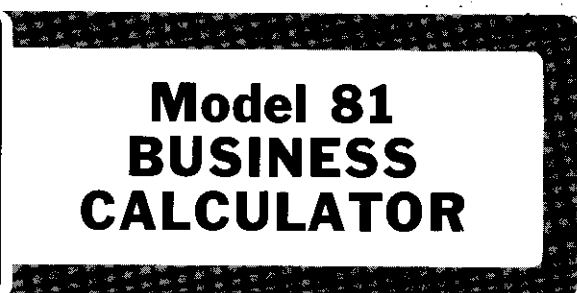
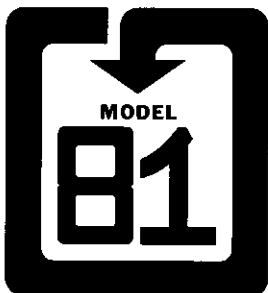


RICHARD WARE  
HEWLETT PACKARD

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TECHNICAL DATA AUGUST 1973



## FEATURES

**Printer:** The impact printer with special alphanumeric capability, gives clear, easy-to-read symbols with all operations you perform making your hard copy a truly valuable permanent record.

**Key Sequence:** The special financial keys on the left side need not be used in a special sequence. Simply enter the data as you state the problem. Individual entries can be modified without reentering the entire problem every time.

**Twenty Storage Registers:** Need to save a date or special number for repetitive calculations? Enter it in the machine once in the morning and recall it when it is needed.

**Ten Modes:** Pre-tax and after-tax, annual or semi-annual coupon, 30-day or actual day month, 360 or 365 day year basis, bonds or notes. When calculating bond or note problems, simply select the modes you need.

**Ten Extended Calculations:** Extra power and ease of use is built into the HP-81 by using these extensions:

- 0 - Interest Per Period
- 1 - Discounted Rate of Return
- 2 - Declining Balance Depreciation Schedule
- 3 - Diminishing Balance Depreciation Schedule
- 4 - Sum-of-the-Digits Depreciation Schedule
- 5 - Rule-of-78's Prepayment
- 6 - Amortized Loan Schedule
- 7 - Odd Days Interest
- 8 - Coupon Equivalent Yield
- 9 - Percent of Total

For the first time, a desk-top calculator different from all the rest. The HP-81 is a printing, preprogrammed calculator that solves complex business problems. No need to use tables or remember formulas, for they are all contained within this machine. Everyone whose responsibility involves computing time and money problems including presidents, managers, analysts, consultants, bankers, real estate men, investors, brokers, accountants, professors and business students can use this decision-making aid.

**Display Option:** The HP-81 has an optional LED display. With this option you can use the display and the printer simultaneously or use the display only.

## CAPABILITIES

**Primary:**  $+ - \times \div$ ; multiply and divide by any constant; %,  $\Delta\%$ ,  $\log_{10} X$ ,  $Y^X$ ,  $\sqrt{X}$ ; 2 two-hundred year calendars, 360/365.

**Investment Analysis:** Discounted Cash Flow; Discounted Rate of Return (for up to 9 cash flows); Compounded Growth Rate.

**Depreciation:** Straight Line Calculations; Sum-of-the-Digits Calculations and Schedule; Declining Balance Schedule; Diminishing Balance Schedule.

**Loans:** Accrued Interest; Present Value, Future Value; Interest per Period; Rule-of-78's Prepayment; Amortized Loan Schedule; APR Odd Days Interest; APR given Add-on Interest; Monthly Payment for Direct Reduction Loan.

**Annuities:** Future Value of Sinking Fund; Rate of Interest for Sinking Fund; Payment Amount for Sinking Fund.

**Bonds and Notes:** Bond Price and Yield; Callable Bond Price and Yield; Note Price and Yield; Coupon Equivalent Yield; Discounted Note.

**Statistics:** Linear Regression Trend Line; Expanded Linear Regression with Uneven Periods; Correlation Coefficient; Mean and Standard Deviation.

**Retail:** Markup and Price; Cash Discounts; Proration; Commissions.

# EXAMPLES

## Discounted Rate of Return:

Suppose you invest \$10,000 and receive the following cash flows: \$2,000, \$4,000, \$1,000, \$6,000. What is the discounted rate of return?

Enter the number of years:

4 n

Enter the initial cash outlay:

1 0 0 0

0 CHS PV

(change sign for the out flow)

Enter the cash flows:

2 0 0 0

STO 1

4 0 0 0

STO 2

1 0 0 0

STO 3

6 0 0 0

STO 4

Press EXT(ention) 1 for pre-programmed calculation:

EXT( ) 1

Answer is automatically printed: 9.89

CLEAR		
	4.00	→ N
-	10000.00	→ P
	2000.00	→ 1
	4000.00	→ 2
	1000.00	→ 3
	6000.00	→ 4
	DISC ROR	
	9.89	

## Two Variable Trend Line:

Suppose you want to forecast a value but your historical data is incomplete. You know only that:

Period	Value
1	16.20
3	21.0
6	31.62
7	Forecast

Simply enter the data as:

1 STO TL 1 6 . 2

TL

3 STO TL 2 1 .

0 TL

6 STO TL 3 1 . 6

2 TL

Press: [ ] TL

([ ]) acts as a shift key giving a key two functions)

Correlation Coefficient: .99  
Slope: 3.12  
Y Intercept: 12.54

The equation then is  $Y = 12.54 + 3.12X$ .

To forecast the 7th period,

Press: 7 n TL

Answer: 34.38

CLEAR		
	1.00	→ 3*
	16.20	T
	3.00	→ 3*
	21.00	T
	6.00	→ 3*
	31.62	T

T L	FACTR
S	.99
y	3.12
	12.54
y	7.00 → N
	34.38

## BOND YIELD TO CALL:

You need to compute the bond yield to call on a 30/360, semi-annual, pre-tax bond that can be called at 107.75 on Oct. 15, 1976. Coupon is 7.5%, price 113.57, settlement April 15, 1973.

Data can be entered in any order on the HP 81, but the 30 day/month and 360 day/year modes must be set before any calculations are made.

107.75 FV

113.57 PV

7.5 PMT

4.151973

10.151976

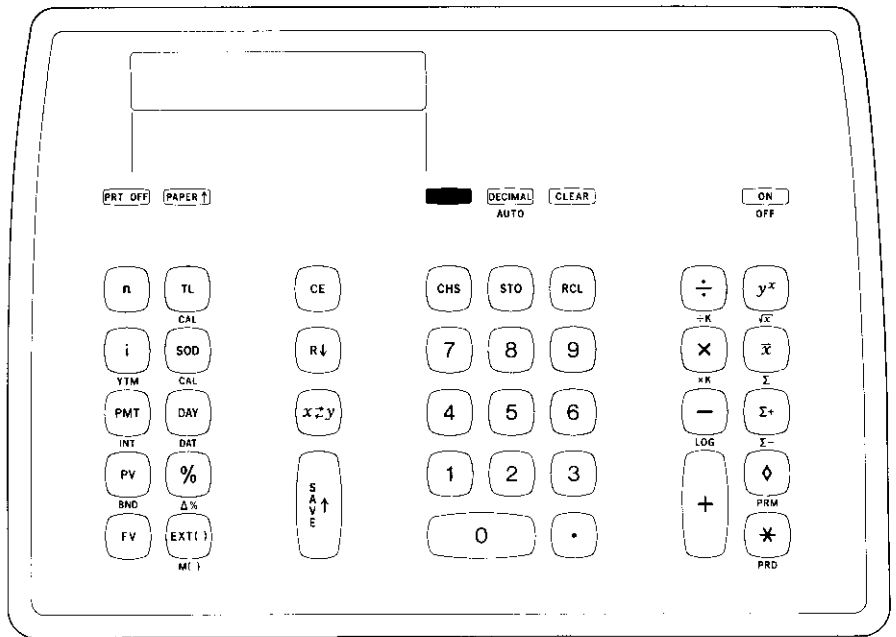
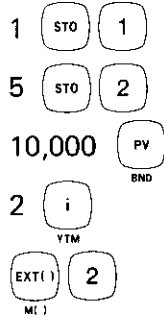
[ ] i Answer



D A Y	360	4
B A	360	6
CLEAR		
	107.75	→ F
	113.57	→ P
	7.50	→ PT
	4.151973	↑
D A Y S	360	
	1260.00	
YIELD		
TO	CALL	
	5.25	

### Declining Balance Schedule:

You have a \$10,000 asset with a five-year life and no salvage value. You want the entire depreciation schedule, assuming 200% declining balance depreciation.



	CLEAR	
	1.00	→1
	5.00	→2
	10000.00	→P
	2.00	→ I
	DCL	
FACTR	2.00	
1	4000.00	
	6000.00	
2	2400.00	
	3600.00	
3	1440.00	
	2160.00	
4	864.00	
	1296.00	
5	518.40	
	777.60	

Remaining Book Value  
Depreciation Amount

### WARRANTY

The HP-81 is warranted against defects in materials and workmanship for one (1) year from the date of delivery. Hewlett-Packard will repair or replace components which prove to be defective during the warranty period, providing the defective units are returned to Hewlett-Packard. No other warranty is expressed or implied, and Hewlett-Packard is not liable for consequential damage. Service will be available directly from Hewlett-Packard.

The tables programmed into the HP-81 are those commonly used in the U.S. business community.

### SPECIFICATIONS

Temperature:  
32 - 113°F (0 - 45°C)  
Power:  
117V ± 10% } 48 - 66 Hz  
230V ± 10% }  
Weight:  
13 lbs. 8 oz. (6.12 kg)  
Dimensions:  
10.9 inches wide (27.7 cm)  
15.5 inches deep (39.4 cm)  
5.5 inches high (14 cm)



Sales, service and support in 172 centers in 65 countries.  
Loveland, Colorado 80537. Offices in principal cities throughout the U.S.