may be used as a subroutine to interpolate tables of x-y pairs. The polynomial degree may be set from zero to one less than the number of x-y pairs. Included is a routine which prompts for table entry, loads the table pointer register and returns with the next available register.

137 Program Steps
Necessary Accessories: Additional memory modules depending on table length.

Documentation — $8.00 Cost of 1 card — $1.25

01435-41 : Spline - Interpolation - Package

Some programs concerning spline-interpolation or spline-curves: a. Enter data-points (1-,2- or 3-dimensional), b. Compute natural spline- polynomials, c. Draw the curve point by point, d. Intersect a spline- curve with another geometric object (plane, sphere or user-defined), e. Single, fixed integral (exact, no approximation), f. 2-dimensional integral: area enclosed by the curve (exact too).

1435 Program Steps
Necessary Accessories: None
Documentation — $20.00 Cost of 14 cards — $17.50

01442-41 : Interpolation and Extrapolation

This program linearly interpolates between an array of x,y ordinates and linearly extrapolates in the region beyond the range of data ordinates.

98 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01454-41 : Osculating Inverse Interpolation

Finds and stores the constants of Salzer's decomposition of the Hermite interpolation formula for the inverse of a function known, together with its derivative, at certain arbitrarily spaced points, so that the argument can be found for any other point in the range.

127 Program Steps
Necessary Accessories: One Memory Module
Documentation — $8.00 Cost of 2 cards — $2.50

01530-41 : Cubic Spline Interpolation

Given up to 33 randomly spaced data points this program generates the Cubic Spline which passes through all of them. When the Spline is evaluated both value and slope at the desired point can be obtained. This could be the last interpolation program you ever need.

504 Program Steps
Necessary Accessories: 2 - 4 Memory Modules.
Documentation — $14.00 Cost of 5 cards — $6.25

01587-41 : Inverse Interpolation by Salzer's Method

Two programs. The first finds and stores the coefficients of Salzer's Inverse Interpolation formula given three to six function values known as uniform spacings of the independent variable. The second finds and stores the coefficients of Salzer's decomposition of the Lagrange Interpolation polynomial for the inverse functions. After the coefficients are stored both programs can evaluate the formula for any chosen value of y to give the corresponding value of x.

375 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01669-41 : Aitken's Method of Interpolation

Aitken's Method of Interpolation is a popular alternative to the difference formulas of other methods. It is unnecessary to choose the degree of the approximating polynomial in advance and the method works for unequally-spaced arguments. The basic HP-41C will handle up to ten data pair.

104 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02079-41 : Bridge Deck Elevations I

Program computes bridge finished deck elevations at equal increments up to 15 longitudinal lines. Program will handle two segments of vertical alignment (tangents or vertical curves). Bents may have different skew angles. Crowned sections are permitted. Curves, non-parallel longitudinal lines, and superelevation transitions are not permitted.

626 Program Steps
Necessary Accessories: Quad Memory Module, Printer
Documentation — $14.00 Cost of 6 cards — $7.50

02255-41 : Polynomial Interpolation I - Progressive Method

Given n points, computes a (n-1) order polynomial. You can enter some points in any order, evaluate, add more points, and so on. Fast algorithm, rejects redundant points. One memory module can hold 23 points. Evaluation subroutine can be called from other programs (R00 to R11 not used in evaluation).

231 Program Steps
Necessary Accessories: One or more memory modules. Card Reader and Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

02332-41 : Polynomial Interpolation II - Explicit Form & Derivative

Given n points, computes a (n-1) order polynomial, and its first derivative. Uses "PVT" program from MATH 1 module to solve the equations system. With one memory module can hold 6 points. The evaluation subroutine can be called from other programs (R00 to R11 not used in evaluation).

222 Program Steps
Necessary Accessories: One or more memory modules; Math 1 Module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

02362-41 : 1, 2, 3 Dimensions - Inter/Integ (Quadratic)

Elements with quadratic sides for interpolation or numerical integration. Included: L3 T6 Q8 C10 and H20. Useful to describe geometrical domain with curved boundary or to use a better approximation than a linear one. "1, 2, 3 Dimensions - Integration (Basic)" required for integration. "1, 2, 3 Dimensions - Interpolation (Basic)" absolutely required.

760 Program Steps
Necessary Accessories: Up to three memory modules
Documentation — $16.00 Cost of 7 cards — $8.75

02363-41 : 1, 2, 3 Dimensions - Integration (Basic)

Using finite element techniques, numerical integration on 1, 2 or 3 dimensions domain of a function of 1, 2 or 3 independent variables can be performed. Program: 1, 2, 3 Dimensions - Interpolation (Basic) is required.

930 Program Steps
Necessary Accessories: Two memory modules
Documentation — $20.00 Cost of 5 cards — $6.25

02364-41 : 1, 2, 3 Dimensions - Interpolation (Basic)

Using finite elements technique, allow interpolation of function (of 1, 2 or 3 parameters) known at only some points. Can be immediately used as main program or as subroutine ... and, in this last case, without any prompt for input - but using 1 level of subroutine. (Elements: Line, Triangle, Quadrilatere, Tetraedre)

725 Program Steps
Necessary Accessories: Two memory modules - three for complex cases
Documentation — $20.00 Cost of 6 cards — $7.50

02780-41 : Lagrange Polynomial Equation Fitting

Using the Lagrange interpolation method, this program will fit N pairs of (X,Y) data points into a N-1 polynomial. Program works for N between 1 and 64 inclusive.

203 Program Steps
Necessary Accessories: 1 Memory module N less than or equal to 16, 2 memory modules N less than or equal to 32, 3 memory modules N less than or equal to 48, QUAD module for N less than or equal to 64.

Documentation — $12.00 Cost of 2 cards — $2.50

03012-41 : Least Squares Polynomial Regression

Up to 14 points may be interpolated by this program, using the least squares method. Given N, the program asks sequentially for N 2-dimensional points, computes and stores elements for N+1 simultaneous equations, and then outputs coefficients of the N degree regression polynomial. Via an entry point, may be called as a subroutine by another program. Projections of X computed, either by keyboard or by program. Compact (uses PVT routine in Math Pac I), printer compatible, requires $N^2 + 2N + 15$ registers.

173 Program Steps
Necessary Accessories: Math Pac, Memory Modules as needed

Documentation — $12.00 Cost of 2 cards — $2.50

L302 Interpolation Approximation

02255-41 : Polynomial Interpolation I - Progressive Method

Given n points, computes a (n-1) order polynomial. You can enter some points in any order, evaluate, add more points, and so on. Fast algorithm, rejects redundant points. One memory module can hold 23 points. Evaluation subroutine can be called from other programs (R00 to R11 not used in evaluation).

231 Program Steps
Necessary Accessories: One or more memory modules. Card Reader and Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02332-41 : Polynomial Interpolation II - Explicit Form & Derivative

Given n points, computes a (n-1) order polynomial, and its first derivative. Uses "PVT" program from MATH 1 module to solve the equations system. With one memory module can hold 6 points. The evaluation subroutine can be called from other programs (R00 to R11 not used in evaluation).

222 Program Steps
Necessary Accessories: One or more memory modules; Math 1 Module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02596-41 : Brent's Minimum Finder Algorithm

This algorithm finds the minimum of a function within an interval. The user must supply the function to be evaluated and the interval to be scanned. The method uses a combination of Golden-Section Search and Successive Parabolic Interpolation. The algorithm solves one-dimensional optimisation problems.

300 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

03253-41 : Horn

This program uses the Taylor formula for giving a complete Horner scheme. Formula:

$$F(x) = F(A) + F'(A)(x - A) + \frac{F''(A)(x - A)^2}{2!} + \cdots$$

$$+ \frac{F^{n-1}(A)(x - A)^{n-1}}{(n-1)!}$$

A =number of your choice.

85 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03254-41 : Horner Scheme Polynomial

In the neighborhood of a certain point each function can be written as a polynomial. This program gives the whole Horner Scheme and the coefficients of Taylor. The program, Horn, can be used when you want a Taylor development of a polynomial.

107 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

L350 Linear Systems/Matrices

00335-41 : System of 16 Equations in 16 Unknowns

This program solves a system of 16 equations in 16 unknowns with the method of Gaussian elimination.

Necessary Accessories: Four Memory Modules (for the HP-41C) and Card Reader.

Documentation — $12.00 Cost of 2 cards — $2.50

00342-41 : Symmetrical Linear Equations

Subroutine Symlin. A subroutine to solve linear systems with a symmetric matrix by Gaussian elimination. Symmetry allows compact storage, and minimizes the number of operations. Systems of size 2 × 2 to 5 × 5 (no Memory Modules) or 22 × 22 (four Memory Modules) can be solved. The subroutine is useful for problems arising from regression analysis. No Memory Modules required for example.

166 Program Steps
Necessary Accessories: Memory Modules according to the size of system.

Documentation — $8.00 Cost of 2 cards — $2.50

00343-41 : Linear Systems (Subroutine LIN)

Subroutine LIN Solves systems of linear equations by Gaussian elimination without pivoting. Systems of size $2x2$ to $4x4$ (no Memory Modules) or $15x15$ (four Memory Modules) may be solved. No Memory Modules required for example.

174 Program Steps
Necessary Accessories: Memory Module according to size of system.

Documentation — $12.00 Cost of 2 cards — $2.50

00407-41 : Characteristic Polynomial of a Square Matrix

This program determines the characteristic polynomial of a 14x14 matrix. Danilevsky's method is used for transforming the matrix to the Frobenius Canonical form, yielding the coefficients of the polynomial. These coefficients are then displayed.

348 Program Steps
Necessary Accessories: One Memory Module for up to a 5x5 matrix and four Memory Modules for a 14x14 matrix.

Documentation — $12.00 Cost of 3 cards — $3.75

00598-41 : Determinant of a N by N Matrix

This program given U^2+5 registers of data memory will solve any N by N matrix. The way the program is designed if you had $\infty^2 + 5$ registers you would be able to solve an infinity by infinity matrix. The program prompts for all data input.

146 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00599-41 : Cramer's Rule

Cramer's rule is a short cut in solving 3 equations with 3 unknowns. This is done very quickly on the 41c due to its "key assignment" power. The matrix of coefficients in the equations are punched in an "assigned keyboard matrix".

149 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00608-41 : N Simultaneous Equations in N Unknowns

This program will solve up to 13 equations in 13 unknowns with 3 additional memory modules. This program was designed to access coefficients as a one dimensional array allowing more efficient execution. Resides on three program cards.

259 Program Steps
Necessary Accessories: Card Reader. Memory Modules as desired.

Documentation — $12.00 Cost of 3 cards — $3.75

00703-41 : Product of Two General Matrices

This program solves for the product of two general matrices A and B.

176 Program Steps
Necessary Accessories: At least one Memory Module.

Documentation — $12.00 Cost of 2 cards — $2.50

00718-41 : Matrix Operations, Addition, Subtraction and Multiplication

This program will multiply, add, or subtract two matrices. The matrices may be rectangular or square and their size depends upon the total available space for data storage.

234 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00720-41 : Echelon Form of a Matrix

This program solves for the echelon form of a matrix - either square or rectangular - where the maximum matrix size is determined only by the maximum number of available storage registers, minus 70 registers for program memory, and working space for the program.

254 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00723-41 : Matrix Inversion Subroutine with Complete Pivoting Option

This subroutine can be used to compute the inverse of an nxn matrix using the Gauss-Jordan exchange algorithm, complete pivoting is used to improve accuracy. The size of the problem that can be solved is limited by the number of memory modules in use.

243 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

00724-41 : Cholesky Decomposition Subroutine

This subroutine can be used to solve the problem $ax = b$ for symmetric positive-definite matrices. The size of the problem that can be solved is limited by the number of memory modules in use. One memory module necessary to handle problems larger than 3x3.

222 Program Steps
Necessary Accessories: One Memory Module necessary to handle problems larger than 3 by 3.

Documentation — $12.00 Cost of 2 cards — $2.50

00747-41 : Eigenvalues and Eigenvectors using Jacobi's Algorithm.

This program finds the Eigenvalues and normalized Eigenvectors of real, symmetric nxn matrices. Jacobi's algorithm for matrix diagonalization is used. With two memory modules $3 \leq n \leq 5$ while with three memory modules $3 \leq n \leq 8$. With four memory modules $3 \leq n \leq 9$.

460 Program Steps
Necessary Accessories: Two Memory Modules minimum for then HP-41C.

Documentation — $12.00 Cost of 4 cards — $5.00

00754-41 : Conjugate Gradient Method Subroutine for Symm Matrices

This subroutine can be used to solve the problem ax=b for symmetric matrices. The coefficient matrix, a, remains unchanged during the computation. The size of the problem that can be solved is limited by the number of memory modules in use.

216 Program Steps
Necessary Accessories: One Memory Module minimum

Documentation — $12.00 Cost of 2 cards — $2.50

00838-41 : Matrix Determinant and Inversion

This program calculates the inverse and the determinant of matrices sized up to fifteen.

277 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

00899-41 : Power "N" of a 2x2 Matrix

This program raises matrices of 2x2, and real coefficients to powers. The method is iterative and the solutions are displayed with alphanumeric texts.

80 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00984-41 : Crout Reduction Subroutine

This subroutine can solve the problem ax=b when no column or row interchanges are required. Up to a 4x4 problem can be solved with a 41C and a 16x16 problem with the equivalent of four memory modules. As a subroutine, no I/O routines are provided.

162 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01082-41 : Solution of Tridiagonal Systems

System of n equations in the form of a tridiagonal matrix are solved. This routine can be used as a main program or as a subroutine. Required number of memory modules = int((2n-28)/64).

140 Program Steps
Necessary Accessories: Number of Memory Modules=Int((2n-28)/64)

Documentation — $12.00 Cost of 2 cards — $2.50

01105-41 : General Linear Programme, with Reduced Costs

This program uses the Tucker-Beale Contracted Tableau Formulation of the linear programme. The optimum solution, and the reduced costs of variables not in the solution, are calculated and displayed. Validation checks are carried out on the constraints input, and the constraint set is tested for infeasibility and unboundedness. If necessary the program will carry out, automatically, a complete phase I and phase II infeasibility form calculation on the initial problem. The size of the largest problem which can be solved is determined only by the availability of data storage. Although powerful this program is easy to use.

499 Program Steps
Necessary Accessories: One Memory Module and Card Reader
Documentation — $14.00 Cost of 5 cards — $6.25

01142-41 : NxN Matrix Multiplication

Any number of n x n matrices can be multiplied together with each matrix input only once, or each matrix can be multiplied by a constant matrix which is input only once. Optional routines use Math Pac I to find the inverse or determinant of a matrix.

290 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01201-41 : Programmed Equations

PREQ solves a system of n nonlinear equation. Stand alone user subroutines include NR for single iteration of nonlinear equations using Newton-Raphson's method, JM to generate the Jacobian matrix and LE to solve a system of n linear equations by Gaussian elimination using complete pivoting. PREQ requires size $(n+1)^2$.

576 Program Steps
Necessary Accessories: At least one Memory Module for the HP-41C. Printer optional.
Documentation — $14.00 Cost of 7 cards — $8.75

01277-41 : 3 D Vector Calculations

This program performs many common vector-math operations such as addition, subtraction, cross product, dot product, sign change, unit vector, vector magnitude, scalar times vector, matrix times vector, and vector storage, recall and exchange. It also computes the transponse, inverse and determinant of a 3 x 3 matrix.

227 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01370-41 : Solution of Tridiagonal Matrices by Thomas Algorithm

The solutions of tridiagonal matrices is found by Thomas Method. This method is valid to systems up to 7 unknowns with an HP-41C. With an additional memory module you can solve systems up to 23 unknowns and with a Quad memory module you can work systems up to 71 unknowns.

161 Program Steps
Necessary Accessories: Card reader optional
Documentation — $12.00 Cost of 2 cards — $2.50

01375-41 : Banded Matrix Solution

Computes solutions to systems of banded matrices which occur in finite-difference or finite-element analysis. In effect, linear systems as high as 60 equations normally outside the scope of the 41C, now become a possibility with this program. Its register saving ability over conventional Gaussian systems is outstanding.

284 Program Steps
Necessary Accessories: Between one to four Memory Modules. Card Reader and Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01379-41 : System of Equations: Version 1 (Maximum Accuracy)

This program solves a system of up to fifteen linear equations with real coefficients in fifteen unknowns. It presents the determinant absolute value of the matrix of coefficients for a first check of the solution.

220 Program Steps
Necessary Accessories: One Memory Module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01380-41 : System of Equations: Version 2 (Maximum Size)

This program solves a system of up to thirty linear equations with real coefficients in thirty unknowns. The calculations are done as the coefficients are entered and a minimum storage registers are required for this program.

172 Program Steps
Necessary Accessories: Memory Modules for more than 6 equations. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01446-41 : Linear Multiple Regression Analysis

This collection of seven programs and subroutines allows the user to fit multifactor data to an equation of the form $y = b_0 + b_1x_1 + b_2x_2 + b_kx_k$, where b_0 may be set to zero if desired. Problems having up to 15 independent variables have been handled using a Quad Memory module. Standard errors and evaluation of the significance of the fit can be calculated.

1537 Program Steps
Necessary Accessories: Card reader, printer and two Memory Modules for the examples given, plus 12 magnetic cards.
Documentation — $25.00 Cost of 14 cards — $17.50

01488-41 : Iterative Multiplication of Matrices

This program computes the product of two matrices A and B, shows the result (option), prompts for a third matrix C, computes the product $A \times B \times C$, and so on. It also computes $A^N = A \times A \times \ldots \times A$ (N times).

275 Program Steps
Necessary Accessories: At least 1 Memory Module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

01566-41 : Best Way to Solve Simultaneous Equation up to 3 Unknowns

This program transforms your HP-41C(V) to an equation solver. You actually write the equation, bit by bit, to the display. So now you can check visually as you proceed. If the wrong equation is entered, the program also provides a way to rewrite the previous equation you have written.

225 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01619-41 : 2 X 2 Complex Matrix

This program determines the determinant of a 2 X 2 complex matrix. It also solves the two unknown variables by Cramer's rule. The calculation does not require data re-entry.

181 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01814-41 : Eigenvalue/Vectors for Nth Order Systems.

This program will compute eigenvalues/vectors for systems up to and including 7th order. It uses the standard format $BX = \lambda AX$ where A is diagonal and B is symmetric. Options include finding the square roots of the eigenvalues and normalizing the eigenvectors. SIZE check, data correction and data review subroutines are included. A plotting program for mode shapes is also included.

775 Program Steps
Necessary Accessories: Minimum of three Memory Modules required for 6th & 7th order systems. Printer is optional. Printer & Card Reader necessary to merge and run Plotting Prgm.

Documentation — $14.00 Cost of 7 cards — $8.75

01967-41 : Warshalls Algorithm

This program transforms one as input given matrix M into its transitive completion M+ where M is the square Boolean matrix with maximal rank of 80 (with quad RAM). Some error correction and editing routines and size test are added. Program runs quite long, so some current execution status information is shown on display.

282 Program Steps
Necessary Accessories: One Memory Module and Printer

Documentation — $12.00 Cost of 3 cards — $3.75

02112-41 : Simultaneous Equations (MXM) Variable Size

This program utilizes the ITERATION METHOD and its restrictions (see Operating Limits and Warnings) for solving any system of M equations with M variables. A trial vector can be entered or the default assumption is a unit trial vector upon which, convergence to a solution is attained. One advantage of the iteration method is that does not carry round off error.

273 Program Steps
Necessary Accessories: Minimum of One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02355-41 : A^nB Matrix Multiplication

This program takes the A and B matrices and produces the A^nB matrix (where n is any integer greater than zero). Changes are included so that the program can be used without the Extended Functions Module and with a Printer).

218 Program Steps
Necessary Accessories: One+ memory modules and Extended Functions Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02443-41 : Matrix Operations

This program solves a system of simultaneous equations, finds the inverse or determinant of a matrix, or uses Gaussian elimination to reduce the matrix to echelon form. The size of the matrix is limited only by the amount of same way.

287 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02485-41 : Polynomial Equation Graph

This program will allow the user to manually plot any polynomial equation by inputing just the coefficients for the x power terms. the program then prompts for "X" and computes f(x) til user is done. Program is written for easy recovery from errors entered by the user. The program's limit for the x power terms is determined by setting of the SIZE function. Written as time saver for student since equation is entered only once.

80 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02501-41 : Solution To System of Up to 16 Equations Simultaneously

This program solves up to sixteen (16) simultaneous equations by a modified Gauss-Jordan method. It also allows for reviewing and editing the coefficients before they are used in the solution. The coefficients are entered as they appear in the order of the equation, instead of by two separate matrices, thus making entry easier.

139 Program Steps
Necessary Accessories: Additional memory if over a 4x4 system.

Documentation — $8.00 Cost of 1 card — $1.25

02521-41 : Linear Programming

This program is used to solve a wide variety of linear programming problems by using the simplex method. The program can check the multiple optimal solution, no feasible solution and unbounded Z.

543 Program Steps
Necessary Accessories: Two memory modules

Documentation — $14.00 Cost of 5 cards — $6.25

02549-41 : Solutions For Linear Systems of Equations With 2&3 Unknowns

These two independent programs solves systems of equations with two and three unknowns respectively. Each program prompts for coefficients input. The output is explicit and fast.

283 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 3 cards — $3.75

02576-41 : Complex Matrix Calculations

This program calculates the determinant and inverse of up to 9x9 complex matrix, and gives the solution of a system of simultaneous equations in 9 unknowns.

490 Program Steps
Necessary Accessories: Quad Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

02579-41 : Solutions of a Second Degree Matrix Equation

This program solves the matrix equation $AX^2 + BX + CI = M$, where M is a 2×2 matrix. I is the unitary matrix (second error) and A, B and C are real numbers. The solutions X are four 2×2 matrices with real elements.

208 Program Steps
Necessary Accessories: One memory module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

02620-41 : Thomas Algorithm: Solution of A Tridiagonal Matrix

Program solves a tri-diagonal matrix, of maximum size: 9x9, by means of the Thomas algorithm (size of matrix handled can be increased by program modification).

133 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02658-41 : Matrix Multiplication

This program performs the multiplication of two matrices 'A' and 'B'. The number of storage registers required is automatically calculated and displayed for the user. Input is prompted in row, column format after which an edit feature is provided for viewing the entered values and making corrections as required.

217 Program Steps
Necessary Accessories: At least one memory module. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02670-41 : Solutions For Linear Systems of Equations With 4 Unknowns

This program solves systems of equations with four unkowns. The program prompts for coefficients input. The output is explicit and relatively fast.

312 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

02676-41 : Extended Memory Matrix Operations

This program will add, subtract, multiply, and transpose rectangular matrices stored as data files in extended memory.

300 Program Steps
Necessary Accessories: Extended Functions/memory and one or more memory modules
Documentation — $12.00 Cost of 3 cards — $3.75

02790-41 : Vector Operations

This program performs operations on 3-dimensional vectors, either in rectangular or polar coordinates. Functions include: summation with later recall, multiplication by a scalar, calculation of the unit vector, changing the magnitude, dot product, angle between two vectors, projection of one vector on another, cross product and scalar triple product. Conversions between the rectangular and polar forms are also provided. All functions are assigned to keys, facilitating easier use.

292 Program Steps
Necessary Accessories: One memory module or the equivalent.
Documentation — $12.00 Cost of 3 cards — $3.75

02807-41 : Lin Alg With the Subroutines Sys Inv/Adj, and Out1, 2

The above three progams, operating together, perform the following operations involving the n x n matrix A in minimal time, provided det A is not equal to 0: 1) Evaluate det A up to dimension n = 11. 2) Solve the n x n system of equations Ax = b up to dimension n = 8. 3) Compute the inverse of the matrix A up to dimension n = 8. 4) Compute the adjoint of the matrix A up to dimension n = 8.

488 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 6 cards — $7.50

02826-41 : Symmetric Matrix Solution - Cholesky Modified Method

This program solves a set of linear simultaneous equations in matrix form. The matrix must be symmetric, as is typical of many linear systems of practical interest, but need not be positive definite. All input and output is alpha labeled for clarity. The size of the matrix which can be solved depends on the number of data storage registers available. An HP-41CV with SIZE = 283 can solve a 22x22 matrix.

153 Program Steps
Necessary Accessories: Memory modules or equivalent for larger than 5x5 matrix
Documentation — $8.00 Cost of 2 cards — $2.50

02851-41 : Complex Determinant and Simultaneous 3x3 Equations

Program calculates the complex determinant of a 3x3 matrix with his simultaneous in rectangular form (X + j Y). Program calculates the value of the determinant and the answer is displayed, then calculates the values of the 3 unknown variables. Program functions without printer, but if one is available it will print the inputs and the answers.

292 Program Steps
Necessary Accessories: HP 82170A Quad Memory and HP 82180A Extended Functions Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

02883-41 : Real/Complex Matrix Multiplication

Given the matrices A(m x n) and B(n x p), this program calculates the multiplication matrix C(m x p), A x B = C. But with the particularity of that both matrices, A and B, can be real or complex matrices, with different size requirements in each case. The values m x n, n x p are the rows x columns value of the matrices for the same values m, n,and p. The size in the complex case would be the double size in the real case.

217 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

02916-41 : Solution of Complex Equations

This program will solve any system of m complex equations with n unknowns. Size of the system is depending on the number of memory modules available. Input and output are very comfortable (numbers displayed as a+jb with a or jb ommited if zero, etc.). Program is pretty fast and quite accurate. Automatic matrix inversion is provided. As a subroutine you have a program that solves m real equations with n unknowns. This program can be used individually.

404 Program Steps
Necessary Accessories: Quad memory module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02975-41 : Over- determined System of Linear Equations

Systems of equations with more equations than unknowns are solved by minimizing the least square of residuals. Program produces exact solution if system is consistent. Up to eight Unknowns with 11 equations, or more equations with fewer unknowns. Routine for matrix correction. Uses Math Pac, (or substitute your subroutine) to solve NxN system.

232 Program Steps
Necessary Accessories: Quad Memory, Math Pac
Documentation — $12.00 Cost of 2 cards — $2.50

03084-41 : Vector Calculator

This program simulates the RPN system of calculations but with 3-D vector operations. The simulated four-register stack has three numbers per stack register. This allows for 3-D vector addition, subtraction, scalar multiplication, unit-vector, angle between vectors, cross product, and dot product. The regular RPN functions $x <> y$, CHS, R↑, RDN, STO, RCL, and LASTX have extended capabilities for 3-D.

288 Program Steps
Necessary Accessories: Extended Function module
Documentation — $12.00 Cost of 3 cards — $3.75

03150-41 : Simplex Method For Linear Programming

This program uses the simplex method to solve linear programming problems, finding either the minimum or the maximum. If a solution exists, the volumes, surpluses, inputed costs, slack, and the limit are all displayed. Besides inequalities, the program has facilities to also deal with equalities. The only limit on the number of variables or constraints is the amount of available memory. All inputs and outputs are individually labeled, making the program easy to use.

739 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

03205-41 : Sequential Multiplication of Real/Complex Matrices

Given the matrices A(mxn) and B(nxp), this program calculates the multiplication matrix C(mxp), A x B = C. The values m, n and p are the rows x columns value of the matrices. This program shows the solution as an option and prompts for another matrix and computes the sequential multiplication with the last solution performing in this way the sequential product of any number of matrices. The matrix elements can be real or complex.

293 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03257-41 : Anke-Simultaneous Equation System

This program solves a simultaneous equation system up to 14th degree. The program contains features to solve matrices stored in X-Memory and to save matrices.

374 Program Steps
Necessary Accessories: HP 82180A Extended Function Memory Module, one memory module (minimum).

Documentation — $12.00 Cost of 4 cards — $5.00

03282-41 : Simplex Method

This program uses the simplex method to solve the linear program min Z=CX, subject to AX=B, X not negative. If needed, the program will solve first phase I problem to find a feasible solution. Size of problems that can be solved depend on the amount of memory available.

432 Program Steps
Necessary Accessories: Two memory modules; printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

03376-41 : Matrix Operations On Fractions

This program was mainly designed to aid in the application of the simplex algorithm. It can also be used for any matrix factorization such as the determination of a system of simultaneous equations and the inversion of a matrix. It applies the factorization in the matrix; therefore you must decide upon which element the factorization will be applied. The computation and display are completed using fractions.

463 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

03384-41 : Matrix Arithmetic

Matrices need to be entered only once and must be compatible. Dimensions of a result matrix C are calculated automatically. Viewing of all matrices is provided. Program performs: $A \times B$, $A + B$, scalar operations ($\times$, $+$, $-$) on A, B, or C. A and B matrices can be exchanged or C moved to A, this makes chain operations, powers of A and operations where A and B is a constant matrix easy.

272 Program Steps
Necessary Accessories: For HP-41C; one memory module, X Functions Module.

Documentation — $12.00 Cost of 3 cards — $3.75

L352 Linear Systems/Matrices Simultaneous Equations

01598-41 : Three Simultaneous Linear Equations

Program uses the Gauss Reduction Method to quickly and economically find the unknowns. Program has full alphanumeric prompting for fast, and convenient, data entry; a routine for immediate data correction following an incorrect entry; a routine for automatic, sequential review of the contents of all data registers and an answer recall routine.

167 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01746-41 : System of N Linear Equations with Complex Coefficients

(N=9 max for standard 41CV or equivalent). equations. Program designed for easy input and editing of coefficients. Evaluates real and imaginary parts of N unknowns of a system of linear

434 Program Steps
Necessary Accessories: 1 + INT((2N(N + 1) + 44)/64) Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 4 cards — $5.00

01798-41 : Cramers Rule Calculations of Third Level Equations

This program uses Cramer's Rule to solve 3-equation, 3-variable problems. The equations must be in standard form: $AX + BY + CZ = D$, and if the system of equations is inconsistent, a "data error" results. Data is inputed by entering the variables A_1, A_2, A_3, B_1, B_2 etc., and pressing R/S after each. Output is in X, Y, Z form, as in a plane in space.

143 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

02414-41 : n Complex Simultaneous Equations

Program will solve a system of n simultaneous equations with complex coefficients. Will solve for n=2 with one additional memory module, n=4 with two, n=5 with three, and n=7 with four or a Quad memory module. Tips included for using the Math Pac ROM to perform the same task. Also, tips included for using the Extended Functions module to decrease memory requirements.

364 Program Steps
Necessary Accessories: One memory module. Quad for 7 equations.

Documentation — $12.00 Cost of 3 cards — $3.75

02642-41 : System of Simultaneous Equations

This program will solve two types of linear equations using Cramer's Rule: two unknowns, x and y within two equations and three unknowns, x, y, and z within three equations. Example problems show user how to check program's matrix calculations, if required.

249 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02767-41 : Simultaneous Nonlinear Equations

This program will find a set of roots, for up to three unknowns, in a present range. The program uses a modified 1/2 method of find the roots, so it is slow. The program is set up so you can spot an inflection point and go around it. Note: You must input the equations as a subroutine.

344 Program Steps
Necessary Accessories: One or more memory modules

Documentation — $12.00 Cost of 3 cards — $3.75

02826-41 : Symmetric Matrix Solution - Cholesky Modified Method

This program solves a set of linear simultaneous equations in matrix form. The matrix must be symmetric, as is typical of many linear systems of practical interest, but need not be positive definite. All input and output is alpha labeled for clarity. The size of the matrix which can be solved depends on the number of data storage registers available. An HP-41CV with SIZE = 283 can solve a 22x22 matrix.

153 Program Steps
Necessary Accessories: Memory modules or equivalent for larger than 5x5 matrix

Documentation — $8.00 Cost of 2 cards — $2.50

03058-41 : Overdetermined Systems

Program solves an overdetermined simultaneous system of linear equations with least squares method; every equation can have up to four unknowns and number of equations must be equal or greater than four. If whole memory is available in HP-41C, program can compute up to fifteen equations with two memory modules, up to twenty seven equations with three memory modules and up to thirty seven equations with four memory modules. Connecting a printer, program prints also all useful data.

328 Program Steps
Necessary Accessories: Up to four memory modules, Ext. Func/mem module 82180A; to print data: HP-IL mod. 82160A and printer 82162A.

Documentation — $12.00 Cost of 3 cards — $3.75

03209-41 : Almost Linear System of Equations

This program solves a system of equations which is dominated by large linear terms, and smaller non-linear functions. Will solve for maximum of 12 unknowns. It can also be used to invert a matrix, solve a linear system of 12 unknowns, and to perturb system of linear equations to examine slight changes in the coefficients. User must write function sub-routine.

393 Program Steps
Necessary Accessories: CV, CX, or Quad Memory

Documentation — $12.00 Cost of 4 cards — $5.00

L400 Number Theory

00366-41 : Diophantine Equations $ax + by = c$

This program finds the integer solutions to the equation $ax + by = c$. The parametric forms of the solutions, $x = m + ut$ and $y = n + vt$ are displayed directly, and the coefficients m, u, n and v can be used in further studies.

81 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00383-41 : Rational Number Operations

Turns HP-41C into a rational number (fraction) calculator. Features an automatic four level stack with last x register. Operations are: enter, clear x, change sign, enter integer, x<>y, roll up, roll down, last x, +, −, ÷, ×, 1/x, x^2. Optional store and recall are included for users with a memory module.

208 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00388-41 : Multinumber Generator

Several programs in one. One program generates successive primes starting with 1 or a user-supplied odd integer n. Another program computes the coefficients of the expansion of $(x + 1)^n$, otherwise known as Pascal's triangle for values less than or equal to 69. A third generates Fibonacci numbers. A fourth computes $\log x!$

125 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00470-41 : Permutations of Symbolic Set to 12 Members

Systematically generates all permutations of symbolic sets with 1 to 12 members. Members may consist of 0 to 6 alpha characters and may be of different lengths. The limiting factor is the 24 character display. Program provides non-prompting entry points for use as a subroutine.

76 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00601-41 : Chinese Remainder Theorem

Given any number of relations of the form "x is congruent to a_i modulo m_i" (where a and m are integers). The "CH" program will solve for an x that satisfies all n equations. (The RPN coding shows how some basic language statements may be transposed to run on the 41C).

72 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00634-41 : Digit-Sum Computation

Computes the sum of the digits of an integer value of ten or fewer digits. It returns a positive result if the input is positive and a negative result if the input is negative. May be used as a subroutine or in chain calculations and has useful number theoretical applications.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00729-41 : Perfect Number Research

To detect perfect number occurrence in interval beginning with choice number.

49 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01021-41 : Prime Factorization

This short program will factor a positive integer into primes. The alphanumeric abilities of the HP-41 display are used to present the factors and their exponents in a readily understandable manner. This program is very useful for finding the GCD and LCM of more than two numbers.

70 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01178-41 : Index

Computes the index of an integer to a given primitive root of a prime, using a pseudorandom sequence.

280 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01535-41 : Quadratic Reciprocity

This program takes as input 2 whole numbers, L and P (a prime) and by computing the Legendre symbol (L/P), determines whether or not L is a quadratic residue (mod P). That is whether or not the equation $x^2 - L = 0$ has a solution modulo the prime P.

273 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

01597-41 : Greatest Commom Divisor, Least Common Multiple - Factoring

Given two numbers, the program will factorize them, display the factors or "N=PRIME" and find the GCD and LCM.

233 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01613-41 : Base Transformation and Arithmetic

This program performs base conversion of a positive or negative integer from one base to another base. Arithmetic of two numbers on a same base N1 is also performed for addition, subtraction, multiplication and division, answer is displayed on base N2. The bases are integer values from 2 to 23.

314 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01663-41 : Bigger Base Conversion

This program converts integers between any base between 2 and 20, including binary, decimal, and hexadecimal. Binary up to 18 digits, decimal up to 10 E10, and hexadecimal up to 2540BE3FF can be converted by this program. Expandable to calculate bases larger than 20 when needed.

188 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01753-41 : Symbol Selection and/or Permutation

Program will systematically select and/or permute a non-null subset of a symbolic set of up to ten members. Provision has been made for the use of output routines other than the one in the program.

239 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01935-41 : Base Conversion

This program converts any number, real or integer, from any base to any other base, two through ten inclusive. The conversion is accomplished through a process known as the remainder theorem.

235 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02289-41 : Cancel

The present program, will transform a given fraction to it's simplest expression, by the mathematical method of Cancellation.

213 Program Steps
Necessary Accessories: Print optional
Documentation — $12.00 Cost of 4 cards — $5.00

02360-41 : Numerical Differentiation by Three-Point and Five-Point Form

This program uses three or five-point formulas for finding the first derivative of equally spaced data points. The slope at each point is found. Formulas were derived using the method of undetermined coefficients.

201 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02441-41 : Decimal to Fraction

This program changes decimal numbers in fractions. It is available for rational periodic or non-periodic numbers.

94 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02539-41 : Number Generator Pack

This program consists of four programs that generate: Perfect numbers, Narcissistic numbers, Persistence Numbers & Egyptian fractions. The most interesting program, Perfect Numbers Generator, will generate all the perfect numbers below 10 11 (there are 6 of them) in only 1 min. 40 sec. Methods are explained under Program Description.

306 Program Steps
Necessary Accessories: None
Documentation — $14.00 Cost of 4 cards — $5.00

02581-41 : Ro-Diagram-Pollards Method

This program computes c (number of points in circular part), t (the number of points in tail) and L (the leader) of ro-diagram of function f(x). The program is a valuable tool by testing the behavior of functions or random number generators.

145 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02702-41 : Interelation of 2 Blocks in Decreasing Order

This program intercalculates two blocks of registers in decreasing order. These blocks can have different sizes, but both must be decreasing in order. The program has sequence control and error messages.

88 Program Steps
Necessary Accessories: Memory modules and printer optional
Documentation — $8.00 Cost of 1 card — $1.25

02704-41 : Intercalculation of 2 Blocks of N Registers (Increas.)

This program intercalculates two blocks of registers in increasing order. Both blocks must be also in increasing order. The program uses only the registers 00,01,02. It has a sequence control with error message. It intercalculates 2 blocks of 10 registers in 12 sec. The blocks can have different number of registers.

88 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02794-41 : Prime

This program checks whether an odd number is prime or not and generates a series of prime numbers starting from 2, or from any number.

80 Program Steps
Necessary Accessories: None, but a printer would be very useful.
Documentation — $8.00 Cost of 2 cards — $2.50

02797-41 : Prime Factor Analyses

Prime factors of arbitrary positive integers are selected. For $1 < m < 10^{10}$ prime numbers are selected starting with the smallest.

84 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03022-41 : PR?

Using a special list this program divides all numbers in the corresponding prime numbers. This program runs rather fast.

101 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 3 cards — $3.75

03492-41 : Multiplicative Inverse of a Mod Function.

This program is a algorithm for computing the multiplicative inverse of (b mod p) is provided by generalizing Euclid's Algorithm for the computation of the greatest common divisor. By generalizing, Euclid's Algorithm can be reduced to finding integers x and y such that PX+by=1. This implies that Y is the multiplicative inverse of b mod p.

53 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 2 cards — $2.50

L450 Polynomials

00365-41 : Binomial Expansions

This program expands the binomial $(ax+by)^n$ and gives any or all of its terms.

Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00390-41 : Roots of Polynomials

Real and complex roots of Polynomials of order up to 20 are evaluated using Laguerre's method having a much faster rate of convergence than the Newton-Raphson method. Global convergence to real roots is guaranteed. The polynomial is reduced using synthetic division and the process continued until all roots are determined.

300 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00525-41 : Synthetic Substitution

This program performs synthetic substitution involving polynomials. It can be used to locate zeros, factors of f(x), and can help when using derivations of f(x) to find the slope of a point on the curve.

97 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00660-41 : Polynomial Roots by Maechly's Method

This program finds the real roots of a polynomial with real coefficients by using Maechly's method, a modification of Newton's. The basic 41C will handle a tenth degree polynomial, and 32 degrees can be added for each memory module. The program will also calculate p(x) and p-prime(x) given x.

131 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00749-41 : Calculating a Quadratic Equation Given Three Points

This program given three points in cartesian co-ordinate form will calculate a quadratic equation representing these points. Once in quadratic form a subroutine will determine the roots provided they are not complex.

134 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

00862-41 : Multiplication of Polynomials

Given two polynomials of degree n and m respectively, this program will calculate their product. At full capacity, $n+m$ can be as large as 139. Memory modules are not needed, unless n+m is large. (size = $2(n+m)+13$). Coëfficients must be real.

105 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00863-41 : Quadratic Equation

Finds the two roots of the equation $ax^2+bx+c=0$, whether the roots are real or complex, by using the quadratic equation : $\left(-b \pm \sqrt{(b^2-4ac)}\right)/2a$. This program uses no memories!

83 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00869-41 : Partial Fraction Expansion

The purpose of this program is to evaluate the coefficients of the partial fraction expansion of a rational function with the poles of multiplicity up to 4, where the degree of numerator is less than that of the denominator for the rational function. Necessary accessories: memory modules according to the following formula: int(110+4p+n/64), where p & n are the number of poles & the order of denominator.

340 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

00879-41 : Cubic Spline

This program calculates at first the four coefficients of the cubic polynomial passing through any four non-collinear assigned points; then prompts for an input x-value and determines the related interpolated y-value allowing the user to calculate as many interpolated values as required. The four coefficient of the cubic spline are left, at the end of the program execution, in four memory registers, in order to be used, eventually, by a subsequent routine to calculate first and second derivative and the radius of curvature at any given point.

136 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01016-41 : Polynomial Factorization

This program factors polynomials by synthetic division, provided that the coefficient for the first term is prime and there is no more than one factor of degree 2 or higher. The size is set to allow for degree 10 polynomials, but any degree can be factored by changing the size.

176 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01058-41 : Equation of Curve Going Through Two, Three, or Four Points

Fit $y = ax^3 + bx^2 + cx + d$ to four sets of x, y data; or $y = ax^2 + bx + c$ to three sets, or $y = (ax + b)/(cx + 1)$ to three sets, or $y = ax + b$ to two sets. Coefficients a, b, c, d are given and the y is calculated for any x.

699 Program Steps
Necessary Accessories: Three Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 6 cards — $7.50

01086-41 : Binomial Expansion

This program expands binomials of the $(ax + by)^n$ type and includes the exponents of x in the display. The only limit on n is the number of free registers.

94 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01393-41 : Cubic

This program provides a general solution for real roots of the cubic equation to any desired precision, first displaying the quantity of real roots (1 or 3). Additionally, this program is an integral part of another program which solves fourth-order equations.

271 Program Steps
Necessary Accessories: For combined programs Quad Memory or HP-41CV.

Documentation — $12.00 Cost of 6 cards — $7.50

01415-41 : Polynomial Curve Fitting, 2nd through 9th Order

Eight polynomial equations, 2nd through 9th order, may be calculated for a given set of (x, y) data using least squares method and Gauss elimination. The data need be entered only once. A coefficient of determination is calculated for each fit. Running time: approximately 3.5 minutes for 9th order fit.

293 Program Steps
Necessary Accessories: 3 Memory Modules/8th,9th order; 2 Memory Modules/3rd-7th order; 1 Memory Module/2nd order.

Documentation — $12.00 Cost of 3 cards — $3.75

01449-41 : Polynomial Derivatives

Given the coefficients of a polynomial of degree N, this program calculates the coefficients of the derivative polynomial for any order K. The values of this derivative for arbitrary values of X can then be found. SIZE = 2N+8.

140 Program Steps
Necessary Accessories: One Memory Module if N > 12.

Documentation — $8.00 Cost of 1 card — $1.25

01494-41 : Simplification of Algebraic Expressions

This program simplifies algebraic expressions of several variables involving addition, multiplication, integral powers (but not division) and parentheses. The HP-41C's ability beyond number crunching is demonstrated.

730 Program Steps
Necessary Accessories: 4 Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01507-41 : Product of Polynomials

This program computes the product on two polynomials of degree less than or equal to seven. If the printer is connected, all solutions will be printed. You can see the solution by only pressing "A". The program has the possibility to exchange the second polynomials by another one and computes its product with the first.

121 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01534-41 : Laguerre's Polynomial Root Finder

This program can be used to find the real and complex roots of a polynomial of up to degree 80. Data input utilizes error recovery and prompts for degree, size, accuracy, and coefficients. Laguerre's iteration method converges fast and gives good global convergence. A printer may be used for output.

371 Program Steps
Necessary Accessories: 2 to 4 Memory Modules

Documentation — $12.00 Cost of 3 cards — $3.75

01549-41 : Division of Polynomials

Given the coefficients of two polynomials N & M, of degrees n & m respectively, this program calculates N/M, displays the resultant polynomial (of degree n-m), including the remainder of the division performed.

180 Program Steps
Necessary Accessories: Depending on n degree, 1 (at least) or more Memory Modules are required.

Documentation — $12.00 Cost of 2 cards — $2.50

01665-41 : Partial Fraction

Express F(x) = N(x)/D(x) in partial fraction form. N(x) can be polynomial or product-of-zeros form, D(x) must be product-of-poles. Each pole has multiplicity 1 to 4. Size requirement is n + 2d +15, where n = order of numerator, d = number of poles.

271 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01667-41 : Complex Roots of Polynomials

This program based on a new algorithm computes the real and complex roots of polynomials up to the power of 100 (tested) or more. Special qualities are: 1) low number of needed data registers, 2) automatic computing of all roots, 3) high accuracy even in the case of several identical roots.

236 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01755-41 : Cubic and Quartic Solution

This program solves third and fourth degree polynomials. All roots, real and complex, are found. The program can be used to find the eigenvalues of third and fourth degree characteristic polynomials.

394 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01839-41 : Unique Nth Degree Polynomial through N+1 Points

This program finds the unique Nth degree polynomial through $N + 1$ data points ($N < 15$). A short and powerful program. Can also be used to aid long division of polynomials.

275 Program Steps
Necessary Accessories: INT($N^2/49 + 1$) Memory Modules. (One for degree, $N < 7$).

Documentation — $12.00 Cost of 2 cards — $2.50

01842-41 : Calculation of Polynomials

From a Polynomial you know some points or other data like: $x = 3$, maximum, points of inflections or only: $f'(-3) = 2$ or $f''(1) = 7$. The program will calculate the coefficients of the Polynomial.

121 Program Steps
Necessary Accessories: Math Pac

Documentation — $8.00 Cost of 1 card — $1.25

01886-41 : Synthetic Division

This program does synthetic division for polynomials with real coefficients and for real monomial divisors. The program will give the quotient, or it can give p(c). The program can be used to find intervals in which p(x) = 0. The divisor is of the form x + c, where c is a real value.

121 Program Steps

Documentation — $12.00 Cost of 2 cards — $2.50

01946-41 : Polynomial Evaluation Utilizing the Math Pac

The POLY routine in the Math Pac suffers from the limitation that the leading coefficient of any polynomial evaluated by the routine must be one. This program corrects this by rewriting the polynomial in its original form. This allows INTG and SOLVE to be used on the polynomial. True evaluation can be performed, and x can be found for any given f(x).

75 Program Steps

Necessary Accessories: HP41 Math Pac - 00041-15003

Documentation — $12.00 Cost of 1 card — $1.25

01973-41 : Real Roots of a Real Coefficient Polynomial-Up to degree 249

Program finds all real roots of a polynomial (degree 249 and below)s by Newton-Raphson's method; using Ruffini's Rule to divide polynomial by (x-b). All roots remain in memory after exectuion. P(x) and P1(x) can be evaluated. Ruffini's Rule can be used separately. Machine handles degree 57 polynomials with one memory module (249 with 4).

258 Program Steps

Necessary Accessories: One Memory Module (Printer optional)

Documentation — $12.00 Cost of 3 cards — $3.75

02002-41 : Cubic Equation

This program calculates the 3 roots, both real and complex, or any cubic equation. By using equations, it is faster and more accurate than iteration techniques. No initial guesses are necessary.

134 Program Steps

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02024-41 : Cubic Equation Solutions

Program computes the roots, including complex roots, for a general cubic. Roots are computed by employing the trigonometric solution. All input is prompted and output is annotated.

271 Program Steps

Necessary Accessories: One Memory Module; (Printer is optional)

Documentation — $12.00 Cost of 2 cards — $2.50

02026-41 : Polynomial Fitting

This program solves for the coefficients of a polynomial of any order N using N+1 data points. The program requires only 17+2N storage registers and it is characterized by a very high accuracy. There are no restrictions on the spacing between data points.

244 Program Steps

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02070-41 : Quartic Equation

This program calculates the 4 roots, both real and complex, of any quartic (fourth degree) equation. By using equations, it is faster and more accurate than iteration techniques. No initial guesses are necessary.

293 Program Steps

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02071-41 : Multiplication of Binomials/Polynomials

This program calculates (A) expansion of 2 binomials and calculation of their product with given the coefficients of 2 binomials and exponent N, M; (B) binomial expansion; (C) the product of 2 polynomials with degree N, M; (D) the square of a polynomial with degree N.

307 Program Steps

Necessary Accessories: Quad Ram and Extended Functions Module

Documentation — $12.00 Cost of 3 cards — $3.75

02093-41 : Binomial Expansions

This program expands the binomial expression $(AX^N + BY^M)^P$ and $(AX^N + BX^M)^P$. A, B, M, N and P can be any real numbers. And calculate the coefficient or value of the term by input its power of X or term number. Also find the numberical greatest term and numerical greatest coefficient.

236 Program Steps

Necessary Accessories: Quad memory for the HP-41C. Extended Functions Module is helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

02106-41 : Newton Interpolation Polynomial

This program computes to $n+1$ given datapairs (x_1, y_1) $(i = 0, 1, 2, 3, \ldots n)$ the only possible polynomial with degree less or equal to n and $p(x_1) = y_1$. You may increase n whenever you want. $p(x)$ may be computed for each real x.

76 Program Steps

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02258-41 : Bessel Polynomials

This program computes the coefficients b_n of complex Bessel polynomial of order n for $n \leq 11$. For $n = 11$, $b_0 = b_1 = 13,749,310,575$ which exceeds the number of digits that can be displayed on the HP-41C. When the program is executed, simply input the order n, and all the coëfficients from b_0 to b_n will be displayed.

78 Program Steps

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02301-41 : Binomial Expansion

This program calculates Binomial Expansion, given the following parameters. In the example $(3x + 2y^2)^5$, the calculator will request the exponent of the binomial (5), the coefficient of x and y (3 and 2), the exponent of x and y (1 and 2) and then will, on request, calculate the rth term, the first three terms, or in the above example all 6 terms. All results are printed and labeled. The program will not operate without the printer because of the use of PRA which speeds up printing.

213 Program Steps

Necessary Accessories: HP-41C with one memory module. Printer and Card Reader.

Documentation — $12.00 Cost of 3 cards — $3.75

02321-41 : Quartic, Cubic, and Quadratic Equations

This program calculates and displays all roots, both real and complex, of any quartic, cubic, or quadratic equation. Because it uses equations instead of iteration techniques, the roots are calculated faster and automatically accurate within the limits of the calculator. No initial guesses are necessary.

428 Program Steps

Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02325-41 : Babbage Difference Engine

This program simulates the Babbage Difference Engine and finds values for integer x values of an nth degree polynomial given any n+1 points with succesive x-values. This program is capable of handling any polynomial with real coefficients of degree 1 or higher. The polynomial does not have to be programmed, and no program changes ever have to be made.

122 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02434-41 : Polynomials Modific., Newton Form and Shifted Power Form

From a polynomial in the shifted power form (Taylor expansion) or in the Newton form, you can enter new centers, obtain the power form or evaluate the polynomial at a point 2. The coefficients and the centers are stored in the calculator thus at any time 3 routines help you to visualize them. Maximum degree is 84 (41CV or Quad).

246 Program Steps
Necessary Accessories: One memory module and X-Functions module

Documentation — $12.00 Cost of 2 cards — $2.50

02485-41 : Polynomial Equation Graph

This program will allow the user to manually plot any polynomial equation by inputing just the coefficients for the x power terms. the program then prompts for "X" and computes f(x) til user is done. Program is written for easy recovery from errors entered by the user. The program's limit for the x power terms is determined by setting of the SIZE function. Written as time saver for student since equation is entered only once.

80 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02496-41 : Disequation Evaluation

This program permits evaluation of second degree disequations. User inputs are the coefficients (a, b, c) and the type of disequation, or a no-solution message. Particular effort was made to insure portability and reliability: result is a compact, no data regs using program. Subroutine call option provided, fully standard and HP-IL printer compatible.

82 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

02634-41 : Solution of Quadratic Equation — Complex Form

Given the coefficients in (Radius, Angle), of a quadratic equation, this program computes the real or complex roots, using the general solution formula. $aX^2 + bX + c = 0$. The roots are output in the form of (Radius, Angle), and in $x_1 = r_1 + i_1$, $x_2 = r_2 + i_2$.

172 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

02657-41 : PROOT — Polynomial Root Finder

PROOT calculates real roots of a polynomial of degree n via Newton's Method when given an initial guess. PROOT uses Horner's Algorithm to evaluate the polynomial and its derivative, so that only n multiplications, not $2n-1$, are performed per iteration. Also, an iteration index may be specified so that convergence may be monitored.

148 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02675-41 : Chebyshev Polynomial Evaluation and Coefficients

This program evaluates an important class of Orthogonal Polynomials known as Chebyshev polynomials. Six kinds of Chebyshev polynomials of order N and argument X are evaluated. In addition, the program provides the capability to determine the coefficient vectors of each of the polynomial types. Polynomial interrelationships are utilized in the evaluation process.

389 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02771-41 : Differentiation

Program differentiates polynomials that are in a factored form. The function can have up to three factor groups with up to three terms in each group. The input consists of the number of factor groups, power and number of terms in each group, and the coefficient and power for each term. Program saves the trouble of multiplying out lengthy differentiated polynomials and also calculates the value of the function and its derivative at any point.

554 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

02780-41 : Lagrange Polynomial Equation Fitting

Using the Lagrange interpolation method, this program will fit N pairs of (X,Y) data points into a N-1 polynomial. Program works for N between 1 and 64 inclusive.

203 Program Steps
Necessary Accessories: 1 Memory module N less than or equal to 16, 2 memory modules N less than or equal to 32, 3 memory modules N less than or equal to 48, QUAD module for N less than or equal to 64.

Documentation — $12.00 Cost of 2 cards — $2.50

02785-41 : Solving 2nd, 3rd and 4th degree equations by algorithm

This program solves quadratic, cubic and 4th degree equations by algorithm and determines all the real roots, if real roots are available otherwise it displays no real roots and stops.

475 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

02914-41 : Complex Polynomial Evaluation

Given any complex or real X value, this program evaluates any polynomial of nth degree with complex or real coefficients. The program runs very fast because it uses the Horner's method of evaluation.

67 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02928-41 : Polynomial Arithmetic and Derivation

This program performs arithmetic and derivation on polynomials whose only degree limit is number of available registers. Evaluation of a specific value, addition, subtraction, multiplication, division and synthetic division (both with remainder displayed), and derivation are provided. A handy feature permits the result of the previous calculation to be used as the first polynomial in the next calculation without having to re-enter the coefficients. All input prompts and output is clearly labeled.

388 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

03003-41 : Polynomial Curve Fitting

This program will determine the coefficients of $a(i)$ for $i = 0, 1, 2 \ldots n$, of the desired n-order polynomial curve fitting. It can handle polynomial equations up to order $1 \leq n \leq 13$. This computation requires matrix pivoting as a subroutine (Math modules). For $n = 1$ to 4 requires one memory module.

174 Program Steps
Necessary Accessories: Math module. Quad module for higher order N.

Documentation — $12.00 Cost of 2 cards — $2.50

03005-41 : Fast Polynomial Multiplication

This program performs the multiplication of two polynomials of any degree and leaves the solution in memory so you can multiply it with other polynomials of any degree. This program uses a very fast algebra algorithm implemented on big computers.

130 Program Steps
Necessary Accessories: Memory modules for polynomials of high degree

Documentation — $12.00 Cost of 1 card — $1.25

03008-41 : Polynomial Products

Input, with prompting, the coefficients of two algebraic expressions. Get the coefficients of the product as output: some "What if" capabilities are incorporated.

193 Program Steps
Necessary Accessories: Ext. Func. Module and one memory module

Documentation — $12.00 Cost of 2 cards — $2.50

03009-41 : Polynomial Division

Poly% prompts for the coefficients of two algebraic expressions: a numerator and a denominator the output is the quotient and remainder's coefficients. The use of the top row keys gives some "What If" capabilities.

224 Program Steps
Necessary Accessories: One memory module and Extended Functions Module

Documentation — $12.00 Cost of 2 cards — $2.50

03019-41 : Newton

This program calculates the coëfficients of an expanded binomial: $(aX + b)^n = A_n X^n + A_{n-1} X^{n-1} + \ldots + A_1 X + A_0 = 0$

66 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03020-41 : Vieta

This program calculates the coefficients of any polynome if you know all the real roots. It makes use of the theoreme de VIETA.

93 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03061-41 : Factorization of Polynomials

This program performs the factorization of any polynomial of any degree into the product of polynomials of the form: (x^2+px+q) or $(x+q)$. The running time depends on the precision you want and the type of polynomials, but the program runs very fast because it uses a new modification of Bairstow's algorithm.

157 Program Steps
Necessary Accessories: For a degree superior to 10, one memory module is needed for the hP-41C.

Documentation — $12.00 Cost of 4 cards — $5.00

03076-41 : Race II

This program calculates the roots of a quadratic equation and gives the solution under a form with only integer numbers. The solution can be real or complex and when you want you can also get the solution under a decimal form (with a point).

236 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03100-41 : Polynomial Roots

LIN calculates polynomial roots for orders $2 \leq N \leq B$ using approximation cycles of the S. Lin method. The process stops after convergence to nine places and a quadratic portion is processed for two more roots. Any odd real root is evaluated in the last step.

199 Program Steps
Necessary Accessories: X Functions is used but not required if SIZE 040 is set as initial state.

Documentation — $12.00 Cost of 4 cards — $5.00

03207-41 : Fast Division of Polynomials

This program calculates the division of two polynomials of degree N (numerator) and M (denominator) where $N > M$ and displays the quotient and the remainder of the division performed. This program runs very fast and the size requirement is minimum. The full alphanumeric capabilities of the calculator are used.

95 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03259-41 : Bernoulli and Euler Numbers and Polynomials

Bernoulli and Euler numbers are generated using recursion formula given X, BN(X) and/or EN(X) calculated. Program description includes useful information for applying BN, EN for series and asymptotic expansions, Euler-Maclaurin expansions, etc.

90 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

03392-41 : Large Numbers: Factorials, Combinations, and Binomials

This three program package calculates: a) factorials of small ($N < 69$) and large ($N > 69$) numbers in arithmatic or logarithmic form; these can be used (b) to calculate combinations and/or permutations, and these, in turn, for (c) binomials and/or cumulative binomials or large numbers.

201 Program Steps
Necessary Accessories: One memory module, extended module.

Documentation — $12.00 Cost of 3 cards — $3.75

03394-41 : Roots of Cubic Equations

This program computes the real and complex rootss of cubic equations. The program runs fast because it uses Cardano solution with exact equations.

256 Program Steps
Necessary Accessories: ThinkJet of thermal printer is desirable.

Documentation — $12.00 Cost of 2 cards — $2.50

03446-41 : Real Factors to Polynomials

Program HELP 1 accepts input of real factors (x+Ak) and K_0 constant and computes the polynomial coefficients. Order N should not exceed N=15.

106 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03515-41 : Polynomial Regression

This program yields a best fit polynomial function of a degree specified by the user. The principal virtue of this program is that it needs only 26 memory registers (but it needs the Math Pac or its program MATRIX in the calculator memory). With four memory modules (or the 319 register HP-41CV) and the Math Pac, the program can fit a polynomial up to degree fifteen.

116 Program Steps
Necessary Accessories: Extended Function/Memory Module and Math Pac (or its program MATRIX in the calculator memory).

Documentation — $8.00 Cost of 1 card — $1.25

03525-41 : Gauss - Fit

This program approximates a gaussian shaped curve to a histogram (with arbitrary spacing). The histogram should be assumed to represent data which may be described by gaussian curves. Only half of the histogram needs to be known, from the maximum point to any distance from it. The data may be entered by hand, also a routine getting the inputs from an extended memory data file is inserted. The center (maximum point) of the histogram is expected to lie at X=0. The data are logarithmized and treated as a polynomial fit with the coefficent of first order equal 0. Only the parameters of the fit (high and sigma) are calculated; from these the total fit to any point is easily calculated.

117 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 1 card — $1.25

L500 Series/Sequences/Progressions

00426-41 : Geometric Progression

This program calculates and outputs (with output labeling) the ratio and series for a geometric progression.

76 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00474-41 : Binomial Expansion

This program performs binomial expansion, and, given the coefficients of the two terms and the exponent, will output all the terms of the series.

100 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00593-41 : Sequencer

Without extra memory modules, this program sorts up to 35 numbers in a given series from the smallest to the greatest. The numbers can be reviewed before and after ordering.

95 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00805-41 : Accelerated Convergence of Series

This program includes 3 techniques that are used to predict the sum of an infinite series. For slowly converging series the accuracy obtained by these methods may surpass the direct summation of hundreds or thousands of terms. The included techniques are repeated averaging, Shank's transformation, and Richardson's extrapolation.

231 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00833-41 : Fourier Series

This program produces the same results as 00026-41 for Fourier series. In addition, it will allow up to 134 frequencies with memory modules in all three angle modes and can delete data errors. Designed for use with Fourier power series program (included). The power series is designed to convert the coefficients on the 41C Fourier series program to a trig power series that produces identical results but in 65% less time or better.

179 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

00868-41 : Fast Fourier Transform I

This program computes the FFT or IFFT of a complex sequence up to 128-point, using the well-known decimation-in-time algorithm with radix 2. Necessary accessories: additional memory modules according to the total registers given by tot. Eg=62+2n, where n is the number of points.

220 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01004-41 : Geometric Progressions

Given any three or four of the following of a geometric progression, the program will calculate the remaining values: first term, common ration, number of terms, last term, and sum of the terms. The program also uses part of program 04367-97 (by Kiyoshi Akima) to solve the difficult combination of a, n, s.

551 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

01298-41 : Algebraic Manipulation of Series and Polynomials

This program contains 15 subroutines that allow algebraic manipulation of functions $f(x)$ defined as power series of variable order up to x^{19}. For functions $f(x)$ and $g(x)$, one can calculate $f(x)g(x)$, $f(g(x))$, $\exp(f(x))$, $\ln(f(x))$, df/dx, the integral, the inverse function, $f(x)^n$, evaluate $f(x)$, and more.

492 Program Steps
Necessary Accessories: Three Memory Modules for the HP-41C.

Documentation — $12.00 Cost of 5 cards — $6.25

01357-41 : Fast Fourier Transform II

This program can compute Discrete Fourier Transform (DFT) or Inverse Dft (IDFT) of up to a 64-point complex sequence, a 128-point real sequence and two 64-point real sequences simultaneously, using the radix-2 decimation-in-time FFT algorithm, and also can plot the magnitude and phase of input and output sequences.

684 Program Steps
Necessary Accessories: Quad Memory or HP-41CV and Printer

Documentation — $16.00 Cost of 10 cards — $12.50

01359-41 : Harm (Harmonic Analysis of a Periodic Function)

This program calculates the fourier sine and cosine coefficients for any specified harmonic of a periodic function of arbitrary period. The function is approximated over one period by n equally spaced linear segments. The fourier coefficients of the approximating function are exact. The program is interactive and prompts for all required inputs.

187 Program Steps
Necessary Accessories: Memory Modules according to the number of points in the approximating function.

Documentation — $12.00 Cost of 2 cards — $2.50

01661-41 : Arithmetic and Geometric Sequences

This program will find the number that you are in search of and the sum of these numbers whether the sequence be arithmetic or geometric.

101 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01676-41 : Fast Walsh Transform

Program computes the Walsh transform or Inverse Walsh transform in Walsh order or Hadamard order. Input is a set of N(equal to an integer power of 2) real numbers, with N less than or equal to 32. Output is the Walsh transformed data set and Power/Phase Spectra.

482 Program Steps
Necessary Accessories: 3 Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

01800-41 : Chebyshev Series-304 Samples

Computes discrete Chebyshev Minimax representation from properly spaced samples. As unique features, only Memory 00 and 14 Program Memories are used. Intermediate results are kept in the stack enabling faster calculation. Up to 304 samples can be processed with Full Memory Capability. Coefficients may be computed in any order.

59 Program Steps
Necessary Accessories: Up to 48 Samples: None - 304 Samples: Full Memory
Documentation — $12.00 Cost of 2 cards — $2.50

01818-41 : Fourier Series-300 Samples

Computes discrete fourier representation from equally spaced samples. As unique features, only Memory 00 and 18 program memories are used. Intermediate results are kept in the stack enabling faster calculations. Up to 300 samples can be used with full memory capability. Coefficients may be computed in any order.

77 Program Steps
Necessary Accessories: Up to 44 Samples: None - 300 Samples: Full Memory.
Documentation — $12.00 Cost of 3 cards — $3.75

02282-41 : Arithmetic, Geometric, Harmonic Progressions

This program calculates Arithmetic, Geometric and Harmonic Progressions; prints them and solves for unknown factors, given three known factors. The factors are 1) Number of terms. 2) Difference or ratio. 3) First term. 4) Last term.

481 Program Steps
Necessary Accessories: HP-41 with two memory modules. HP-41CV and Printer. Card Reader optional.
Documentation — $12.00 Cost of 5 cards — $6.25

02515-41 : Taylor Series

This program calculates the coefficients in a Taylor or Maclarin series expansion of a user defined function. The first eleven coefficients are determined, with the help of central difference formulae for the derivatives. Lower coefficients are accurate to 7-10 significant figures; highest coefficient to 1-3 significant figures.

376 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02717-41 : Auto or Crosscorrelation of Large Data Files in Ext-Memory

Program calculates either the autocorrelation coefficients of a data file or the crosscorrelation coefficients of two data files, when the data files are stored in extended memory.

162 Program Steps
Necessary Accessories: HP 82180A with or without HP 82181A
Documentation — $12.00 Cost of 2 cards — $2.50

02748-41 : Magic Squares

This program generates a two-dimensional, square matrix, in which the sums of all the rows, columns, and main diagonals are the same.

196 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02823-41 : Sequences and Series

This program performs calculations dealing with arithmetic, geometric, and other sequences and series. For arithmetic and geometric sequences, the nth term, common difference or ratio, number of a term, any number of means, and sums, including convergent infinite geometric series, may be calculated. The program also finds the sum of a series defined y a user-input function and uses formulas for sums of powers 1 to 10 of successive integers.

471 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 4 cards — $5.00

03010-41 : Full Evaluation of Geometric Progressions

When given n contiguous terms in a geometric progression, five quantities can then be defined: number of terms, value of 1-st and n-th term, ratio, and sum of all n terms. The program, given at least three of the above quantities, will print or display these with the remaining unknowns. The program can also be easily called as a subroutine by another program. All possible combinations of input with changing values have been tested.

296 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 2 cards — $2.50

03011-41 : Full Evaluation of Arithmetic Progressions

Given n contiguous terms of an arithmetic progression, five quantities are usually defined: number of terms, value of 1-st and n-th term, difference or ratio, and total sum of terms. The program asks for at least three of the above quantities, and then prints or displays these with the remaining unknowns. The program can also be easily called as a subroutine by another program. All possible combinations of input with different values have been tested.

247 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

L550 Special Functions

00359-41 : Polynomial Approximations to Four Common Functions

Contains four subroutines which calculate the gamma function, error function, normal and inverse normal distributions. The subroutines use polynomial approximation to obtain fast and accurate answers.

176 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00615-41 : Hyperbolic Functions

This program uses the Gudermannian function to compute the hyperbolic functions sinh(x), cosh(x), tanh(x), and their inverses.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00637-41 : Theta Function

Computes the sum of $\exp(-\pi z n^n)$ over all integers n, using the properties of Dedekinds ETA function, which also is determined. The logarithms of these functions are determined for complex arguments.

174 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00641-41 : Euler Phi Function

This enhanced program rapidly computes the Euler phi value of a positive integer n – that is, the number of positive integers less than n which are relatively prime to n. It takes advantage of the HP-41C's alphnumerics and also preserves the stack; thus it may be used in chain calculations.

116 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00648-41 : Dawson's Integral

For x real, this program will calculate the value of Dawson's integral, $d = \exp(-x^2)\int_0^x \exp(t^2)dt$. Power series expansion is used, producing an error of at most 10^{-9}. A print/no print option is provided.

35 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00815-41 : Complex Gamma Function

Computes LN(gamma) for all complex values except negative and real.

193 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00829-41 : Gamma Function; Fraction and Negative Values

Two different algorithms to calculate the gamma function. (i) uses an expanded Stirling approximation and can calculate gamma of 10^{98}. (ii) gives more precise results for $\Gamma(z)$ when $1 \leq z \leq 2$. This algorithm calculates $\Gamma(z)$ with z between the limits of positive and negative 70.957.

161 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00876-41 : Vector Operations (Dot and Cross Products)

The program is set up as a friendly program which determines the dot and cross products of three dimensional vectors. The program is set up so a single vector can be changed and either dot or cross product is outputted; as requested.

130 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00976-41 : 41C Hyperbolics

This program computes all the hyperbolic functions. Sinh, cosh, tanh, asinh, acosh, atanh, csch, sech, coth, acsch, asech, acoth. This program uses no data registers.

117 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01157-41 : Gamma Function Also Near Integers ≤ 0

For $-69.53 \leq x \leq 70.87$, program calculates $\Gamma(x)$, $1/\Gamma(x)$, $\Gamma(n+f)$, or $1/\Gamma(n+f)$, the latter two for positive or nonpositive integer n and $|f| \leq 0.5$. Thus, $\Gamma(-4.99999984365127)$ is found using input $x = n = -5$ and $y = f = 1.634873 \times 10^{-8}$. Relative accuracy of results is 3×10^{-10} but for rounding errors increasing with $|n|$.

143 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01158-41 : Ln of Gamma Fn or of Factorial

This program calculates $\ln(\Gamma(x))$ for negative as well as positive x, but particularly fast for large positive $x \leq 4.673262 \times 10^{97}$. By it we can also calculate $\ln(n!) = \ln(\Gamma(n+1))$. Absolute accuracy is 3×10^{-9} for small x, and relative accuracy is 1×10^{-9} for large x.

108 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01326-41 : Bessel Function Arbitrary Order

This program calculates, with an error less than 10^{-8} the values of the Bessel Function $J_\nu(x)$ of arbitrary order ν for $|x| < 10$. The program will also calculate the gamma function.

113 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01462-41 : Complex Error Function

This program calculates the complex error function over the entire complex plane. The Voigt function, Fresnel integrals and Dawson's integral are also obtained. The program is designed to be used interactively, or as a subroutine.

211 Program Steps
Necessary Accessories: One Memory Module.

Documentation — $12.00 Cost of 3 cards — $3.75

01523-41 : Symbolic Differentiation

This program allows algebraic entry of a formula which can be differentiated. After the differentiation, the solution may be expressed as a formula or as a numeric quantity which is the derivative at some point.

960 Program Steps
Necessary Accessories: Quad Memory Module

Documentation — $14.00 Cost of 13 cards — $16.25

01595-41 : Fractions Calculator

This program adds, subtracts, multiplies, and divides fractions; it converts between decimals and fractions, and vice versa, and finds GCD and LCM. Advantages over similar programs are more flexible entry, two level stack for easy chain calculations, automatic reduction to the simplest mixed number, and easy to remember key locations.

97 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01725-41 : Bessel Functions of Integer Order

This program uses recursion to calculate the Bessel functions of the first and second kind, for any integral order, and for any positive real argument. The running time can be fairly lengthy, but the program has great generality and high accuracy.

220 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01751-41 : Vector Products and Magnitudes

This program solves dot and cross products of two vectors. The dimension of the vectors for the dot product can possibly be up to $9.999999999 \times 10^{99}$. The program also computes the magnitude of vectors which can possibly be of dimension up to $9.999999999 \times 10^{99}$.

83 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02274-41 : Complex Exponential Integral by Continued Fractions

EKZ computes the complex exponential integral from a continued fraction representation, to within a user-specified tolerance. The method is valid in the entire complex plane, except the origin and the negative real axis. Convergence is too slow to be practical for $|Z| < 0.05$. The method is valid for complex order. But only real orders are considered in this program.

139 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02359-41 : Legendre Functions

This program calculates values for Legendre Functions of the first kind — $P_n(x)$ — and Legendre Functions of the second kind — $Q_n(x)$ — where n and x are greater than or equal to 0.

236 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02385-41 : Properties of Logarithmic Spiral Segments

This program will compute several properties of logarithmic spiral segment, such as the length of the arc, the area of the spiral segment, the moments about the pole, the variable radius vector, and the coordinates of the centroid of the sector area of the spiral.

135 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02403-41 : Bessel Functions of Integer Order

The program consists of four routines which calculate solutions for Bessel functions of the first kind, $J_n(x)$, the second kind, $Y_n(x)$, and modified Bessel functions of the first kind, $I_n(x)$, and second kind, $K_n(x)$. Functions are calculated for positive integer order and positive argument.

643 Program Steps
Necessary Accessories: Three memory modules (or equivalent)
Documentation — $12.00 Cost of 7 cards — $8.75

02475-41 : The Gamma Function and Related Functions

This program and its subroutines provides for calculation of the Gamma Function, the Incomplete Gamma Function, the Beta Function, and the group of related functions known as the Psi Function (Digamma Function) and the Polygamma Functions. Each function may be accessed separately and their modular structure permit easy adaptation as subroutines for other programs.

687 Program Steps
Necessary Accessories: Three memory modules
Documentation — $14.00 Cost of 7 cards — $8.75

02483-41 : Confluent Hypergeometric Function

This program calculates values of the confluent hypergeometric function. The function includes as special cases many of the functions of mathematical physics, including bessel functions, solutions of the Schroedinger equation for Coulomb and for harmonic oscillator potentials. The fresnel integrals of classical optics, and many others. The program runs much faster than a straightforward evaluation of the infinite series.

153 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02516-41 : Special Functions

This program computes nineteen different special functions of mathematical physics, each with a separate global label, and consumes only 92 registers of program memory, plus five data registers and one flag. Includes: Legendre, Laguerre, Modified Bessel, Hypergeometric, Chebyshev, Hermite, Whittaker and other functions. No prompting — you simply load the stack with indices and an x value.

411 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02534-41 : Bessel Functions J & Y

Computes the bessel functions $J_n(x)$ and $Y_n(x)$ for positive integral order n and positive argument x. Combinations of $J_n(x)$ and $Y_n(x)$ are useful in expressing the general solutions to several differential equations. For faster computation, polynomial approximations are used for $x \geq 3$.

364 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 3 cards — $3.75

02881-41 : Gaussian Error Function/Probability Integral: erf(Z)

The Gaussian Error Function is commonly used in heat and mass transfer problems. Usually, this information is only presented in tabular or graphical form. This program calculates the value of erf(Z) for the absolute value of Z between 2 and 0.015 using the trapezoid method. Values with magnitude greater than 2 may be entered but run time is quite long. This program is designed to serve as a called function (similar to SIN or LN).

75 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02884-41 : Hyperbolic Functions For Complex Variables

This program computes all the hyperbolic functions: Sinh, Cosh, Tanh, Asinh, Acosh, Atanh, of a complex variable in rectangular mode (Z = X + JY) and only uses two (2) registers. This program is very useful (and fast) as subroutines for electric transmission lines calculations programs.

105 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02966-41 : Inverse Gamma Function

Given gamma(x) in the range of 2 to 9E99, this program calculates the inverse, or x, to four decimal places. If x is an integer, subtract one to get the inverse factorial. Taking only 24 registers of program memory, it requires no data storage registers and allows recovery of the input value.

59 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03023-41 : Factorial Functions for Numbers Greater than 69.

This program is an extension of the FACT function of the HP-41. This program gives good approximations for great numbers, even greater than 69. The program has two possibilities: -FA is correct up to the 5th position behind the decimal point -FAC is correct up to the 7th position behind the decimal point. Both routines only work in the stack.

72 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03264-41 : Fast Hyperbolics

This fast and short program (only 43 steps) calculates the SINH, COSH, TANH, SECH, COSECH, COTANH, and their inverses. It is designed as separate subroutines. This program is very accurate because it uses the E↑X-1 and LN1+X functions.

43 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03287-41 : Elliptical Integrals

This program calculates the elliptical integrals of the three orders.

105 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03288-41 : Gamma Function

This program calculates gamma (r) of X with a great precision and only in the stack.

78 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

L600 Symbolic Mathematics

02637-41 : Huffmans Code

This program transforms as input given alphabet and its probabilities into the output alphabet in Huffmans code. The hard copy is printed if printer connected else results are displayed.

265 Program Steps
Necessary Accessories: Memory module and X-Functions module. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02698-41 : Transitive Closure

This program transforms a given matrix M into its transitive completion M+.M is the square Boolean matrix with maximal rank of 175. Some error correction and editing routines are added. Program runs quite long, so some current status informations are shown in the display. The routine for nice printing is included but printer is not necessary for running this program. Warshalls algorithm is used in this program.

473 Program Steps
Necessary Accessories: Two memory modules, X-Functions module and X-memory module. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

L602 Symbolic Mathematics Algebra

L650 Trigonometry/Analytic Geometry

00334-41 : Triangle Solutions

Improved triangle solver for all cases which will give standard angle configuration (A, B and C) and also standard side configuration (a, b and c).

253 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

00392-41 : Triangle Solution-Automated

This program finds the unknown parts of a triangle. You enter the known parts in arbitrary order; the program chooses the proper algorithm and generates the solution. Then you request output in any order. After key assignments are cleared this program will run on an HP-41C without Memory Modules.

230 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

00574-41 : Volume and CG of a Hexahedron

Given the x,y,z coordinates of a hexahedron (6-sided polyhedron), the volume and cg are calculated by summing the volumes and cg's of the five tetrahedrons that form it. The surfaces or sides need not be parallel.

Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

00670-41 : Chord from Arc Height & Length

Iterative solution for the algebraically inseparable problem gives the chord length to 9 significant figures between the limits of the straight line and semicircle conditions. Applications include the approximate degree of pullout from a frame for a uniformly pressure loaded flat plate supported on two opposite edges.

84 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00706-41 : Analysis of Conics with Invariants

This program determines the type of conic represented by a second order equation (parabola, hyperbola, ellipse and degenerate forms). After a classification, the program calculates the coefficients of the conical form with a rotation.

155 Program Steps
Necessary Accessories: One Memory Module and Math Pac
Documentation — $12.00 Cost of 2 cards — $2.50

00774-41 : Sphere

This program provides interchangeable solutions for radius, surface area & volume, segment area & volume, lune area & angle, segment height and segment area & volume. It fully utilizes the alphanumeric capability of the 41C and instructions are part of the program; therefore, written instructions or mnemonics are not necessary to use the program.

239 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00775-41 : Circles and Polygons

Given a regular polygon (side number & length), the program outputs area, radii of inscribed & circumscribed circles, central & outer angles. It calculates area and circumference given a circle (radius), generates the various angle-subtended parameters given central angle and describes the inscribed & circumscribed polygons for given polygon (side number). It outputs inscribed & circumscribed circles given a triangle (three sides).

230 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00776-41 : Polyhedra

This program lists five different types of regular polyhedra, allowing the user to select one of interest. Once a polyhedron is selected, this program describes the type of surface and provides interchangeable solutions for edge length, surface area and volume.

150 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00927-41 : Equation of a Plane

This program finds the equation of a plane given three points, two points and a parallel vector, or two parallel vectors and a point. It also contains subroutines to compute two and three dimensional dot and cross products.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00947-41 : Circle Calculations

This program calculates: 1. Given the co-ordinates of three non-collinear points, the center and the radius of the circle passing through these three points; 2. Given center co-ordinates and radius the location of points on the corresponding circle. When used in the first mode, the program can also provide location of points on the circle.

199 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01050-41 : Vector Operations

This program calculates basic vector operations such as addition, dot or scalar product, cross product, and the angle between two vectors, either in two or three dimensions. You may execute chain calculations whenever the result is a vector. The program is helpful for anybody into physics, mathematics, engineering, etc.

127 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01075-41 : Polyhedrons & Prismatoids

This program solves for the following parameters in polyhedrons, given the length of the sides: diagonal e, altitude v, circumradius r, inradius r, dihedral angle (given), surface area s, and volume. In prismatoids, given sides and altitude v & lateral edge h solves for: diagonal e, circumradius r, area of base b, lateral area a surface area s & volume v.

68 Program Steps
Necessary Accessories: Quad Memory Module, Printer and Card Reader.

Documentation — $14.00 Cost of 9 cards — $11.25

01104-41 : Cylinders & Cones

This program, given certain parameters, solves volume, surface area, lateral area, area of bases, etc of cylinders, cones, torus & barrels. The formulas are standard, but this program makes full use of the alpha-numeric capabilities of the 41C. Also the subroutines, called by numeric labels, are used to save space. The numeric labels save bytes.

712 Program Steps
Necessary Accessories: HP-41CV or Quad Memory Module, Card Reader and Printer

Documentation — $14.00 Cost of 10 cards — $12.50

01218-41 : Polygon Centroid (CG) and Area

Program calculates the centroid location (center of gravity) and area of any irregular polygon or group of polygons which are assumed to lie in a plane.

165 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01235-41 : Right Angle Triangle Solutions–Automatic

A useful and easily implemented program for solving all right triangles. This program simply prompts for the three sides and angle. With any two known values, it then solves for the other two and gives area. Solutions are automatic by simply pressing R/S. Data can be recalled for solving subsequent triangles.

140 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01243-41 : Sphere

Program solves spherical triangles. User inputs any three parts-program runs for less than two minutes and then outputs all six parts. If the ambiguous case of a second possible spherical triangle exists, the program continues solving the second triangle.

951 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV.

Documentation — $14.00 Cost of 8 cards — $10.00

01257-41 : 3 "D"

The program enables the user to create accurate perspective drawings of solid objects by calculating the foreshortening projection of points of a three-dimensional object onto a plane.

106 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01266-41 : Conics

This program classifies, finds the center and gives the reduced equation of a conic (given by a general equation) formed by section of right circular cone by a plane. The program needs approximately 12 seconds to compute all results.

245 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01304-41 : Spheres, Spherical Angles & triangles, Barrels, Ellipsoids

This program, given certain parameters, solves volume, surface area, lateral area of spheres, barrels, ellipsoids, paraboloids & the area of spherical angles and triangles. The formulas are standard, but the program fully utilizes the alphanumeric capabilities of the 41C. Also subroutines, called by numeric labels, save space & bytes.

679 Program Steps
Necessary Accessories: HP-41CV or Quad Memory Module, Card Reader and Printer.

Documentation — $14.00 Cost of 9 cards — $11.25

01368-41 : Line Coordinate Calculations

A package of 6 routines including 2d or 3d coordinate input, 3d line extrapolation, useful for any linear relationship, a plane through 3 points, angle between points (requires 4 points), plane translation rotation and line-line and line-plane intersection (this routine provides for changing the intersecting line after a solution has been output).

850 Program Steps
Necessary Accessories: One Memory Module
Documentation — $20.00 Cost of 10 cards — $12.50

01558-41 : Angle Between Two Planes

This program calculates the acute angle between two planes formed by four points, two of which are common to both planes. The program calculates the angle θ using the x, y, z coördinates of the points and finds the distances between the points. In draftsman's terms this figures valley angles for any type of chute.

256 Program Steps
Necessary Accessories: 1 Memory Module. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01684-41 : Sine Rule

This program fully employs the "Sine Rule" of mathematics for solving 'Triangle Solution' problems.

445 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C.
Documentation — $12.00 Cost of 4 cards — $5.00

01723-41 : Intersections of Two Circles

Given two circles in the form $(x-a)^2+(y-b)^2=r^2$, the program will first determine how many intersections exist (none, one, or two). Then it will provide the x and y coördinates of the intersections.

234 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C. (Printer optional)
Documentation — $12.00 Cost of 2 cards — $2.50

01729-41 : Polygon Area and Perimeter

Given the X-Y coordinates of the vertices of any plane polygon, the program computes the polygon's area and perimeter.

177 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01734-41 : Plane Geometry of Regular Polygons

This program solves plane geometry problems involving Regular Polygons. Given certain facts, other parameters of each polygon are calculated and printed. Calculation and printout are automatic after the prompted factors are all entered. There are 17 different problems and 23 subroutines. These subroutines label and print the answers.

790 Program Steps
Necessary Accessories: Quad Module, Card Reader and Printer
Documentation — $14.00 Cost of 10 cards — $12.50

01754-41 : ANG-Line Orientations in an Orthogonal System

Find six orientation angles and three direction cosines of a line, given any two of the angles or any two non-zero direction cosines. With intersecting lines or planes, find junction angle and descriptor angles of normal "hinge" line. Useful for struts, frames, pivoted members, and mitered surfaces.

432 Program Steps
Necessary Accessories: 2 Single Density Memory Modules (or equivalent memory capacity)
Documentation — $12.00 Cost of 4 cards — $5.00

01807-41 : Line Through a Point and Tangent to a Circle

Given the circle's radius and center co-ordinates and the point's coordinates, the two tangent points and distance between a tangent point and the given point are calculated. The program will also provide formulas for the tangent lines and/or lines normal to the tangent and through the circle center. Very user friendly.

167 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01810-41 : Areas of Polygons, Triangles, Trapezoids, Rhombi and Circle

This program calculates area of various plane Geometric figures, given certain known parameters. Once the knowns are entered, calculation is automatic. It will calculate other parameters when given the area and one other factor. It uses usual algorithms. The subroutines (14) label input and print-out. There are 28 problems.

795 Program Steps
Necessary Accessories: Quad Module for the HP-41C.
Documentation — $14.00 Cost of 11 cards — $13.75

01832-41 : Conic Sections

This program takes a general second degree without an xy-term and determines the conic section: circle, ellipse, parabola, or hyperbola. Then it gives all information necessary for graphing such as center, distance to foci and vertices, direction, length of latus rectum, and other information specific to just one section.

230 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01833-41 : Conic Sections with Rotation

This program will take any general second degree equation and determine the conic section: circle, ellipse, hyperbola, or parabola. If the equation has an xy-term, the program will rotate the axes and rewrite the equation without the xy-term for the new axes. Then all information necessary for graphing will be given.

312 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01852-41 : Case VI Oblique Spherical Triangles – 6 Variations

This program solves CASE IV Oblique Spherical Triangles. There are 6 variations, four of which have 2 solutions. A single set of algorithms are used, where 2 angles and a side opposite one of them are known. This is a companion program to one solving Case I thru V oblique spherical triangles.

329 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 5 cards — $6.25

01873-41 : Oblique Spherical Triangles — Case I through V

This program solves Oblique Spherical Triangles, Case I through V, including the Polar Triangles. All the varieties of Cases III through V are handled. Standard formulae are used and variations in each case use the same algorithm. The different printouts (alphanumeric) of angle and side are controlled by flags 00 through 06. The flags are set automatically when each LBL is keyed. Triangles with two solutions are solved automatically.

1012 Program Steps
Necessary Accessories: Quad Module, Printer and Card Reader.
Documentation — $14.00 Cost of 10 cards — $12.50

01900-41 : Oblique Stereographic Projection

This program will compute the X and Y coordinates for plotting an oblique stereographic projection. Full prompting, automatic X and Y coordinate viewing, and tone signals for input-output is featured.

78 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01961-41 : Vectorial Algebra Utilities–Point - Line - Plane

Given the necessary vectors, this program can solve for: Norm, Modulus, Director Cosines and Angles, Scalar Product, Vectorial Product, Mixt Product, Double Vectorial Product, All Angles, Projections, Planes and All Distances.

675 Program Steps
Necessary Accessories: Two Memory Modules (Printer optional)
Documentation — $14.00 Cost of 6 cards — $7.50

01993-41 : Circle Computations

This program calculates the center and radius of a circle given 3 points, length of side and area of an inscribed or circumscribed regular polygon, equally spaced points on a circle, and the area of a sector and segment. None of the area routines use any storage registers.

217 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02001-41 : Points on an Ellipse and Line Parallel to the Ellipse

This program calculates points on an ellipse and points on a line parallel to an ellipse either inside or outside in the Cartesian coordinate system.

256 Program Steps
Necessary Accessories: Printer/Plotter
Documentation — $12.00 Cost of 3 cards — $3.75

02059-41 : Segmental Curve Fitting

Performs curve fitting, dividing a curve into contiguous branches, not necessarily continuous among themselves. Each segment will be a second degree curve whose coëfficients are determined by the program. Also serves as auxiliary to the program Dynamic Analysis Subsidies.

78 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02150-41 : Spherical Trig Solutions

This program is a compact package of solutions for spherical triangles to be used either directly from the keyboard or as a set of subroutines by another program. All six cases of spherical triangles are solved including the two ambiguous cases.

138 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02158-41 : Right Circular Cones

This program gives a complete treatment of right circular cones. The program computes the radius, height, slant height, lateral area, total area, volume, base area and base circumference of any right circular cone given any two of these eight possible inputs. There are 28 possible cases, and the program solves each and every feasible case for a total of twenty unique and solvable cases.

401 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

02159-41 : Cubes

This program provides a complete treatment of the cube. The program computes the edge, the lateral area, the total area, the volume, the diagonal length, the area of any face, and the perimeter of any face of a cube given any one of these seven possible inputs.

99 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02160-41 : Right Cylinders

This program gives a complete treatment of right circular cyliners. The program computes the radius, height, lateral area, total area, volume, base area and base circumference of any right circular cylinder given any two of these seven possible inputs. There are 21 possible cases, and the program solves each and every feasible case for a total of seventeed unique and solvable cases.

356 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

02175-41 : Spherical Right, Quadrantal and Isosceles Triangles

This program solves all Spherical Right, Quarantal & Isosceles Triangles. It uses the 10 fundamental rules for solving Right Spherical Triangles and prompts for (Sides a, b, c) (Angles A, B, C). If the given side or angle is greater than zero, it will be printed, otherwise the display shows the next side/angle to be entered. Once all known factors are entered, XEQing the proper label will initiate calculation and print-out of the unknowns.

770 Program Steps
Necessary Accessories: HP-41C with Quad Module or HP-41CV, Card Reader, Printer
Documentation — $14.00 Cost of 8 cards — $10.00

02268-41 : Equal Cones Interpenetration

Two equal circular cones interpenetrate at same level, and the volume lost by each one is computed by the program. Applicable in ground resistance to pulling out caissons, when ground cones interference occurs.

93 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02309-41 : Triangle Computations Sides and Angles

This program will solve any real triangle given the coordinates of each of its vertices. Using the distance formula to determine the length of each side, the Law of Cosine to compute each angle and finally the Half - Perimeter Equation to compute the area of the triangle. Program will solve any real triangle given any three parts of that triangle. You enter your three known parts in any order following the rules of SSS, (Side-Side-Side), SAS, (Side-Angle-Side), SSA, (Side-Side-Angle), or SAA, (Side-Angle-Angle). The calculator will then compute the remaining three sides as long as the information given is that of a legally existing triangle.

268 Program Steps
Necessary Accessories: One Memory Module. Card Reader Optional
Documentation — $12.00 Cost of 2 cards — $2.50

02310-41 : Triangle Computation Coordinates

This program will solve any real triangle given the coordinates of each of its vertices. Using the distance formula to determine the length of each side, the Law of Cosine to compute each angle and finally the Half-Perimeter Equation to compute the area of the triangle. Card Reader can be used for easy loading of program. 58 total registers are used.

180 Program Steps
Necessary Accessories: Card Reader optional
Documentation — $12.00 Cost of 2 cards — $2.50

02342-41 : Perspective Drawing

This program provides a complete treatment for one-point perspective drawing. The viewing parameters specified are: view reference point, center of projection, view plane normal, orientation and scale of view plane. User may enter the coordinates of an object and draw it projection. He may also change any viewing parameter without re-entering all coordinates.

285 Program Steps
Necessary Accessories: One memory module. Printer helpful.
Documentation — $12.00 Cost of 2 cards — $2.50

02343-41 : Coordinate Transformations (Improved)

This program provides 2-dimensional and 3-dimensional coordinate translation and/or rotation. It performs the same functions as 00244-41, but is more user friendly, and with some possible sources of errors eliminated. The total registers required is also reduced (from 74 to 61) so that program can run on a standard 41C.

173 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02350-41 : Cone, Cylinder, and Sphere Computations

This program calculates: lateral and surface area, volume, and slant height of cones; lateral and surface area, volume, and slant height of frustums; lateral and surface area, and volume of cylinders; surface area and volume of spheres; surface area and volume of a zone and segment; surface area of a line; and volume of a sector. All inputs are prompted for, and all outputs are labelled. No storage registers are used.

232 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02482-41 : Plane Analytic Geometry Straight Lines

This program solves analytic problems involving "Straight Lines". Area of a triangle, two point lines, point and slope, intercept, parallel lines, perpendicular lines and normal forms of the equation of a line. Solution of matrices are involved in some of these problems, otherwise standard formulas are used. The program requires the use of the printer because some graphic subroutines are used.

657 Program Steps
Necessary Accessories: Two memory modules and Printer. Card Reader optional.
Documentation — $12.00 Cost of 6 cards — $7.50

02496-41 : Disequation Evaluation

This program permits evaluation of second degree disequations. User inputs are the coefficients (a, b, c) and the type of disequation, or a no-solution message. Particular effort was made to insure portability and reliability: result is a compact, no data regs using program. Subroutine call option provided, fully standard and HP-IL printer compatible.

82 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

02514-41 : Circle-Line Intersection

Given a circle $(x - A)^2 + (y - B)^2 = r^2$ and a line $y = mx + c$ or $x = n$, the program will first determine how many intersections exist (none, one, or two). Then it will provide the x and y coördinates of the intersections.

205 Program Steps
Necessary Accessories: One memory module for the HP-41C. Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

02544-41 : Trigonometric Complex Functions

For complex numbers in rectangular form, this program calculates the following trigonometric functions: sin z, asin z, cos z, acos z, tan z, atan z, sinh z, asinh z, cosh z, acosh z, tanh z, atanh z, and their reciprocal functions. Each function is automatically assigned to a keyboard location and uses no storage registers.

230 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02555-41 : Triangles Solutions-All Cases

This program solves any triangle, when three elements are known. All cases (combinations of known elements) are reduced to four cases. The program prompts for input and "CASE #?". The output is explicit.

439 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

02709-41 : Plane & Solid Analytic Geomt Pts, Distance, Slopes, Angles

This program solves problems in Plane and Solid Analytic Geometry involving points, distance, slopes, angles and areas. The formulas are routine, and much use is made of Alphanumeric printouts. Some of these strings are created by synthetic programming. Once the required coordinates are entered, most calculations are automatic after the proper LBL is keyed. All of the entries are printed in order to confirm accuracy of entry. All results are stored so that other calculations can be carried out as desired.

911 Program Steps
Necessary Accessories: Quad Module or HP-41CV. Printer optional.
Documentation — $14.00 Cost of 9 cards — $11.25

02760-41 : Quadrics Reduction Classification (by Variants)

This program eliminates rectangular and linear terms (when possible) of the complete second degree equation in three unknowns, identifying the canonic equation found: hyperboloid (1 or 2 leaves): paraboloid (elliptical- hyperbolic): cone; ellipsoid (real-imaginary): cylinders (parabolic- hyperbolic-elliptical): planes (real-imaginary).

588 Program Steps
Necessary Accessories: 3 Memory modules; extended functions module.
Documentation — $12.00 Cost of 6 cards — $7.50

02806-41 : Properties of the Circle

Automatically solves for radius R, arc angle A, arc length a, chord C, versin b, X-Y coordinate on arc plus sector and segment area. Solves RA, Ra, RC, Rb, RXY, Cb, AC, Ab, Aa combinations plus the X or Y coordinate. Will not solve for ab or Ca problems. Prompts, solves, displays answers and stores (9 registers). Positive, negative or angles ¿ 360 deg. User friendly.

346 Program Steps
Necessary Accessories: Memory module - printer optional
Documentation — $12.00 Cost of 3 cards — $3.75

02809-41 : Analytical Geometry of Circles

This program is designed to solve 12 different types of problems involving construction of equations of Circles, given the following parameters as singles or in combination. 1) Coordinates of the centers. 2) Points that the circles pass through. 3) The equations of lines that are tangent to the circle. 4) The equations of the lines forming a triangle which is circumscribed by the circle. 5) A circle inscribed in a triangle. 6) A circle involved with a triangle whose vertices coordinates are known. Given the equation of a circle, the center coordinates and radius are calculated. Given D, E, and r get F and calculate the equation of the circle.

658 Program Steps
Necessary Accessories: Two memory modules and printer. Math Pac or a program to solve Linear Equations of order 2 & 3 optional.
Documentation — $14.00 Cost of 5 cards — $6.25

02859-41 : Polygon Solutions

Given any two variables of any regular polygon this program calculates other thirteen variables very fast and accurate. It contains 76 problems which are combined by four routines that makes the calculator "intelligent".

1276 Program Steps
Necessary Accessories: Quad Memory Module
Documentation — $14.00 Cost of 10 cards — $12.50

02913-41 : The Cube by Three Points

This program computes the three dimensional position of a cube where three of it's edges, that converge to the same vertice, pass through three non-colineal points.

431 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02969-41 : Complex Quadratic Equation

This program find the real or complex roots of a quadratic equation of the form $Ax^2 + Bx + C = 0$, for real or complex values of A, B, C.

51 Program Steps
Necessary Accessories: Mathematics Pac
Documentation — $8.00 Cost of 1 card — $1.25

03029-41 : Area of n Sided Polygon

This program finds the area of an n-sided figure ($n \geq 3$). n can be up to 147 with an HP-41CV, CX or C with Quad memory module.

79 Program Steps
Necessary Accessories: Extended Functions Module — if unavailable program code may be altered to eliminate its necessity.
Documentation — $8.00 Cost of 1 card — $1.25

03047-41 : Right Triangles and Bevels

A program for the solution for the right-triangles and their corresponding bevels.

211 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 3 cards — $3.75

03050-41 : The Sphere by Four Points

Given a set of four points, this program calculates the radius and the coordinates of the center of a sphere that contains these points.

215 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

03059-41 : Parabolic Intersections

Given two parabolas in the form: $ax^2 + bx + c$ this program will determine the coördinates of the intersections if they exist.

69 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03060-41 : Three Points Circle

Given a set of three non-colineal points, this program finds the equation of the circle that contains these points.

124 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03096-41 : Partial Cylinder Volume

This program determines partial volumes of cylinder with horizontal axis with only the cylinder diameter length and depth of fluid known. Its accuracy is within 1/2%. Anyone needing to know partial volumes of horizontal cylinders could use this solution in lieu of tables or other complex calculations.

84 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03162-41 : Intersections of Lines, Circles, and Conics; and Distances

This program calculates the intersection points between lines; line and circle; circle and circle; line and ellipse; line and hyperbola; line and parabola and calculates perpendicular distance from a point to a line in the cartesian coordinate system.

579 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $14.00 Cost of 5 cards — $6.25

03169-41 : Vector Operations

The program enables you to store 5 three-dimensional vectors and you can execute the following operations: dot product, cross product, addition, subtraction, angle between two vectors, magnitude, area of two vectors, volume of three vectors, new entry of a vector, unit vector, scalor triple product, transformation cartesian-polar and vice versa.

417 Program Steps
Necessary Accessories: Two memory modules. Printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

03237-41 : Straight Lines and Points

Given one or two points and one or two straight lines, this program computes the equation of the straight line passing by the two points; the scalar product of the two points; the euclidian, maxi-,taxi-, nth distances between the two points; norm of a point, the angle made by the vector of that point and the X-axis; intersection between, angle made by the two straight lines. Also computes the equation of the straight line making an angle theta, that you give, with the first of the two given points. You can also exchange the two straight lines and the two points. The program is printer compatible.

496 Program Steps
Necessary Accessories: One memory module, printer is optional.
Documentation — $12.00 Cost of 4 cards — $5.00

03260-41 : Circle and Pie Graph Chart Calculations

This program uses only the stack. Given one of the following calculates all of the other three. Radius, diameter, circumference or area. It also calculates the information for sector of a circle given either percentage, portion or angle. Uses only the stack with all outputs labeled.

87 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03330-41 : Circle Interchangeable Solutions

This program provides interchangeable solutions between sector angle, radius, arc length, chord length and sector area of a circle. At least two inputs must be made to solve for the remaining unknowns. Additionally, the area of section between arc and chord will be computed. May be conveniently called as a subroutine by another program via an entry point.

184 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03527-41 : Catenary Curve

This program solves for the length of rope which has the same weight as the horizontal component of the tension of a rope forming a catenary curve. Required input includes the length of rope whose weight is equivalent to the total tension at two points, as well as the span (horizontal distance) between these two points. This program can be used in applications such as tramway haul ropes or transmission lines.

98 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03581-41 : Sector and Segment Calculations

This program solves for any of fifteen combinations of two variables: arc angle (radians & degrees), radius R, arc length S, chord length c, distance from center to chord d, and segment height H, including the iteratively solved combinations sc, sd and sh. Also calculated are sector and segment areas A and the center of gravity for each b.

425 Program Steps
Necessary Accessories: One memory module; printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03587-41 : Ellipse Construction

This program provides the necessary data to construct an ellipse by two methods: points on the ellipse and/or a series of three radii per quadrant. Output is based on one quadrant of the ellipse.

208 Program Steps
Necessary Accessories: Printer is optional

Documentation — $12.00 Cost of 2 cards — $2.50

03591-41 : ATAN 2

An arctangent evaluation algorithm based on the input of a signed pair of arguments (x, y), such that: ANGLE = arctan(y/x), with (x, y) having signs afixed at input. The ANGLE is determined for the range 0 to 360 degrees, with special logic being used for 0, 90, 180, and 270 degrees, For an input of $(0, 0)$ the system teturns a NO SOL mesage, denoting "no answer." The program is easily modified to become a subroutine in other computational systems.

102 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

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MISC. TECHNICAL APPLICATIONS

P000 Miscellaneous Technical Applications
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P302 Marine Navigation — Ship Stability
P304 Marine Navigation — Yachting
P400 Photography
P500 Special Information Applications
P502 Special Information Applications — Data Bases/Files (non-programs)
P600 Subroutine Packages

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

P000 Miscellaneous Applications

00312-41 : Musical Composer (complete)

With this program, your calculator can compose music! The program selects an appropriate tempo and then calculates the pitch and duration for each note or rest, which is then displayed using the alphanumeric capabilities of the HP-41C. You may select any number of beats per measure and vary the length of a note by using the "add-a-beat" feature.

203 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00355-41 : Sum of Digits of Number in Stack Register X

Program will give you the sum of the digits of the number in the x register (excluding any exponent). The number will be saved in the y register and the sum will be in the x register. The contents of the t, z, y & l registers will be lost after execution. Program is useful in generating random numbers.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00499-41 : Blind Numerical Operations *1

Program is to enable blind people to "read" the numerical display, by the correct number of audio tones for each digit. Special audio signals indicate decimal and/or minus numbers. Orginal number is returned unaltered to display (except SCI and ENG displays, which are only returned unaltered when they will not fit the normal fix display).

84 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00524-41 : Banner

Program asks for letter or number and prints character in 1.5" letters horizontally on printer paper.

Necessary Accessories: None

Documentation — $12.00 Cost of 8 cards — $10.00

00530-41 : Banner

Program prints user defined characters at normal size or vertically along paper as giant banners with each column being printed as one line. Banner size characters make editing with the program's several editing features a snap.

214 Program Steps
Necessary Accessories: One Memory Module and Printer.

Documentation — $12.00 Cost of 2 cards — $2.50

00552-41 : Vin Check Digit Calculation

This program computes the vehicle inspection number check digit. The program prompts for each vin digit (except the check digit) and then computes the check digit.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00595-41 : League Table

This program compiles results and prints the league table for any sport with low scoring matches. The program was designed to be used for association football results for up to 24 teams in the league. It uses a subroutine for team names and one store per team for data. This is fun to run particularly for the British football enthusiast every Saturday evening. It is a useful program for organizers of leagues.

257 Program Steps
Necessary Accessories: One or Two Memory Modules, Card Reader and Printer.

Documentation — $12.00 Cost of 6 cards — $7.50

00607-41 : Display Format Restore

After running a program that temporarily changes the display format, the user often finds it necessary to return to the original format manually. This subroutine can be used to automatically restore the previous display format when the program is finished. This subroutine does not alter the stack.

33 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00708-41 : Triads, Chords of the Seventh and Chords of the Ninth

Given the key (tonality), chord (in arabic numeral), and mode (major or minor), the program outputs the triad, chord of the seventh or chord of the ninth. Given a triad, it provides a complete list of the appropriate keys, chords and modes.

419 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

00744-41 : D=RT Calculations

This program solves a variety of problems involving distance, time and speed. Time is entered as hours, min, seconds and hundredths of seconds. distance in miles or km and speed in min/mile, min/km, or km/hr. It is particularly useful for orienteering, jogging, cycling, and racing, as well as any general d=rt problems.

145 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00763-41 : High Resolution Plotter

This program was derived from the PRPLOT program included with the printer. instead of using the same printing character for each line printed, HIPLOT makes a new special character each time a line of the plot is printed. This special character matches the graph as closely as possible within the 7x7 dot matrix. The result is high resolution plots at a slower speed than PRPLOT.

227 Program Steps
Necessary Accessories: One Memory Module and Printer.

Documentation — $12.00 Cost of 2 cards — $2.50

00768-41 : Blow Your Stack: a Ten-Fold Stack for 41C

At the expense of one (or two) extra key strokes per data entry, and a couple extra milliseconds "XEQ" shun time you can have a 41C with a ten fold stack: - deeper, if your heart desires, and your mind can master the modifications. All the usual functions of the 41C function as usual (or so it appears).

93 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00804-41 : Greek Alphabet

This program will print out all Greek letters using the graphics of the 82143A printer or standard characters. It can be used as a reference and will print the complete alphabet or single letters in upper and/or lower case. If a letter is required for a formula the graphics are documented for ease of extraction to your own programming needs.

572 Program Steps
Necessary Accessories: Two Memory Modules, Card Reader and Printer

Documentation — $12.00 Cost of 6 cards — $7.50

00823-41 : Textile Count Conversions

Provides any of the twenty (20) possible conversions between the following textile count or size numbering systems. 1) Cotton count which is based on 840 yards for one pound for cotton count=1.00. 2) Worsted count is based on 560 yards for one pound for worsted count = 1.00. 3) Tex count is based on 1 kilometer for one gram for tex count = 1.00. 4) Denier is based on 9 kilometers for one gram for denier = 1.00. 5) Metric count is based on one gram per meter for metric count = 1.00.

279 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00824-41 : Ring Spinning Calculations

Given 1) spindle speed, 2) twist multiplier 3) ring diameter in inches, 4) yarn size (cotton count) 5) roving size (cotton count), and front roll diameter in inches. Calculates 1) twist (turns/in), 2) traveller sp (ft/min), 3) front roll speed, 4) draft, and 5) production in lbs/spindle/hour.

164 Program Steps
Necessary Accessories: Printer optional
Documentation — $12.00 Cost of 2 cards — $2.50

00911-41 : Musical Scales–Frequencies

This program is intended as a "companion" program to "Frequencies of Musical Pitch–Equal-Tempered Scale" although complete by itself. This program will print the frequencies of all eight notes in any major scale (or natural or harmonic minor scales) in any octave using any note as a starting note for that scale.

161 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00958-41 : Frequencies of Musical Pitch–Equal-Tempered Scale

Pitch is that qualitative attribute of auditory sensation which denotes highness or lowness in the musical scale and is conditioned primarily on the frequency of sound waves. This program provides the user with the frequency of any note in the musical scale (in any octave). Full use is made of the HP-41C's alphanumeric capabilities.

168 Program Steps
Necessary Accessories: Printer optional.
Documentation — $8.00 Cost of 2 cards — $2.50

01017-41 : Bicycle Commuter Computer

Use your HP-41C to determine speed, pedal cadence, gear ratio and estimated time of arrival. Built-in timer establishes an audible cadence or keeps track of trip time. This program gives you many features found on specialized bicycle computers. Works on any 5 to 21 speed derailleur bicycle.

173 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01023-41 : Athletic Endurance Equation

The endurance equation estimates the time required to run any distance from 1 to 26.2 miles based upon known performance at a single distance. It also provides comparison with "world class" standards and may also be used to compute equivalent requirements for swimming, bicycling, rollerskating, and race walking as alternative exercise.

243 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01024-41 : Step Test of Aerobic Capacity: U.S. Forest Service Method

This program determines aerobic capacity for men and women of all ages according to age, weight and pulse rate following a 5-minute "step" test. The program follows the method used by the U.S. Forest Service to measure physical fitness and to predict ability of men and women to sustain arduous work (such as fire line duty). The program also estimates the distance a subject is capable of "running" during a 15-minute period, based on the ability to take in, transport, and utilize oxygen.

345 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 4 cards — $5.00

01052-41 : Tones and Semi-Tones

This program deals with sound waves. You give the HP-41C two frequencies of your choice and it will determine how many semi-tones there are between the two frequencies introduced. You give the HP-41C one frequency and it will tell you the name of the tune that corresponds to this frequency introduced (long live the alphanumeric display!!).

168 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01074-41 : Pseudo-Talk for the Speech Handicapped

This program enables a speech handicapped individual to communicate, at the press of a single key, with anyone capable of reading. Using the alpha-numeric capabilities of the HP 41C, it assigns basic sentences to various keys on the keyboard. Sentences can be 'stock' or user individualized based upon needs.

123 Program Steps
Necessary Accessories: One Memory Module. Quad Memory Module would allow more sentences or other use. Card Reader would ease inputting program.
Documentation — $12.00 Cost of 4 cards — $5.00

01077-41 : Pitch to Frequency

This program takes an alphabetic pitch and numerical octave from the user and converts it to a frequency in hertz, based on the equal-scale. The answer which is displayed is completely unambiguous: it shows the frequency in hertz, the note (sharp, flat or natural) and the octave.

104 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

01156-41 : Enduro by AMA Rules Chk Pts/Enduro

This program computes the final score for each individual competitor in an Enduro according to the Endero rules of the American Motorcyclist Association (AMA). The program disqualifies any participant arriving earlier than 15 minutes or later than one hour and 59 seconds to any due check point.

Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01233-41 : Hebrew Typewriter

Using the printer, this program can be used to compose Hebrew words and sentences. Although this is a rather obscure use of the 41-C, when applied to a larger machine like the HP-85, it would be a powerful tool in teaching students foreign languages.

123 Program Steps
Necessary Accessories: Two Memory Modules, Printer and Card Reader.
Documentation — $12.00 Cost of 3 cards — $3.75

01301-41 : Quantity of Tiles Per Square Foot of Floor Space

This program will calculate the number of floor tiles needed to cover n square feet of floor space using standard floor tiles. Calculations may be made with or without provisions for waste. Full use is made of the HP-41C's alphanumeric capabilities.

123 Program Steps
Necessary Accessories: Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01302-41 : Nails Per Pound/Kilogram

This program will calculate the approximate number of nails per pound (or kilogram) for common, box, casing, and finishing nails. Full use is made of the HP-41C's alphanumeric capabilities.

178 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01369-41 : Long Distance Phone Call Timer

Program times long distance phone calls, displaying the cost and duration of calls simultaneously, continually updated. Stores phone rates for three rate periods to four locations. Alerts user with "BEEP" when selected time or cost has accumulated. Accepts non-programmed time rates. Displays key captions.

120 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01498-41 : Radio Direction Finding Accuracy

Program calculates the target location error CEP and the dimensions and orientation of the error ellipse for a three sensor line-of-bearing radio direction finder. Input variables are sensor RMS accuracy, spacing between sensors, and the radio emitter coordinates. A weighted least squares intersection of three bearing lines is used to estimate the accuracy of the DF fix.

177 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02418-41 : Audio Tape Counter/Timer Conversions

This program makes conversions between a tape counter (cassette, reel to reel, you name it), and real time. Functions include skipping a passage, elapsed time for a given counter reading and vice versa, and time between readings. Easy to write you own routines. Comes with separate routine to compute two necessary constants for your player experimentally.

76 Program Steps
Necessary Accessories: One working tape deck

Documentation — $12.00 Cost of 2 cards — $2.50

02749-41 : Script Letters

This program uses the "special-characters" feature of the HP 82143 printer to form legible script characters.

89 Program Steps
Necessary Accessories: HP 82143 Printer

Documentation — $8.00 Cost of 2 cards — $2.50

02860-41 : "Shackle" Encode/Decode

Using a random number algorithm and your chosen password, "SHACKLE" encodes and writes onto a magnetic card up to 180 characters of text; decodes such cards and displays the original text. Included are comprehensive edit and review features to ease text handling.

411 Program Steps
Necessary Accessories: Two memory modules, X-Functions Module and Card Reader

Documentation — $14.00 Cost of 5 cards — $6.25

03477-41 : Component Percentages In A Wine Blend

This program applies the technique of interchangeable solutions to the "percentage in the blend" problem. Given four of the five variables [(A) volume of first wine, (B) volume of second wine, (M) percentage in the blend, (b) percentage of second wine, (a) percentage of first wine,] the fifth will be computed. The percentages (a), (b) and (M) pertain to the same attribute as it occurs in the wines.

121 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

P100 Aviation

00463-41 : 41C PWS Airline Miles

This program computes the IXC distances between any two airports. Users must have access to V & H coordinates which comply with grid definitions used by AT&T in tariff FCC#264. This program is especially helpful for communication consultants, communication service managers or anyone who sells or leases full period (dedicated) communication facilities.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00521-41 : Wind Triangle

Program solves wind triangle.

152 Program Steps
Necessary Accessories: Aviation X Pac

Documentation — $12.00 Cost of 2 cards — $2.50

00584-41 : Aircraft Position

Program designed to work in conjunction with Aviation X Pac program "Plan" to provide course/distance information from latitudes/longitudes.

269 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00667-41 : Flying IV Conversions

Converts the following values: NM to/from SM, NM to/from KM, SM to/from KM, IMP gal to/from US gal, IMP gal to/from liters, US gal to/from liters, kg to/from lbs, feet to/from meters, deg c to/from deg f, reciprocal headings for use with "flying I preflight and inflight calculations", or may be used independently. This program also available in special program #01319C. (Recommend additional memory module if used with "flying I" program).

141 Program Steps
Necessary Accessories: Recommend Additional Memory Module if used with "Flying I" program.

Documentation — $12.00 Cost of 2 cards — $2.50

00701-41 : Flight Planning and Management

The program is designed to perform all preflight preplanning tasks. Navigational data may be input from prepared data-cards, or manually. It will handle crossing of checkpoints in climb segment and contains a method of modelling atmospheric conditions. Aircraft climb characteristics are modelled in a separate program appended to the main one.

529 Program Steps
Necessary Accessories: Three Memory Modules. Card Reader optional.

Documentation — $12.00 Cost of 6 cards — $7.50

00836-41 : Cruise Optimization

The program will calculate minimum time and minimum fuel required and display the altitudes at which this occurs. Inputs to the program are winds aloft, temperatures aloft, aircraft weight and power setting. The program is general in that the aircraft characteristics are modelled in a program appended to the main one.

505 Program Steps
Necessary Accessories: Three Memory Module. Card Reader optional.

Documentation — $14.00 Cost of 8 cards — $10.00

00968-41 : Load Capacity of Hot-Air Balloons

Program is for pre-flight determination of whether the planned grossweight can or cannot be lifted without exceeding the balloon envelope's limit-temperature (tmax.) in the existing atmospheric conditions (O.A.T. Deg f & p in hg.) a. From atmospheric data & tmax & volume of envelope compute grossweight (w): b. Atmospheric data & w & vol. Compute tmax (t); c. Atm. data, tmax & w inputs give needed volume (ft3) (v).

99 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01319-41 : Flying

4 programs that calculate results of flight calculations routine to light aircraft; distance, true course, and magnetic course from latitude, longitude and variation using the Rhumbline Navigation routine; the center of gravity limits; and converts various aviation related terms to/from metric.

884 Program Steps
Necessary Accessories: One to three Memory Modules and a Card Reader.

Documentation — $16.00 Cost of 11 cards — $13.75

01527-41 : Flight Computer System

This set of programs is designed for use in combination with Aviation Application Pac. Together they convert the 41-C into a complete flight computer. Major programs include: Alt. computations (T.A., D.A.); Course and Distance between 2 points using Rhumblines; Wind Correction Angle Comp. (WCA, GS, TH, MVC); and an Inflight Log that assists in controlling flight progress. Utilities include: Temperature, Distance and Time conversions, True Air Temperature, and weighted average ground speed. A set of suggested key reassignments round out the package.

694 Program Steps
Necessary Accessories: Quad Memory Module, Aviation Pac Rom (Keyboard Overlay recommended)

Documentation — $20.00 Cost of 21 cards — $26.25

02243-41 : Distance off Great Circle Track

Program finds Great Circle Initial Course and Distance. To a Point(3) off Track it will find the closest point thereto on Course (Lx & LOx) and the course and distance from there to Point 3 (Cx3 & Dx3). Also finds distance from Departure to Point X and the percentage of the trip. Program works just as well for Air as for Sea. It is unique in that it saves hundreds of steps by varying the contents of registers and using the same 43 step routine for ten different equations.

318 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02381-41 : Time, Fuel, and Distance to Climb

This program iterates on AOA and FPA to find the time, fuel, and distance throughout a scheduled climb. Tabular data for Co, thrust, and fuel flow are required. The linear interpolation subroutine used is unique in that it will handle two different variables stored in the same data register.

561 Program Steps
Necessary Accessories: Quad Module and Printer

Documentation — $12.00 Cost of 11 cards — $13.75

02677-41 : Altitude Versus DME Reading For Instrument Approaches

Program calculates the altitude for the distance measuring equipment (DME) cockpit readout for a nominated glide path. The program will accept a course to any azimuth aid (Localiser, VOR, NDB) which may be offset from the extended centreline. The DME does not have to be co-located with the azimuth aid and the program takes into account the offset track and slant range when calculating the DME distance.

559 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 5 cards — $6.25

02707-41 : Wind Triangle

Wind speed and direction are solved for given true heading, true air speed, true track and ground speed. Alternatively, if wind speed and direction, true track and true air speed are given then the true heading required to maintain track and ground speed are output.

158 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

02750-41 : Aerial Photography, Mapping Percent of Overlap, Frame

Program gives camera release interval needed to maintain the desired negative overlap required in aerial mapping. Program allows for changes in altitude, air speed, lenses, and overlap (in any combination, or all at once). Printer gives reminders of user parameters and associated registers for ease in updating.

120 Program Steps
Necessary Accessories: Printer helpful

Documentation — $12.00 Cost of 2 cards — $2.50

03033-41 : Great Circle Distance/Bearing

This program computes the great circle distance and true bearings between two points on the earth given the coordinates. Conversely, given a point on the earth, and the distance and bearing to a second point, the program calculates the latitude/longitude of the second point and the bearing from the second point to the first.

254 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

03197-41 : Navigation Computations

Program designed for preflight and inflight use. Gives accurate readouts for all of the basic navigation problems faced by the pilot whether flying light aircraft or operating international heavy jets.

731 Program Steps
Necessary Accessories: Minimum of three memory modules or HP-41CV. Printer helpful but not required.

Documentation — $14.00 Cost of 9 cards — $11.25

03519-41 : Vertical Navigation Computer

Convert your HP-41 into a computer for vertical navigation. Climb or descend flight paths are calculated in percent, degrees, feet/nautical mile, altitudes to be reached in a given distance, and speed/vertical speed cockpit readings; from any one input. Top of climb and descend distance, timing and pressure (QNH) correction are also provided. Designed for pilots to calculate obstacle clearance, engine out performance, normal climb and descend, SIDS and approaches. No key assignments as local alpha labels are used. Program is printer compatible.

212 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 3 cards — $3.75

P102 Aviation Avigation

00352-41 : Enroute RNAV Great Circle Navigation

This program calculates great circle distance and initial magnetic course from present position to destination. It also calculates distance off course. It uses VOR radial and DME information to compute present position or destination waypoint. Can update departure point to present position.

198 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

00673-41 : Density Altitude

Given the altimeter setting & indicated altitude, computes pressure altitude. Given any two of the three quantities 1) pressure altitude, 2) density altitude, 3) temperature (degrees centigrade), program computes third.

77 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01710-41 : Preflight Planning

Program designed to provide complete navigational preflight planning assistance. Allows entry of data in coordinate form, or from radio or navigational aid charts. It eliminates need for use of hand held (E6B type) or manual computers. Allows direct computation of distances and true courses.

461 Program Steps
Necessary Accessories: 3 Memory Pacs or Quad Memory Pac

Documentation — $14.00 Cost of 6 cards — $7.50

01745-41 : Distance and Direction

Computes great circle distance between any two points on the face of the globe including coordinates at the poles or 180 degrees apart and also initial heading in degrees, minutes, and seconds or by mariner's (32-point) compass. Distance is given in nautical miles, statute miles, or kilometers. Can be used with or without a printer.

344 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01804-41 : Interactive Flight Information Manager

Program is useful for IFR and VFR planning and enroute flight management functions. Features include: extensive alphanumeric prompting, functional keyboard, clock function, extensive data storage/recall capability, look ahead/look back for distances, times, and fuel reserves, and automatic printing with the HP printer. Useful for other modes of transportation.

807 Program Steps
Necessary Accessories: Quad Module. Card Reader optional. Printer useful, but not required.

Documentation — $20.00 Cost of 8 cards — $10.00

01829-41 : Vortac/Tacan Point to Point Navigation

This program computes Distance, Course, Wind Corrected Heading and ETE to a Tacan defined destination (Radial & DME) from a present Radial and DME. Wind and TAS are prestored in locations compatible with Aviation X programs. Easy in-flight updating of present position is provided.

128 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

01834-41 : Lat/Lon to or from Bearing/Distance

This program calculates the True or Magnetic Bearing and Distance from one set of Lat/Lon coordinates to another. Also, given one set of coordinates and a Bearing/Distance from those coordinates it will determine the Lat/Lon of the Bearing/Distance point. Assumes flat Earth and a Rhumbline Route.

136 Program Steps
Necessary Accessories: 1 Memory Module. (It could easily be modified, as only 45 Registers are needed.

Documentation — $12.00 Cost of 2 cards — $2.50

01864-41 : FAA AC 90-45A Computation of Geodesic Information

The FAA presents "Mathematical formualas (they) used for geodetic computations (which) are derived from a procedure developed by Sodano (U.S. Army Engineer; Geodesy, Intelligence and Mapping Research and Development Agency; Fort Belvoir, Virginia.) The method provides very good direct and inverse computational compatibility; it is used by the FAA for all Route development."

640 Program Steps
Necessary Accessories: One (1) HP 82106A memory. Optional: HP00041-14007 NavPac and HP82180A Extended Functions

Documentation — $12.00 Cost of 4 cards — $5.00

01978-41 : Critical Field Length for Jet Aircraft

This program calculates the critical field length and refusal speed for multi-engine jet aircraft. The entire velocity and distance time history can be determined. The engine thrusts are assumed to be constant.

442 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

02213-41 : Tacan Point to Point With in Flight Wind Calculations

This program computes course, distance and wind corrected headings, ETE and ETA to a tacan or VOR/DME defined destination. Easy in flight updating of present position is provided, and when updated the wind and ground speed are calculated. A global label is provided for the wind triangle subroutine for use by other programs.

272 Program Steps
Necessary Accessories: Time Module and one memory module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

02427-41 : DME With Approach Timer and Wind Triangle

Uses Time Module to provide time and distance remaining to a fix. Provides for input of distances and groundspeeds during preflight and gives constant readings during flight. Also provides low fuel warning alarms and missed approach alarms. Wind triangle program is included for convenience of flight planning.

216 Program Steps
Necessary Accessories: One memory module and Time Module
Documentation — $12.00 Cost of 3 cards — $3.75

02659-41 : Pressure Navigation

Pressure differential (or pressure pattern) flying and navigation methods enable the pilot to compute a single magnetic heading which will compensate for all winds aloft between points of departure and destination providing a minimum time route with resultant economies of both time and cost. Based on inputs of latitude, magnetic variation, barometric pressure, true course, airspeed, and ground distance program will compute the magnetic heading to be flown. Assignment of data registers aligns with use of registers by the Aviation Pac. Program requires use of 1 memory module but may be modified by reassigning data regs so that no additionaal mem mod req.

125 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

03017-41 : Magnetic Variation in Australia

This program calculates magnetic declination (variation of the compass) from an output of Latitude and Longitude. The program can be used as a subroutine for navigation programs.

184 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

03081-41 : Aeronautical Radionavigation Frequencies

The NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management (revison Jan 1984) specifies the authorized operating frequencies for Air Navigation systems in the common Civil/Military National Airspace System. This HP-41 program calculates the S-band TACAN-DME frequencies, the VHF VOR/ILS frequencies and the UHF Glide-Scope frequencies for any of the 1 through 126 "X" or "Y" channel number inputs. All of the 734 frequency assignments authorized by the NTIA manual can be identified.

225 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 2 cards — $2.50

03094-41 : Low Level Flight Planning

This program calculates true heading, magnetic heading, point to point true heading, distance, point to point distance, estimated time enroute, estimated time of arrival, fuel required, fuel remaining, total distance, total time and total fuel given aircraft true airspeed, angle of bank in turns, fuel flow and initial fuel weight, and navigation checkpoint latitude, longitude, altitude (elevation) and magnetic variation. The program calculates headings and distances using great circle navigation equations.

538 Program Steps
Necessary Accessories: HP-41CX or equivalent
Documentation — $14.00 Cost of 6 cards — $7.50

03393-41 : Tacan Point to Point Navigation

This program calculates the no wind heading and distance solution given a current TACAN (or VORTAC) radial and DME and a new radial and DME.

68 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03513-41 : Universal Transverse Mercator to Geographic Conversions

This program will convert both ways between Geographic and Universal Transverse Mercator systems. The program is set up to use the Clark Spheroid of 1886 (USA System), but constants are included for the International Spheroid (Europe) and formulae are included to generate constants for other systems (e.g. Bessel Spheroid).

287 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

P104 Aviation Aircraft Operation

00719-41 : General Aircraft Weight and Balance

Program calculates center of gravity, gross weight and gross moment. Used to determine if an aircraft is loaded within the weight and balance envelope. inputs are weight and respective arm or moment. Program easily allows for changes to final weight and balance output to accomodate shifts or changes to aircraft loading.

49 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00832-41 : Aircraft Range

The program ("range") calculates remaining cruise-distance for aircraft from inputs, which are either known, or instrument-readable to the pilot. It uses the classical Breguet-equation, which is presented in forms for propeller and jet-driven airplanes. Can be used for pre-flight and in-flight computations. Program returns to start, and ready for new inputs, if the answer to the question "landing?" is other than yes "y".

181 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00989-41 : Cabin Pressurization

The program calculates the remaining variable given any two of the pressurization differential and cabin pressure altitude.

Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02011-41 : Engine Trend Monitoring Program for PT6A-11/21/25/27/28

This program helps to monitor engine performances and is sufficient to key in observed cockpit panel readings. The calculator will calculate and display the delta ITT, fuel flow and NG; these can then be plotted directly.

209 Program Steps
Necessary Accessories: One Memory Module
Documentation — $14.00 Cost of 3 cards — $3.75

P200 Chronology

02249-41 : Calendar Events by Month (Events)

Scans, calculates and neatly prints holidays (from a list of 27) within any user selected YEAR/MONTH. Also checkmarked monthly calendar, complete annual Gregorian or Julian calendar, and finally program extensions for birthdays, anniversaries, dates to remember, etc., using RSUB.

970 Program Steps
Necessary Accessories: HP-41CV or 4 memory modules, Card Reader and Printer

Documentation — $16.00 Cost of 14 cards — $17.50

02419-41 : Tropical Year Calculations

Astronomers, chronologists, and calendar enthusiasts now have an easy program to calculate the length of the tropical year for any year past or present. Program also calculates accumulated tropical years from 1582 to any year in the future or from 1900 to any year in the past (down to 900 A.D.). High accuracy is maintained to 10 decimal places, whatever the length of the integer (representing whole days). This feature allows checking the accuracy of the mean year of any calendar system with high precision.

164 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03034-41 : Epact & Golden Number

The epact has been solved! From the "involved" tables originally devised by Luigi Lilio, designer of the Gregorian calendar, now comes an HP-41 program to calculate the epact for any year from 1 A.D. to 9999 A.D. Before 1583, theDionysian formula is used while after that, Lilio's. Also included is the golden number for any year in the Christian era (in Roman or Arabic numerals). The epact - the age of the moon on January 1 - is used to calculate the date of Easter and other holidays of the Christian church and can even be used to calculate Chinese New Year and the Vietnamese Tet holiday.

134 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

03564-41 : Headers For Labeling Printouts

This program conveniently collects date, day of week and time for display or to provide a useful one-line header on printouts. An independently addressable section enables ALPHA entry of an identifying title which is printed as a separate one-line header. Day-to-day manual execution can be facilitated by assignment to USER keyboard (two positions). Program uses stack only and restores initial keyboard conditions.

53 Program Steps
Necessary Accessories: Printer.

Documentation — $8.00 Cost of 1 card — $1.25

P202 Chronology Date/Calendar

00321-41 : Calendar Functions

Given a date, this program will find the Julian day number (JD #), the day of the week (DOW) and/or the phase of the Moon (Moon) for any date from Jan. 1, 4713 BC to Dec. 31, 9999 AD. The program uses the 41C's alpha-capabilities, is adjustable for the Julian (old) or Gregorian (current) style of calendars, allows the user to select Printer on/off (using the 82143A printer) and error traps any "Feb. 29th" inputs for non-leap years.

201 Program Steps
Necessary Accessories: One Memory Module for the HP-41C. Optional: Printer and Card Reader

Documentation — $12.00 Cost of 2 cards — $2.50

00322-41 : Calendar Printout

This program prints a neatly formatted calendar for any year on the 82143A printer. Only two data registers are used, and the program does not require any memory modules.

Necessary Accessories: Printer

Documentation — $8.00 Cost of 2 cards — $2.50

00323-41 : Jewish Holidays

The calculation of the Gregorian dates for the main Jewish holidays are precisely performed for any year from 1900 to 2099. Dates are given for Rosh Kashanah (Jewish New Year), Yom Kippur, (Day of Atonement), Passover, Chanvkah, Purim, Sukkot, Simchat Torah, and Shavuot. No knowledge of the Jewish calendar is required.

309 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00393-41 : Perpetual Calendar

Program generates day-of-week for any given date after 1/10/1592, and number of days (or years) between any two given dates. Further, the date of any given number of days (plus or minus) from a given date is also determined.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00437-41 : Calendar

This program prints a calendar for any month between 1 A.D. And 9999 A.D. It uses a special output formatting technique which allows it to print the entire calendar in less than 22 seconds, while still consuming only 310 bytes of memory.

174 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 2 cards — $2.50

00439-41 : Holidays

This program is designed for use with a Calendar Printout Program and adds to it the ability to print out holidays. In addition to the standard holidays incorporated in the program, it can be configured by the user for birthdays, anniversaries, etc. Printer and program "Calendar" by Oliver Collins needed.

93 Program Steps
Necessary Accessories: Printer and Program "Calendar" by Oliver Collins.

Documentation — $8.00 Cost of 2 cards — $2.50

00691-41 : Date Verifier

Dates are verified using algorithms without logical tests. If not valid an attempt is made to correct (eg 29th Feb 1900 is converted to 28th Feb 1900). Written for Gregorian calendar but easily converted to other systems - eg 365 day year. Uses: verifying input dates, calculations of dividend dates and durations.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00764-41 : Islamic Calendar

This program converts any civil date (Anno Dei) to its corresponding Islamic date (after hegira) and also displays the day of week (dow). The Islamic date is displayed numerically or with the month named as an option. This program is an adaptation of program 60124 (UPLE) written for HP 67/97 and includes the 400 year correction.

336 Program Steps
Necessary Accessories: One Memory Module. Printer and Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

00786-41 : Continuous Calendar

This program generates a full calendar for any given month between Oct. 5, 1582 and Dec. 1, 2499. Calendar is displayed as a continuously running string of date/day characters along with a leap year annunciator. Using printer, calendar is printed in a nice, easy to read format, with display off.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00980-41 : Day of Week

Calculate day of week (dow) for any date, A.D. Or B.C., Gregorian (GCD) or Julian (JCD) calendar date. The program uses no data registers.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01031-41 : Complete Holidays

After "telling" the calculator the year you want, all holidays: national, Christian and Jewish are read out as requested, in the form most easily understood (i.e. February 18, 1985). In addition, all holidays of any specified year can be displayed (and printed if desired) in approximate chronological order.

665 Program Steps
Necessary Accessories: None

Documentation — $14.00 Cost of 10 cards — $12.50

01090-41 : Calendar Date to Julian Day No.

This program converts any calendar date to Julian day number; converts any Julian day number to correct calendar date. Determines day of week. Valid for any date from January 1, 4713 B.C. A.D. or B.C. Julian or Gregorian calendar, to any future date for which the Gregorian calendar applies without modification.

275 Program Steps
Necessary Accessories: One Memory Module and Printer. Card Reader or Wand desirable.

Documentation — $12.00 Cost of 3 cards — $3.75

01135-41 : 2600 Year Calendar

This program provides a 2,600-year calendar, correct from March 1, 1500 to Feb. 28, 4100. It gives the number of days between any two dates or the date of a given number of days before or after a specified date. It gives the Julian day and day of week for any date, switches over from the Julian to Gregorian calendar after Oct. 4, 1582 and converts Julian days to calendar dates. It also gives the day of the year and the remaining days in the year. The routine rejects invalid dates and dates outside of its range.

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01327-41 : Calendars

Calculates Leap Year tec, prints a calendar AD 100 to 4,000, any year and any number of months. Solves your past, present and future calendar needs. Also the same in Julian old style, AD. to 4,200, for comparison chronology, i.e., history, documents, prophesies etc.

Necessary Accessories: One Memory Module and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

01347-41 : Complete Christian-Era Calendar

Performs calendar functions from Jan. 1, A.D., through Dec. 31, 4903, the entire period of the Christian-Era Calendar that can be calculated with any certainty. Program allows for both the Augustan and Gregorian corrections and computes Julian day, days between dates, day of week, and date of a specified number of days before or after a given date. Rejects invalid dates.

598 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

01356-41 : Ten-Billion Year Calendar with Date Stack

A ten-billion year Gregorian (current) calendar with input date selectively yielding: day (alpha name); corresponding Julian date; numbers unique to the date; input date, or corrected date for invalid input date. Uses a two-level date stack. Provides days or weeks and days between any two dates in the stack. Alters one date by any number of days in the display.

Necessary Accessories: None

Documentation — $14.00 Cost of 4 cards — $5.00

01421-41 : 27 Million Year Calendar with Date Stack

A 27 million year Gregorian (current) calendar with input date selectively yielding: day (alpha name), Julian date, unique numbers and input date, or corrected date for invalid input date. Uses a two level date stack, provides days and/or weeks and days between dates in stack. Alters one date in stack by number of days in display.

Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01593-41 : The Ultimate Calendar - A.D. & B.C.

Complete calendar from Jan. 1, 45 B.C. to Feb. 28, 4904 A.D., the entire period of the Julio-Gregorian calendar that can be calculated with certainty. Computes days between dates, day of week, day of year, days remaining in the year, date of a number of days before or after a given date, Julian day, and conversion of julian day to calendar date. Invalid dates are rejected. Program allows for Roman errors in inserting leap years between 45 B.C. and 8 B.C. and for both the Augustan and Gregorian corrections.

706 Program Steps
Necessary Accessories: HP-41C requires 3 Memory Modules. Card Reader or Wand useful.

Documentation — $12.00 Cost of 7 cards — $8.75

01614-41 : Print Calendar

This program will generate a complete calendar for a given year. Unique features include a half spacing technique for precise format centering and several unusual programming techniques resulting in the most compact program of this type to date. Only one global label, three local labels and two data registers used.

106 Program Steps
Necessary Accessories: HP-82143A Printer

Documentation — $8.00 Cost of 2 cards — $2.50

01759-41 : Calendar - Short Form

Ideal 200-year calendar for someone who just wants a short stand-alone program or one to use as a subroutine for days between dates, date of a given number of days before or after a given date, plus day of week. Easy to use, fast, and easy-to-read display but a minimum of "gingerbread". Results displayed in one of following forms: DAYS=123 or 4,12,1982 MON. Valid from March 1, 1900, through February 28, 2100.

188 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01844-41 : Select Calendar Number from Gregorian or Julian Input Year

For any Gregorian or Julian input year from ten billion BC to ten billion AD the program will select which of the fourteen possible calendars should be used. Julian calendar answers are distinguished with a "*" in the display answer.

100 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01872-41 : Calendars

Calculates and prints a calendar for a given year, and a single or any number of months, AD.0 to AD.4000. Prints 1 year within 1 Min 45 Sec. Also a Julian Calendar with the same options AD.0 to AD.4200, for chronological history documents, etc. Can function without a printer.

213 Program Steps
Necessary Accessories: Printer, 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01919-41 : Astronomical Calendar

This one card program uses a unique "matched pair" of algorithms devised by the author to perform conversions between Gregorian calendar dates (1 March 0000 to 31 December 9999 inclusive) and dates in the astronomical calendar (Julian days). Conversions in both directions take only about 2 seconds.

122 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01927-41 : Annual Calendar Printout

This program gives a neat printout of a calendar for any year between 1900 and 2099.

233 Program Steps
Necessary Accessories: 82162 printer, 1 memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

01944-41 : 20-Billion Year Gregorian/Julian Calendar w/Date Conversion

Accepts either Gregorian or Julian input dates from 10 billion BC to 10 billion AD and gives day name and repeats the input date. On request, the corresponding date on the other calendar system is provided. A date may be altered by any number of days. The number of days between the last two input dates may be determined. Program indicates which of 14 possible calendars is to be used for any year. Corrects invalid input dates to a valid date; gives astronomical Julian Day Numbers; and several other features.

647 Program Steps
Necessary Accessories: Two Memory Modules (or Quad)

Documentation — $16.00 Cost of 5 cards — $6.25

01949-41 : Religious Calendar (O'Beirne's Algorithm)

For Gregorian calendar years in the period 1901 to 2099 inculsive, this program uses a modified version of O'Beirne's Easter algorithm to compute the dates of Septuagesima Sunday, Ash Wednesday, Quadragesima Sunday, Passion Sunday, Palm Sunday, Easter Sunday, Rogation Sunday, Whit Sunday, Trinity Sunday and Corpus Christi.

146 Program Steps
Necessary Accessories: None (A card reader is useful)

Documentation — $12.00 Cost of 2 cards — $2.50

01963-41 : Working Days Between Dates

Program determines the number of working days between dates in one calendar year given user supplied holiday dates. The program assumes a five-day week, but may be modified for other work week lengths.

132 Program Steps
Necessary Accessories: Time Module (Card Reader useful)

Documentation — $8.00 Cost of 1 card — $1.25

02089-41 : New Moon and Full Moon Day of Month (Improved)

Computes day and time (GMT) for new or full moon given any month between 1 AD and 2500 AD.

119 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02222-41 : Jewish-Common Era Calendar Conversions

Converts between dates on the Jewish calendar and the Julian/Gregorian calendar. Provides days between dates, Julian day, date of a given number of days before or after a known date, day of week, and converts Julian day to both Jewish and Julian/Gregorian date. Valid from Jan. 1, 1 to Feb. 28, 4904 C.E. (A.D >) or Tebet 16, 3761 to Adar 6, 8664 A.M.

1012 Program Steps
Necessary Accessories: Quad memory for the HP-41C; Extended Functions. Printer optional.

Documentation — $14.00 Cost of 9 cards — $11.25

02259-41 : Date: Counting by Weekdays

Calculates the date and day of the week for a given number of weekdays before or after a given date. Valid from March 1, 1900, through February 28, 2100. May be used as a main program or subroutine.

307 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02299-41 : Supercalendar: Seven Million Days - Past, Present & Future

Practical, hard-working calendar valid from 9999 B.C. to 9999 A.D. Dates can be entered U.S., British, or Continental style. Computes days between dates, date of a number of days before or after a date, Julian day as well as modified Julian day, modified Julian day or Julian day to calendar date, day of week, and converts Julian calendar to Gregorian and vice versa only when valid. Uses the modern chronologer's method for projecting the Julian calendar backwards. Invalid dates and dates outside of its range are rejected.

521 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 5 cards — $6.25

02419-41 : Tropical Year Calculations

Astronomers, chronologists, and calendar enthusiasts now have an easy program to calculate the length of the tropical year for any year past or present. Program also calculates accumulated tropical years from 1582 to any year in the future or from 1900 to any year in the past (down to 900 A.D.). High accuracy is maintained to 10 decimal places, whatever the length of the integer (representing whole days). This feature allows checking the accuracy of the mean year of any calendar system with high precision.

164 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02462-41 : Calendar Printer, for any month of any year

Ever try to plan ahead or wonder what day a certain date fell on?, but you couldn't find a calendar when you needed it, especially for the past. Well, you'll never have that problem again with Calendar Printer. Given any year, (0001 A.D. - the future) and any month of that year, this program will compute and print a calendar for that month. The program will even mark out special days with an asterisk to remind you of its importance.

240 Program Steps
Necessary Accessories: One memory module and Printer. Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02506-41 : Calendar Printout Using 82905B Impact Printer

This program gives a printout of a calendar for any year between 1900 and 2099 using the 82905B Impact Printer.

282 Program Steps
Necessary Accessories: One memory module, 82182A Time Module, 82160A HP-IL module, 82905B Impact Printer.

Documentation — $12.00 Cost of 3 cards — $3.75

02529-41 : Working Days Calendar Functions

This program computes the number of inclusive working days between two dates. Or, the last date given a specifed start date and number of inclusive days. User selects the number of working days per week to be considered in making calculations.

139 Program Steps
Necessary Accessories: Time Module

Documentation — $8.00 Cost of 2 cards — $2.50

02531-41 : Worldwide Calendar and Time

Calculates Julian day corrected for local mean time and provides universal time for date and local mean time for any other point on the globe. Converts Julian day to local date and time and provides day of week and modified Julian day as well as days (and fractional days) between dates as well as the date of a given number of days (and fractional days) before or after a given date. Valid from January 1, 4713 B.C. to December 31, 9999 A.D. Input and output can be American or European style as desired. Input accuracy is up to 10 decimal places for Julian day. May be used with or without a printer.

860 Program Steps
Necessary Accessories: Quad module. Card Reader or Wand recommended.

Documentation — $14.00 Cost of 8 cards — $10.00

02625-41 : Date Calculator

Program DAY will return the data of a specified day in one of the following formats: +n days, -n days, dd, mm (first occurance of data, month), mm/dd, day (first occurance of weekday), day+n (n'th occurance of weekday) and day-n (n'th occurance of weekday, backwards in time). Output from DAY is in ALPHA (as seen when DATE is executed manually) and in X, both in DMY or MDY format.

160 Program Steps
Necessary Accessories: Time module and extended functions module

Documentation — $8.00 Cost of 2 cards — $2.50

02680-41 : Calculation of Easter Sunday

This program calculates the date of Easter Sunday for any year of the Gregorian Calendar from 1583 onward. A historical abstract, related points of interest, and one alternate method are given.

169 Program Steps
Necessary Accessories: Card reader and printer optional

Documentation — $8.00 Cost of 2 cards — $2.50

02768-41 : DOY and M-D

First program converts date from MD (Month-Day) or MDY (also DM or DMY) format to DOY (Day of Year). Second program converts date from DOY (Day of Year) to M-D (Month-Day) or D-M format. Uses Time Module functions for increased speed. Checks for errors on input, allows for leap years. Uses only the stack registers.

118 Program Steps
Necessary Accessories: Time module or HP-41CX

Documentation — $12.00 Cost of 2 cards — $2.50

03034-41 : Epact & Golden Number

The epact has been solved! From the "involved" tables originally devised by Luigi Lilio, designer of the Gregorian calendar, now comes an HP-41 program to calculate the epact for any year from 1 A.D. to 9999 A.D. Before 1583, theDionysian formula is used while after that, Lilio's. Also included is the golden number for any year in the Christian era (in Roman or Arabic numerals). The epact - the age of the moon on January 1 - is used to calculate the date of Easter and other holidays of the Christian church and can even be used to calculate Chinese New Year and the Vietnamese Tet holiday.

134 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

03435-41 : Days Between Dates

This program calculates the days between two dates. The user may base the calculation on 360 or 305/6 days per year. Only the stack is used for the calculation.

115 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 1 card — $1.25

P204 Chronology Time

00318-41 : Hours/Min/Sec/Frames Arithmetic

This program performs time arithmetic with numbers in the form hh.mmssff where the frames used are those of the American NTSC television system, equal to 1/30th of a second. Program uses non-drop (consecutive) frames. Useful in keeping track of program times in editing videotape.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00428-41 : Timer

The program modifies the HP-41C in a silent or second beeping timer that can count up or down from any initial value. This program can not be used where the time has to be known accurately, since timing varies somewhat.

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00481-41 : World Time Converter

This program computes time in 22 other time zones of the world given time and a particular time zone. It also gives keys to the time in 29 other cities besides those 22 the HP flashes. Output is given in hours and minutes with AM/PM indicator and date. The program has been designed for convenience. Once a known time and a known city/time zone are entered, time in the 22 other zones can be determined without the need to repeatedly key in variables.

190 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00482-41 : Timetable

This program sorts, tests and displays the input data according to the beginning and duration times. Events are displayed in timetable form in ascending order, with each day displayed separately, signaling if two events overlap. This program is an excellent aid for making college timetables, train schedules, travel plans, or any other time-dependent schedules.

231 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00508-41 : Sunrise, Sunset and Twilight from 1900

Sunrise, sunset, local apparent noon and astronomical, nautical and civil twilight times are calculated from the geocentric orbital data for the sun for standard time zones automatically in either standard or daylight-saving time. In the "exact" mode all times agree with the ephemeris to within one minute.

400 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $14.00 Cost of 5 cards — $6.25

00579-41 : Sundial

This program computes the time of day (accurate to better than a minute of time) from either the altitude or azimuth of the sun. A routine is included to correct for atmospheric refraction.

258 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01269-41 : Appointment Calendar

An interactive program using mass storage or the card reader to create files of upcoming appointments and reminders. Appointments may be added or edited at any time and either viewed, printed or set as alarms interactively or in a group. The program prints out a memo page style calendar starting at any date. Using mass storage, the calculator can search the database automatically every morning and set the alarms for the day without the presence of the user. Program will not stop even if the printer is turned off.

359 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 6 cards — $7.50

01270-41 : World Time Converter

WTIME is a program for time conversion between a home and a destination city with different time offsets from Greenwich Mean Time. It can also set alarms in either the home or destination city. Alarms earlier than the current time are set for the next day.

110 Program Steps
Necessary Accessories: Time Module

Documentation — $8.00 Cost of 1 card — $1.25

01271-41 : Exercise Monitor

This program may be used for timing periods of aerobic exercise preceded by a pulse count and followed by pulse counts at one and five minute intervals to monitor recovery. It can additionally time a warmup period and overall time limit. Runners can input the various distance markers for any course and overall time goal for the course and alarms will signal when each marker should be reached to remain on goal. Splits may be stored and later "replayed" and compared to goals. The course is easily set up before the exercise period and remains in the 41C till ready.

260 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 3 cards — $3.75

01272-41 : Automobile Trip Computer and Speed Calibration

Two programs designed to work together to perform timing functions on automobile trips. Speed calibration program may also be used as a subroutine by other programs or independently. Users of the trip program can calculate their estimated time of arrival and required speed to a planned destination. The program has routines for setting periodic alarms, converting tachometer RPMs to speed in a given gear & correcting a speedometer reading. Alarms may be set, cleared, changed or temporarily silenced at any time. A feature of the program is its ability to be interrupted & restarted as often as needed. Time-outs are also provided.

378 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 5 cards — $6.25

01273-41 : Four-Channel Controller

Manages independent control of four timers or "channels" with their own alpha names, time, data and note files and simple message alarms or user-defined control alarms. May be used for industrial control, interactive data storage, reminders or general time keeping. Programs and alarm signals may be deleted or added at any time. Data is recalled and printed by channel number. Program additionally synchronizes the stopwatch to any channel for high accuracy timing and outputs a pointer value that will avoid storing splits over any important data. Provides nine registers for user programs.

245 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 4 cards — $5.00

01274-41 : Logbook

Logbook uses the HP82180A Extended Functions Module to store the names and times worked for accounts that are billed at an hourly rate. Purchase order numbers, billing codes and descriptive remarks can be stored without regards to length or format. The starting time and date for each account is saved in an ASCII file and requires no data registers to maintain. Files can be viewed or printed at any time and total time worked can be updated on a daily basis. Access to stored information is by account name or the first few letters of the name. Useful in professional offices and any application where time must be recorded and stored in an easy to use format.

205 Program Steps
Necessary Accessories: Tme Module and Extended Functions Module

Documentation — $12.00 Cost of 2 cards — $2.50

01276-41 : Playback Programmable Timer

A timer interactively programmed by users to playback a series of alpha messages or prompts up to 12 characters in length for specified lengths of time. Optionally, user-defined programs may be run during any segment of the playback sequence. User programs may scroll longer displays, print or perform any desired functions. Periodic tones of frequencies 0-9 may be placed to accompany messages. The program's features include routines to store, recall, save and edit playback sequences and is compatible with any HP-41C storage medium. Two modes are available: manual stop-start or auto sequence w/out pause through entire playback. Modes chosen when intializing.

275 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 4 cards — $5.00

01537-41 : Time Zone Convertor

Converts local time in any time zone to time in any other time zone on earth or to GMT. Besides the 25 standard time zones, all major areas with half-hour differentials can be calculated. GMT display is on a 24-hour clock while others are on a 12-hour clock with a.m. or p.m. identified. Display also indicates whether new time is the same day as input, the next day, or the day before. Program has been designed for simplicity of operation and operational keys have been spaced to minimize risk of error. Rejects nonsense times.

313 Program Steps
Necessary Accessories: HP-41C requires 2 Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01632-41 : Two Month Time

This program performs all calculations involving date/time in any two month interval, both forward and backward with times in either HR or HMS format, AM/24 HR or PM format. Needless repetitive key strokes are avoided.

267 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01646-41 : Time Totaler

User enters hours, minutes, seconds in 1 of 3 chosen formats. Program displays number entries and total time entered or time remaining. User sums entries and time displayed. Displays data summed, total time entered, original starting time, and last entry. User can abort last entry. Stores data for 16 runs. Can resume any run or merge stored data with current run. Scrolls or displays stored data; reads and writes data using magnetic cards.

615 Program Steps
Necessary Accessories: Quad Memory Module for HP41-C. Card Reader and Printer highly recommended for full use of program's features.

Documentation — $16.00 Cost of 6 cards — $7.50

01865-41 : Analemmic Sundial Design

Given the observer's Latitude and Longitude, this program calculates the layout of an Analemmic Sundial of the desired size. This movable-Gnomon design gives times accurate to one minute (Limited only by the Sundial dimensions and Gnomon shadow width).

227 Program Steps
Necessary Accessories: One Memory Module; Card Reader desirable.

Documentation — $12.00 Cost of 3 cards — $3.75

01943-41 : Long Distance Time and Charges

Using the HP82182A Time Module, this program shows a dynamic display of long distance time and charges as you talk. Features include a log of each call, cumulative totals, tax calculation, use of calculator while talking, finding current rate period, converting time and charges, direct dial or operator assisted calls.

190 Program Steps
Necessary Accessories: HP82182A Time Module; (Printer is useful)

Documentation — $12.00 Cost of 2 cards — $2.50

02141-41 : Lawn Watering Timer

The program determines the rate of flow from two sprinkler systems. Given the rate of evapotranspiration the optimum lawn watering time is calculated. Alarms are set and reset to indicate the need to either move or shut off the sprinkler. A nomograph for computing evapotranspiration is included.

154 Program Steps
Necessary Accessories: HP-82182A Time Module

Documentation — $12.00 Cost of 2 cards — $2.50

02281-41 : Student Exam Timer

You input the time that your exam is due, a relative weighting of each problem, and press R/S when you start on the first problem. The program divides the time period between the problems, and sets alarms to remind you when to go on to the next problem.

133 Program Steps
Necessary Accessories: HP 821824 Time Module

Documentation — $8.00 Cost of 2 cards — $2.50

02292-41 : Automobile Trip Timer

The program estimates arrival time and date given odometer readings. Mile timer uses tones to indicate velocity above speed limit, useful for nightime driving. Simple global labels control program execution for determination of current average velocity and time and date of arrival. The stopwatch is not used in the program.

223 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 2 cards — $2.50

02419-41 : Tropical Year Calculations

Astronomers, chronologists, and calendar enthusiasts now have an easy program to calculate the length of the tropical year for any year past or present. Program also calculates accumulated tropical years from 1582 to any year in the future or from 1900 to any year in the past (down to 900 A.D.). High accuracy is maintained to 10 decimal places, whatever the length of the integer (representing whole days). This feature allows checking the accuracy of the mean year of any calendar system with high precision.

164 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02531-41 : Worldwide Calendar and Time

Calculates Julian day corrected for local mean time and provides universal time for date and local mean time for any other point on the globe. Converts Julian day to local date and time and provides day of week and modified Julian day as well as days (and fractional days) between dates as well as the date of a given number of days (and fractional days) before or after a given date. Valid from January 1, 4713 B.C. to December 31, 9999 A.D. Input and output can be American or European style as desired. Input accuracy is up to 10 decimal places for Julian day. May be used with or without a printer.

860 Program Steps
Necessary Accessories: Quad module. Card Reader or Wand recommended.

Documentation — $14.00 Cost of 8 cards — $10.00

02652-41 : Astronomical Clock

Set of two short and useful programs. The first one, converts your calculator in a sidereal clock, that displays continuously Local Sidereal Time with an error of less than 1,5 sec. The second program, computes and recomputes Local Hour Angle of a celestial body, given its Right Ascension. The programs are independent, but they can fit together in the basic HP-41C.

110 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 2 cards — $2.50

02782-41 : Telephone Call Monitor for the United Kingdom

Displays cost and duration of direct dialed calls from the United Kingdom taking account of the different types of inland and international calls. Program checks if call is being made during cheap/standard/peak times. Extended memory maintains all international dialing code and a large number of inland codes so that search can be made of dialing code to establish charge band. Daily cumulative totals held in memory and transferred periodically to magnetic card.

620 Program Steps
Necessary Accessories: transfer and permanent storage. Quad Memory, Time Module, X Functions. Card Reader optional for data

Documentation — $16.00 Cost of 9 cards — $11.25

02798-41 : High School Debate Timer

This program "knows" the sequence and duration of high school debates (8 minute constructives, 4 minute rebuttals, 3 minute cross examinations, and 5 minutes of prep time). When the program is run, it flashes the time remaining in the speech, cross-ex, or prep time every 2 or 3 seconds. The user advances it to the next speech by simply pressing any alpha character at the end of the speech.

170 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 2 cards — $2.50

02821-41 : Apparent Sidereal Time and Obliquity 2000.0

Program similar to 01548-41 one, but including the new constant values for the equinox 2000.0; it gives, for any place, apparent and mean sidereal time and equation of equinoxes at ± 0.01 sec, Julian Day at ± 0.00001 of a day less than one second) and apparent obliquity at ± 0.1 arc second. It also gives the mean time from apparent or mean sidereal time.

382 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02838-41 : Travel Time Measurement and Analysis

Carry the HP-41 and document urban travel time, locations, odometer and vehicle information. Ten registers are filled per trip, thirteen trips can be stored before a dump to cards. The analysis routine prints data, finds speed and does a linear regression for any set of trips.

502 Program Steps
Necessary Accessories: Quad Memory, time module, printer and card reader.

Documentation — $14.00 Cost of 5 cards — $6.25

02893-41 : Time Counter

This program was especially designed for people who record music. It will conveniently add and subtract times, store all entries for verification, and display time remaining. It also allows for easy correction and for gap time. These functions are just some of the convenient operations in this revolutionary program.

228 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02929-41 : Trip Computer

This program provides data for automobile trips of any length. The user only needs to input distances as either odometer readings or increments to calculate current elapsed time, average speed, and distance, all with and without pauses. Hours until and data and time at given distance, average speed necessary for given distance at given time, and distance at a given time may also be calculated. Off-course pauses of time and distance are provided.

290 Program Steps
Necessary Accessories: One memory module and Time module

Documentation — $12.00 Cost of 3 cards — $3.75

03335-41 : Mass Storage Time and Date

The file system established by the HP 82160A HP-IL Module on a mass storage device does not allow recording the time and date of creation of a file, along with its name, type and length. However, directory space reserved for this type of information does exist and is currently used by other controllers. Now, with the WRT function provided by this program, you can easily store time and other date of a new file, and retrieve this information with the functions FLTIME and FLDATE.

351 Program Steps
Necessary Accessories: Extended I/O or HP-IL Development Module; HP-IL Module; Mass storage device. Time Module useful.

Documentation — $12.00 Cost of 4 cards — $5.00

P300 Marine Navigation

00347-41 : Lan Error Minimization

Given a sequence of sun shots made before, during and after local apparent Noon, the program determines the most likely time of Lan and the sextant altitude at Lan by fitting a parabola to the data with the mean square error minimized and the slope of the directrix constrained to be infinite.

180 Program Steps
Necessary Accessories: One Memory Module for the HP-41C. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

00511-41 : Navigation Package

Program solves celestial sight of any heavenly body and gives line of position. Contains almanac for sun and stars. Nautical almanac required for moon and planets. Solves great circle problem and dead reckoning sailings. Uses 722 steps, and only eight storage registers. Easy to operate with prompting and automatic execution.

722 Program Steps
Necessary Accessories: Two Memory Modules. Printer and Card Reader optional.

Documentation — $14.00 Cost of 10 cards — $12.50

00638-41 : Celestial Sight Reduction

This program determines the computed altitude and azimuth for each of two celestial bodies then solves for and prints out the latitude and longitude of the fix. Provision is made not only for insertion of H0 instead of H3 but also for correction of movement of observer between observations.

374 Program Steps
Necessary Accessories: Two Memory Modules and Printer.

Documentation — $12.00 Cost of 5 cards — $6.25

00982-41 : Navpac for Yachtsmen

A program designed for yachtsmen combining the HP 41C Navpac module, its splendid features and long term almanac into routines giving L.O.P.S., time mer. passage, latitude, time body rises/sets, azimuth at rise, long if lat. known and long. from time of sun rise/set.

516 Program Steps
Necessary Accessories: Three Memory Modules, HP-41C Navpac Module. Printer optional.

Documentation — $14.00 Cost of 5 cards — $6.25

01145-41 : Star Identifier and Celestial Body Locator

Third of several programs for 41C Navigation Pac, it computes SHA and DEC of unknown star to compare with star chart; or LHA and GHA of Aries for use with star finder; has angle reduction routine; precomputes HC and ZN of key celestial bodies; uses 10 41C Nav. Pac sub-routines.

137 Program Steps
Necessary Accessories: 41C Nav. Pac and One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01146-41 : Local Apparent Noon

This is the second of several programs intended to be used with the 41C Navigation Pac. It computes the latitude and longitude at local apparent noon; correction for height of eye (DIP); sextant corrections for Sun; and precomputes HC and ZN. It uses 12 41C Nav. Pac. subroutines, including "RM".

136 Program Steps
Necessary Accessories: 41C Nav. Pac and One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01147-41 : Voyage Planner

This is the first of several programs intended to be used with the 41C Navigation Pac. It computes distance, speed, time-eta, speed by wooden block, date-time, distance to or beyond horizon, and hull speed. It uses three subroutines from the 41C Nav. Pac.

98 Program Steps
Necessary Accessories: 41C Nav. Pac and Printer

Documentation — $8.00 Cost of 1 card — $1.25

01148-41 : Lines of Position

This is the fourth of several programs for use with the 41C Navigation Pac. It permits traverse (composite) sailing and determination of position from one sextant shot or from distance off beam or distance by vertical angle. It uses three 41C Nav. Pac. subroutines.

184 Program Steps
Necessary Accessories: One Memory Module. Card Reader necessary for "Drl" - otherwise optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01284-41 : Sight Reduction and Most Probable Position

Given the dead reckoning position coordinates of latitude and longitude, the Greenwich hour angle and declination from the nautical almanac. Calculate the altitude (HC) and azimuth (ZN) of a celestial body. Given the corrected sextant observed altitude (HO) calculate the altitude intercept, the latitude and longitude of the most probable position from a single celestial observation. Accepts and displays data in degrees, minutes and tenths of minutes, degrees and tenths of degrees of ZN, nautical miles and tenths of miles of altitude intercept. Can also be used for star identification.

181 Program Steps
Necessary Accessories: Card Reader and Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01372-41 : Ragman

Program finds tacking angle, modified wind speed and direction, course to steer on opposite tack, amount of time to spend on each tack to reach the mark. It also finds the speed and distance made good on each tack as well as total time and distance to reach the mark. It also provides for proper solution if conditions change after beginning the first tack.

412 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

01373-41 : The Sailings

Program solves all basic Sailings problems; crosses the IDL and/or Equator; computes Great Circle Initial Course and Distance; Lats and Los of vertex; computes L0 of legs at regular intervals with corresponding latitude and the course and distance thereto; and composite sailing with limiting latitude. Program then compares the 5 distances involved.

713 Program Steps
Necessary Accessories: Three memory modules. Printer optional.

Documentation — $12.00 Cost of 6 cards — $7.50

01384-41 : Celestial Fix or Running Fix

Given dead reckoning coordinates of latitude and longitude, Greenwich hour angles, declinations and corrected sextant observed altitudes for two celestial observations. Calculate the coordinates of latitude and longitude for a two body fix or a running fix from the last entered dead reckoning position. The program calculates the computed altitude (HC), azimuth (ZN) and altitude intercept (A) of both observations. Accepts and displays data in degrees, minutes and tenths of minutes, degrees and tenths of degrees of zn, nautical miles and tenths of miles of altitude intercept.

209 Program Steps
Necessary Accessories: Printer and Card Reader optional.

Documentation — $12.00 Cost of 3 cards — $3.75

01419-41 : Tide Predictions

This program computes the times and heights of tide at high and low water, also the times the tide is at a required level and its rate of changes. It evaluates level and rate for any hour of the day.

259 Program Steps
Necessary Accessories: Harmonic constants and daily angles and factors.

Documentation — $12.00 Cost of 2 cards — $2.50

01432-41 : Fix From Two Sextant Readings

Without benefit of any estimate of position, progam derives a fix from GHA and DEC of two bodies and their observed alitudes (HO) and bearings.

382 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

01437-41 : Tide Calculations

An advanced program for determining the height of tide and associated navigation calculations during any 24 hour day. Times and heights of the day's tides are input from tide tables with local corrections. Output starts with corrected heights and times and, with printer, a graph of time vs. height. Subroutines determine clearance under overhead obstructions such as bridges or power lines for specific times (daily plot also available) and keel clearance from the bottom for given times (plot available).

423 Program Steps
Necessary Accessories: 2 Memory Modules. Printer desirable but not required.

Documentation — $12.00 Cost of 5 cards — $6.25

01464-41 : Sunset

This program gives the time or sunrise or sunset at the ship's D.R. latitude and longitude, so the navigator can plan for his star sights.

128 Program Steps
Necessary Accessories: NAV Pac and one Memory Module.

Documentation — $12.00 Cost of 2 cards — $2.50

01709-41 : Automatic Selection Fix

Program derives a fix from a combination of any two of from three to six observations from estimated DR coordinates, using a and Zn from observations of different bodies. Note: This is more friendly than original version of same program.

142 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

01745-41 : Distance and Direction

Computes great circle distance between any two points on the face of the globe including coordinates at the poles or 180 degrees apart and also initial heading in degrees, minutes, and seconds or by mariner's (32-point) compass. Distance is given in nautical miles, statute miles, or kilometers. Can be used with or without a printer.

344 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

01760-41 : Lat/Lon from Sun Rise/Set Times without Sextant or Almanac

Given the month, day, times of sunrise and sunset, and time zone, this program will determine users' latitude and longitude. The solution is derived from the declination analemma for the sun. Input times and LAT/LON outputs are in the format: HH.MM. Alpha prompts and output tags.

154 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01877-41 : Monthly Tide Predictions

31-day tide predictions. Within this period, program computes times, heights at high and low water, evaluates tide height and rate of change at given times, finds times at given height of tide–for all the world. Harmonic constants and daily tidal angles and factors.

470 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

01908-41 : Radar Plotting with Timer

This program plots concurrently 5 radar targets. It returns relative, true course, speed of targets, CPA times, distances and bearings. Your own ship may alter course and speed in the process.With your ship's simulated course and speed alterations, the program forecasts plotted targets CPA times, distances and bearings for the best course-of-action to avoid complex close-quarters situations. No stopwatch is needed. The Time Module feeds times directly to calculations.

339 Program Steps
Necessary Accessories: Time Module
Documentation — $12.00 Cost of 3 cards — $3.75

01910-41 : Man. Radiogoniometer Position Calculations w/3 Measurements

Given position and direction of three broadcasting stations, this program finds possible position of ship and indetermination radius (error).

244 Program Steps
Necessary Accessories: One Memory Module (Printer optional)
Documentation — $14.00 Cost of 2 cards — $2.50

01950-41 : Sunrise, Sunset and Civil, Nautical & Astronomical Twilight

Given DR L, Lo and the year and the date (MM.DD), program will compute Sunrise, Sunset, Nautical, Civil or Astronomical Twilight to within + 2m for any date in the latter half of this century. Useful for Lat between 65 degrees N and 65 degrees S.

233 Program Steps
Necessary Accessories: One Memory Module (Printer optional)
Documentation — $12.00 Cost of 2 cards — $2.50

02204-41 : Fix from Two Objects

Program uses two simultaneous compass bearings on two charted objects to compute the vessel's position at the time of the observation.

161 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02205-41 : Sumner Line of Position

From a single observation of the sun giving GHA, Dec & HO together with the DR Lat, program finds corresponding longitude. Assume a second Lat (10' or 20' more or less than the DR Lat) and get a second corresponding longitude for the other end of the LOP. Note: Program is set to run with Flag 21 clear but will accept Printer without change. It runs equally well with Flag 21 set and Printer on.

103 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02206-41 : Mercator Sailing

Given the Starting Position (L1 & L01) and the destination (L2 & L02), program will compute the TRUE Course and the Distance. If given the starting position and the TRUE Course and distance, it will compute the destination position (L2 & L02). It will cross the Equator and the two meridians of the International Date Line and of Greenwich. Note: While program is set to run with Flag 21 clear, it is also set to run with a printer without any changes necessary. It runs equally well with Flag 21 clear or set - see sample run on page 6 of program documentation.

235 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

02208-41 : Grand Traverse or Round 'Square' Robin

Given the True Course, vessel speed, variation and deviation, program computes Compass Course and Speed Made Good. Then given the starting position, time of start and desired arrival time, it computes the new position (DR). It also keeps track of cumulative distance. Program is unique in that it will 'run down the latitude' with ease. It should be excellent for a Predicted Log Contest.

241 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02209-41 : Rhumb Line Sailing

Given the starting and destination coordinates, program computes Course and Distance. When given new destination coordinates program uses former destination coordinates as new starting coordinates and computes course and distance for that leg. Sums leg distance for total distance. Will do any number of legs.

167 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

02243-41 : Distance off Great Circle Track

Program finds Great Circle Initial Course and Distance. To a Point(3) off Track it will find the closest point thereto on Course (Lx & LOx) and the course and distance from there to Point 3 (Cx3 & Dx3). Also finds distance from Departure to Point X and the percentage of the trip. Program works just as well for Air as for Sea. It is unique in that it saves hundreds of steps by varying the contents of registers and using the same 43 step routine for ten different equations.

318 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02265-41 : Longitude Solution

For centuries navigators vainly sought to determine longitude. This program finds longitude in a few minutes by either of two methods: 1) By determining true latitude from a round of star sights the combining meridian angle with GHA to obtain longitude, or 2) by lunar distance method which will give true time and thus true longitude.

525 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 5 cards — $6.25

02266-41 : Great Circle Sailing

Given starting and destination coordinates, program computes Initial Great Circle Course and Distance; coordinates of the vertex of the Great Circle; coordinates of intermediate points at regular intervals of longitude and the course and distance thereto; and finally the total leg distance as compared to the Great Circle Distance.

393 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02302-41 : Time and Altitude on Prime Vertical

When taking an observation on the prime vertical, the latitude and declination must be of the same name, but declination can be greater or less than latitude of the observer. Program computes the time and altitude on the prime vertical (when lat is more than dec) or time and altitude on nearest approach to PV (when lat is less than dec), so navigator can plan his sights. Program goes on to compute Zn in both cases. Note: Program is set to run with Flag 21 CLEAR BUT will accept Printer without change. When run on Printer program stops only for data entry.

200 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

02361-41 : Great Circle Direction Converted To Mercator Direction

Program converts a radio (great-circle) bearing to a Mercator direction so it can be plotted on a Mercator chart, or it will convert a Mercator direction as measured on a chart to a great-circle bearing. It is unique in that it selects, automatically, from eight choices of plus and minus to determine whether the conversion angle is to be added to or subtracted from the bearing in question.

184 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02479-41 : Off Shore Navigation For Sail Racer/Cruisers

For offshore navigator who must maintain accurate dead reckoning position. Object is to eliminate difficult chart work under sailing conditions. Needs only attention to compass, speed, and time. Program has separate "tide" corrections. Execution of "MK" computes proper sailing heading to any mark given its bearing and distance.

214 Program Steps
Necessary Accessories: One memory module. Card Reader optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02550-41 : Time Solution

Program find the time from a single sight of the sun, or it finds the time when the sun will be on the Prime Vertical so one can work a 'time sight' or when it is necessary to find the longitude.

291 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02635-41 : USPS Navigation Course Checker

Program is designed to check the Student's work sheets in the United States Power Squadrons' Celestial Navigation Courses. In the first part one enters neccesary data and program computes the yellow (Almanac) pages data for comparison with the student's solution. The last three parts compute entries for the HO 229, HP 211 (modified) and calculator solutions for comparison with the student's work sheet.

1074 Program Steps
Necessary Accessories: Four memory modules. Printer highly desirable.
Documentation — $14.00 Cost of 9 cards — $11.25

02651-41 : Local Apparent Noon

Program calculates the local time of the meridian passage of the sun, without the use of an Almanac. The program prompts for the inputs: Latitude, Date and Time Zone, and uses routines from the Navigation Pac. While the latitude is not actually required it is included in the program so that a natural progression from morning sight to noon is maintained.

70 Program Steps
Necessary Accessories: One memory module and Navigation Pac
Documentation — $8.00 Cost of 1 card — $1.25

02696-41 : Continuous Sun Azimuth

This program computes for any date and time and in any position the true azimuth of the sun, and then continuously updates the true azimuth every 40 seconds. The only inputs required are Latitude and Longitude. The program is invaluable for compass adjustment.

40 Program Steps
Necessary Accessories: One memory module, Time Module and Navigation Pac
Documentation — $8.00 Cost of 1 card — $1.25

02697-41 : Sunrise and Sunset

This program calculates the standard time of sunrise or sunset at any position without the use of a Nautical Almanac. Inputs required are: whether sunrise or sunset required, DR latitude, DR longitude, date and time zone. It is useful for planning star sights.

151 Program Steps
Necessary Accessories: One memory module and Navigation Pac
Documentation — $12.00 Cost of 2 cards — $2.50

02786-41 : Sea Passage - Printing Option

Intended as a printing option of program SEA PASSAGE: From stored positions computes and prints RL course, distance both in seamiles and int. nautical miles, accumulated distances sequentially from waypoint to waypoint. Also it computes same information from positions entered from the keyboard.

299 Program Steps
Necessary Accessories: Quad Memory Module with Extended Function/Memory. HP-IL Module and HP 82905B Printer. Program SEA PASSAGE.
Documentation — $16.00 Cost of 11 cards — $13.75

02907-41 : Latitude by Meridian Altitude

The program calculates the latitude from the meridional altitude of the celestial bodies most commonly used by navigators except Polaris and stars below the pole. Inputs required are, Longitude, GMT Date and Time, Height of Eye, Observed altitude, name of body and whether bearing north or south. DR latitude is included to provide compatibility with other programs. It can be entered as 0 degrees.

117 Program Steps
Necessary Accessories: One memory module and Navigation Pac
Documentation — $12.00 Cost of 2 cards — $2.50

02939-41 : Tidal Current Plotting

Given the standard tidal current predictions for any primary or secondary current station from NOAA or Canada Hydrographic tables, this program will develop a full calendar day of graphical representation of current vs. time of day. The program will also correctly represent a modified wave form which occurs in certain types of "hydraulic channels".

927 Program Steps
Necessary Accessories: Quad Memory Module if used with HP-41C, Card Reader, 82162A HP-IL Printer.
Documentation — $14.00 Cost of 8 cards — $10.00

03131-41 : Most Probable Position using the 'Least Square Method'

This program calculates the observer's Most Probable Position (MPP), using the 'Least Square Method'. Required inputs: Course, speed and DR of the vessel. Height of eye of the observer. Date and GMT for the MPP. And, for each observation: GMT and sextant height. Output: MPPLatitude and MPPlongitude. At least 2 observations must be taken.

199 Program Steps
Necessary Accessories: One memory module and HP-41 Navigation module
Documentation — $12.00 Cost of 2 cards — $2.50

03276-41 : Tidal Prediction Curve

This program produces a 24-hour tidal curve using Harmonic Constants from British Admiralty Tide Tables.

183 Program Steps
Necessary Accessories: HP-41c, one Ram, a printer.
Documentation — $12.00 Cost of 2 cards — $2.50

03277-41 : Coriolis Force on ULCC's

This program calculates the coriolis force on Ultra Large Crude Carriers (ULCC'S) and the drift and set caused by this force. The program is designed for ease of operation by including ship's length and length x beam in the program steps.

62 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03345-41 : Traverse Sailing

Using traverse sailing techniques, this program computes the net course and distance made good from initial point to final point after tacking through a number of courses and distances.

31 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25

03518-41 : Sky Map and Compass

For any local position, the program computes the present altitude and azimuth of the sun, moon, navigational planets, and the 58 stars of the Navigation Pac. The celestial position of the displayed object is continuously updated with the internal clock and the calendar of the time module. The program serves as a perpetual map to the heavens, and as a means for establishing direction and compass adjustment at night as well as in daytime.

165 Program Steps
Necessary Accessories: Navigation Pac, Time Module, one memory module.
Documentation — $12.00 Cost of 2 cards — $2.50

03583-41 : Astronomical Sight Reductions

This program is an important improvement on the program "Sight" in the Navigation Pac. It avoids having to repeat each step of the program when several bodies are observed at about the same time.

125 Program Steps
Necessary Accessories: Navigation Module
Documentation — $8.00 Cost of 2 cards — $2.50

P302 Marine Navigation Ship Stability

00534-41 : Tanker Loading, Plot of Cargo Stress on Ship and Tanker Drafts

Three programs. The first program will load a bulk liquid tanker. User enters the tons of cargo to be loaded or unloaded (a negative number), in what tank the cargo is to go, and the factor for that tank. Program will output the total displacement, trim numeral, whether the ship is hogging or sagging and by what factor.

The second program will plot a curve of the stress placed on the ship by the cargo loaded. It will also indicate whether the ship is down by the bow or stern.

For the third program, the user enters the forward and after factors for each tank and loads the bunkers and their factors also. The program displays the forward and after draft of the ship in decimal feet.

297 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C. A Printer for the second program.
Documentation — $12.00 Cost of 3 cards — $3.75

00748-41 : Displacement, Trim and Righting Arm Curve for Deck Barge

Given measurable characteristics of any barge and factors for components of load, program computes displacement, draft, trim g m, vcgc and righting arm for various degrees of heel. Righting arm curve is printed.

668 Program Steps
Necessary Accessories: Three Memory Modules and Printer
Documentation — $12.00 Cost of 6 cards — $7.50

01164-41 : Planning Boat Power Prediction

This program predicts horsepower (EHP) requirements for planning craft over a selected range of speeds and LCG locations. It essentially automates the "Savitsky Short Form" procedure. Other output of interest during preliminary design includes trim angle, bare hull and appended resistance and a factor to predict porpoising.

326 Program Steps
Necessary Accessories: One Memory Module and Printer
Documentation — $14.00 Cost of 4 cards — $5.00

01254-41 : 'Respla' Planning Regime

Procedure for: hydrodynamic evaluation of planning hulls in smooth water. Program #3 of the package for the planning regime determines the resistance in lbs & kg for 1. barehull, 2. appendices (keel), 3. superstructure and the a) effective power, b) final power in horsepower.

415 Program Steps
Necessary Accessories: None
Documentation — $16.00 Cost of 18 cards — $22.50

01920-41 : Twin Rudder Settings - Ackermann Principal

You can improve the performance and speed of your catamaran or any boat with twin rudders by setting the rudder angles according to Ackermann geometry. Only three inputs are necessary to find the crosslink length and the tiller head angle. Input and output may be in feet and inches, decimal feet, or meters. Much faster and more accurate than ruler and compass! Program may be used with or without a printer.

261 Program Steps
Necessary Accessories: 1 memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02015-41 : Wind Capsize Point for Multihulls

Calculates the wind capsize point of a multihull sail craft using both the conventional static formula as well as the dynamic formula that allows for gusts of wind. Output is given in knots, miles per hour, and on the Beaufort scale. Input is in tons or pounds, feet and inches, and square feet, according to the correct parameter.

242 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

02934-41 : Nevins's Scantling Rules For Wooden Yachts

Nevin's boatyard at City Island, New York, was considered one of the best in the United States for many years. The late Henry B. Nevins left behind a major contribution to boatbuilding by working out all the different sizes of members and fastenings for a wooden boat's structure. If his rules are strictly adhered to, they will produce an excellently built wooden boat, not too heavy and not too light. This program makes all the necessary calculations based on Nevins's rules when only the diplacement, load waterline, ballast weight and number of keel bolts are entered.

1405 Program Steps
Necessary Accessories: Quad Module, Extended Functions Module, Extended Memory Module and Printer.
Documentation — $16.00 Cost of 19 cards — $23.75

03090-41 : Vessel Stability Calculation

Program can be used for most kinds of vessels to load any cargo (especially for grain loading). User given weights of cargo, fuel, water, stores and height of the center of gravity of cargo components and tanks above keel, Inertial moment of each tank; Volumetric Heeling Moment, Vertical Shifting Moment. Program computes Displacement, KG, GM, Grain Heeling Moment, Correction for Grain Vertical Shifting Moment and Angle of Heel.

284 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 4 cards — $5.00

03131-41 : Most Probable Position using the 'Least Square Method'

This program calculates the observer's Most Probable Position (MPP), using the 'Least Square Method'. Required inputs: Course, speed and DR of the vessel. Height of eye of the observer. Date and GMT for the MPP. And, for each observation: GMT and sextant height. Output: MPPLatitude and MPPlongitude. At least 2 observations must be taken.

199 Program Steps
Necessary Accessories: One memory module and HP-41 Navigation module

Documentation — $12.00 Cost of 2 cards — $2.50

03250-41 : Ship's Stability Calculation

This program calculates a ship's final GM, Trim and final draft. By displaying the vessel's final displacement, the appropriate stability data can be extracted from the ship's tables and entered when requested by the program. Adjustments to tanks, cargo spaces, etc., can be made if desired without the need to re-enter all other data and the new GM, Trim and Draft obtained.

262 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

03276-41 : Tidal Prediction Curve

This program produces a 24-hour tidal curve using Harmonic Constants from British Admiralty Tide Tables.

183 Program Steps
Necessary Accessories: HP-41c, one Ram, a printer.

Documentation — $12.00 Cost of 2 cards — $2.50

P304 Marine Navigation Yachting

00520-41 : Yacht Racing Rules Judge

The program uses a decision tree to determine which yacht should be disqualified in any "right-of-way" situation. Multi-boat situations are not directly covered but may be resolved by solving for two adjacent yachts and iterating. The program will assist both race protest committees and students of Nayru rules.

Necessary Accessories: Three Memory Modules. Printer and Card Reader Desirable.

Documentation — $12.00 Cost of 8 cards — $10.00

01430-41 : Coastal Navigation by Two Bearings

This program uses two bearings, either radio or visual, for known position references as input. The code calculates dead reckoned course, distance to the pre-established destination and the vessel position. The program can use data for the position references from a self composed library.

468 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 9 cards — $11.25

01606-41 : Sailing-Force Plot

Program prompts for beat-angle and produces a plot of relative force provided for varying direction of main sail boom for as many angles as required; then outputs plot of maximum sailing force available at each angle of beat.

72 Program Steps
Necessary Accessories: Peripheral Printer, 82143A.

Documentation — $8.00 Cost of 1 card — $1.25

02015-41 : Wind Capsize Point for Multihulls

Calculates the wind capsize point of a multihull sail craft using both the conventional static formula as well as the dynamic formula that allows for gusts of wind. Output is given in knots, miles per hour, and on the Beaufort scale. Input is in tons or pounds, feet and inches, and square feet, according to the correct parameter.

242 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02232-41 : Tide Calculations Heights, Time & Depth of Water to Low Tide

Input the tide tables and the program will calculate the height of tide at any specified time between high and low water. Also the time at which any specified height is reached can be calculated. If a sounder reading and its time are inputted the depth of water at low tide is calculated. This is a useful feature for the yachtsman. A display routine is included.

186 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02251-41 : PHRF Race Results

Program "LOAD" segment prompts for Sail Number, Division (up to 6), PHRF rating. Rating and DIV. of up to 105 Yachts is entered once. "RESULTS" segment prompts for race course data, then sail number and finish times. A bubble "SORT" is done. Output lists each Yacht, DIV, corrected time from fastest to slowest.

220 Program Steps
Necessary Accessories: Card Reader optional

Documentation — $12.00 Cost of 3 cards — $3.75

02934-41 : Nevins's Scantling Rules For Wooden Yachts

Nevin's boatyard at City Island, New York, was considered one of the best in the United States for many years. The late Henry B. Nevins left behind a major contribution to boatbuilding by working out all the different sizes of members and fastenings for a wooden boat's structure. If his rules are strictly adhered to, they will produce an excellently built wooden boat, not too heavy and not too light. This program makes all the necessary calculations based on Nevins's rules when only the diplacement, load waterline, ballast weight and number of keel bolts are entered.

1405 Program Steps
Necessary Accessories: Quad Module, Extended Functions Module, Extended Memory Module and Printer.

Documentation — $16.00 Cost of 19 cards — $23.75

02944-41 : Herreshoff's Rules for Wooden Yachts

Even to this day, yachtsmen speak with awe about boats designed by Nathanael G Herreshoff ("the Wizard of Bristol") who wrote down his rules for the construction of wooden yachts in 1927. This program calculates Herreshoff's five fundamental factors from the dimensions of the yacht and then provides a printout of the sizes of all the material necessary for building the wooden boat. The program uses an ingenious trick with extended memory to allow for the fact that it would normally be too long for the capacity of the HP-41.

1039 Program Steps
Necessary Accessories: Quad-Four module; Extended Functions module; Extended memory module; HP-IL Loop; HP82162A Printer

Documentation — $16.00 Cost of 15 cards — $18.75

P400 Photography

00918-41 : Vivitar 283 Flash Guide Number & F-Stop Computations

This program computes guide numbers and f-stops for the Vivitar 283 electronic flash, when given inputs for the films ASA number, with provisions for Vivitar wide angle/telephoto filters and the varipower module. This program will also compute f-stop settings for other electronic flashes when given the guide number and distance.

128 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00970-41 : Find Focal Length and Sets Camera Settings for Fixed Object Plane

Find the exact focal length from two known lens settings and reductions for subsequent computing of any other reduction desired, lens and object (copy board) settings. Program designed for fixed object plane process cameras. Fully prompted and labeled. Lens and image plane to reading location delta accounted for in the calculation.

147 Program Steps
Necessary Accessories: Card Reader optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01008-41 : Precision Camera Image Sizing and Exposure Computer

Correct lithographic image sizes ± 0.00005" on the 2 basic types of precision industrial cameras, fixed objective or image. Choose type, enter focal length, reduction, image size, dimension achieved and the dimension desired and you are given the lens and image or object delta. There is also an exposure compensation computer routine that will convert an existing expose at one reduction or enlargement to another completely chain prompted and labeled.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01042-41 : Find Focal Length & Sets Camera Settings for Fixed Image

Find the exact focal length from two known lens setting and reductions for subsequent computing of any other reduction desired, lens and object (copy board) settings. Program designed for fixed image plane industrial process cameras and has full prompts and labels. Lens and object to reading location delta accounted for in calculation.

127 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01172-41 : Slide Performance Rating and Sorting

Program calculates slide score of a single contest and of all contests entered. The slide number of contests entered and overall score is stored. The slide record is printed out in order stored and then ranked from best to worst performance. Data is read to cards for future updating.

156 Program Steps
Necessary Accessories: Card Reader and Printer.

Documentation — $12.00 Cost of 3 cards — $3.75

01283-41 : Solar System Astro-Photography Exposures

This program estimates the exposure necessary to take a picture of various phases of the Moon, solar eclipses and the Sun, and planets Mercury through Uranus. Photo takes full advantage of the 41C's alphanumeric capability. User inputs film speed (ASA#), f-ratio of camera system, and object name.

252 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01286-41 : Enlarger Settings

This program calculates where to set an enlarger head for any combination of negative size, lens focal length, easel height and print size, in terms of an arbitrary scale attached to the column, and provides exposure times for any size print relative to the first one.

80 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01392-41 : B&W Reciprocity Curve Data

Using quadratic curve fitting techniques, this program provides all essential reciprocity effect adjustments in time and development required by kodak professional B&W films as given in tabular and graphical form in Kodak Publication #0-2.

125 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01780-41 : Print Time for Enlargements or Paper Speed Change

Given an initial print time for a specific print size and paper speed, this program calculates the new printing time required when either final print size is to be enlarged/reduced or paper speed is to be changed. Different audio signals for information display and inputs facilitate darkroom use.

73 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01866-41 : Photographer's Log

This program creates an ASCII file in Extended Memory for each roll of film, storing roll number, film type and speed and data for each frame. Minimum per frame data are shutter speed and aperture with a 24-character text routine available as a user option.

219 Program Steps
Necessary Accessories: One Memory Module, Extended Funcitons/Memory Module(s). Printer.

Documentation — $12.00 Cost of 3 cards — $3.75

02067-41 : FDT - Film Developing Timer

This program calculates the development times for six B&W film/developer combinations over a range of temperatures (F or C). It then functions as a timer for the entire processing cycle (in accordance with Kodak Darkroom Dataguide - 6th Ed.) with agitation reminders and drain interval provision. Customization possible.

327 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 4 cards — $5.00

02082-41 : Tungsten Lamp Characteristics

Given the nominal colour temperature and nominal operating voltage of a tungsten filament lamp, this program calculates the colour temperature and relative luminous brightness when used at reduced voltages. The relative spectral intensity may be calculated for any wavelength, for a given colour temperature. NO BAR CODE IS AVAILABLE WITH THIS PROGRAM.

152 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02194-41 : Temperature Correction Filters

Given the colour temperature of the film and the temperature of the light source, the program calculates the mired shift required, the mired filter to give that shift, and the wratten filter equivalents. Very useful for mixing film and light sources.

120 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02203-41 : Manual Electronic Flash Calculator

Program calculates any of the following variables; F/Stop; Flash-to-subject distance; power output ratio (if available) assuming at least one of the variables is known. Allowance can be made for on-flash accessories such as filters, wide-angle diffusers and telephoto attachments provided the manufactures filter factor is known.

139 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02214-41 : Close Up and Depth of Field Solutions

Program calculates the distance, from either camera lens or film plane, to an object so that it will exactly fill the film and calculates the close-up exposure correction, both numerically and as an f stop correction. It also calculates depth of field for any circumstances and the hyperfocal distance.

126 Program Steps
Necessary Accessories: None, but will print output if printer is available

Documentation — $12.00 Cost of 2 cards — $2.50

02224-41 : Development Calculator For Black and White Films

This program enables a photographer to perform calculations involving development time, temperature and negative contrast when processing black- and-white films. The routine uses the method of interchangeable solutions, and may also be used to determine the development number for a particular film/developer combination.

111 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02819-41 : Camera Lens Focus

This is a time saving program for serious photographers meeting a wide variety of subjects at different magnifications. First it establishes the required magnification. Then it finds the image-object distance for the available lens if feasible. Or it suggests the supplemental lens required. It accounts for and reports two special cases with appropriate direction.

138 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

03018-41 : Exposure Times of Increased Photos

This program calculates all the other exposure times of increased photos knowing one status that works: you must find out one exp. time by a manual test.

74 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03563-41 : Darkroom Process Timer

This program serves as a timer for any photographic process; color or black & white, films or papers. The program includes step length, drain, and selectable agitate reminders. It will operate in auto start or manual start mode. It also prompts the user at any time during timing sequence with name of current step or name of the next step, and the time remaining in the current step or the entire process. Extended memory filing functions are also included.

328 Program Steps
Necessary Accessories: 82200A Touchpad Keyboard Overlay.

Documentation — $12.00 Cost of 4 cards — $5.00

03593-41 : Rail View Camera Closeup Settings

This program rapidly converts the Front and Rear Standard positions on the calibrated rail of a studio view camera into lens and meter settings. The actual inputs are: Lens focal length, Front Standard rail position, a figure for acceptable blurring (the circle of confusion) and the first and second Rear Standard rail positions at focus. Lens and meter settings are corrected to actual f-stops and correction factors are automatically calculated into the final outputs.

380 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

P500 Special Information Applications

01014-41 : Two Language Dictionary

This program translates words of one language to a second and viceversa. The program incorporates automatic feed-in of words and review of same. Each magnetic card will hold four maximum 12-letter words and eight maximum 6-letter words of the first language and their corresponding translations.

102 Program Steps
Necessary Accessories: Card Reader necessary if storage of data in cards is desired.

Documentation — $8.00 Cost of 1 card — $1.25

01479-41 : Telephone List

Telephone List - shows all characteristics of a "real world" computer program: file creation, record find, file browse, record change/delete, and file compact/condense. A maximum of 50 names and 50 numbers with area code can be handled.

212 Program Steps
Necessary Accessories: Quad Memory. Printer an advantage, but not essential.

Documentation — $12.00 Cost of 2 cards — $2.50

01553-41 : Greek Alphabet

This program is designed to help fellow HP-41C users who may want to use letters of the Greek alphabet in their own programs, as these are common in Engineering and Mathematics. This program uses "synthetic text" lines to produce non-standard printer characters and "alpha" or "acchr" for the standard printer characters. Use of synthetic functions increases speed and uses less memory than similar program using BLDSPEC printer function.

247 Program Steps
Necessary Accessories: 1 Memory Module, Card Reader (or Wand), Printer.

Documentation — $12.00 Cost of 3 cards — $3.75

01571-41 : Japanese Katakana

This program enables storage and printing of the Japanese Katakana alphabet. Part 1 loads the storage registers, and Part 2 is used to print them.

1089 Program Steps
Necessary Accessories: Quad Memory Modules and Printer (Card Reader optional)

Documentation — $14.00 Cost of 11 cards — $13.75

01599-41 : Address Book

The HP-41C keeps your address files on mag-cards, one track per entry, (name, address, phone #, birthday, and anniversary). The printer gives a handy output but is not required.

111 Program Steps
Necessary Accessories: 1 Memory Module, Card Reader. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

01644-41 : Bar Code Generator

This program, when coupled with knowledge from the 82153-90019 "Create Your Own HP-41 Bar Code" manual, will allow the user to print up to 16 continuous bytes of bar coded information. Required inputs are made as the decimal equivalent of the binary code.

74 Program Steps
Necessary Accessories: HP-IL Module 82160A, HP-Thermal Printer 82162

Documentation — $12.00 Cost of 1 card — $1.25

01921-41 : Phone Directory II

A phone directory which holds up to 98 names and phone numbers (including any area codes). Program will allow deletion of any name, addition of a name, prevent overflow of names, changing of either name, number or both, and uses extensive indirect pointer operation to prevent the need for "packing" names when one is deleted. Documentation covers use of indirect pointers and 3 additional programs are included: Write Data to mag cards, Write Data to cassette tape and 'Scan' data on display or printer.

241 Program Steps
Necessary Accessories: Quad Memory Module and Card Reader (or HP-IL with Digital Cassette Drive)

Documentation — $14.00 Cost of 5 cards — $6.25

02039-41 : Phone Book/Area Codes

Provides permanent phone directory of names/numbers/area codes. Searches for a name and returns number. Up to 12 character name with area code. Convenient prompts. Easy correction. No surprise memory wipes. Not affected by use of main memory registers. Allows total directory review. Program stores in only 33 registers of extended memory.

70 Program Steps
Necessary Accessories: Extended Function/Memory Module

Documentation — $8.00 Cost of 2 cards — $2.50

02127-41 : Key Assignments

These programs are used to maintain and access a set of assignment files in extended memory. The files are used to dynamically reassign specified keys. The programs should be useful for those who: A) Have no card reader; B) Have many user programs assigned to keys; and C) Change key assignments often.

288 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

02154-41 : EDITEX — Text Editor

With this program you can write text with your HP-41 and have complete control of it. It is possible to correct words at any moment and at any point of the text. You can clear words, groups of words, one or more lines, insert new lines and print it totally or partially.

118 Program Steps
Necessary Accessories: Extended Function Module. Extended Memory Modules and Printer are optional.

Documentation — $12.00 Cost of 2 cards — $2.50

02264-41 : Numeric Barcode For the 82162A Printer

This program, when coupled with the HP-IL Printer (82162A), will automatically generate numeric barcode. No knowledge of barcode is required of the user. User simply places number in x and executes bar-dta. The program may also be used as a subroutine.

227 Program Steps
Necessary Accessories: 82160A HP-IL module, 82162A Thermal Printer, Extended Functions module, one memory module if the HP-41C is used.

Documentation — $12.00 Cost of 2 cards — $2.50

02431-41 : Video-Calc

Electronic worksheet for the HP-41C. This program is an adaptation of MicroCalc (01115-41) that uses the Video Interface to produce a 4-column by 5-row micro-spread sheet. The user can input ALPHA data or numerical data in any selected cell, display all cells on video unit or a single cell on the HP-41C. Whole sheet re-calculation is available on command.

396 Program Steps
Necessary Accessories: Two memory modules (for the HP-41C), IL Module, Video-Interface.

Documentation — $12.00 Cost of 4 cards — $5.00

02472-41 : Extended Memory ASCII File Management

This program provides the capability to easily construct ASCII files in extended memory, to record the contents of these files on magnetic cards for future use, and to read them back into extended memory when required.

239 Program Steps
Necessary Accessories: Extended Functions/Memory Module, HP 82180A; Card Reader, 82104A.

Documentation — $12.00 Cost of 3 cards — $3.75

02646-41 : Encode: Calculator Cryptography Made Easy

Although not really a word "game", this program will let you encode or decode longer messages with ease. By using two "keys" (a keyword of up to eight letters, and a number) you can generate a virtually unbreakable personalized code. Message entry is done all at one time in lines of up to 24 letters. The message is then transposed using the keyword and number at a rate of approximately 4 seconds per letter.

195 Program Steps
Necessary Accessories: One memory module and Extended Functions module.

Documentation — $12.00 Cost of 2 cards — $2.50

02772-41 : Printing HP-41 Program Bar Code With HP 82905B Printer

Program will print HP-41 program bar code for any program in memory up to 1400 bytes in length using the HP 82905B 80 column printer. It runs without user intervention after typing in the name of the program to be printed. Printing of bar code of longer programs may require a few hours.

163 Program Steps
Necessary Accessories: HP-41C with X-Functions Module and quad memory modules. HP-IL interface, plotter modules, 82905B printer and Card Reader (or Wand).

Documentation — $12.00 Cost of 2 cards — $2.50

02835-41 : Grinding Mill Power Draw

Program calculates the power draw of a grinding mill (either rod or ball mill) under various operating (wet or dry) and discharge configurations (grate or overflow).

342 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 4 cards — $5.00

02860-41 : "Shackle" Encode/Decode

Using a random number algorithm and your chosen password, "SHACKLE" encodes and writes onto a magnetic card up to 180 characters of text; decodes such cards and displays the original text. Included are comprehensive edit and review features to ease text handling.

411 Program Steps
Necessary Accessories: Two memory modules, X-Functions Module and Card Reader

Documentation — $14.00 Cost of 5 cards — $6.25

03079-41 : Synthetic Programmer

This program makes synthetic programming friendly. User only has to key in decimal codes and the calculator does the rest. It tells him how many dummy bytes to insert and positions itself at the beginning of the program under development.

139 Program Steps
Necessary Accessories: Extended Functions memory module

Documentation — $12.00 Cost of 2 cards — $2.50

03119-41 : ASCII File Viewing and Editing on the 41-CX

Program uses many functions exclusive to the HP-41CX. ASCII files can be viewed by "SST" and "BST" through records in extended memory. The 41CX text editor can be invoked at any time to manipulate a file. Program prompts for alpha input, searches for character string and displays entire record containing string. File resizing is completely automated. Ideal for phone, address and general record keeping files. Additional routines included for mass file printing and file creation.

75 Program Steps
Necessary Accessories: HP-41CX. Printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03125-41 : Dictionary/Data Base

This program maintains a data base consisting of up to 55 records. Each record contains two fields, each of which can hold 12 characters. The program has a "SEARCH" function which allows it to be an electronic dictionary. Given one string, it can search all records for a match and show the second field. For example, a record might hold an English word and its Spanish translation. By specifying the English, the program will print the Spanish. You can INSERT or DELETE records from the Data Base, SAVE and LOAD Data, and SORT by any field. You can also LIST the entire Data Base.

492 Program Steps
Necessary Accessories: Quad RAM and Card Reader

Documentation — $14.00 Cost of 5 cards — $6.25

03144-41 : I.V. Label-Generating Programs

The programs (handheld computer programs for generating labels for selected I.V. (intervaneous) admixtures) were developed based on a hospital pharmacy model preparing large and/or small-volume I.V. admixtures for anywhere from zero to 42 patients daily. The program's objectives are to 1) reduce the time spent and errors occurring in the typing of labels; 2) supplement existing manual systems, and 3) serve as a back-up for existing computerized systems.

936 Program Steps
Necessary Accessories: A manual system for maintaining I.V. profiles; Printer; Card Reader; Maximum Memory

Documentation — $25.00 Cost of 35 cards — $43.75

03229-41 : Questionaire or Interview Response Tabulation 99x260x5

Frequencies of responses are accumulated for up to 99 questionaires of up to 260 questions, each with up to 5 possible answers or no response. Output is 6 counts per question separated within one display or sequential display of percentages. Also for recording structured interview response without paperwork.

180 Program Steps
Necessary Accessories: None. HP-41C may require extra memory modules.

Documentation — $12.00 Cost of 2 cards — $2.50

03246-41 : HP-41/HP-2225B Program Bar Code

This program prints HP-41 program bar code on the HP-2225B ThinkJet Printer.

200 Program Steps
Necessary Accessories: HP-82170A Quad Memory Module, HP-82160A HP-IL Interface Module, HP-82184A Plotter Module, HP-00041-15043 HP-IL Development Module,HP-2225B ThinkJet Printer.

Documentation — $12.00 Cost of 2 cards — $2.50

03249-41 : Telephone Directory

This is a telephone directory program. Phone numbers may be quickly retrieved by indexing on the first few letters of the first or last name. All names and phone numbers can be reviewed. The names and phone numbers are stored in extended memory.

76 Program Steps
Necessary Accessories: Extended Functions Memory Module

Documentation — $12.00 Cost of 1 card — $1.25

03256-41 : K-Means Algorithm

This program assigns vectors of up to eight dimensions into up to eight cluster domains (pattern classes) based on minimization of the squared euclidean distances from all vectors in a cluster domain to the cluster center, using the K-means algorithm. The results are useful in pattern recognition for artificial intelligence.

365 Program Steps
Necessary Accessories: Extended memory module.

Documentation — $12.00 Cost of 3 cards — $3.75

03260-41 : Circle and Pie Graph Chart Calculations

This program uses only the stack. Given one of the following calculates all of the other three. Radius, diameter, circumference or area. It also calculates the information for sector of a circle given either percentage, portion or angle. Uses only the stack with all outputs labeled.

87 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03297-41 : Column Operations and Data Retrieve

Set of programs which gives the HP-41 the power to deal easily with datas that can be framed in a matrix of files and columns: this is any operation among the columns, add up the column elements, input datas file by file or column, by column, classify files automatically or numerically using the elements of a column, search for an element in a column and show the file which contains it, and other features.

670 Program Steps
Necessary Accessories: One memory module for the HP-41C. Printer useful.

Documentation — $16.00 Cost of 8 cards — $10.00

03317-41 : Gunning's Verbal Fog Index

In a text sample, easy words, difficult words, and sentence terminators are tallied by pressing user assigned keys which give a tone feedback to pace data entry. After the first sentence terminator beyond the minimum sample of 100 words, the Fog Index is displayed and, optionally, average sentence length and percentage of difficult words. The index approximates USA high school grade level required to understand the text.

51 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03409-41 : Telephone Directory

This program may be used as a telephone and address directory with the addresses stored in an ASCII file.

117 Program Steps
Necessary Accessories: Extended Functions Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

P502 Special Information Applications Data Bases/Files (non-programs)

02803-41 : Storage Register Manager

Sets up data file with one register per record. Once set up, can add, change, delete, or insert data. R_{00}–R_{08} left for use by calling program. Can also be used as a stand-alone program from the USER mode keyboard. Has routines to pack/unpack data — comes with routines to pack (x, y) pairs into single $x.y$ numbers $(0 \leq (x \text{ or } y) \leq 999.99)$ change these routines to suit your needs. User friendly questions and prompts ensure against mistakes when changing, deleting or inserting.

165 Program Steps
Necessary Accessories: Minimum one memory modulefor the HP-41C.

Documentation — $12.00 Cost of 2 cards — $2.50

P600 Subroutine Packages

01500-41 : Signal Processing - Fast Fourier Transform

Time and frequency domain processing of a signal represented by a sequence of complex numbers is provided as is transformation from one domain to the other. Operations are carried out in place (with optional readout of intermediate results) and can be reiterated in any meaningful sequence. Also provided is a set of simple processing routines, structured for easy addition or substitution of the user's own processing routines. Forward and inverse discrete fourier transformation data held in a defined set of storage registers can be computed.

269 Program Steps
Necessary Accessories: 1 Memory Module (minimum)

Documentation — $14.00 Cost of 8 cards — $10.00

01946-41 : Polynomial Evaluation Utilizing the Math Pac

The POLY routine in the Math Pac suffers from the limitation that the leading coefficient of any polynomial evaluated by the routine must be one. This program corrects this by rewriting the polynomial in its original form. This allows INTG and SOLVE to be used on the polynomial. True evaluation can be performed, and x can be found for any given f(x).

75 Program Steps
Necessary Accessories: HP41 Math Pac - 00041-15003

Documentation — $12.00 Cost of 1 card — $1.25

02168-41 : Video Bar Graph

Bold, legible, easy to read graphs are displayed on your video screen. Complete control of Y and X axis increment. Long graphs can be scrolled on screen. Program includes fast, easy Data Register input. Useful analytical tool for weather, markets, sales, costs, financial, etc., data. Comprehensive comparison at a glance.

344 Program Steps
Necessary Accessories: Two memory modules, HP Interface Loop, Video Interface, Monitor or TV

Documentation — $12.00 Cost of 5 cards — $6.25

02176-41 : Extended Functions Extended

This package is a series of programs that demonstrate some of the many possible uses of the Extended Functions Module. With these programs you can control up to 2000+ flags, move and swap blocks of registers indirectly, create a calculator with a very fast extended stack and an easy-to-use complex number stack, clear specified blocks of registers quickly and give the HP-41 a new display format: FIX-ENG.

429 Program Steps
Necessary Accessories: Extended Functions/Extended memory module + one memory module

Documentation — $14.00 Cost of 6 cards — $7.50

02229-41 : Video Cursor Control and Text-Writing Routines

This program has 24 routines to automate the 1) sending of escape sequences to the video interface (position cursor, scroll through display memory, clear display), and 2) text printing in u.c./l.c. & normal/inverse modes. Alpha cells may be loaded directly, or indirectly from character codes in stack. All routines may be executed manually, are fully subroutinable, and are optimized for execution time. Documentation includes numerous examples.

183 Program Steps
Necessary Accessories: HP-IL module, Video Interface, X-Functions Module, Moniter

Documentation — $12.00 Cost of 3 cards — $3.75

02284-41 : Sort/Merge for Extended Memory ASCII Files

This is a general utility sort program for Extended Memory ASCII files. Sort fields may contain any character except the null byte. Each character is ordered according to its equivalent numeric value. The user must specify the sort field's starting location and length (up to 24 characters long), and whether the sort is to be in ascending or descending order. New records may easily be merged into an already sorted file. A subroutine entry point is also provided.

139 Program Steps
Necessary Accessories: Extended Functions Module

Documentation — $12.00 Cost of 2 cards — $2.50

02286-41 : Tanscendental Equation Solver

A translation of the fortran routine ZEROIN to solve F(X) = 0, combining the certainty of the bisection method and the speed of secant interpolation. This program can be either used interactively or called by other programs.

180 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02464-41 : Multiprinting of Matrices

This program enables multiprinting of matrices. Multiprinting denotes printing on more stripes and then glued these together. The user must input the number of rows and columns, the number of places and the number of decimal places for one number. With this input parameters the user can choose his/her own format for printing. Note that this program is meant as a subroutine.

103 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

02516-41 : Special Functions

This program computes nineteen different special functions of mathematical physics, each with a separate global label, and consumes only 92 registers of program memory, plus five data registers and one flag. Includes: Legendre, Laguerre, Modified Bessel, Hypergeometric, Chebyshev, Hermite, Whittaker and other functions. No prompting — you simply load the stack with indices and an x value.

411 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 3 cards — $3.75

02518-41 : Save and Restore Machine State

Comprises two programs: SSAVE and RESTO. SSAVE saves the states (set or clear) of flags 00-48. RESTO takes SSAVE output as input to: 1. Set flags 00-30. 2. Set display format and No. of digits according to flags 36-41. 3. Set grads, rads, or degrees according to flags 42-43. 4. Set alpha mode on/off according to flag 48.

195 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02795-41 : Video Output Routines: Text-Writing and Special Effects

Customize your video output with this collection of 17 routines: 1) Print strings (up to 24 characters). Tabbed, centered, or right-justified; with normal or inverse characters; in upper or lower case. 2) Make vertical dividers. 3) Make three types of frames ("boxes"). 4) Bring "posters" #1 and #2 into view alternately by random roll up/roll down. These are independent routines, but may be merged with the author's 02229-41 with the overall saving of code. Easy to use, either manually or as subroutines called by your program.

540 Program Steps
Necessary Accessories: HP-IL and X Functions modules; Video Interface and Monitor. Quad memory module if optional Time module is used, else 2 single-density modules.

Documentation — $14.00 Cost of 5 cards — $6.25

03075-41 : Device Independent "Format" Commands

This selection consists of routines which emulate the HP-IL "FMT" command, and extend device formatting to support both the 82143 and 82162 printers, and optionally the 82163 video interface.

34 Program Steps
Necessary Accessories: Two memory modules and Extended Functions Module

Documentation — $12.00 Cost of 4 cards — $5.00

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SCIENCE

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T476	Chemistry — Physical — Spectroscopy
T478	Chemistry — Physical — Thermodynamics
T480	Chemistry — Quantitative Analysis
T500	Geography
T600	Geology
T700	Geophysics
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T900	Physics
T910	Physics — Classical Mechanics
T920	Physics — Nuclear and Atomic Physics
T930	Physics — Optics
T940	Physics — Quantum Mechanics
T950	Physics — Relativity
T960	Physics — Thermal

Documentation only programs include program description, user instruction, sample problem(s), program listing. Barcode is included with 99% of the programs. Documentation prices are listed with each abstract and the additional amount for magnetic cards noted.

Other available media includes 3.5" discs at $3.50/ea or a mini data-cassette at $10.00/ea. The recording charge is $7.50/medium. Several programs may be recorded on one cassette or disc. The cost for recording one or more programs is the same.

These program abstracts were written with the HP-41C in mind. The HP-41CV and HP-41CX have much greater built-in memory than the HP-41C. HP-41CV/CX built-in memory = the HP-41C + 4 memory modules. Depending on the information you have currently stored in your calculator's memory, any of these programs will run on the HP-41CV/CX without added memory needed.

Attention HP-42S owners — 75%–80% of the HP-41 programs will run on the 42S. Remember that you will be manually keying in the program(s), so you might want to steer clear of very long ones (indicated by the number of steps listed). You also cannot use add-ons (pacs, extension modules, or peripherals.) But you have about 20 times the memory of the standard HP-41C.

Necessary accessories may be purchased — new or used — from Solve and Integrate depending on availability.

T000 SCIENCE

01129-41 : Color Science Tristimulus Integration

Given reflectance values at 20 nanometer increments from 400 to 700 nanometers, calculates the CIE tristimulus values x, y, and z. From these values the chromaticity coordinates (sometimes called the trichromatic coefficients) are calculated. After calculating x,y, and z, the munsell value functions vx, vy, and vz are calculated.

289 Program Steps
Necessary Accessories: Two Memory Modules, Card Reader (for fast entry of required numerical data) and Printer

Documentation — $12.00 Cost of 5 cards — $6.25

T100 Atmospheric Sciences

01121-41 : Wind Chill Warnings

Program compiles wind chill temperature (Centigrade or Fahrenheit) from given ambient air temperature (Centigrade or Fahrenheit) and given wind velocity (kilometers or miles per hour). The program displays or prints out the inputs, the wind chill temperature, and information relevant to your physical well being and the advisability of open travel.

244 Program Steps
Necessary Accessories: One Memory Module. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

01265-41 : Emissivity Determination and Computations

Emissivity is a crucial parameter in any computation of heat transfer by thermal radiation. This program provides two methods for determining surface emissivities and also provides a method for determining background radiation. Black body radiation may also be calculated.

184 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01280-41 : Hurricane Tracking

This program uses two successive positions of a hurricane to calculate its speed, direction, distance to you, course to you and travel time to you at current speed.

201 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01722-41 : Mercurial Barometer Corrections

Using Centigrade temperature, uncorrected mercurial barometer readings, instrument corrections, elevation above sea level, average elevation for 100 mile radius, and latitude, this program produces corrected barometric pressure without the use of gravity or temperature correction tables. Readings are given for both millibar and inch scales. Printer is useful.

172 Program Steps
Necessary Accessories: 1 Memory Module (Printer optional)

Documentation — $12.00 Cost of 3 cards — $3.75

02533-41 : Substitute Missing Precipitation Data

Since short breaks in precipitation records are common (instrument failure, observer absence, lost data, etc.), it is often necessary to fill in missing data. This program utilizes five different methods which are in common usage by several agencies to estimate the data at the gauge where the record is missing.

251 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02775-41 : Temperature Measurement System

This program will make thermistor temperature sensor measurements in degrees Celsius or degrees Fahrenheit, and may be graphed or listed as a function of time. The user will be able to define the beginning, end and interval of the measurements. The system will power up and power down at the proper time.

673 Program Steps
Necessary Accessories: HP-41CV, HP-IL Module, Time Module, Printer, Multimeter, Thermistor Temperature Sensor (5000 OHM at 25 degrees Celsius).

Documentation — $14.00 Cost of 10 cards — $12.50

02868-41 : Wind Data Summary

Resultant (prevailing) wind direction, resultant run, resultant velocity, total run, mean velocity, and steadiness ratio are calculated for wind data obtained in the form of miles or kilometres of wind travel by eight cardinal and intercardinal directions for a time period of some hours (usually 24).

228 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 5 cards — $6.25

03156-41 : Weather Forecaster

This program produces 12 hour weather forecasts including predicted high and low temperatures. The user enters month, time, temperature, barometer, and cloud information. The program is based on a unique combination of two scientifically valid but independent single station analysis systems. The program is regionalized for 5 geographic areas. BARCODE IS NOT AVAILABLE FOR THIS PROGRAM.

849 Program Steps
Necessary Accessories: HP-41CV or HP-41C with four memory modules or 1 Quad memory module

Documentation — $16.00 Cost of 55 cards — $68.75

T200 Astronomy

00409-41 : Siderial Time & Polaris Position

This program accurately computes local siderial time and determines the position of polaris in terms of astronomical coordinates and angular relationship to celestial north pole. Also yields universal time and Julian date. Inputs are local longitude, time, and date. Use of alpha mode simplifies operation and clarifies display.

161 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00433-41 : Star Identification

This program determines the sidereal hour angle and declination of a star. It also prints out the name of the star. If a planet is observed, the Greenwich Hour Angle and the declination will be displayed.

372 Program Steps
Necessary Accessories: Card Reader, Printer and two Memory Modules

Documentation — $12.00 Cost of 6 cards — $7.50

00726-41 : Stellar Encounters

This program solves the tangential and space velocity, new proper motion, minimum distance, new magnitude, and time hence when the last three values will occur. Required data are: present distance to selected star, its proper motion in seconds of arc per year, its radial velocity, and its apparent magnitude.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00771-41 : Lunar Day Converter/Astrophotography Exposure Guide

Combines HP97 programs of same but separate titles. Automatically prompts for required data. Will print if printer used. Exposure guide prompts for all necessary data plus filter factor & automatically displays/prints exposure times along with complete bracketing. Lunar converter uses days & hours giving brightness & stellar magnitude. Field conversion for when lunar diameter larger than camera field. Exposure guide uses elevation angle, stellar magnitude, telecamera f/no., film asa, and filter factor. Computes atmospheric absorption if significant, & corrects magnitude, computing brightness, uncorrected exposure time, & corrected for reciprocity.

443 Program Steps
Necessary Accessories: Three Memory Modules. Printer optional.
Documentation — $12.00 Cost of 7 cards — $8.75

00865-41 : Almanac for Computers: Power Series and Chebyshev Expansions

Program evaluates power series and Chebyshev expansions using any number of terms as published in "Almanac for Computers" to facilitate the computation of navigational and astronomical functions such as lunar, solar and planetary coordinates, sidereal time, equation of equinoxes, nutation, GHA and declination of sun, moon, navigational planets, etc.

249 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

00928-41 : Positional Astronomy of Navigational Objects

This program provides position of selected object from "Almanac for Computers" section C & E for sun, moon, planet or star for any specified location on earth or time (daylight or standard), output views declination, GHA, LHA, altitude and azimuth. Also included is a data card reading program for almanac data.

190 Program Steps
Necessary Accessories: One Memory Module and Card Reader
Documentation — $12.00 Cost of 4 cards — $5.00

00941-41 : Orbit

Given the orbital elements of a minor planet or comet and the heliocentric equatorial rectangular coordinates of the earth. This program computes the geocentric right ascension and declination, radius vector, distance from the earth, elongation to the sun and the phase angle. Either parabolic or elliptical elements can be used. This program is compatible with program 01322-41 "Astronomical Calculations".

Necessary Accessories: One Memory Modulefor the HP-41C. Printer and Card Reader useful.
Documentation — $12.00 Cost of 3 cards — $3.75

00973-41 : Position of Celestial Bodies by Location, Date and Time

Program provides position of selected object from "connaissance des temps". Objects are sun, moon and twelve planets, for any specified location and time. Output views right ascension, declination, lha, altitude and azimuth. "Almanac for Computers" sec. D with eight planets may be used. Star positions are converted to altitude - azimuth coordinates.

294 Program Steps
Necessary Accessories: Three Memory Modules and Card Reader
Documentation — $14.00 Cost of 10 cards — $12.50

01010-41 : Precession of Rt Ascension and Declination

Program calculates the right ascension and declination of an astronomical object at any selected epoch, given the object's position at a known initial epoch. Output is displayed in hours/degrees, minutes, seconds format.

262 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 3 cards — $3.75

01043-41 : Positions of the Galilean Satellites of Jupiter

Program calculates and displays the positions of the Galilean satellites of Jupiter at a selected date and time. Positions can also be plotted over a selected time period. The position of each satellite is plotted using a unique symbol.

394 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 5 cards — $6.25

01062-41 : Visual Binary Star Orbits

Given the orbital elements of a visual binary star system, this program calculates the separation and position angle of the secondary star relative to the primary. Additional corrections for precession and proper motion can be applied. You may also compute the apparent eccentricity of the orbit.

266 Program Steps
Necessary Accessories: One Memory Module. Card Reader and Printer useful.
Documentation — $12.00 Cost of 2 cards — $2.50

01071-41 : Horizon Coordinates

Given the obsrever's longitude, latitude, local 24 hour time, and date, this program will calculate the horizon coördinates of any celestial object providing the declination and right ascension of the object is known. Memory registers can be recalled to provide universal time, Julian date at 0 hr U.T., and local sidereal time.

164 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01175-41 : Messier Object Search

This program will identify the type and coordinates of all Messier objects within a user-specified area of the evening sky. This will aid the astronomer in performing an orderly search of all Messier objects. It also doubles as a ready reference of the coordinates for a desired Messier object.

226 Program Steps
Necessary Accessories: Two Memory Modules. Printer optional.
Documentation — $12.00 Cost of 7 cards — $8.75

01192-41 : Sidereal Time and Julian Date Ephemeris Printout

Prints for a given year, an Ephemeris of Julian data and Greenwich Mean Sidereal Time at 0h UT. Accuracy ± 0.001 sec. Users can choose either number of lines per column, or number of total columns. Prints columns headlines and months names. Prints one line each 7 sec.

272 Program Steps
Necessary Accessories: One Memory Module and Printer
Documentation — $12.00 Cost of 2 cards — $2.50

01236-41 : Planetary Positions

Planet computes the right ascension, declination, distance from Earth, apparent diameter, phase, and magnitude for any of the eight planets. Heliocentric longitude and latitude, and geocentric ecliptic longitude and latitude are also available. User provides the date and planet name. Automatic printout is provided for the printer.

466 Program Steps
Necessary Accessories: Two Memory Modules and Card Reader. Printer optional.
Documentation — $12.00 Cost of 8 cards — $10.00

01241-41 : Astronomical Co-ordinate Systems

This program calculates Julian day number, local sidereal time, and conversions between the horizontal, equatorial, ecliptic and galactic system of co-ordinates. It includes a separate input for the user's geographical position.

210 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01246-41 : Az-El Table Plus Astronomy Utility Routines

Az-el table is a system of user oriented programs specifically set up to generate a table of azimuths and elevations for any given date interval, time interval, time increment and ra-dec. Global subroutines include Julian day, local apparent sidereal time, day # of year and date-time output formatting.

440 Program Steps
Necessary Accessories: Two Memory Modules and Printer
Documentation — $12.00 Cost of 4 cards — $5.00

01252-41 : Precession and Proper Motion Corrections

This program performs rigorous reduction for the effects of precession and proper motion from the equator and equinox of one epoch to that of another, correct to ± 0.01 seconds in R.A. And ± 0.1 seconds in declination. Alpha prompts and labeled answers simplify its use.

212 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01322-41 : Astronomical Calculations

Eleven programs: Calendar date to Julian day number; Julian day number to Calendar date; local mean siderial time; local hour angle of a celestial body; rigorous reduction for precession and proper motion; reduction of mean to apparent place; astronomical spherical triangle evaluation; hour angle/declination to azimuth/altitude and vice versa; converts between equatorial and ecliptic coordinates; converts equatorial to galactic coordinates and vice versa. The last program calculates the local hour angle of the rising or setting of the Sun or a star, the geometric azimuth of rising or setting, and the inclination of the ecliptic to the horizon.

1404 Program Steps
Necessary Accessories: One Memory Module. Card Reader and Printer optional.
Documentation — $25.00 Cost of 17 cards — $21.25

01402-41 : Restricted Three Body Problem

Given two masses in circular revolution about their common center of mass due to their mutual gravitational interaction, this program calculates the resulting three dimensional motion of a third, much smaller mass with respect to the two primary masses. Forces on the third mass are gravitational, centrifugal, and the coriolis force.

192 Program Steps
Necessary Accessories: Rechargeable batteries and AC Power Supply strongly recommended.
Documentation — $12.00 Cost of 2 cards — $2.50

01425-41 : Satellites of Jupiter

This program will calculate and present the relative positions of the four major satellites of Jupiter as they would appear to an observer of Earth. If a printer is used, a graphical representation of the view through a small telescope is also printed.

500 Program Steps
Necessary Accessories: 2 Memory Modules. Printer desirable
Documentation — $12.00 Cost of 5 cards — $6.25

01450-41 : Precessional Calculations

Given the time of one epoch and the time of another, this program can be used to: 1) Calculate the precessional constants, 2) Perform rigorous reduction for the effects of proper motion and precession, 3) Calculate the effects of precession on proper motion.

292 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 3 cards — $3.75

01548-41 : Apparent Sidereal Time and Obliquity

Gives, for any place, apparent and mean sidereal time and equation of equinoxes at ± 0.01 sec, Julian Date at ± 0.00001 of a day, and apparent obliquity at ± 0.1 arc second. Gives also the mean time from apparent or mean sidereal time.

365 Program Steps
Necessary Accessories: 1 Memory Module for the HP-41C. Printer optional
Documentation — $12.00 Cost of 4 cards — $5.00

01573-41 : Chebyshev Approximation for US Naval Observatory Almanac for Computers

Program provides full prompting for input of all 40 or less coefficients — dependent upon the accuracy required — from the Almanac for Computers of the U.S. Naval Observatory. A quick-load routine facilitates rapid entry of data; and a day number finder routine is included. Fast as full computer.

151 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01591-41 : White Dwarf Star

This program builds a White Dwarf Star given the Hydrogen concentration and core density. By integrating the hydrostatic equilibrium conditions from the center of the star to the surface where the pressure drops to zero, the radius and mass of the star is calculated.

150 Program Steps
Necessary Accessories: Printer optional.
Documentation — $12.00 Cost of 2 cards — $2.50

01596-41 : Sideral Time, Horizontal & Equatorial Hourary Coördinates

Giving date, time, longitude, latitude of observation point and Declination and Right Ascension of a sidereal object, the program calculates the horizontal coördinates: azimuth, altitude, zenital distance, and the equatorial hourary coördinate: hour angle. Equinox equation, Greenwich sidereal time, local sidereal time are also calculated.

550 Program Steps
Necessary Accessories: 2 Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

01785-41 : Computation of the Proper Motion of Stars

This program calculates the change in proper motion of a star taking into account the precession of the equinoxes. The program uses two rigorous equations from Woodward and Clemence, "Spherical Astronomy" and a routine for the calculation of precessional constants from "Mathematical Astronomy with a Pocket Calculator" by Aubrey Jones.

202 Program Steps
Necessary Accessories: 1 Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

01999-41 : Comet Ephemerides

Given the orbital elements of a comet, referred to a standard epoch and given the geocentric equatorial rectangular coordinates X, Y, Z, of the Sun referred to the same epoch. This program computes the geometric right ascension and declination, radius vector, distance from the Earth, elongation from the Sun, phase angle and finally the magnitude. The program will calculate elliptical, parabolic or hyperbolic cases.

412 Program Steps
Necessary Accessories: One Memory Module; (Card Reader is useful)

Documentation — $12.00 Cost of 3 cards — $3.75

02080-41 : Sun Ephemeris

This is a versatile program with a wide range of options providing data, from date and observer position, on selected twilight-zones, with times and azimuths, and declination at zone-minimum. Precision routines relate time, height, azimuth and rise-angle, and curves can be traced by Plot-routines.

1082 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV; HP-82143A or HP-82162A Printers are optional but necessary for Plot-routines.

Documentation — $20.00 Cost of 10 cards — $12.50

02091-41 : Position of Sun and Planets II

Finds position, right acension and declination of Sun, Mercury, Venus, Mars, Jupiter and Saturn. Also finds apparent diameter in seconds of arc. Equations for orbital parameters which need to be calculated are provided. Limited to epochs between 1950.0 and 2000.0.

287 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02275-41 : Solstices and Equinoxes

For a given calendar year, this program calculates the dates and clock times of the vernal equinox, summer solstice, autumnal equinox and winter solstice. The algorithms used are valid for a time period extending several centuries either side of the epoch 1900.0 and have an accuracy of 0.001 of a day.

171 Program Steps
Necessary Accessories: 82104A Card Reader; 82106A memory module (HP-41 only).

Documentation — $12.00 Cost of 3 cards — $3.75

02351-41 : New- and Full Moon Predictions (NAFM)

Predicts New- and Full Moons within any given month to three minutes accuracy from year 1700 through 2050. Useful back to year AD 1 but at gradually decreasing accuracy. Program also establishes accurate relationships between Gregorian dates, Julian dates, Julian day numbers and weekdays. Neat printouts if printer available.

917 Program Steps
Necessary Accessories: HP-41CV (or four memory modules) and Card Reader

Documentation — $14.00 Cost of 10 cards — $12.50

02391-41 : Almanac for Computers - Chebyshev Expansions for Astronomy

Program developed to obtain RA, DEC and distance (optional), it can be easily modified for other tables, changing the Alphas. The coefficients are stored, to be re-used any number of times, and it can be reviewed, edited and reworded for future use. An intensive stack usage savaes memory.

226 Program Steps
Necessary Accessories: One or more Memory Modules; (Printer and Card Reader are optional).

Documentation — $12.00 Cost of 2 cards — $2.50

02419-41 : Tropical Year Calculations

Astronomers, chronologists, and calendar enthusiasts now have an easy program to calculate the length of the tropical year for any year past or present. Program also calculates accumulated tropical years from 1582 to any year in the future or from 1900 to any year in the past (down to 900 A.D.). High accuracy is maintained to 10 decimal places, whatever the length of the integer (representing whole days). This feature allows checking the accuracy of the mean year of any calendar system with high precision.

164 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02538-41 : Rigorous Correction For the Effects of Precession

Program corrects for the effects of precession and proper motion in right ascension and declination. Program should not be used to find positions previous to epoch 1950.0. However, there are no restrictions to future epochs.

199 Program Steps
Necessary Accessories: Card Reader optional

Documentation — $12.00 Cost of 2 cards — $2.50

02566-41 : Rigorous Reduction From One Epoch to Another

This program will perform rigorous reduction calculations from one epoch to another, which will be accurate to within 0.001 seconds in right ascension and 0.01 seconds in declination. All effects of precession and proper motion are taken into consideration.

288 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02652-41 : Astronomical Clock

Set of two short and useful programs. The first one, converts your calculator in a sidereal clock, that displays continuously Local Sidereal Time with an error of less than 1,5 sec. The second program, computes and recomputes Local Hour Angle of a celestial body, given its Right Ascension. The programs are independent, but they can fit together in the basic HP-41C.

110 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 2 cards — $2.50

02705-41 : Homogeneous Stellar Model

A homogeneous stellar model with a radiative core and a convective envelope is computed. Needed input is the gas pressure and its temperature at the center, the hydrogen and helium abundance, the t/g opacity factor and the energy generation coefficient. The system of differential equations are solved by the Runge-Kutta method. The radius, mass, luminosity and effective temperature of the stellar model are obtained.

670 Program Steps
Necessary Accessories: Quad memory or HP-41CV. Printer highly recommended.

Documentation — $14.00 Cost of 7 cards — $8.75

02821-41 : Apparent Sidereal Time and Obliquity 2000.0

Program similar to 01548-41 one, but including the new constant values for the equinox 2000.0; it gives, for any place, apparent and mean sidereal time and equation of equinoxes at ± 0.01 sec, Julian Day at ± 0.00001 of a day less than one second) and apparent obliquity at ± 0.1 arc second. It also gives the mean time from apparent or mean sidereal time.

382 Program Steps
Necessary Accessories: One memory module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

03041-41 : Single-Line Spectroscopic Binary

This program generates synthetic radial velocity curves for single-line spectroscopic binary stars, given a set of orbital elements. Once a crude orbital determination has been made graphically, any orbital parameter may be varied. A theoretical curve which more closely fits the observations is readily obtained through trial-and-error.

72 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

03064-41 : Enlightened Fraction of Moon

Entering date (year, month and day numbers), program computes the value of enlightened fraction of the moon in the form of a number between 0 and 1 (zero is for new moon, 1 is for full moon). Program is valid from March 1st, year zero (1 B.C.).

147 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

03176-41 : Orbital Elements Given Semimajor Axis, Eccentricity and Mass

Given the semimajor axis, eccentricity, and mass the program computes the semiminor axis, aphelion radius, perihelion radius, velocity at apogee, velocity at perigee, angular momentum, total energy and period of an orbiting body.

119 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

03278-41 : Halley's Comet

Given only the date, the position in the sky of Halley's Comet is computed. The position is given in right ascension and declination using hours- minutes-seconds and degrees-minutes-seconds format.

284 Program Steps
Necessary Accessories: Time Module

Documentation — $12.00 Cost of 3 cards — $3.75

03372-41 : Horizon, Drop, and Refraction

For any spherical body, program computes for any altitude above surface, the slant range to horizon, range over surface, and subtended angle at center of body (dip of horizon). Constants for all solar system planets are given. Provision is made for iterative operation. For terrestrial altitude observations of celestial bodies, program computes angular correction for atmospheric refraction, dip of horizon, height of observer above sea level, and with sextant zero index correction input, the total correction to be applied to the observed celestial altitude, or zenith distance.

84 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

03436-41 : Rectangular Solar Coordinates

The rectangular solar coordinates necessary for the calculation of ephemerides of planets, and other bodies of the solar system, are calculated. The program is valid for the years 1801 through 2099.

400 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 4 cards — $5.00

03441-41 : Besselian Day Numbers

The Besselian day numbers are calculated with sufficient accuracy for the calculation of ephemerides of astronomical objects. The program is useful for astronomical observers who do not have an astronomical yearbook which tabulates those numbers.

382 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 4 cards — $5.00

03478-41 : Algol Almanac

This program calculates the geocentric dates and times of the minimum brightness of the variable star Algol. On the average, these time predictions are in error by less than one minute and agree well with SKY AND TELESCOPE magazine's predictions. Times are displayed as Universal Time or Local Civil Time. With the printer attached, the calculator produces a monthly calendar of dates and times of future minima.

322 Program Steps
Necessary Accessories: One memory module with HP-41C; printer is optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03512-41 : Position of Celestial Objects by the Turner Method

The position of a celestial object is determined by comparison of its position on an astronomical exposure with a number of stars (equal or more than three) on the same plate. Due to method of measuring the plate, the accuracy of the results may reach one arcsecond.

278 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

03517-41 : Apparent Place of Stars

To ensure observing the correct object, the coordinates for the date and time of observation must be known. This is also important if relative differences of celestial objects are wanted to define the position of the objects. Programs calculating the precessional corrections can give you only an approximate position near the date and time of observation. This program allows you to calculate the exact position for the object you want to observe. The 'day number technique' is used, first introduced by Ressel.

220 Program Steps
Necessary Accessories: One memory module.

Documentation — $12.00 Cost of 2 cards — $2.50

03518-41 : Sky Map and Compass

For any local position, the program computes the present altitude and azimuth of the sun, moon, navigational planets, and the 58 stars of the Navigation Pac. The celestial position of the displayed object is continuously updated with the internal clock and the calendar of the time module. The program serves as a perpetual map to the heavens, and as a means for establishing direction and compass adjustment at night as well as in daytime.

165 Program Steps
Necessary Accessories: Navigation Pac, Time Module, one memory module.

Documentation — $12.00 Cost of 2 cards — $2.50

03524-41 : Conversion From Equatorial Into Galactic Coordinates/Reverse

This program provides the transformation from equatorial coordinates of astronomical objects into the galactic coordinates system (system II). Also, the retransformation from the galactic coordinates into the equatorial system is possible.

148 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 1 card — $1.25

03526-41 : Correction of Radial Velocities to Heliocentrum

Due to the earth's rotation around its axis and the motion of the earth around the sun, spectral lines are shifted. These might lead to errors in determining radial velocities of celestial objects. This program calculates the correction to be added to the spectra from the observer's position, the date and the celestial coordinates of the object. The results are given in km/s and may be easily transformed to shift in wavelength.

225 Program Steps
Necessary Accessories: One memory module; printer is optional.

Documentation — $12.00 Cost of 2 cards — $2.50

03562-41 : Position of Celestial Objects by the Schlesinger Method

The position of celestial objects is determined by comparison of its coordinates on the exposure with the coordinates and positions of three nearby stars. The object must lie inside the triangle built up by the comparison stars. The distance of those stars may not exceed one degree.

185 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

03584-41 : Astronomical Distances

This program allows the estimation of distances of several astronomical objects such as: stars with known trigonometric parallax, star stream members, cephei stars, W-Virginis stars, RR Lyrae stars, Mira variables and cosmological objects. The distance module may also be used individually.

207 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

03585-41 : Orbital Elements for Parabolic Orbits: Three Observations

This program allows the determination of orbital elements of bodies moving on parabolic orbits. In case of more than one solution, the data storage is saved into an XF-Data-File. Alternatively, magnetic cards or a printer may be used with only small changes in the program.

925 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 7 cards — $8.75

03586-41 : Orbital Elements: Elliptical Orbits From Three Observations

From at least three observations the orbital elements of a celestial object, supposed to be in an elliptic orbit, are calculated. The elements may be used to calculate the ephemerids of that object with standard ephemerid programs.

1075 Program Steps
Necessary Accessories: None.

Documentation — $14.00 Cost of 8 cards — $10.00

T300 Biology

03267-41 : Growth and Decay

This program can predict the size or mass of a species or element knowing original size or mass, and time. It can also predict the time required to reach a size or mass. Exponential growth and decay is used for both.

65 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

T320 Biology Ecology

00636-41 : Von Bertalanffy Growth Curve

The Von Bertalanffy equation is an asymptotic growth model commonly used by fishery biologists. This program uses Rafail's method to determine the three constants and goodness of fit, given annual measurements for up to 25 years. It provides for estimation of age given length, and vice versa. An optional printing routine (56 steps) is also provided.

206 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 3 cards — $3.75

01836-41 : Species Diversity Indices

This program calculates measurements of species diversity using four indices: number of species, Simpson's Index of Diversity, Shannon-Weiner Diversity Index, and probability of interspecific encounter from data of field ecology sampling.

126 Program Steps
Necessary Accessories: None

Documentation — $16.00 Cost of 1 card — $1.25

02708-41 : Sum Thermal Units in Day Degrees

Program prompts for temperature scale and physiological development threshold. A sine-wave is fit to maximum-minimum temperature curves and the area above developmental threshold integrated. Output is for 12 hr intervals. Cumulative day-degree totals are given for succeeding 24 hr periods in Fahrenheit and Celsius and the days counted.

144 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 2 cards — $2.50

02957-41 : Sequential Analysis of Negative Binomial Distribution Data

Sequential analysis serves to classify populations rather than to provide estimates of population parameters. It is particularly applicable to surveys — most notably, agricultural pest surveys. Such surveys are the first line of attack in minimizing losses by destructive pests. Many pest populations fit a negative binomial distribution making sequential analysis widely applicable and very useful.

127 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

02995-41 : Fit of Negative Binomial Distribution to Biological Data

Many biological phenomena closely follow a negative binomial distribution. For example, insect populations infesting a field or a forest compare closely to this distribution. This has made study of pest population distributions an important part of Integrated Pest Management programs for farmers, foresters and agricultural extension officers.

168 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03124-41 : Leslie's Random Recapture Test

Animal surveys often rely upon marking techniques for estimating population densities. A critical assumption when using these techniques is that the processes of capturing and marking animals will not affect their subsequent catchability. The validity of this assumption is determined by Leslie's Random Recapture Test.

163 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03267-41 : Growth and Decay

This program can predict the size or mass of a species or element knowing original size or mass, and time. It can also predict the time required to reach a size or mass. Exponential growth and decay is used for both.

65 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03399-41 : Jolly-Seber Stochastic Method for Population Parameters

Marking, releasing and recapturing individual animals is a common method of estimating animal populations. This program determines the total population, number of marked animals at large, and their survival rate. It will also estimate the number of new animals for animals marked on a series of two or more occasions.

216 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

T340 Biology Genetics

01562-41 : Analysis of Salmonella (AMES) Assay Results

Unlimited numbers of Salmonella (Ames) assay data pairs are fitted to a least-squares regression line forced through the origin. To check linearity (especially helpful for screening work) both a scatter plot for up to nine doses (no replications) and a 95% confidence interval for the slope are given.

525 Program Steps
Necessary Accessories: 2 Memory Modules, Printer, Card Reader
Documentation — $12.00 Cost of 6 cards — $7.50

01906-41 : Genetic Code Translator and Table of Aminoacids

Program translates triplets of messenger RNA nitrogen bases into corresponding aminoacid. Codon entry is direct. Another subroutine displays or prints a complete table of equivalency for all codons with 3 tones characterizing each triplet according to the sequence of bases.

173 Program Steps
Necessary Accessories: but useful. 2 memory modules (1 will be fully saturated), card reader and printer opt.,
Documentation — $12.00 Cost of 5 cards — $6.25

02116-41 : Genetic Code

This program computes the Codogen, the basetriplet from the complementary DNA-cord, the Codon, Anticodon and the aminoacid, if one of these four triplets is known. To a given aminoacid the program calculates all possible basecodes and shows to each code all triplets as mentioned above.

429 Program Steps
Necessary Accessories: Three Memory Modules or HP-41CV
Documentation — $12.00 Cost of 5 cards — $6.25

T360 Biology Molecular Biology

T380 Biology Microbiology

01717-41 : Soil Bacteriology

Using U.S. EPA microbiological procedures, program calculates number of bacteria per unit mass oven dry soil (or sediment). User inputs: (1) Data to determine soil moisture content and (2) Enumeration data of the bacterial population in a moist soil (or sediment) sample based on standard plate count (or MPN) techniques.

64 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

T400 Chemistry

00324-41 : Acid Dissociation at Given pH

Given the acid dissociation constants for a polyprotic acid (one to nine equilibria) program calculates the fraction of each species present in solution at a given pH.

104 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00326-41 : Molecular Weight Calculator

Calculates molecular weight from chemical formula. Also can look up atomic number given the chemical symbol for an element, and can look up atomic weight given atomic number.

160 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 5 cards — $6.25

00386-41 : Electrolytic Conductance (Fuoss 1975 Equation)

Fits concentration-conductance data to the Fuoss (1975) Equation ("F75"). An HP-41C version of part number 04713-97. It is about three times faster than the HP-97 program, and much more convenient to use, as the iterating routine and experimental points are contained within the machine. After keying in the points, no further attention is necessary.

867 Program Steps
Necessary Accessories: Three Memory Module and Card Reader. Printer optional.
Documentation — $14.00 Cost of 9 cards — $11.25

00448-41 : Single Reactant Kinetics

Having problems with the kinetics of a single reactant with non-integer order of reaction? Then this program is tailored for you! Yes, you don't have to keep guessing a dozen values of reaction order. Relax, and let the HP-41C do the search of the order and reaction rate constant.

151 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 2 cards — $2.50

00544-41 : Computation of Acid-base Species Distribution

This program will determine the distribution, as a function of pH or (H^+), of the several possible forms of an acid or base in aqueous solution. The program can also calculate the fractional amounts of all species in a complex ion equilibrium given the ligand concentration.

125 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

00586-41 : Strong Acid-Base Titration Calculations

This program calculates the hydrogen ion concentration, hydroxide ion concentration, the pH and pOH of a strong acid-base titration. The total volume, the volume of the acid, the volume of the base, the original strong acid concentration, and the original strong base concentration are inputs.

155 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00619-41 : Electrolysis and Faraday's Law

This program uses Faraday's law to solve problems of electrolysis to the following variables: time of electrolysis, current of electrolysis and grams of: element (metal or not metal), acid, salt, or basis.

152 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00700-41 : Potentiometric Titration of Weak Acid-Strong Base Simulated

This program calculates the whole curve pH vs. volume for the potentiometric titration of a weak acid and a strong base, both in aqueous solution.

128 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

00709-41 : Concentrations and Disolutions Chemistry

This program solves problems in chemistry of solutions and concentrations using the following variables: grams of solutions, solute, and solvent; density, volume, mole fraction of solute and solvent; percent concentration, molarity normality, molality, valence, number of moles, molecular weight, equivalent weight and number of equivalents.

772 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $12.00 Cost of 7 cards — $8.75

00717-41 : Rates of Effusion of Gases - Graham's Law

Determines unknown quantity when given 3 of 4 quantites: GMW gas a, GMW gas b, rate of effusion gas a, rate of effusion gas b; or 3 of 4 quantities: GMW gas a, GMW gas b, time of effusion gas a, time of effusion gas b.

82 Program Steps
Necessary Accessories: Card Reader optional.

Documentation — $8.00 Cost of 1 card — $1.25

00727-41 : Heterogeneous Kinetics 2

Program prints out a table of fraction reacted vs. time for the shrinking unreacted core model of heterogeneous kinetics, given reaction times for chemical control alone, and for diffusion control alone. Useful for plotting a fitted curve for comparison with the experimental points treated by "Heterogeneous Kinetics 1".

87 Program Steps
Necessary Accessories: Printer

Documentation — $8.00 Cost of 1 card — $1.25

00728-41 : Heterogeneous Kinetics 1

Program fits fraction reacted/time data to the shrinking unreacted core model of uniform spheres reacting with a gas or solution. Reaction rate is considered to be limited by chemical reaction at the surface of the core, and by diffusion of reactant through the product layer. Output is r^2 for the regression, the time constants for chemical and for diffusion control, and the parameters of a confidence ellipse.

280 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00779-41 : Distribution Coefficient

Given the solubility of a solute in water and an organic solvent, the mg of solute and the ml of water and organic solvent, the program will calculate the distribution coefficient and the amount of solute extracted from the water phase.

Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00870-41 : Experimental Simulated Study of a Gas

This program supplies fifteen values to plot the pressure-volume curve of a gas for all temperatures with great accuracy in respect to the experimental curve. It is very helpful to chemistry and physics students.

80 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00871-41 : Reaction Kinetics Simulated

This program allows the study of the reaction kinetics of the order 0, 1 and 2 ($2a \rightarrow b$ or $a + b \rightarrow c$) in one step, at any temperature. It is intended for students of chemistry.

134 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

00872-41 : Non-Standard Enthalpy and Free Energy of a Chemical Reaction

Known the heat capacities of reactants and products for a reaction in the form of equations based on temperatures, this program calculates the enthalpy and free energy of the reaction at any given temperature. A reference or standard state must be defined with known enthalpy and free energy (usually 25°C).

205 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

00880-41 : Tafel Equation Fit

Program fits current - voltage data to the modified tafel equation. It allows the determination of all the parameters, including the tafel slope, the ohmic drop, and the exchange current density. Errors are given, as is a residual for each point.

387 Program Steps
Necessary Accessories: Two Memory Modules

Documentation — $12.00 Cost of 4 cards — $5.00

00881-41 : Calorimetry

Designed for the LKB-8700-1 calorimeter, but readily adaptable to other constant environment temperature calorimeters, such as a simple Dewar in a thermostat, this program corrects the measured temperature change for heat leakage by the Regnault Pfaundler method. It is suitable for work of the highest accuracy.

428 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 5 cards — $6.25

00974-41 : 41C Beattie-Bridgeman's Equation of State

Given the five Beattie-Bridgeman's constants for a gas (a_0, b_0, a, b, c) this program finds the pressure, temperature or molar volume given the other two. Calculating t or v requires a Newton-Raphson iteration procedure with accuracy specified by the user and with the ideal (PV = RT) value as starting point.

343 Program Steps
Necessary Accessories: One Memory Module for the HP-41C.

Documentation — $12.00 Cost of 3 cards — $3.75

01057-41 : pH, Equilibrium Chemistry and Buffers

This program solves problems of pH, equilibrium chemistry and buffers for the following variables: grams, number of moles, molecular weight, molarity, volume and concentration of acid, base and salt. Grade of dissociation, pH, pOH, and concentration of polyprotic acid is also treated.

946 Program Steps
Necessary Accessories: Four memory modules.

Documentation — $14.00 Cost of 8 cards — $10.00

01199-41 : Calculation of Peptide-Molecular Weight

This program calculates the molecular weights and the atomic composition of peptides and peptide-derivatives. Amino acids and protecting groups should be keyed in with abbreviations (as used in peptide-chemistry).

346 Program Steps
Necessary Accessories: Quad Memory Module or HP-41CV. Printer optional.

Documentation — $12.00 Cost of 7 cards — $8.75

01281-41 : API Gravity Reduction to 60 Degree F

This program reproduces API and ASTM Table 5B. Table 5B provides API gravity (density) at 60 degree f from observed API gravity at temperatures other than 60 degree f.

261 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01377-41 : Inorganic Carbon Computation

Program calculates inorganic carbon species in water, given pH, temperature, alkalinity and ionic strength. Program is similar to 00653-41 except that only one magnetic card is required, no accessories are necessary, and only eight (instead of 38) storage registers are used.

119 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01567-41 : Ion Selective Electrodes. Known Addition Method

Do you work with ion selective electrodes? This program will make all the calculations you need for a sample analysis by the standard solution known addition method. The program follows all the steps of this method. It computes the slope of the electrode in assay conditions, the size of a convenient addition and the sample concentration. Also, you will obtain a printed report with all results.

192 Program Steps
Necessary Accessories: 1 Memory Module and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

01643-41 : Periodic Table of the Elements and Electron Structure

Incredible. Carry a periodic table of the elements in your HP-41. The program asks you for the element (usually 2 letters) then gives you: atomic number, oxidation state, atomic weight, state, neutrons, density, melting point, first energy of ionization, electronegativity. Moreover it computes the electron structure of every element. EX: 4f*14/5d*10/65*2/6p*2 (Lead, Pb).

879 Program Steps
Necessary Accessories: Card Reader and Quad Module (or HP-41CV)

Documentation — $12.00 Cost of 17 cards — $21.25

01747-41 : Chemistry Solution

This program computes the pH, pKa, C, Q of a solution containing one acid-base pair. The four data can be introduced in any order (only two data are required) and the HP41C will compute, pH, pKa, C, Q (the factor dissolution) and [a] and [b].

781 Program Steps
Necessary Accessories: 3 Memory Modules, Card Reader

Documentation — $14.00 Cost of 6 cards — $7.50

01752-41 : Hueckel Pi Molecular Orbital Calculation (HMO-PI)

This program calculates Pi orbital energies, orbital coefficients and total pi-electron energy of linear or monocyclic conjugated hydrocarbons without branching in Hueckel approximation. For input it requires only size (i.e., number of carbon atoms in molecule), charge and type (cyclic or linear). Size must be less than 1000 and bigger than 1 for linear or bigger than 2 for cyclic molecule. No explicit diagonalization of Hueckel secular determinant is done.

500 Program Steps
Necessary Accessories: 3 Memory Modules. Printer is recommended but not essential.

Documentation — $14.00 Cost of 7 cards — $8.75

01982-41 : Computerized Periodic Table of Elements

This three program set is a computerized periodic table of elements. Program 1 contains 73 elements listing atomic number, name, atomic weight and group number. Program 2 and 3 represent Lanthanide and Actinide series. For these, atomic number, name and atomic weight are printed out. Names are abbreviated.

939 Program Steps
Necessary Accessories: None

Documentation — $16.00 Cost of 14 cards — $17.50

01996-41 : Internal Combustion Engine Fuels

This program calculates the balance of different types of hydrocarbon fuels for combustion engines. Also calculates air-fuel ratio, approximate heat combustion of fuel and weight of all combustion products for any one air excess. The inputs are fuel combustion (hydrocarbons only). Units in English or Metric system.

412 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 4 cards — $5.00

02048-41 : Ideal and Van Der Waals Gas Laws

This program will solve problems involving pressure, volume, moles, R, and temperature by the Ideal, Boyle's, Avogadro's, Charles, Van Der Waals and General gas laws. Data need not be reentered.

240 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02123-41 : X-Ray Characteristic Lines

Provides the practicing x-ray analyst with ready conversion between wavelength of characteristic emission line and atomic number of emitting atom. Combines the technique of interchangeable solution and Kelly's equations.

94 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02173-41 : pH of 13 Different Cases

This program calculates the pH of 13 different acid/base equilibriums: weak acid + strong base; moderately strong acid; weak acid; strong acid; strong acid + weak base; strong base; weak acid + weak base; weak base; moderately strong base; weak acid + weak acid; semineutralized weak acid; diprotic acid; weak base + weak base. The program uses a theory called "the condition of the proton". It is very quick and it has a good exactness.

271 Program Steps
Necessary Accessories: One memory module for the HP-41C.
Documentation — $12.00 Cost of 4 cards — $5.00

02336-41 : Molecular Mass Calculator

This program finds the mass of a molecule given its formula, the atomic mass of an atom given its atomic number, and the atomic number of an atom given its formula. This program uses the great speed and efficiency of the POSFL statement to make a "look up" table practical for the first time.

112 Program Steps
Necessary Accessories: One memory module and Extended Functions Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

02392-41 : Evaluation of Molecular Cartesian Coordinates

Knowledge of the Cartesian coordinates for all atoms in a given molecule is often necessary for many problems dealing with chemistry. This program allows easy and convenient evaluation of the atomic Cartesian coordinates for any molecular system with given bond lengths and valence to torsional angles.

330 Program Steps
Necessary Accessories: Two to Four Memory Modules depending on Molecule size.
Documentation — $12.00 Cost of 3 cards — $3.75

02567-41 : General Chemistry I: Periodic Chart, Formula Weight and More

This program can solve four basic chemistry functions. It can: Use the Periodic Chart to find the Atomic Weight of an element: Calculate the Formula Weight of any given formula; Determine the Empirical Formula given the elements and their percent composition; Compute the Percent by Weight for any element in a given formula. An invaluable asset for chemist and college chemistry students.

498 Program Steps
Necessary Accessories: Three memory modules. Printer optional.
Documentation — $14.00 Cost of 7 cards — $8.75

02588-41 : Molar Volumes by Ackerman's Corr. of Redlich-Kwong Equation

This program finds molar volumes of a pure substance (gas phase) using a correction for Redlich-Kwong compressibility factor including the acentric factor by means of two complex equations, using 25 constants, proposed by Ackerman. With this correction, the results are in good agreement with the compressibility factor charts of Pitzer's correlation. This version of R-K equation is not very popular because of the need of electronic computation but now it is here, at hand.

250 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02600-41 : General Chemistry II: Periodic Chart & Electron Configuration

This program uses the Periodic Table of Elements to find the Atomic Weight of a given element or to compute the Electron Configuration of that element. This program comes equipped with thirty of the most commonly noted elements of the chart, but can be easily expanded to encompass the entire list of elements. There is an automatic Stack Saver which assists User in avoiding stack data lost. Great for chemist and college chemistry students.

390 Program Steps
Necessary Accessories: Two memory modules. Printer applicable.
Documentation — $12.00 Cost of 5 cards — $6.25

02682-41 : Fuming Sulfuric Acid Concentration Expressed in Various Ways

Given any of these ways of expressing concentration of a fuming sulfuric acid solution, this program calculates the other five corresponding ways of expression: actual H_2SO_4 (%), equivalent H_2SO_4 (%), combined water (%), free SO_3 (%), total SO_3 (%) and combined SO_3 (%). Use of program replaces tables used for that purpose with the advantage of permitting interchangeable conversions from any "KEY ENTRY" form of expressing concentration.

302 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02692-41 : Vapor-Liquid Equilibrium Temperature Calculations

This program solves for bubble-point, dew-point, and equilibrium mixture temperatures. Antoine constants or K-value coefficients-fitted to cubic equations from DePriester's charts - are used. Calculations are made for N components in a batch equilibrium distillation. Plate-by-plate bubble point calculations in a multi-component distillation are also applicable.

309 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02915-41 : Delta G1

This program was designed to be friendly and efficient in arriving at the solutions for various problems involving the state functions of entropy, enthalpy and free energy. A menu of equations is contained within it.

215 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02941-41 : Molecular Weight and Percent Composition

Program calculates the molecular weight and percent composition of chemical compounds containing up to seven elements. Elements may have atomic numbers from 1 through 92. For hydrates, water may be considered to be an element.

122 Program Steps
Necessary Accessories: Extended Function Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

02974-41 : Ionic Strength of Weak Acid Solution

In thermodynamic equations for non-ideal solutions and in accurate kinetic work involving charged reactants or acid-base catalysis, knowledge of the ionic strength is necessary. At a given concentration and pH, this program calculates ionic strength. It may also be used to display the fraction of each anionic species for neutral salts and weak acid solutions having monovalent cations.

128 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 1 card — $1.25

03405-41 : Barometric Distribution Law Calculations Using Boltzmann's

BARLAW will compute the final pressure, initial pressure, temperature, and height of any system which obeys the Barometric Distribution Law. The program prompts for four of the five variables amd then computes the fifth variable.

130 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

T410 Chemistry Acid-Base

02909-41 : Solubility vs pH - A Least Square Fit

A program to determine the dissociation constant and the intrinsic solubility of a monoprotic weak acid or base via least square fit to its pH - total solubility data. The program is applicable over the pH range where solubility is limited by the non-ionized species. Estimates of total solubility or of pH may be made given the other parameters. An adaptation and expansion of an HP-67/97 program.

209 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03242-41 : Solubility vs pH: Amphoteric and Zwitterionic Compounds

A least square fit to pH — solubility data applicable to amphoteric compounds whose solubility is limited by that of the neutral or zwitterionic species. The regression coefficient, the limiting solubility of the neutral species, and the two pKa's are determined. The pH and solubility at the isoelectric point is also determined and its percent ionic character. The solubility at a given pH may be estimated as may the two pH's which give a desired solubility.

307 Program Steps
Necessary Accessories: None, printer/plotter optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03243-41 : Solubility vs. pH: Divalent Acids Or Bases

A least square fit to pH - solubility data that is applicable to divalent acids or bases whose solubility is limited by the solubility of the free acid or base. The regression coefficients, limiting solubility, and the two pKa's or pKb's are determined. Solubility at a given pH or the pH required to achieve a desired solubility may be estimated. The pKw for water may be estimated from the water temperature.

327 Program Steps
Necessary Accessories: None, printer/plotter optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03271-41 : HPLC Capacity Factors vs. pH (Diprotic / Amphoteric Species)

The pH dependence of the HPLC retention time of an amphoteric or diprotic species expressed as it's capacity factor k is related to it's two pKa's and three species capacity factors. Given the fully protonated and deprotonated factors, the remaining factor and two pKa's are determined from the pH - k data via least square regression. The regression coefficient is determined. The k at a given pH or the pH(s) needed for a given k may be estimated.

305 Program Steps
Necessary Accessories: None; printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

03273-41 : HPLC Capacity Factors vs. pH (Monoprotic Acids or Bases)

The pH dependence of the HPLC retention time of a monoprotic weak acid or base, expressed as capacity factor, k, is related to its pK and the capacity factors of its protonated and deprotonated species. This program calculates the pK, the two species capacity factors, and the correlation coefficient for the pH k data set via. least square regression. Estimates of the capacity factor given the pH or of the pH given the capacity factor may be made.

216 Program Steps
Necessary Accessories: None.

Documentation — $12.00 Cost of 2 cards — $2.50

T420 Chemistry Agricultural

T430 Chemistry Biochemistry

01670-41 : Adenylate Cyclase Specific Activity Calculations PH*CYC

Program calculates adenylate cyclase (E.C. 4.6.1.1.) specific activity (PM-CAMP/min/mg) by the Salomon, Londus, and Rodbell Method. The user inputs counts obtained by the dual-labeled procedure for points (one to ten determinators per point), and output is specific activity, activation relative to basal, and activation t-test.

365 Program Steps
Necessary Accessories: 2 Memory Modules

Documentation — $12.00 Cost of 5 cards — $6.25

01790-41 : ESR Order Parameter Calculations

This program calculates order parameters from electron spin resonance (ESR) data. Such order parameters are a widely employed measure of the fluidity of cellular membranes.

97 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

01841-41 : Spectrophotometric and Spectrofluorometric Assays

Sample calculations in any photometric assay which yields a linear calibration curve. Blanks and range factored in each absorbance. Curve slope, Y-intercept, R are given. Experimental dilution, assay dilution, enzyme amount and number of minutes give concentration in Mass/Vol/Min. Results may be further normalized per unit of DNA and/or Protein. Fully prompted.

271 Program Steps
Necessary Accessories: One Memory Module; Printer Optional.

Documentation — $12.00 Cost of 3 cards — $3.75

01899-41 : Routine Centrifugation Calculations

This program is really two programs in one. The first solves interchangeably for the radius, revolutions per second, or the relative centrifugal force of a centrifuge. The second can determine the revolutions per minute required to generate a sucrose density gradient equivalent to a standard sucrose density gradient at a given rpm and time.

102 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02135-41 : Stock Solution Dilution II: Up to Ten Components Per Mix

Solves for the volumes of concentrated stock solutions required to give a desired final concentratin, given the initial volume, the initial concentrations (if any), and the concentrations of the stock solutions (M,%,etc.). It corrects for volume addition errors using Newton's method. Extension of Stock Dilution I.

310 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 3 cards — $3.75

02166-41 : Stock Dilution I: Laboratory Solution Preparation

Solves for the volume of a concentrated stock solution that is required to convert a solution of known volume (or a desired final volume) and known initial concentration (if any) to a desired final concentration. Stock solution concentration may be expressed as M, %, etc. Uses Newton's Method. Useful as a subroutine.

73 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02220-41 : Phosphate Buffer Composition

This program computes the concentrations of mono- and dibasic phosphate salts required for preparation of buffers of desired pH and total phosphate concentration at 25 degrees Celcius. This program also permits compensation for the presence of other neutral electrolytes in solution and their effect they will have on the apparent pK_2 of phosphate.

111 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03328-41 : Enzyme Kinetics: Two-Substrate Reaction

Given the concentrations of the "variable" and "fixed" substrates, and the initial velocities, this program determines the slope, intercept and correlation coefficient of each line of a two-substrate primary plot, then goes on to calculate the kinetic parameters Vmax, Ka, Kb, and Kia for an enzyme-catalyzed two-substrate reaction.

156 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

T440 Chemistry Chromatography

02624-41 : The Complete "High Performance Liquid Chromatography" Calculator

In order to fully describe HPLC, a number of parameters have been defined, concerning relationships of solvent to solute, efficiency, comparison with thin layer chromatrography and resolution of peaks. Liquid Chromatrographs, in general, print out a fully notated plot of the detector response. This program uses this information, with physical constants, to evaluate the remaining, unknown parameters.

858 Program Steps
Necessary Accessories: Four memory modules or one quad memory. 82143A or 82162A printer.
Documentation — $16.00 Cost of 8 cards — $10.00

02626-41 : Statistical Moments M0 - M4 + Skew and Excess

A program to calculate the area and the first four statistical moments for arbitrarily spaced intensity vs time data such as chromatographic peaks. The skew and excess are also determined. Size required = 10 + 2 x number of data pairs. Accuracy of moment determinations increases with increased number of data pairs. Correction of the baseline for drift or zero setting is optional.

191 Program Steps
Necessary Accessories: One memory module per 32 data points or part thereof
Documentation — $12.00 Cost of 2 cards — $2.50

02779-41 : Quantitative RI Analysis Without Analyte Identification -(QRI)-

A program to calculate the concentration of an unknown without identification by measurement of the refractive index change occuring in two HPLC solvents with different known refractive indices. It determines the unknown's concentration and it's refractive index by applying the concepts presented in "Analytical Chemistry" 55, 1599-1603 (1983).

108 Program Steps
Necessary Accessories: None, printer optional.
Documentation — $12.00 Cost of 1 card — $1.25

03228-41 : Chromatographic Figures of Merit - CFOM

A program to calculate Chromatographic Figures of Merit (CFOM) for ideal and skewed peaks as described in "Analytical Chemistry", vol. 55, pp 730-737 (April 1983). Output includes number of plates (observed or maximum). Percent relative system efficiency, the first four statistical moments, the skew and excess, the time of gaussian peak, the deviation of the gaussian and the exponential tailing factor.

362 Program Steps
Necessary Accessories: One memory module, printer optional.
Documentation — $12.00 Cost of 4 cards — $5.00

03271-41 : HPLC Capacity Factors vs. pH (Diprotic / Amphoteric Species)

The pH dependence of the HPLC retention time of an amphoteric or diprotic species expressed as it's capacity factor k is related to it's two pKa's and three species capacity factors. Given the fully protonated and deprotonated factors, the remaining factor and two pKa's are determined from the pH - k data via least square regression. The regression coefficient is determined. The k at a given pH or the pH(s) needed for a given k may be estimated.

305 Program Steps
Necessary Accessories: None; printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

03273-41 : HPLC Capacity Factors vs. pH (Monoprotic Acids or Bases)

The pH dependence of the HPLC retention time of a monoprotic weak acid or base, expressed as capacity factor, k, is related to its pK and the capacity factors of its protonated and deprotonated species. This program calculates the pK, the two species capacity factors, and the correlation coefficient for the pH k data set via. least square regression. Estimates of the capacity factor given the pH or of the pH given the capacity factor may be made.

216 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 2 cards — $2.50

03326-41 : Kovats and McReynolds Indices

A tool to help the serious gas chromatographer compare GC columns by calculating their Kovats Indices and McReynolds Constants from the observed retention times of methane, an alkane mix, and either a five or seven component McReynolds probe mixture. May be used to identify 'mystery' columns and to characterize new columns and phases.

164 Program Steps
Necessary Accessories: None; printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

T450 Chemistry Crystallography

T460 Chemistry Nuclear

T470 Chemistry Physical

01790-41 : ESR Order Parameter Calculations

This program calculates order parameters from electron spin resonance (ESR) data. Such order parameters are a widely employed measure of the fluidity of cellular membranes.

97 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

02449-41 : Surface Tensions of Aqueous Organic Solutions

Given the surface tensions and molar volumes of the pure components at a given temperature (water and organic compound), this program estimates the surface tension for a solution of a given molar composition. The method of Tamura, Kurata and Ooani is employed here. Any composition greater than zero and less than one can be employed.

171 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02681-41 : Fitting Adsorption Data With Langmuir and B-E-T Equations

This program fits experimental data of gas volume adsorpted at several partial pressures and calculates the parameters of the Brunauer-Emmett-Teller Equation and Langmuir Isotherm representing these data. Up to 20 data pairs can be analyzed. New values can be predicted by program using both equations. Also, using the parameters resulting from B-E-T equation, volume adsorpted due to multilayers can be predicted keying the number of layers.

316 Program Steps
Necessary Accessories: Two memory modules

Documentation — $12.00 Cost of 3 cards — $3.75

03108-41 : Steady Shear Data Analy For Weissenberg R17 Rheogoneometer

A data analysis program for the weissenberg R17 Rheogoneometer in steady shear mode, cone and plate configuration. This program takes instrument constants and up to 20 sets of gearbox, torque, and normal force data and outputs either shear rate, shear stress, and viscosity or shear rate, viscosity and first normal stress difference, if normal force data is supplied. With minor modifications, the program can be adapted to other models such as the R16 and R18.

484 Program Steps
Necessary Accessories: HP 82143A Printer

Documentation — $12.00 Cost of 7 cards — $8.75

03126-41 : Quantum Mechanical Addition of Angular Momenta

Angular momentum (AM) addition always takes up a chapter in physics texts on quantum mechanics, and represents perhaps the most difficult and tedious topic for the beginning student. Now the HP-41 can do the addition automatically. Utility routines are provided for calculation of many quantities useful in AM addition, including the 3-j, 6-j, and 9-j symbols. Students of advanced physics, spectroscopists, nuclear physicists and chemical physicists will find this program of unique interest.

1138 Program Steps
Necessary Accessories: CV or Quad Memory

Documentation — $16.00 Cost of 9 cards — $11.25

T472 Chemistry Physical Electrochemistry

01543-41 : Lambert-Beer / Nernst

This program is used to compute the results of colorimetric and potentiometric (selective electrodes) determinations by means of the equations of Lambert-Beer and Nernst, using statistics concerning linear regression and confidence limits.

1. It prints out the results of the measurements.
2. It computes standard curves and their confidence limits.
3. It computes concentrations of unknown samples with confidence limits.

Results are printed out automatically in the correct unities. New standard data are stored on a magnetic card per element, so that future analytical results can be interpreted directly after entering the appropriate standard data card.

323 Program Steps
Necessary Accessories: 2 Memory Modules; Printer and Card Reader optional

Documentation — $12.00 Cost of 6 cards — $7.50

T474 Chemistry Physical Kinetics

01888-41 : Reaction Rate Evaluation

Given kinetic data on a reaction (concentrations and the times at which those concentrations occurred), this program will evaluate that data for a user specified reaction order. The program computes the correlation coefficient, the slope, the y-intercept, the rate constant, the initial concentration, and the half-life. Linear estimation is also permitted. One Memory Module is required to accomodate the program and 31 data points. Each additional Memory Module permits an additional 32 data points.

227 Program Steps
Necessary Accessories: One Memory Module minimum.

Documentation — $12.00 Cost of 2 cards — $2.50

02681-41 : Fitting Adsorption Data With Langmuir and B-E-T Equations

This program fits experimental data of gas volume adsorpted at several partial pressures and calculates the parameters of the Brunauer-Emmett-Teller Equation and Langmuir Isotherm representing these data. Up to 20 data pairs can be analyzed. New values can be predicted by program using both equations. Also, using the parameters resulting from B-E-T equation, volume adsorpted due to multilayers can be predicted keying the number of layers.

316 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 3 cards — $3.75

03328-41 : Enzyme Kinetics: Two-Substrate Reaction

Given the concentrations of the "variable" and "fixed" substrates, and the initial velocities, this program determines the slope, intercept and correlation coefficient of each line of a two-substrate primary plot, then goes on to calculate the kinetic parameters Vmax, Ka, Kb, and Kia for an enzyme-catalyzed two-substrate reaction.

156 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

T476 Chemistry Physical Spectroscopy

01543-41 : Lambert-Beer / Nernst

This program is used to compute the results of colorimetric and potentiometric (selective electrodes) determinations by means of the equations of Lambert-Beer and Nernst, using statistics concerning linear regression and confidence limits.

1. It prints out the results of the measurements.
2. It computes standard curves and their confidence limits.
3. It computes concentrations of unknown samples with confidence limits.

Results are printed out automatically in the correct unities. New standard data are stored on a magnetic card per element, so that future analytical results can be interpreted directly after entering the appropriate standard data card.

323 Program Steps
Necessary Accessories: 2 Memory Modules; Printer and Card Reader optional
Documentation — $12.00 Cost of 6 cards — $7.50

02056-41 : AAS Data Analyst - Report Generator For Bench Top

Program analyzes data from a) standard calibration and b) standard addition using linear regression with visual and audio prompts for input. Printer generates report as you input data. Program calculates and prints means and standard deviations for absorbances, regression parameters and result in G/L or % according to sample nature. Uses synthetic functions.

323 Program Steps
Necessary Accessories: One memory module, Printer, and Card Reader (unless user is able to key in synthetic instructions).
Documentation — $12.00 Cost of 4 cards — $5.00

T478 Chemistry Physical Thermodynamics

01863-41 : C_p' from Tables

The program converts equations for C_p to real values. It has a built in size check and is set up to take "N" terms. The power of the "T" may be +, − or 0. It uses 2N+6 data registers. It will run on HP-41C with five terms in the equation.

154 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02588-41 : Molar Volumes by Ackerman's Corr. of Redlich-Kwong Equation

This program finds molar volumes of a pure substance (gas phase) using a correction for Redlich-Kwong compressibility factor including the acentric factor by means of two complex equations, using 25 constants, proposed by Ackerman. With this correction, the results are in good agreement with the compressibility factor charts of Pitzer's correlation. This version of R-K equation is not very popular because of the need of electronic computation but now it is here, at hand.

250 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02643-41 : Benedict-Webb-Rubin Equation of State For Mixtures

This program needs 116+ registers (one more for each component over five) and uses the Lorentz combination. This program will find volume, pressure, or temperature if the other two are known (note: will not work if have only one component). The program uses the 1/2 method of find volume and temperature. The program uses a printout to check the input of each set of constants.

401 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02778-41 : High Temperature Stability Constants — Helgeson Theory

Estimate equilibrium constants of aqueous complexation reactions from 25°C (298°K) to 300°C. User inputs log K at 25°C and standard enthalpy change at 25°C. Program computes log K (T) at 25° intervals, fits results to a convenient function of T, and computes standard deviation of the curve fit.

207 Program Steps
Necessary Accessories: Math module (for curve fit only. Can be omitted.) One Memory Module if using Math module.
Documentation — $12.00 Cost of 2 cards — $2.50

02781-41 : High Temperature Stability Constants — Fuoss Theory

Estimate equilibrium constants of aqueous complexation reactions from 25 to 200°C. User inputs log K at 25°C and charges of metal ion and ligand. Program computes log K(T) at 25° intervals, fits data to convenient function of T, and computes standard deviation of curve fit.

242 Program Steps
Necessary Accessories: Math Module for curve fitting only. Can be omitted.
Documentation — $12.00 Cost of 3 cards — $3.75

02788-41 : Enthalpy of 89 Elements and Their Oxides Above 298 Degrees K

This program is based on "Thermodynamic Properties of Elements and Oxides", by L.B. Pancratz (Bumines Bull. 672, 1982, 509 PP, avail. Sup Doc's for $17.00-1983). Four polynomial terms for each phase that the substance has are to be mnemonically transformed and with other data then stored on cards. 433 substances are available. Accuracy is $\approx \pm 10\%$ at worst. Prompted and labeled; input in four temperature scales, output in Cal/Mol., Cal/Grm., and Cal/Cgl. Data for 29 substances included.

416 Program Steps
Necessary Accessories: Two memory modules; card reader very useful.

Documentation — $14.00 Cost of 6 cards — $7.50

02810-41 : Equilibrium Constants of Hydrothermal Reactions

Program computes equilibrium constants of mineral dissolution reactions over the temperature range 298 to 473 degrees K. User inputs average heat capacities of aqueous ions and heat capacity power functions of minerals. Program fits equilibrium constants to convenient function of temperature and computes standard deviation as measure of goodness of fit.

353 Program Steps
Necessary Accessories: Two memory modules. Math module optional.

Documentation — $12.00 Cost of 4 cards — $5.00

02839-41 : Mineral-Water Equilibria

Inputs are concentrations of 12 ions and pH. Program computes equilibria between free ions and 40 complexes and saturation indexes of 12 minerals. Easily expanded or modified.

677 Program Steps
Necessary Accessories: Three memory modules. Card reader optional.

Documentation — $14.00 Cost of 8 cards — $10.00

03068-41 : Mixture Rules for Benedict Webb Rubin Equation

This program calculates pseudocritical constants of gas mixtures, namely, the pseudocritical temperature, pseudocritical pressure, pseudocritical specific volume, the mixture molecular weight, the pseudocritcal Pitzer Factor, and the gas constant of the mixture. The mixing rates are those recommended for use with the Benedict-Webb-Rubin equation, as modified by Lee and Kesler. The input required is component critical temperature, critical pressure, molecular weight, Pitzer Factor, and flowrate.

211 Program Steps
Necessary Accessories: Two memory modules. Printer optional.

Documentation — $8.00 Cost of 2 cards — $2.50

03212-41 : "GENCOR" Generalized Correlation

The program calculates B, B_0, B_1, dB/dT, dB_0/dT_R, B_{ij}'s, $\Delta h/RT$, $\Delta S/R$, ΔH, ΔS, dB_{ij}/dT, BP_c/RT_c and Z. No unit conversions are necessary, the user is prompted for the units desired by the program, and the program makes the conversions. In its present form the program will work only for a one or two component mixture.

327 Program Steps
Necessary Accessories: Petroleum Fluids Pac

Documentation — $12.00 Cost of 4 cards — $5.00

03368-41 : Thermodynamics Assistant: Calculations Based on Steam Tables

Introductory thermodynamics classes often make great use of steam tables. This package of three subroutines automates the repetitive calculations most often used in reading the steam tables. Linear interpolation is provided for estimation of non-listed table values. The quality of a saturated mixture "X" can be calculated given vapor and fluid specific volumes, internal energy, enthalpy, or entropy. Conversely, the specific volume, internal energy, enthalpy, or entropy can be calculated given "X" and the specific fluid and vapor contributions.

68 Program Steps
Necessary Accessories: None.

Documentation — $8.00 Cost of 1 card — $1.25

T480 Chemistry Quantitative Analysis

01543-41 : Lambert-Beer / Nernst

This program is used to compute the results of colorimetric and potentiometric (selective electrodes) determinations by means of the equations of Lambert-Beer and Nernst, using statistics concerning linear regression and confidence limits.

1. It prints out the results of the measurements.
2. It computes standard curves and their confidence limits.
3. It computes concentrations of unknown samples with confidence limits.

Results are printed out automatically in the correct unities. New standard data are stored on a magnetic card per element, so that future analytical results can be interpreted directly after entering the appropriate standard data card.

323 Program Steps
Necessary Accessories: 2 Memory Modules; Printer and Card Reader optional

Documentation — $12.00 Cost of 6 cards — $7.50

02048-41 : Ideal and Van Der Waals Gas Laws

This program will solve problems involving pressure, volume, moles, R, and temperature by the Ideal, Boyle's, Avogadro's, Charles, Van Der Waals and General gas laws. Data need not be reentered.

240 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

02368-41 : Water Analyses: Charge and Conductivity Balance

Use this program to check the accuracy of chemical analyses of natural and waste waters. Program prompts for major ion concentrations, conductivity, and temperature. Program then calculates charge balance error and conductivity error. (Equivalent conductivities generated by program.) Input concentrations can be in mg/l or mM.

187 Program Steps
Necessary Accessories: None. Printer optional.

Documentation — $12.00 Cost of 3 cards — $3.75

02874-41 : Caustic Soda Content - SG or Titration Method

The package contains two programs. SG estimates %NaOH and $\%N_2O$ of a solution based on its specific gravity and temperature in degree celsius. It works for 0 to 30C and 0 to 50% NaOH. Average discrepancy is 0.12% NaOH. TITR does data treatment for hydrochloric acid standardization using sodium carbonate and double indicator titration. Standard deviation is reported as appropriate. In both program runs, printer gives annotated hard copies. Program TITR uses synthetic functions but full documentation is given.

322 Program Steps
Necessary Accessories: Printer and one memory module. Time module optional. Wand or Card Reader necessary unless you can key in synthetic code.

Documentation — $16.00 Cost of 4 cards — $5.00

03021-41 : Chemistry Quantitative Analysis

Having a solution of a substance A in the solvent B in a certain concentration you calculate all the other concentration units with this program.

118 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

T500 Geography

00632-41 : Distance on Earth's Surface Per FCC Rules

This program calculates the distance between two points on the earth's surface per FCC rules. Optional input prompting. Flag controllable decimal degree or d. MSS input format. Extremely useful for determining the distance to possible interfering broadcasting stations.

77 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01556-41 : Five Azimuthal Projections

Program calculates X and Y coordinates for construction of Gnomonic, Orthographic, Equidistant and Lambert Equal Area projections. The grids may be polar, equatorial or oblique. Program prompts for all input data and labels all output data. Audio signal of input and output is included. Program can be edited if no memory module is available.

213 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01900-41 : Oblique Stereographic Projection

This program will compute the X and Y coordinates for plotting an oblique stereographic projection. Full prompting, automatic X and Y coordinate viewing, and tone signals for input-output is featured.

78 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02789-41 : Latitude – Longitude Distances

This program provides conversions for distances on the surface of a sphere between points defined by latitude and longitude. It calculates shortest distance between two points, latitudinal and longitudinal distances, and coordinates of the second point given the position of the first point and latitudinal and longitudinal distances. Since longitudinal distances are dependent on latitude, the program also allows operations to be performed latitudinal then longitudinal and vice versa. NOTE: This program does not work well on the HP-42S, use 00632-41 instead.

172 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

T600 Geology

01049-41 : Textural Analysis

This program computes the mean, standard deviation, skewness and kurtosis given the undefined units from a sieve (or pipette) analysis. The program accepts equally spaced phi classes only in calculating the above moment statistics. Output is in phi units.

166 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01474-41 : Seismic Reflection Normal Move Out Equation

This program solves basic normal moveout equations governing seismic ray/path reflections without dipping beds. Travel time, zero offset time, offset distance, average velocity and depth to bed, reflection angle are input and/or computed values.

244 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

01708-41 : Three-Point Problem

Simplifies 3-point problems. Given elevations of three points and two user-supplied measurements the strike line and dip are computed.

56 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01803-41 : Reserve Calculation

The program calculates and assigns coal reserves to a designated category, such as: measured, indicated or inferred. Input are planimeter data, which may be averaged over several runs, seam height and the tonnage factor. Raw data is printed and output labeled for reference.

153 Program Steps
Necessary Accessories: Printer

Documentation — $12.00 Cost of 2 cards — $2.50

01819-41 : Drill Hole Drift Survey

This program solves for the coordinates of selected points down a drill hole, in three dimensions, given the surface coordinates of the hole collar and hole orientation data obtainable from single shot type down the hole survey tools.

49 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02088-41 : Gravity Tides

The gravitational effects of the moon, the sun, and the gravity tide correction are calculated by this program for any point on earth at any time in the twentieth century. In the process, the earth-moon and earth-sun distances are determined, as well as zenith angles, etc.

585 Program Steps
Necessary Accessories: Three Memory Modules or One Quad Module

Documentation — $14.00 Cost of 6 cards — $7.50

02123-41 : X-Ray Characteristic Lines

Provides the practicing x-ray analyst with ready conversion between wavelength of characteristic emission line and atomic number of emitting atom. Combines the technique of interchangeable solution and Kelly's equations.

94 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02207-41 : Formula Calculation From a Mineral Analysis

The program determines, from an oxide weight mineral analysis, a chemical formula on the basis of a given number of anions, e.g., O, OH, F, CI, S. "Modular" subroutines allow rapid insertion or deletion of specific elements to tailor the program to user's needs or calculator memory capacity.

276 Program Steps
Necessary Accessories: One or more memory modules - depending upon the number of elements included in program.

Documentation — $12.00 Cost of 3 cards — $3.75

02328-41 : CIPW NORM

This program computes the CIPW norm of any igneous rock analysis. Input is wt.% of the major oxides and output is wt.% normative minerals.

550 Program Steps
Necessary Accessories: Three memory modules

Documentation — $12.00 Cost of 12 cards — $15.00

02390-41 : Coal Quality Calculations

The program accepts coal quality data from a proximate analysis and calculates coal quality on a dry-, and dry, ash-free basis. Factors are normalized to 100%. In addition, coal quality on a dry, ash-free basis is calculated by the Parr Formula.

229 Program Steps
Necessary Accessories: One Memory Module or equivalent; (Printer is optional).

Documentation — $12.00 Cost of 3 cards — $3.75

02456-41 : Gravimeter Data Reduction To Boguer Anomaly

The program calculates a Boguer Anomaly value (not terrain corrected) from prompted inputs for Boguer slab density, time, gravimeter reading, elevation and north-south distance from base station in either miles, kilometers or minutes of latitude. Drift is assumed to be linear and evaluated from base occupation times and gravimeter readings.

120 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02591-41 : Land Locator

Program displays quarter-quarter-quarter breakdown of a section given distance in feet from the North or South line and East or West line. Points located on a quarter line are denoted with an asterisk. Program use speeds quarter-quarter-quarter determinations and reduces errors.

143 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 2 cards — $2.50

T700 Geophysics

00532-41 : Earthquake Energy

Prompts for and accepts magnitude of earthquake on richter scale. Outputs earthquake radiated energy in joules and then in equivalent tons of tnt.

32 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02303-41 : Seismic Reflection Field Array Design

Source and receiver arrays for reflection surveys must be designed to generate and receive a maximum of energy within the signal spectrum and a minimum of energy outside the spectrum. This program helps to optimize field arrays for the best signal to noise ratio. Results are plotted.

113 Program Steps
Necessary Accessories: Printer and one memory module. Card Reader helpful.

Documentation — $12.00 Cost of 2 cards — $2.50

02494-41 : Four Layer Weathering Static Correction Computation

The program calculates and prints out static corrections for up to four weathered layers. All velocities depths, elevations and travel times are also printed in groups according to layers. The replacement velocity and the datum plane elevation, which are constant in most areas, are entered and stored in data registers and can be changed by going to the appropriate steps. (These values are also printed).

195 Program Steps
Necessary Accessories: 82143A Printer and two memory modules

Documentation — $12.00 Cost of 3 cards — $3.75

02719-41 : Seispac - Reflection Seismic Routines

This is a collection of four routines useful in reflection seismic data interpretation. The four routines are: Dix equation (int. velo., depth, and aver. velo.); a routine to calculate interval, average and RMS velocity from time-depth pairs; a routine to determine an instantaneous velocity function, linear in depth, from time-depth pairs; and a routine to calculate an instantaneous velocity function, linear in time, from time-depth pairs.

224 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02720-41 : Seismic Fresnel Zone Calculations - HP-41

"SFZ" is an improvement on the 67/97 version of this program, since it includes complete prompting and output labeling, as well as a displayed "menu". The program calculates the radius of the Fresnel Zone for reflection seismic data. The calculations are based on either plane or spherical waves and for constant velocity fields or for a field with a linear velocity gradient.

69 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

02721-41 : Linear Velocity Function Determination and Migration

This program accepts up to 240 time-depth pairs (with 41CV) and fits a linear velocity function, linear in depth, to the data in a least-squares sense. Once the function has been determined, depth can be found for any time or time can be found for any depth. In addition, a raypath migration routine is included which uses the parameters from the velocity function.

238 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

02722-41 : Linear Geophone Array Design and Response

This program, which is an elaboration of the 67/97 program of the same name, allows the user to compute spacing or number of geophones for either minimum length or maximum rejection over the noise wavelength range. Given the number of geophones, the spacing between 'phones and the noise wavelength range, it will compute the array response at any point or average array response over the noise range. This program includes complete input prompts and output labeling as well as audible indications that it is finished.

134 Program Steps
Necessary Accessories: Printer optional

Documentation — $12.00 Cost of 2 cards — $2.50

02723-41 : Geophone Sensitivities For Chebyshev Optimized Arrays

This program will quickly calculate the weights to be applied to each individual geophone in a Chebyshev optimized array, based on the number of geophones available and the desired reject ratio in the reject band. The algorithm is based on the method of Reitsch as published in Geophysics, Vol. 44, #6, pp.1142-1143. This program is very similar to the 67/97 program of the same name, but it includes input prompting and output labeling to make the program more user friendly.

129 Program Steps
Necessary Accessories: Printer helpful

Documentation — $8.00 Cost of 1 card — $1.25

02725-41 : Density Porosity - Neutron Porosity Crossplot

This program will calculate effective porosity (shale- and hydrocarbon- corrected), shale fraction and water saturation using standard log measurements using a density porosity-neutron porosity crossplot method. The evaluation of each point only takes about 10 seconds once the program has been initialized.

159 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

02729-41 : Bulk Density - Neutron Porosity Crossplot

This program performs a bulk density-neutron porosity crossplot, yielding effective porosity, shale percentage and water saturation. Input parameters are resistivities, densities and neutron porosities and gamma ray reading for the matrix material, the shales and the formation waters. Once the program is initialized the evaluation takes only about 15 seconds per point. All input is prompted and all output is labelled, making the program easy to understand and use.

184 Program Steps
Necessary Accessories: Mass storage and a printer are useful

Documentation — $12.00 Cost of 2 cards — $2.50

02841-41 : Archeological Electrical Resistance Survey

The program is for field use. It provides for entering each resistance measurement (with error correction) and completes the set of measurements by adding time, date, and name. It prints a data table and records data on cards. It plots raw data and/or "filtered data" to improve field interpretation of survey.

367 Program Steps
Necessary Accessories: X-Functions module, Time Module, Card Reader and Printer

Documentation — $12.00 Cost of 4 cards — $5.00

T800 Oceanography

01003-41 : Fluid Boundary Normal Transmission Loss

This program calculates sound transmission loss across fluid boundaries at normal incidence. A table of required acoustical properties of materials is provided for program input.

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01293-41 : Ray Tracing for Underwater Sound Transmission

This program provides a model to generate ray tracing plot data for sound transmission in the sea. The program accomodates four ocean layers and ray traces for surface duct and convergence zone sound transmission modes. Data inputs for generating the sound velocity profile (SVP) are requested.

607 Program Steps
Necessary Accessories: Three Memory Modules and Printer.

Documentation — $14.00 Cost of 7 cards — $8.75

01581-41 : Linear Water Wave Theory

Linear Wave Theory is used to compute wave height, wave number, wave celerity, shoaling coefficient, refraction coefficient, and horizontal and vertical velocities. Input parameters are wave period, deep water wave angle, deep water wave height, water depth, depth of interest, and wave phase angle. English or metric units may be used.

238 Program Steps
Necessary Accessories: HP82143A Printer

Documentation — $12.00 Cost of 3 cards — $3.75

02076-41 : Underwater Sound Propagation

Program calculates values related to underwater sound propagation at sea or in large bodies of fresh water. All parameters are calculated and output automatically in either English or SI units following the cued input. This program is an improved HP-41C version of HP-67 program 03080-97 by the same author.

520 Program Steps
Necessary Accessories: Three Memory Modules

Documentation — $14.00 Cost of 6 cards — $7.50

T810 Oceanography Biological

T820 Oceanography Chemical

T840 Oceanography Physical

01827-41 : Mechanics of Wave Motion

This program solves a variety of wave equations including wavelength, pressure factors, wave energy fractions, shoaling coefficients, group velocity to deepwater wave velocity ratios, and energy coefficients based on the Linear wave theory using a Newton-Raphson searching scheme. Use of this program saves interpolation of ocean wave tables.

205 Program Steps

Documentation — $12.00 Cost of 2 cards — $2.50

T900 Physics

00329-41 : BRT Superconducting Thermal Conductivities / BCS Energy Gaps

Calculates the BRT ratio of the electronic thermal conductivity in the superconducting state (KES) to the normal state (KEN) for weak coupling superconductors. A numerical expression is used to calculate the value of the BCS superconducting gap delta(t)/delta(o) between absolute zero and the transition temperature (TC).

Necessary Accessories: None

Documentation — $8.00 Cost of 3 cards — $3.75

00447-41 : Germanium Resistor Thermometry Interpolation & Calibration

Using data packing techniques, encodes 2 digit "t", 5 digit "r", and 4 digit "dr/dt" to fit into a single storage register. A series of these registers form a calibration table, which is used for interpolating (to second order) a "tsubx" corresponding to a given "rsubx".

Necessary Accessories: One Memory Module (& Card Reader) recommended but not required.

Documentation — $12.00 Cost of 3 cards — $3.75

00653-41 : Inorganic Carbon Calculations

This program calculates the concentrations of carbon dioxide bicarbonate, carbonate and total inorganic carbon in aquatic systems using values of alkalinity, temperature and pH (ionic strength is optional). It uses the alphanumeric capacity of the HP41C to request inputs.

163 Program Steps

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00680-41 : Thermal Conductivity with Carbon Resistors

Calculates the thermal conductivity (κ) of a sample at low temperatures by a one heater-two thermometer technique. The thermometers are carbon resistors and are characterized by a quadratic equation in $\ln R$ and $\ln T$. κ is determined to second order. Also calculated are dR/dT, d^2R/dT^2, ΔT and T_{ave}. Also supplied are HP-67/97 keystrokes.

218 Program Steps

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00687-41 : Equation of Position, Speed, Gravity, and Time

Program calculates the unknown gravity in the equation: $0 = \frac{1}{2}gt^2 + V_0t + S_0$. Program prompts for inputs. After providing three knowns the calculator will calculate the unknown quantity and store it for future use.

163 Program Steps

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00767-41 : Motion

This program is a tremendous time-saver for all who use the motion equations of physics. Given at least three of the five variables, acceleration, time, original velocity, final velocity, and distance, the program will solve for the other two, deciding which equations to use.

223 Program Steps

Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

00788-41 : Equations of Particle Dynamics

Given any three of the following, this program will solve the other 2 with the press of a single key: distance, time, initial velocity, final velocity, acceleration.

161 Program Steps

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00816-41 : Conductivity by Electromagnetic Induction

This geophysical analysis calculates the apparent conductivity of a multi-layered earth to model the response of an electromagnetic induction meter. Horizontal stratification is assumed; transmitter and receiver dipoles are vertical, above the earth, and have a spacing much less than the skin depth in any stratum.

76 Program Steps

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00841-41 : Grey Body Color Temperature & Emissivity

Given the radiances at two wavelengths, the grey-body color temperature is calculated. If the radiances are in absolute units, the emissivity is also obtained. Also calculates blackbody radiance given the temperature and wavelength. Re-iterative parameter entry, which saves time on repeat problems, is used. 41C math applications pac optional.

173 Program Steps

Necessary Accessories: 41C Math Applications Pac optional.

Documentation — $8.00 Cost of 2 cards — $2.50

00859-41 : Frequency of Vibrating Strings

This program provides for interchangeable solutions for frequency, radius, length, tension and density. The alpha-prompting features of the 41C fully utilized, instructions are part of the program and no local labels are used. In repeat cases, the variables remaining the same need not be re-entered.

112 Program Steps

Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

00905-41 : Ingall's Ballistics

This program calculates the ballistics of a bullet in flight. Velocity, energy, flight time, mid-range height, drop, 10 mph wind drift and trajectory for any sight-in range is calculated for all ranges from muzzle to maximum range input. This program is a complete exterior ballistics system.

277 Program Steps

Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

00910-41 : Black Body Photon Emission

Computes black body photon emission using SI units. Input format follows hp thermal (energy) radiation program (00152-41).

140 Program Steps

Necessary Accessories: One Memory Module and Card Reader

Documentation — $8.00 Cost of 2 cards — $2.50

00955-41 : Bohr Hydrogen Atom

This program uses alphanumeric prompting and data format to yield such information about the classical Bohr hydrogen atom as maximum nubers of possible electrons in atom per level, radius of orbital, velocity of electron in orbital; kinetic, potential, and total energies of electrons in orbital. Too, this program lists the five spectra series of the hydrogen atom, the energy of the released photons, and their frequencies.

164 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01160-41 : Levels of Systems

Program allows user to consider kinematics problems from up to 10 interdependent frames of reference; user-defined coordinate systems of the frames of reference may independently be of different magnitudes; undergo rotations or transformations.

138 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 1 card — $1.25

01204-41 : Exterior Ballistics

This program solves typical exterior ballistics problem for small arms. The program will generate data based on Ingals tables or British 1909 tables. The program is based on a basic program 1980 V5N9, Pg 270 "Exploring Ballistics with Your Computer" by Robert W Jenks.

628 Program Steps
Necessary Accessories: Four Memory Modules

Documentation — $16.00 Cost of 9 cards — $11.25

01289-41 : Compton Crossections

Compton scattering, absorption, and total crossections per electron for photon interactions are computed from the equations derived by Klein-Nishina. Mean recoil electron and scattered photon energies are also computed. User must provide initial photon energy in MEV.

101 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

01607-41 : Acoustic Wavelength, Temperature and Velocity

This program calculates interchangable solutions between frequency, wavelength, temperature and velocity for sound in air. Values, for input and output, may be expressed directly in feet, inches, meters, centimeters, milimeters, Hertz, Kilohertz, degrees Celsius, degrees Fahrenheit, velocity in meters per second, and velocity in feet per second. Inputs and outputs are fully labeled.

324 Program Steps
Necessary Accessories: 1 Memory Module. Printer optional.

Documentation — $12.00 Cost of 4 cards — $5.00

01707-41 : Hertz to Notes Conversion

Converts: A) Any frequency (in Hertz) to the corresponding musical pitch name, octave number, and deviation from exact pitch or; B) Any note name, octave, and deviation to the corresponding frequency. Pitches are based on the Equal Tempered scale, octaves are numbered by USA Standards recommendation, and deviations are in cents (1/100 half step).

147 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01762-41 : Blackbody Calculator

With this program, a user can compute all quantities related to the spectral emittance of a blackbody source, including integrated emittance between two wave lengths. Both photon and energy-density units are accommodated. Alphanumeric labeling is used for all outputs.

208 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01860-41 : Inelastic Collisions

This program solves inelastic collisions for two dimensions. The program deals with variables: 2 angles, M1, M2, V1, U1, Vf. Knowing six of the variables, the seventh variable can be computed. Also the program calculates initial and final kinetic energy and the energy loss.

232 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01928-41 : Audio Power Output

Program calculates the relative power output from a loudspeaker when positioned near three walls, as compared to empty-space (or anechoic chamber). Computes relative output at 56 different frequencies and stores these values, with frequency for quick recovery. Also computes relative power output for any given frequency.

215 Program Steps
Necessary Accessories: 1 Memory Module

Documentation — $12.00 Cost of 2 cards — $2.50

01970-41 : DPM Quench Correction

A samples Channels Ratio Quench correction curve is calculated. The ratio of Channel A (narrow window) and Channel B (wide window) versus the efficiency of Channel B (CPM/Total DPM added) is used to compute a least squares L.R. The efficiency of the samples, calculated with their A/B ratio, is used to determine the actual DPM. Fully prompted. Printer is optional.

148 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

01982-41 : Computerized Periodic Table of Elements

This three program set is a computerized periodic table of elements. Program 1 contains 73 elements listing atomic number, name, atomic weight and group number. Program 2 and 3 represent Lanthanide and Actinide series. For these, atomic number, name and atomic weight are printed out. Names are abbreviated.

939 Program Steps
Necessary Accessories: None

Documentation — $16.00 Cost of 14 cards — $17.50

02029-41 : Collisions: Conservation of Linear Momentum

Third program in the "Physics Teacher" series uses a slightly different approach to yield interchangeable solutions between eleven variables, including the coefficient of restitution, when two bodies collide centrally with each other. Both elastic and inelastic collisions are solvable.

346 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02057-41 : Electrotechnical Calculations

Under the input of three known variables (U, I, Q, t, P, W or R) the program calculates the four unknown variables fully automatically.

350 Program Steps
Necessary Accessories: One Memory Module

Documentation — $12.00 Cost of 3 cards — $3.75

02373-41 : Rotational Motion Equations

Given three of five variables: angular acceleration; initial angular velocity; angular velocity; angular displacement or time, an unknown or both unknowns will be calculated. Furthermore, this program calculates the radial and tangential acceleration components and the resultant acceleration's direction and magnitude.

398 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02483-41 : Confluent Hypergeometric Function

This program calculates values of the confluent hypergeometric function. The function includes as special cases many of the functions of mathematical physics, including bessel functions, solutions of the Schroedinger equation for Coulomb and for harmonic oscillator potentials. The fresnel integrals of classical optics, and many others. The program runs much faster than a straightforward evaluation of the infinite series.

153 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02498-41 : Sound Speed in Air and Water

This program calculates the speed of sound in air or water for user-selected parameters of barometric pressure, air temperature, humidity, water temperature, salinity and water depth. Calculations are made for either English or SI units.

394 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 5 cards — $6.25

02597-41 : Doppler Effect: Interchangeable Solutions

This program solves for one of the following given the other four: wave velocity, observer velocity, source velocity, original frequency, shifted frequency. It will not solve problems in which the observer and source are moving in the same direction, but one of their velocities can be equal to zero.

111 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02685-41 : Elastic Collisions in Two Dimensions

This program will find the result of an elastic collision of two bodies in two dimensions, given a velocity or angle of the final conditions. Given the final conditions and one initial velocity or initial angle, the initial conditions can be calculated. The mass ratio may also be calculated. Both of the sets of solutions are displayed. All inputs are prompted for, and all outputs are clearly labelled.

390 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02686-41 : Inelastic Collisions in Two Dimensions

This program will find the result of an inelastic collision of two bodies in two dimensions. Initial conditions can be calculated from the final results and both initial velocities, both initial angles, velocity and angle of one body, or velocity of one and angle of the other. The mass ratio may also be calculated. In cases where two solutions exist, both are displayed. All inputs are prompted for and all outputs are clearly labeled.

395 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

02687-41 : Laws of Motion

This program uses the basic laws of motion to provide solutions for problems involving motion with constant acceleration in one dimension. Values that may be input or solved for include: time, displacement, initial velocity, current velocity, acceleration, mass, momentum, impulse, force, and kinetic energy. Once quantities have been input, the user may select other quantities which are then calculated, if possible.

481 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02791-41 : Room Modes Calculations

The program calculates the eigentones (room modes) of a rectangular room or enclosure given width, length, and height, then sorts them in ascending order.

119 Program Steps
Necessary Accessories: One memory module
Documentation — $8.00 Cost of 1 card — $1.25

03007-41 : External Ballistics - 3, Kick

This program solves some of the more important factors such as muzzle energy, trajectory, bullet flight time, impulse, recoil velocity, recoil energy (kick). Impulse, recoil velocity, and recoil energy (kick) should be of interest to black powder shooters as computations can be made for black powder and for smokeless powders.

Necessary Accessories: None. Card Reader useful.
Documentation — $12.00 Cost of 1 card — $1.25

03030-41 : External Ballistics - 1, Drop

This program computes flight time, G, trajectory, and drop. The only input data necessary are terminal velocity, muzzle velocity, ballistic coefficient, and distance. These computations are entirely valid for small arms projectiles to more than 1000 yards.

136 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03165-41 : Recoil

Based upon Powder Charge, Bullet weight, Muzzle Velocity and gun weight program calculates recoil velocity in FPS and Recoil Energy in FT.LBs.

41 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03232-41 : External Ballistics - 2: Trajectory

This program computes trajectories to 100 yards for pistol or 1000 yards for rifle. Only drops are required for trajectory calculation. Drops may be obtained from use of EXTERNAL BALLISTICS - 1, DROP or other similar programs or other sources.

71 Program Steps
Necessary Accessories: None, however, a card reader would be useful.
Documentation — $12.00 Cost of 1 card — $1.25

03267-41 : Growth and Decay

This program can predict the size or mass of a species or element knowing original size or mass, and time. It can also predict the time required to reach a size or mass. Exponential growth and decay is used for both.

65 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03299-41 : Gravity

This program computes the artificial gravity on a circular space station or centrifuge. The weight of an object at altitude, the acceleration of gravity at altitude, the neutral point and attraction of two bodies or particles.

86 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03303-41 : Relki

This program calculates the relativistic parameters of elementary particles for which the mass is given in Mev. If one of the following parameters: Momentum "P", Gamma, Kinetic Energy "T" or Total Energy "E", are known, the others are calculated using the technique of interchangable solutions.

112 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 2 cards — $2.50

T910 Physics
Classical Mechanics

01797-41 : Projectile Equations of Motion

If a projectile is fixed with a given velocity and angle, it will have a definite position at any given time. Given any three of velocity, angle, time, horizontal distance or altitude, the other two will be computed. Air resistance is neglected. Metric or English and all angle units applicable.

380 Program Steps
Necessary Accessories: 1 Additional Memory Module: Printer Optional.
Documentation — $12.00 Cost of 4 cards — $5.00

01808-41 : Uniformly Accelerated Motion: Interchangeable Solutions

Second program in a series for First-Term Physics: PT2 differs from 00236-41 not in results but in method of Data Entry (Key in 3 unknowns: 41C 'Jumps' to solution of the other 2 unknowns). User may play "What-If" very readily. Program uses X <> F function to expedite Multiple Flag Testing and Branching.

229 Program Steps
Necessary Accessories: Extended Function Module (uses only X <> F function)
Documentation — $12.00 Cost of 2 cards — $2.50

01827-41 : Mechanics of Wave Motion

This program solves a variety of wave equations including wavelength, pressure factors, wave energy fractions, shoaling coefficients, group velocity to deepwater wave velocity ratios, and energy coefficients based on the Linear wave theory using a Newton-Raphson searching scheme. Use of this program saves interpolation of ocean wave tables.

205 Program Steps
Documentation — $12.00 Cost of 2 cards — $2.50

01828-41 : Mass

This program computes the mass, center of gravity, longitudinal moment of inertia and transverse moment of inertia of an arbitrary body of revolution.

301 Program Steps
Necessary Accessories: One Memory Module. Printer Helpful.
Documentation — $12.00 Cost of 3 cards — $3.75

02822-41 : Angles of Interception

This program calculates the angles necessary for one projectile to intercept a target moving in 3 dimensions. The target is not under the influence of gravity, but the projectile may be. The interception point is either the closest point of the trajectory to the origin or the first point of less than a specified distance. An optional feature will check if the target will crash and let it crash if certain criteria are met.

356 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

T920 Physics
Nuclear and Atomic Physics

00440-41 : Radioactive Decay

This program computes the fourth given three of the following parameters: time, half life, initial mass, and final mass for radioactive decay (or, with a little ingenuity for a first order chemical reaction).

72 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

01287-41 : Four Atom Decay

Kinetics of radio-decay, for chain lengths of up to four atoms, are computed for two optional cases: (1) isotopes introduced into media of interest at a constant rate or as an amount during an interval or (2) fixed initial isotopic amounts at time zero. HP-41 will ask for data as needed. Results read-out in alpha mode.

459 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 4 cards — $5.00

01790-41 : ESR Order Parameter Calculations

This program calculates order parameters from electron spin resonance (ESR) data. Such order parameters are a widely employed measure of the fluidity of cellular membranes.

97 Program Steps
Necessary Accessories: Printer optional
Documentation — $8.00 Cost of 1 card — $1.25

03248-41 : Nuclear Magnetic Resonance

This program solves for free proton nmr; magnetic dipole potential energy (spin up or spin down), spin up/spin down energy changes and associated frequency of photon emission/absorption and proton precession, given a measured change of precession frequency in an nmr experiment, the magnetic field change is calculated.

71 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03304-41 : Attenuation of Radiation

This program calculates the attenuation of radiation by shielding which generally is described by an exponential function. It makes use of the technique of interchangeable solutions and allows for a multiple choice of parameters due to a special input/output subroutine. The latter prompts for input without stopping program with direct return to beginning of ATTEN after final result has been displayed for a new calculation.

86 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

03403-41 : Radiation Analysis By Change In Quantum Level

This program calculates wavelength, frequency and energy of photon emitted when an electron drops from initial quantum energy level to a final, lower quantum energy level. Initial quantum level and final quantum level must be known values. The units are displayed beside the answers.

42 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

T930 Physics Optics

00435-41 : Optical Calculations for Imaging Systems

Determines any two of object distance, image distance, focal length and magnification given the other two.

146 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

00442-41 : HP Laser Compensation

This program calculates the compensation factor used by HP-5526A Laser systems. Inputs are: air temperature and pressure, relative humidity, material coefficient of expansion and temperature. Material temperatures may be averaged. Input data may be reviewed and changed without re-entering unchanged data.

Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01186-41 : Spherical

This program solves problems in optics of the Descartes Equation using the following variables: a=distance object-mirror, b=distance image mirror, f=focal length, i=image size, o=object size, p=power of the mirror, c=optics enter, desv=deviation total of the ray in a prism, refraction angle, density of the prism, incidence angles, emergence angles and the character of images on a mirror. Program is valid for concave and convex mirror.

559 Program Steps
Necessary Accessories: Two Memory Modules
Documentation — $12.00 Cost of 5 cards — $6.25

01505-41 : Spectral Reflectance Computations for Thin Film Coatings

Spectral reflectances for thin film optical coating designs are computed using an algorithm developed for electrical transmission calculations. The method is iterative. Application is limited to normal incidence angle and for essentially non-absorbing materials. For example, program capability is 48 spectral points for a 35 layer filter design.

474 Program Steps
Necessary Accessories: 3 Memory Modules, Printer, Card Reader
Documentation — $14.00 Cost of 5 cards — $6.25

01726-41 : Optic Transfert Matrices, PI and T Networks Transformations

This program computes the transfert matrice of a "PI" or "T" network. "PI" network is two lenses separated by a certain distance. "T" network is one lens between two distances. Transformations between "T" and "PI" are also performed.

156 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

01869-41 : Optical Properties of Solids

This program evaluates the Optical Constants Reflectivity, Refractive Index, Absorption coefficient, and Complex Dielectric constant. At a user-specified frequency. The model is that of Drude, modified by the presence of up to four Lorentz Oscillators. Model parameters can be saved or read on one Magnetic Card Track.

222 Program Steps
Necessary Accessories: 1 Memory Module and (Optionally) Card Reader.
Documentation — $12.00 Cost of 3 cards — $3.75

02012-41 : Rayleigh Scattering Spheroid Radar Cross Section

This program calculates the (Bistatic) radar cross section (RCS) for a spheroidal particle with size and refractive index much smaller than the radar wavelenght. Another restriction is that the polarization must be parallel to the spheroid's axis of symmetry. The index of refraction may be complex.

126 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02463-41 : Third Order Lens System Design-Transversal Aberrations

Given a system of N thin spherical lenses, this program based on the "lens bending" method, computes the transversal aberrations for different surface curvatures of the lenses, but keeping the individual powers as a constant; thus, it is easy to find the configuration that minimizes the total aberrations. The system can also include spherical mirrors.

392 Program Steps
Necessary Accessories: One or more memory modules. Printer optional.
Documentation — $12.00 Cost of 3 cards — $3.75

02597-41 : Doppler Effect: Interchangeable Solutions

This program solves for one of the following given the other four: wave velocity, observer velocity, source velocity, original frequency, shifted frequency. It will not solve problems in which the observer and source are moving in the same direction, but one of their velocities can be equal to zero.

111 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

02633-41 : Raytrace I: Spherical Surfaces

Given an optical system with up to 12 spherical surfaces (refractive or reflective), this program computes the trajectories of the equivalent to 93 rays, from an object in or out the optical axis, of any angle and at any distance, prints the coordinates of the incidence points on the focal plane, and the spot diagram of the image blur. It can be modified for the HP82143A printer.

686 Program Steps
Necessary Accessories: Quad memory module or HP-41CV; X-Func module; one X-memory module; HP-IL module and HP82162A printer
Documentation — $14.00 Cost of 5 cards — $6.25

02660-41 : Spherical Mirrors, Lenses, and Refraction

This program solves problems dealing with spherical mirrors, thin lenses, and refraction. Variables include: object distance, image distance, focal length, radii, index of refraction, magnification, object height, and image height. At a refractive surface, the indices of refraction and angles of incidence and refraction may be solved. One function enables easier entry of a series of lenses or refractive surfaces. All functions and modes are assigned to keys, facilitating easy use.

487 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 5 cards — $6.25

02733-41 : Siedel Aberrations

Program calculates the five siedel aberrations of a 1 to 6 element lines, with or without an aperture stop. The aberrations are: spherical, sagittal coma, transverse astigmatism, distortion, and petzval field curvature. Program allows for changing the object distance, field of view and ray height at the first surface.

644 Program Steps
Necessary Accessories: Four modules or Quad module. Printer optional.

Documentation — $14.00 Cost of 6 cards — $7.50

02811-41 : Focus Calculations

This program solves the focus of any thick, thin or combination of lenses.

192 Program Steps
Necessary Accessories: One memory module

Documentation — $12.00 Cost of 2 cards — $2.50

03004-41 : Raytrace II: General Case

Given an optical system conformed by a set of any type of revolution surfaces (spheric, conic or polinomics of any order) this program computes the exact trajectories of the equivalent to 93 rays, for an object at infinite distance and for any entrance angle. The table of the output coordinates of each ray, and the spot diagram, can be printed or shown on the TV screen, if TV interface is used.

1206 Program Steps
Necessary Accessories: HP-41CV; X-Func Module; two X-Memory modules; HP-IL module; HP 82162A printer; HP 82163 Video Interface (optional).

Documentation — $16.00 Cost of 11 cards — $13.75

03067-41 : R and T of a Thin Absorbing Film on an Absorbing Substrate

The optical parameters describing a thin absorbing film on an absorbing substrate immersed in a transparent medium are supplied by the user. The program calculates the reflection from the front, the transmission, and the reflection from the back for an infinite substrate and for a finite thick substrate immersed in the transparent medium. Normal incidence is assumed. All index and absorption coefficients are assumed to be constant with wavelength.

423 Program Steps
Necessary Accessories: Card Reader and Printer

Documentation — $12.00 Cost of 5 cards — $6.25

03381-41 : Aberations and Ray Trace

This three part program traces a marginal ray and a principal ray through an symmetric, therefore there is no loss of generality in choosing the optical system, one surface at a time. The optical system is rotationally number of surfaces used is dependent upon the available memory. standard deviation are calculated and all coordinates can be printed. The incident direction to lie in the Y,Z plane. The position of the mean and the

559 Program Steps
Necessary Accessories: 41-CV or 41-C with Quad Memory; Extended Functions; Printer useful.

Documentation — $16.00 Cost of 8 cards — $10.00

03454-41 : Laser Cavity Design

This program calculates beam parameters of a gaussian fundamental mode (TEM 00) laser beam propagating in or out of a laser resonator consisting of two concave or convex spherical mirrors. The calculator checks cavity stability, computes the mode radius at points inside or outside the cavity, the confocal beam parameter, and the beam divergence. The calculator also computes the wavefront curvature, and the transmission in percent of a circular aperture placed anywhere along the propagation path of the laser beam.

218 Program Steps
Necessary Accessories: One memory module; printer optional.

Documentation — $12.00 Cost of 2 cards — $2.50

T940 Physics
Quantum Mechanics

01790-41 : ESR Order Parameter Calculations

This program calculates order parameters from electron spin resonance (ESR) data. Such order parameters are a widely employed measure of the fluidity of cellular membranes.

97 Program Steps
Necessary Accessories: Printer optional

Documentation — $8.00 Cost of 1 card — $1.25

01912-41 : Broadening Effects; Collision, Doppler & Natural Width

This program computes the three major broadening effects of spectral lines. It then displays the effects in their decreasing order so you know the relative weight of each efect, namely: the natural width (intrinsic property), the Doppler effect and the collision effect.

112 Program Steps
Necessary Accessories: None

Documentation — $12.00 Cost of 2 cards — $2.50

03126-41 : Quantum Mechanical Addition of Angular Momenta

Angular momentum (AM) addition always takes up a chapter in physics texts on quantum mechanics, and represents perhaps the most difficult and tedious topic for the beginning student. Now the HP-41 can do the addition automatically. Utility routines are provided for calculation of many quantities useful in AM addition, including the 3-j, 6-j, and 9-j symbols. Students of advanced physics, spectroscopists, nuclear physicists and chemical physicists will find this program of unique interest.

1138 Program Steps
Necessary Accessories: CV or Quad Memory

Documentation — $16.00 Cost of 9 cards — $11.25

03403-41 : Radiation Analysis By Change In Quantum Level

This program calculates wavelength, frequency and energy of photon emitted when an electron drops from initial quantum energy level to a final, lower quantum energy level. Initial quantum level and final quantum level must be known values. The units are displayed beside the answers.

42 Program Steps
Necessary Accessories: None

Documentation — $8.00 Cost of 1 card — $1.25

T950 Physics
Relativity

02133-41 : Relativistic Rocket

Given ship mass, fuel mass, exhaust velocity, and constant acceleration, program finds distance and time able to accelerate and final velocity and mass, all in reference frames of both ship and takeoff planet.

291 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 4 cards — $5.00

03211-41 : Relative Mass

This program uses rest mass, observed or relative mass, and velocity. Given any two, the program will generate the third. Alpha input and output is used to increase usability.

75 Program Steps
Necessary Accessories: None
Documentation — $8.00 Cost of 1 card — $1.25

03496-41 : Relativistic Mass, Length, and Time

This program solves for any variable in the relativistic mass, length, and time equations. The user inputs which unknown to solve for the required known information. The possible unknowns include relativistic mass, rest mass, relativistic length, rest length relativistic time, rest time, and velocity using any of these three relativity equations. The purpose of the extensive use of global labels in this program is to allow easier access to the various segments of the program according to the variable to be solved.

186 Program Steps
Necessary Accessories: None.
Documentation — $12.00 Cost of 2 cards — $2.50

T960 Physics Thermal

02387-41 : Past Blackbody Integrals

Blackbody radiant excitance and photon excitance in any spectral band, for any temperature is calculated by summation of a series rather than by numerical integration. This provides fast and accurate results for any spectral region.

194 Program Steps
Necessary Accessories: One Memory Module
Documentation — $12.00 Cost of 2 cards — $2.50

02663-41 : Thermal Expansion and Conduction

This program provides interchangeable solutions for thermal expansion or conduction problems. The thermal expansion part solves for temperatures, length or volume, change in length or volume, or coefficients of expansion. The thermal conduction solves for heat current, temperatures, or resistance, using either conductivities or R-factors. A routine sums arrangements of resistors in series or parallel. If resistance has been solved, then the equivalent conductivity or R-factor, area, or thickness may be solved.

420 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 4 cards — $5.00

02684-41 : Change of Phase

This program calculates the initial or final temperature or the heat required to change the temperature of a substance. The substance may have any melting and boiling points or latent heats, and different specific heats for the different phases of the substance may be entered. If the temperature change starts or stops during a phase change, the amount of each phase at that point may be input or calculated.

430 Program Steps
Necessary Accessories: Two memory modules
Documentation — $12.00 Cost of 4 cards — $5.00

02848-41 : Ideal Gas Physics

One inputs the known quantities and the HP-41C calculates the unknown quantity. The gas constant is prompted for so that any unit system can be used. Also, the work, energy, heat and entropy change between two states can be calculated for constant pressure, volume or temperature transformations and adiabatic transformations.

231 Program Steps
Necessary Accessories: None
Documentation — $12.00 Cost of 2 cards — $2.50

02927-41 : Thermodynamic Processes of an Ideal Gas

This program calculates the constant pressure, constant volume, isothermal, and adiabatic contractions or expansions of an ideal gas. The work done, change in internal energy, and total heat are displayed, and the efficiency of a cycle may be calculated. Pressure, volume, and temperature may be solved using each other. Two systems of units are provided, as well as monatomic, diatomic, and polyatomic gas defaults if the gamma ratio or heat capacities are not input.

357 Program Steps
Necessary Accessories: One memory module
Documentation — $12.00 Cost of 3 cards — $3.75

03368-41 : Thermodynamics Assistant: Calculations Based on Steam Tables

Introductory thermodynamics classes often make great use of steam tables. This package of three subroutines automates the repetitive calculations most often used in reading the steam tables. Linear interpolation is provided for estimation of non-listed table values. The quality of a saturated mixture "X" can be calculated given vapor and fluid specific volumes, internal energy, enthalpy, or entropy. Conversely, the specific volume, internal energy, enthalpy, or entropy can be calculated given "X" and the specific fluid and vapor contributions.

68 Program Steps
Necessary Accessories: None.
Documentation — $8.00 Cost of 1 card — $1.25
