

Hewlett-Packard

System 45B

Desktop Personal Computer



Owner's Manual



Warranty Statement

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Owner's Manual



HP System 45B Desktop Computer

Hewlett-Packard Desktop Computer Division
3404 East Harmony Road, Fort Collins, Colorado 80525
(For World-wide Sales and Service Offices see back of manual.)
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Printing History

Periodically, this manual is updated. Each new edition of this manual incorporates all material updated since the previous edition. Each new or revised page is indicated by a revision date.

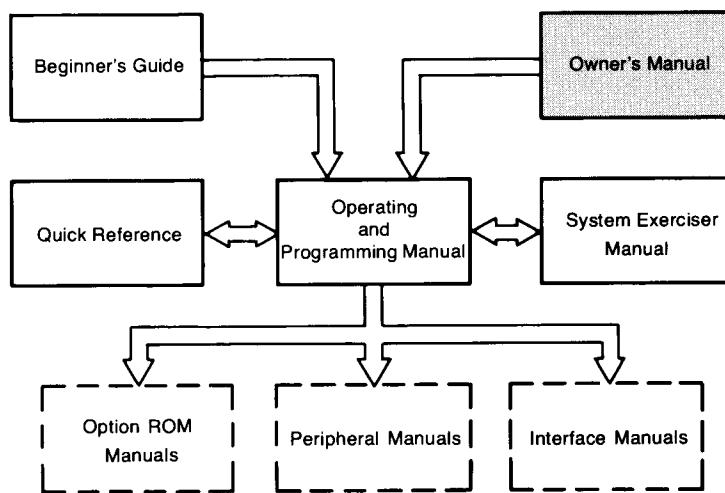
The date on the back cover changes only when each new edition is published.

First Printing.....March 1, 1979

Second Printing...May 2, 1979

System 45B Manual Reference

The following block diagram shows manuals that are included in the System 45B Documentation scheme and suggested progression. Dotted-line borders indicate those manuals available with specific options; solid borders indicate those manuals that are shipped with every System 45B.



Beginner's Guide (09845-91001) for the novice programmer. Covers the fundamentals of programming and the BASIC language. The beginner can then progress to the Operating and Programming Manual.

Operating and Programming (09845-91000) for all users. All features of the computer and the language are explained.

Owner's Manual (09845-91005) for System 45B owners. Covers initial set-up, cleaning the computer, ROMs, the tape cartridge, peripherals, and interfaces.

Quick Reference (09845-91015) for all users. A reference to all language syntax.

System Exerciser (09845-91040) to use when you want to test your computer or if there is any doubt that it is operating properly.

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About the 9845B

Introduction

The HP 9845B Desktop Computer is a high-speed, powerful computing tool. This manual is intended for owners and users of a 9845B and contains information concerning the 9845B, its options, accessories, maintenance and initial setup. Available peripherals and interfaces are also discussed.

The following topics are covered in this chapter-

- An Overview of the 9845B
- Features and Options
- Language
- Using the System 45B

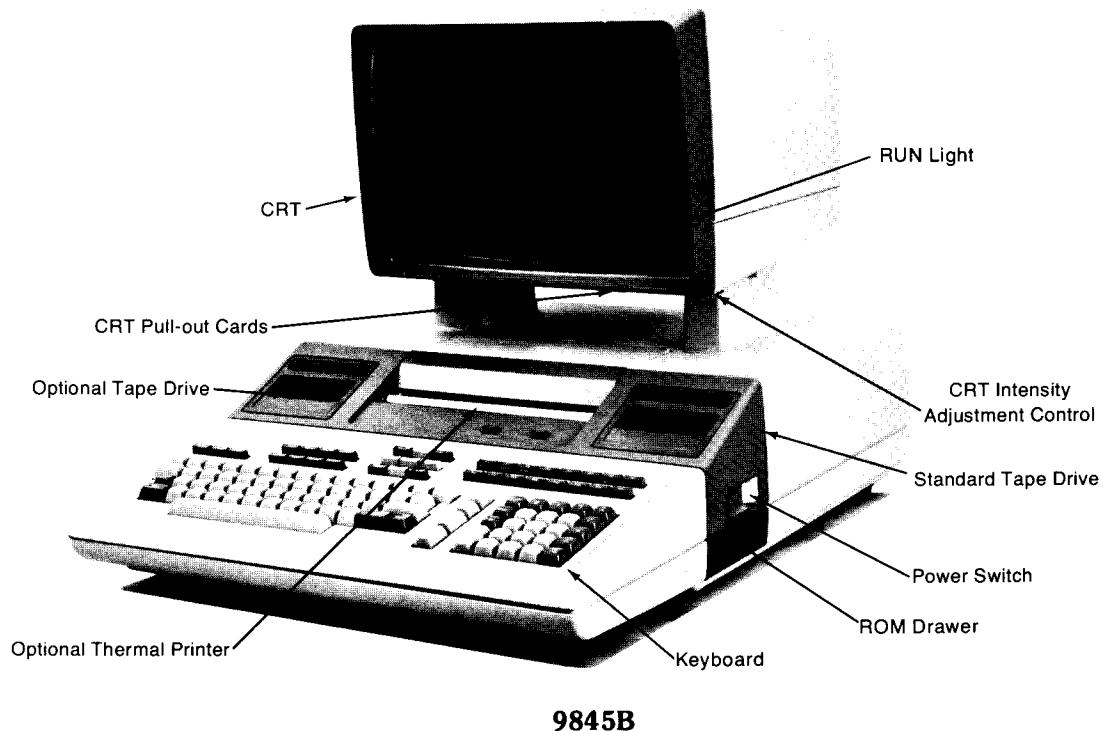
* * * * *

Customer Questionnaire

To help us in preparing new manuals, there is a questionnaire in the back of this manual. Your answers to the questions assist us in producing better, more useful manuals. Your feedback is our only way of determining the effectiveness of our manuals. Please complete the questionnaire and mail it - postage is already paid in the United States. Thank you.

Chapter 1

An Overview of the 9845B



Features and Options

This section covers features and options which are available for the 9845B computer.

The CRT

The 9845B comes equipped with an 80-character by 24-functional-line CRT (Cathode Ray Tube) display. It is the primary means for viewing data, keyboard inputs, results, program listings, error messages and system comments, and for editing programs. It is divided into four functional areas -

- Printout Area - 20 lines which function similarly to a printing device.
- Display Line - for displayed output and input prompts.
- Keyboard Entry Area - two lines (160 characters) for viewing keyboard entries.
- System Comments Line - used for error messages, system indicators and results of keyboard calculations.

CRT brightness is controlled by a knob underneath the CRT on the righthand side.

CAUTION

SHOULD A SINGLE, BRIGHT HORIZONTAL LINE APPEAR ACROSS THE CENTER OF THE CRT, IMMEDIATELY SWITCH THE COMPUTER OFF TO AVOID DAMAGE. THEN CONTACT YOUR SALES AND SERVICE OFFICE FOR SERVICE ASSISTANCE.

Hewlett-Packard products which use Cathode Ray Tubes are designed to limit X-radiation levels to values of 0.5mR/hour or below. This level has been established by the United States Bureau of Radiological Health, and conforms to similar international requirements. All measurements are made using a Victoreen 440 RF/c instrument, and are conducted with the equipment operating under normal conditions as well as worst case control misadjustment.

ROMs

There are several plug-in Options ROMs (Read Only Memories) which provide additional language capabilities to perform specific tasks, such as using mass storage devices.

The ROMs are -

- Graphics ROM (HP P/N 98411A) allows the graphics option and plotters to be used with the 9845B.
- I/O ROM (HP P/N 98412A) expands input and output capabilities.
- Mass Storage ROM (HP P/N 98413A) allows discs to be used with the 9845B.
- Advanced Programming ROM (HP P/N 98414) extends programming capabilities by adding statements for sort/search routines and others.

A manual is supplied with each ROM. Part numbers are listed in Chapter 4.

Read/Write Memory

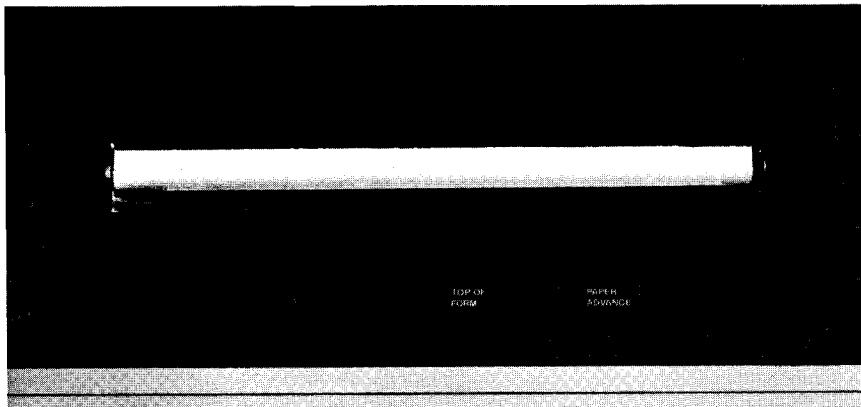
The standard Read/Write Memory is 56 266 bytes. The following memory options are available -

Option	Number of Bytes ¹
204	187 146
205	318 026
206	448 906

¹ These figures are obtained by executing SCRATCH A, then LIST. The SFK definitions use 160 bytes (138 if you don't have the lefthand tape cartridge). This memory can be used by executing SCRATCH KEY.

The Internal Printer

The optional internal thermal printer is an 80-character line printer used for hard-copy output. Two types of paper are available: blue printout, continuous paper and black printout, perforated paper. Paper comes in two widths: 8.5 in. and 210 mm. See Chapter 2 for part numbers.



Two keys are used to control the internal printer. The PAPER ADVANCE key on the right advances the paper until the key is released. The TOP OF FORM key on the left advances the paper past perforations to the top margin which is approximately 1/2" below the perforations. If the paper isn't perforated, it is advanced 12 inches.

Language

An enhanced form of the BASIC (Beginners All-Purpose Symbolic Instruction Code) programming language is used in the System 45B. The fundamental programming unit is the **statement**. A program consists of a numbered sequence of statements, or lines, which are stored in memory. Most statements can also be executed from the keyboard.

The computer also has many math, trigonometric, string, output and error **functions**, which are used within statements to evaluate expressions or control output. Most functions can also be executed as keyboard operations.

You also have many **commands** for controlling computer operation and editing programs. Commands are executed only from the keyboard; they are not programmable.

More statements and functions can be added to the language by adding option ROMs which are inserted into the drawers in the sides of the computer.

HP Compatible BASIC

The BASIC language as implemented on the System 45B Computer is an enhanced form of HP Compatible BASIC. HP Compatible BASIC consists of statements, functions, operators and commands that will be implemented in new HP BASIC machines. The HP Compatible BASIC is implemented in the System 45B as Level I. Level I refers to the highest-performance computational products. Thus, any program consisting entirely of Level I BASIC language can be transported to any Level I BASIC machine.

The following is a list of HP Level I BASIC. Contact your HP Sales and Service Office to obtain information concerning the transporting of programs between machines.

Operators

+	=	AND
-	>	OR
*	<	NOT
/	≥	EXOR
^	≤	
DIV	<>	&
MOD		

Functions

ABS	SIN	COL	LIN	LWC\$	TYP
EXP	COS	DET	SPA	REV\$	
INT	TAN	DOT	TAB	UPC\$	
LGT	ASN	ROW	PAGE	CHR\$	
LOG	ACS	SUM		LEN	
MAX	ATN			NUM	
MIN				POS	
RND				RPT\$	
SGN				TRIM\$	
DROUND				VAL	
PROUND				VAL\$	
FRACT					
PI				ERRL	
SQR				ERRN	
				ERRM\$	

Statements

ASSIGN	MAT...RSUM	REDIM
BEEP	MAT INPUT	REM
CALL	MAT PRINT	RESTORE
COM ¹	MAT PRINT#	RETURN
COPY	MAT READ	SHORT
CREATE	MAT READ#	STANDARD
DATA	OFF END	STOP
DEF FN	OFF ERROR	SUB
DEG	ON END	SUBEXIT
DIM	ON ERROR	SUBEND
EDIT	ON...GOSUB	WAIT
END	ON...GOTO	
FIXED	OPTION BASE	
FLOAT	PAUSE	
FN END	PRINT	
FOR	PRINT#	
NEXT	PRINT USING	
GOSUB	PURGE	
GOTO	RAD	
GRAD	RANDOMIZE	
IF	READ	
IMAGE	READ#	
INPUT	REAL	
INTEGER		
LET		
LINPUT		
MAT array = array		
MAT array = array + - * . / < <= > > = <> array		
MAT...CON		
MAT array = (num. exp.)		
MAT array = (num. exp.)+ - * / < <= > > = <> = array		
MAT array = array + - * / < <= > > = <> = (num. exp.)		
MAT...INV		
MAT...TRN		
MAT...IDN		
MAT...ZER		
MAT...CSUM		

¹ The type words INTEGER, SHORT and REAL can be specified in a COM statement or formal parameter list. Dimensionality of arrays is limited to 6 dimensions.

Using the System 45B

Manuals

To help you in using your 9845B computer, there are three manuals related to operating and programming which are supplied -

- Operating and Programming - This manual is designed for those of you with programming background. It covers the physical aspects of the computer (such as the keyboard and CRT) as well as 9845B BASIC language. All elements of the BASIC language are introduced and explained.
- Beginner's Guide - This manual is designed for those of you who have never programmed a computer. The fundamentals of programming concepts, the BASIC language and machine operation are all covered. You can then progress to the Operating and Programming Manual.
- Quick Reference - This manual serves as a "mind-jogger" for 9845B programmers. The syntax of all statements, commands and functions are listed as well as a brief description of each. After you are familiar with the System 45B, this small booklet is generally all you'll need to continue to use the System 45B.

CRT Pull-out Cards

The 9845B, in addition, has four pull-out cards under the CRT which serve as a handy reference for operating the 9845B. They are-

- Error Messages
- Statements
- ROM Errors
- About the 9845B

Introductory Training Tape

An introductory training tape and accompanying workbook are designed for the beginning System 45B user. They provide a self-instructing program that let you become familiar with programming the System 45B.

Getting Started

Introduction

This chapter covers unpacking and setting up your 9845B Desktop Computer and contains other information that is important when you first receive your computer.

1 Unpacking Your Computer

Inspecting the 9845B

The computer was thoroughly inspected before it was shipped to you. All equipment should be in good operating order. Carefully check the 9845B, ROMs, peripheral equipment, and other items for any physical damage sustained in transit. Notify HP and file a claim with the carrier if there is any such damage.

Please check to ensure that you have received all of the items which you ordered and that any options specified on your order have been installed in your machine. Refer to the table on the next page and check that all accessories are present. If any items are missing, please contact your nearest HP Sales and Service Office; addresses are supplied in the back of this manual.

Chapter 2

Equipment Supplied

Peripheral devices, ROMs and interface cards are packaged separately from your 9845B; each of these has its own manual or operating note and may also have extra items packaged with it. The following items are packaged with each 9845B -

Item	Quantity	Part Number
Operating and Programming Manual	1	09845-91000
Beginner's Guide	1	09845-91001
Owner's Manual	1	09845-91005
Quick Reference	1	09845-91015
System Exerciser Manual	1	09845-91040
System Exerciser Cartridge	1	09845-91041
Manual Binder	1	9280-0713
Training Tape	1	09845-10024
The Workbook	1	09845-91090
Utility Library	1	09845-10200
BASIC User's Club Brochure	1	11141-10203
Special Function Key Overlays	5	7120-6164
Blank Tape Cartridges	2	9162-0061
Dust Cover	1	9222-0592
Magnetic Head Cleaner	1	8500-1251
Spare Fuses		
2.5 Amp (SB)	1	2110-0380
5 Amp (NB)	1	2110-0010
Power Cord ¹	1	See footnote
Printer Paper ²	3	See the following table

All the equipment in the previous table can be purchased by ordering HP Part Number 09845-80020. Single items can be purchased using the appropriate part number. Contact your Sales and Service Office for ordering information.

¹ The System 45B is shipped with the correct power cord for use in your area. See the section on power cords.

² Printer paper is supplied only if your System 45B has the internal printer.

The following items are also available -

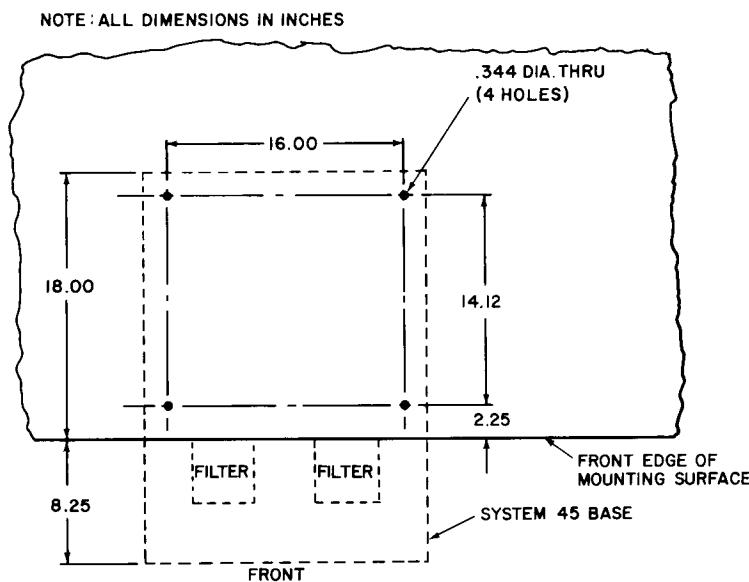
Item	Part Number
Hard and Soft Carrying Cases - CRT	09845-64402
Hard and Soft Carrying Cases - Computer	09845-64401
Soft Carrying Case - CRT	09845-64404
Soft Carrying Case - Computer	09845-64403
Hard Carrying Case - CRT	09845-64406
Hard Carrying Case - Computer	09845-64405
Thermal Printer Paper - Black Perforated 8.5" width	9720-0565
210 mm width	9270-0568
Thermal Printer Paper - Blue Continuous 8.5" width	9270-0566
210mm width	9270-0569

Table Mounting

The System 45B mainframe can be secured to a table top by replacing each foot with an internally threaded device and bolting up through a desk or table top that has a lockable drawer. Care must be taken in laying out the bolt holes so that the front edge of the computer overhangs the edge of the table top. This ensures that air filters can still be removed and cleaned.

Your desktop computer can be secured to the top of a desk or table in the following manner -

1. Drill four holes in the top of your desk or table to accommodate 5 / 16-24 NF-2A screws according to the following diagram.
2. Replace the four rubber feet attached to the bottom of the computer with the four hexagonal spacers supplied with the Table Mounting Accessory (P/N 09845-61201), using the same 6-19 x .438 Pan Head, Pozidrive, Plastite screws.
3. Attach the computer to the desk or table top, using four 5 / 16-24 NF-2A machine screws that are 3 / 8 inch longer than the thickness of the desk or table top. The hexagonal spacers should be held with a wrench while these screws are tightened to prevent stripping the smaller screws out of the plastic base.
4. The keyboard should extend 8.25 inches in front of the desk or table top, as shown, to make the air filters accessible for periodic cleaning or replacement.



2 Checking Fuses, Voltage and Power Cords

Introduction

The power cord connector, fuse and voltage selector switch are all located in the rear panel of the computer. The power cord must be disconnected before removing or installing a fuse or setting the voltage selector switch.

Fuses

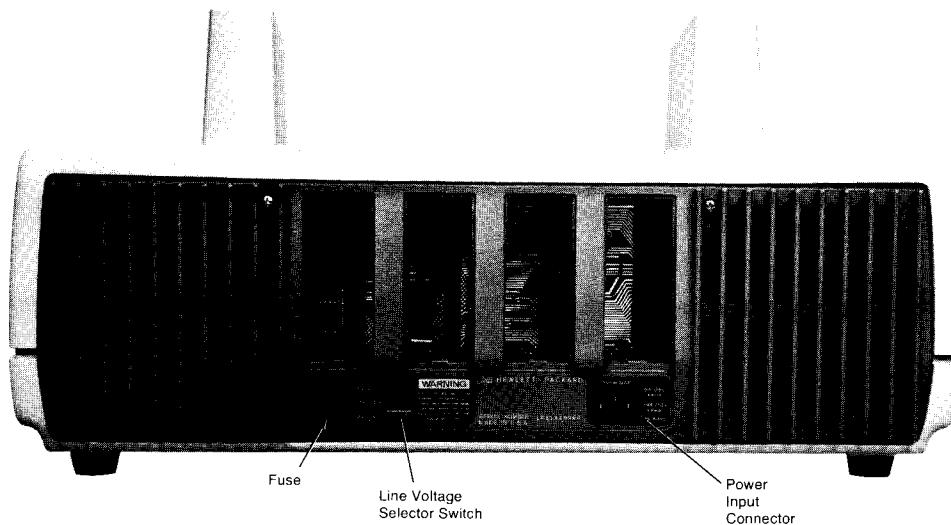
Always be sure that the correct fuse is installed. Failure to do so may result in damage to the computer. When changing the fuse, make sure that the replacement is the proper rating and type.

A different fuse is required for each of the two voltage ranges of 120 Vac and 240 Vac. Be sure that the fuse is the proper type and rating as shown below.

Voltage Setting	Fuse Rating	HP Part Number
100, 120	5 NB	2110-0010
220, 240	2.5 SB	2110-0380

WARNING

TO AVOID THE POSSIBILITY OF SERIOUS INJURY, DISCONNECT THE AC POWER CORD BEFORE REMOVING OR INSTALLING A FUSE.



9845B Rear Panel

The photo above shows the location of the fuse in the rear panel of the computer. To change the fuse, first disconnect the power cord from the computer. Then remove the fuse cap by pressing downward while twisting it counterclockwise. Remove the fuse from the cap and insert the correct replacement fuse (either end) into the cap. Finally, put the fuse and cap back into the fuse holder. Press on the cap and twist it clockwise until it locks in place.

Voltage

Next, ensure that the voltage selector switch is set for the nominal line voltage in your area. The switch is located in the rear panel of the computer, as shown in the previous drawing. The drawing below shows the correct setting for each nominal line voltage.

WARNING

ALWAYS DISCONNECT THE COMPUTER FROM ANY AC
POWER SOURCE BEFORE SETTING THE VOLTAGE
SELECTOR SWITCH.

If it is necessary to alter the setting of the switch, disconnect the power cord. Then insert the tip of a small screwdriver into the slot on the switch. Slide the switch so that the position of the slot corresponds to the desired voltage, as shown below.



Nominal Line Voltage Settings

CAUTION

CHECK THE SELECTOR SWITCH SETTING BEFORE APPLYING POWER. DAMAGE TO THE COMPUTER WILL OCCUR IF THE SELECTOR SWITCH IS SET TO 110 VOLTS AC AND 220 VOLTS AC IS APPLIED TO THE POWER INPUT CONNECTOR.

Power Requirements

The 9845B has the following power requirements -

AC Line Voltage -

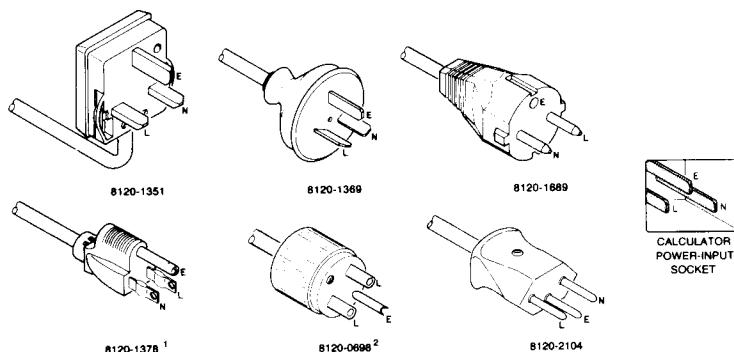
Nominal Voltage	Operating Range -10%, +5% of Nominal
100	90 to 105 volts
120	108 to 126 volts
220	198 to 231 volts
240	216 to 252 volts

Line Frequency - 48-66 Hz

Power Consumption - 275 va

Power Cords

Make sure that you have the correct power cord. However, don't connect it until steps 3, 4, and 5 are completed. Power cords with different plugs are available for the 9845B; the part number of each cord follows. Each plug has a ground connector. The cord packaged with each computer depends upon where that computer is to be delivered. If your equipment has the wrong power cord for your area, please contact your local HP Sales and Service Office.



¹UL and CSA approved for use in the United States of America and Canada with equipment set for either 100 or 120 Vac operation.

²UL and CSA approved for use in the United States of America and Canada with equipment set for either 200 or 240 Vac operation.

Power cords supplied by HP have polarities matched to the power-input socket on the computer, as shown below:

- L = Line or Active Conductor (also called "live" or "hot")
- N = Neutral or Identified Conductor
- E = Earth or Safety Ground

WARNING

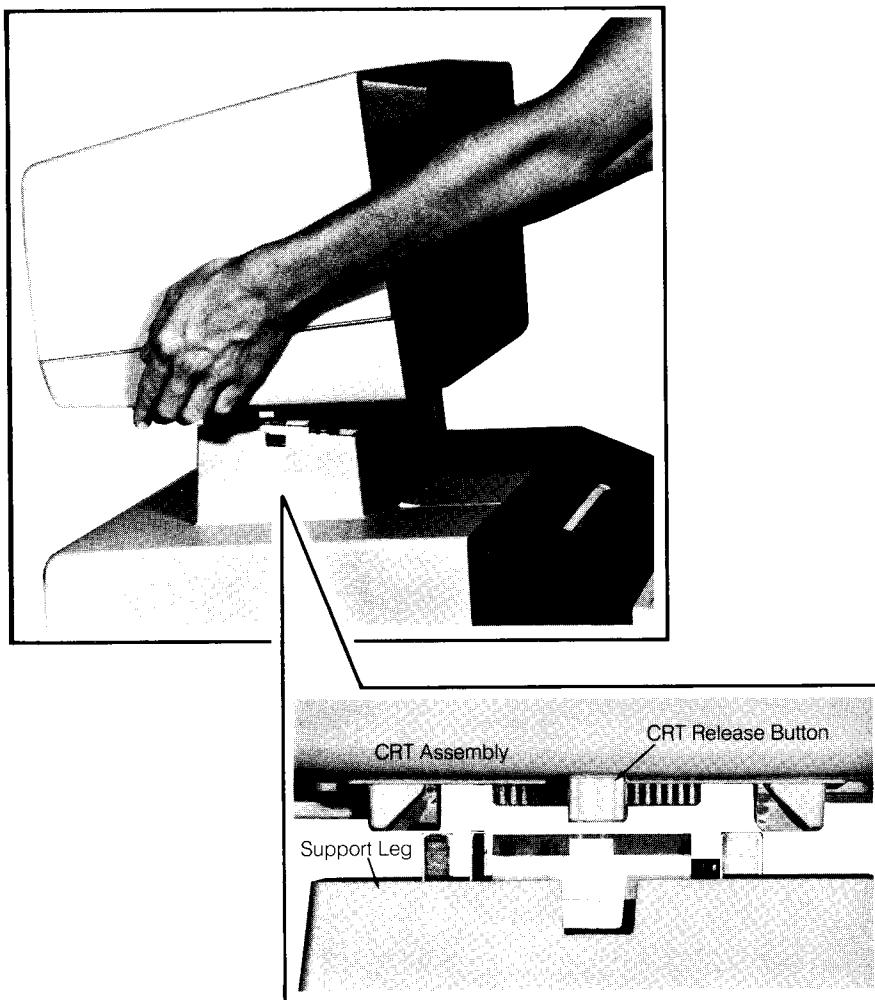
IF IT IS NECESSARY TO REPLACE THE POWER CORD, THE REPLACEMENT CORD MUST HAVE THE SAME POLARITY AS THE ORIGINAL. OTHERWISE, A SAFETY HAZARD FROM ELECTRICAL SHOCK TO PERSONNEL, WHICH COULD RESULT IN INJURY OR DEATH, MIGHT EXIST. IN ADDITION, THE EQUIPMENT COULD BE SEVERELY DAMAGED IF EVEN A RELATIVELY MINOR INTERNAL FAILURE OCCURRED.

Grounding Requirements

To protect operating personnel, the National Electrical Manufacturers' Association (NEMA) recommends that all equipment be properly grounded. The 9845B is equipped with a three-conductor power cable which, when connected to an appropriate power receptacle, grounds the computer. To preserve this protection feature, do not operate the computer from an ac power outlet which has no ground connection.

3 Installing the CRT

Next, mount the CRT onto the body of the computer. The CRT assembly locks into place on top of the mainframe support legs. It is important that the guides on the CRT assembly and the mainframe support legs are aligned properly before assembly. The picture below shows the proper alignment necessary for the CRT assembly installation. Notice how the buttons on the bottom of the CRT assembly align with the notches in the support legs.



CRT intensity is controlled by a knob on the lower righthand corner of the CRT.

4 ROMs

All desired option ROMs should be in place when the computer is switched on. This section covers installing and removing ROMs.

The ROM Drawers

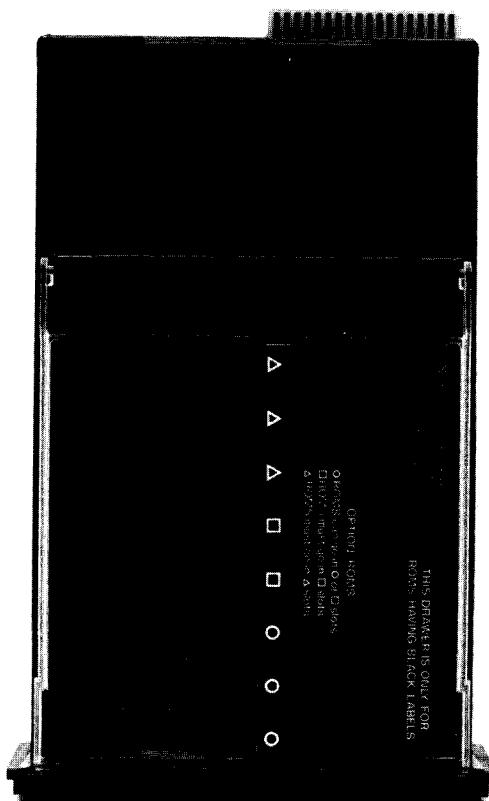
The System 45B has two ROM drawers, one located on each side of the machine at the base of the dark stripe. They contain the option ROMs. There is a distinction made between drawers. The ROMs in the lefthand drawer have green labels and those in the right drawer have black labels. Since it is important that the two not be interchanged, there are small raised ribs along the sides of the drawers which fit into recesses in the bottom of the ROMs. These ribs differ to prevent a ROM from being inserted in the wrong place.

To help insure that a ROM is inserted in a proper slot, the labels on the drawers and on the ROM have symbols on them. Each ROM and each ROM slot have a circle, square or triangle on them. These guidelines determine in which slot a ROM can be placed—

- ○ ROM can go in ○ or □ slots
- □ ROM must go in □ slots
- Δ ROM must go in Δ slots



Left-hand Drawer



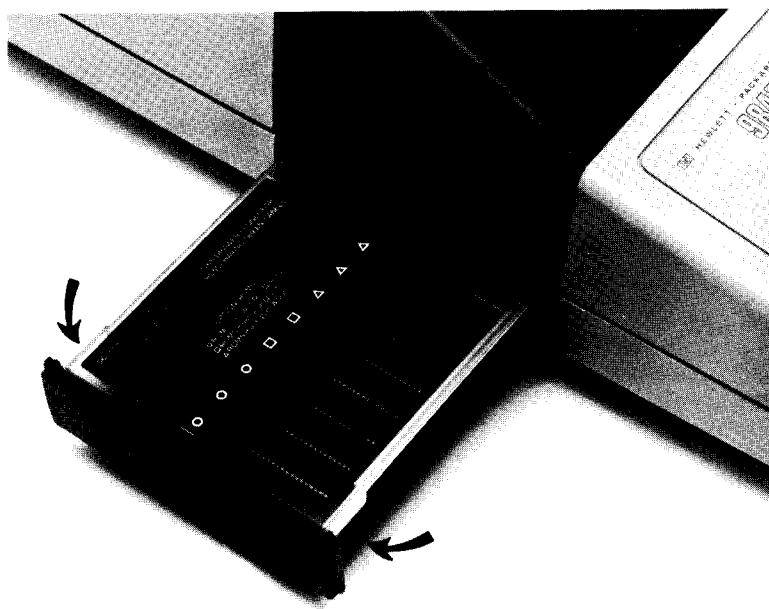
Inserting a ROM

To insert a ROM -

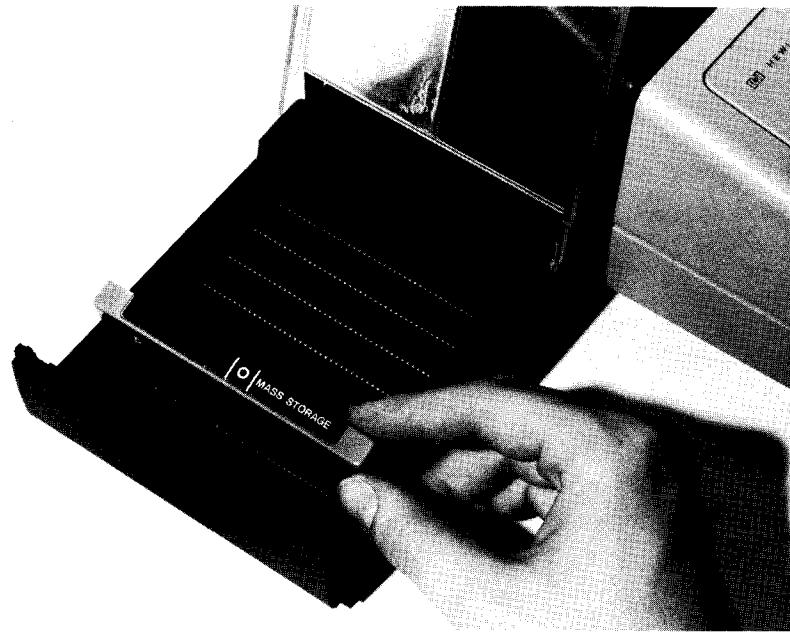
- Turn off power to the computer.
- Slide the drawer all the way out and make sure the label color matches that of the ROM you want to insert.

Left Drawer - Green	Right Drawer - Black
Mass Storage ROM	Graphics ROM
I/O ROM	I/O ROM
	Advanced Programming ROM

- Open the clear plastic cover by squeezing the sides of the cover (as shown) to gain access to the connectors.



- Orient the ROM so that the tops of the letters on the label are toward the computer.



- Make sure that the shape (○, □ or Δ) on the ROM corresponds to the shape for the slot.
- Insert the ROM vertically so that it goes all the way to the bottom of the connector.



The small raised rib on the top of the drawer should fit into the recess on the bottom of the ROM. If it doesn't, make sure you've made the proper color, shape and orientation matches.

- When the ROM is inserted, snap the clear cover shut and close the drawer until it is flush with the outside cover.

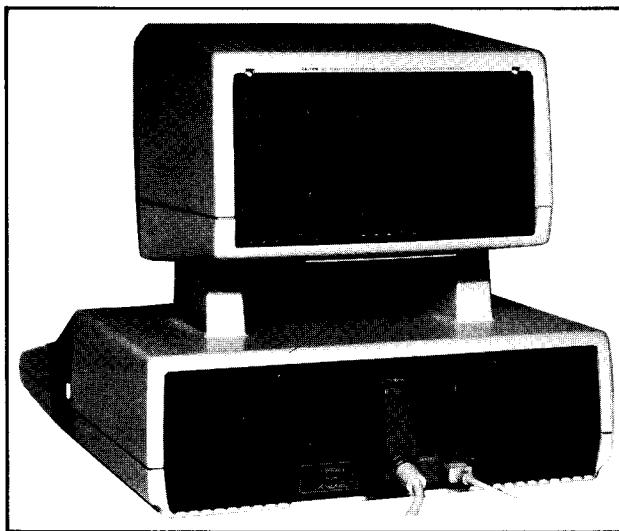
Removing a ROM

To remove a ROM -

- Turn off power to the computer.
- Slide out and open the proper drawer.
- Grasp the ROM and gently pull straight up.
- Close the cover and slide the drawer in.

5 Connecting Interfaces

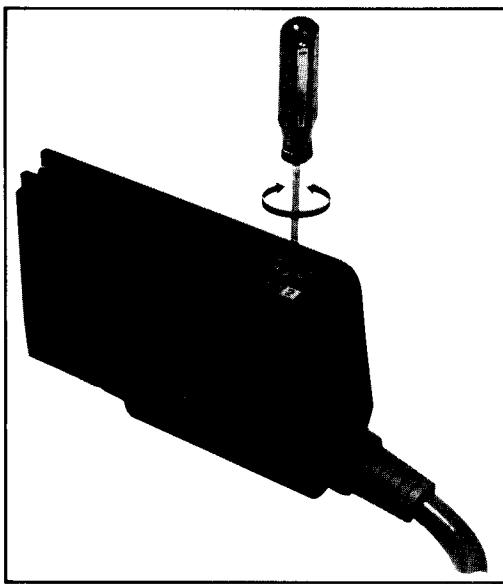
Peripheral devices are connected to the 9845B computer by means of an interface. An interface can be inserted into any of the four I/O slots in the back of the computer as shown in the picture below. The I/O slots each have a "door" in them when you receive your computer. You must remove the door before inserting an interface into a slot. To do this, lift up on the door, then pull out the lower end. When an interface is removed, install a door back into the slot. This can be done by placing the tab on the door into the top of the slot and pushing the door into place.



Before connecting an interface, make sure that the computer and peripheral are switched off. Then insert the interface into any of the I/O slots.

Select Codes

The select code is set on the interface. To change the select code, use a small screwdriver to rotate the switch which is accessible through the top of the interface rear housing. Do not set more than one interface to the same select code.



The following select codes are permanently reserved by the system and can't be set on an interface -

- 0 – Internal thermal printer and keyboard
- 13 – Graphics Option
- 14 – Optional tape cartridge drive
- 15 – Standard tape cartridge drive
- 16 – CRT

CAUTION

ALWAYS SWITCH OFF THE COMPUTER WHEN INSERTING OR REMOVING ROMS AND INTERFACES. FAILURE TO DO SO COULD DAMAGE EQUIPMENT.

6 Turn On

Once your computer is set up properly, it is ready to turn on.

Before you "throw the switch", here are some things to check-

- Is the proper fuse installed?
- Is the proper voltage set?
- Are the desired option ROMs installed?
- Are the desired interfaces connected?

Next connect the power cord to the power input connector on the back of the machine. Plug the other end of the cord into the ac power outlet.

Now that your system is set up, set the power switch on the righthand side of the machine to the "1" position to turn it on.

What Should Happen

When the power is switched on, the computer beeps and begins its self-test. During the self-test, the computer tests every location in the Read/Write memory. While the self-test is in progress, this message -

MEMORY TEST IN PROGRESS

is displayed. The complete self-test should take less than thirty seconds. When the key is successfully completed, the computer is ready for use when -

9845B READY FOR USE.

is displayed.

If the computer does detect a bad memory location during the self-test, it attempts to complete the self-test by ignoring the block of memory which contains the bad location. If this is successful, you can use computer when -

PART OF MEMORY FAILED SELF-TEST!

is displayed. You can still use the System 45B for programs which aren't large enough to need the entire memory. You can determine the severity of the memory failure by executing -

LIST

and comparing the amount of available memory shown with the amount of memory that should be present. Call your Sales and Service Office for assistance. If your 9845B has the internal printer (and if there is paper in it), one or more lines are printed if the self-test fails. Save this information; it will help the Customer Engineer isolate the memory failure.

If the self-test fails and the computer cannot meet its minimum Read/Write memory requirements, it beeps repeatedly (about once per second) and no message appears in the display. Call your Sales and Service Office for assistance.

If no message appears during the self-test and the computer begins to beep rapidly, check to see if the CRT is properly connected. Be sure to turn the power off before connecting the CRT.

Auto Start

If the Auto-Start key is latched and a tape cartridge with a file named "AUTOST" on it is present in the standard tape drive at power on, the computer automatically performs the following operation -

LOAD "AUTOST", 1

after the self-test is completed. See the System 45B Operating and Programming Manual for more explanation of auto start.

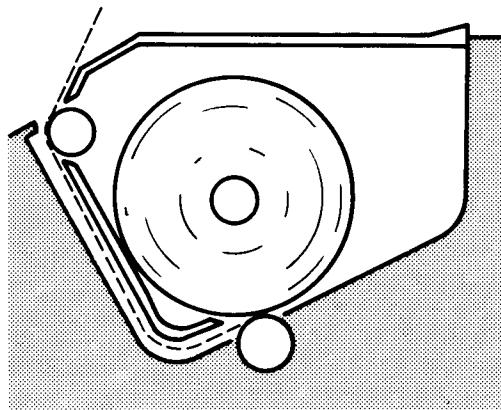
7 Testing the System

If you wish to test your machine, or if there is any doubt that it is operating correctly, refer to the System 45B System Exerciser Manual for test procedures.

8 Loading Printer Paper

Printer paper is loaded by using the following procedure. To perform the following steps, the computer must be switched ON.

1. Lift or remove the access cover on the top of the printer by pushing down on the raised surface at the rear of the door. The door can be removed by lifting up and pulling it toward you. It is reinstalled by placing it on the hinge pins and pushing until it snaps into place.
2. Remove and discard the paper core of any previous roll. If the remaining roll is small and a new roll is to be used, remove the old roll by:
 - a. Unrolling and lifting it upwards until the roll is above the printer; then,
 - b. Holding the roll firmly and pulling it upward and forward; the paper guide will tear the paper off.
3. If any paper remains in the printer mechanism, remove it by pressing the PAPER ADVANCE key until the paper stops moving.
4. Remove the first layer of paper from a new roll. Be sure the paper has a cleanly torn or cut edge, as paper with a ragged edge may not load properly. The corners can be folded back to form a point for easier loading.
5. Insert the new roll such that the free end is positioned as shown. Press the PAPER ADVANCE key until paper appears at the front of the printer, then close the access door.



The Tape Cartridge

Introduction

The internal tape cartridge drives allow high density, high quality tape cartridges to be used for up to 217K bytes of data and program storage per cartridge. This chapter covers specifications and care of the tape cartridge and drives.

For heavy usage of mass storage files, such as nonconsecutive file sorts or data base management applications, flexible disks or hard discs are recommended for optimum performance and reliability.

Inserting and Removing the Tape Cartridge

Insert the tape cartridge so that its label is up and the open edge is toward the computer, as shown. Both the drive window and the door beneath it open when a cartridge presses on the lower door; the cartridge can then be inserted.



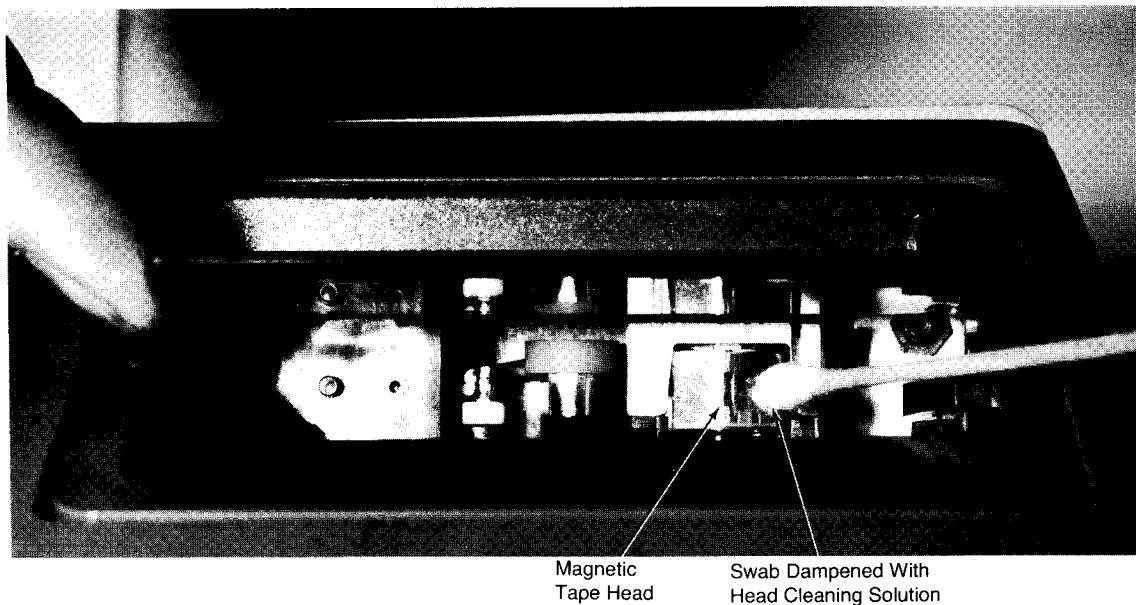
To remove the tape cartridge, press the eject bar. If it is pulled out without pressing the eject bar, another cartridge cannot be inserted until the eject bar is pressed. Do not remove the tape or execute reset while it is moving at low speed; damage to the tape may result.

Chapter 3

Tape Care

A dirty tape drive is the greatest cause of cartridge-related errors. Several basic precautions can greatly reduce such problems

- Clean the tape head of the tape drive at least as often as every eight hours of tape use, or more frequently in dirty environments. Use a cotton applicator dampened with magnetic head cleaner (HP P/N 8500-1251) to wipe the tape head a few times. Be sure the head is dry before inserting a cartridge in the drive. It is a good idea to clean the head before making an important recording.
- Rewind the tape before removing it. This also makes the directory easily accessible for the next use.
- Keep the cartridge in the plastic container supplied with it.
- Never eject the tape cartridge while it is moving. Damage to information can be severe if a write or directory operation is in progress.



Cleaning the Tape Head

Other factors can affect the reliability of the tape cartridge. Strong magnetic fields can erase programs and data stored on the tape. Keeping the cartridge in a metal box, such as a card index, protects it. Physical damage to the tape, such as a wrinkle or fold, can cause recording and loading problems.

NOTE

A back-up copy of vital programs or data should be maintained on a separate tape cartridge.

Tape Life

The tape cartridge has a typical life span of 50 to 100 hours. Environmental conditions of 25° C (77° F) and 20-50% relative humidity are most favorable for long tape life. A high duty cycle (percent of time the tape is accessed during the total time the computer is in use), high turning resistance and continuous use for long periods of time (greater than 1/2 hour) all decrease tape life.

30 The Tape Cartridge

Peripherals, Interfaces, ROMs and Manuals

Introduction

Many HP peripherals are available for use with the System 45B. This chapter describes what ROMs and interfaces you need to use with them. General programming information for all peripherals can be found in the System 45B Operating and Programming Manual, HP P/N 09845-91000. This chapter covers the manuals that go with the various peripherals, interfaces and ROMs.

Peripheral Hardware Requirements

Peripheral	Interface	ROM(s) Required	ROM for Extended Control
9866A/B Thermal Printer	98032A Opt. 466	none	I/O
9871A Impact Printer	98032A Opt. 471	none	I/O
9871A Impact Printer Option 001	98034A	none	I/O
9876A Thermal Printer	98034A	none	
2608A Line Printer	98034A	none	I/O
2631A/G Line Printer	98034A	none	Graphics (2631G only)
7245A Plotter/Printer	98034A	Graphics	
9872A Plotter	98034A	Graphics	I/O
9874A Digitizer	98034A	I/O	
9884A Tape Punch	98032A Opt. 484	none	I/O
9883A Paper Tape Reader	98032A Opt. 483	I/O	
9869A Card Reader	98032A Opt. 469	I/O	
9875A Cartridge Tape Unit	98034A	I/O	
9878A I/O Expander	Included	none	
9885 Flexible Disk Drive	98032A Opt. 485	Mass Storage	
7900-series Hard Disc Drives	98041A	Mass Storage	

Chapter 4

Option ROM Manuals

These manuals are supplied with option ROMs. Each manual is also available separately.

Mass Storage Techniques	09845-91070
I/O ROM Programming	09845-91060
Graphics ROM Programming	09845-91050
Advanced Programming ROM Manual	09845-91065

Peripheral Manuals

Printers

HP 9866A/B Thermal Printer	
9866A/B Printer Peripheral Manual	09866-90001
HP 9871A Impact Printer	
9871A Installation Manual	09871-90035
9871A Operating Manual for HP-IB	09871-90001
HP 9876A Thermal Printer	
9876A Peripheral Manual	09876-90000
HP 2608A Line Printer	
2608A Line Printer Operator's Manual	02608-90901
2608A Line Printer Condensed Operator's Manual	02608-90902
2608A Line Printer Technical Reference	02608-90903
HP 2631A Line Printer	
2631A Operator's Manual	02631-90901
2631A Printer Programming Manual	02631-90903
HP 2631G Line Printer	
2631G Operator's Manual	02631-90909
2631G Technical Reference	02631-90911
HP 7245A Plotter/Printer	
7245A Plotter/Printer Operating and Programming Manual	07245-90001

Plotter

HP 9872A Plotter

9872A Graphics Plotter Operating and Service Manual	09872-90000
Graphics ROM Programming	09845-91050

Digitizer

HP 9874A Digitizer

9874A Digitizer Installation and Service Manual	09874-90000
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Paper Tape

HP 9884A Tape Punch

9884A Tape Punch Operating and Service Manual	09884-90000
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HP 9883A High Speed Paper Tape Reader

9883A Operating and Service Manual	02748-90032
9883A Operating and Programming Manual	09883-90001

Card Reader

HP 9869A Card Reader

9869A Card Reader Operating and Service Manual	09869-90002
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Cartridge Tape Unit

HP 9875A Cartridge Tape Unit

9875A Installation and Operation Manual	09875-90000
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I/O Expander

HP 9878A I/O Expander

9878A I/O Expander Installation and Service Manual	09878-90000
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Disc Drives

HP 9885 Flexible Disk Drive

9885 Flexible Disk Drive Installation Manual	09885-90010
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HP 7906A Disc Drive

7906A Disc Drive User's Manual	07906-90901
7906A Disc Drive Installation Manual	07906-90902

34 Peripherals, Interfaces, ROMS and Manuals

HP 7920A Disc Drive

7920A Disc Drive Operating and Service Manual 07920-90001

HP 7925A Disc Drive

7925A Disc Drive User's Manual 07925-90901

7925A Disc Drive Installation Manual 07925-90902

Interface Manuals

Interfaces are necessary for the System 45B to communicate with peripherals. Refer also to the section on Hardware Requirements.

98032A 16-Bit Interface

98032A 16-Bit Interface Installation and Service Manual 98032-90000

98033A BCD Interface

98033A BCD Interface Installation and Service Manual 98033-90000

98034A HP-IB Interface (IEEE-488)

98034A HP-IB Interface Installation and Service Manual 98034-90000

98035A Real Time Clock Interface

98035A Real Time Clock Installation and Service Manual 98035-90000

98036A Serial I/O Interface

98036A Serial I/O Interface Installation and Service Manual 98036-90000

98040A Incremental Plotter Interface

98040A Incremental Plotter Interface
Installation and Service Manual 98040-90000

98041A Disc Interface

98041A Disc Interface Installation Manual 98041-90000

Accessories

Prerecorded Programs

Software Packs containing programs for solving problems from many disciplines are available for the System 45B. Disciplines include Structures, Statistics, Management Science, Numerical Analysis, Payroll and Forecasting. A Utility Library having a collection of commonly used programs and subprograms is supplied with System 45. For a complete list of prerecorded software programs and for pricing information, contact an HP Sales and Service Office; addresses are provided in the back of this manual.

Keyboard Magazine

Keyboard is a magazine containing general information about HP desktop computers and related equipment. It includes articles and programs written by desktop computer users, descriptions of the latest equipment and prerecorded programs, programming tips, and many other items of general interest to desktop computer users.

To receive your free subscription to Keyboard, complete and mail the order form supplied with the computer.

BASIC Users' Club

The BASIC Users' Club is especially for System 45B users. It maintains a library of BASIC language programs contributed by users — you can submit as many programs as you like, and for each program you contribute, you can choose three others from the library. A catalog contains descriptions of all programs the club offers.

Chapter 5

Maintenance

Introduction

This chapter covers cleaning and servicing of your 9845B Desktop Computer.

Cleaning

The 9845B can be cleaned with a soft cloth dampened either in clean water or in water containing a mild detergent. Do not use an excessively wet cloth or allow water to penetrate the computer. Do not use any abrasive cleaners, especially on the CRT screen or tape cartridge window.

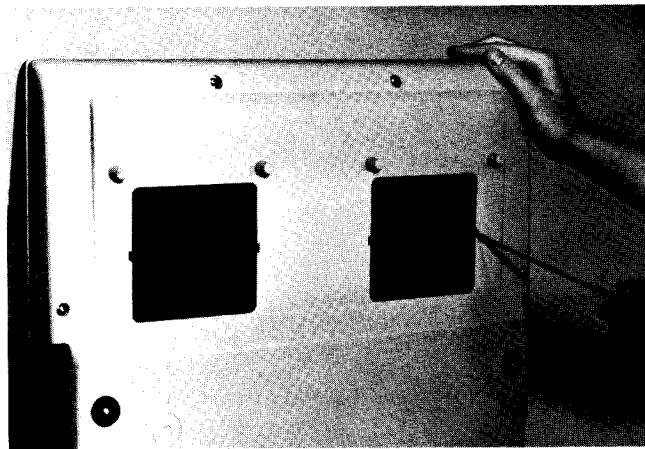
The tape head should be cleaned after a maximum of eight hours of use; for more information on cleaning the tape head, see Chapter 3.

Chapter 6

Cleaning The Air Filters

There are two air intakes which are located under the keyboard in the bottom surface of the computer. These must be inspected periodically (every three months, approximately) and cleaned if found to be dirty.

The easiest way to inspect the filters is to turn the computer off, then slide it forward on the table until you can see the filters. If this degree of access is inadequate for removing the filters for cleaning, the computer can be lifted up onto its rear panels for better access, as shown below. Be sure to turn the power off and disconnect any cabling before taking this step.



The filters can then be removed by inserting a key or screwdriver into one of the slots on either side of each filter and prying them out. Clean the filters thoroughly either by holding them under running water or by washing them in warm soapy water and then rinsing them in clear water. Dry the filters thoroughly before snapping them back into place.

Service

WARNING

LETHAL VOLTAGES ARE PRESENT INSIDE THE 9845B.
THERE ARE NO CUSTOMER SERVICEABLE PARTS IN-
SIDE THE 9845B.

Maintenance Agreements

When you buy a Hewlett-Packard desktop computer, service is an important factor. If you are to get maximum use from your machine, it must be in good working order. An HP Maintenance Agreement is the best way to keep your computer in optimum running condition.

Consider these important advantages —

- **Fixed Cost** — The cost is the same regardless of the number of calls, so it is a figure that you can budget.
- **Priority Service** — Your Maintenance Agreement assures that you receive priority treatment, within an agreed-upon response time.
- **On-Site Service** — There is no need to package your equipment and return it to HP. Fast and efficient repair at your location saves you both time and money.
- **A Complete Package** — A single charge covers labor, parts, and transportation.
- **Regular Maintenance** — Periodic visits are included, per factory recommendations, to keep your equipment in optimum operating condition.
- **Individualized Agreement** — Each Maintenance Agreement is tailored to support your equipment configuration and your requirements.

After considering these advantages, we are sure you will see that a Maintenance Agreement is an important and cost-effective investment.

For more information, please contact your local HP Sales and Service Office.



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In order to write this manual, we made certain assumptions about your computer background. By completing and returning the comments card on the following page you can assist us in adjusting our assumptions and improving our manuals.

Feel free to mark more than one reply to a question and to make any additional comments.

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