HP-19C/HP-29C Quick Reference Card

AUTOMATIC MEMORY STACK

T	0.00
Z	0.00
Y	0.00
X	0.00

Note: If **Error** is displayed when calculator is turned on, continuous memory has been cleared by a power interruption.

Always displayed.

PRIMARY STORAGE REGISTERS

[i] Address

R_0		0 **(Indirect Register)**
R_1		1
R_2		2
R_3		3
R_4		4
R_5		5
R_6		6
R_7		7
R_8		8
R_9		9
$R_{.0}$		10 n
$R_{.1}$		11 Σx
$R_{.2}$		12 Σx^2
$R_{.3}$		13 Σy **Statistical Registers**
$R_{.4}$		14 Σy^2
$R_{.5}$		15 Σxy

Primary storage registers, program memory, displayed X-register, and display format are maintained by continuouous memory.

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INDIRECT STORAGE REGISTERS (Indirect access only)

[i] Address

$R_{(16)}$		16
$R_{(17)}$		17
$R_{(18)}$		18
$R_{(19)}$		19
$R_{(20)}$		20
$R_{(21)}$		21
$R_{(22)}$		22
$R_{(23)}$		23
$R_{(24)}$		24
$R_{(25)}$		25
$R_{(26)}$		26
$R_{(27)}$		27
$R_{(28)}$		28
$R_{(29)}$		29

STO [n] or **STO** [·] [n] stores x value in R_n or $R_{·n}$.

RCL [n] or **RCL** [·] [n] recalls value from R_n or $R_{·n}$.

STO [0] stores x value in indirect register (R_0-register).

RCL [0] recalls value from R_0.

RCL [i] recalls value from register who's address is stored in R_0.

STO [+] [n], **STO** [−] [n], **STO** [×] [n], **STO** [÷] [n], or **STO** [+] [·] [n], **STO** [−] [·] [n], **STO** [×] [·] [n], **STO** [÷] [·] [n]; x value is added to, subtracted from, multiplied by, or divided into the contents of R_n or $R_{·n}$, and the result is placed in R_n or $R_{·n}$. Can be performed on primary storage registers R_0 through R_9, $R_{·0}$ through $R_{·5}$.

[■]CLEAR **REG** clears all storage registers to 0.00.

ACCUMULATIONS

Press [■]CLEAR [Σ] to clear the statistical registers ($R_{·0}$ through $R_{·5}$).

[Σ+] stores accumulations of the numbers in the X- and Y-registers of the stack in storage registers $R_{·0}$ through $R_{·5}$.

USING REGISTER R_0 FOR INDIRECT CONTROL

A value can be placed in R_0 by pressing **STO** [0]. The [i] function then uses the integer portion of the number stored in R_0 as an address value. If the number in R_0 is outside the specified limits, an error condition occurs.

Indirect control can be performed with:

STO [i] or **RCL** [i]; stores the x value in or recalls x value from the primary or indirect storage register addressed by the number in R_0.

STO [+] [i], **STO** [−] [i], **STO** [×] [i], **STO** [÷] [i]; x value is added to, subtracted from, multiplied by, or divided into the contents of the storage register addressed by the number in R_0; the result is placed in the storage register addressed by the number in R_0.

[ISZ], [DSZ]; increments (adds 1 to) or decrements (subtracts 1 from) R_0. In a running program, if the value in R_0 becomes 0, execution skips one step of program memory before continuing.

[GTO] [i], [GSB] [i], with number in R_0 from 0 through 9, transfers execution to the portion of the program defined by the selected label according to the address scheme below:

[i] Address

[LBL] [0]	0
[LBL] [1]	1
[LBL] [2]	2
[LBL] [3]	3
[LBL] [4]	4
[LBL] [5]	5
[LBL] [6]	6
[LBL] [7]	7
[LBL] [8]	8
[LBL] [9]	9

With −1 through −99 in R_0, [GTO] [i] or [GSB] [i] transfers execution *back* in program memory the number of steps specified by the number in R_0.

PROGRAMMING THE HP-19C/HP-29C

PROGRAM MEMORY (Maintained by Continuous Memory)

HP-19C			HP-29C	
00		Top-of-memory marker.	00	
01	64		01	74
02	64		02	74
03	64		03	74
98	64	98 steps for your program instructions.	98	74

PROGRAM MODE

In program mode, only the following functions are active. All other functions are loaded into program memory when pressed.

[PRT PRGM] Print program (HP-19C). Prints step number and operation beginning at the current step and continuing until two R/S instructions or step 98 is encountered.

[GTO] [·] [n] [n] sets calculator to step nn of program memory.

[SST] Single step. Moves calculator forward one step in program memory.

[BST] Back step. Moves calculator back one step in program memory.

[DEL] Delete. Deletes current instruction from program memory. All subsequent instructions move up one step.

CLEAR [PRGM] Clears program. Clears program memory to all [R/S] instructions, sets calculator to step 00.

[f] CLEAR [PREFIX] Clear prefix. After [f], [g], [STO], [STO] [·], [RCL], [RCL] [·], [GTO], or [GSB] cancels that key.

RUN MODE

Pressed from the Keyboard:

[GTO] [·] [n] [n] sets the calculator to step nn of program memory.

[GTO] followed by a label designator ([0] through [9], [i]) causes calculator to search downward through program memory to the first designated label and stop there.

[GSB] followed by a label designator ([0] through [9], [i]) causes calculator to search downward through program memory to the first designated label and execute that section of program memory as a subroutine.

[RTN] sets calculator to step 00 of program memory.

[R/S] begins execution from current step of program memory. Stops execution if program is running.

Any Key. Pressing any key on the keyboard stops execution of a running program. Execution cannot be stopped during digit entry.

Some functions that are active in PROGRAM mode operate differently in RUN mode:

[SST] single step. Displays step number and keycode of current program memory step when held down; executes current instruction, displays result, and moves to next step when released. Used for single-step execution of program.

[BST] Back step. Moves to previous step and displays step number and keycode of that previous memory step when [BST] is held down; displays original contents of X-register when released. No instructions are executed.

[DEL] Cancels the [g] prefix key.

CLEAR [PRGM] Cancels the [f] prefix key.

Executed in a Program:

Function keys may be executed as instructions in a program. Some function keys that are most often used in or are unique to programming applications are shown below:

[0] [1] [2] [3] [4] [5] [6] [7] [8] [9] Label designators. When preceded by [LBL], define beginning of routine. When preceded by [GTO] or [GSB], cause calculator to stop execution, search downward through program memory to first designated label, and resume execution there.

[PAUSE] Stops program execution for 1 second, displays contents of X-register, then resumes program execution.

[x≥y] [x=y] [x>y] [x≤y] [x=0] [x>0] [x<0] [x≠0] Conditionals. Each tests value in X-register against 0 or value in Y-register as indicated. If true, calculator executes instruction in next step of program memory. If false, calculator skips one step before resuming execution.

[RTN] Return. If executed as result of pressing a label designator or executing a [GTO] instruction, stops execution and returns control to keyboard. If executed as a result of a [GSB] instruction, returns control to next step after the [GSB] instruction.

[R/S] Run/stop. Stops program execution.

[GTO] Go to. Followed by label designator ([0] through [9], [i]), causes calculator to search downward through program memory to first designated label and begin execution there.

[GSB] Go to subroutine. Followed by label designator ([0] through [9], [i]), causes calculator to search downward through program memory to first designated label and execute that section of program memory as a subroutine. Subroutines can be nested up to three levels deep.

HP-19C PRINTER FUNCTIONS

[PRT PRGM] Print program. Prints the step number, mnemonics and keycodes (if in MAN or NORM) for each step of program memory, beginning with the current step and continuing until two R/S instructions or step 98 is encountered.

[PRT Σ] Print statistical registers. Prints the contents of the six statistical registers ($R_{·0}$ through $R_{·5}$).

[PRT STK] Print stack. Prints the contents of the automatic memory stack registers (T, Z, Y, X).

[PRT REG] Print registers. Prints the contents of all storage registers (R_0 through R_9, $R_{·0}$ through $R_{·5}$, $R_{(16)}$ through $R_{(29)}$).

[PR X] Print X-register. Prints the value in the displayed X-register.

[SPC] Space. Advances the printer paper one or more spaces without printing.