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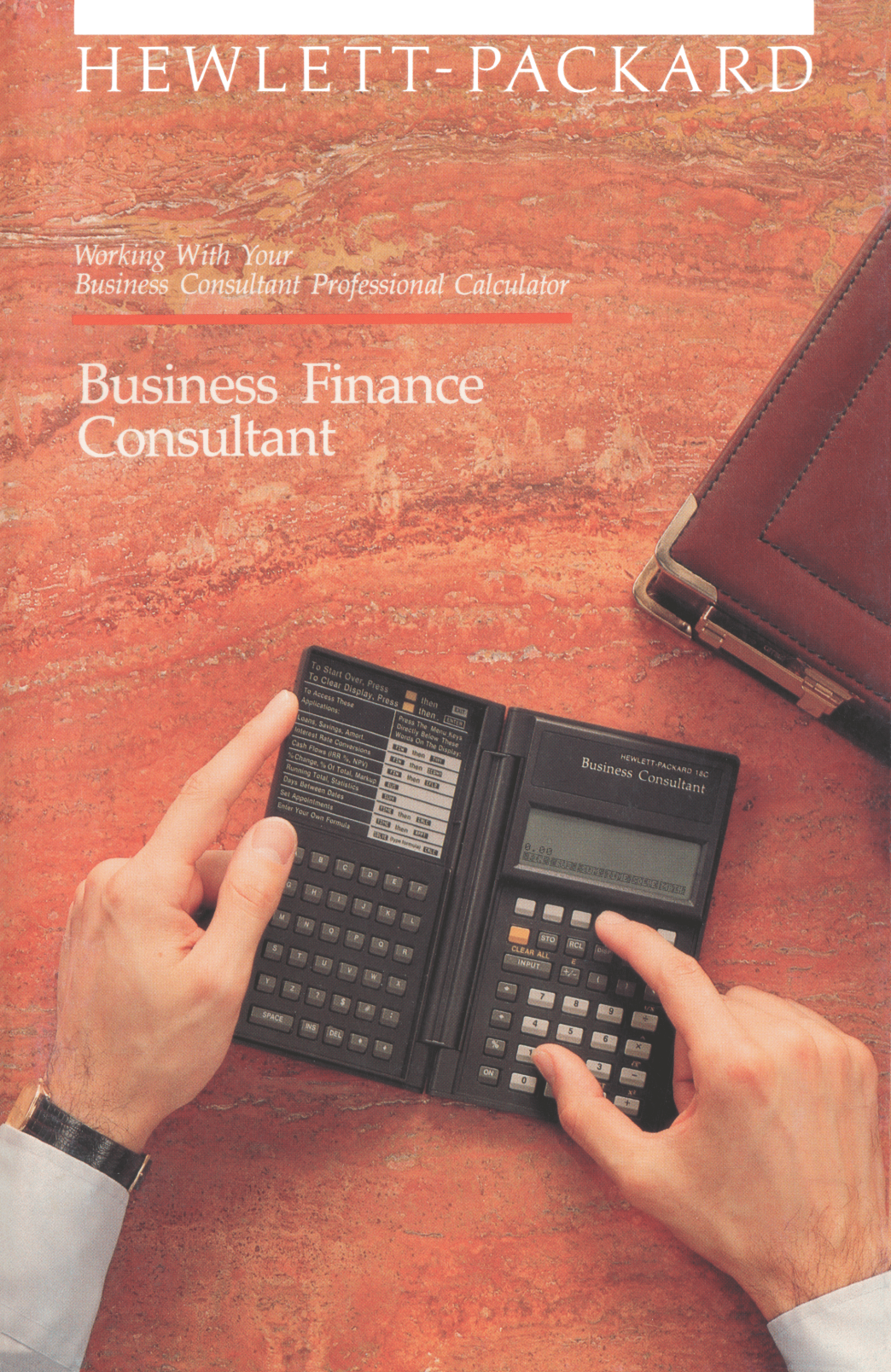
Working With Your
Business Consultant Professional Calculator

Business Finance Consultant



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Portable Computer Division
1000 N.E. Circle Blvd.
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Welcome...

...to the Consultant applications series! This series is designed to help you get the most from your Business Consultant professional calculator.

The purpose of the *Business Finance Consultant* is to help you solve the specialized problems your industry or profession demands. We've worked with professionals in your field to provide a sample of analysis concepts that are useful and relevant. Included are keystrokes and routines to help you forecast sales or expenses, analyze profits, make investment decisions and calculate depreciation. The *Business Finance Consultant* is designed to serve both as a reference and a starting point for using the Business Consultant to develop your own unique analyses.

Before you use the solutions in this book, you should be familiar with certain concepts from the owner's manual:

- Chapter 1: the basics of your calculator—how to move from menu to menu, identify and move to the MAIN menu, and use the menu keys to do calculations.
- Chapter 9: entering and using formulas.

The examples in this book show two decimal places. If your display is set to something other than two, the answers in your display will not match exactly what is in this book. Refer to your owner's manual for more information about changing the number of decimal places.

For more information about the topics in the *Business Finance Consultant*, refer to a basic textbook on the subject. Specific sources on the more specialized topics are included at the end of those topics.

Contents

When Entering Formulas...

When entering formulas into your Business Consultant, follow the instructions in chapter 9 of your owner's manual. Here are hints to help you in common error situations:

1. If the calculator displays `INVALID FORMULA` when you press CALC, the calculator doesn't understand something in the formula. When the formula returns to the screen, the cursor is positioned where your calculator detected the error. Check the formula in the screen against the formula in the book. Make sure the parentheses match and that the operators are where they should be.
2. If the calculator accepts the formula but your answer doesn't match the example, check the values stored in the menu key variables by recalling them (press RCL, then the menu key). If the values are correct, return to the SOLVE menu and check the formula. (Press EXIT to return to the SOLVE menu and press EDIT to view and edit the formula.) Check the formula against the one in this book for accuracy. When you find an error, edit the formula and press CALC to display the custom menu again.
3. If the calculator displays `INSUFFICIENT MEMORY` when you press INPUT or CALC, you must free portions of memory before continuing. Refer to pages 188 and 189 of the owner's manual for additional information.

The formulas in the *Business Finance Consultant* use variable names that are intended to remind you of what to store. Feel free to change them to something more meaningful to you.

Return on Equity

The return on equity ratio measures the profitability of a company relative to the amount of equity (ownership) capital invested. The measure is usually calculated each year, over a period of five or more years, to identify trends in this measure. Return on equity is also used to compare companies or industries.

Entering and Using the ROE% Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the ROE% formula as follows:

   ROE%=INCOME÷CAPITAL×100
3. Press CALC to verify the formula and display the custom menu.
4. Store two of the following variables:
   - Return on equity as a percent in ROE%.
   - Total net income after taxes in INCO.
   - Equity capital invested in the company (assets minus liabilities) in CAPIT.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. Your company has after tax earnings of $2,500,000. The net worth is $18,000,000. What is the return on equity?

Start from the ROE% custom menu.

Keys:	Display:	Description:
2500000 INCO	INCOME= 2,500,000.00	Stores income after taxes.
18000000 CAPIT	CAPITAL= 18,000,000.00	Stores capital investment
ROE%	ROE%=13.89	Calculates percent return on equity.

Part 2. Your industry averages 14.76% ROE. Given the capital investment in part 1, what after-tax income would you need to match that return on equity?

14.76 ROE%	ROE%=14.76	Stores industry return on equity.
INCO	INCOME= 2,656,800.00	Calculates income after taxes.

Bond Interest Coverage Ratio

The bond interest coverage ratio is a measure of a bond's quality and financial safety. It is a ratio of the funds available to pay interest during a given year to the interest requirements associated with a bond issue.

The calculation can be made several ways, depending on the legal status of different issues of bonds, interest costs on other than bond debt, and whether the company has issued preferred stock.

All other things being equal, the higher the coverage ratio, the higher the quality of the bond.

Entering and Using the COVER Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the COVER formula as follows:

   COVER=(EARNINGS+$INT)÷$INT
3. Press CALC to verify the formula and display the custom menu.
4. Store two of the following variables:
   - Coverage ratio in COVER.
   - Earnings before taxes in EARNI.
   - Annual interest payments in $INT.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. What is the interest coverage ratio of a bond with annual interest payments of $2,000,000, and corporate earnings before taxes of $8,000,000?

Start from the COVER custom menu.

Keys:	Display:	Description:
8000000 EARNI	EARNINGS= 8,000,000.00	Stores corporate earnings.
2000000 $INT	$INT= 2,000,000.00	Stores annual interest payments.
COVER	COVER=5.00	Calculates the bond interest coverage ratio.

Five dollars of funds are available to pay each dollar of bond interest.

Part 2. Suppose the average bond interest coverage ratio in your industry is 4.85. Calculate how much you could pay in annual interest payments if you borrowed additional funds so that your bond interest ratio matched that of the industry.

4.85 COVER	COVER=4.85	Stores bond interest coverage ratio.
$INT	$INT= 2,077,922.08*	Calculates annual interest payments.

* The solver searches for a numerical solution and displays intermediate estimates.

Price-to-Earnings Ratio

The price-to-earnings ratio is used by investors to indicate how much they are investing to obtain one dollar of earnings. Individual securities are often compared to the ratios of stock market indexes or averages.

Entering and Using the PERATIO Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the PERATIO formula as follows:

   PERATIO=PRICE÷EARNINGS
3. Press CALC to verify the formula and display the custom menu.
4. Store two of the following variables:
   - Price-to-earnings ratio in PERAT.
   - Current market price of one share of common stock in PRICE.
   - Current earnings per share in EARNI.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. Your company stock is selling for $75 per share and has earnings of $6 per share. Calculate the price-to-earnings ratio.

Start from the PERATIO custom menu.

Keys:	Display:	Description:
75 PRICE	PRICE=75.00	Stores price per share.
6 EARNI	EARNINGS=6.00	Stores earnings per share.
PERAT	PERATIO=12.50	Calculates price-to-earnings ratio.

Part 2. The Dow Jones Industrial Average is $1,550. Earnings are $140.90. Is your stock doing better or worse than the DJIA in terms of price-to-earnings ratio?

1550 PRICE	PRICE=1,550.00	Stores DJIA price.
140.9 EARNI	EARNINGS=140.90	Stores DJIA earnings.
PERAT	PERATIO=11.00	Calculates DJIA price-to-earnings ratio.

The price-to-earnings ratio for your stock is higher than that of the DJIA, indicating your stock is more attractive, relative to what the average stock is doing.

Return on Investment

One way of evaluating a new investment is through a simple return on investment (ROI) analysis. Return on investment is the ratio of net profit after taxes to the assets used to make the net profit.

Although this calculation is simple to do on any calculator, using SOLVE makes it easy to try what-if situations, and to analyze what you can do to meet a minimum return on investment.

Entering and Using the ROI% Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the ROI% formula as follows:

   `ROI%=($REV×PROF%÷100)÷$INV×100`
3. Press CALC to verify the formula and display the custom menu.
4. Store three of the following variables:
   - Return on investment as a percent in ROI%.
   - Total revenues in $REV.
   - Net profit as a percent of revenues in PROF%.
   - Capital investment in the project or business in $INV.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. A new store requires $480,000 in new assets. The anticipated revenues the first year are $1,000,000. Your net profit goal is 10%. Assuming the net profit goal is met, calculate the return on investment.

Start from the ROI% custom menu.

Keys:	Display:	Description:
1000000 $REV	$REV= 1,000,000.00	Stores total anticipated revenues.
10 PROF%	PROF%=10.00	Stores net profit percent.
480000 $INV	$INV=480,000.00	Stores investment.
ROI%	ROI%=20.83	Calculates percent return on investment.

Part 2. The store's sales are actually $750,000 in the first year. Calculate the ROI%.

750000 $REV	$REV=750,000.00	Stores actual revenues.
ROI%	ROI%=15.63	Calculates percent return on investment.

Part 3. At the level of revenues in part 2, what total investment can you sustain to achieve an ROI of 18%.

18 ROI%	ROI%=18.00	Stores required ROI%.
$INV	$INV=416,666.67	Calculates investment to reach this goal.

Part 4. Suppose you realize a 5% net profit on revenues of $750,000. Your investments are $480,000, as in part 1. Calculate the ROI%.

5 PROF%	PROF%=5.00	Stores net profit.
480000 $INV	$INV=480,000.00	Stores investment.
ROI%	ROI%=7.81	Calculates return on investment.

Break-Even Analysis

Break-even analysis is a technique for analyzing the relationships among fixed costs, variable costs, and income. Until the break-even point is reached (total costs equal total income), the producer operates at a loss. After the break-even point, each unit produced and sold makes a profit. The variables in the formula below are fixed costs, variable costs per unit, sales price per unit, number of units sold, and gross profit.

Entering and Using the PROFIT Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the PROFIT formula as follows:

   PROFIT=#SOLD×(PRICE-VARCO)-FIXCO
3. Press CALC to verify the formula and display the custom menu.
4. Store four of the following variables:
   - Gross profits in PROFI.
   - Number of units sold in #SOL.
   - Price per unit in PRICE.
   - Variable costs per unit in VARCO.
   - Fixed costs in FIXCO.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. Your product sells for $13. The fixed costs are $12,000. Variable costs are $6.75 per unit. Calculate the number of units that must be sold to break even (profit equals 0).

Start from the PROFIT custom menu.

Keys:	Display:	Description:
0 PROFI	PROFIT=0.00	Stores break-even profit of zero.
13 PRICE	PRICE=13.00	Stores price per unit.
6.75 VARCO	VARCO=6.75	Stores variable costs per unit.
12000 FIXCO	FIXCO=12,000.00	Stores fixed costs.
#SOL	#SOLD=1,920.00	Calculates number that must be sold to break even.

Part 2. Calculate the gross profit if 2,500 units are sold.

2500 #SOL	#SOLD=2,500.00	Stores number sold.
PROFI	PROFIT=3,625.00	Calculates gross profit.

Part 3. You want a gross profit of $4,500 at the sales volume in part 2 (2,500 units). What should the sales price be?

4500 PROFI	PROFIT=4,500.00	Stores required gross profit.
PRICE	PRICE=13.35	Calculates required sales price.

Forecasting Based on History

One method of forecasting is to look at historical trends. Once you have historical data, the data are fit to a curve with time on the x-axis, and the quantity you are forecasting on the y-axis. Linear curve fit is appropriate if you have a fairly constant growth rate; exponential curve fit is appropriate with compound growth, such as sales for a new product.

1. From the MAIN menu, press SUM to select the SUM menu.
2. Press CLEAR ALL YES to clear the list. (If you don't want to delete the list, name the old list and get a new one.)
3. Enter your data. Press INPUT after each item.
4. Name your list.
5. Get a new list and enter your second list as in step 3.
6. Name your list.
7. Press CALC, MORE, then FRCST.
8. Select the list containing your x-values.
9. Select the model (LIN for linear, EXP for exponential).
10. Key in the x-value and press XLIST.
11. Press YLIST to forecast the y-value.

Example 1: Forecasting using linear curve fit. You want to determine the sales forecast for the next two years using a linear curve fit. The following data represents your sales for the past nine years.

Year	Sales
1	100,000
2	112,100
3	130,600
4	160,750
5	205,900
6	210,000
7	240,650
8	280,720
9	325,190

Start from the MAIN menu.

Keys:	Display:	Description:
SUM *		Displays SUM menu.
■ CLEAR ALL YES		Clears the list.
1 INPUT 2 INPUT 3 INPUT 4 INPUT 5 INPUT 6 INPUT 7 INPUT 8 INPUT 9 INPUT	TOTAL=45.00	Enters time values.
NAME YEARS INPUT		Names the list.
GET *NEW		Displays a new list.
100000 INPUT 112100 INPUT 130600 INPUT 160750 INPUT 205900 INPUT 210000 INPUT 240650 INPUT 280720 INPUT 325190 INPUT	TOTAL= 1,765,910.00	Enters sales data.
NAME SALES INPUT		Names the list.
CALC MORE FRCST		Displays FRCST menu.

* If you want to preserve the current list, skip the next step (pressing ■ CLEAR ALL), name the list, then press GET *NEW.

YEARS		Selects list YEARS as the x-variable.
LIN		Selects linear model.
10 XLIST	XLIST=10.00	Stores year 10 as the x-value.
YLIST	YLIST=335,876.39	Calculates a y-value—sales forecast for year 10.
11 XLIST	XLIST=11.00	Stores year 11 as the x-value.
YLIST	YLIST=363,809.22	Calculates a y-value—sales forecast for year 11.

Example 2: Forecasting using exponential curve fit. The sales history for your new product is shown below for the first six months after introduction.

Month	Sales ($K)
June	31.7
July	52.5
August	48.3
September	56.6
October	72.7
November	90.9

Part 1. Using the exponential model, estimate the sales for December.

Start from the MAIN menu.

Keys:	Display:	Description:
SUM *		Displays SUM menu.
CLEAR ALL YES		Clears the list.

* If you want to preserve the current list, skip the next step (pressing CLEAR ALL), name the list, then press

1 INPUT 2 INPUT 3 INPUT 4 INPUT 5 INPUT 6 INPUT	TOTAL=21.00	Enters month numbers.
NAME MONTHS INPUT		Names the list.
GET *NEW		Displays a new list.
31.7 INPUT 52.5 INPUT 48.3 INPUT 56.6 INPUT 72.7 INPUT 90.9 INPUT	TOTAL=352.70	Enters monthly sales.
NAME MOSLS INPUT		Names the list.
CALC MORE FRCST		Displays FRCST menu.
MONT		Selects list MONTH as the x-variable.
EXP		Selects exponential model.
7 XLIST	XLIST=7.00	Stores month seven as the x-value.
YLIST	YLIST=105.78	Calculates a y-value—projected sales for December, the seventh month.

Part 2. Calculate the continuous compound growth rate.

B x 100 =	18.29	Calculates estimate of monthly continuous compound growth rate.

Forecasting Using Simple Moving Average

Moving averages are often useful in forecasting. In a moving average, a specified number of data points are averaged. When there is a new piece of input data, the oldest piece of data is discarded to make room for the most recent data. This replacement scheme makes the moving average a valuable tool in following trends. The fewer the number of data points, the more trend sensitive the averages become. With a large number of data points, the average behaves more like a regular average, responding slowly to new input.

1. From the MAIN menu, press SUM to display the SUM menu.
2. Press CLEAR ALL YES to clear the list. (If you don't want to delete the list, name the old list and get a new one.)
3. Enter your data.
4. Press CALC, then MEAN to calculate the average.
5. When you have a new data point, move the pointer to the oldest item. Enter the new item and press INPUT. The oldest item is replaced by the new one.

Example. You want to calculate a 3 month moving average for the units sold each month. Volumes for the first six months were:

January	4400	April	3670
February	5360	May	4040
March	2900	June	3200

Start from the MAIN menu.

Keys:	Display:	Description:
SUM *		Displays SUM menu.
[shift] CLEAR ALL YES		Clears the list.
4400 INPUT 5360 INPUT 2900 INPUT	TOTAL=12,660.00	Enters sales for first three months.
CALC MEAN	MEAN=4,220.00	Calculates average for the first three months.
EXIT		
[shift] ↑		Moves pointer to top of list.
3670 INPUT	TOTAL=11,930.00	Enters month four and deletes oldest item.
CALC MEAN	MEAN=3,976.67	Calculates average for months two, three, and four.
EXIT		
4040 INPUT	TOTAL=10,610.00	Enters month five and deletes oldest item.
CALC MEAN	MEAN=3,536.67	Calculates average for months three, four, and five.
EXIT		
3200 INPUT	TOTAL=10,910.00	Enters month six and deletes oldest item.
CALC MEAN	MEAN=3,636.67	Calculates average for months four, five, and six.

* If you want to preserve the current list, skip the next step (pressing [shift] CLEAR ALL), name the list, then press GET *NEW.

Simple Payback Period

The simple payback period method determines the length of time (in years) required for a business to recover its entire investment in a capital expenditure. Capital expenditures are purchases of assets such as machinery or equipment that have lives of one year or more.

The shorter the payback period, the better—the sooner the investment is recovered, the sooner the funds can be used for another project. For a capital expenditure to be considered profitable, its life must exceed the length of the payback period.

Entering and Using the PAYBK Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the PAYBK formula as follows:

   PAYBK=INVEST÷INFLOW
3. Press CALC to verify the formula and display the custom menu.
4. Store two of the following variables:
   - Length of time in years required to recover investment in PAYBK.
   - Investment in capital expenditure in INVES.
   - Annual cash inflow for the life of the purchase in INFLO.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. You are considering a new machine costing $100,000. The annual cash inflow for the life of the machine is $15,000. What is the payback period?

Start from the PAYBK custom menu.

Keys:	Display:	Description:
100000 INVES	INVEST= 100,000.00	Stores investment.
15000 INFLO	INFLOW= 15,000.00	Stores yearly inflow.
PAYBK	PAYBK=6.67	Calculates payback period in years.

Part 2. Your company desires a payback period of 5 years. What must the investment be to meet this goal?

5 PAYBK	PAYBK=5.00	Stores required payback period.
INVES	INVEST=75,000.00	Calculates investment.

Using NPV and IRR to Make Investment Decisions

Net present value (NPV) and internal rate of return (IRR%) are used to determine if an investment meets a minimum rate of return and what rate of return can be expected. The built-in CFLO menu makes it easy to calculate these two values.

The method below helps the decision-making process when choosing between two mutually exclusive options—such as deciding between two pieces of equipment. This method looks at the period by period difference between the two investments, then uses these differences as cash flows. The investment becomes the difference between option A and option B. If the net present value is positive at the desired rate of return, then the more expensive option is the better one; otherwise, the less expensive option is better.

When the differences result in a conventional series of cash flows, you can also look at the IRR% to determine which is the better investment. (Refer to the footnote in table 5-2 on page 87 of the owner's manual for the definition of "conventional series of cash flows.") If the IRR% is higher than your required percent, the investment in the more expensive machine is a good investment. If the differences are not a conventional series of cash flows (multiple sign changes), you can still use NPV to analyze the investment.

1. From the MAIN menu, press FIN then CFLO to display the CFLO menu.
2. Press CLEAR ALL YES to clear the list. (If you don't want to delete the list, name the old list and get a new list.)
3. Calculate the difference between the cash flows for the two options for each period. Enter the net cash flows and number of periods into the cash flow number list.
4. Press CALC to display the cash flow CALC menu.
5. To calculate the net present value, enter the periodic interest rate as a percent in I%, then press NPV.
6. To calculate the internal rate of return, press IRR%.

Example. You want to compare two equipment options. The table below summarizes the initial flows, the cash flows over the five year life of the machines, and the difference between the two options.

	A	B	A−B
Initial Investment	$−35,000	$−25,000	$−10,000
Cost in year 1	−200	−1,300	1,100
Cost in year 2	−200	−1,400	1,200
Cost in year 3	−200	−2,500	2,300
Cost in year 4	−800	−2,500	1,700
Cost in year 5	15,000	7,000	8,000

Calculate the IRR% and NPV to determine which machine should be purchased. (Note that this is a conventional series of cash flows.) The required rate of return is 10%.

Start from the MAIN menu.

Keys:	Display:	Description:
FIN CFLO *		Displays CFLO menu.
CLEAR ALL YES		Clears list
10000 +/− INPUT		Enters initial cash flow.
1100 INPUT INPUT 1200 INPUT INPUT 2300 INPUT INPUT 1700 INPUT INPUT 8000 INPUT INPUT		Enters cash flows.

* If you want to preserve the current list, skip the next step (pressing CLEAR ALL), name the list, then press GET *NEW.

CALC		Displays CALC menu.
10 I%	I%=10.00	Stores required return on investment.
NPV	NPV=-151.75	Calculates net present value.
IRR%	IRR%=9.56	Calculates internal rate of return.

Option B is the better choice because NPV is negative and IRR% is 9.56, less than the 10% required rate of return.

Economic Ordering Quantity

The economic ordering quantity is the optimum quantity to order each time an order is placed. It is based on the cost of placing and receiving an order, annual sales, carrying costs (including warehousing costs, interest on funds tied up in inventory, insurance, and obsolescence), and the purchase price of the goods.

The equation below assumes that usage is at a constant rate and that delivery lead times are constant.

Entering and Using the EOQ Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the EOQ formula as follows:

   EOQ=SQRT(2×FIXCO×#UNITS÷(CARY%÷100×PRICE))
3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Fixed costs of placing and receiving an order in FIXCO.
   - Annual unit sales in #UNI.
   - Carrying costs as a percentage of inventory value in CARY%.
   - Purchase price per unit of inventory in PRICE.
5. Press EOQ to calculate the economic ordering quantity.

Example. Your annual sales are 10,000 units. Purchase price per unit is $4.73. Carrying cost is 20% of inventory value and the cost of placing and receiving an order is $35. What is the economic ordering quantity?

Start from the EOQ custom menu.

Keys:	Display:	Description:
35 FIXCO	FIXCO=35.00	Stores fixed cost of placing an order.
10000 #UNI	#UNITS=10,000.00	Stores annual sales in units.
20 CARY%	CARY%=20.00	Stores carrying cost.
4.73 PRICE	PRICE=4.73	Stores price per unit.
EOQ	EOQ=860.21	Calculates economic ordering quantity.

Cost of Failing to Take a Cash Discount

A cash discount gives a buyer a reduction in price if payment is made within a specified time period. For example: "2/10, net 30" means that the buyer can deduct 2 percent if payment is made within 10 days after the date of billing. If payment is not made within 10 days, the full amount must be paid by the 30th day.

The formula below calculates the cost of failing to take the cash discount. The cost is calculated as an annual interest rate charged for delaying payment.

Entering and Using the COST% Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the COST% formula as follows:

   ```
   COST%=DISC%÷(100-DISC%)×
   360÷(TOTDA-DISCDA)×100
   ```

3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Discount percent if the payment is made early in DISC%.
   - Total number of days until the bill must be paid in TOTDA.
   - Number of days for which discount is available in DISCD.
5. Press COST% to calculate the cost of failing to take the discount.

Example 1. You receive a bill with the credit terms 2/10, net 30. What is the cost of not taking the cash discount?

Start from the COST% custom menu.

Keys:	Display:	Description:
2 DISC%	DISC%=2.00	Stores discount rate.
30 TOTDA	TOTDA=30.00	Stores total days.
10 DISCD	DISCDA=10.00	Stores number of days discount is available.
COST%	COST%=36.73	Calculates annual interest rate for not taking the cash discount.

Example 2. Another bill has credit terms 3/10, net 180. What is the cost of not taking this discount?

Keys:	Display:	Description:
3 DISC%	DISC%=3.00	Stores discount rate.
180 TOTDA	TOTDA=180.00	Stores total days.
10 DISCD	DISCDA=10.00	Stores number of days discount is available.
COST%	COST%=6.55	Calculates annual interest rate for not taking the cash discount.

Degree of Leverage

Leverage analyzes the fixed costs that are part of the cost of doing business. Formulas for operating leverage, financial leverage and combined leverage are included in this section.

Operating Leverage

Operating leverage focuses on a company's fixed operating costs. These costs include administrative costs, rent, and depreciation expenses and do not include interest on debt.

The degree of operating leverage is defined as the percentage change in earnings before interest and taxes as a result of a percentage change in units sold. The greater a firm's degree of operating leverage, the more its earnings before interest and taxes vary with unit sales fluctuations.

Entering and Using the OPLEV Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the OPLEV formula as follows:

   `OPLEV=1÷(1-FIXCO÷(#UNITS×(PRICE-VARCO)))`
3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Fixed costs in FIXCO.
   - Number of units sold in #UNI.
   - Price per unit in PRICE.
   - Variable costs per unit in VARCO.
5. Press OPLEV to calculate the degree of operating leverage.

Example 1. Your company sold 10,000 units last year at $20 each. Fixed costs were $50,000; variable costs per unit were $5. Calculate the degree of operating leverage.

Start from the OPLEV custom menu.

Keys:	Display:	Description:
50000 FIXCO	FIXCO=50,000.00	Stores fixed costs.
10000 #UNI	#UNITS=10,000.00	Stores number of units sold.
20 PRICE	PRICE=20.00	Stores price per unit.
5 VARCO	VARCO=5.00	Stores variable costs per unit.
OPLEV	OPLEV=1.50	Calculates degree of operating leverage.

Financial Leverage

Financial leverage focuses on a company's financial fixed costs. The primary example is interest expense on borrowed funds.

The degree of financial leverage is defined as the percentage change in earnings per share as a result of a percentage change in earnings before interest and taxes. The greater a firm's degree of financial leverage, the greater the fluctuations in the return on owner's equity.

Entering and Using the FINLEV Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the FINLEV formula as follows:

   ```
   FINLEV=1÷(1-$INT÷(#UNITS×(PRICE-VARCO)-
   FIXCO))
   ```

3. Press CALC to verify the formula and display the custom menu.

4. Store the following variables:
   - Annual interest expense in $INT.
   - Number of units sold in #UNI.
   - Price per unit in PRICE.
   - Variable costs per unit in VARCO.
   - Fixed cost in FIXCO.
5. Press FINLE to calculate the financial leverage.

Example 2. Use the same information in example 1. Your company's interest expense is $20,000. If you have done example 1 and the common variables (#UNITS, PRICE, VARCO and FIXCO) are still stored, skip the shaded portion. If you haven't done example 1, do the shaded portion first.

Start from the FINLEV custom menu.

Keys:	Display:	Description:
10000 #UNI	#UNITS=10,000.00	Stores number of units sold.
20 PRICE	PRICE=20.00	Stores price per unit.
5 VARCO	VARCO=5.00	Stores variable costs per unit.
50000 FIXCO	FIXCO=50,000.00	Stores fixed costs.
20000 $INT	$INT=20,000.00	Stores interest expense.
FINLE	FINLEV=1.25	Calculates financial leverage.

Combined Leverage

The degree of combined leverage measures the total leverage caused by both operating fixed costs and financial fixed costs.

Degree of combined leverage indicates the percentage change in net after-tax earnings due to a one percent change in sales. Combined leverage increases as operating leverage and financial leverage increase. The degree of combined leverage measures the impact of operating and financial fixed costs on variability of net income.

Entering and Using the COMBLEV Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the COMBLEV formula as follows:

   ```
   COMBLEV=1÷(1-(FIXCO+$INT)÷
   (#UNITS×(PRICE-VARCO)))
   ```

3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Fixed costs in FIXCO.
   - Annual interest expense in $INT.
   - Number of units sold in #UNI.
   - Price per unit in PRICE.
   - Variable costs per units in VARCO.
5. Press COMB to calculate the degree of combined leverage.

Example 3. Use the information in examples 1 and 2 to calculate combined leverage. If you have done example 2 and the common variables (#UNITS, PRICE, VARCO, FIXCO, and $INT) are still stored, skip the shaded portion. If you haven't done example 2, do the shaded portion below first.

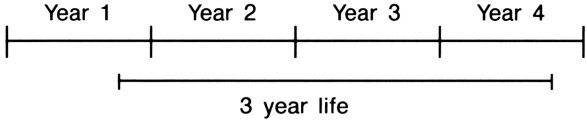
Start from the COMBLEV custom menu.

Keys:	Display:	Description:
50000 FIXCO	FIXCO=50,000.00	Stores fixed costs.
20000 $INT	$INT=20,000.00	Stores annual interest cost.
10000 #UNI	#UNITS=10,000.00	Stores number of units sold.
20 PRICE	PRICE=20.00	Stores price per unit.
5 VARCO	VARCO=5.00	Stores variable costs per unit.
COMB	COMBLEV=1.88	Calculates the combined leverage.

Depreciation Calculations

Four methods of depreciation are included in this section: straight-line, sum-of-the-years-digits, declining-balance, and Accelerated Cost Recovery System.

Note for straight-line, sum-of-the-years-digits and declining-balance depreciation: If the number of months in the first calendar year is less than 12, the amount of depreciation in the first year and last year will be less than a full year's depreciation. The actual number of years that depreciation will occur is equal to the life plus one. For example, a drill has a life of three years and is purchased three months before year end. The following time diagram shows that depreciation will occur over four calendar years.



Straight-Line Depreciation

Entering and Using the SL Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the SL formula as follows:

   SL=(BOOK-SALV)÷LIFE×#MO÷12
3. Press CALC to verify the formula and display the custom menu.

4. Store the following variables:
   - Starting book value in BOOK.
   - Salvage value in SALV.
   - Useful life expectancy in LIFE.
   - Number of months in the year that you depreciate the asset in #MO.
5. Press SL to calculate the yearly straight-line depreciation on the asset.

Example 1: Part 1. On September 1, your company purchased a machine for $10,000. Its useful life is 5 years, and the salvage value is $500. Calculate the depreciation for the first year.

Start from the SL custom menu.

Keys:	Display:	Description:
10000 BOOK	BOOK=10,000.00	Stores book value.
500 SALV	SALV=500.00	Stores salvage value.
5 LIFE	LIFE=5.00	Stores useful life.
4 #MO	#MO=4.00	Stores number of months in the year asset is depreciated.
SL	SL=633.33	Calculates straight-line depreciation for year one.

Part 2. Calculate the depreciation for years two, three, four, and five.

12 #MO	#MO=12.00	Stores number of months asset is depreciated.
SL	SL=1,900.00	Calculates straight-line depreciation for years two, three, four, and five.

Part 3. Calculate the depreciation for year six. The remaining depreciable life is 8 months.

8 #MO	#MO=8.00	Stores number of months in the year that asset is depreciated
SL	SL=1,266.67	Calculates depreciation for eight months of year six.

Sum-of-the-Years-Digits Depreciation

Entering and Using the SOYD Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the SOYD formula as follows:

   SOYD=IF(YR#=1:#MO:12×(LIFE-#MO÷12-YR#+2)÷LIFE)×(BOOK-SALV)÷(5×LIFE+LIFE+6)
3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Year number in YR#.
   - Number of months in the year that you depreciate the asset in #MO.
   - Useful life expectancy in LIFE.
   - Starting book value in BOOK.
   - Salvage value in SALV.
5. Press SOYD to calculate the depreciation for the year.

Example 2. On January 1, you purchased an asset for $25,000, with a useful life of 5 years and a $1,500 salvage value. Calculate the depreciation for each year.

Start from the SOYD custom menu.

Keys:	Display:	Description:
1 YR#	YR#=1.00	Stores year number.
12 #MO	#MO=12.00	Stores number of months in first year asset is depreciated.
5 LIFE	LIFE=5.00	Stores useful life.
25000 BOOK	BOOK=25,000.00	Stores book value.
1500 SALV	SALV=1,500.00	Stores salvage value.
SOYD	SOYD=7,833.33	Calculates depreciation for year one.
2 YR#	YR#=2.00	Stores year number.
SOYD	SOYD=6,266.67	Calculates depreciation for year two.
3 YR#	YR#=3.00	Stores year number.
SOYD	SOYD=4,700.00	Calculates depreciation for year three.
4 YR#	YR#=4.00	Stores year number.
SOYD	SOYD=3,133.33	Calculates depreciation for year four.
5 YR#	YR#=5.00	Stores year number.
SOYD	SOYD=1,566.67	Calculates depreciation for year five.

Declining-Balance Depreciation

Entering and Using the DB Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the DB formula as follows:

   DB=BOOK×(FACT%÷(100×LIFE))×#MO÷12
3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Remaining book value in BOOK.
   - Declining-balance factor as a percent in FACT%.
   - Useful life expectancy in LIFE.
   - Number of months in the year that you depreciate the asset in #MO.
5. Press DB to calculate depreciation.
6. For subsequent years, subtract depreciation from remaining book value and store the new remaining book value by pressing STO − BOOK. Repeat step 5 to calculate depreciation for the next year.

Example 3. Use the information in example 2 to calculate the depreciation for each year using declining balance. Use 200% as the declining-balance factor.

Start from the DB custom menu.

Keys:	Display:	Description:
25000 BOOK	BOOK=25,000.00	Stores book value.
200 FACT%	FACT%=200.00	Stores declining-balance factor.
5 LIFE	LIFE=5.00	Stores useful life.
12 #MO	#MO=12.00	Stores number of months in the year asset is depreciated.
DB	DB=10,000.00	Calculates depreciation for year one.
STO − BOOK	DB=10,000.00	Calculates and stores remaining book value.
DB	DB=6,000.00	Calculates depreciation for year two.
STO − BOOK	DB=6,000.00	Calculates and stores remaining book value.
DB	DB=3,600.00	Calculates depreciation for year three.
STO − BOOK	DB=3,600.00	Calculates and stores remaining book value.
DB	DB=2,160.00	Calculates depreciation for year four.
STO − BOOK	DB=2,160.00	Calculates and stores remaining book value.
DB	DB=1,296.00	Calculates depreciation for year five.

Accelerated Cost Recovery System

No formula exists for determining ACRS percentage. Tables must be used to find the appropriate recovery percentage. (Refer to Internal Revenue Service Publication 534 on Depreciation for the ACRS tables.) The percentage varies with the life of the investment and when the investment was made. The formula below determines the depreciation amount based on your input of the recovery percentage.

The cost recovery deduction is equal to the original book value times the appropriate percentage from the appropriate table. The book value need not be reduced by the salvage value.

Entering and Using the ACRS Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the ACRS formula as follows:

   ACRS=RCOV%÷100×BOOK
3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Recovery percentage from the table in RCOV%.
   - Starting book value in BOOK.
5. Press ACRS to calculate depreciation for the period.

Example 4. A piece of equipment was purchased for $13,950 in 1986. Find the depreciation for the equipment's five-year life. The recovery percentages for years one through five are 20%, 32%, 24%, 16%, 8%.

Start from the ACRS custom menu.

Keys:	Display:	Description:
13950 BOOK	BOOK=13,950.00	Stores book value.
20 RCOV%	RCOV%=20.00	Stores recovery percent for year one.
ACRS	ACRS=2,790.00	Calculates depreciation for year one.
32 RCOV%	RCOV%=32.00	Stores recovery percent for year two.
ACRS	ACRS=4,464.00	Calculates depreciation for year two.
24 RCOV%	RCOV%=24.00	Stores recovery percent for year three.
ACRS	ACRS=3,348.00	Calculates depreciation for year three.
16 RCOV%	RCOV%=16.00	Stores recovery percent for year four.
ACRS	ACRS=2,232.00	Calculates depreciation for year four.
8 RCOV%	RCOV%=8.00	Stores recovery percent for year five.
ACRS	ACRS=1,116.00	Calculates depreciation for year five.

A

Conserving Memory

The formulas in this book are intended to provide useful solutions. The variable names are several characters long to be meaningful to you. The formulas change a percent to a decimal so you don't have to remember to do it. These features make the formulas longer and take up more memory. Here are a few hints to help you conserve memory, should you need to:

- Shorten variable names. Variables are named to be as intuitive as possible. One way to save memory is to use single letter variable names.
- Delete division by 100. The formulas using a percent are written so you enter the percentage rather than the decimal value. Examples of this are tax rate as a percent, discount rate as a percent, or interest rate. If you do delete division by 100 from the formulas, remember to divide the percent by 100, or enter the percent and press [%], before storing the value in the variable.
- Delete variables for other formulas. When the SOLVE menu is displayed and you press [CLEAR ALL] VARS, the variables are erased, giving you more usable memory. (If you select BOTH instead of VARS, all formulas and their variables will be gone.)
- Delete individual formulas. When the SOLVE menu is displayed, move the pointer to the formula you want to delete, and press DELET BOTH.

Working With Your Business Consultant Professional Calculator

The *Business Finance Consultant* contains a variety of applications, formulas and keystrokes to help you solve the specialized problems of your profession.

- Return on Equity
- Bond Interest Coverage Ratio
- Price-to-Earnings Ratio
- Return on Investment
- Break-Even Analysis
- Forecasting Based on History
- Forecasting Using Simple Moving Average
- Simple Payback Period
- Using NPV and IRR to Make Investment Decisions
- Economic Ordering Quantity
- Cost of Failing to Take a Cash Discount
- Degree of Leverage
- Depreciation

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