

9134A and 9135A

 HEWLETT
PACKARD

Disc Memory User's Manual





Warranty Statement

Hewlett-Packard products are warranted against defects in materials and workmanship. For Hewlett-Packard Desktop Computer Division products sold in the U.S.A. and Canada, this warranty applies for ninety (90) days from date of delivery. * Hewlett-Packard will, at its option, repair or replace equipment which proves to be defective during the warranty period.

Within HP service travel areas, warranty service for products installed by HP and certain other products designated by HP will be performed at Buyer's facility at no charge. Outside HP service travel areas, warranty service will be performed at Buyer's facility only upon HP's prior agreement and Buyer shall pay HP's round trip travel expenses. In all other cases, products must be returned to a service facility designated by HP.

Buyer shall prepay shipping charges for products returned to HP for warranty service and HP shall pay for return of the products to Buyer. However, Buyer shall pay all shipping charges, duties and taxes for products returned to HP from another country.

Repairs necessitated by misused of the equipment, or by hardware, software, or interfacing not provided by Hewlett-Packard are not covered by this warranty.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HEWLETT-PACKARD SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES.

*For other countries, contact your local Sales and Service Office to determine warranty terms.

Federal Communications Commission Radio Frequency Interference Statement USA Only

The Federal Communications Commission (in Subpart J of Part 15, Docket 20780) has specified that the following notice be brought to the attention of the users of this product.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

9134A and 9135A
Disc Memory User's Manual

Hewlett-Packard Greeley Division
3404 East Harmony Road, Fort Collins, Colorado 80525
(For Worldwide Sales and Service Offices see back of manual.)
Copyright by Hewlett-Packard Company, 1982



Table of Contents

Chapter 1: Introduction	
General Description	3
Technical Specifications	4
Equipment Supplied	5
Cleaning the Case	5
Maintenance	6
Service	6
Warranty	6
Flexible Disc Usage and Handling (HP 9135A only)	6
Flexible Disc Media	6
Operating cleanliness	7
Handling Flexible Disc Media	8
Flexible Disc Drive Head Cleaning Kit	10
 Chapter 2: Installation	
Unpacking Your HP 9134A and HP 9135A Disc Memories	11
Setting the Line Voltage Select Switches	11
Fuses	12
Power Cords	12
Selecting the Device Address	13
The HP-IB Interface	14
HP-IB Interface Restrictions	14
 Chapter 3: System Operation	
Introduction	15
Controls and Indicators	15
Loading of the Flexible Disc (HP 9135A only)	16
Write Protection	16
Flexible Disc Structure	17
Winchester Disc Structure	18
Power Up	19
Basic System Operation	19
Series 80 System with the HP 9134A or HP 9135A	19
System 125	21
HP 9835A/9835B Systems with the HP 9134A	23
HP 9845B/9845C Systems with the HP 9134A	25
HP 9826/9836 Systems with the HP 9134A or HP 9135A	26
HP 1000 Model 5/9/10 RTE-XL Systems with the HP 9134A	27

Figures

1-1	HP 9134A Disc Memory.....	3
1-2	HP 9135A Disc Memory.....	3
1-3	Head/Media Critical Requirements.....	7
1-4	Defective Disc.....	10
2-1	Line Voltage Select Switches.....	11
2-2	Available Power Cords.....	12
2-3	Device Address Switch Setting.....	13
2-4	HP-IB Interface Cables.....	14
3-1	Front and Rear Panels.....	15
3-2	Disc Loading.....	16
3-3	Write Protection.....	17
3-4	Flexible Disc Structure.....	17
3-5	Winchester Disc Structure.....	18
	List of HP Sales and Support Offices.....	32

Chapter 1

Introduction

General Description

The HP 9134A and HP 9135A Disc Memories (Figures 1-1 and 1-2) are random access data storage devices. The HP 9134A contains a 5¼" Winchester disc drive providing 4.6 Mbytes of storage capacity. The HP 9135A contains both the 5¼" Winchester disc drive and a 5¼" flexible disc drive providing a total storage capacity of 4.886 Mbytes.

The Winchester drive in both the HP 9134A and HP 9135A has been designed to emulate an HP 9895A 8" flexible disc drive master with three slaves. Thus, most HP computers that support the 9895A flexible disc drive can operate the Winchester drive in either the HP 9134A or HP 9135A. Only computers that support the HP 9895A and HP 82900 disc drives can fully operate both disc drives in the HP 9135A.

Refer to the Mass Storage Manual for your computer for programming information for either the HP 9895A (used for the Winchester drive), or HP 82900 5¼" flexible disc drive (used for the flexible disc drive in the HP 9135A).

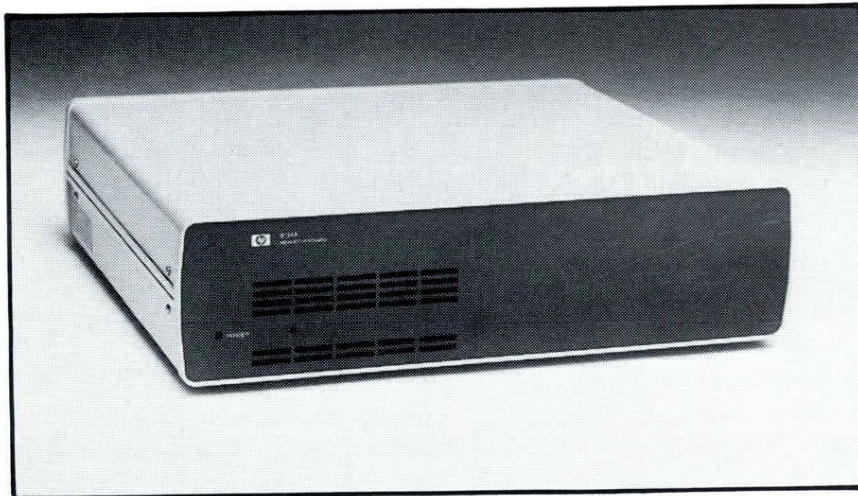


Figure 1-1. HP 9134A Disc Memory

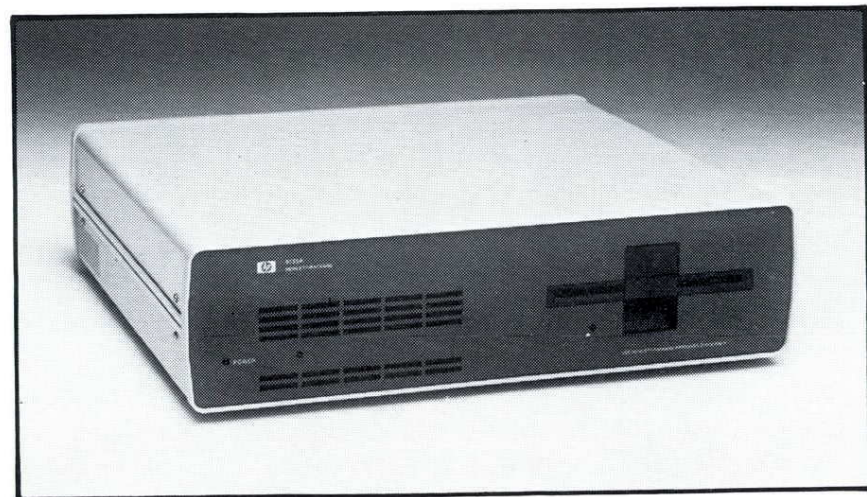


Figure 1-2. HP 9135A Disc Memory

Technical Specifications

Listed below are the electrical and physical specifications for the HP 9134A and HP 9135A disc memories.

	HP 9134A	HP 9135A
Number of drives	5¼" Winchester (1)	5¼" Winchester (1) 5¼" Flexible Disc (1)
Net Weight	13.4 kg (29.5 lbs)	15.5 kg (44.1 lbs)
Height	130 mm (5.125 in)	130 mm (5.125 in)
Depth	476 mm (18.7 in)	476 mm (18.7 in)
Width	425 mm (17 in)	425 mm (17 in)
Formatted Storage Capacities:	4.6 Mbytes (Winchester)	4.6 Mbytes (Winchester) 270 Kbytes removable
Interface	HP-IB	HP-IB
Average Access Time	60 ms (Winchester)	60 ms (Winchester) 187 ms (Flexible Disc)
Maximum Access Time	173 ms (Winchester)	173 ms (Winchester) 290 ms (Flex Disc-500 ms (including motor start-up))
Data Transfer Rates:		
HP Format:		
Burst	250 Kbytes/sec	250 Kbytes/sec Winchester 12 Kbytes/sec Flexible Disc
Sustained Average	46 Kbytes/sec	46 Kbytes/sec Winchester 6.8 Kbytes/sec Flexible Disc
System	System Dependent	System Dependent
Rotational Speed	3600 RPM ± 1%	3600 RPM ± 1% Winchester 300 RPM ± 1.5% Flexible Disc
Power Source	140 Watts	140 Watts
Requirements Line Frequency	48Hz to 66Hz	48Hz to 66Hz
Environmental Specs:		
Operating Temperature	10° to 40° C (50° to 104° F)	10° to 40° C (50° to 104° F)
Operating Humidity	8% to 80%	20% to 80%
Max. Wet Bulb	78% non-condensing	78% non-condensing
Storage Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Operating Altitude	-300 to 15,240m (-1000 ft to 50,000 ft)	-300 to 15,240m (-1000 to 50,000 ft)
Storage Temperature	-40° to 60° C (-40° to 140° F)	-40° to 60° C (-40° to 140° F)
Storage Altitude	-300 to 15,200m (-1000 to 50,000 ft)	-300 to 15,200m (-1000 to 50,000 ft)

NOTE

The flexible disc in the HP 9135A Disc Memory is designed for operation in a typical office environment. Use of the equipment in an environment containing corrosive substances will cause the flexible disc drive and media life to be drastically reduced.

Equipment Supplied

The following equipment is supplied with each HP 9134A or HP 9135A disc memory:

Description	Quantity		HP Part Number
Power Cable			Dependent on location (see Chapter 2)
User's Manual	1		09135-90000
Fuse	1	100 & 120Vac 2.5 Amp	2110-0083
	1	220 & 240Vac 1.5 Amp	2110-0043
Flexible Disc Media (with HP 9135A only)	1		9164-0128

Cleaning the Case

Before cleaning your HP 9134A or HP 9135A case, the ~AC line switch should be turned off and the power cord removed. The case can be cleaned with a lint free clean cloth dampened in clean clear water or water containing a very mild detergent. You should not use detergents that contain ammonias, benzines, chlorides, or abrasives. Do not use an excessively wet cloth or allow the cleaning solution to get inside the case. A non-abrasive eraser may be used to remove pen and pencil marks. After cleaning with a detergent, always wipe the case with a clean lint free cloth slightly dampened in clean water.

Maintenance

The HP 9134A/9135A Disc Drives do not require regular maintenance. However, the performance and life of the flexible disc heads and the flexible disc media depend directly on how carefully they are handled.

Be sure to follow the disc care and handling guidelines presented on the following pages and the Operating Environment restrictions presented above.

There are several other areas of caution that should concern you. They are as follows:

CAUTION

ALWAYS SET THE ~AC LINE SWITCHES TO "OFF" (0) FOR THE COMPUTER AND THE DISC DRIVES WHEN INSERTING OR REMOVING THE INTERFACE CABLES. USE ONLY CABLES DESIGNED BY HEWLETT-PACKARD SPECIFICALLY FOR THE HP 9134A/9135A DISC DRIVES. FAILURE TO DO SO COULD DAMAGE THE DISC DRIVE, OR THE CONTROLLING COMPUTER.

CAUTION

KEEP THE SIDES AND BACK OF THE DISC DRIVE FREE FROM OBSTRUCTIONS TO AVOID RESTRICTING THE AIR FLOW. FAILURE TO DO SO COULD CAUSE THE UNIT TO OVERHEAT AND RESULT IN DAMAGE TO THE UNIT.

Service

There are no operator serviceable parts within your HP 9134A or HP 9135A. If at any time you suspect that your disc memory is malfunctioning, call the HP sales office or dealer from which you purchased your disc memory.

Warranty

The complete warranty statement for the U.S. and Canada is included inside the front cover of this manual. For other countries, contact your local HP Sales Office or dealer from which you purchased your disc memory to determine warranty terms.

If you have questions concerning the warranty. Please contact an authorized dealer or the HP sales and service office (see the list in the back of this manual for the nearest office) where you purchased your disc drive.

Flexible Disc Usage and Handling (HP 9135A only)

Flexible Disc Media

The removable storage medium used in the HP 9135A is a flexible mylar disc coated with a thin layer of magnetic oxide. The disc is enclosed in a protective plastic jacket with a slot for head access to the recording surface. Both sides of the flexible disc are used for data storage.

Up to 270 Kbytes of data can be stored on each disc. Since some storage is used for a directory, the exact amount available for user storage depends upon the controller and the number of files stored. Refer to the appropriate mainframe mass storage programming or reference manual for details.

Each flexible disc must be initialized before it can be used for data storage. The initialization procedure marks each disc sector, checks for defective tracks, and may establish file directories. Refer to the mainframe programming or reference manual or Chapter 3 of this manual for the correct initialization procedure.

CAUTION

USE ONLY HP APPROVED MEDIA SINCE THE USE OF NON-HP APPROVED MEDIA CAN RESULT IN PREMATURE FLEXIBLE DISC MEDIA FAILURE OR DAMAGE TO THE HP 9135A. USING NON-HP APPROVED MEDIA FOR ONE TIME ONLY APPLICATIONS SUCH AS DATA INTERCHANGE WILL NOT DAMAGE THE DRIVE OR DESTROY THE MEDIA, BUT IF EXTENDED USAGE IS ANTICIPATED, THE DATA SHOULD BE TRANSFERRED TO MEDIA APPROVED FOR THE HP 9135A.

For your convenience, HP offers a package of ten 5¼" flexible discs for the HP 9135A (HP part number 92190A). Contact your dealer or nearest HP Sales office for instructions on how to order this package.

Operating Cleanliness (HP 9135A flexible disc drive only)

The critical elements involved in the read/write process are shown in Figure 1-3. The read/write heads must maintain contact with the disc during read and write operations. Also shown are various types of contaminants and their size relationships. A contaminant particle hard enough and of the right size may scratch the media oxide coating or the head surface. Even if not hard enough to scratch, it may be large enough to lift the head from the surface, causing data errors or damage to the media.

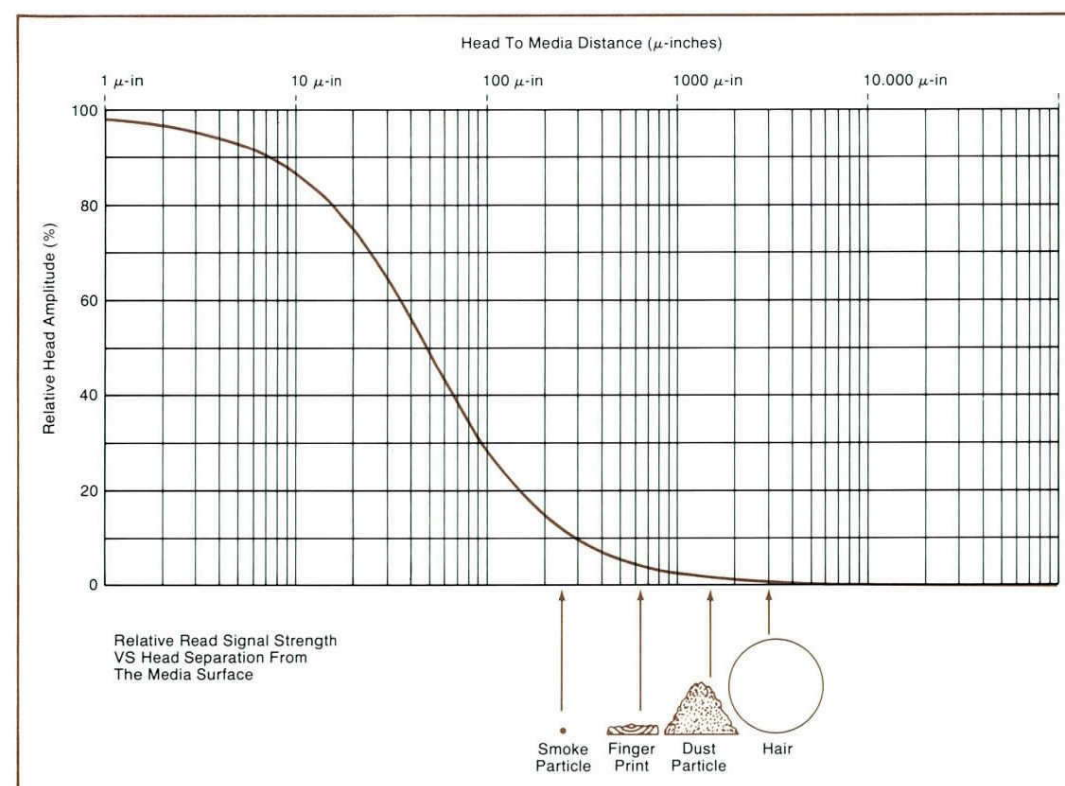


Figure 1-3. Head/Media Critical Requirements

Handling Flexible Disc Media

The flexible disc is basically maintenance free, but it is delicate and **MUST BE HANDLED CAREFULLY**. Remember, the disc contains your valuable data and programs, and should be treated accordingly. A good rule of thumb is to treat your disc as you would a valuable record album. Here are some specific Do's and Don'ts to avoid loss of data or damage to your discs.

EVEN A LITTLE CARELESSNESS IN DISC HANDLING CAN DRAMATICALLY REDUCE THE LIFE OF THE DISC.

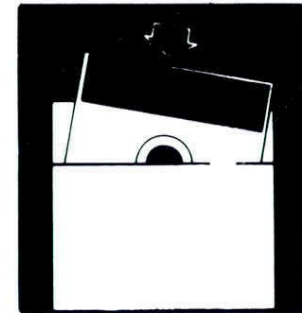
Do

Back Up Discs Frequently

There is always a chance of losing data when mass storage devices are accessed. There are many causes in any computer system—a programming bug, operator error, power failure, or hardware failure. In the case of flexible discs, another mode is possible—media failure from contamination or wearout. **YOUR ONLY PROTECTION AGAINST DATA LOSS IS FREQUENT BACKUP OF YOUR FILES.**

Return Disc to Storage Envelope When Not in Use

This is the single most important thing to remember about handling your disc because it prolongs disc life by protecting it from dust and scratches. Between uses, discs should be stored upright in a dust free container. The box in which the discs are shipped in, or a similar container, is a good choice.



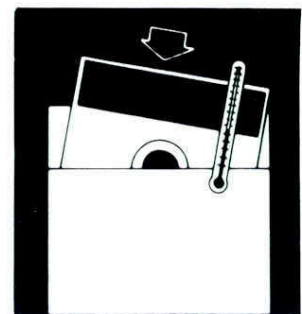
Operate Your System in a Clean Environment

Airborne contaminants and particles accidentally dropped onto the disc will cause your disc to wear out prematurely and may cause unreliable data storage and retrieval operations. Some of the most common contaminants are **DUST, SMOKE, ASHES, ERASER CRUMBS, and BREAD CRUMBS**. Chemical vapors may also cause premature wearout.



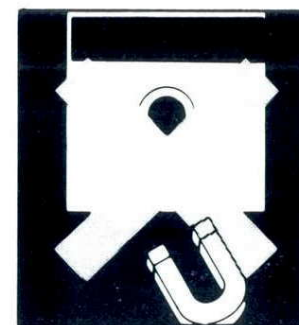
Maintain Proper Temperature and Humidity

The proper operating range is 10° C (50° F) to 40° C (104° F) and 20% to 80% relative humidity. While temperature is usually easy to control, it may be necessary to make special provisions to keep the humidity in the proper range. Although the disc will continue to operate outside the normal humidity range, it will wear out more quickly and will have a higher error rate.



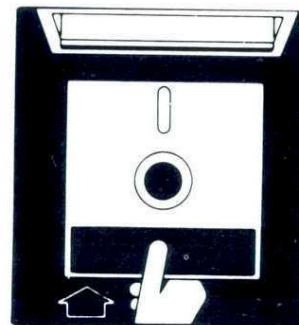
Avoid Magnetic Fields

The data is stored on the disc magnetically, and can be erased by an external magnetic field. Avoid placing a disc near power transformers, magnets or large disc memories.



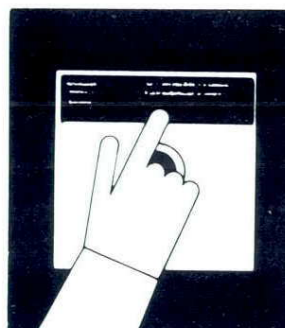
Remove Disc from Drive When Not In Use

Remove the disc completely from the drive when access is not needed for an extended period of time.



Use a Felt Tip Pen to Label Your Disc

Use a soft felt tip pen to label your disc, and be careful to write only in the label area. Avoid the exposed media while labeling the disc. If possible, write on the large labels provided BEFORE applying them to the disc.



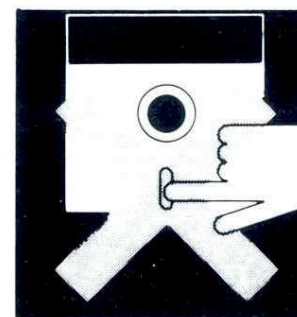
Replace Discs Frequently

Although discs are designed to provide several million revolutions of useful life, they will eventually wear out. The life of a disc is VERY dependent on how carefully it is handled and how much it is used. A disc used sparingly (less than 20 minutes a day) should last over a year. A disc that is used heavily (more than 2 hours a day) should not be expected to last more than 3 months. Discs should be replaced every three months for a heavily used disc or at least once a year, even for lightly used discs. If you ever see visible signs of abrasion on the disc, do an immediate backup and discard the worn disc.

Don't

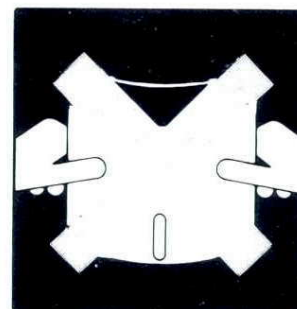
Do Not Touch the Surface of the Disc

The thickness of a fingerprint is enough to lift the head off the disc and cause errors. The oils in a fingerprint will also collect dust which can cause a disc to wear out sooner than it normally would.



Do Not Bend or Fold the Disc

The disc is flexible but will not operate if it is creased. Using ball point pens, rubber bands, paper clips, etc. can crease the disc.



Do Not Try to Clean a Disc

The inside surface of the disc jacket is covered with a special material that cleans the disc as it rotates. Any other method of cleaning may cause solvent damage to the media or scratch the disc, causing loss of data. If a disc becomes dirty or scratched, immediately transfer the data to a new disc and dispose of the old disc.

CAUTION

IF YOU EVER DESTROY MEDIA (IF IT LOOKS ANYTHING LIKE THE PHOTO BELOW, FIGURE 1-4) IN THE FLEXIBLE DISC DRIVE OF YOUR 9135A, STOP USING THE DRIVE UNTIL IT CAN BE SERVICED. THIS IS EXTREMELY IMPORTANT, AS CONTINUED USE OF THE DRIVE MAY DESTROY MORE MEDIA. IMMEDIATELY CLEAN THE HEADS ON YOUR FLEXIBLE DISC DRIVE OR CALL YOUR NEAREST HP SALES AND SERVICE OFFICE (SEE THE LIST IN THE BACK OF THIS MANUAL FOR THE NEAREST OFFICE.)



Figure 1-4. Defective Disc

Flexible Disc Drive Head Cleaning Kit

In the event that media is destroyed on your HP 9135A flexible disc drive, a head cleaning kit is available for removing any debris remaining on the flexible disc drive heads. Instructions for using the cleaning kit is supplied with the kit. The kit part number is 92193A.

Chapter 2

Installation

Unpacking Your HP 9134A and HP 9135A Disc Memories

Your disc memory was carefully inspected, both electrically and mechanically, before shipment. Remove the unit from the shipping carton and carefully inspect the unit for any physical damage that may have occurred during shipment. If you find any damage, you should immediately notify your dealer and file a claim with any carriers involved.

CAUTION

THE DISC MEMORY IS A PRECISION INSTRUMENT. MECHANICAL SHOCK CAN MISALIGN THE READ/WRITE HEADS, RESULTING IN READ ERRORS AND/OR DAMAGED DISCS WHETHER THE DISC IS OPERATING OR NOT.

If the disc memory is moved, be careful when picking it up and setting it down.

For shipping the HP 9135A, insert a drive protect card or scratch disc into the flexible disc drive and close the door to prevent the read/write heads from contacting each other.

Carefully repack the disc memory in a shipping carton before transporting it to another site.

NOTE

Evidence of excessive shock will void the warranty.

Please check to insure that you have received all of the standard equipment. If any items are incorrect or missing, please contact the dealer from whom you purchased the unit.

Setting the Line Voltage Select Switches

The voltage select switches on the rear panel must be set to the nominal line voltage for the area in which it is operating. Figure 2-1 shows the setting of the voltage select switches for the various line voltages.

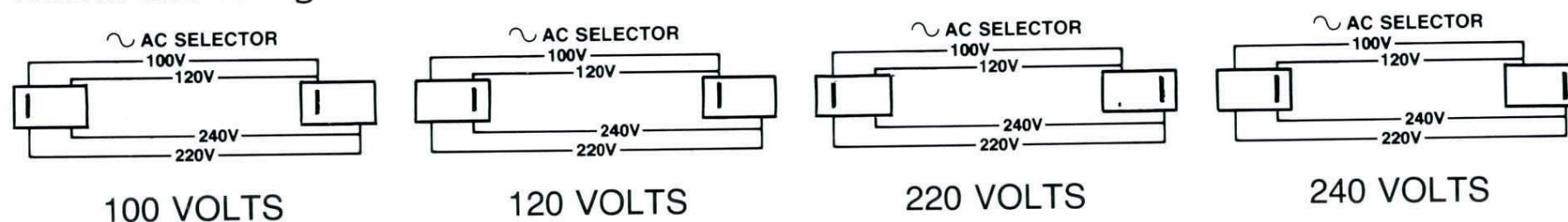


Figure 2-1. Line Voltage Select Switches

Fuses

A different fuse is required for each of the two voltage ranges of 110-220 and 220-240 Vac for both the HP 9134A and HP 9135A disc memories. Table 2-1 gives the correct fuse ratings and part numbers for both the HP 9134A and HP 9135A.

Table 2-1. Fuses

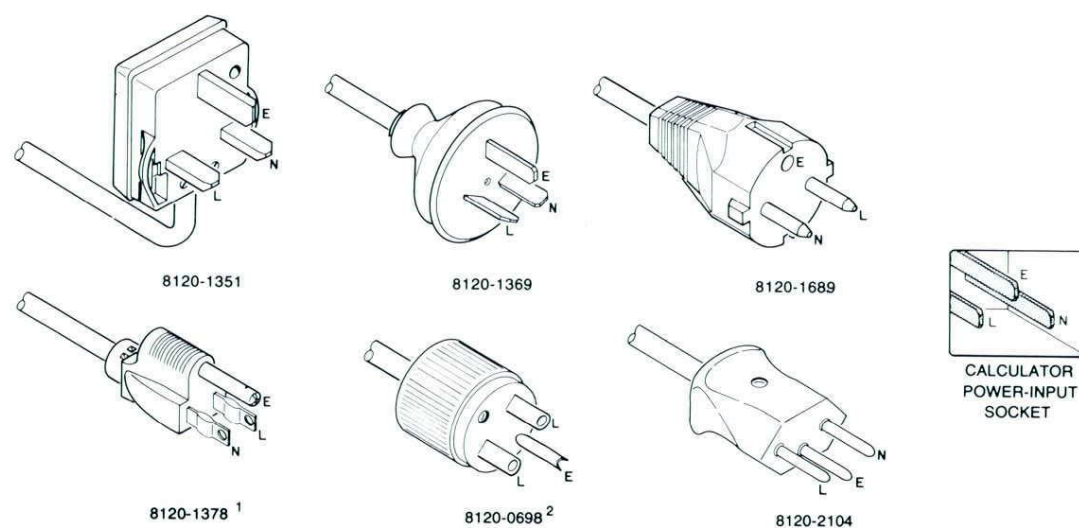
	Voltage Ranges	Fuse Rating	HP Part Number
HP 9134A	100 & 120Vac	2.5A 250 Vac-Normal Blow	2110-0083
HP 9134A	220 & 240Vac	1.5A 250 Vac-Normal Blow	2110-0043
HP 9135A	100 & 120Vac	2.5A 250 Vac-Normal Blow	2110-0083
HP 9135A	220 & 240Vac	1.5A 250 Vac-Normal Blow	2110-0043

WARNING

ALWAYS DISCONNECT THE DISC MEMORY FROM ~AC LINE BEFORE CHANGING FUSES.

Power Cords

Power cords supplied by HP have polarities matched to the power-input socket on the equipment (Figure 2-2).



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.

Figure 2-2. Available Power Cords

Power cords with different plugs are available for equipment; the part number of each cord is shown in Figure 2-2. Each plug has a ground connector. The cord packaged with the equipment depends upon where the equipment is to be delivered.

Selecting the Device Address

Each device in an HP-IB system must be set to a unique device address. The HP 9135A contains two separate devices (the flexible disc drive and the Winchester drive). See Figure 2-3 for switch locations.

Prior to setting the device address switches, turn the disc memory ~AC line switches OFF.

The switches can be set to any one of eight device addresses, ranging from decimal 0 through 7. Refer to Figure 2-3 to set these switches to the desired device address.

Switch Segments

Address	Switch Segments				
	1	2	3	4	
0	X	UP	UP	UP	(Factory setting for Winchester)
1	X	UP	UP	DOWN	(Factory setting for flexible disc)
2	X	UP	DOWN	UP	
3	X	UP	DOWN	DOWN	
4	X	DOWN	UP	UP	
5	X	DOWN	UP	DOWN	
6	X	DOWN	DOWN	UP	
7	X	DOWN	DOWN	DOWN	

(X = Don't Care)

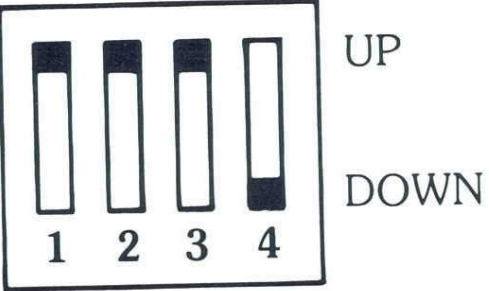
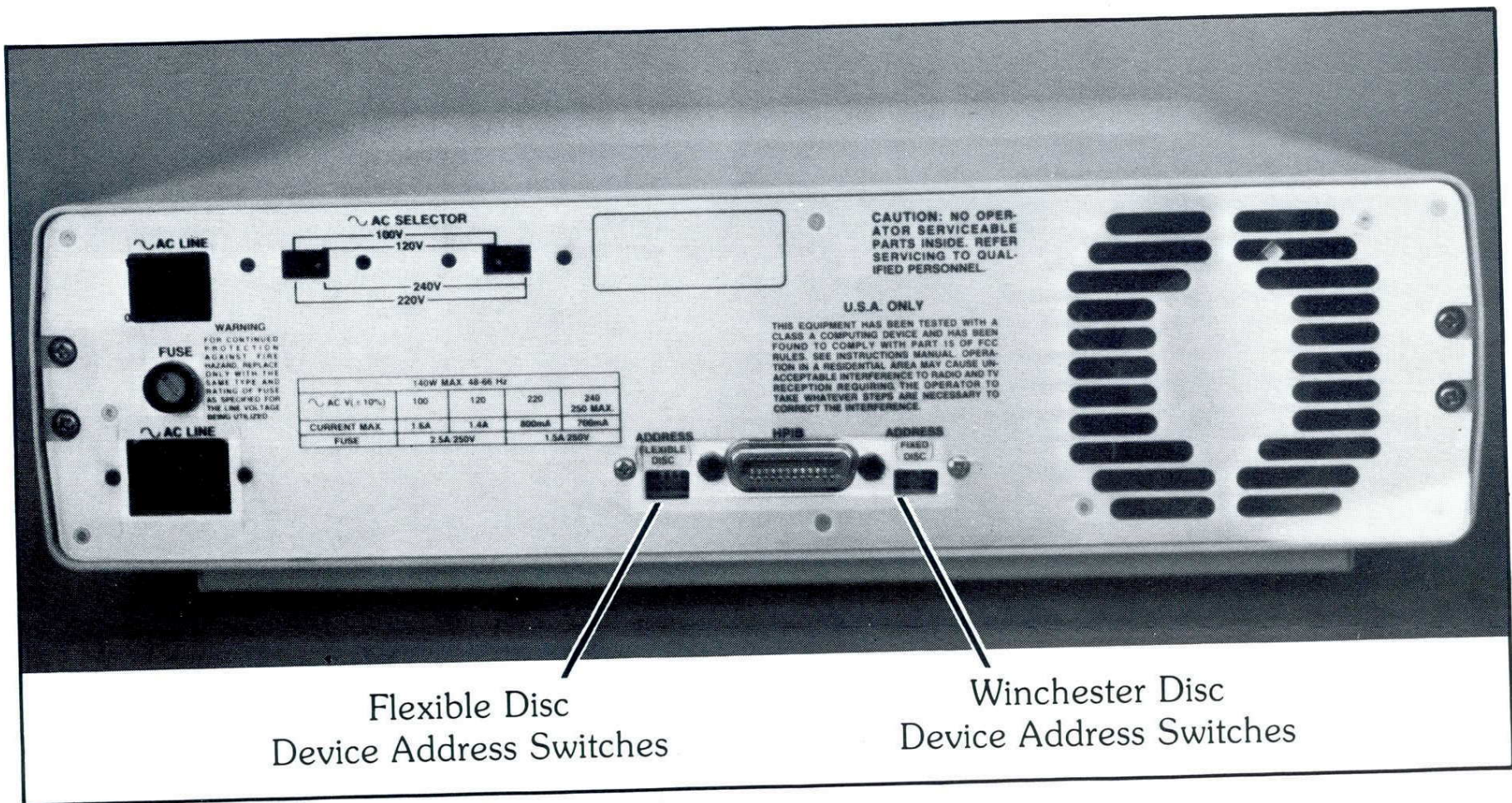



Figure 2-3. Device Address Switch Setting

The HP-IB Interface

The HP 9134A and HP 9135A are connected to the computer via the Hewlett Packard Interface Bus (HP-IB). Refer to the figure below for a list of the HP-IB interface cables used with HP computers.

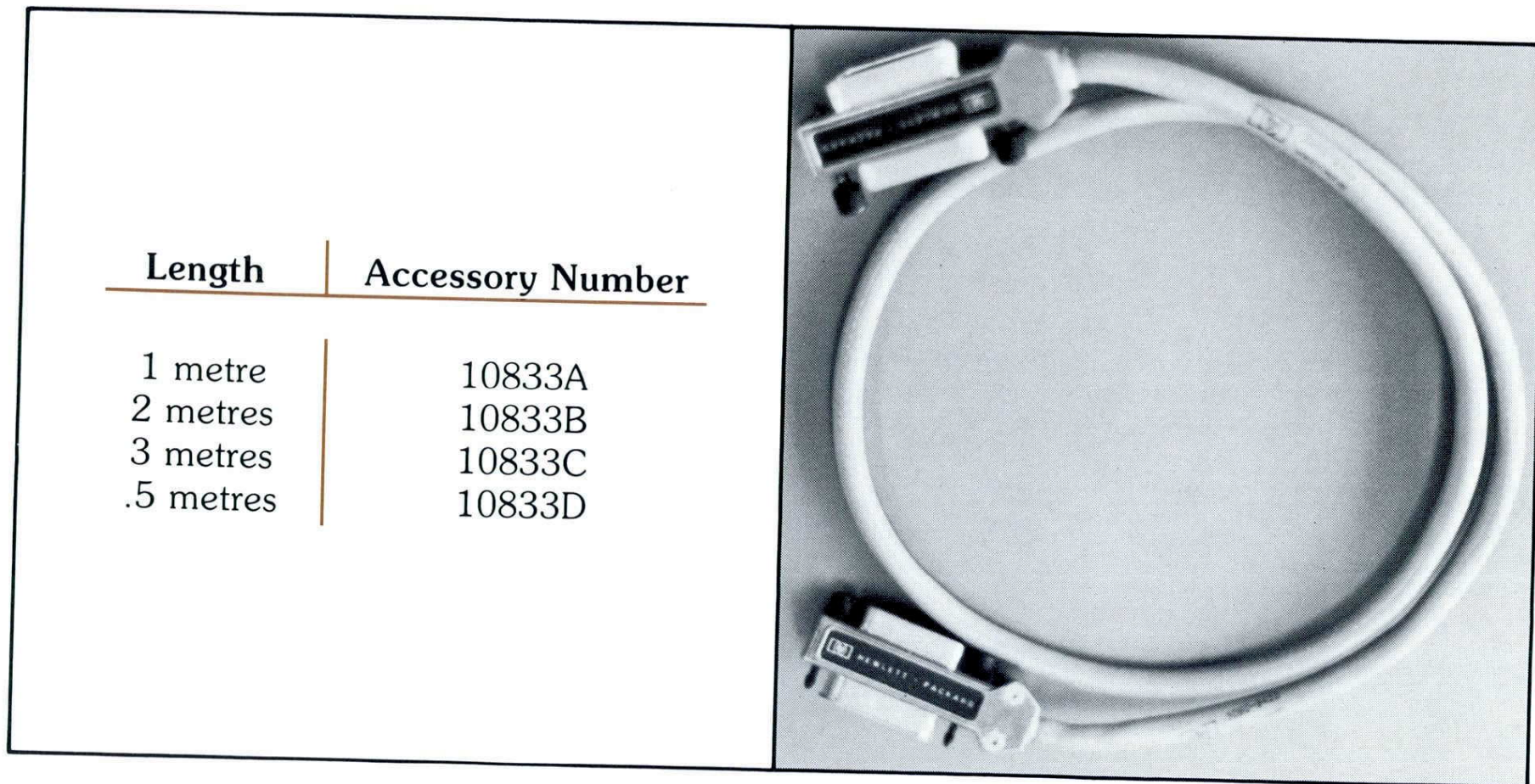


Figure 2-4. HP-IB Interface Cables

HP-IB Interface Restrictions:

1. All the ~AC line switches must be turned "OFF" when connecting (and disconnecting) devices to your system.
2. The total length of cable permitted in one bus system must be less than or equal to two metres times the number of devices connected together (the interface card is counted as one device).
3. The total length of the cable must not exceed 20 metres. For example, a system containing six devices can be connected together with cables that have a total length less than or equal to 12 metres (six devices x 2m/device = 12 metres). The individual lengths of cable can be distributed in any manner desired as long as the total length does not exceed the allowed maximum. If more than 10 devices are to be connected together, cables shorter than two metres must be used between some of the devices to keep the total cable length less than 20 metres.
4. The maximum number of devices that can be connected together in one bus system is 15.

There are no restrictions to the way cables may be connected together; however, it is recommended that no more than four piggyback connectors be stacked together on one device. The resulting structure could exert enough force on the connector mounting to damage it.

Chapter 3

System Operation

Introduction

This chapter offers a physical description, power-up procedure and brief description of basic system operations. Since each disc drive is completely controlled by the computer, refer to your computer documentation or mass storage documentation for complete information on how to program the disc drives.

Controls and Indicators

The indicators are located on the front panel. The indicators, as shown in Figure 3-1, are the power-on light, the Winchester disc drive access light, and flexible disc access light. The disc access lights are illuminated whenever the disc is accessed for data storage or retrieval.

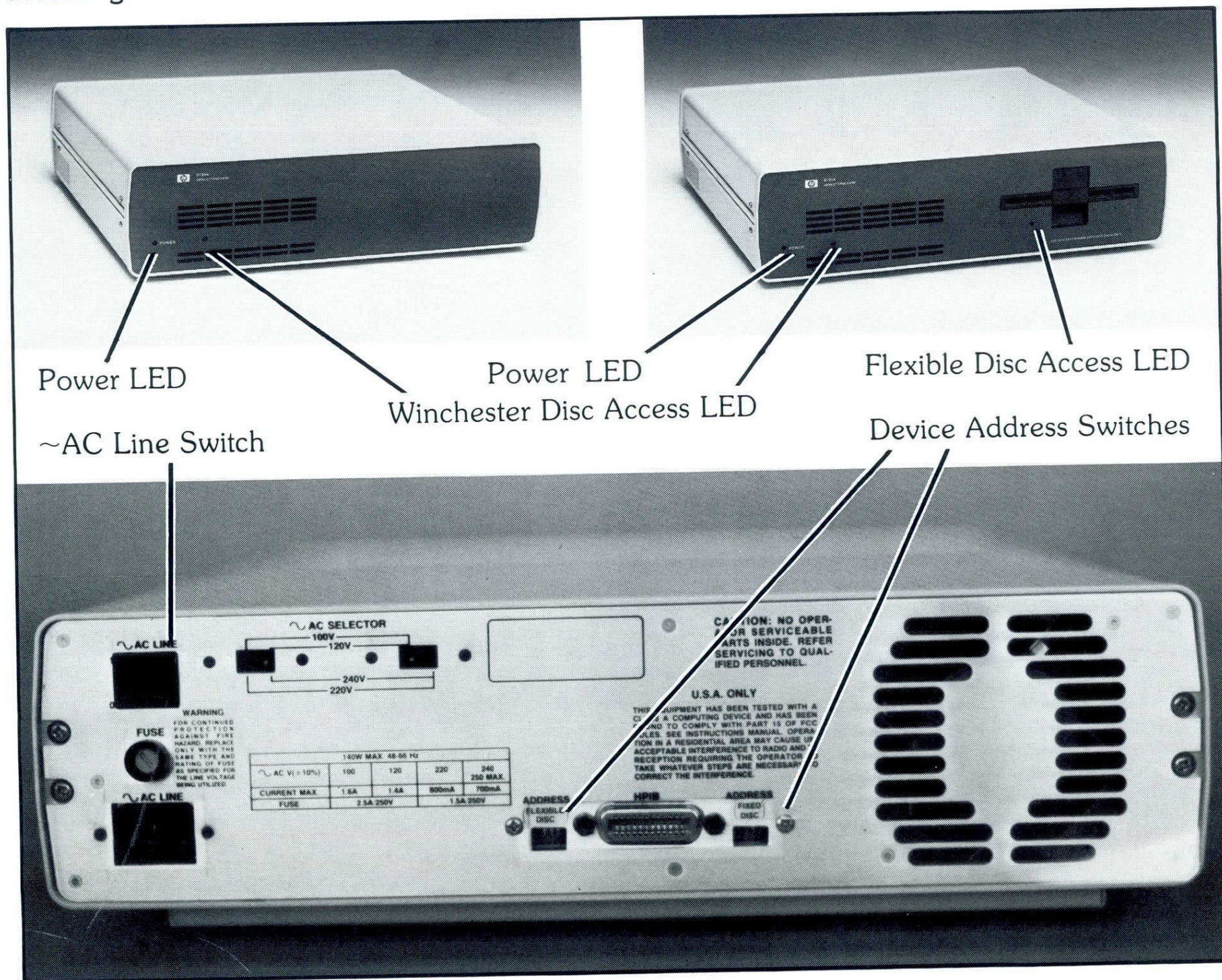


Figure 3-1. Front and Rear Panels

Loading of the Flexible Disc (HP 9135A only)

Refer to Figure 3-2 for proper loading of the flexible disc in the HP 9135A.

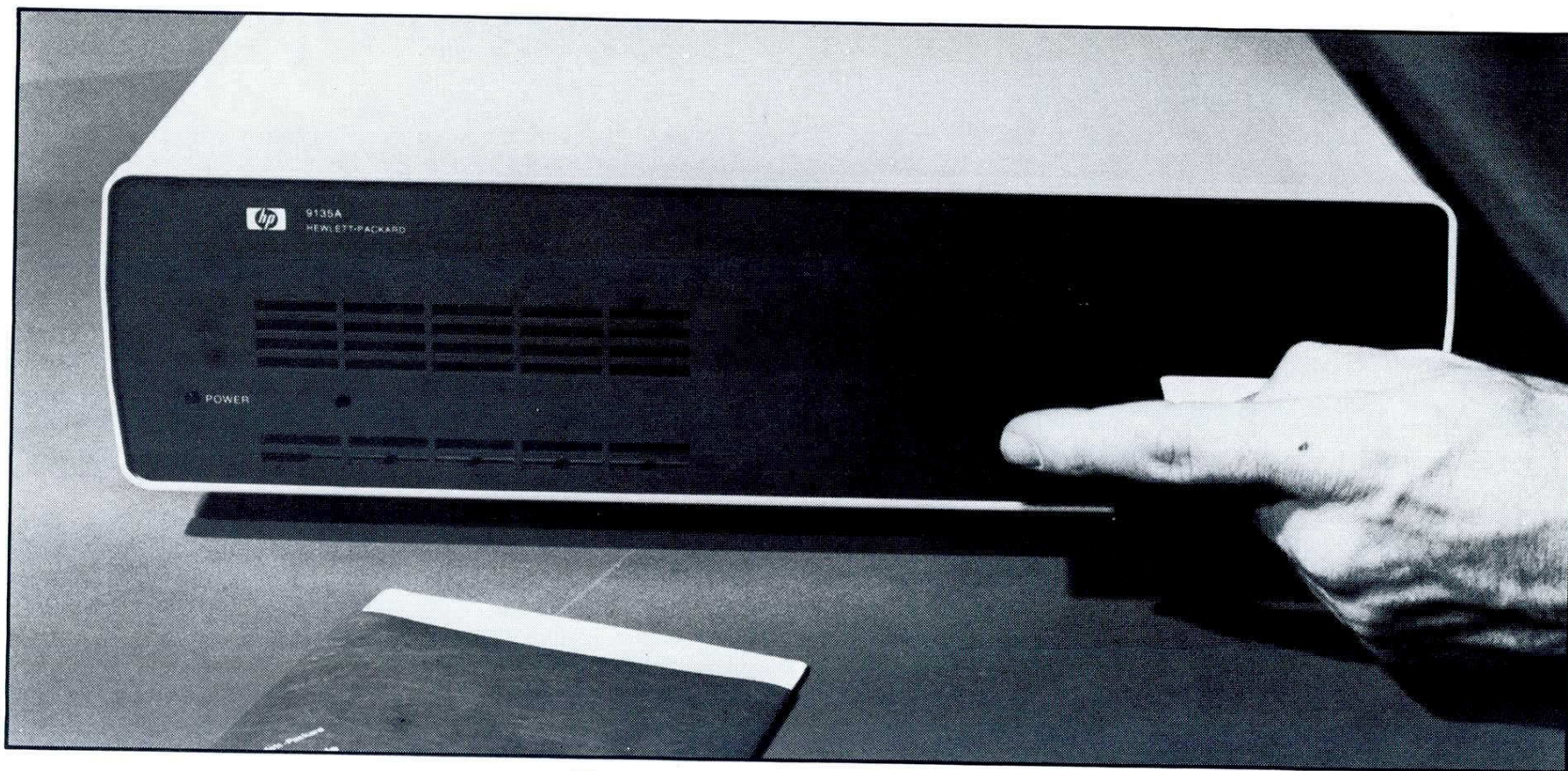


Figure 3-2. Disc Loading

To install and remove flexible discs, perform these steps.

1. Open the door of the drive by pulling up on the drive latch.
2. Remove the disc from its protective envelope and carefully slide it into the drive until you feel it bottom out against the rear of the drive.
3. Close the door by pressing down on the drive latch. Never force the drive latch, as the media can be latched off center within the protective jacket. The disc can be installed with power on without harming the disc.
4. Remove the disc by pulling up on the drive latch and pulling straight out. Always store discs in their protective envelopes to ensure prolonged disc life.

Write Protection (HP 9135A only)

Data and programs stored on flexible discs can be protected from being written over (Figure 3-3). The disc is "write protected" by covering the write protect slot with a write protect tab (provided with the discs). This prevents you from writing any information on the disc. The disc can, however, be read normally. To write on a protected disc, remove the write protect tab from the write protect slot. Remember, fingerprints can be disastrous to your data, so do not touch the surface of the disc.

NOTE

There is no write protect capability on the Winchester drive. Caution must be used to avoid writing over data stored on the Winchester disc.

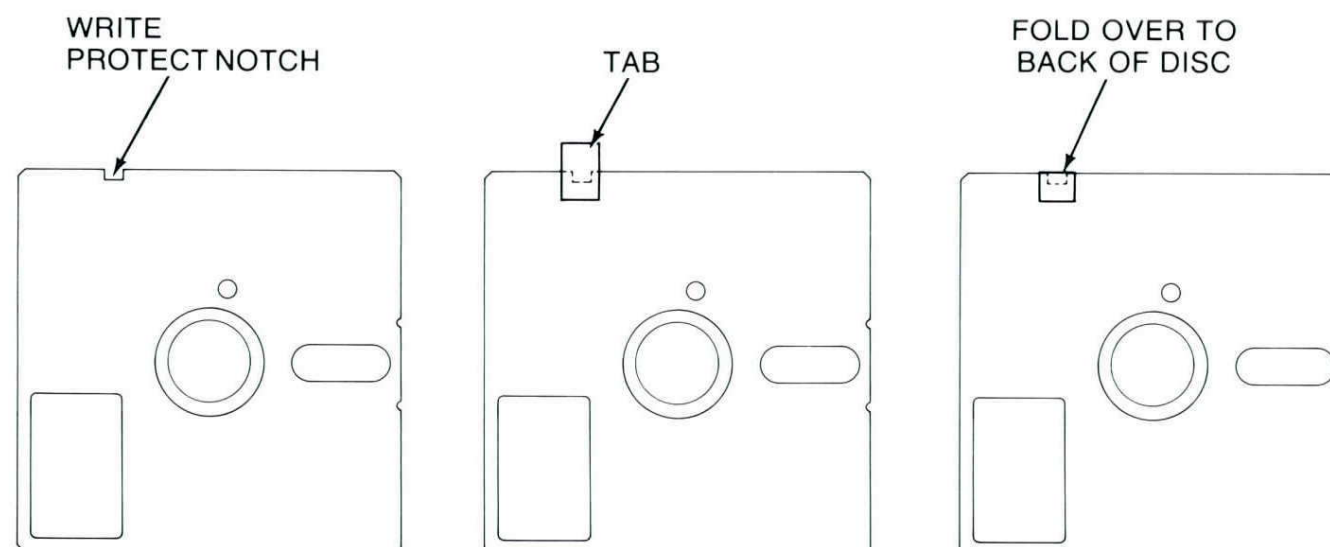


Figure 3-3. Write Protection

Flexible Disc Structure

The surface of the flexible disc is coated with ferromagnetic iron oxide. Data is stored in the form of binary digits represented by magnetic flux reversals on the disc. Information is stored and retrieved by the disc unit's heads that come in contact with the disc's upper and lower surface.

Information is stored in 35 concentric tracks on each side of the disc (Figure 3-4). The tracks are numbered 0 through 34. Each track is divided into 16 physical records (sectors), numbered 0 through 15. Each record contains 256 bytes (characters) of information. There is an important difference between a physical record and a logical record. A physical record is the smallest accessible unit of data on the disc. It is always the same size (256 bytes). A logical record is one that you define when you create a data file. Its size is variable and depends on the type of data you are storing.

Some of the space on each disc is reserved for the directory. The amount reserved depends on the controlling computer and the number of records in the file directory.

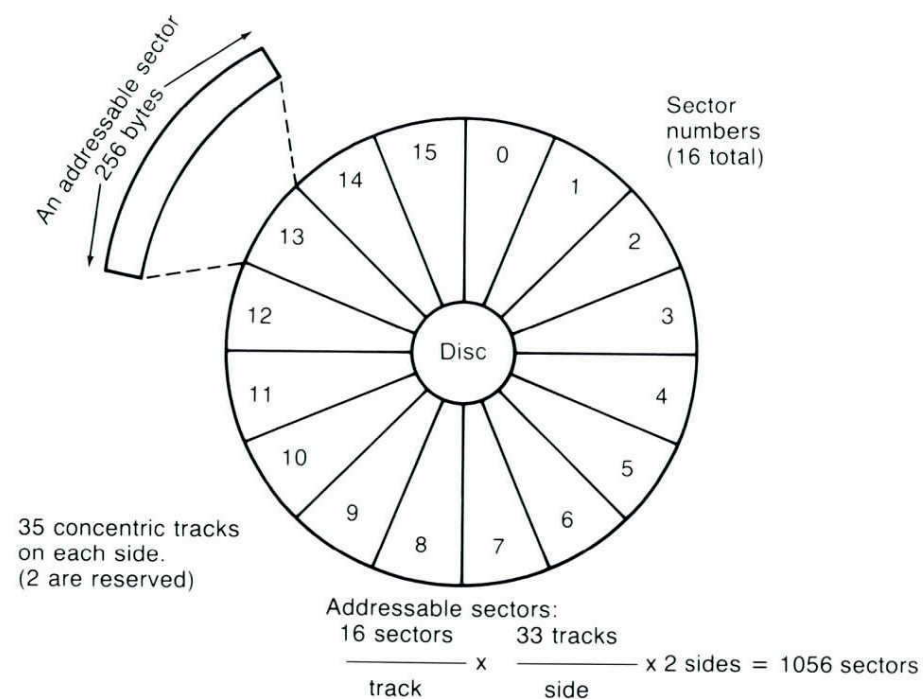


Figure 3-4. Flexible Disc Structure

Winchester Disc Structure

The Winchester drive used in the HP 9134A and HP 9135A disc memories contain two non-removable hard discs, each consisting of a thin magnetic coating on a circular aluminum substrate.

Data is stored in the form of binary digits represented by magnetic flux reversals on the disc. Information is stored and retrieved by the disc unit's four read/write heads which float on a layer of air 19 micro-inches above and below the disc's upper and lower surfaces.

Information is stored on 150 concentric tracks on each side of the disc (Figure 3-5). The tracks are numbered 0 through 149. Each track is divided into 32 physical records (sectors), numbered 0 through 31. Each record contains 256 bytes (characters) of information. As previously stated, there is an important difference between a physical record and a logical record. A physical record is the smallest accessible unit of data on the disc. It is always the same size (256 bytes). A logical record is one that you define when you create a data file. The Winchester drive emulates a 9895A flexible disc drive master and three slaves (four volumes). This is done by dividing the Winchester discs into four equal parts, 37 cylinders per volume. The heads are capable of reading or writing on four cylinders before stepping to the next set of cylinders.

Some of the space on each disc is reserved for the directory. The amount reserved depends on the controlling computer and the number of records in the file directory.

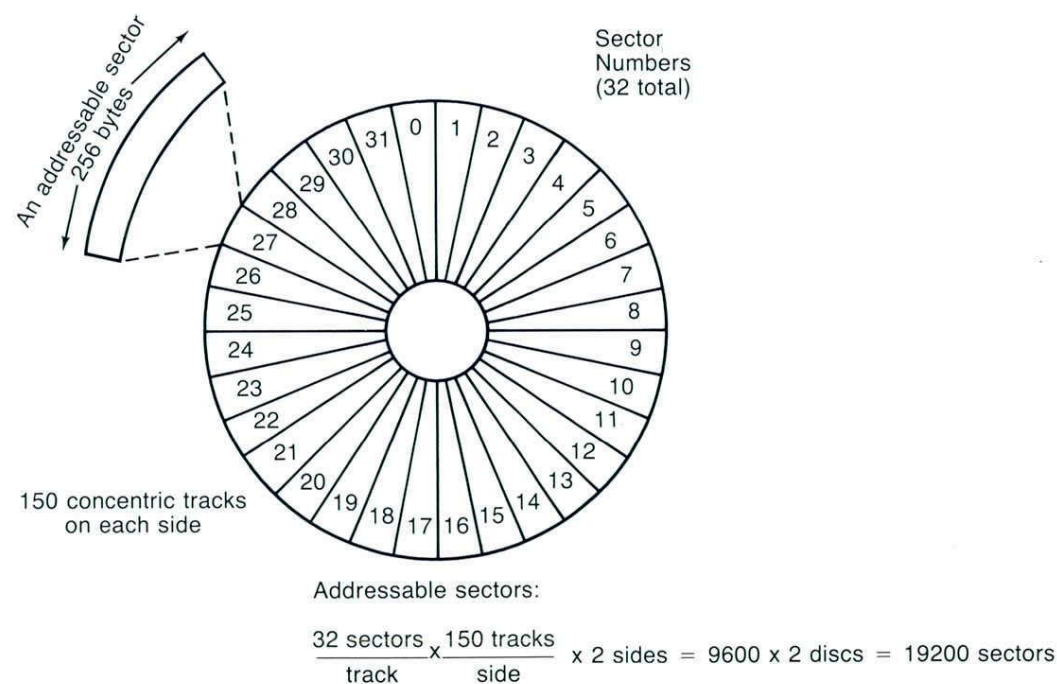


Figure 3-5. Winchester Disc Structure

Power-up

Before turning the disc memory on, be sure to perform all the procedures in Chapter 2. Locate the ~AC line switch on the rear panel and set it to the "ON" or "1" position. The fixed disc drive requires about 20 seconds after the application of power before it is ready for operation.

Basic System Operation

Before using a blank flexible disc or prior to the initial use of the Winchester disc, it must be formatted or initialized for use with your computer. This process checks the disc for defects (areas where information cannot be stored) and then creates a file directory. The directory holds the name and location of each file on the disc. When a disc is first initialized, the directory is empty, so no files are listed when you catalog the disc.

Remember, the Winchester drive emulates a 9895A controller with four 1.5 Mbyte drives. Thus you program it using mass storage ROM or driver statements that your computer manuals describe for a 9895A disc drive.

This section describes the disc initialization and back-up procedures for each of the mainframes that the HP 9134A and HP 9135A disc memories can be operated.

Series 80 System With the HP 9134A or HP 9135A

Initializing a Flexible Disc or a Volume of the Winchester

To initialize a new flexible disc, or re-initialize (erase all files) on an old flexible disc or to initialize the four volumes of the Winchester disc:

1. Be sure the flexible disc is not write protected by removing any write protect label covering the write enable notch. Insert the flexible disc into the flexible disc drive and close the latch.

To determine whether or not a disc has been initialized, type the CAT ":msus" command and press the END LINE key. The message "ERROR 130 : DISC" indicates that the disc has not been initialized.

2. Type in the INITIALIZE command, specifying the flexible disc:
INITIALIZE ("new volume label" (, "msus" or ".old volume label" (, directory size (, interleave factor))))

- "new volume label" - is a six-character name assigned to the disc. The . (period), : (colon), and " (quotes) are the only characters which can not be used inside the quotes.

- "msus" or ".old volume label" — is the mass storage unit specifier or the existing old volume label.

—directory size — is the number of records to be allocated.

—interleave factor — specifies how the physical records on the flexible disc medium are to be numbered. This command allows you to control the efficiency of your flexible disc. The Winchester disc is always initialized to an interleave of 10 regardless of the interleave specified.

The Initialization process takes about two minutes for the flexible disc and about 12 minutes for the four volumes on the Winchester.

CAUTION

ANY INFORMATION STORED ON THE WINCHESTER OR FLEXIBLE DISC WILL BE DESTROYED BY INITIALIZING THE WINCHESTER OR FLEXIBLE DISC.

For example; the following statements initialize the four volumes of the Winchester disc and the flexible disc (HP 9135A only):

```

10 INITIALIZE "DISC-0", ":D700"
20 INITIALIZE "DISC-1", ":D701"
30 INITIALIZE "DISC-2", ":D702"
40 INITIALIZE "DISC-3", ":D703"
50 INITIALIZE "DISC-4", ":D710"      (HP 9135A only)
60 BEEP @ WAIT 300 @ BEEP @ WAIT 300 @ BEEP
70 END

```

Backing Up a File or Volume

To back up a file from a flexible disc to the Winchester drive or from the Winchester drive to a flexible disc (the Winchester must have been initialized on a Series 80 mainframe):

NOTE

One volume of the Winchester drive is equivalent to that of an 8" disc (1.5 mbytes) and the capacity of a 5¼" Flexible disc is 270 kbytes. Therefore, caution must be used in copying from the Winchester to the flexible disc so as not to exceed the capacity of the 5¼" disc.

1. Type COPY "File Name:msus" TO "File Name:msus"
2. Press END LINE

To back up a volume from the flexible disc to the Winchester or from the Winchester to flexible disc:

1. Type Copy ":msus" TO ":msus"
2. Press END LINE.

To back up a volume on the Winchester may require up to five flexible discs due to the flexible disc's limited capacity.

System 125

Note

Winchesters supported only on operating systems supplied after 2/15/82.

Initializing (formatting) a new flexible disc or the Winchester disc

1. Turn the disc memory ~AC line switch "OFF".
2. Set the device address switch on the flexible disc drive to 0 and the device address switch on the Winchester drive to 2.
3. Turn the disc memory ~AC line switch "ON".
4. Insert the system disc into the flexible disc drive and close the drive latch.
5. Load the OP SYS by pressing key f6.
6. Select utility 125 by pressing the f1 key.
7. Load the DISC FORMAT routine by pressing the f2 key.
8. To format a flexible disc in the flexible disc drive, remove the system disc and insert the disc you wish to format (label side up and nearest you).
 - a. The disc drive(s) holding the disc(s) to be formatted is turned ON (CONFIGURATION MODE display control) and all others OFF (A through D is address 0, volumes 0 through 3, and E through F is address 2, volumes 0 through 3).
 - b. The type of disc is noted for each drive.
 - c. The appropriate stagger is specified. (Stagger is the number of sectors separating one logical sector from the next on the drive; suggested value is four for a 5 $\frac{1}{4}$ " disc, the Winchester disc stagger is preset.)

To make the necessary changes on the menu, use the TAB key or the cursor keys to move to the field you want to change, then press the function keys labeled NEXT CHOICE or PREVIOUS CHOICE until the value you want in the field is displayed.

7. Press the function key labeled START PROGRAM (f5) to start the DISC FORMAT program.

If there is no disc in the drive set "ON", the following message appears on the screen:

INITIALIZING DISC

DRIVE or DISC NOT AVAILABLE

If you start to format a disc that has already been formatted, the program will stop and display the following message:

Disc Type: HP — DOUBLE SIDED

(or)

Disc Type: IBM — SINGLE SIDED

Now select your Function to continue.

Your options are as follows:

1. To continue to run the program and reformat the disc;
2. To stop formatting the current disc and proceed to the next disc;
OR
3. To stop the entire formatting operation.

If you choose CONTINUE, the disc will be reformatted.

NOTE

Reformatting a disc that has already been formatted will erase all information — programs and data — stored on the disc. Be certain there is no useful data remaining on a disc before responding with the continue function key.

If you choose STOP CURRENT, the message

OPERATION ABORTED — DISC X

is displayed (where X is the current drive). The program then tries to format the next disc selected in the menu if more than one has "ON" indicated.

If you choose STOP ALL, the same message is displayed, and the following functions are available:

RESTORE MENU to return to the Disc Format Menu

START PROGRAM to continue with the formatting

EXIT to return to the Application Menu

To copy a file from the flexible disc to a volume on the Winchester or from a volume on the Winchester to the flexible disc or from the Winchester volume to another Winchester volume, perform the following:

Load the operating system by pressing the f6 key

EXIT TO CP/M by pressing the f8 key

The prompt Type A> appears on the display.

Device Specifier	File to be Copied	Type of File
---------------------	----------------------	-----------------

Type	pip e: = a:XXXXXX.YYYYYY	
------	--------------------------	--

Press RETURN.

NOTE

One volume of the Winchester drive is equivalent to that of an 8" disc (1.5 mbytes) and the capacity of a 5¼" disc is 270 kbytes. Therefore caution must be used in copying from the Winchester to the flexible disc so as not to exceed the capacity of the 5¼" Flexible disc.

Storing the Operating Systems on the Winchester

You may wish to store the operating systems (presently on flexible discs) onto the Winchester drive (the first operating system stored is the operating system the HP 125 will boot up). To do this, perform the following steps:

1. Turn the disc memory ~AC line switch "OFF".
2. Set the device addresses on the rear of the HP 9135A as follows:
Set the flexible disc drive Device Address to 0.
Set the Winchester drive Device Address to 2.

Refer to Chapter 2 for information about setting the Device Address switches.

3. Turn the disc memory ~AC line switch "ON".

After this is completed, the flexible disc drive specifier (in the CONFIGURATION mode) is "A" and the four Winchester volumes are "E,F,G, and H".

4. Insert the flexible disc drive and copy them to the first volume of the Winchester (E). The first operating system copied to volume one of the Winchester will be the operating system that the HP 125 boots up on when the power is applied.
5. After the operating system discs have been copied to volume one of the Winchester drive, the device addresses of the drives must be changed. To do this, perform the following:
Turn the disc memory ~AC line switch OFF.
Set the Winchester drive Device Address switch to 0.
Set the Flexible disc drive Device Address switch to 2.
Turn the disc memory ~AC line switch ON.

Refer to Chapter 2 for the information on setting Device Addresses.

After the new device addresses have been set, the flexible disc drive specifier (in the CONFIGURATION mode) is "E" and the four volumes of the Winchester are "A,B,C, and D".

HP 9835A/9835B Systems With the HP 9134A

Initializing the Winchester Drive

(Requires Mass Storage ROM 98331B)

The "INITIALIZE" statement enables an unused mass storage medium to be used with the HP 9835A/9835B Systems by establishing physical records, and main and spare directories.

A used medium can also be re-initialized; in the process, it is cleared of all information it previously contained.

The interleave factor is a numeric expression which defines the number of revolutions per track to be made for a complete data transfer. It is not used with the Winchester drive because the interleave is preset internally.

INITIALIZE "mass storage unit specifier"

Main and spare directories and all physical records are established and tested when a mass storage medium is initialized.

For example; the following statements initialize the four volumes of the Winchester disc.

```
10 INITIALIZE ":H7,0,0"
20 INITIALIZE ":H7,0,1"
30 INITIALIZE ":H7,0,2"
40 INITIALIZE ":H7,0,3"
50 END
```

Backing Up Files on the Winchester Drive

To store an individual file from another mass storage device (internal tape or a flexible disc) on the Winchester drive, or to back up one volume of the Winchester on another volume, or on another mass storage device:

1. Type COPY "FILE NAME:msus"TO"File Name:msus"
2. Press EXECUTE

To copy an entire volume from any mass storage device to any other mass storage device, use the following program. Be sure that the mass storage volume capacities are compatible to prevent overflowing the receiving or target medium.

```
10 REM ***MEDIA COPY PROGRAM
20 DIM Catalog$(1:2)[41],File$(6)
30 DISP "WHAT IS THE MASS STORAGE UNIT SPECIFIER OF THE MEDIUM TO BE
   COPIED?";
40 Media: LINPUT Old$
50 Old$ = UPC$(TRIM$(Old$))
60 IF Old$[1,1]<>":" THEN Old$ = ":"&Old$
70 LINPUT "WHAT IS THE MASS STORAGE UNIT SPECIFIER OF THE TARGET
   MEDIUM",New$
80 New$ = UPC$(TRIM$(New$))
90 IF New$[1,1]<>":" THEN New$ = ":"&New$
100 IF Old$<>New$ THEN Copy_files
110 DISP "CAN'T COPY TO THE SAME MEDIUM. RE-ENTER MASS STORAGE UNIT
   SPECIFIER TO COPY"
120 GOTO Media
130 Copy_files: !
```



```

140 ON ERROR GOSUB Duplicate_name
150 CAT TO Catalog$(*),Counter,Counter;Old$
160 FOR Loop = 1 to 2
170 IF NOT LEN(Catalog$(Loop)) THEN STOP
180 File$ = Catalog$(Loop)[1,6]
190 DISP "WORKING ON <"&CHR$(129)&File$&CHR$(128)&">"
200 IF Catalog$(Loop)[15;1]<>"?" THEN COPY File$&Old$ TO File$&New$
210 NEXT Loop
220 IF Counter THEN Copy_files
230 END
240 Duplicate_name: !
250 BEEP
260 IF ERRN<>54 THEN Fatal_error
270 PRINT "FILE <"&CHR$(129)&File$&CHR$(128)&"> ALREADY EXISTS ON
    "&New$
280 RETURN
290 Fatal_error: !
300 DISP ERRM$
310 END

```

HP 9845B/9845C Systems With the HP 9134A

Initializing the Winchester Drive

The "INITIALIZE" statement enables a new mass storage medium to be used with the HP 9845B/9845C Systems by establishing physical records and main and spare directories.

A used medium can also be re-initialized; in the process, it is cleared of all information it previously contained.

INITIALIZE "mass storage unit specifier"

The interleave parameter is not used with the Winchester drive because the interleave is preset internally.

For example; the following statements initialize the four volumes of the Winchester disc.

```

10 INITIALIZE ":H7,0,0"
20 INITIALIZE ":H7,0,1"
30 INITIALIZE ":H7,0,2"
40 INITIALIZE ":H7,0,3"
50 END

```

Backing Up Files on the Winchester Drive

To store an individual file from another mass storage device (internal tape or a flexible disc) on the Winchester drive, or to back up one volume of the Winchester on another volume, or on another mass storage device:

1. Type COPY "FILE NAME:msus" TO "File Name:msus"
2. Press EXECUTE

To copy an entire volume from any mass storage device to any other mass storage device, use the following program. Be sure that the mass storage volume capacities are compatible to prevent overflowing the receiving or target medium.

```

10 REM ***MEDIA COPY PROGRAM
20 DIM Catalog$(1:2)[41],File$(6)
30 DISP "WHAT IS THE MASS STORAGE UNIT SPECIFIER OF THE MEDIUM TO BE
   COPIED?"
40 Media: LINPUT Old$
50 Old$ = UPC$(TRIM$(Old$))
60 IF Old$[1,1]<>":" THEN Old$ = ":"&Old$
70 LINPUT "WHAT IS THE MASS STORAGE UNIT SPECIFIER OF THE TARGET
   MEDIUM",New$
80 New$ = UPC$(TRIM$(New$))
90 IF New$[1,1]<>":" THEN New$ = ":"&New$
100 IF Old$<>New$ THEN Copy_files
110 DISP "CAN'T COPY TO THE SAME MEDIUM. RE-ENTER MASS STORAGE UNIT
   SPECIFIER TO COPY"
120 GOTO Media
130 Copy_files: !
140 ON ERROR GOSUB Duplicate_name
150 CAT TO Catalog$(*),Counter,Counter;Old$
160 FOR Loop = 1 to 2
170 IF NOT LEN(Catalog$(Loop)) THEN STOP
180 File$ = Catalog$(Loop)[1,6]
190 DISP "WORKING ON <"&CHR$(129)&File$&CHR$(128)&">"
200 IF Catalog$(Loop)[15;1]<>"?" THEN COPY File$&Old$ TO File$&New$
210 NEXT Loop
220 IF Counter THEN Copy_files
230 END
240 Duplicate_name: !
250 BEEP
260 IF ERRN<>54 THEN Fatal_error
270 PRINT "FILE <"&CHR$(129)&File$&CHR$(128)&"> ALREADY EXISTS ON
   "&New$
280 RETURN
290 Fatal_error: !
300 DISP ERRM$
310 END

```

HP 9826/9836 Systems With the HP 9134A or HP 9135A

Initializing the Winchester Drive or Flexible Disc

This operation requires that you have the Basic 2.0 or greater BASIC language software package loaded into your HP 9826.

Since the Winchester emulates an HP 9895A flexible disc, you can initialize a new disc, or re-initialize (erase all files) an old disc by typing in the INITIALIZE command, specifying the msus for the HP 9895 (Winchester) and/or the HP 82901 (5¼" flexible disc drive) with the HP-IB/device address, and unit number:

INITIALIZE “:Equipment type,HP-IB and device address,unit specifier”

The initialization routine runs automatically and continually displays its progress initializing the disc. The routine takes about three minutes per volume of the Winchester disc and 4.5 minutes for the flexible disc.

For example; the following statements initialize the four volumes of the Winchester disc and the flexible disc (HP 9135A only).

```
10 INITIALIZE “:HP 9895,700,0”
20 INITIALIZE “:HP 9895,700,1”
30 INITIALIZE “:HP 9895,700,2”
40 INITIALIZE “:HP 9895,700,3”
50 INITIALIZE “:HP 82901,701”      (HP 9135A only)
60 END
```

If less than five tracks are found defective, a directory is created on the disc. The computer can automatically replace up to four bad tracks with spare ones. At the end of the routine the number of defective areas is listed.

If more than five defective tracks are found, however, the routine is halted and a displayed message tells you how many tracks are bad.

To copy a volume on the flexible disc to a volume on the Winchester drive:

1. Type COPY “:HP 82901,msus”TO“:HP 9895,msus”
2. Press EXECUTE

To copy a volume on the Winchester drive with another volume on the same drive:

1. Type COPY “:HP 9895,msus”TO“:HP 9895,msus”
2. Press EXECUTE

HP 1000 Model 5/9/10 RTE-XL Systems with the HP 9134A

The following is a description of how to use the HP 9134A with the RTE-XL primary system.

Units 0 and 1 of the HP 9134A Winchester drive can be immediately used with the primary system on the Model 5 or Model 9/10 replacing the 7902/9895 which is configured as LU 10 and LU 11. To do this, the HP-IB address must be the same as the 7902/9895 would have been (check in the Getting Started With Your Model 5/9/10 manual). The disc can be formatted with the FORMT utility (also described in the Getting Started Manual and the RTE/XL Utilities Manual).

At this point you will only be able to use half of your Winchester disc.

To use the other half of the Winchester disc, (units 2 and 3) the following steps must be followed. Note that step 1 generates your new operating system, steps 2-6 are necessary to format units 2 and 3 of the HP 9134A, and step 7 allows you to begin using your HP 9134A. For a fuller description refer to the RTE-XL Software Installation Guide.

1. Generate a system which includes all four units of the HP 9134A according to the generator reference manual and additional information provided in this manual concerning the HP 9134A. This is most easily done by editing the primary system answer file (#ANS on your system) or your current answer file if it is different than #ANS and adding the example records described in this manual.
2. Generate a second system, identical to that generated in step 1, but which has only 1 ID segment. (See ID segment Allocation in the Memory Allocation Phase section of the RTE/XL Generator Reference Manual.) This system will be used to build a format system to format the additional LU's on the HP 9134A. Specify the system file name as 'FOSYS, The snapshot file name as 'FOSNP.
3. Create a type 6 copy of the FORMT program by running the LOADR program. You should specify 'FOSNP as the snapshot file, FOPGM as the output, specify \$DKLIB as a library to be searched and relocate %FORMT.

Example:

```
FMGR: RU,LOADR
LOADR: SN,FORSNP      <underlining implies operator input>
LOADR: OU,FOPGM
LOADR: SZ,20
LOADR: LIB,$DKLIB
LOADR: RE,%FORMT
LOADR: EN
```

At which point the LOADR will complete the loading of the program. The output file generator will be called FOPGM.

4. Run the BUILD utility to create a memory-based format system using the FOPGM program. Build can be run interactively or with a command file. The command file for BUILD (call it *FBILD) should contain the following:

	(Do not include this in the file)
NO,	(no automatic partitioning)
40,	(pages of memory)
14,	(size of first partition)
/C	(no more partitions required)
RP,FOPGM	(rp the program)
ST	(make FOPGM the startup program)
/E	(end of commands).

Then run the BUILD program as follows: FMGR: RU,BUILD,,F9134,'FOSNP,'FOSYS,/A

Note that all of the files which have been named along the way have been used in this example, so if you use different names for any of the files (FORSYS, FORSNP, *FBILD, FOPGM...) change them in the appropriate places. The result is the file F9134 which can be booted up on your primary system. If you plan to use the new system exclusively, there may no longer be a need to keep the old FORMT utility, and you may wish to purge it.

M7902:0	a file you have constructed according to the instructions in the section covering the Table Generation Phase of the Generator Operation Manual.
lu	is the logical unit number to be assigned to the disc LU.
address	is the HP-IB address to be assigned to the device. (Refer to the section covering the HP-IB Interface Driver in the RTE/XL Driver Reference Manual for a description of device addresses.) An address of 2 should be used if you will be using this disc LU as the default boot device.
unit	is the unit number or the logical unit. The unit numbers for the HP 9134A are 0 through 3.

The defaults contained in the default file (%DD.30) for M7902:0 are:

Entry point (Entry point:	DD.30
Device type (DT:dt):	30B
Time out (TO:to):	750 TBG Interrupts
Buffer limits (BL):	None
Table extension (TX:tx):	25
Priority (PR:pr):	0
Queueing (QU:qu):	None
# of driver parameters (DX:dx):	8

Driver parameters are:

DP 1 = 0	HP-IB Address (Should be modified at generation)
DP 2 = 0	Unit Number (Should be modified at generation)
DP 3 = 0	Starting Head
DP 4 = 0	Starting Cylinder
DP 5 = 3	Number of Spare Tracks
DP 6 = 134	Number of Tracks (excluding spares)
DP 7 = 30	Number of 128-word Sectors/Track
DP 8 = 2	Number of Surfaces

Overriding the DVT Defaults

The driver parameters area is used to describe the layout of the disc (i.e., track assignments for disc logical units) and you might find it advantageous to redefine the eight driver parameters to layout the disc differently. Therefore, if you are going to override the default values described above, you should refer to the section titled Configuring a Disc Subsystem in the RTE-L Generation Planning Manual to determine the values to be placed into the driver parameter area. Remember to refer to the 7902 subsection in that manual.

Node List Entries

RTE/XL requires that all devices with multiple LU's using the same controller must have their LU numbers placed in a node list.

The NODE generator command should look like this:

```
NODE, lu of cartridge 1, lu of cartridge 2, lu of cartridge 3.
```

Memory Allocation Phase:

Cartridge List Allocation:

As described in the Generator Operation Manual, the maximum number of disc cartridges to be mounted on the system at one time must be described at this time. Therefore, you must remember to add the total number of DVT's constructed for each 9134 drive to the number passed to the generator.

Following is an example of the necessary records to include in the generation answer file:

In the table generation phase:

```
DVT,%DD.30,M7902:0,LU:60,DP:1:7:0
DVT,%DD.30,M7902:0,LU:61,DP:1:7:1
DVT,%DD.30,M7902:0,LU:62,DP:1:7:2
DVT,%DD.30,M7902:0,LU:63,DP:1:7:3
```

In the Node list phase:

```
NODE,60,61,62,63
```




Arranged alphabetically by country

Product Line Sales/Support Key

- Key Product Line
A Analytical
CM Components
C Computer Systems Sales only
CH Computer Systems Hardware Sales & Services
CS Computer Systems Software Sales & Services
E Electronic Instruments & Measurement Systems
M Medical Products
MP Medical Products Primary SRO
MS Medical Products Secondary SRO
P Personal Computing Products
 * Sales only for specific product line
 ** Support only for specific product line

IMPORTANT: These symbols designate general product line capability. They do not insure sales or support availability for all products within a line, at all locations. Contact your local sales office for information regarding locations where HP support is available for specific products.

HP distributors are printed in italics.

ANGOLA

Telectra
Empresa Técnica de Equipamentos
Eléctricos, S.A.R.L.
R. Barbosa Rodrigues, 41-I DT.
Caixa Postal 6487
LUANDA
Tel: 35515,35516
E,M,P

ARGENTINA

Hewlett-Packard Argentina S.A.
 Avenida Santa Fe 2035
Martinez 1640 BUENOS AIRES
 Tel: 798-5735, 792-1293
 Telex: 122443 AR CIGY
 Cable: HEWPACKARG
 A,E,CH,CS,P
Biotron S.A.C.I.y.M
Av Paseo Colon 221, 9 Piso
1399 BUENOS AIRES
Tel: 30-4846, 30-1851, 30-8384
Telex: 17595 BION/AR
M
Fate S.A. I.C.I./Electronica
Venezuela 1326
1095 BUENOS AIRES
Tel: 379026, 379027
Telex: 18137, 22754 ALVAR AR
P

AUSTRALIA

Adelaide, South Australia Office

Hewlett-Packard Australia Pty.Ltd.
 153 Greenhill Road
PARKSIDE, S.A. 5063
 Tel: 272-5911
 Telex: 82536
 Cable: HEWPAARD Adelaide
 A*,CH,CM,,E,MS,P

Brisbane, Queensland Office

Hewlett-Packard Australia Pty.Ltd.
 5th Floor
 Teachers Union Building
 495-499 Boundary Street
SPRING HILL, Queensland 4000
 Tel: 229-1544
 Telex: 42133
 Cable: HEWPAARD Brisbane
 A,CH,CM,,E,MS,P

Canberra, Australia Capital Territory Office

Hewlett-Packard Australia Pty.Ltd.
 121 Wollongong Street
FYSHWICK, A.C.T. 2609
 Tel: 80 4244 Telex: 62650
 Cable: HEWPAARD Canberra
 A*CH,CM,E,MS,P

Melbourne, Victoria Office

Hewlett-Packard Australia Pty.Ltd.
 31-41 Joseph Street
BLACKBURN, Victoria 3130
 Tel: 89-6351
 Telex: 31-024
 Cable: HEWPAARD Melbourne
 A,CH,CM,CS,E,MS,P

Perth, Western Australia Office

Hewlett-Packard Australia Pty.Ltd.
 141 Stirling Highway
NEDLANDS, W.A. 6009
 (effective 28 Sept. 1981:
 261 Stirling Highway
CLAREMONT, W.A. 6010)
 Tel: 386-5455
 Telex: 93859
 Cable: HEWPAARD Perth
 A,CH,CM,,E,MS,P

Sydney, New South Wales Office

Hewlett-Packard Australia Pty.Ltd.
 17-23 Talavera Road
 P.O. Box 308
NORTH RYDE, N.S.W. 2113
 Tel: 887-1611
 Telex: 21561
 Cable: HEWPAARD Sydney
 A,CH,CM,CS,E,MS,P

AUSTRIA

Hewlett-Packard Ges.m.b.h.
 Grottenhofstrasse 94
 Verkaufsburo Graz
A-8052 GRAZ
 Tel: 21-5-66
 Telex: 32375
 CH,CM,E*

Hewlett-Packard Ges.m.b.h.
 Wehlstrasse 29
 P.O. Box 7
A-1205 VIENNA
 Tel: (222) 35-16-210
 Telex: 135823/135066
 A,CH,CM,CS,E,MS,P

BAHRAIN

Green Salon
P.O. Box 557
BAHRAIN
Tel: 25503-250950
Telex: 84419
P

Wael Pharmacy
P.O. Box 648
BAHRAIN
Tel: 256123
Telex: 8550 WAEL GJ
M

BELGIUM

Hewlett-Packard Belgium S.A./N.V.
 Blvd de la Woluwe, 100
 Woluwedal
B-1200 BRUSSELS
 Tel: (02) 762-32-00
 Telex: 23-494 paloben bru
 A,CH,CM,CS,E,MP,P

BRAZIL

Hewlett-Packard do Brasil I.e.C.
 Ltda.
 Alameda Rio Negro, 750
ALPHAVILLE 06400 Barueri SP
 Tel: 421-1311
 Telex: 011 33872
 Cable: HEWPACK Sao Paulo
 A,CH,CM,CS,E,MS
 Hewlett-Packard do Brasil I.e.C.
 Ltda.
 Avenida Epitacio Pessoa, 4664
 22471 **RIO DE JANEIRO-RJ**
 Tel: 286-0237
 Telex: 021-21905 HPBR-BR
 Cable: HEWPACK Rio de Janeiro
 A,CH,CM,E,MS,P*

CANADA

Alberta

Hewlett-Packard (Canada) Ltd.
 210, 7220 Fisher Street S.E.
CALGARY, Alberta T2H 2H8
 Tel: (403) 253-2713
 A,CH,CM,E*,MS,P*

Hewlett-Packard (Canada) Ltd.
 11620A-168th Street
EDMONTON, Alberta T5M 3T9
 Tel: (403) 452-3670
 A,CH,CM,CS,E,MS,P*

British Columbia

Hewlett-Packard (Canada) Ltd.
 10691 Shellbridge Way
RICHMOND, British Columbia V6X 2W7
 Tel: (604) 270-2277
 Telex: 610-922-5059
 A,CH,CM,CS,E*,MS,P*

Manitoba

Hewlett-Packard (Canada) Ltd.
 380-550 Century Street
WINNIPEG, Manitoba R3H 0Y1
 Tel: (204) 786-6701
 A,CH,CM,E,MS,P*

New Brunswick

Hewlett-Packard (Canada) Ltd.
 190 Wilbur Street
MONCTON, New Brunswick E2B 2V0
 Tel: (506) 386-1677
 Telex: 01931470
 CH**

Nova Scotia

Hewlett-Packard (Canada) Ltd.
 P.O. Box 931
 900 Windmill Road
DARTMOUTH, Nova Scotia B2Y 3Z6
 Tel: (902) 469-7820
 Telex: 01931470
 CH,CM,CS,E*,MS,P*

Ontario

Hewlett-Packard (Canada) Ltd.
 552 Newbold Street
LONDON, Ontario N6E 2S5
 Tel: (519) 686-9181
 Telex: 610-352-1201
 A,CH,CM,E*,MS,P*

Hewlett-Packard (Canada) Ltd.
 6877 Goreway Drive
MISSISSAUGA, Ontario L4V 1M8
 Tel: (416) 678-9430
 Telex: 610-492-4246
 A,CH,CM,CS,E,MP,P

Hewlett-Packard (Canada) Ltd.
 2670 Queensview Dr.
OTTAWA, Ontario K2B 8K1
 Tel: (613) 820-6483
 Telex: 610-563-1636
 A,CH,CM,CS,E*,MS,P*

Quebec

Hewlett-Packard (Canada) Ltd.
 17500 South Service Road
 Trans-Canada Highway
KIRKLAND, Quebec H9J 2M5
 Tel: (514) 697-4232
 Telex: 05821521
 A,CH,CM,CS,E,MP,P*

Hewlett-Packard (Canada) Ltd.
 Les Galeries du Vallon
 2323 Boulevard du Versant Nord
STE. FOY, Quebec G1N 4C2
 Tel: (418) 687-4570
 CH

CHILE

Jorge Calcagni y Cia. Ltda.
Arturo Burhle 065
Casilla 16475
SANTIAGO 9
Tel: 222-0222
Telex: Public Booth 0001
 A,CM,E,M
Olympia (Chile) Ltd.
Rodrico de Araya 1045
Casilla 256-V
SANTIAGO 21
Tel: 225-5044
Telex: 40565 OLYMP CL
 C,P

CHINA, People's Republic of

CEIEC Inc.
44 Beiwei Rd.
BEIJING, China
Telex: 22475 CEIEC CN
 A,CH,CM,CS,E,P

COLOMBIA

Instrumentación
H. A. Langebaek & Kier S.A.
Apartado Aéreo 6287
BOGOTÁ 1, D.E.
Carrera 7 No. 48-75
BOGOTÁ, 2 D.E.
 Tel: 287-8877
 Telex: 44400
 Cable: AARIS Bogota
 A,CM,E,M,P

COSTA RICA

Cientifica Costarricense S.A.
Avenida 2, Calle 5
San Pedro de Montes de Oca
Apartado, 10159
SAN JOSE
Tel: 24-38-20, 24-08-19
Telex: 2367 GALGUR
 CM,E,M

CYPRUS

Telexa Ltd.
P.O. Box 4809
14C Stassinou Avenue
NICOSIA
 Tel: 62698
 Telex: 2894 Levidocy
 E,M,P

CZECHOSLOVAKIA

Hewlett-Packard
Obchodni Zastupitelstvi v CSSR
Post. schranka 27
CS-118 01 PRAHA 011
Tel: 66-296
Telex: 121353 IHC

DENMARK

Hewlett-Packard A/S
 Datavej 52
DK-3460 BIRKEROD
 Tel: (02) 81-66-40
 Telex: 37409 hpas dk
 A,CH,CM,CS,E,MS,P
 Hewlett-Packard A/S
 Navervej 1
DK-8600 SILKEBORG
 Tel: (06) 82-71-66
 Telex: 37409 hpas dk
 CH,CM,E

ECUADOR

CYEDE Cia. Ltda.
Avenida Eloy Alfaro 1749
Casilla 6423 CCI
QUITO
Tel: 450-975, 243-052
Telex: 2548 CYEDE ED
 A,CM,E,P
Hospitalar S.A.
Robles 625
Casilla 3590
QUITO
Tel: 545-250, 545-122
Telex: 2485 HOSPTEL ED
 Cable: HOSPITALAR-Quito
M

EGYPT

International Engineering Associates
24 Hussein Hegazi Street
Kasr-el-Aini
CAIRO
Tel: 23-829
Telex: 93830
 CH,CS,E,M
Informatic For Systems
22 Talaat Harb Street
CAIRO
Tel: 759006
Telex: 93938 FRANK UN
 CH,CS,P
Egyptian International Office
for Foreign Trade
P.O.Box 2558
CAIRO
Tel: 984935
Telex: 93337 EGPOR
P

EL SALVADOR

IPESA de El Salvador S.A.
Boulevard de los Heroes 1148
SAN SALVADOR
Tel: 252787, 259621
Telex: Public Booth 20107
 A,CH,CM,CS,E,P

FINLAND

Hewlett-Packard Oy
 Revontulentie 7
SF-02100 ESPOO 10
 Tel: (90) 455-0211
 Telex: 121563 hewpa sf
 A,CH,CM,CS,E,MS,P

FRANCE

Hewlett-Packard France
Le Ligoures
Bureau de Vente de Aix-en-Provence
Place Romée de Villeneuve
F-13090 **AIX-EN-PROVENCE**
Tel: (42) 59-41-02
Telex: 410770F
A,CH,CM,E,MS,P*

Hewlett-Packard France
Boite Postale No. 503
F-25026 **BESANCON**
28 Rue de la Republique
F-25000 **BESANCON**
Tel: (81) 83-16-22
CH,M

Hewlett-Packard France
Bureau de Vente de Lyon
Chemin des Mouilles
Boite Postale No. 162
F-69130 **ECULLY Cédex**
Tel: (78) 33-81-25
Telex: 310617F
A,CH,CM,CS,E,MP

Hewlett-Packard France
Immeuble France Evry
Tour Lorraine
Boulevard de France
F-91035 **EVRY Cédex**
Tel: (60) 77-96-60
Telex: 692315F
CM,E

Hewlett-Packard France
5th Avenue Raymond Chanas
F-38320 **EYBENS**
Tel: (76) 25-81-41
Telex: 980124 HP GRENOB EYBE
CH,CM

Hewlett-Packard France
Bâtiment Ampère
Rue de la Commune de Paris
Boite Postale 300
F-93153 **LE BLANC MESNIL**
Tel: (01) 865-44-52
Telex: 211032F
CH,CM,CS,E,MS

Hewlett-Packard France
Le Montesquieu
Avenue du President JF Kennedy
F-33700 **MERIGNAC**
Tel: (56) 34-00-84
Telex: 550105F
CH,CM,E,MS

Hewlett-Packard France
32 Rue Lothaire
F-57000 **METZ**
Tel: (87) 65-53-50
CH,CM

Hewlett-Packard France
3 Rue Julien Videment
F-44200 **NANTES**
Tel: (40) 48-09-44
CH**

Hewlett-Packard France
Zone Industrielle de Courtaboeuf
Avenue des Tropiques F-91947 Les
Ulises Cédex **ORSAY**
Tel: (1) 907-78-25
Telex: 600048F
A,CH,CM,CS,E,MP,P

Hewlett-Packard France
Paris Porte-Maillot 13, 15 25
Boulevard De L'Amiral Bruix
F-75782 **PARIS Cédex 16**
Tel: (01) 502-12-20
Telex: 613663F
CH,CM,MS,P

Hewlett-Packard France
2 Allee de la Bourgonette
F-35100 **RENNES**
Tel: (99) 51-42-44
Telex: 740912F
CH,CM,E,MS,P*

Hewlett-Packard France
98 Avenue de Bretagne
F-76100 **ROUEN**
Tel: (35) 63-57-66 CH** ,CS

Hewlett-Packard France
4 Rue Thomas Mann
Boite Postale 56
F-67200 **STRASBOURG**
Tel: (88) 28-56-46
Telex: 890141F
CH,CM,E,MS,P*

Hewlett-Packard France
20 Chemin de la Cépière
F-31081 **TOULOUSE Cédex**
Tel: (61) 40-11-12
Telex: 531639F
A,CH,CM,CS,E,P*

Hewlett-Packard France
Bureau de Vente de Lille
Immeuble Péricentre
Rue Van Gogh
F-59650 **VILLENEUVE D'ASQ**
Tel: (20) 91-41-25
Telex: 160124F
CH,CM,E,MS,P*

GERMAN FEDERAL REPUBLIC

Hewlett-Packard GmbH
Technisches Büro Berlin
Keithstrasse 2-4
D-1000 **BERLIN 30**
Tel: (030) 24-90-86
Telex: 018 3405 hpbn d
A,CH,CM,E,M,P,X

Hewlett-Packard GmbH
Technisches Büro Böblingen
Herrenberger Strasse 110
D-7030 **BÖBLINGEN**
Tel: (07031) 667-1
Telex: 07265739 bbn or 07265743
A,CH,CM,CS,E,MP,P

Hewlett-Packard GmbH
Technisches Büro Düsseldorf
Emanuel-Leutze-Strasse 1
D-4000 **DUSSELDORF**
Tel: (0211) 5971-1
Telex: 085/86 533 hpdd d
A,CH,CM,CS,E,MS,P

Hewlett-Packard GmbH
Vertriebszentrale Frankfurt
Berner Strasse 117
Postfach 560 140
D-6000 **FRANKFURT 56**
Tel: (0611) 50-04-1
Telex: 04 13249 hpffm d
A,CH,CM,CS,E,MP,P

Hewlett-Packard GmbH
Technisches Büro Hamburg
Kapstadtring 5
D-2000 **HAMBURG 60**
Tel: (040) 63804-1
Telex: 21 63 032 hphh d
A,CH,CM,CS,E,MS,P

Hewlett-Packard GmbH
Technisches Büro Hannover
Am Grossmarkt 6
D-3000 **HANNOVER 91**
Tel: (0511) 46-60-01
Telex: 092 3259
A,CH,CM,E,MS,P

Hewlett-Packard GmbH
Technisches Büro Mannheim
Rosslauer Weg 2-4
D-6800 **MANNHEIM**
Tel: (621) 70050
Telex: 0462105
A,C,E

Hewlett-Packard GmbH
Technisches Büro Neu Ulm
Messerschmittstrasse 7
D-7910 **NEU ULM**
Tel: 0731-70241
Telex: 712816 HP ULM-D
A,C,E*

Hewlett-Packard GmbH
Technisches Büro Nürnberg
Neumeyerstrasse 90
D-8500 **NÜRNBERG**
Tel: (0911) 56-30-83
Telex: 0623 860
CH,CM,E,MS,P

Hewlett-Packard GmbH
Technisches Büro München
Eschenstrasse 5
D-8021 **TAUFKIRCHEN**
Tel: (089) 6117-1
Telex: 0524985
A,CH,CM,E,MS,P

GREAT BRITAIN

Hewlett-Packard Ltd.
Trafalgar House
Navigation Road
ALTRINCHAM
Cheshire WA14 1NU
Tel: (061) 928-6422
Telex: 668068
A,CH,CS,E,M

Hewlett-Packard Ltd.
Oakfield House, Oakfield Grove
Clifton

BRISTOL BS8 2BN
Tel: 36806
Telex: 444302
CH,CM,M,P

Hewlett-Packard Ltd.
14 Wesley Street
CASTLEFORD
Yorkshire WF10 1AE
Tel: (0977) 550016
Telex: 5557355
CH

Hewlett-Packard Ltd.
Fourier House
257-263 High Street
LONDON COLNEY
Herts., AL2 1HA
Tel: (0727) 24400
Telex: 1-8952716
CH,CS,E

Hewlett-Packard Ltd.
Tradax House, St. Mary's Walk
MAIDENHEAD
Berkshire, SL6 1ST
Tel: (0628) 39151
CH,CS,E,P

Hewlett-Packard Ltd.
308/314 Kings Road
READING, Berkshire
Tel: 61022
Telex: 84-80-68
CM,P

Hewlett-Packard Ltd.
Quadrangle
106-118 Station Road
REDHILL, Surrey
Tel: (0737) 68655
Telex: 947234 CH,CS,E

Hewlett-Packard Ltd.
Westminster House
190 Stratford Road
SHIRLEY, Solihull
West Midlands B90 3BJ
Tel: (021) 7458800
Telex: 339105
CH

Hewlett-Packard Ltd.
King Street Lane
WINNERSH, Wokingham
Berkshire RG11 5AR
Tel: (0734) 784774
Telex: 847178
A,CS,E,M

GREECE

Kostas Karayannis S.A.
8 Omirou Street
ATHENS 133
Tel: 32-30-303, 32-37-371
Telex: 21 59 62 RKAR GR
A,CH,CM,CS,E,M,P

PLAISIO S.A.
G. Gerardos
24 Stournara Street
ATHENS
Tel: 36-11-160
Telex: 21 9492
P

GUATEMALA

IPESA
Avenida Reforma 3-48
GUATEMALA 9
Tel: 316627, 314786
Telex: 4192 TELETR GU
A,CH,CM,CS,E,M,P

HONG KONG

Hewlett-Packard Hong Kong, Ltd.
G.P.O. Box 795
5th Floor, Sun Hung Kai Centre
30 Harbour Road
HONG KONG
Tel: 5-8323211
Telex: 66678 HEWPA HX
Cable: HP ASIA LTD Hong Kong
E,CH,CS,P

Schmidt & Co. (Hong Kong) Ltd.
Wing On Centre, 28th Floor
Connaught Road, C.
HONG KONG
Tel: 5-455644
Telex: 74766 SCHMX HX
A,M

ICELAND

Eding Trading Company Inc.
Hafnarnvoli-Tryggvagotu
P.O. Box 895
IS-REYKJAVIK
Tel: 1-58-20, 1-63-03
M

INDIA

Blue Star Ltd.
11 Magarath Road
BANGALORE 560 025
Tel: 55668
Telex: 0845-430
Cable: BLUESTAR
A,CH,CM,CS,E

Blue Star Ltd.
Band Box House
Prabhadevi
BOMBAY 400 025
Tel: 422-3101
Telex: 011-3751
Cable: BLUESTAR
A,M

Blue Star Ltd.
Sahas
414/2 Vir Savarkar Marg
Prabhadevi
BOMBAY 400 025
Tel: 422-6155
Telex: 011-4093
Cable: FROSTBLUE
A,CH,CM,CS,E,M

Blue Star Ltd.
Kalyan, 19 Vishwas Colony
Alkapuri, **BORODA, 390 005**
Tel: 65235
Cable: BLUE STAR
A

Blue Star Ltd.
7 Hare Street
CALCUTTA 700 001
Tel: 12-01-31
Telex: 021-7655
Cable: BLUESTAR
A,M

Blue Star Ltd.
133 Kodambakkam High Road
MADRAS 600 034
Tel: 82057
Telex: 041-379
Cable: BLUESTAR
A,M

Blue Star Ltd.
Bhandari House, 7th/8th Floors
91 Nehru Place
NEW DELHI 110 024
Tel: 682547
Telex: 031-2463
Cable: BLUESTAR
A,CH,CM,CS,E,M

Blue Star Ltd.
15/16:C Wellesley Rd.
PUNE 411 011
Tel: 22775
Cable: BLUE STAR
A

Blue Star Ltd.
1-1-117/1 Sarojini Devi Road
SECUNDERABAD 500 033
Tel: 70126
Telex: 0155-459
Cable: BLUEFROST
A,E

Blue Star Ltd.
T.C. 7/603 Poornima
Maruthankuzhi
TRIVANDRUM 695 013
Tel: 65799
Telex: 0884-259
Cable: BLUESTAR
E

INDONESIA

BERCA Indonesia P.T.
P.O.Box 496/JKT.
Jl. Abdul Muis 62
JAKARTA
Tel: 373009
Telex: 46748 BERSAL IA
Cable: BERSAL JAKARTA
P

BERCA Indonesia P.T.
Wisma Antara Bldg., 17th floor
JAKARTA
A,CS,E,M
BERCA Indonesia P.T.
P.O. Box 174/SBY.
Jl. Kutei No. 11
SURABAYA
Tel: 68172
Telex: 31146 BERSAL SB
Cable: BERSAL-SURABAYA
A*,E,M,P

SALES & SUPPORT OFFICES

Arranged alphabetically by country

IRAQ

Hewlett-Packard Trading S.A.
Mansoor City 9B/3/7
BAGHDAD
Tel: 551-49-73
Telex: 2455 HEPAIRAQ IK
CH,CS

IRELAND

Hewlett-Packard Ireland Ltd.
Kestrel House
Clanwilliam Court
Lower Mount Street
DUBLIN 2, Eire
Tel: 680424, 680426
Telex: 30439
A,CH,CM,CS,E,M,P
Cardiac Services Ltd.
Kilmore Road
Artane
DUBLIN 5, Eire
Tel: (01) 351820
Telex: 30439
M

ISRAEL

Electronics Engineering Division
Motorola Israel Ltd.
16 Kremenetski Street
P.O. Box 25016
TEL-AVIV 67899
Tel: 3-338973
Telex: 33569 Motil IL
Cable: BASTEL Tel-Aviv
A,CH,CM,CS,E,M,P

ITALY

Hewlett-Packard Italiana S.p.A.
Traversa 99C
Giulio Petrone, 19
I-70124 **BARI**
Tel: (080) 41-07-44
M

Hewlett-Packard Italiana S.p.A.
Via Martin Luther King, 38/111
I-40132 **BOLOGNA**
Tel: (051) 402394
Telex: 511630
CH,CM,E,MS

Hewlett-Packard Italiana S.p.A.
Via Principe Nicola 43G/C
I-95126 **CATANIA**
Tel: (095) 37-10-87
Telex: 970291 C,P

Hewlett-Packard Italiana S.p.A.
Via G. Di Vittorio 9
I-20063 **CERNUSCO SUL NAVIGLIO**
Tel: (2) 903691
Telex: 334632
A,CH,CM,CS,E,MP,P

Hewlett-Packard Italiana S.p.A.
Via Nuova san Rocco A
Capodimonte, 62/A
I-80131 **NAPOLI**
Tel: (081) 7413544
A,CH,CM,E

Hewlett-Packard Italiana S.p.A.
Viale G. Modugno 33
I-16156 **GENOVA PEGLI**
Tel: (010) 68-37-07 E,C

Hewlett-Packard Italiana S.p.A.
Via Turazza 14
I-35100 **PADOVA**
Tel: (49) 664888
Telex: 430315
A,CH,CM,E,MS

Hewlett-Packard Italiana S.p.A.
Viale C. Pavese 340
I-00144 **ROMA**
Tel: (06) 54831
Telex: 610514
A,CH,CM,CS,E,MS,P*

Hewlett-Packard Italiana S.p.A.
Corso Giovanni Lanza 94
I-10133 **TORINO**
Tel: (011) 682245, 659308
Telex: 221079
CH,CM,E

JAPAN

Yokogawa-Hewlett-Packard Ltd.
Inoue Building
1-1348-3, Asahi-cho
ATSUGI, Kanagawa 243
Tel: (0462) 24-0451
CM,C*,E

Yokogawa-Hewlett-Packard Ltd.
Sannomiya-Daiichi Seimei-Bldg. 5F
69 Kyo-machi Chuo-ku
KOBE 650
Tel: (078) 392-4791
C,E

Yokogawa-Hewlett-Packard Ltd.
Kumagaya Asahi Yasoji Bldg 4F
3-4 Chome Tsukuba
KUMAGAYA, Saitama 360
Tel: (0485) 24-6563
CH,CM,E

Yokogawa-Hewlett-Packard Ltd.
Mito Mitsui Building
1-4-73, San-no-maru
MITO, Ibaragi 310
Tel: (0292) 25-7470
CH,CM,E

Yokogawa-Hewlett-Packard Ltd.
Sumitomo Seimei Nagoya Bldg.
11-2 Shimo-sasajima-cho
Nakamura-ku
NAGOYA, Aichi 450
Tel: (052) 571-5171
CH,CM,CS,E,MS

Yokogawa-Hewlett-Packard Ltd.
Chuo Bldg., 4th Floor
5-4-20 Nishinakajima, 5-chome
Yodogawa-ku

OSAKA, 532
Tel: (06) 304-6021
Telex: YHPOSA 523-3624
A,CH,CM,CS,E,MP,P*

Yokogawa-Hewlett-Packard Ltd.
3-29-21 Takaido-Higashi 3-chome
Suginami-ku
TOKYO 168

Tel: (03) 331-6111
Telex: 232-2024 YHPTOK
A,CH,CM,CS,E,MP,P*

Yokogawa-Hewlett-Packard Ltd.
3-30-4 Tsuruya-cho
Kanagawa-ku,
YOKOHAMA Kanagawa, 221
Tel: (045) 312-1252
CH,CM,E

JORDAN

Mouasher Cousins Company
P.O. Box 1387
AMMAN
Tel: 24907, 39907
Telex: 21456 SABCO JO
CH,E,M,P

KENYA

ADCOM Ltd., Inc.
City House, Wabera Street
P.O. Box 30635
NAIROBI
Tel: 331955
Telex: 22639
E,M

KOREA

Samsung Electronics
Industrial Products Div.
76-561 Yeoksam-Dong
Kangnam-Ku
C.P.O. Box 2775
SEOUL
Tel: 555-7555, 555-5447
Telex: K27364 SAMSAN
A,CH,CM,CS,E,M,P

KUWAIT

Al-Khalidya Trading & Contracting
P.O. Box 830 Safat
KUWAIT
Tel: 42-4910, 41-1726
Telex: 2481 Areeg kt
CH,E,M

Photo & Cine Equipment
P.O. Box 270 Safat
KUWAIT
Tel: 42-2846, 42-3801
Telex: 2247 Matin
P

LEBANON

G.M. Dolmadjian
Achratieh
P.O. Box 165.167
BEIRUT
Tel: 290293
MP

LUXEMBOURG

Hewlett-Packard Belgium S.A./N.V.
Blvd de la Woluwe, 100
Woluwedal
B-1200 **BRUSSELS**
Tel: (02) 762-32-00
Telex: 23-494 paloben bru
A,CH,CM,CS,E,MP,P

MALAYSIA

Hewlett-Packard Sales (Malaysia)
Sdn. Bhd.
Suite 2.21/2.22
Bangunan Angkasa Raya
Jalan Ampang
KUALA LUMPUR
Tel: 483544
Telex: MA31011
A,CH,E,M,P*

Protel Engineering
Lot 319, Satok Road
P.O. Box 1917
Kuching, **SARAWAK**
Tel: 53544
Telex: MA 70904 PROMAL
Cable: PROTELENG
A,E,M

MALTA

Philip Toledo Ltd.
Natabile Rd.
MRIEHEL
Tel: 447 47, 455 66
Telex: MW.649
P

MEXICO

Hewlett-Packard Mexicana, S.A. de
C.V.
Avenida Periferico Sur No. 6501
Tepepan, Xochimilco
MEXICO CITY 23, D.F.
Tel: (905) 676-4600
Telex: 017-74-507
A,CH,CS,E,MS,P
Hewlett-Packard Mexicana, S.A. de
C.V.
Rio Volga 600
Colonia del Valle
MONTERREY, N.L.
Tel: 78-42-93, 78-42-40, 78-42-41
Telex: 038-410
CH

MOROCCO

Dolbeau
81 rue Karatchi
CASABLANCA
Tel: 3041-82, 3068-38
Telex: 23051, 22822
E

Gerep
2 rue d'Agadir
Boite Postale 156
CASABLANCA
Tel: 272093, 272095
Telex: 23 739
P

NETHERLANDS

Hewlett-Packard Nederland B.V.
Van Heuven Goedhartlaan 121
NL 1181KK **AMSTELVEEN**
P.O. Box 667
NL 1080 AR **AMSTELVEEN**
Tel: (20) 47-20-21
Telex: 13 216
A,CH,CM,CS,E,MP,P
Hewlett-Packard Nederland B.V.
Bongerd 2
NL 2906VK **CAPPELLE**, A/D IJssel
P.O. Box 41
NL 2900 AA **CAPELLE**, IJssel
Tel: (10) 51-64-44
Telex: 21261 HEPAC NL
A,CH,CM,CS

Koning en Hartman Electrotechniek
B.V.
Koperwerf 30
2544 En den Haag
The **NETHERLANDS**
Tel: 070-210101
Telex: 31528
CM

NEW ZEALAND

Hewlett-Packard (N.Z.) Ltd.
169 Manukau Road
P.O. Box 26-189
Epsom, **AUCKLAND**
Tel: 687-159
Cable: HEWPACK Auckland
CH,CM,E,P*

Hewlett-Packard (N.Z.) Ltd.
4-12 Cruickshank Street
Kilbirnie, **WELLINGTON 3**
P.O. Box 9443
Courtenay Place, WELLINGTON
Tel: 877-199
Cable: HEWPACK Wellington
CH,CM,E,P
Northrop Instruments & Systems
Ltd.
369 Khyber Pass Road
P.O. Box 8602
AUCKLAND
Tel: 794-091
Telex: 60605
A,M

Northrop Instruments & Systems
Ltd.
110 Mandeville St.
P.O. Box 8388
CHRISTCHURCH
Tel: 486-928
Telex: 4203
A,M

Northrop Instruments & Systems
Ltd.
Sturdee House
85-87 Ghuznee Street
P.O. Box 2406
WELLINGTON
Tel: 850-091
Telex: NZ 3380
A,M

NORTHERN IRELAND

Cardiac Services Company
95A Finaghy Road South
BELFAST BT 10 OBY
Tel: (0232) 625-566
Telex: 747626
M

NORWAY

Hewlett-Packard Norge A/S
Folke Bernadottesvei 50
P.O. Box 3558
N-5033 **FYLLINGSDALEN (BERGEN)**
Tel: (05) 16-55-40
Telex: 16621 hpnas n
CH,CM,E

Hewlett-Packard Norge A/S
Oesterndalen 18
P.O. Box 34
N-1345 **OESTERAAS**
Tel: (02) 17-11-80
Telex: 16621 hpnas n
A*,CH,CM,E,MS,P

OMAN

Khimijl Ramdas
P.O. Box 19
MUSCAT
Tel: 72-22-17, 72-22-25
Telex: 3289 BROKER MB MUSCAT
P

PAKISTAN

Mushko & Company Ltd.
10, Bazar Road
Sector G-6/4
ISLAMABAD
Tel: 26875
Cable: FEMUS Rawalpindi
A,E,M

Mushko & Company Ltd.
Oosman Chambers
Abdullah Haroon Road
KARACHI 0302
Tel: 511027, 512927
Telex: 2894 MUSKO PK
Cable: COOPERATOR Karachi
A,E,M,P*

PANAMA

Electrónico Balboa, S.A.
Calle Samuel Lewis
Apartado 4929
Panama 5
Edificio "Alfa" No. 2
CIUDAD DE PANAMA
Tel: 64-2700
Telex: 0383 ELECTRON PG
A,CM,E,M,P

PANAMA (Con't.)

Foto Internacional, S.A.
Free Zone Colon
Apartado 2068
COLON 3
Tel: 45-2333
Telex: 379 8626, 386 8722
P

PERU

Cía Electro Médica S.A.
Los Flamencos 145, San Isidro
Casilla 1030
LIMA 1
Tel: 41-4325, 41-3703
Telex: Pub. Booth 25306
A,CM,E,M,P

PHILIPPINES

The Online Advanced Systems
Corporation
Rico House, Amorsolo Cor. Herrera
Street
Legaspi Village, Makati
P.O. Box 1510
Metro MANILA
Tel: 85-35-81, 85-34-91, 85-32-21
Telex: 3274 ONLINE
A,CH,CS,E,M
Electronic Specialists and
Proponents Inc.
690-B Epifanio de los Santos
Avenue
Cubao, **QUEZON CITY**
P.O. Box 2649 Manila
Tel: 98-96-81, 98-96-82, 98-96-83
Telex: 40018, 42000 ITT GLOBE
MACKAY BOOTH
P

POLAND

Buro Informacji Technicznej
Hewlett-Packard
Ul Stawki 2, 6P
PL00-950 **WARSZAWA**
Tel: 39-59-62, 39-67-43
Telex: 812453 hepa pl

PORTUGAL

SOQUIMICA
Av. da Liberdade 220-2
P-1298 **LISBOA Codex**
Tel: 56 21 81, 56 21 82
Telex: 13316
Telectra-Empresa Técnica de
Equipamentos Eléctricos S.a.r.l.
Rua Rodrigo da Fonseca 103
P.O. Box 2531
P-LISBON 1
Tel: (19) 68-60-72
Telex: 12598
CH,CS,E,P
Mundinter
Intercambio Mundial de Comércio
S.a.r.l.
P.O. Box 2761
Avenida Antonio Augusto de Aguiar
138
P-LISBON
Tel: (19) 53-21-31, 53-21-37
Telex: 16691 munter p
M

PUERTO RICO

Hewlett-Packard Puerto Rico
P.O. Box 4407
CAROLINA, Puerto Rico 00630
Calle 272 Edificio 203
Urb. Country Club
RIO PIEDRAS, Puerto Rico 00924
Tel: (809) 762-7255
Telex: 345 0514
A,CH,CS

QATAR

Nasser Trading & Contracting
P.O. Box 1563
DOHA
Tel: 22170
Telex: 4439 NASSER
M
Compute Arabia
P.O. Box 2570
DOHA
Tel: 329515
Telex: 4806 CHPARB
P

ROMANIA

Hewlett-Packard Reprezentanta
Boulevard Nicolae Balcescu 16
BUCURESTI
Tel: 130725
Telex: 10440

SAUDI ARABIA

Modern Electronic Establishment
P.O. Box 193
AL-KHOBAR
Tel: 44-678, 44-813
Telex: 670136
Cable: ELECTA AL-KHOBAR
CH,CS,E,M,P
Modern Electronic Establishment
P.O. Box 1228, Baghdadiyah Street
JEDDAH
Tel: 27-798
Telex: 401035
Cable: ELECTA JEDDAH
CH,CS,E,M,P
Modern Electronic Establishment
P.O. Box 2728
RIYADH
Tel: 62-596, 66-232
Telex: 202049
CH,CS,E,M,P

SCOTLAND

Hewlett-Packard Ltd.
Royal Bank Buildings
Swan Street
BRECHIN, Angus, Scotland
Tel: 3101, 3102
CH,CM
Hewlett-Packard Ltd.
SOUTH QUEENSFERRY
West Lothian, EH30 9GT
GB-Scotland
Tel: (031) 3311000
Telex: 72682
A,CH,CM,CS,E,M

SINGAPORE

Hewlett-Packard Singapore (Pty.)
Ltd.
P.O. Box 58 Alexandra Post Office
SINGAPORE, 9115
6th Floor, Inchcape House
450-452 Alexandra Road
SINGAPORE 0511
Tel: 631788
Telex: HPSGSO RS 34209
Cable: HEWPACK, Singapore
A,CH,CS,E,MS,P

SOUTH AFRICA

Hewlett-Packard South Africa (Pty.)
Ltd.
P.O. Box 120
Howard Place
Pine Park Center, Forest Drive,
Pinelands
CAPE PROVINCE 7450
Tel: 53-7955, 53-7956, 53-7957
Telex: 57-0006
A,CH,CM,E,MS,P

Hewlett-Packard South Africa (Pty.)
Ltd.
P.O. Box 37099
Overport
DURBAN 4067
Tel: 28-4178, 28-4179, 28-4110
CH,CM

Hewlett-Packard South Africa (Pty.)
Ltd.
P.O. Box 33345
Glenstantia 0010 **TRANSVAAL**
1st Floor East
Constantia Park Ridge Shopping
Centre
Constantia Park
PRETORIA
Tel: 01298-1126
Telex: 32163
CH,E

Hewlett-Packard South Africa (Pty.)
Ltd.
Private Bag Wendywood
SANDTON 2144
Tel: 802-5111, 802-5125
Telex: 89-84782
Cable: HEWPACK Johannesburg
A,CH,CM,CS,E,MS,P

SPAIN

Hewlett-Packard Española S.A.
c/Entenza, 321
E-BARCELONA 29
Tel: (3) 322-24-51, 321-73-54
Telex: 52603 hpbee
A,CH,CM,CS,E,MS,P
Hewlett-Packard Española S.A.
c/San Vicente S/N
Edificio Albia II, 7 B
E-BILBAO 1
Tel: (944) 423-8306, 423-8206
A,CH,CM,E,MS
Hewlett-Packard Española S.A.
Calle Jerez 3
E-MADRID 16
Tel: 458-2600
Telex: 23515 hpe
A,CM,E

Hewlett-Packard Española S.A.
c/o Costa Brava 13
Colonia Mirasierra
E-MADRID 34
Tel: 734-8061, 734-1162
CH,CS,M

Hewlett-Packard Española S.A.
Av Ramón y Cajal 1-9
Edificio Sevilla 1,
E-SEVILLA 5
Tel: 64-44-54, 64-44-58
Telex: 72933
A,CM,CS,MS,P
Hewlett-Packard Española S.A.
C/Ramon Gordillo, 1 (Entlo.3)
E-VALENCIA 10
Tel: 361-1354, 361-1358
CH,CM,P

SWEDEN

Hewlett-Packard Sverige AB
Enighetsvägen 3, Fack
P.O. Box 20502
S-16120 BROMMA
Tel: (08) 730-0550
Telex: (854) 10721 MESSAGES
Cable: MEASUREMENTS
STOCKHOLM
A,CH,CM,CS,E,MS,P

Hewlett-Packard Sverige AB
Sunnanvagen 14K
S-22226 LUND
Tel: (46) 13-69-79
Telex: (854) 10721 (via BROMMA
office)
CH,CM

Hewlett-Packard Sverige AB
Vastra Vintergatan 9
S-70344 OREBRO
Tel: (19) 10-48-80
Telex: (854) 10721 (via BROMMA
office)
CH,CM

Hewlett-Packard Sverige AB
Frötallsgatan 30
S-42132 VÄSTRA-FRÖLUNDA
Tel: (031) 49-09-50
Telex: (854) 10721 (via BROMMA
office)
CH,CM,E,P

SWITZERLAND

Hewlett-Packard (Schweiz) AG
Clarastrasse 12
CH-4058 BASLE
Tel: (61) 33-59-20
A,CM

Hewlett-Packard (Schweiz) AG
Bahnhofstrasse 44
3018 BERN
Tel: (031) 56-24-22
CH,CM

Hewlett-Packard (Schweiz) AG
47 Avenue Blanc
CH-1202 GENEVA
Tel: (022) 32-30-05, 32-48-00
CH,CM,CS

Hewlett-Packard (Schweiz) AG
29 Chemin Château Bloc
CH-1219 LE LIGNON-Geneva
Tel: (022) 96-03-22
Telex: 27333 hpag ch
Cable: HEWPACKAG Geneva
A,CM,E,MS,P

Hewlett-Packard (Schweiz) AG
Zürcherstrasse 20
Allmend 2
CH-8967 WIDEN
Tel: (57) 50-111
Telex: 59933 hpag ch
Cable: HPAG CH
A,CH,CM,CS,E,MS,P

SYRIA

General Electronic Inc.
Nuri Basha-Ahmad Ebn Kays Street
P.O. Box 5781

DAMASCUS
Tel: 33-24-87
Telex: 11215 ITIKAL
Cable: ELECTROBOR DAMASCUS
E

Middle East Electronics
Place Azmé
Boite Postale 2308
DAMASCUS
Tel: 334592
Telex: 11304 SATACO SY
M,P

TAIWAN

Hewlett-Packard Far East Ltd.
Kaohsiung Office
2/F 68-2, Chung Cheng 3rd Road
KAOHSIUNG
Tel: 241-2318, 261-3253
E,MS,P

Hewlett-Packard Far East Ltd.
Taichung Office
#33, Cheng Tr Rd.
10th Floor, Room 5
TAICHUNG
Tel: (042) 289274

Hewlett-Packard Far East Ltd.
Taiwan Office
5th Floor
205 Tun Hwa North Road
TAIPEI
Tel: (02) 751-0404
Cable: HEWPACK Taipei
A,CH,CS,E,MS,P
Ing Lih Trading Co.
3rd Floor 18, Po-Ai Road
TAIPEI (100)
Tel: (02) 311-1914
Cable: INGLIH TAIPEI
A

THAILAND

Unimesa
30 Patpong Ave., Suriwong
BANGKOK 5
Tel: (234-091) (234-092)
Telex: TH 81160, TH 81038
Cable: UNIMESA Bangkok
A,C,E,M
Bangkok Business Equipment Ltd.
5/5-6 Dejo Road
BANGKOK
Tel: 234-8670, 234-8671
Telex: 87669-BEQUIPT TH
Cable: BUSIQUIPT Bangkok
P

TRINIDAD & TOBAGO

Caribbean Telecoms Ltd.
50/A Jerningham Avenue
P.O. Box 732
PORT-OF-SPAIN
Tel: 624-4213, 624-4214
Telex: 3235, 3272 HUGCO WG
A,CM,E,M,P

TUNISIA

Tunisie Electronique
31 Avenue de la Liberte
TUNIS
Tel: 280-144
E,P

Corema
1 ter. Av. de Carthage
TUNIS
Tel: 253-821
Telex: 12319 CABAM TN
M

TURKEY

Teknim Company Ltd.
Iran Caddesi No. 7
Kavaklidere, **ANKARA**
Tel: 275800
Telex: 42155
E
E.M.A.
Medina Eldem Sokak No.41/6
Yüksel Caddesi
ANKARA
Tel: 175 622
M,P

UNITED ARAB EMIRATES

Emitac Ltd.
P.O. Box 1641
SHARJAH
Tel: 354121, 354123
Telex: 68136 Emitac SL
CH,CS,E,M,P

SALES & SUPPORT OFFICES

Arranged alphabetically by country

UNITED KINGDOM

see: GREAT BRITAIN
NORTHERN IRELAND
SCOTLAND

UNITED STATES

Alabama

Hewlett-Packard Co.
700 Century Park South
Suite 128
BIRMINGHAM, AL 35226
Tel: (205) 822-6802
CH,CM,MP

Hewlett-Packard Co.
P.O. Box 4207
8290 Whitesburg Drive, S.E.
HUNTSVILLE, AL 35802
Tel: (205) 881-4591
CH,CM,CS,E,M*

Alaska

Hewlett-Packard Co.
1577 "C" Street, Suite 252
ANCHORAGE, AK 99510
Tel: (206) 454-3971
CH*,CM

Arizona

Hewlett-Packard Co.
2336 East Magnolia Street
PHOENIX, AZ 85034
Tel: (602) 273-8000
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
2424 East Aragon Road
TUCSON, AZ 85702
Tel: (602) 889-4631
CH,CM,E,MS**

Arkansas

Hewlett-Packard Co.
P.O. Box 5646
Brady Station
LITTLE ROCK, AR 72215
Tel: (501) 376-1844, (501) 664-8773
CM,MS

California

Hewlett-Packard Co.
99 South Hill Dr.
BRISBANE, CA 94005
Tel: (415) 330-2500
CH,CM,CS

Hewlett-Packard Co.
7621 Canoga Avenue
CANOGA PARK, CA 91304
Tel: (213) 702-8300
A,CH,CM,CS,E,P

Hewlett-Packard Co.
1579 W. Shaw Avenue
FRESNO, CA 93771
Tel: (209) 224-0582
CM,MS

Hewlett-Packard Co.
1430 East Orangethorpe
FULLERTON, CA 92631
Tel: (714) 870-1000
CH,CM,CS,E,MP

Hewlett-Packard Co.
5400 W. Rosecrans Boulevard
LAWDALE, CA 90260
P.O. Box 92105
LOS ANGELES, CA 90009
Tel: (213) 970-7500
CH,CM,CS,MP

Hewlett-Packard Co.
3939 Lankershim Blvd.
NORTH HOLLYWOOD, CA 91604
Tel: (213) 877-1282
Regional Headquarters

Hewlett-Packard Co.
3200 Hillview Avenue
PALO ALTO, CA 94304
Tel: (415) 857-8000
CH,CM,CS,E

Hewlett-Packard Co.
646 W. North Market Boulevard
SACRAMENTO, CA 95834
Tel: (916) 929-7222
A*,CH,CM,CS,E,MS

Hewlett-Packard Co.
9606 Aero Drive
P.O. Box 23333 SAN DIEGO, CA
92123

Tel: (714) 279-3200
CH,CM,CS,E,MP

Hewlett-Packard Co.
Suite A
5553 Hollister
SANTA BARBARA, CA 93111
Tel: (805) 964-3390

Hewlett-Packard Co.
3003 Scott Boulevard
SANTA CLARA, CA 95050
Tel: (408) 988-7000
A,CH,CM,CS,E,MP

Colorado

Hewlett-Packard Co.
24 Inverness Place, East
ENGLEWOOD, CO 80112
Tel: (303) 771-3455
A,CH,CM,CS,E,MS

Connecticut

Hewlett-Packard Co.
47 Barnes Industrial Road South
P.O. Box 5007
WALLINGFORD, CT 06492
Tel: (203) 265-7801
A,CH,CM,CS,E,MS

Florida

Hewlett-Packard Co.
P.O. Box 24210
2727 N.W. 62nd Street
FORT LAUDERDALE, FL 33309
Tel: (305) 973-2600
CH,CM,CS,E,MP

Hewlett-Packard Co.
4080 Woodcock Drive, #132
Brownett Building
JACKSONVILLE, FL 32207
Tel: (904) 398-0663
CM,C*,E*,MS**

Hewlett-Packard Co.
P.O. Box 13910
6177 Lake Ellenor Drive
ORLANDO, FL 32809
Tel: (305) 859-2900
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
6425 N. Pensacola Blvd.
Suite 4, Building 1
PENSACOLA, FL 32575
Tel: (904) 476-8422
A,CM,MS

Hewlett-Packard Co.
110 South Hoover, Suite 120
Vanguard Bldg.
TAMPA, FL 33609
Tel: (813) 872-0900
A*,CH,CM,CS,E*,M*

Georgia

Hewlett-Packard Co.
P.O. Box 105005
2000 South Park Place
ATLANTA, GA 30339
Tel: (404) 955-1500
Telex: 810-766-4890
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
Executive Park Suite 306
P.O. Box 816
AUGUSTA, GA 30907
Tel: (404) 736-0592
CM,MS

Hewlett-Packard Co.
P.O. Box 2103
1172 N. Davis Drive
WARNER ROBINS, GA 31098
Tel: (912) 923-8831
CM,E

Hawaii

Hewlett-Packard Co.
Kawaiahao Plaza, Suite 190
567 South King Street
HONOLULU, HI 96813
Tel: (808) 526-1555
A,CH,CM,E,MS

Idaho

Hewlett-Packard Co.
11311 Chinden Boulevard
BOISE, ID 83707
Tel: (208) 376-6000
CH,CM,M*

Illinois

Hewlett-Packard Co.
211 Prospect Road
BLOOMINGTON, IL 61701
Tel: (309) 663-0383
CH,CM,MS**

Hewlett-Packard Co.
1100 31st Street
DOWNERS GROVE, IL 60515
Tel: (312) 960-5760
CH,CM,CS

Hewlett-Packard Co.
5201 Tollview Drive
ROLLING MEADOWS, IL 60008
Tel: (312) 255-9800
A,CH,CM,CS,E,MP

Indiana

Hewlett-Packard Co.
P.O. Box 50807
7301 No. Shadeland Avenue
INDIANAPOLIS, IN 46250
Tel: (317) 842-1000
A,CH,CM,CS,E,MS

Iowa

Hewlett-Packard Co.
5815 S.W. 5th Street
DES MOINES, IA 50315
Tel: (515) 243-5876
CH,CM,MS**

Hewlett-Packard Co.
2415 Heinz Road
IOWA CITY, IA 52240
Tel: (319) 351-1020
CH,CM,E*,MS

Kansas

Hewlett-Packard Co.
1644 S. Rock
WICHITA, KA 67207
Tel: (316) 265-5200
CH,CM

Kentucky

Hewlett-Packard Co.
10170 Linn Station Road
Suite 525
LOUISVILLE, KY 40223
Tel: (502) 426-0100
A,CH,CM,CS,MS

Louisiana

Hewlett-Packard Co.
P.O. Box 1449
3229 Williams Boulevard
KENNER, LA 70062
Tel: (504) 443-6201
A,CH,CM,CS,E,MS

Maryland

Hewlett-Packard Co.
7121 Standard Drive
HANOVER, MD 21076
Tel: (301) 796-7700
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
2 Choke Cherry Road
ROCKVILLE, MD 20850
Tel: (301) 948-6370
Telex: 710-828-9685
A,CH,CM,CS,E,MP

Massachusetts

Hewlett-Packard Co.
32 Hartwell Avenue
LEXINGTON, MA 02173
Tel: (617) 861-8960
A,CH,CM,CS,E,MP

Michigan

Hewlett-Packard Co.
23855 Research Drive
FARMINGTON HILLS, MI 48024
Tel: (313) 476-6400
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
4326 Cascade Road S.E.
GRAND RAPIDS, MI 49506
Tel: (616) 957-1970
CH,CM,CS,MS

Minnesota

Hewlett-Packard Co.
2025 W. Larpentour Ave.
ST. PAUL, MN 55113
Tel: (612) 644-1100
A,CH,CM,CS,E,MP

Mississippi

Hewlett-Packard Co.
P.O. Box 5028
322 N. Mart Plaza
JACKSON, MS 39216
Tel: (601) 982-9363
CM,MS

Missouri

Hewlett-Packard Co.
11131 Colorado Avenue
KANSAS CITY, MO 64137
Tel: (816) 763-8000
Telex: 910-771-2087
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
1024 Executive Parkway
ST. LOUIS, MO 63141
Tel: (314) 878-0200
A,CH,CM,CS,E,MP

Nebraska

Hewlett-Packard
7101 Mercy Road
Suite 101, IBX Building
OMAHA, NE 68106
Tel: (402) 392-0948
CM,MS

Nevada

Hewlett-Packard Co.
Suite D-130
5030 Paradise Blvd.
LAS VEGAS, NV 89119
Tel: (702) 736-6610
CM,MS**

New Jersey

Hewlett-Packard Co.
Crystal Brook Professional Building
Route 35
EATONTOWN, NJ 07724
Tel: (201) 542-1384
A*,CM,C*,E*,P*

Hewlett-Packard Co.
W120 Century Road
PARAMUS, NJ 07652
Tel: (201) 265-5000
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
60 New England Av. West
PISCATAWAY, NJ 08854
Tel: (201) 981-1199
A,CH,CM,CS,E

New Mexico

Hewlett-Packard Co.
P.O. Box 11634
11300 Lomas Blvd., N.E.
ALBUQUERQUE, NM 87123
Tel: (505) 292-1330
Telex: 910-989-1185
CH,CM,CS,E,MS

New York

Hewlett-Packard Co.
5 Computer Drive South
ALBANY, NY 12205
Tel: (518) 458-1550
Telex: 710-444-4691
A,CH,CM,E,MS

Hewlett-Packard Co.
9600 Main Street
CLARENCE, NY 14031
Tel: (716) 759-8621
Telex: 710-523-1893
CH

Hewlett-Packard Co.
200 Cross Keys Office
FAIRPORT, NY 14450
Tel: (716) 223-9950
Telex: 510-253-0092
CH,CM,CS,E,MS

Hewlett-Packard Co.
No. 1 Pennsylvania Plaza
55th Floor
34th Street & 8th Avenue
NEW YORK, NY 10119
Tel: (212) 971-0800
CH,CM,CS,E*,M*

Hewlett-Packard Co.
5858 East Molloy Road
SYRACUSE NY 13211
Tel: (315) 455-2486
A,CH,CM,E,MS

Hewlett-Packard Co.
3 Crossways Park West
WOODBURY, NY 11797
Tel: (516) 921-0300
Telex: 510-221-2183
A,CH,CM,CS,E,MS

North Carolina

Hewlett-Packard Co.
P.O. Box 15579
2905 Guess Road (27705)
DURHAM, NC 27704
Tel: (919) 471-8466
C,M

Hewlett-Packard Co.
5605 Roanne Way
GREENSBORO, NC 27409
Tel: (919) 852-1800
A,CH,CM,CS,E,MS

Ohio

Hewlett-Packard Co.
9920 Carver Road
CINCINNATI, OH 45242
Tel: (513) 891-9870
CH,CM,CS,MS

Hewlett-Packard Co.
16500 Sprague Road
CLEVELAND, OH 44130
Tel: (216) 243-7300
Telex: 810-423-9430
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
962 Crupper Ave.
COLUMBUS, OH 43229
Tel: (614) 436-1041
CH,CM,CS,E*

Ohio (Con't)

Hewlett-Packard Co.
330 Progress Rd.
DAYTON, OH 45449
Tel: (513) 859-8202
A,CH,CM,E*,MS

Oklahoma

Hewlett-Packard Co.
P.O. Box 366
1503 W. Gore Blvd., Suite #2
LAWTON, OK 73502
Tel: (405) 248-4248
C

Hewlett-Packard Co.
P.O. Box 32008
304 N. Meridan Avenue, Suite A
OKLAHOMA CITY, OK 73107
Tel: (405) 946-9499
A*,CH,CM,E*,MS

Hewlett-Packard Co.
Suite 121
9920 E. 42nd Street
TULSA, OK 74145
Tel: (918) 665-3300
A**,CH,CM,CS,M*

Oregon

Hewlett-Packard Co.
1500 Valley River Drive, Suite 330
EUGENE, OR 97401
Tel: (503) 683-8075
C

Hewlett-Packard Co.
9255 S. W. Pioneer Court
WILSONVILLE, OR 97070
Tel: (503) 682-8000
A,CH,CM,CS,E*,MS

Pennsylvania

Hewlett-Packard Co.
1021 8th Avenue
King of Prussia Industrial Park
KING OF PRUSSIA, PA 19406
Tel: (215) 265-7000

Telex: 510-660-2670
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
111 Zeta Drive
PITTSBURGH, PA 15238
Tel: (412) 782-0400
A,CH,CM,CS,E,MP

South Carolina

Hewlett-Packard Co.
P.O. Box 6442
6941-0 N. Trenholm Road
COLUMBIA, SC 29260
Tel: (803) 782-6493
CH,CM,E,MS

Hewlett-Packard Co.
814 Wade Hampton Blvd.
Suite 10
GREENVILLE, SC 29609
Tel: (803) 232-0917
C

Tennessee

Hewlett-Packard Co.
P.O. Box 22490
224 Peters Road
Suite 102

KNOXVILLE, TN 37922
Tel: (615) 691-2371
A*,CH,CM,MS

Hewlett-Packard Co.
3070 Directors Row
MEMPHIS, TN 38131
Tel: (901) 346-8370
A,CH,CM,MS

Hewlett-Packard Co.
Suite 103
478 Craighead Street
NASHVILLE, TN 37204
Tel: (615) 383-9136
CM,MS**

Texas

Hewlett-Packard Co.
Suite 310W
7800 Shoal creek Blvd.
AUSTIN, TX 78757
Tel: (512) 459-3143
CM,E

Hewlett-Packard Co.
Suite C-110
4171 North Mesa
EL PASO, TX 79902
Tel: (915) 533-3555
CH,CM,E*,MS**

Hewlett-Packard Co.
5020 Mark IV Parkway
FORT WORTH, TX 76106
Tel: (817) 625-6361
CM,C*

Hewlett-Packard Co.
P.O. Box 42816
10535 Harwin Street
HOUSTON, TX 77036
Tel: (713) 776-6400
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
3309 67th Street
Suite 24
LUBBOCK, TX 79413
Tel: (806) 799-4472
M

Hewlett-Packard Co.
P.O. Box 1270
930 E. Campbell Rd.
RICHARDSON, TX 75081
Tel: (214) 231-6101
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
205 Billy Mitchell Road
SAN ANTONIO, TX 78226
Tel: (512) 434-8241
CH,CM,CS,E,MS

Utah

Hewlett-Packard Co.
3530 W. 2100 South Street
SALT LAKE CITY, UT 84119
Tel: (801) 974-1700
A,CH,CM,CS,E,MS

Virginia

Hewlett-Packard Co.
P.O. Box 9669
2914 Hungry Spring Road
RICHMOND, VA 23228
Tel: (804) 285-3431
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
P.O. Box 4786
3110 Peters Creek Road, N.W.
ROANOKE, VA 24015
Tel: (703) 563-2205
CH,CM,E**

Hewlett-Packard Co.
P.O. Box 12778
5700 Thurston Avenue
Suite 111
VIRGINIA BEACH, VA 23455
Tel: (804) 460-2471
CH,CM,MS

Washington

Hewlett-Packard Co.
15815 S.E. 37th Street
BELLEVUE, WA 98006
Tel: (206) 643-4000
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
Suite A
708 North Argonne Road
SPOKANE, WA 99206
Tel: (509) 922-7000
CH,CM,CS

West Virginia

Hewlett-Packard Co.
4604 MacCorkle Ave., S.E.
CHARLESTON, WV 25304
Tel: (304) 925-0492
A,CM,MS

Wisconsin

Hewlett-Packard Co.
150 S. Sunny Slope Road
BROOKFIELD, WI 53005
Tel: (414) 784-8800
A,CH,CM,CS,E*,MP

URUGUAY

Pablo Ferrando S.A.C. e.l.
Avenida Italia 2877
Casilla de Correo 370
MONTEVIDEO
Tel: 80-2586
Telex: Public Booth 901
A,CM,E,M
Guillermo Kraft del Uruguay S.A.
Av. Lib. Brig. Gral. Lavalleja 2083
MONTEVIDEO
Tel: 234588, 234808, 208830
Telex: 6245 ACTOUR UY
P

U.S.S.R.

Hewlett-Packard Co.
Representative Office
Pokrovsky Blvd. 4/17 KV12
MOSCOW 101000
Tel: 294-2024
Telex: 7825 HEWPACK SU

VENEZUELA

Hewlett-Packard de Venezuela C.A.
Apartado 50933
3A Transversal Los Ruices Norte
Edificio Segre
CARACAS 1071
Tel: 239-4133
Telex: 25146 HEWPACK
A,CH,CS,E,MS,P

YUGOSLAVIA

Iskra-Commerce-Representation of Hewlett-Packard
Sava Centar Delegacija 30
Milentija Popovica 9
11170 BEOGRAD
Tel: 638-762
Telex: 12042, 12322 YU SAV CEN
Iskra-Commerce-Representation of Hewlett-Packard
Kopraska 46
61000 LJUBLJANA
Tel: 321674, 315879
Telex:

ZAIRE

Computer & Industrial Engineering
25 Avenue de la Justice
B.P. 10-976
Kinshasha VZaire
GOMBE
Tel: 32063
Telex: 21-457 SGEKIN ZR
CH,CS

ZIMBABWE

Field Technical Sales
45 Kelvin Road, North
P.B. 3458
SALISBURY
Tel: 705 231
Telex: 4-122 RH
C,E,M,P

FOR COUNTRIES AND AREAS NOT LISTED:**CANADA**

Ontario
Hewlett-Packard (Canada) Ltd.
6877 Goreway Drive
MISSISSAUGA, Ontario L4V 1M8
Tel: (416) 678-9430
Telex: 610-492-4246

EASTERN USA

Maryland
Hewlett-Packard Co.
4 Choke Cherry Road
Rockville, MD 20850
Tel: (301) 258-2000

MIDWESTERN USA

Illinois
Hewlett-Packard Co.
5201 Tollview Drive
ROLLING MEADOWS, IL 60008
Tel: (312) 255-9800

SOUTHERN USA

Georgia
Hewlett-Packard Co.
P.O. Box 105005
450 Interstate N. Parkway
ATLANTA, GA 30339
Tel: (404) 955-1500

WESTERN USA

California
Hewlett-Packard Co.
3939 Lankersim Blvd.
LOS ANGELES, CA 91604
Tel: (213) 877-1282

EUROPEAN AREAS NOT LISTED, CONTACT

SWITZERLAND
Hewlett-Packard S.A.
7 Rue du Bois-du-Lan
CH-1217 MEYRIN 2, Switzerland
Tel: (022) 83-81-11
Telex: 27835 hpse
Cable: HEWPACKSA Geneve

EAST EUROPEAN AREAS NOT LISTED, CONTACT

AUSTRIA
Hewlett-Packard Ges.m.b.h.
Wehlstrasse 29
P.O. Box 7
A-1205 VIENNA
Tel: (222) 35-16-210
Telex: 135823/135066

MEDITERRANEAN AND MIDDLE EAST AREAS NOT LISTED, CONTACT

GREECE
Hewlett-Packard S.A.
Mediterranean & Middle East
Operations
32 Kifissias Ave.
Atrina Center
PARADISOS, Amaroussion
Tel: 808-1741-4
Telex: 21-6588 HPAT GR
Cable: HEWPACKSA Athens

INTERNATIONAL AREAS NOT LISTED, CONTACT

OTHER AREAS
Hewlett-Packard Co.
Intercontinental Headquarters
3495 Deer Creek Road
PALO ALTO, CA 94304
Tel: (415) 857-1501
Telex: 034-8300
Cable: HEWPACK

FOR COUNTRIES AND AREAS NOT LISTED, CONTACT:**AFRICA****NORTHERN AND CENTRAL AFRICA**

SWITZERLAND
Hewlett-Packard S.A.
7 Rue du Bois-du-Lan
CH-1217 MEYRIN 2, Switzerland
Tel: (022) 98-96-51
Telex: 27835 hpse
Cable: HEWPACKSA Geneve

ASIA

HONG KONG
Hewlett-Packard Asia Ltd.
6th Floor, Sun Hung Kai Center
30 Harbor Rd.
G.P.O. Box 795
HONG KONG
Tel: 5-832 3211
Telex: 66678 HEWPA HX
Cable: HP ASIA LTD Hong Kong

EUROPE**EASTERN EUROPE**

AUSTRIA
Hewlett-Packard Ges.m.b.h.
Wehlstrasse 29
P.O.Box 7
A-1205 VIENNA
Tel: (222) 35-16-210
Telex: 135823/135066

NORTHERN EUROPE

THE NETHERLANDS
Hewlett-Packard S.A.
Uilenstede 475
NL-1183 AG AMSTELVEEN, The Netherlands
P.O.Box 999
NL-1180 AZ AMSTELVEEN, The Netherlands
Tel: 20 437771

SOUTH EASTERN EUROPE

SWITZERLAND
Hewlett-Packard S.A.
7 Rue du Bois-du-Lan
CH-1217 MEYRIN 2, Switzerland
Tel: (022) 98-96-51
Telex: 27835 hpse
Cable: HEWPACKSA Geneve
(Offices in the World Trade Center)

MEDITERRANEAN AND MIDDLE EAST

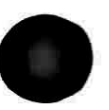
GREECE
Hewlett-Packard S.A.
Mediterranean and Middle East
Operations
Atrina Centre
32 Kifissias Ave.
Amaroussion, ATHENS, Greece
Tel: 808-0359 808-0429
Telex: 21-6588
Cable: HEWPACKSA Athens

OTHER INTERNATIONAL AREAS

Hewlett-Packard Co.
Intercontinental Headquarters
3495 Deer Creek Road
PALO ALTO, CA 94304
Tel: (415) 857-1501
Telex: 034-8300
Cable: HEWPACK
August 1981 5952-6900



2





**HEWLETT
PACKARD**