



**HEWLETT  
PACKARD**

**INSTALLATION MANUAL**

**7910  
DISC DRIVE**

Manual part no. 07910-90902

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**OPTIONS COVERED**

This manual covers option 015 as well as the standard HP 7910 Disc Drives.

The Federal Communications Commission (in 47 CFR 15.805) 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. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. 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.

# LIST OF EFFECTIVE PAGES

Changed pages are identified by a change number adjacent to the page number. Changed information is indicated by a vertical line in the margin of the page. Original pages (Change 0) do not include a change number. Insert latest changed pages and destroy superseded pages.

Change 0 (Original) ..... JUN 1981

All pages in this edition are original.

## NOTICE

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# SAFETY CONSIDERATIONS

## KEEP WITH MANUAL

**GENERAL** - This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation.

### SAFETY SYMBOLS



Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect the product against damage.



Indicates hazardous voltages.



Indicates earth (ground) terminal (sometimes used in manual to indicate circuit common connected to grounded chassis).

### WARNING

The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.

### CAUTION

The **CAUTION** sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a **CAUTION** sign until the indicated conditions are fully understood and met.

**SAFETY EARTH GROUND** - This is a safety class I product and is provided with a protective earthing terminal. An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and be secured against any unintended operation.

**BEFORE APPLYING POWER** - Verify that the product is configured to match the available main power source per the input power configuration instructions provided in this manual.

If this product is to be energized via an auto-transformer (for voltage reduction) make sure the common terminal is connected to the earth terminal of the main power source.

### SERVICING

#### WARNING

**Any servicing, adjustment, maintenance, or repair of this product must be performed only by service-trained personnel.**

**Adjustments described in this manual may be performed with power supplied to the product while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.**

**Capacitors inside this product may still be charged even when disconnected from its power source.**

**To avoid a fire hazard, only fuses with the required current rating and of the specified type (normal blow, time delay, etc.) are to be used for replacement.**

# CONTENTS

	Page		Page
Introduction .....	1	Tools .....	3
Unpacking and Inspection .....	1	Test Equipment .....	3
Manuals .....	1	Power Requirements .....	4
Equipment .....	1	AC Power Outlet and External Ground .....	4
Claims Procedure .....	1	Fuse Rating Check .....	4
Site Preparation .....	3	Voltage Select Switch .....	5
Environmental Requirements .....	3	Power Cord Installation .....	5
Cooling Requirements .....	3	Interconnection Instructions .....	8
Mounting Requirements .....	3	HP-IB Cabling .....	8
Installation Information .....	3	HP-IB Unit Address .....	8
Manual Updating .....	3	Installation Checks .....	8
Tools and Test Equipment Required .....	3	Repackaging for Shipment .....	8

# ILLUSTRATIONS

Title	Page	Title	Page
HP 7910H/HR Disc Drives .....	1	AC Power Cord Sets .....	7
Disc Drive Shipping Package .....	2	Maximum Cable Length for the HP-IB Channel .....	9
HP 7910H/HR Disc Drive Airflow .....	4	HP-IB Unit Address Switch and Self-Test Display Locations .....	10
Mounting the HP 7910HR Disc Drive .....	5		
HP 7910H/HR Disc Drive, Rear Panels .....	6		

# TABLES

Title	Page	Title	Page
Standard Tools .....	3	HP 7910H/HR Disc Drive Specifications .....	11

## 1. INTRODUCTION

This manual contains information needed for a normal initial set-up and check-out of the HP 7910H/HR Disc Drive. (See figure 1.) This section also contains information necessary for shipment of the disc drive; therefore, this manual should be retained for reference purposes. For disc drive servicing instructions, refer to the *HP 7910 Disc Drive Service Manual*, part no. 07910-90903.

## 2. UNPACKING AND INSPECTION

The disc drive is shipped in a reusable container. When the shipment arrives, ensure that the container has been received as specified by the carrier's bill of lading. Inspect the shipping container immediately upon receipt for evidence of mishandling during transit. If the container is damaged or water-stained, request that the carrier's agent be present when the container is unpacked.

If the container appears to be received in satisfactory condition, proceed with the unpacking instructions. The disc drive is unpacked as follows:

- a. Using a large screwdriver, remove the climp fasteners that secure the top of the container to the base. Set the top aside and retain the fasteners. (Refer to figure 2.)

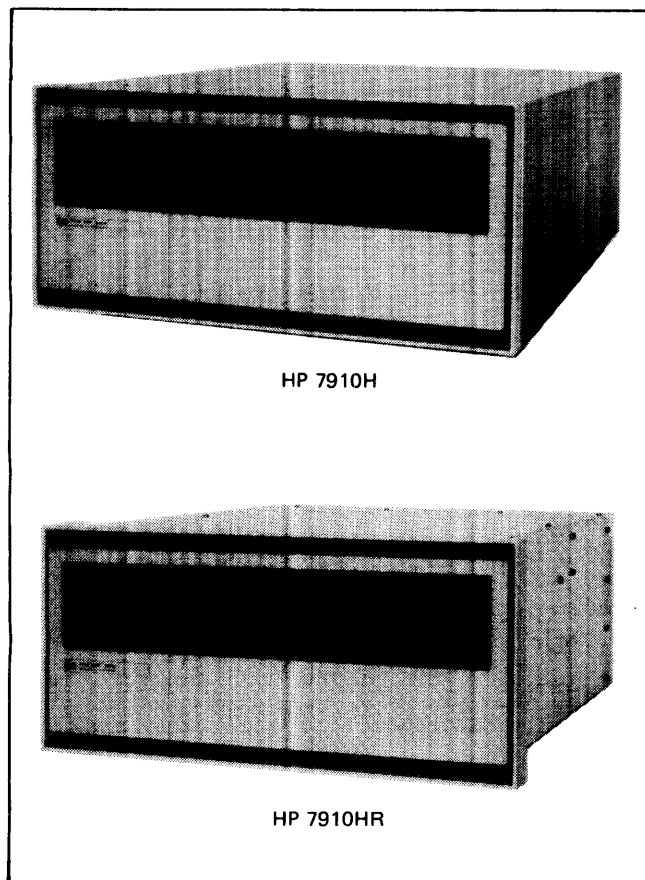


Figure 1. HP 7910H/HR Disc Drives

- b. Locate the packing list and compare this list against the purchase order to verify that the shipment is correct.
- c. Cut the polystrap banding.

### CAUTION

To avoid damage to the disc drive, avoid applying any sudden shocks to it.

- d. Lift the disc drive off the base and remove the plastic bag.
- e. Visually inspect the disc drive for damage.
- f. If a visual examination reveals any damage to the disc drive, follow the claims procedures described in paragraph 5.

Note: Retain the shipping container and packing material for future use.

## 3. MANUALS

Check to ensure that all manual(s) that are specified on the packing list have been received.

## 4. EQUIPMENT

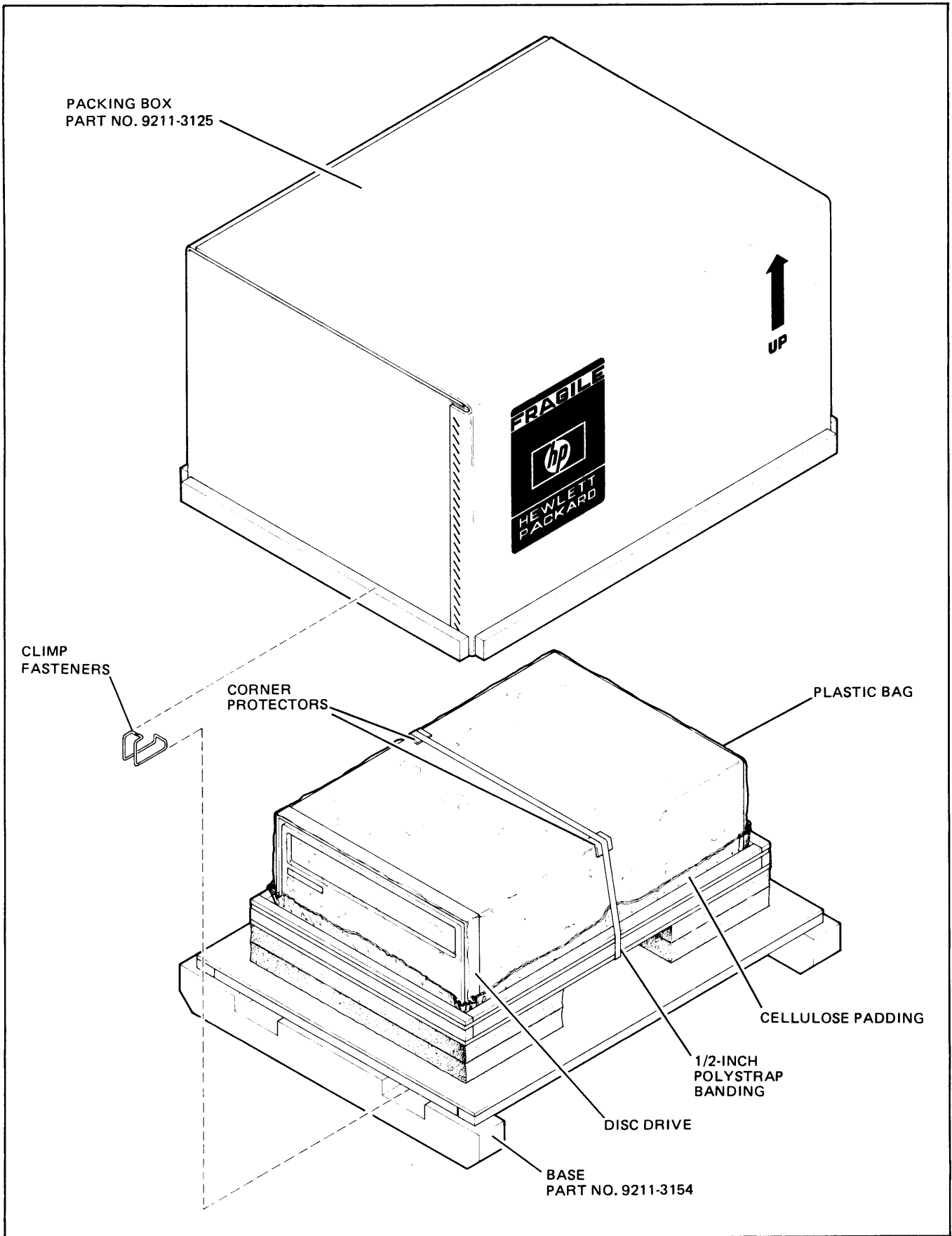
The disc drive model number and full serial number are stamped on an identification label affixed to the rear panel. Be sure to include the model number and serial number in any correspondence with Hewlett-Packard about this product.

## 5. CLAIMS PROCEDURE

### WARNING

To avoid dangerous electrical shock, do not apply power to the disc drive when there are signs of physical damage to any portion of the outer enclosure.

If the shipment is incomplete or if the equipment is damaged or fails to meet specifications, notify your nearest Hewlett-Packard Sales and Service office. If the damage occurred in transit, notify the carrier as well. Hewlett-Packard will arrange for replacement or repair without waiting for settlement of claims against the carrier. In the event of damage in transit, retain the shipping container(s) and packaging material for inspection.



REF 7314-29

Figure 2. Disc Drive Shipping Package

## 6. SITE PREPARATION

Site preparation information for the disc drive includes environmental, power, cooling, and mounting requirements. Each of these requirements is discussed in the following paragraphs.

### WARNING

**The disc drive does not contain operator-serviceable parts. To prevent electrical shock, refer all installation and maintenance activities to service-trained personnel.**

## 7. ENVIRONMENTAL REQUIREMENTS

### CAUTION

To avoid damage to the disc drive, ensure that it is operated within the limits specified in table 2.

The HP 7910H/HR Disc Drive has been designed to operate within the environmental limits specified in table 2. Table 2 contains power requirements and specifications as well as the environmental requirements for the disc drive.

## 8. COOLING REQUIREMENTS

A fan attached to the rear panel of the disc drive provides adequate ventilation when the disc drive is operated in an appropriate environment. (Refer to table 2.) As shown in figure 3, cooling air is drawn into the enclosure through the front and is exhausted through the fan attached to the rear panel.

Note: To obtain maximum cooling efficiency, ensure that the airflow through the front or rear of the disc drive is not restricted.

## 9. MOUNTING REQUIREMENTS

The HP 7910H Disc Drive is mounted in a freestanding enclosure and is intended for use on any flat stable surface (such as a table).

The HP 7910HR is designed for mounting in a standard 48.3 cm (19 in.) wide system cabinet (rack) such as an HP 29400-Series Cabinet or an HP 29420-Series Cabinet. Figure 4 illustrates that the HP 7910HR can be mounted using cabinet (rack) angles. After the HP 7910HR is installed in the cabinet, the front frame of the disc drive should be attached to the front of the cabinet.

## 10. INSTALLATION INFORMATION

The following paragraphs provide the necessary information to install the HP 7910H/HR Disc Drive. The information includes instructions on manual updating, tools and test equipment required for installation, ac outlet and external ground requirements, power cord information, and HP-IB considerations.

## 11. MANUAL UPDATING

Before installing the disc drive, read all updating supplements for the disc drive manuals and any related manuals. Updating supplements (if any) are provided with the appropriate manual.

## 12. TOOLS AND TEST EQUIPMENT REQUIRED

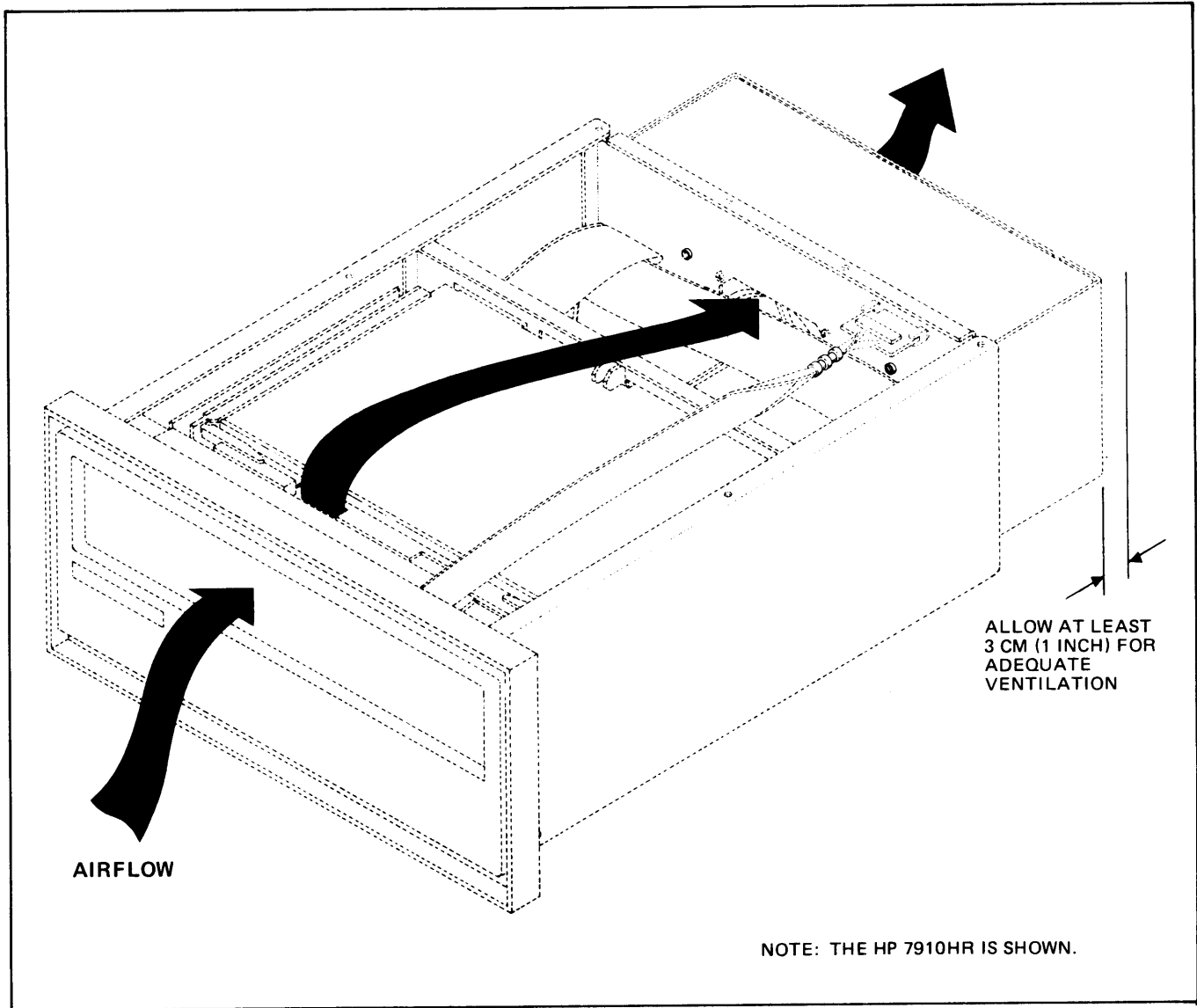
The following paragraphs describe the tools and test equipment required to install the disc drive.

**13. TOOLS.** No installation tools other than ordinary hand-tools are required. (Refer to table 1.)

**14. TEST EQUIPMENT.** A suitable ac voltmeter (HP 970A Digital Voltmeter, or equivalent battery-operated device suitable for measuring primary ac line voltage) is the only test equipment required for installation. The ac voltmeter is used to measure the voltage value of the ac power outlet.

Table 1. Standard Tools

TOOL	HP PART NO.
Pin extractor	8710-0688
Pliers, diagonal cutting	8710-0006
Pliers, long nose	8710-0016
Screwdriver, 4 x 1/4-inch	8730-0001
Screwdriver, 3 x 3/16-inch	8730-0019
Screwdriver, Pozidriv	8710-0900
Screwdriver, Pozidriv	8710-0899
Screwdriver, Pozidriv, stubby	----
Screwdriver, offset	----
Socket set, 1/4-inch drive	----
Soldering iron	8690-0011
Soldering iron tip	8690-0021
Steel rule, 6-inch	8750-0001
Wire strippers	8710-0058
Wrench, 7/16-inch box	8720-0017



REF 7314-31

Figure 3. HP 7910H/HR Disc Drive Airflow

**15. POWER REQUIREMENTS**

The HP 7910H/HR Disc Drive may be operated continuously from a single phase, primary power source of 100 or 120 Vac for the standard disc drive, or 220 or 240 Vac for option 015. The power source requirements are contained in table 2.

**16. AC POWER OUTLET AND EXTERNAL GROUND**

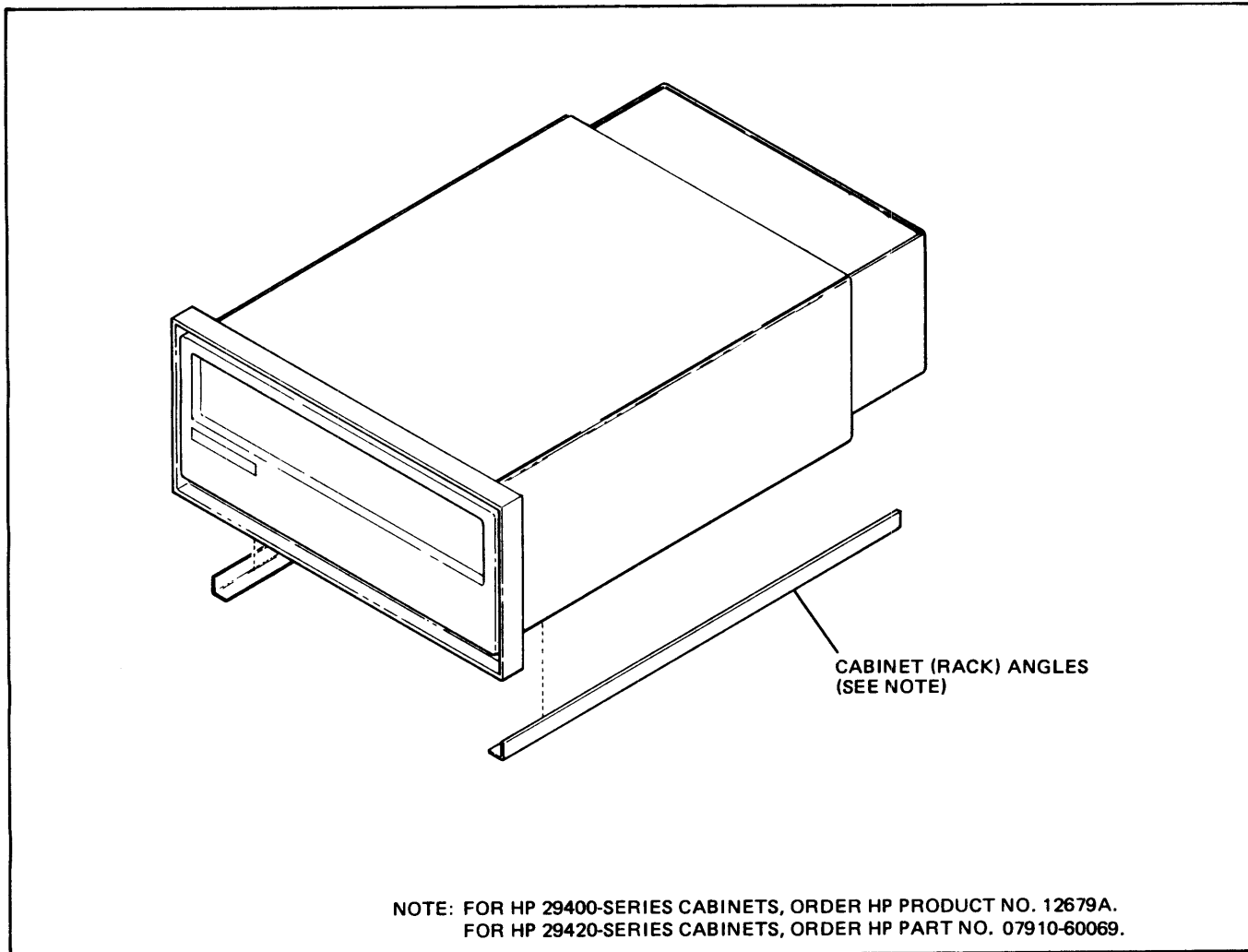
Have a qualified electrician check the power outlet with an ac voltmeter to ensure that the required voltage is present. (Refer to table 2.) Also, check the earth or safety ground, in the power outlet, to ensure that there is a good earth ground (properly earthed ac outlet).

**17. FUSE RATING CHECK**

The disc drive is equipped with one primary power fuse. Figure 5 calls out the location of the primary power fuse on the rear panel. The fuse value is dependent on the operating voltage; therefore, it should be checked to ensure it is the value shown in the following list:

OPERATING VOLTAGE (Vac)	FUSE DESCRIPTION	HP PART NO.
100	3A, 250V, slo-blo	2110-0029
120	3A, 250V, slo-blo	2110-0029
220	1.5A, 250V, slo-blo	2110-0304
240	1.5A, 250V, slo-blo	2110-0304





REF 7314-32

Figure 4. Mounting the HP 7910HR Disc Drive

**18. VOLTAGE SELECT SWITCH**

**CAUTION**

To avoid damage to the disc drive, ensure that the voltage select switch is set to the proper value.

As shown in figure 5, the voltage select switch is located on the rear panel of the disc drive. This switch should be set for the setting indicated below depending on the ac input voltage measured in paragraph 16.

DISC DRIVE VOLTAGE SELECT SWITCH SETTING	INPUT AC VOLTAGE RANGE (Vac, RMS; refer to paragraph 16)
100	90 to 105
120	108 to 126
220	198 to 231
240	216 to 252

**19. POWER CORD INSTALLATION**

Check the input ac voltage, fuse rating, and voltage select switch setting before proceeding with the power cord installation. The disc drive is supplied with an appropriate power cord. The various power cords available are shown in figure 6. To attach a power cord, proceed as follows:

**CAUTION**

Do not attempt to operate a disc drive configured for 100/120 Vac on 220/240 Vac or vice-versa. Damage to the disc drive may result.

- a. Set the line switch of the disc drive to the 0 (off) position.
- b. Plug the female end of the power cord into the ac power inlet connector at the rear of the disc drive. (Refer to figure 5.)

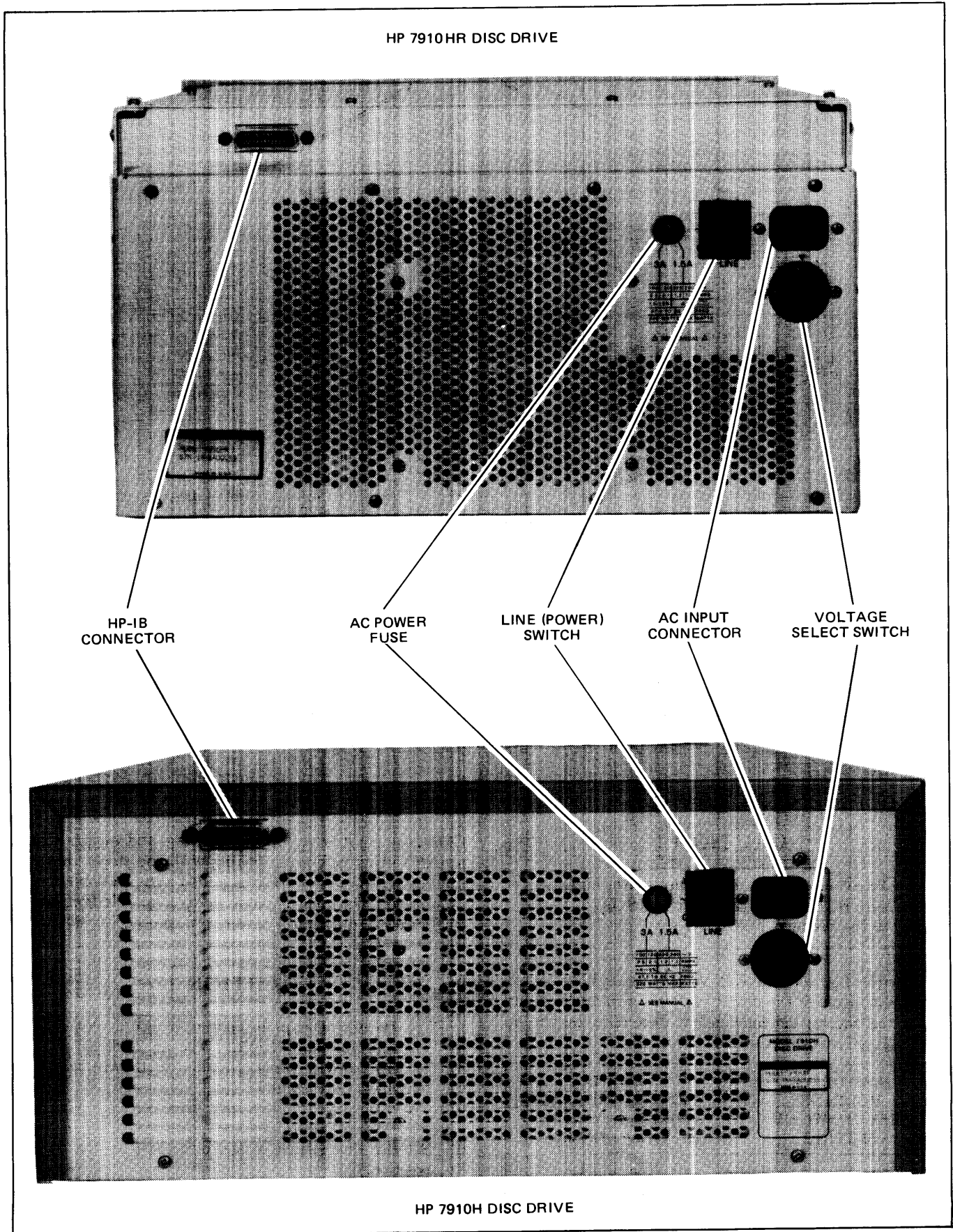
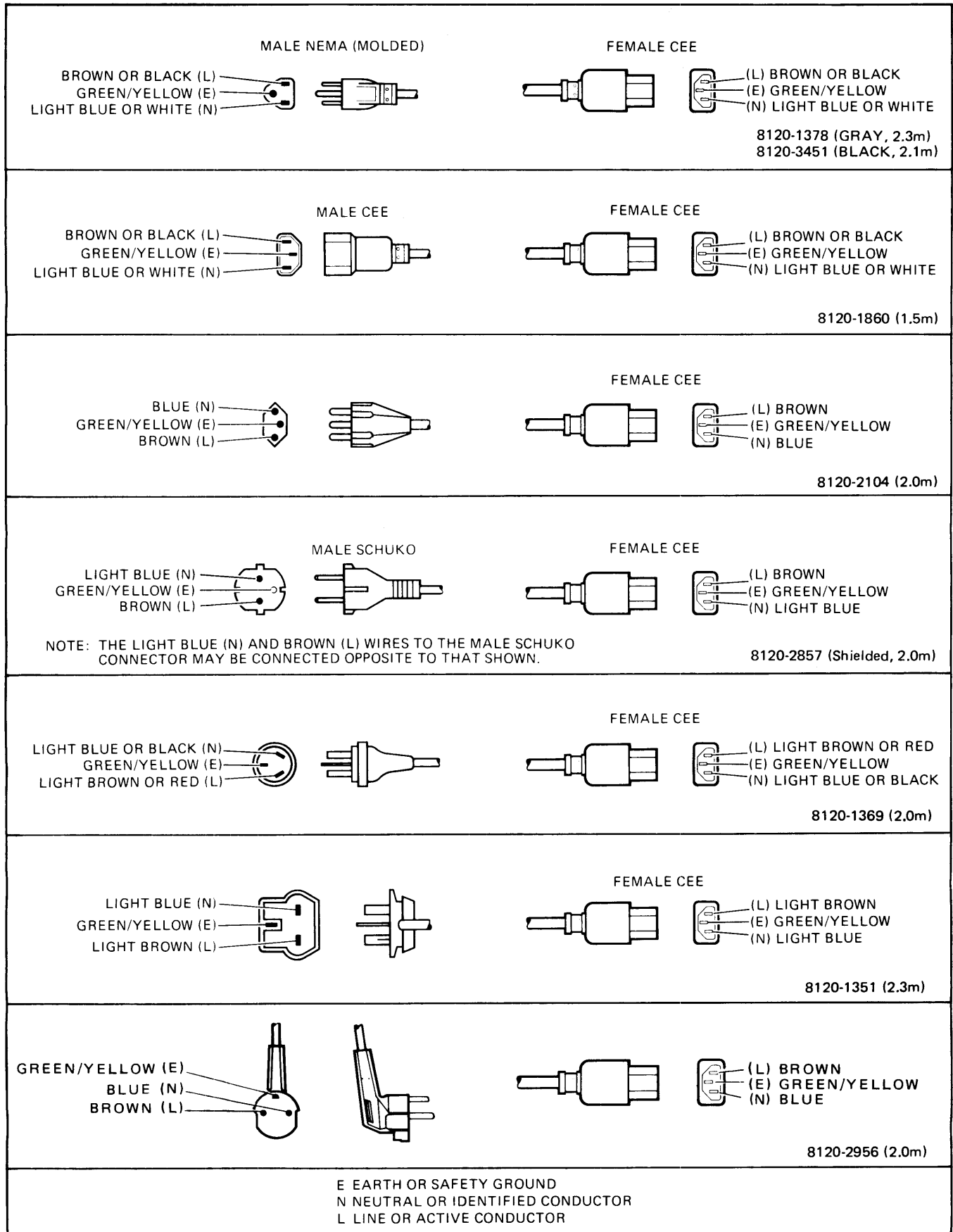


Figure 5. HP 7910H/HR Disc Drive, Rear Panels



REF 7311-1D

Figure 6. AC Power Cord Sets

**20. INTERCONNECTION INSTRUCTIONS**

**CAUTION**

Do not connect or disconnect HP-IB cable with power applied to the 7910.

The interconnection of the disc drive to a system through the Hewlett-Packard Interface bus (HP-IB) cable (HP Model No. 10833B) is dependent on the system. The location of the HP-IB connector for the HP 7910H/HR is shown in figure 5. The major HP-IB considerations concerning the HP 7910 Disc Drive are contained in the following paragraphs.

**21. HP-IB CABLING.** The Hewlett-Packard Interface Bus (HP-IB) has certain rules which must be followed for a successful installation of the HP 7910 Disc Drive. The disc drive must be installed in a system which conforms to the following rules:

- The total number of HP-IB equivalent loads connected to the HP-IB channel must not be more than 15.

Note: This restriction limits the resistive loading on the HP-IB channel. Some devices are considered more than one HP-IB equivalent load.

- The maximum cable length is restricted and depends on the number of HP-IB equivalent loads connected to the HP-IB channel.

Note: This restriction limits the capacitive loading on the HP-IB channel.

If the number of HP-IB equivalent loads is less than 10, the following formula determines the maximum HP-IB cable length. (Refer to figure 7.)

$$\left[ \begin{array}{l} \text{Total Number of} \\ \text{HP-IB Equivalent} \\ \text{Loads on the} \\ \text{HP-IB Channel} \\ \text{(less than 10)} \end{array} \right] \times \left[ \begin{array}{c} 2 \\ \text{metres} \end{array} \right] = \left[ \begin{array}{l} \text{Maximum Cable} \\ \text{Length for the} \\ \text{HP-IB Channel} \\ \text{(in metres)} \end{array} \right]$$

If there are 10 to 15 HP-IB equivalent loads, the maximum cable length for the HP-IB channel is 20 metres.

Note: This rule applies only to the maximum cable length of the HP-IB channel, not how the cable is distributed between the devices.

It is important to note that the HP 7910 Disc Drive is considered as one HP-IB equivalent load when the disc drive is connected to the HP-IB channel.

**22. HP-IB UNIT ADDRESS.** The HP 7910 Disc Drive has a thumbwheel switch on controller PCA-A2 (see figure 8) which sets the HP-IB unit address for the disc drive. To check the position of the thumbwheel switch, proceed as follows:

- a. Remove the front panel from the disc drive. To remove the panel, pull on the bottom of the panel in the place indicated in figure 8.
- b. Check the HP-IB unit address switch and ensure that no two devices in the system have the same unit address.
- c. If the unit address must be changed, remove the printed circuit assembly (PCA) access cover and rotate the thumbwheel switch to the desired position. Replace the PCA access cover after the switch has been set.
- d. Leave the front panel off so that self test can be checked. (Refer to paragraph 23.)

Note: The PCA access cover acts as a radio frequency interference (RFI) shield for the disc drive. If the PCA access cover is not replaced, the level of the RFI from the disc drive will increase.

**23. INSTALLATION CHECKS**

After the disc drive has been installed and the power connections are made, visually inspect the installation. After the visual inspection, apply power to the disc drive and ensure that the disc drive passes self test. The disc drive passes self test, if after 45 seconds the \*LED is lit and all other LED's on controller PCA-A2 are off. (Refer to figure 8.) If the disc drive does not pass self test, refer to the *HP 7910 Disc Drive Service Manual*, part no. 07910-90903, for the repair procedure.

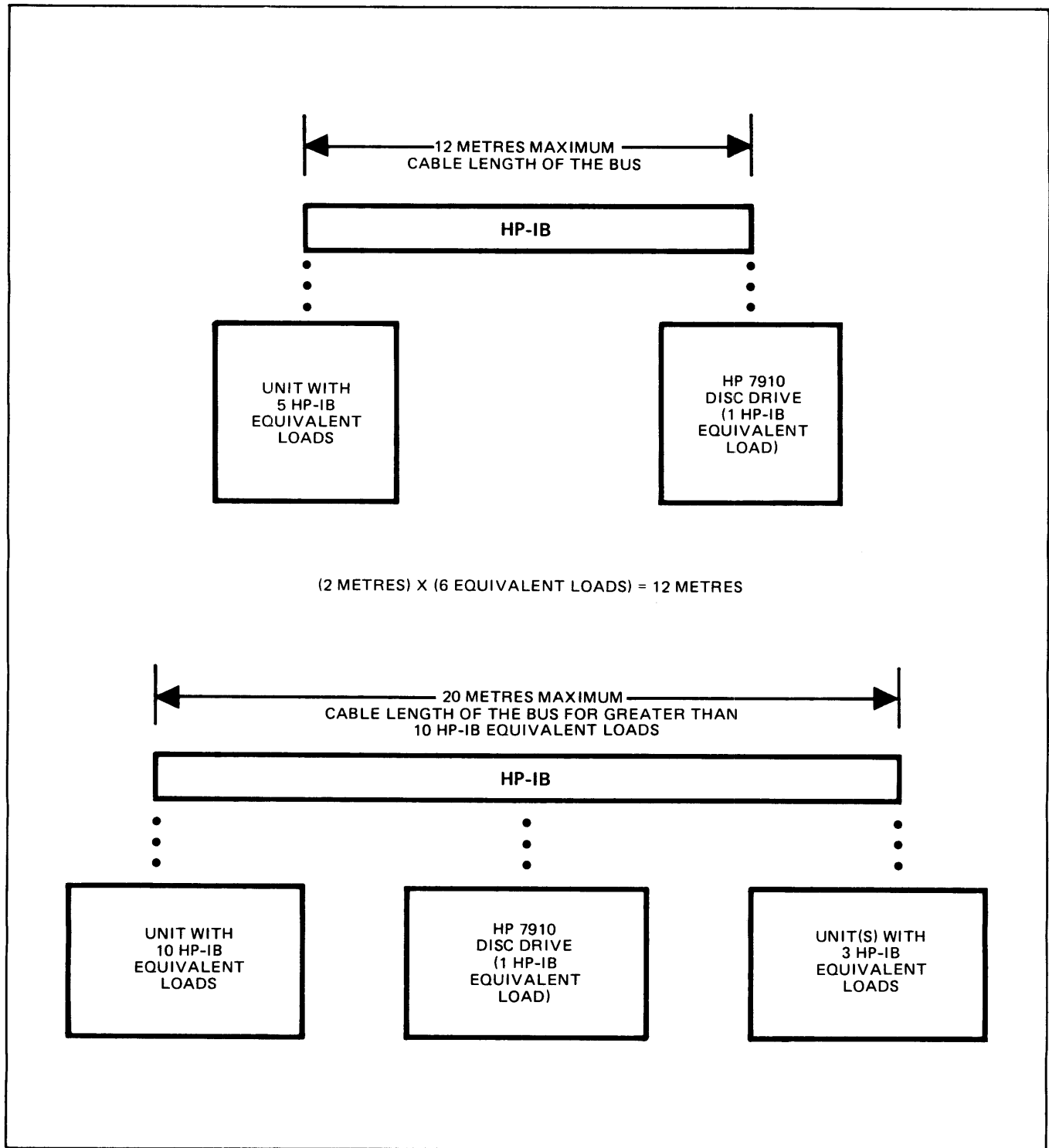
**CAUTION**

Do not connect or disconnect HP-IB cable with power applied to the 7910.

Place the front panel back on the disc drive, remove power, connect the HP-IB cable to the HP-IB channel, and re-apply power.

**24. REPACKAGING FOR SHIPMENT**

When the disc drive requires repackaging for shipment, use the original container and packing material. If the container is not available, consult your local Hewlett-Packard Sales and Service office to obtain a shipping container. Before shipment, the container (or equipment) should have a tag identifying the owner and the service or



7314-39

Figure 7. Maximum Cable Length for the HP-IB Channel

repair to be performed. Include the equipment model number and full serial number.

- a. Place the cellulose padding on the base. (Refer to figure 2.)
- b. Place the disc drive in a plastic bag and put it on the base.

- c. Secure the disc drive to the base using 1/2-inch poly-strap banding.
- d. Secure the top of the container to the pallet using eight climp fasteners.

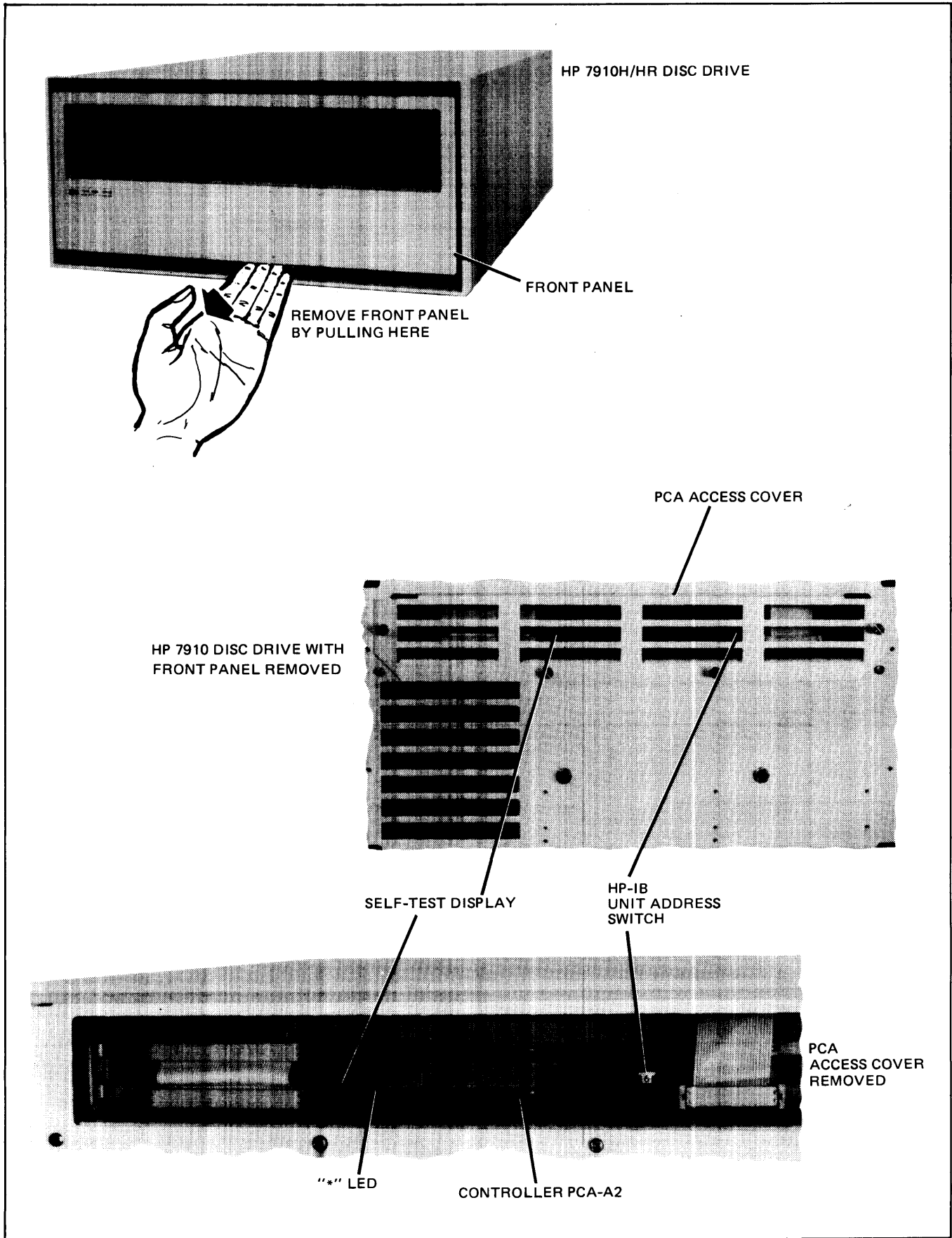


Figure 8. HP-IB Unit Address Switch and Self-Test Display Locations

Table 2. HP 7910H/HR Disc Drive Specifications

<b>Functional specifications</b>		<b>Relative humidity</b>	
<b>Capacity</b>		Operating:	8% to 80%
Formatted:	12.09 Mb	Non-operating:	8% to 80%
Tracks per surface* (2 surfaces):	735 + 3 spares	<b>Altitude</b>	
Bytes per track:	8192	Operating:	Sea level to 4 572 m (15,000 ft)
<b>Seek Times</b>		Non-operating:	Sea level to 15 240 m (50,000 ft)
Average track-to-track:	10 ms	<b>Physical characteristics</b>	
Average random:	70 ms	<b>Dimensions</b>	
Average full-stroke (748 tracks):	100 ms	<b>7910H</b>	
<b>Rotation</b>		Height:	22.2 cm (8.75 in.)
Speed:	3000 rpm	Width:	48.3 cm (19.0 in.)
Average rotational delay (latency):	10 ms	Depth:	68.0 cm (25.75 in.)
<b>Transfer rates</b>		<b>7910HR</b>	
Average, unbuffered:	410 kb/s	Height:	23.7 cm (9.31 in.)
Burst, unbuffered:	526.5 kb/s	Width:	48.3 cm (19.0 in.)
Maximum Buffered – reading:	100 kb/s	Depth:	68.6 cm (27.0 in.)
Average Buffered – reading:	12.8 kb/s	<b>Net weight</b>	
Maximum Buffered – writing:	20 kb/s	7910H:	38.6 kg (85 lb)
Average Buffered – writing:	12.8 kb/s	7910HR:	35.9 kg (79 lb)
* Up to 10 additional tracks per surface may be spared at the factory's option, and are not included in the capacity figures.		<b>Power requirements</b>	
<b>Environmental specifications</b>		100/120/220/240 Vac (+5%, –10%), switch selectable on rear panel.	
<b>Temperature</b>		Frequency:	47.5 to 66 Hz, single phase
Operating:	0° to 45°C (32° to 113°F)	Average power:	190 watts
Non-operating:	–40° to 65°C (–40° to 149°F)	<b>Safety</b>	
Max. rate of change:	10°C/hr (18°F/hr)	The 7910H and 7910HR disc drives are UL listed and CSA certified, except for Option 015.	
Max. operating wet bulb temperature:	25°C (79°F)		