

HEWLETT **hp** PACKARD

System 45

Series 9800 Desktop Computer

TECHNICAL DATA* OCTOBER 1977

```
1500  WRIT 1000
1510  GOTO P
1520  CALL Polyomial(X1,X2,X3,N,Degree,Coeffs),Pages,Rows,Title,ss,ss,ss
1530  PRINT "POLYNOMIAL MODEL: y=a0+a1x+a2x2+...+anxn"
1540  PRINT "Coefficients:"
1550  FOR I=0 TO Degree
1560  PRINT USING Set1;I,Coeffs(I)
1570  Set1 = "D000"
1580  NEXT I
1590  PRINT LIN(1)
1600  GOSUB PlotTab
1610  IF Graphics THEN CALL Plot(A,B,Coeffs,X1,X2,X3,N,Degree)
1620  GOTO 1000
1630  PRINTER IS Select
1640  PRINT LIN(2),SPR(12),DATA
1650  FOR I=1 TO N
1660  PRINT USING Image1;I,X1(I),Y1(I)
1670  Image1 = "Point *D000"
1680  END
```

1500 WRIT 1000
1510 GOTO P
1520 CALL Polyomial(X1,X2,X3,N,Degree,Coeffs),Pages,Rows,Title,ss,ss,ss
1530 PRINT "POLYNOMIAL MODEL: y=a₀+a₁x+a₂x²+...+a_nxⁿ"
1540 PRINT "Coefficients:"
1550 FOR I=0 TO Degree
1560 PRINT USING Set1;I,Coeffs(I)
1570 Set1 = "D000"
1580 NEXT I
1590 PRINT LIN(1)
1600 GOSUB PlotTab
1610 IF Graphics THEN CALL Plot(A,B,Coeffs,X1,X2,X3,N,Degree)
1620 GOTO 1000
1630 PRINTER IS Select
1640 PRINT LIN(2),SPR(12),DATA
1650 FOR I=1 TO N
1660 PRINT USING Image1;I,X1(I),Y1(I)
1670 Image1 = "Point *D000"
1680 END







The Hewlett-Packard System 45 is a desktop computer that incorporates several capabilities and popular peripherals to give you a convenient, powerful, total-solution package.

CRT

The System 45's 310-mm (12.2-in.) diagonal CRT features a high-resolution display and optimizes the image area to give you easy-to-read alphanumeric and graphics including plots and pie charts.

In the alpha mode, the CRT screen can contain up to 24 lines with 80 characters in each line. The top 20 lines are reserved for printouts, and program listings; the remaining four provide an interactive display for prompts or user instructions, data inputs, error messages and calculation results.

The on-screen characters are formatted within a 7 x 9 matrix which is contained in a 9 x 15 matrix. The larger matrix is used for ascenders and descenders, creating better-defined characters. The 9 x 15 matrix also lets you use special highlighting features — underlining, blinking and inverse video — for visual impact.

Graphics

To implement the CRT's graphics mode, an optional graphics hardware package is available which contains graphics memory. A read-only memory (ROM) module is required for use with the package.

These options allow for on-screen plotting at vector writing speeds up to 3 048 mm/second (120 in./second), using BASIC statements such as MOVE, DRAW and PLOT. Once data has been displayed, you can place a CRT cursor over the curve using the \uparrow \leftarrow \downarrow \rightarrow controls, and under program control, return the data coordinates to a variable. You can then digitize displayed data for applications such as integration, data scaling or extrapolation. By

keying in DUMP GRAPHICS, you can also transfer on-screen graphics to the optional built-in thermal printer for hard-copy output.

If you choose the external plotter instead, the HP 9872 with four-color capability, you use the same BASIC program to plot the information. This means you don't have to learn one set of statements to communicate with the CRT graphics hardware and another to communicate with the 9872 Plotter.

Language

This consistency is just one advantage of the enhanced form of BASIC. The System 45's language also provides for matrix and string manipulations, error trapping, flexible tracing, mass storage operations, multicharacter variables and subprogram capability.

Language consistency is also evident in the mass storage structure. No matter which medium you choose — the built-in tape cartridge, the HP 9885 Flexible Disk Drive, the HP 7900 Series Disc Drives (15M Byte Disc Drive or 50M Byte Disc Drive). — you use the same set of statements. This saves you time and money by eliminating the need for program changes when you address different storage devices.

Other Features

With just the built-in tape drive, you can store up to 217k bytes of data and/or programs. A second transport, available as an option and installed at the factory or in

the field, not only gives you an additional 217k bytes of storage but furnishes high-speed duplication capability and flexibility for program/data separation as well.

High-speed throughput is another essential characteristic to consider for your application. The System 45 accomplishes this via its overlapped processing. It executes instructions in BASIC and at the same time can manage all input/output operations. Consequently, computation and I/O occur concurrently, providing up to twice the normal speed.

The System 45's keyboard section includes the standard typewriter-like keyboard, the 32 Special Function keys (16 with shift and 16 without shift), the CRT control key block and program control and editing keys — all designed to provide you convenience and flexibility in programming and general operation.

In addition, the System 45 has a standard read/write memory of 13k bytes, expandable to 62k bytes. This means the System 45 can easily handle large data arrays and complicated equations.

The System 45 is a high-performance system in itself but is also designed for expanded computational capability and peripheral control via ROM modules and interfacing capabilities should your application require them. You can choose from a wide range of Hewlett-Packard peripherals and instruments to complement your system configuration.

- Built-in, limited mass storage operations
- Typewriter-like alphanumeric keyboard
- Read/write memory of 13k bytes expandable to 62k bytes
- Interface capability
- Built-in thermal line printer (optional)

Specifications

STORAGE

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}

System 45 read/write memory

Standard: .. 13 498 bytes

Opt. 201: .. 29 882 bytes

Opt. 202: .. 46 266 bytes

Opt. 203: .. 62 650 bytes

The standard read/write memory contains 16 384 bytes, with 13 498 directly available to the user. The remaining bytes are reserved by the operating system.

Tape cartridge

Capacity: ... 217k bytes

Access: ... directory, file-by-name

Note: Tape cartridges are intended for nominal program or data storage; the typical life cycle is 50-100 hours, depending on the application. It is suggested that tape transports be regularly cleaned and tape cartridges removed from drives after use.

For heavy usage of mass storage files, such as in consecutive file sorts or data base-management applications, flexible disk drives or hard disc drives are recommended for optimum performance and reliability.

Search speed: 2 286 mm/s
 (90 in./s)
 (bidirectional)

Average transfer

rate: 1 480 bytes/s

Rewind time: 19 s (end-to-end)

Cartridge size: 63.5 x 82.5 x
 12.7 mm
 (2.5 x 3.25 x 0.5 in.)

Verification: program recording

Error check: check sum

- Special coding characters
- Off-screen storage with scrolling capability
- Adjustable screen brightness
- 310-mm (12.2-in.)-diagonal screen

Specifications

GENERAL

Screen size: 261 x 193 mm
 (10.3 x 7.6 in.)
 310-mm (12.2-in.)
 diagonal

Raster distortion: ... <1% of full-scale
 raster horizontal
 or vertical

Screen brightness: .. manually
 adjustable from
 12-30 ft - Lamberts

X-ray emission: ≤ 0.5 mR/hr

Refresh rate: 60 Hz (independent
 of line frequency)

Tube phosphor: ... P31

Implosion protection: tension band and
 bonded implosion
 panel

ALPHANUMERIC MODE

Screen capacity: 24 lines x 80
 characters (1 920
 characters)

Raster scan
 size: 236 x 122.94 mm
 (9.3 in. x 4.84 in.)

Character
 generation: 7 x 9 character
 font in a 9 x 15
 character cell

Standard character
 set: 128 ASCII characters

Optional character
 sets: French, Spanish and
 German

Cursor: blinking underline

Highlighting
 features: inverse video, blinking

MOS memory: 8k bytes of nonuser
 read/write memory

Dot resolution: 0.330 mm (0.013 in.)

Cursor: full screen or
 blinking crosshair in
 plotting mode,
 blinking underline
 in letter mode

Character

editing: overstrike in letter
 mode

Display speed: 3 810 mm
 (150 in./s)

Accuracy: <1% full screen

Execution speeds

(for 12 digit
 floating point
 numbers)

Add/subtract22/.27 ms

multiply/divide80/2.60ms

SQR/EXP 2.70/5.70 ms

SIN/TAN 10/13 ms

20 x 20

MAT INV 13 s

40 x 40

MAT INV 100 s

SYSTEM SIZE/WEIGHT

Height: 482.6 mm (19 in.)

Width: 457.2 mm (18 in.)

Depth: 666.75 mm (26.25 in.)

Weight

Net: 18.6 kg (41 lb)
 standard
 mainframe
 10.43 kg (23 lb)
 standard CRT
 0.9 kg (2 lb)
 graphics option
 0.9 kg (2 lb)
 cartridge option
 5.22 kg (11.5 lb)
 optional thermal
 printer

Shipping: 47.2 kg (104 lb)
 (approximate)
 standard
 mainframe
 and CRT
 52.6 kg (116 lb)

standard

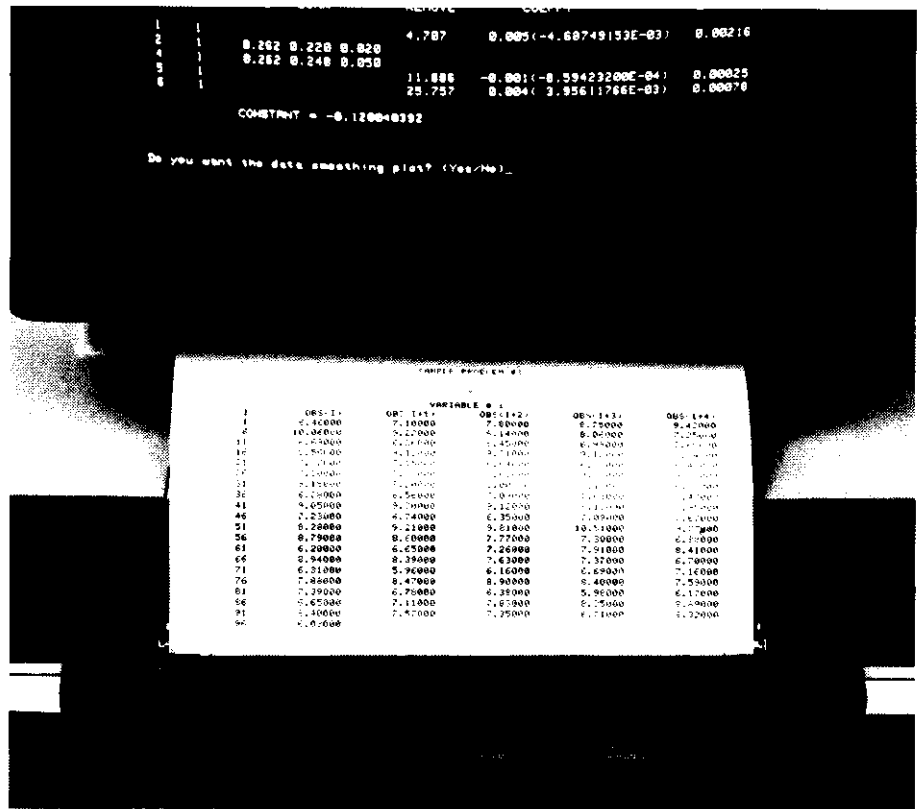
and underline

mainframe,

CRT and
 printer
 48.1 kg (106 lb)
 standard
 mainframe,
 CRT and
 second tape
 cartridge

Cube 0.5 m³ (17 ft³)

System 45 Line Printer



The low-cost, 80-column line printer, offered as either a factory- or field-installable option, fits directly into the system, beneath the CRT.

It contains a 256-character set defined within a 5 x 7 dot matrix font. This provides the standard 128 ASCII upper- and lower-case alphanumerics with full character sets for one major language plus other special symbols and characters. Language sets available are English, German, Spanish and French, each of which must be ordered with an appropriate keyboard.

Up to 80 characters per line can be printed at 300-480 lines per minute. Plot speeds vary, depending upon the mode and complexity of the plot. In the strip-chart-like mode, the speed is about 25.4 mm/second (1 in./second), unidirectionally. With the CRT transfer plotting, which can only be implemented with the graphics option, speeds range from 3.8 to 25 mm/second (0.14 - 1 in./second).

For special character emphasis, two methods of "highlighting" hard copy are available. You can indicate a 150% over-size, which means that character(s) will increase 50% in height but will retain the standard width; you can also specify underlining of the character(s).

If you order the printer, you are also provided character replacement and new character generation capabilities. This means any character in the ASCII set can be replaced by an alternate character or string of characters. In addition, you can create up to nine of your own special symbols or logos by defining the required dot pattern.

Additional features of the printer include convenient form controls such as vertical line spacing, horizontal tabulation and automatic top-of-form sensing.

Two types of paper are available for use with the printer. Black-print perforated paper, in both standard English and metric size, is useful for reports and permanent records. Blue-print continuous roll, also available in English and metric sizes, can be used more for routine day-to-day activities.

Features

- Fast printing/plotting
- Low cost
- Quiet operation
- Easy-to-read hard copy
- Fast transfer of graphics from CRT (graphics option necessary)
- Character-generation flexibility
- Optional character sets
- Form-control functions
- Two paper sizes, print colors

Specifications

Print speed: up to 480 lines/min

Plot speed
normal mode: 25.4 mm/s (1 in./s)

CRT transfer: 3.5 - 25 mm/s (0.14 - 1 in./s)

Noise level: ≤ 55 dba

Paper feed: automatic load

Paper

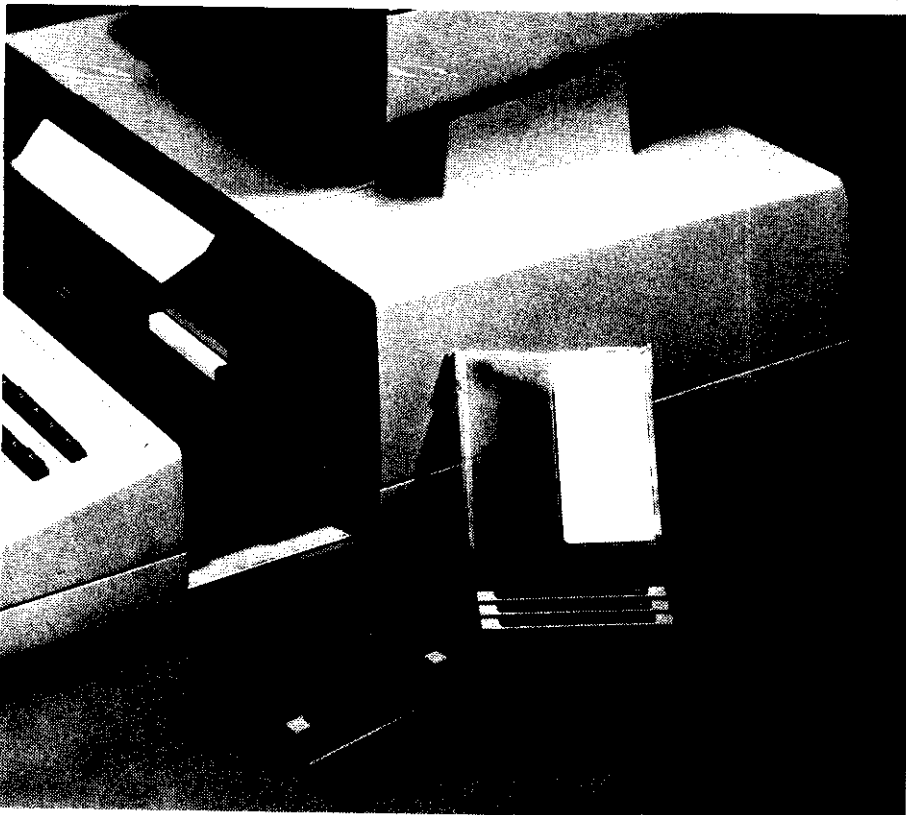
Black-print,

perforated: . . English version
216 mm (8.5 in.) wide
Metric version
210 mm (8.27 in.) wide
both 61 m (200 ft) long

Blue-print, continuous

roll: English version
216 mm (8.5 in.) wide
Metric version
210 mm (8.27 in.) wide
both 61 m (200 ft) long

System 45 Read-Only Memories (ROMs)



The System 45 allows the addition of up to eight read-only memories (ROMs) that can fit into drawers found on the sides of the machine.

Because of HP's state-of-the-art technology, these ROMs have been condensed into 10- x 96.5-mm (0.4- x 3.8-in.) modules that weigh 40 g (1.4 oz.).

Although they are physically small, the ROMs contain all the power needed to extend the System 45's language and permit peripheral and instrument control.

Those ROMs available are:

- Graphics (Opt. 370)
- Mass Storage (Opt. 310)
- I/O (Opt. 320)

Specifications

The ROMs described herein conform to the following physical specifications.

POWER

Supplied by the System 45

SIZE/WEIGHT

Height: 27.9 mm
(1.1 in.)
Width: 10 mm
(0.4 in.)
Length: 96.5 mm
(3.8 in.)
Weight: 40 g (1.4 oz.)

Graphics ROM (Opt. 370)

The Graphics ROM provides the statements necessary to create graphic images on the CRT or peripheral plotters. These commands make simple plotting easy while providing capability for sophisticated data representation.

The following is a complete list of the statements contained in the ROM and also includes a brief description of each mnemonic.

GRAPHICS OPERATIONS

General Statements

DUMP GRAPHICS - creates printer hard copy of CRT graphics
GRAPHICS/EXIT GRAPHICS - selects graphics/alpha raster
PLOTTER IS - selects and initializes plotter

Setup Statements

CLIP/UNCLIP - redefines the plotting rectangle/turns off CLIP
GCLEAR - clear the CRT
LIMIT - defines the physical limits of the plotting area
LOCATE - defines the plotting area rectangle
MSCALE - specifies a rectangle in the plotting area to be expanded to fit the plotting rectangle
SCALE - defines the range of X and Y in user units.

SETGU/SETUU - sets graphics units/user units

SHOW - specifies a rectangle in the plotting area to be expanded to fit the plotting rectangle

Plotting Statements

PDIR - rotates relocatable coordinate system
DRAW - specifies absolute draw
I PLOT - specifies incremental plot
LINETYPE - selects a dash pattern
MOVE - specifies absolute move.
PEN - selects a "pen"
PENUP - lift "pen"
PLOT - specifies absolute plot
RDRAW - specifies relocatable draw
RMOVE - specifies relocatable move
RPLOT - specifies relocatable plot

Axis and Labeling Statements

AXES - draws linear axes
CSIZE - sets character size
FRAME - outlines plotting area
FXD - sets label format
GRIP - draws linear grid
LABEL/LABEL USING - defines label format
LAXES - sets label direction
LGRIP - draws and labels grid
LORG - sets label origin mode

Interactive Statements

CURSOR - reads cursor position
DIGITIZE - reads cursor with wait
GINPUT - inputs data
POINTER - sets cursor position
WHERE - reads pen position



Mass Storage (Opt. 310)

The Mass Storage ROM provides drivers to communicate with the 9885M/S Flexible Disk Drive, or the 7900 Series Disc Drives. † The BASIC language commands for these storage media are resident in the System 45.

†The HP 7900 5M Byte Disc Drive and 7901 2.5M Byte Disc Drive will not operate with the System 45.

I/O (Opt. 320)

The I/O ROM provides both general and extended I/O capabilities. It features basic input/output, binary I/O, buffered I/O using interrupt, fast handshake and direct memory access (DMA), direct I/O to a string or array, programmable vectored interrupt control, complete HP-IB control, interface control, bit manipulation functions and radix conversions.

INPUT AND OUTPUT OPERATIONS

BIT BUCKET - allows syntaxing and execution of a program without actual I/O operations.
BRSTATUS - branches on status statement.
BUSY - indicates activity status function.
CONTROL - Indicates program control statement.
CONVERT - establishes conversion tables.
ENTER - specifies simple or formatted input.
EOL - indicates end-of-line function.
MASSINPUT - specifies direct transfer from mass storage device.
MASSOUTPUT - indicates direct transfer to mass storage device.
NOT READY - halts program when specified I/O device is requested.
OUTPUT - indicates simple or formatted output.
READBIN - Returns an 8-bit or 16-bit word.
STATUS - returns the status of a device.
TIMEOUT - specifies a wait function.
TRL - transfers limit function.

HP-IB (HEWLETT-PACKARD INTERFACE BUS) OPERATIONS

ABORT BUS - resets system.
BRPPOLL - branches on parallel poll statement.
BRSTAT - branches on serial poll statement.
CONFIGURE BUS - indicates HP-IB setup statement.
LOCAL LOCKOUT - switches a device into a local state by a local control.
PASS CONTROL - specifies the active controller.
PPOLL - indicates parallel poll function.
PPOLL CONFIGURE - sets up parallel poll statement.
PPOLL UNCONFIGURE - disables parallel poll on a device.
REMOTE - puts a device into the remote state.
REMOTE DISABLE - returns a device from remote to a local state.
REQUEST - specifies request service statement.
SERIAL POLL - performed using the STATUS statement.
SET LOCAL - sets a device into a local state.
TRIGGER - simultaneously starts device-dependent action.

INTERRUPT CONTROL

INTMASK - interrupts mask.
OFF INT - indicates off interrupt statement.
ON INT - indicates on interrupt statement.

INTERFACE CONTROL OPERATIONS

IO FLAG - indicates I/O flag function.
IOREG IN - indicates input from interface statement.
IOREG OUT - indicates output to interface statement.
IO STAT - indicates I/O status function.

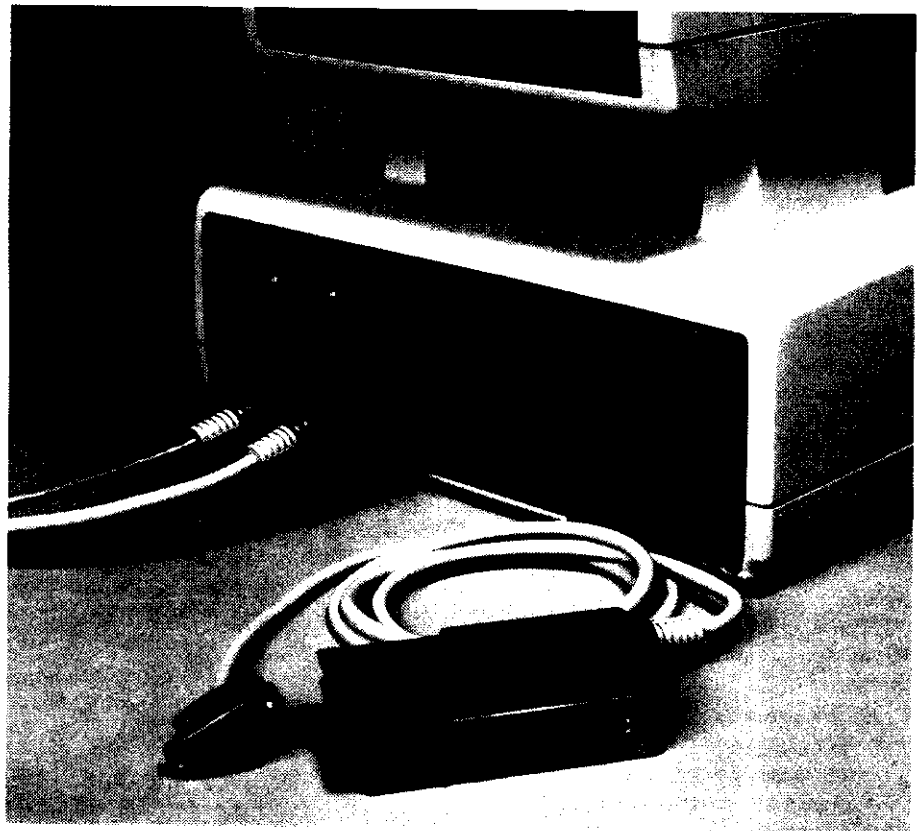
REAL TIME CLOCK OPERATIONS

TIME ABORT - aborts current time card operations.
TIME COUNT - returns the present count value.
TIME INIT - initializes the real time card.
TIME READ - reads the real time from the time card.
TIME SET - sets the time of the real time clock.
TIME STATUS - checks the status of the time card.
TIME TRIGGER - simultaneously starts time operations.

SUPPORT STATEMENTS AND FUNCTIONS

BINAND - specifies binary and.
BINCMP - indicates binary component.
BINEOR - indicates binary exclusive or.
BINIOR - indicates binary inclusive or.
BIT - specifies bit comparison.
DTR\$ - converts from decimal to radix.
ROTATEB - rotates a byte.
ROTATEW - rotates a word.
RTD - converts from radix to decimal.
SHIFTB - shifts a byte.
SHIFTW - shifts a word.

System 45 Interface Cards



The following input/output cards are designed to meet a variety of interfacing needs for the System 45. Each card is listed here with its appropriate part number.

- 16-Bit Parallel I/O (HP 98032A)
- BCD Input (HP 98033A)
- HP-IB (HP 98034A)†
- Real Time Clock (HP 98035A)
- RS-232-C Bit Serial I/O (HP 98036A)
- Disc Interface I/O (HP 98041A)

† Conforms to IEEE Specification 488-1975.

Select Code Settings

On any of these cards, you can choose one of 12 select codes via an externally accessible rotary switch.

Physical Specifications

The interfaces conform to these specifications.

POWER

Provided by the System 45

SIZE/WEIGHT

98032A, 98033A, 98034A, 98035A, 98036A and 98041A Cards

Length: 163 mm (6.4 in.)
 Width: 89 mm (3.5 in.)
 Depth: 38 mm (1.5 in.)
 Weight
 Net: 0.65 kg (1.4 lb)
 Shipping: 2.3 kg (5 lb)

98041A Central data unit

Length: 345.4 mm (13.6 in.)
 Width: 425.5 mm (16.7 in.)
 Depth: 132.6 mm (5.2 in.)
 Weight Net: 10 kg (22 lb)
 Shipping: 14.5 kg (32 lb)

OTHER

Maximum altitude: 4 572 m (15 000 ft)

16-Bit Parallel I/O (HP 98032A)

This interface provides the System 45 with a latched 16-bit input data bus for bidirectional transfer of information. Operation of the 98032A requires the I/O ROM for read functions and for advanced capabilities such as vectored interrupt, buffered input and direct memory access (DMA).

Input/output transfers can be in a 16-bit word format or in two independent 8-bit bytes. Enabling/disabling and interrupt priority are controlled by software commands.

Extended control and status lines are available for applications that require more than one signal from the System 45. These signals, combined with full-word or byte-data transfer modes, allow interfacing to a variety of equipment.

SPECIFICATIONS

Logic Configuration

Fifteen jumpers are provided within a removable cable boot to control the logic of I/O data, control signals, flag information and peripheral status information. Such operating modes as handshake operation, DMA and word/byte data are also controlled by these jumpers.

Accessories

The standard 98032A Interface is shipped with a 4.5-m (15-ft) open-ended cable but is also available with a 2-m (6.6-ft) cable terminated with a specific option. A 98241-67932 Test Connector is available to verify hardware operation of the interface.

BCD Input Interface (HP 98033A)



This interface connects the System 45 with bit-parallel, digit-parallel binary coded decimal devices for data input. Up to ten BCD digits, with overload and sign information, can be input using the I/O ROM.

An input format is selectable which allows two instruments to be read from a single interface card. The speed of the slowest device dictates the overall transfer rate.

SPECIFICATIONS

Data Formats

Data is serialized into the System 45 in a 16-character sequence. Two data formats are switch selectable on the interface card:

- 8-digit signed mantissa with 1-digit signed exponent
- 1-digit function code and overload indication
- or
- 4-digit mantissa
- 5-digit signed mantissa with positive exponent

98033A Interface. This interface has no options; it is shipped with a 4.5-m (15-ft) open-ended cable.

HP-IB (HP 98034A)

This interface allows the HP System 45 to communicate via the HP-IB with as many as 12 compatible instruments per interface. The 98034 utilizes a controlling processor to provide efficient management of interface bus protocol.

The I/O ROM accesses all the capabilities of the 98034A. For example, with this ROM the 98034A provides peripheral interrupt for service requests and data transfer at rates up to 45k bytes/second.

SPECIFICATIONS

Interrupt Capability

The 98034A is capable of responding to any or all of the following interrupt requests:

- take active controller status,
- take active talker status
- take active listener status,
- respond to service request,
- input buffer full,
- output buffer empty,
- interrupt on device clear message.

Accessories

The 98034A is shipped with 4-m (13-ft) interface cable with the standard metric connector.

Additional interface cables available are:

Length	Part No.
1 m (3 ft)	10631A
2 m (6.6 ft)	10631B
4 m (13 ft)	10631C

Real Time Clock Interface (HP 98035A)

The 98035A Interface adds real time reference and time-related control capabilities to the System 45. It provides:

- real time information in the form of month, day, hours, minutes and seconds;
- real time in U.S. (month first) or European (day first) format, jumper selectable;
- four independent timing units which can be used in interrupt or counting mode;
- direct I/O operations on external lines;
- status monitoring;
- synchronization of four independent timing units.

cess the external I/O lines — four external trigger lines (output) and four external gate lines (input). Interrupt can occur (using these units) at a specified real time, after a specified time delay, at a specified periodic interval or at any combination of the preceding, in order to request service from the System 45. These units can also be used as counters, incremented every millisecond, to determine time intervals for such things as the length of an event or the time elapsed between two events.

Synchronization

The four timing units can be synchronized to allow a user to start up to for operations at the same time.

Optional Cable

With the optional cable, output pulses (in bytes) can be sent to an external device and input (in bytes) can be received from an external device.

Accuracy

The accuracy of the clock is 30 ppm (0.003%).

RS-232-C Interface (HP 98036A)

The 98036A Interface provides bit serial communication between the System 45 Desktop Computer and asynchronous EIA RS-232-C devices such as data terminals and modems. Data rates range from 75 to 9600 bits/second and are set via an externally accessible rotary switch. Allowable data formats include 5, 6, 7 or 8 bits per character with 1, 1.5 or 2 stop bits.

Information can be sent and received in either EIA RS-232-C voltage specification or 20-mA current loop configuration. Receive only capability in 60-mA current loop is also possible.

The I/O ROM is required for interrupt, buffered input operations and extended RS-232-C control/status capability.

SPECIFICATIONS

Connector Configurations

Two cables are available for use with the 98036A. The standard cable, for inter-

facing to terminals, is shipped with a 2-m unit.

(6.6-ft) cable terminated with a standard female EIA 25-pin connector. The Opt. 001 cable, for interfacing to modems, is terminated with a 25-pin EIA converter.

Interface Configuration

All signals present at the connector conform electrically to EIA RS-232-C and CCITT V.24 specifications. The interface operates in an asynchronous mode providing 5-, 6-, 7-, or 8-bit data formatting with 1, 1.5 or 2 stop bits and odd, even or no parity.

Data rates available are 75, 110, 150, 300, 600, 1200, 1800, 2400, 4800 and 9600 baud. Data rate selection is via an externally accessible rotary switch. Under programmable control of the 45, the switch selected data rate can be reduced to one half of its set value.

ADDITIONAL OPERATING INFORMATION

Transmitter and receiver sections of the 98036A have separate one-character buffers. The status of these buffers can be interrogated by the System 45.

This interface can be programmed by the System 45 to interrupt when either the input buffer is full, the output buffer is empty or both.

The I/O ROM is required to operate under interrupt control.

Options

If Opt. 001 is ordered, the cable is terminated with a similar male-type connector. A 98241-67936 Test Connector is supplied with each 98036A Interface.

Disc Interface (HP 98041A)

The Disc Interface provides the System 45 access to large capacity, high-speed disc peripherals.

One desktop computer can be connected to as many as four 13037B Controllers. Each controller, in turn, can be connected to any combination of up to eight HP 7900 Series Disc Drives (15M Byte or 50M Byte).

SPECIFICATIONS

The 98041A Interface Card contains drivers and receivers as well as the logic for addressing, interrupts and status. A 3-m (10-ft) long interface cable connects to the central data unit which contains data buffering facilities and conversion logic to transmit data bidirectionally between the interface card and the mass memory devices via DMA.

Mass memory devices are daisy chained to a connector on the central data

Supplementary Information

Ordering Information

The following options are available by ordering the indicated number.

READ/WRITE MEMORY (order only one)

29 882 bytes Opt. 201
46 266 bytes Opt. 202
62 650 bytes Opt. 203

PRINTERS†(order only one)

	Field Installed	Factory Installed
Standard ASCII (English and German)‡ with 8½-in. paper	98450A	Opt. 500
Standard ASCII (English and German)‡ with 210-mm paper	98450A	Opt. 501
French with 8½-in. paper	98451A	Opt. 510
French with 210-mm paper	98451A	Opt. 511
Spanish with 8½-in. paper	98452A	Opt. 520
Spanish with 210-mm paper	98452A	Opt. 521

KEYBOARDS† (order only one)

	Field Installed	Factory Installed
Standard ASCII French	98480A	Opt. 800
Spanish	98481A	Opt. 810
German	98482A	Opt. 820
	98483A	Opt. 830

†Printer and keyboard must be of the same language.

‡German character set is accessible through the Standard ASCII set via Opt. 830 or 98483A.

	Field Installed	Factory Installed
Second tape trans- port and tape cartridge	98460A	Opt. 600
Graphics hardware (order with Opt. 370 or 98437A) ...	98470A	Opt. 700

Any of the following options can be ordered by specifying the appropriate number:

ROMS

	Field Installed	Factory Installed
Mass Storage	98431A	Opt. 310
I/O	98432A	Opt. 320
Graphics	98437A	Opt. 370

INTERFACES

16-Bit Parallel I/O	98032A
BCD Input	98033A
HP-IB	98034A
Real Time Clock	98035A
RS-232-C	
Serial I/O	98036A
Disc Interface I/O	98041A

Also available is 16 384 bytes of field-installable incremental read/write memory — HP Part No. 98420A.

Accessories Supplied

Item	HP Part No.
Beginners Guide	09845-90001
Programmers Introduction	09845-90002
Operating and Pro- gramming Manual	09845-90000
Syntax Reference Manual	09845-90020
System 45 Reference Manual	09845-90010
Utility application pack	09845-10000
Special Function key overlays	7120-6164
System test cartridge	09845-90041
System Test Manual	09845-90040
Blank tape cartridges (2) ...	9162-0061
Tape head cleaner	8500-1251
Spare fuses (2)	
2.5A	2110-0083
5A	2110-0010
Power cord	depends on origin of sale

Accessories Available

Item	HP Part No.
Hard carrying case	
Computer	98445A
CRT	98446A
Soft carrying case	
Computer	98447A
CRT	98448A
Thermal paper	
Black-print, perforated (2 rolls)	
English	9270-0565
Metric	9270-0568
Blue-print, continuous (2 rolls)	
English	9270-0566
Metric	9270-0569

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 desktop computing system products. Current U.S. rates are found in the Maintenance Service and Prices Microfiche, No. 5952-2432D. These agreements represent HP's best level of support. Major advantages to the customer include:

- fixed annual cost,
- priority service response,
- on-site service,
- regular maintenance,
- individualized contracts.

*Data subject to change.



Peripheral Ordering Information

Description	To purchase peripheral, order:	If peripheral is owned, order:	Required ROMs
Thermal Line Printer	9866B, Opt. 045	98032A, Opt. 466	None
Serial Impact Printer	9871A, Opt. 045	98032A, Opt. 471	None
Serial Impact Printer	9871A, Opt. 001	98034A, Opt. 445	None
Plotter	9872A, Opt. 045	98034A, Opt. 445	Opt. 370
I/O Expander	9878A, Opt. 045	not applicable	None
Tape Punch	9884A, Opt. 045	98032A Opt. 484	None
Flexible Disk Drive (Master)	9885M, Opt. 045	98032A, Opt. 485	Opt. 310



Sales and service from 172 offices in 65 countries.
Loveland, Colorado 80537