

Hewlett-Packard

9800-Series  
Calculators  
and  
Peripherals

# 9800-Series

A versatile calculator, the 9810A adapts to almost any application. Simply by installing plug-in ROMs (Read Only Memories), 15 special function keys are redefined for mathematics, statistics or user-definable operation.

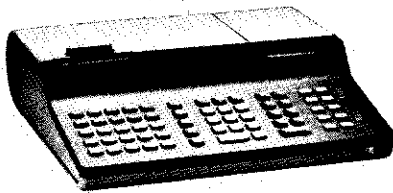
A clear 3-register LED display shows results and an optional built-in thermal printer provides easily readable hardcopy. Programs and data can be conveniently stored on re-usable magnetic cards. Four I/O slots allow connection to a wide range of Hewlett-Packard peripherals and other instrumentation.

Standard memory is 500 bytes and 51 data registers, which can be expanded to 2036 bytes and 111 data registers.

## 9810A Calculator



## 9815A Calculator



The 9815A calculator is well suited to a variety of applications; acting either as a stand alone calculator or as a controller in a measurement system.

Although compact and light-weight, the 9815A has many features. For example, the large display and built-in 16 character printer are valuable aids whether keying in data or running a program. The high speed bidirectional cartridge which holds 96 000 bytes of programs or data. 28 scientific functions for rapid calculation. RPN (Reverse Polish Notation) and editing keys for easy programming. An input/output option which provides the capability to interface to a wide range of HP peripherals or to your own measuring instruments.

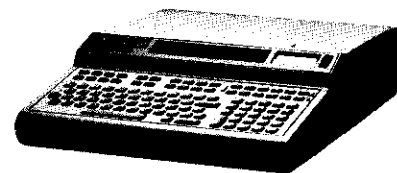
The standard 9815A has 472 program steps. By options the memory can be extended to 2008 program steps. Memory can be assigned to program steps or data registers.

In addition to the 32-character LED display, 16 character thermal printer (both with upper and lower-case), typewriter-style keyboard, high speed data cartridge, three input/output slots and four ROM slots, the 9825A has many features not normally associated with a calculator.

Live keyboard, allows operations to be done from the keyboard while a program is running. HPL, the high level programming language of the 9825, provides power and efficiency for handling equations, data manipulation and input/output operations, yet is easy to use. Two-level interrupt combined with fast input/output rates (with DMA, average exchange of 300 000, 16-bit words per second) provides powerful interface capabilities.

Standard read/write memory is 6844 bytes. By options memory size can be increased to 31 420 bytes.

## 9825A Calculator



## 9830A and 9830B Calculator



Both, the 9830A and 9830B, are designed for a wide range of applications; they even have terminal capabilities. Powerful conversational language, BASIC, large 32 character, alphanumeric display and typewriter-style keyboard make it easy to interact with 9830A and 9830B. In addition to read/write memory, there is a large range of ROM (Read Only Memory) to increase computational power and peripheral control – String and Matrix ROMs are built into the 9830B.

For the 9830A, standard read/write memory is 3 520 bytes, which can be expanded to 15 808 bytes by options. The standard read/write memory for the 9830B is 15 808 bytes, which can be extended to 30 144 bytes.

Where extra large data handling capability is needed, the 9880B connected to the 9830A or 9830B adds an extra 4,8 megabytes of storage capacity.

# Calculators

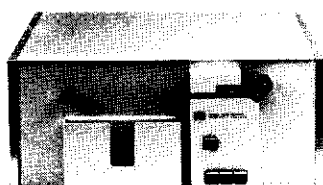


The HP 9800-series desk-top programmable calculators provide a wide range of computing power and a flexible interfacing system. A 9800-series system is easy to set up, with a variety of ready-to-use peripherals and plug-in interface cards. The capability of the calculators can be easily expanded by using plug-in ROMs. From the Reverse Polish language of the 9810A and 9815A, HPL of the 9825A, to the BASIC language of the 9830A and 9830B, there is a 9800-series calculator to fit almost every application.

## Overview

	HP 9810A	HP 9815A	HP 9825A	HP 9830A	HP 9830B
<b>Language</b>	Reverse Polish Notation	Reverse Polish Notation	HPL	BASIC	BASIC
<b>Keyboard</b>	Key per function	Key per function	Alphanumeric	Alphanumeric	Alphanumeric
<b>R/W memory</b>	500 bytes	472 bytes	6 844 bytes	3 520 bytes	15 808 bytes
<b>Optional up to</b>	2036 bytes	2 008 bytes	31 420 bytes	15 808 bytes	30 144 bytes
<b>User definable keys</b>	9 keys optional	15 keys	12 keys shiftable to 24	10 keys shiftable to 20	10 keys shiftable to 20
<b>Recording device</b>	Magnetic card reader	Cartridge 96 384 bytes	Cartridge 250 000 bytes	Cassette 64 000 bytes	Cassette 64 000 bytes
<b>Display</b>	3 register LED	16-character 7-segment gas discharge	32-character alphanumeric upper and lower case LED	32-character alphanumeric LED	32-character alphanumeric LED
<b>Built-in printer</b>	16-character/line optional	16-character/line alphanumeric	16-character/line alphanumeric, upper and lower case	no	no
<b>Interfacing slots</b>	4 slots	2 slots optional	3 slots	4 slots	4 slots
<b>Interfacing</b>	HP 11202A General I/O HP 11203A BCD input HP 11205A Serial interface	HP 98134A General I/O HP 98133A BCD Input HP 98135A Interface-bus	HP 98032A General I/O HP 98033A BCD Input HP 98034A Interface-bus	HP 11202A General I/O HP 11203A BCD Input HP 11205A Serial interface HP 11206A Modem	HP 11202A General I/O HP 11203A BCD input HP 11205A Serial interface HP 11206 Modem
<b>Interrupt</b>	no	no	yes	no	no

# 9800 - Series Peripherals



## 9883 A Tape Reader

Speed and quiet operation are the main features of the 9883A tape reader. Optically it reads tapes at 500 characters per second. This makes it particularly applicable for high volume applications.

**Code:** 8-level. With ROMs other codes can be read.

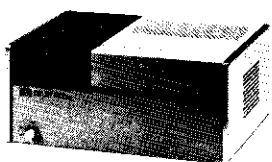
**Tape Material:** Any tape material with less than 60% transmissivity.

**Tape Width:** 25,4 mm (1 in )

**Start Time:** Less than 6 msec

**Stop Time:** Less than 50 msec (stops on character).

**Speed:** Up to 500 character/sec.



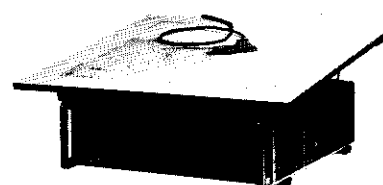
## 9863 A Tape Reader

Connected to your calculator, this peripheral enables, for example, data from analytical instruments, industrial process control instruments, computer terminals or telex to be directly input into the calculator.

**Speed:** 20 characters per second.

**Code:** Reads ASCII/ISO eight-level code (other codes by special order).

**Tape:** 25,4 mm (1 in ) wide.



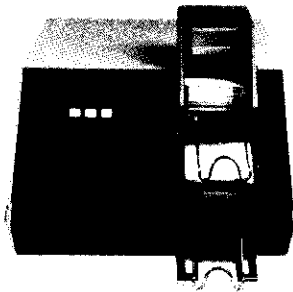
## 9864 A Digitizer

With this peripheral you are able to enter virtually any graphically presented form into your 9800-Series calculator. To make entries, simply trace the shape with the cursor. The 9864A digitizer reduces the shape into a series of digital X-Y coordinates. Your calculator can then print out dimensions and area of the line or contained shape.

**Active Digitizing Area:** 431,8 x 431,8 mm (17 x 17 in ).

**Accuracy:** + 0,38 mm (+ 0.015 in ) per axis from 15°C to 30°C.  
+0,762 mm(+ 0.030 in )per axis from 30° C to 50°C and 0°C to 15°C.

**Maximum Tracing Speed:** 3 810 mm (150 in )/second.



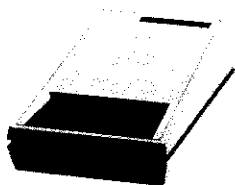
## 9869A Card Reader

For applications that require high volume processing of marked or punched cards the 9869A hopper card reader is the answer. It will read a variety of formatted input at a speed of 300 cards per minute.

**Speed:** Up to 300 cards/min.

**Code:** Cards can be marked or punched in Hollerith. Binary image of card can be transmitted under program control.

**Cards:** American National Standards Institute specifications for general purpose cards for information processing. Up to 279 mm (11 in) long cards can be read.



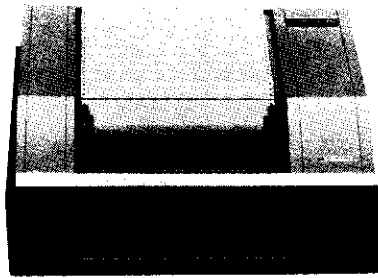
## 9870A Card Reader

This small, low cost, hand-fed card reader, optically reads mark-sense or punched cards. Inserting a card starts the motor which pulls the card through the card reader.

**Speed:** Hand fed cards 82,6 x 187,3 mm (3.25 x 7.375 ins) containing 35 columns can be read in less than two seconds.

**Formats:** Marks, punched holes and even preprinted marks may be randomly intermixed and still be accepted by the reader.

**Line Width:** Pencil marks wider than 0,6 mm (0.025 in) necessary for reliable sensing. (Operates only with the 9830)



## 9881A Line Printer

A reliable, 5 x 7 dot-matrix printer. The printer mechanism makes it quiet enough for the business environment. It prints at 200 lines per minute, regardless of line length, has 132-column line width and provides up to 6 consistent copies.

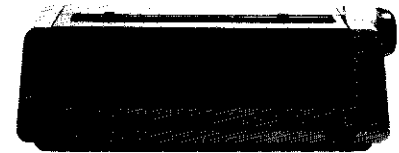
**Printing Speed:** 200 lines/min  
(64-character set).

**Characters Per Line:** 132

**Character Set:** 64-character, ASCII code (standard). 128 character (optional).

**Character Style:** 5 x 7 dot matrix. 5 x 9 for g,j,p,q and y with 128-character set.

**Character Pitch:** Vertical, 6 or 8 lines/in (switch selectable). Horizontal, 10 characters/in, no overprint. (Operates only with 9830)

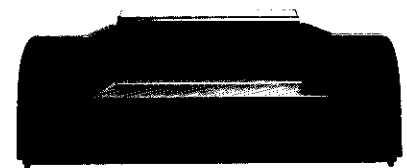


## 9871A Character-Impact Printer

For scientific, commercial and industrial applications. The 9871A provides good quality single sheet or continuous Z-fold print-out. You can write reports in upper and lower-case or fill in preprinted forms with an average speed of 30 characters per second. The printer has multi-copy capability (up to 6 copies) and will even do plots.

**Speed:** Average text line of 10 characters/in: 30 characters/sec. Best case of 10 characters/in. (no rotation): 32 characters/sec. Worst case of 10 characters/in. 180° (rotation): 14 characters/sec. Carrier return or tab (full length): 325 msec line feed 4,32 mm (0.167 in): 50 msec.

**Paper:** Single sheet or continuous feed (form feed recommended for continuous feed). Single part or multi-part, 2 to 6 parts 381 mm (15 in) maximum width.



## 9866 B Thermal Printer

This almost silent page-width thermal printer provides high quality, hard copy output. It produces fully formatted alphanumeric text, tables or simple plots.

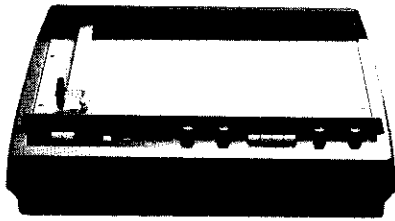
**Speed (Print Mode):** 240 lines/min.  
**(Plot Mode):** 900 rows of dots/min.

**Print Density (Print Mode):** 80 characters/line. 0,24 lines/mm (6 lines/in).

**(Plot Mode):** 400 dots/row.  
2,4 rows/mm (60 rows/in).

**Printer Paper:** 222 mm (8,75 in) wide by 76,2 m (250 ft) long, blue or black.

**Buffer:** 1 line of 80 characters.



## 9862 A Plotter

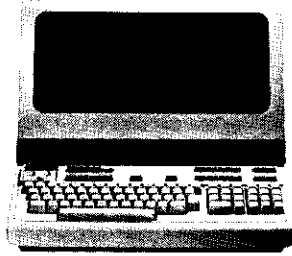
A plot is often the quickest and most reliable way of translating raw data into useful information. The 9862A plotter will plot histograms, and much more.

**Plotting Area:** 250 mm (10 in) on the Y axis by 380 mm (15 in) on the X axis.

**Writing Method:** Disposable ink pens.

**Plotting Accuracy:** 99,7% of full scale at 25°C ± 0,005 per degree centigrade.

**Plotting Time:** 12,7 mm (0,5 in) vector 90 msec.



## 9882 A CRT Subsystem

This is an interactive peripheral for input and output data and programs. 24 lines x 80 columns can be written on the 5 x 10 inches screen. Full editing and programmable fields make data input easy. Under calculator program control, formatted data input with the CRT can be either line by line or as a block. The CRT contains 3k bytes of memory with an option to expand to 5k. (Operates only with 9830A)

**Screen Size:** 127 x 254 mm  
(5 x 10 ins).

**Screen Capacity:** 24 lines x 80  
columns (1 920 characters)

**Character Generation:** 7 x 9 enhanced dot matrix; 9 x 15 dot character cell; interlaced raster scan.

**Character Set:** 128-character Roman

**Cursor:** Blinking underline

**Display Modes:** White on black or black on white (inverse video)

**Refresh Rate:** 60 Hz

**Implosion Protection:** bonded implosion panel

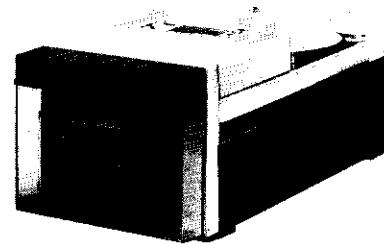
**Memory:** MOS; ROM: 8k bytes (program); RAM: standard 3 072 bytes; 5 120 bytes maximum.

**Keyboard:** full ASCII code keyboard, 8 special functions keys and 12 additional control and editing keys; ten-key numeric pad; cursor pad; multispeed auto-repeat; N-key roll-over.

**Data Rate:** 110, 150, 300, 1 200, 2 400 baud and external switch selectable (110 selects two stop bits).

**Transmission Modes:** full-or half-duplex, asynchronous.

**Operating Modes:** on-line, off-line, character, block parity. Switch selectable, even, odd, none.



## 9884 A Tape Punch

With this peripheral your calculator output can be punched (in any standard alphanumeric code) directly onto paper tape for feeding into computer or machine tool instruction circuitry without further reduction.

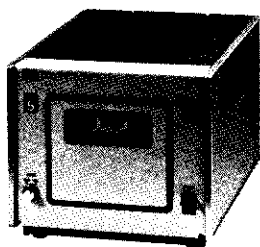
**Code:** 8-level or 5-level

**Speed:** 75 characters/sec.

**Tape Material:** Paper, plastic or mylar

**Tape Width:** Standard 5-level, 17,5 mm (0.69 in); 8-level, 25,4 mm (1 in).

**Tape Thickness:** Paper, 0,08 mm (0.003 in) to 0,13 mm (0.005 in) Mylar, 0,08 mm (0.003 in) to 0,10 mm (0.004 in.) Plastic, 0,08 mm (0.003 in) to 0,11 mm (0.0045 in)



## 9865 A Tape Cassette

The high speed HP 9865A tape cassette lets you easily store, update and retrieve data and programs.

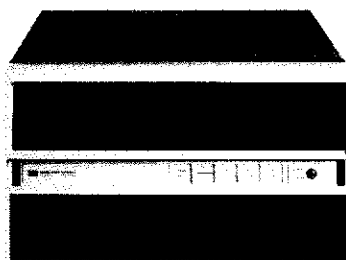
Data may be recalled from the cassette, modified and restored on the same file. All files are numbered sequentially and a fast bidirectional feature lets you locate any file on the tape without rewinding. (Operates only with 9830)

**Capacity:** Approximately 6000 data registers or 4800 program keystrokes on a 91.5 m (300 ft) cassette.

**Search Speed:** Approximately 39,6 m (130 ft) /min.

**Operating Temperature Range:**  
0°C to 45°C

**Tape Life:** At least 1000 head passes.



## 9880B Mass Memory

Provides high capacity data storage capability for accounting, structural design, statistical analysis, and many other commercial, industrial and scientific applications. The memory medium is a permanently installed memory platter for interchangeable cartridges. Each cartridge has a storage capacity of 2,4 million bytes. (Operates only with 9830)

### Data Capacity Available To User :

Bytes	4 866 048
Bytes/Word	2
Word/Record	256
No. of Records	9 504 (4 752/plat.)
Max. No. of Files	1 536 (768/plat.)

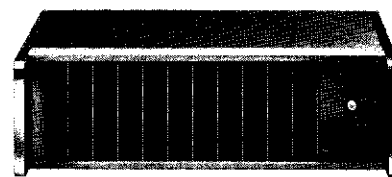
### Speed :

Aver. Access Time	42,5 msec
Data Transfer Rate	800 bytes/sec
Prog. Transfer Rate	2 000 bytes/sec

(Mass Memory to Calculator or vice versa)

### Environmental (Entire System) :

Temperature	
Operating	+10° to +40° C
Nonoperating	-20° to + 65° C
Altitude	0 to 10 000 ft
Humidity	8 to 80% no condensing
Vibration	10 to 50 Hz at 0.01 in peak-to-peak excursion
Attitude	± 30° pitch and roll



## 9868 A Input/output Expander

The 9830 calculator has four I/O slots for external peripherals. By plugging the 9868A I/O Expander into one of these slots, it gives you a further 10 I/O slots. Thus your system is expanded to a total of 13 I/O slots. (Operates only with 9830A)

**Card Slots:** 10 usable slots, expanding the calculator system to 13.

**Cable Length:** 1.83 m (6 ft) cable provided.

**Data Transfer Rate:** Unaffected by 9868A I/O Expander with standard cable.

