

\$5900

HEWLETT **hp** PACKARD

9825

9825A CALCULATOR

TECHNICAL DATA* 19 JANUARY 1976



1 x Rom \$500

DESCRIPTION

The HP 9825A is a desk-top programmable calculator. The standard unit has a 32-character LED display, 16-character thermal strip printer, and a typewriter-like keyboard — all with upper- and lower-case alphanumerics. It has a built-in, two-track, tape cartridge drive, three I/O slots, and four ROM slots. The 9825 can be used as a stand-alone calculator or as a system controller for industrial and scientific applications.

Live Keyboard

The 9825 has a live keyboard, meaning the user can do calculations and subroutines, as well as list the current program and examine or change the program variables, while the program is running. Live keyboard can be turned on or off under program control.

Language

HPL, the high level programming language of the 9825, offers power and efficiency for handling equations, data manipulation, and input/output operations, yet it is easy to learn and use. The structural unit is a line composed of one

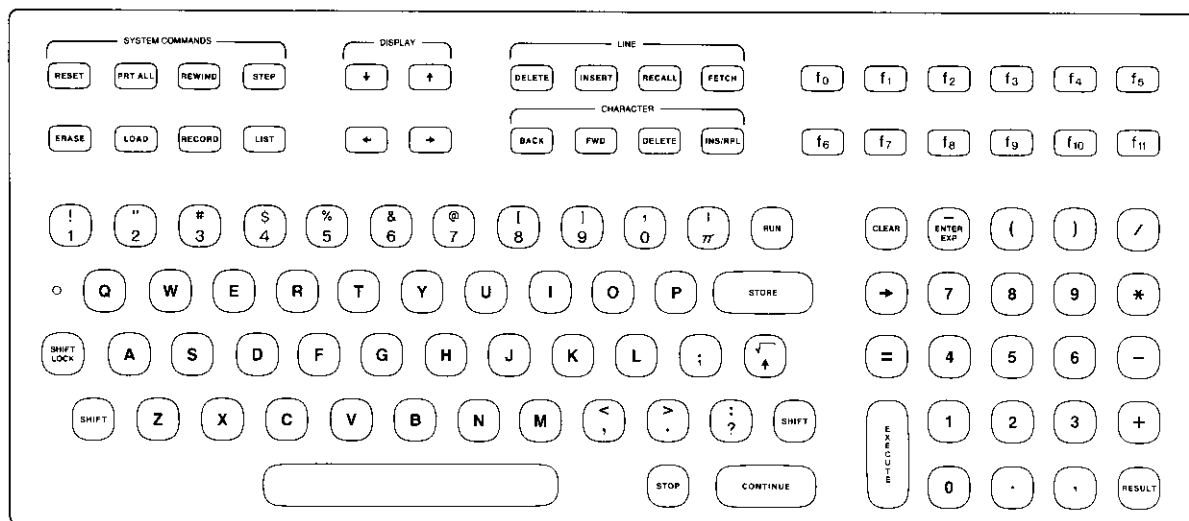
or more statements separated by semicolons. The language has subroutine nesting and 16 flags. Up to 26 simple variables and 26 multidimensional arrays are allowed. Errors are indicated by error messages and line numbers in the display. Math errors, such as division by zero, can be overridden by the programmer. Fixed and floating point formats can be set by the user.

Cartridge Commands

Tape cartridge commands allow the user to load and record data, programs, or the entire memory. After the tape files are recorded, they are automatically verified against the calculator memory.

Editing

Programs can be edited using LIST, STEP, FETCH, STOP, and TRACE commands. Tracing can be done on the entire program, sections of a program, or individual lines. Entire lines or individual characters can be inserted, deleted, or changed. Addresses are automatically renumbered when line insertions or deletions are made.



9825A Keyboard

SPECIFICATIONS

Internal Storage (Read/Write Memory)

Standard	6,844 bytes
Opt. 001	15,036 bytes
Opt. 002	23,228 bytes
Opt. 003	31,420 bytes

Dynamic Range

10^{99} to 10^{-99} , 0, -10^{-99} to -10^{99}

Internal Calculation Range

10^{511} to 10^{-511} , 0, -10^{-511} to -10^{511}

Significant Digits

All numbers are calculated and stored internally with 12 significant digits, regardless of the format used.

Addressing Modes

Conditional and unconditional for absolute, relative, symbolic, and computed.

Special Function Keys:

12, shiftable to 24

Built-In Functions

Math and Trig Functions and Operations (with average execution times):

Absolute	0.19 msec
Fraction	0.37 msec
Integer	0.47 msec
Maximum	Variable
Minimum	Variable
Modulus	3.1 msec
log	8.6 msec
ln	6.7 msec
e^x	5.5 msec
10^x	7.6 msec
Raise to Power	15 msec
Random Number	1.8 msec
Sign	0.20 msec
$\sqrt{\quad}$	2.5 msec
Sine	18 msec
Cosine	18 msec
Tangent	13 msec

Arcsine	22 msec
Arccosine	22 msec
Arctangent	15 msec
+	0.32 msec
-	0.37 msec
*	0.88 msec
/	2.5 msec
Power of Ten Round	0.74 msec
Digit Round	0.53 msec

Logic Operators: AND, NOT, OR, XOR (exclusive or)

Relational Operators:

= (equal to)
 > (greater than)
 < (less than)
 > = or = > (greater than or equal to)
 < = or = < (less than or equal to)
 # or < > or > < (not equal to)

Tape Cartridge

Capacity:	250,000 bytes
Average Access Time:	6 sec
Read/Write Speed:	559 mm/sec (22 in/sec)
Search Speed:	2,286 mm/sec (90 in/sec)
(bidirectional)	
Transfer Rate:	2,750 bytes/sec
Typical Access Rate:	14,300 bytes/sec
Typical Rewind Time:	19 sec (end to end)
Typical Erase Time:	40 sec (one entire track)
Tape Length:	42.67 m (140 ft)
Size:	63.5 mm x 82.5 mm x 12.7 mm (2.5 in x 3.25 in x 0.5 in)
Verification:	Automatic on recording

Printer

Paper Width:	57.15 mm (2.25 in)
Speed:	190 lines/min
Font:	A 5 x 7 dot matrix. Prints all the characters shown below in upper and lower case. Up to 16 characters/line.

Display

The standard 32-character LED display displays all of the following characters:

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz[]_@
0123456789;:<=>?!"#\$%&'()*+,-./↑

With the Strings or General I/O ROM, the following characters are available:

À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï
Ð Ñ Ò Ó Ô Õ Ö × Ø Ù Ú Û Ü Ý Þ ß à á â ã

Peripheral I/O

Capacity: Three general I/O slots.
Transfer Rates: Input rate of up to 400k transfers/sec., output rate of up to 200k transfers/sec. depending on the program, ROM's used, and I/O card. (A transfer is one 16-bit word or one 8-bit byte.)
Interface: Dedicated card and cable assemblies for peripherals, plus general I/O interface cards providing HP-IB, bit-parallel, and BCD formats.

◊Conforms to IEEE Standard 488-1975.

Environmental Range

Operating Temperature: 5° C to 40° C ambient
Storage Temperature: -40° C to +65° C
Ambient Humidity: < 80%

Size/Weight

Height: 129,5 mm (5.1 in)
Width: 383,5 mm (15.1 in)
Depth: 495,3 mm (19.5 in)
Net Weight: 11,8 kg (26 lbs)
Shipping Weight: 19,5 kg (42.88 lbs)
Cubes: .12 cu m (4.13 cu ft)

Power Requirement

Source: 100 V + 5%, -10% } Selected by
120 V + 5%, -10% } rear panel
220 V + 5%, -10% } switches
240 V + 5%, -10% }
Line Frequency: 48 to 66 Hz
Power Consumption: 100V/1.7A
120V/1.5A
220V/.8A
240V/.75A

INTERFACES



Description

Interface Card	Card Number
16-bit Duplex	HP 98032A
BCD	HP 98033A
HP-IB	HP 98034A

ROM'S

String

Single strings and string arrays. String size limited by memory size. Seven string functions and one string operator.

Advanced Programming

Parameter-passing functions and subroutines with local variables. FOR-NEXT statements and cross-reference operator. Split and integer precision number storage.

Matrix

Performs matrix addition, subtraction, multiplication, transposition, and inversion. Performs addition, subtraction, multiplication, division, initialization, and redimensioning on n-dimensional arrays. Prints arrays on the strip printer.

9862A Plotter

HP 9862A Plotter statements for scaling, plotting, labeling, and drawing axes.

General I/O

Basic I/O capabilities including read/write with format control. Lists programs on a peripheral. Status testing. Compatible with HP-IB peripherals.

Extended I/O

Complete HP-IB control. Interrupt commands. Auto start, error trapping, and time out. Bit manipulation and testing. Code conversion, burst read and write, buffered I/O, and direct memory access (DMA).

See Ordering Information for ROM combinations.

PERIPHERALS

Description	To Purchase The Peripheral, Order Peripheral Number:	If Peripheral Is Owned, Order Card Number:	Required ROM's
Plotter	HP 9862A, Opt. 025	HP 98032A, Opt. 062	9862A Plotter
Paper Tape Reader	HP 9863A, Opt. 025	HP 98032A, Opt. 063	General I/O
Digitizer	HP 9864A, Opt. 025	HP 98032A, Opt. 064	General I/O
Thermal Line Printer	HP 9866B, Opt. 025	HP 98032A, Opt. 066	General I/O
Hopper Card Reader	HP 9869A, Opt. 025	HP 98032A, Opt. 069	General I/O
Output Printer	HP 9871A, Opt. 025	HP 98032A, Opt. 071	General I/O
Output Printer (HP-IB)	HP 9871A, Opt. 001	HP 98034A	General I/O
High Speed Tape Reader	HP 9883A, Opt. 025	HP 98032A, Opt. 083	General I/O
Tape Punch	HP 9884A, Opt. 025	HP 98032A, Opt. 084	General I/O

ORDERING INFORMATION

Option No.	Field Installable Kit No.	Description
Standard HP 9825A		6,844 bytes of memory, 32-character LED display, 16-character strip printer.
Opt. 001		15,036 total bytes of memory
Opt. 002		23,228 total bytes of memory
Opt. 003*		31,420 total bytes of memory
	98221F	Field installed 8,192 bytes of memory
	98222F	Field installed 16,384 bytes of memory
Plug-In ROM's	98210A†	String — Advanced Programming
	98211A	Matrix
	98212A	9862A Plotter — General I/O
	98213A†	General I/O — Extended I/O
	98214A†	9862A Plotter — General I/O — Extended I/O

*Will not operate with ROM's 98210A, 98213A, and 98214A.

†Will not operate with 31,420 bytes memory.

ACCESSORIES AVAILABLE

Vinyl Carrying Case	HP 98025A
Thermal Printer Paper (6 rolls)	HP 9270-0479
Blank Data Cartridge	HP 9162-0061
Software Binder	HP 9282-0563

PURCHASE PLANS

Contact one of the Hewlett-Packard worldwide sales and service offices for specific prices and plans in your area.

MAINTENANCE AGREEMENTS

Maintenance agreements are available for all calculator products. Current U.S. rates are to be found in the Maintenance Services and Prices Publication, Part Number 5952-2432D. These agreements represent HP's best level of support. Major advantages to the customer include:

- Fixed annual cost,
- Automatic equipment upgrading,
- Priority service response,
- On-site service,
- Regular maintenance,
- A complete package tailored to the customer's needs.

*Data subject to change.

ACCESSORIES SUPPLIED

Quantity	Item	Part No.
1	Operating and Programming Manual	HP 09825-90000
2	Quick Reference Guide	
1	Blank Data Cartridge	HP 9162-0061
1	Utility Pac	HP 09825-10000
1	AC Power Cord	HP 8120-1378
1	Dust Cover	HP 9222-0495
1	Tape Head Cleaner	HP 8500-1251
5	Special Function Key Overlays (Blank)	HP 7120-4802
1	Test Cartridge	HP 09825-90035
1	Test Cartridge Manual	HP 09825-90031
3	Thermal Printer Paper	
1	Spare Fuse, 1A	HP 2110-0001
1	Spare Fuse, 2A	HP 2110-0002
1	Software Binder	HP 9282-0563
3	I/O Slot Covers	HP 5040-7723

\$17.25

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