



# INSTALLATION MANUAL

## 7920

### DISC DRIVE

Manual part no. 07920-90901  
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#### MODELS COVERED

The main part of this manual covers the HP 7920 Disc Drive. Appendix A covers the HP 7920H Disc Drive.

#### OPTIONS COVERED

This manual covers option 015 as well as the standard HP 7920 Disc Drive. This manual covers the model 7920A and the 7920B Disc Drives.

#### FOR U.S.A. ONLY

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 Insert latest changed pages and destroy superseded pages.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) ..... JUL 1982

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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.**

## 1. INTRODUCTION

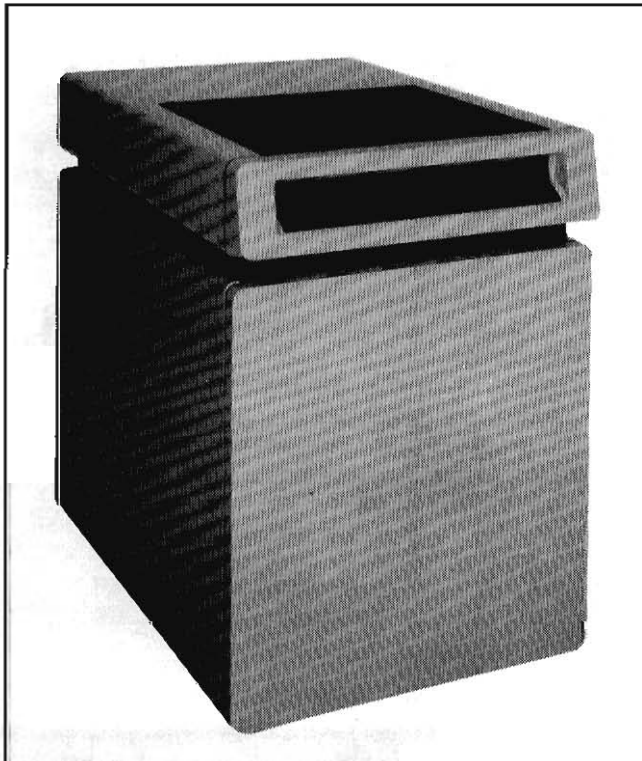
This manual contains information needed for a normal initial set-up and check-out of the model 7920A and model 7920B Disc Drive. (See figure 1.) The manual also contains information necessary for shipment of the disc drive, therefore, this manual should be retained for reference purposes. For disc drive operating instructions, refer to the *HP 7920 Disc Drive Operator's Manual*, part no. 07920-90030. For servicing instructions, refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902 or *HP 7920A Operating and Service Manual*, part no. 07920-90001.

## 2. UNPACKING AND INSPECTION INSTRUCTIONS

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 knife or scissors, remove the polystrap that secures the top of the container to the base. (See figure 2.)



REF 7301-1

Figure 1. HP 7920 Disc Drive

- b. Locate the packing list and compare this list against the purchase order to verify that the shipment is correct.
- c. Remove the ramp and foam shipping pads.
- d. Remove the bolt which secures the retaining member to the base.
- e. Secure the ramp on the pins provided. Ensure that the beveled end of the ramp faces downward.

### WARNING

To avoid personal injury when moving the disc drive off the container base, do not position any part of the body in the path of the disc drive movement.

### CAUTION

To avoid damage from a "runaway" condition when moving the disc drive off the container base, position a handler on each side of the disc drive.

- f. Move the disc drive off the container base and onto the floor using the ramp.
- g. Remove the plastic bag from the disc drive.
- h. Inspect the disc drive for damage such as dented corners, surface scratches, and loose components.
- i. Open the front and rear doors and further inspect the unit for any damage such as broken controls, fuseholders, or loose components. If "M" version disc drive, remove ethafoam vibration damper from between the air filter housing and controller.
- j. If visual examination reveals any damage to the disc drive, follow the claims procedure described in paragraph 5. Retain the shipping container and packing material for re-packaging.

## 3. MANUALS

Check to ensure that all manuals 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. The disc drive model number is important to note because there are variations in the installation instruc-

tions depending on whether the model number is 7920A or 7920B. Be sure to include the model number and serial number in any correspondence with Hewlett-Packard about this product.

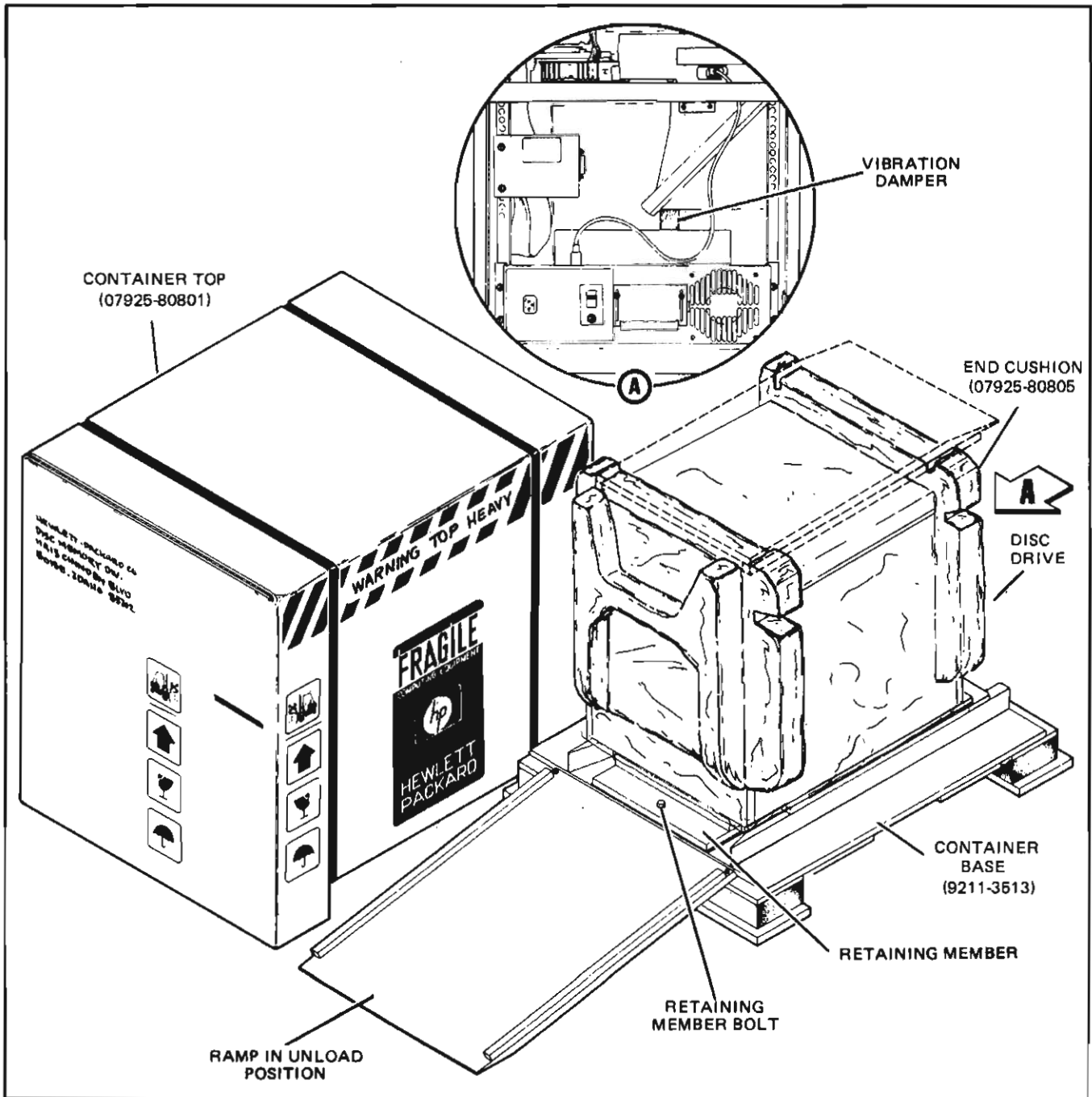
### 5. CLAIMS PROCEDURE

#### 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 Support Office. If 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 7604-5B

Figure 2. Unpacking the Disc Drive

## 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

**This 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

The disc drive has been designed to operate with an air inlet temperature range of 10°C to 40°C (50°F to 104°F) with the rate of temperature change not to exceed 20 Celsius degrees (36 Fahrenheit degrees) per hour. It is expected that the disc packs to be used will be stored at the same room temperature at which the disc drive is operating.

The HP 13394A Disc Pack can provide reliable data exchange in an HP 7920 Disc Drive only if the disc drive is operated in a temperature range of  $\pm 15^{\circ}\text{C}$  ( $\pm 27^{\circ}\text{F}$ ) of the temperature at which the heads were aligned.

Note: The disc pack must be operated in the range of 10°C to 40°C (50°F to 104°F).

## 8. COOLING REQUIREMENTS

A blower provides adequate ventilation to the power board when the disc drive is operated in an appropriate environment. (Refer to paragraph 7.) Cooling air is drawn into the enclosure through the front door plenum and is exhausted through vents on the rear door. Air entering the enclosure is directed through a plenum and prefilter to the heatsink on power and motor regulator PCA-A9, and additionally filtered air to the discs. The air filtration system purges the cooling air, to the discs, of 99 percent of contaminants 0.3 micron or larger. An exhaust blower, mounted on the power panel assembly, provides additional cooling for the enclosure.

Note: To obtain maximum cooling efficiency, ensure that the back of the disc drive is at least 50 cm (20 in.) from any object or barrier.

## 9. MOUNTING REQUIREMENTS

The disc drive is mounted in a free-standing enclosure which requires only that the entire unit be moved to the desired location. The unit should be located to provide adequate air circulation at the front and rear doors. Also, allow adequate clearance to open the doors fully. (See figure 3.)

When positioned, adjust the four feet on the bottom of the unit to relax the "dead-weight" strain from the casters and to provide a more stable foundation than casters normally provide. Place a level on the top of the disc drive and adjust the feet to ensure that the top of the unit is level. Place the level along both the depth and width of the disc drive.

Note: Front-to-back tilt and side-to-side tilt must be less than 20 degrees.

## 10. INSTALLATION INFORMATION

The following paragraphs provide the necessary information to install the disc drive. The information includes manual updating information, a list of tools and test equipment required for installation, an outlet and external ground requirements, a fuse rating check, power cord information, and interconnection instructions.

## 11. MANUAL UPDATING

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

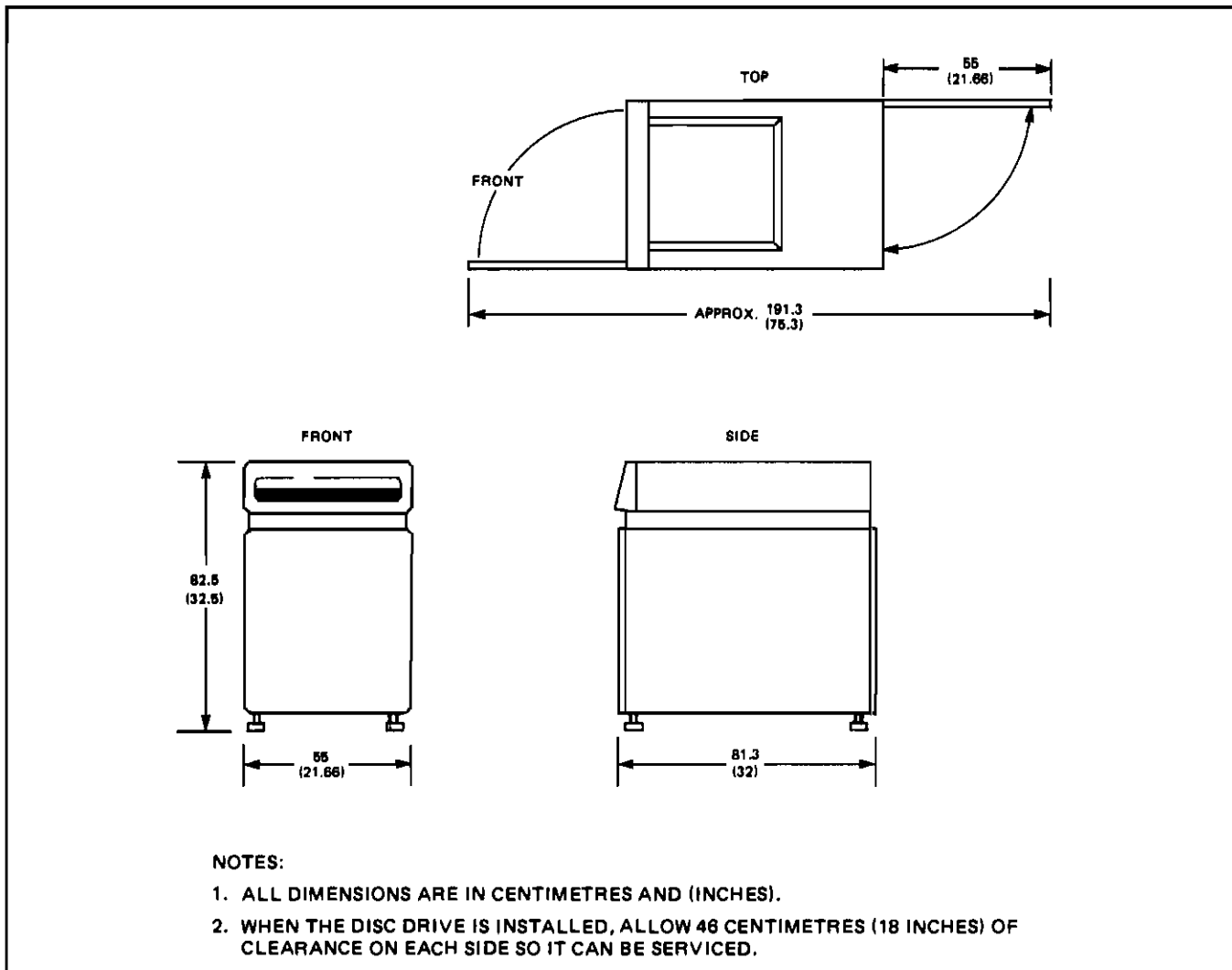
## 12. TOOLS AND TEST EQUIPMENT REQUIRED

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), the CE Alignment Pack (product no. 13398A), and the Customer Service Kit (product no. 19906A) or the equivalent, are the only test equipment required for installation. The ac voltmeter is used to verify the adequacy of the ac power outlet to be used and the Disc Service Unit (DSU) (in the Customer Service Kit) is used to verify the alignment of certain adjustable parameters.





7301-5B

Figure 3. HP 7920 Disc Drive Dimensions

### 15. POWER REQUIREMENTS

The 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 with a maximum power consumption of 475 watts. (Refer to table 1.)

**Note:** If a controller is installed in the enclosure, maximum power consumption for both units is 710 watts.

#### IMPORTANT NOTICE

The disc drive power panel assembly and power supply are wired at the factory for either 120 Vac or 240 Vac (Option 015) input voltage. The label on the back of the enclosure denotes the wiring configuration. (Refer to figure 4.) The 120 Vac configuration can be changed to 100 Vac operation and the 240 Vac configuration

can be changed to 220 Vac by changing the strapping on the power supply terminal board TB1. The 240 Vac power panel assembly may require a power cord change to adapt to the different power outlet. *No other wiring configurations are permissible.*

#### WARNING

**To avoid personal injury, disconnect the power cord from the power source before changing a strapping configuration.**

If the primary power source is other than that noted on the power identification label, remove the power cord from the ac mains power, remove the shroud from the enclosure, and change the strapping configuration of terminal board TB1 on the power supply assembly to correspond with your requirements. Figures 5 and 6 depict and provide instructions for changing the strapping on terminal board TB1.

Table 1. Standard Tools

TOOL	HP PART NO.
Alcohol, isopropyl (filtered)*	8500-0559
Bit, 1/4-inch drive, hex key	8710-0664
Bit, 1/4-inch drive, Pozidriv #1	8710-0915
Bit, 1/4-inch drive, Pozidriv #2	8710-0903
Bit, 1/4-inch drive, slotted	8710-0669
Bit, 1/4-inch drive (used with part no. 1535-2653)	1535-2652
Cleaning sleeves (including cleaning handle)*	9310-5074
Extension bar (used with part no. 8710-1139)	8710-1132
Gauge set, 0.0015 - 0.025 inch	8750-0053
Hex head driver (used with part no. 8710-1139)	8710-1145
Inspection mirror	8630-0005
Kimwipe tissues*	9300-0001
Lubricant*	6040-0084
Pin extractor	8710-0688
Pliers, diagonal cutting	8710-0006
Pliers, long nose	8710-0016
Q-tips	8520-0023
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
Tape, masking	0460-0030
Wire stripper	8710-0058
Wrench, 7/16-inch box	8720-0017
Wrench, torque, 0 - 12 inch-pounds	1535-2853
Wrench, torque, 30 - 200 inch-pounds	8710-1007

\*Do not substitute.

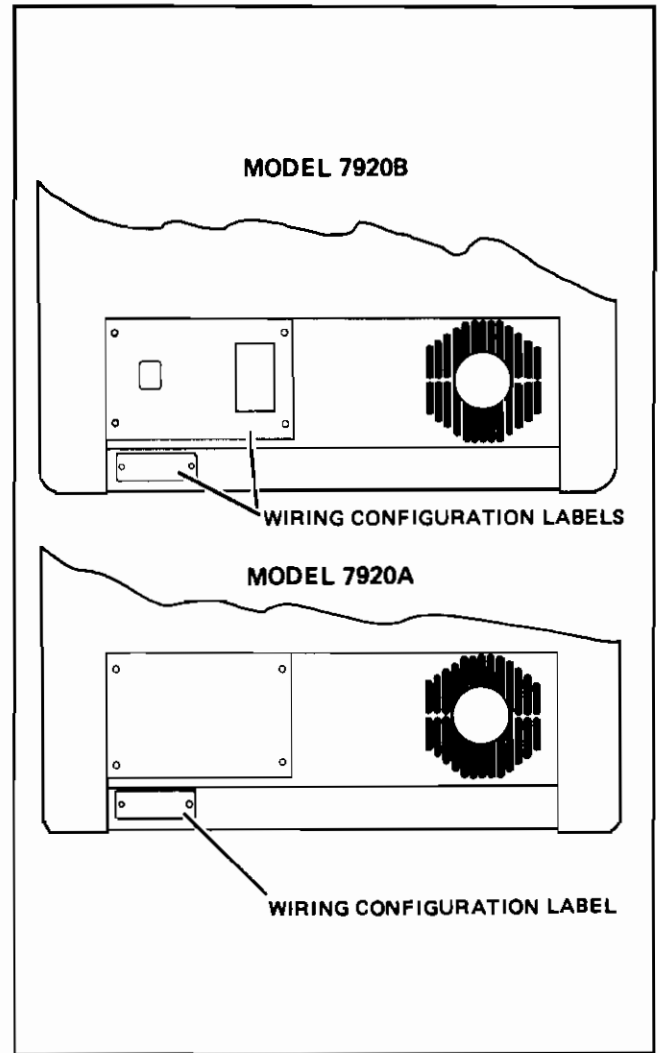
**WARNING**

Isopropyl alcohol is a restricted article (flammable liquid). Transport in accordance with Department of Transportation Regulations, Title 49, parts 171 - 177 (Hazardous Materials).

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

The female power outlet, that will be used to supply ac power to the power panel assembly in the disc drive enclosure, must be checked by a qualified electrician to ensure that the proper voltage is available to the disc drive. The outlet and its associated wiring and circuit breakers must be capable of carrying the current specified in table 2.

Have a qualified electrician check the power outlet with an ac voltmeter to ensure that the required single-phase



REF 7301-79

Figure 4. Wiring Configuration Label

voltage is present. Also, check the earth or safety ground, in the power outlet, to ensure that there is a good earth ground (properly earthed ac outlet). Ensure that input voltage ranges are those specified at upper right for each disc drive:

Disc Drive Operating Voltage (VAC, +5, -10%)	Input AC Voltage Range (VAC, RMS)
100	90 to 105
120	108 to 126
220	198 to 231
240	216 to 252

Bear in mind that the electrical load imposed by the disc drive may reduce the voltage below the non-load value. If the line voltage is not within the correct range, have the electrician check the power outlet to ensure that it is wired correctly with respect to ac high potential (L), ac neutral (N), and earth ground (E). If the outlet is wired improperly, corrections must be made by a qualified electrician. Local electrical codes must be observed if the installation is inside a building.

Table 2. Electrical Characteristics

VOLTAGE AC VOLTS, RMS	7920S				7920M			
	OPERATING <sup>1</sup>		MAXIMUM <sup>2</sup>		OPERATING <sup>1</sup>		MAXIMUM <sup>2</sup>	
	CURRENT AMPERES, RMS	POWER (WATTS)	CURRENT AMPERES, RMS	POWER (WATTS)	CURRENT AMPERES, RMS	POWER (WATTS)	CURRENT AMPERES, RMS	POWER (WATTS)
100	6.0	460	7.2	590	8.6	660	7.2	800
120	5.2	475	6.2	590	7.5	700	6.0	810
220	2.9	460	3.5	580	4.3	700	4.6	820
240	2.8	470	3.2	580	4.0	710	4.4	820

Notes: 1. The operating readings were measured under the following operating conditions:  
 a. Line frequency: 60 Hz for 100 Vac and 120 Vac, 50 Hz for 220 Vac and 240 Vac.  
 b. Disc Drive operation — alternate seeks between widely separated tracks with 25 ms delay between seeks.  
 2. The maximum readings were measured under the following operating conditions:  
 a. Line frequency: 60 Hz for 100 Vac and 120 Vac, 50 Hz for 220 Vac and 240 Vac.  
 b. Disc Drive operation — spindle startup, excluding 60A, 5 ms inrush transient turn-on current.

**17. FUSE RATING CHECK**

The disc drive is equipped with one primary power fuse (F1) and ten secondary fuses (F2 through F9, A9F1 and A9F2).

**WARNING**

Observe the warning label affixed to the power panel assembly for the 7920B (operator panel for the 7920A) when replacing the primary power fuse. Be sure to disconnect the power cord from the power source before changing any fuse.

The primary power fuse is located on the power panel (operator panel for the 7920A). Check to ensure that the rating of the primary power fuse conforms to that specified in table 3.

Eight of the secondary fuses are located at the rear of the power assembly and the other two are located on the power and motor regulator PCA-A9. Ensure that each fuse rating is that specified in table 4.

**18. POWER CORD INSTALLATION**

Check the input ac voltage and the fuse ratings before proceeding with the power cord installation. The disc drive may be equipped with one of two types of power panel assembly. To attach a power cord on a 7920B disc drive, proceed to step a. To install a power cord on a 7920A disc drive with serial number prefix prior to 1740, proceed to step b. To attach a power cord on a 7920A disc drive with serial number prefix 1740 or greater, proceed to step c.

- a. For a 7920B disc drive, the power panel assembly is supplied with an appropriate power cord. The various option 015 power cords available are shown in figure 7. To attach a power cord, proceed as follows:

**CAUTION**

Do not attempt to operate a disc drive configured for 120 Vac on 240 Vac or a disc drive configured for 240 Vac on 120 Vac. Damage to the disc drive may result.

- (1) Set the power switch to the 0 (off) position.
- (2) Plug the female end of the power cord into the ac power inlet in the rear of the disc drive.
- (3) Connect the power cable to a suitable mains power source.
- b. The power panel assembly, part no. 02940-60157, is supplied with a standard 120 Vac hardwired power cord. For the option 015 power panel, part no. 02940-60156, the power cord must be installed locally. To install a power cord, proceed as follows:

**WARNING**

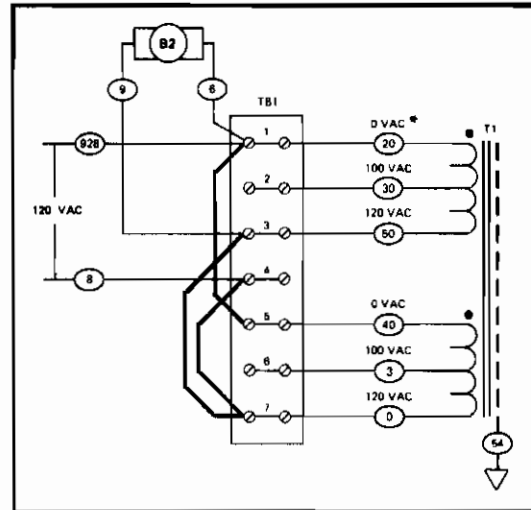
The following must be performed by a qualified electrician. Use extreme caution when connecting the disc drive to the mains power source. Connect the power cable to the disc drive first then connect it to the power source. Heed all "WARNING" signs on equipment.

IF YOUR DISC DRIVE IS CONFIGURED FOR 120 VAC, THE REVERSIBLE POWER IDENTIFICATION LABEL WILL READ AS FOLLOWS, DEPENDING ON THE TYPE OF DISC DRIVE:

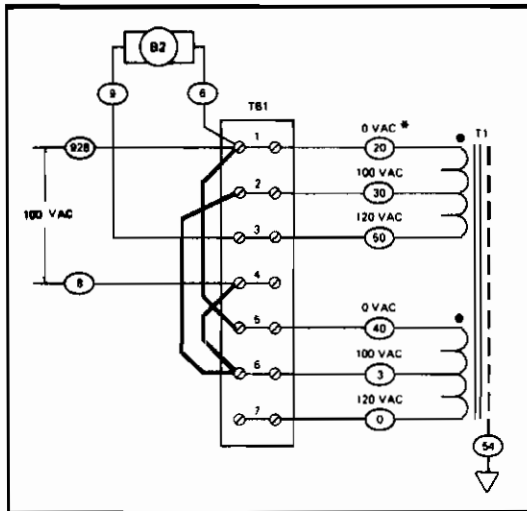
**7920S ~ LINE**  
 120V + 5 - 10%  
 475 WATTS MAX.  
 5.2A MAX.  
 47.5-66Hz

**7920M ~ LINE**  
 120V + 5 - 10%  
 700 WATTS MAX.  
 7.5A MAX.  
 47.5-66Hz

AND TERMINAL BOARD TB1 IS STRAPPED LIKE THIS.



TO CHANGE OPERATING VOLTAGES FROM 120 VAC TO 100 VAC, FIRST REMOVE THE POWER IDENTIFICATION LABEL. THEN STRAP TERMINAL BOARD TB1 AS SHOWN.



\* THIS POINT IS NOT AT ZERO POTENTIAL WITH RESPECT TO THE CABINET. THIS POINT IS AT ZERO POTENTIAL WITH RESPECT TO POINT 928.

THEN REVERSE AND REPLACE THE LABEL, ENSURING THAT IT READS LIKE ONE OF THESE, DEPENDING ON THE TYPE OF DISC DRIVE.

**7920S ~ LINE**  
 100V + 5 - 10%  
 460 WATTS MAX.  
 6.0A MAX.  
 47.5-66Hz

**7920M ~ LINE**  
 100V + 5 - 10%  
 680 WATTS MAX.  
 8.8A MAX.  
 47.5-66Hz

NOTE ENCIRCLED NUMBERS INDICATE WIRING COLOR CODE AS FOLLOWS



COLOR	1 <sup>ST</sup> DIGIT A	2 <sup>ND</sup> DIGIT B	3 <sup>RD</sup> DIGIT C
BLACK	0	0	0
BROWN	1	1	1
RED	2	2	2
ORANGE	3	3	2
YELLOW	4	4	4
GREEN	5	5	5
BLUE	6	6	6
VIOLET	7	7	7
GREY	8	8	8
WHITE	9	9	9

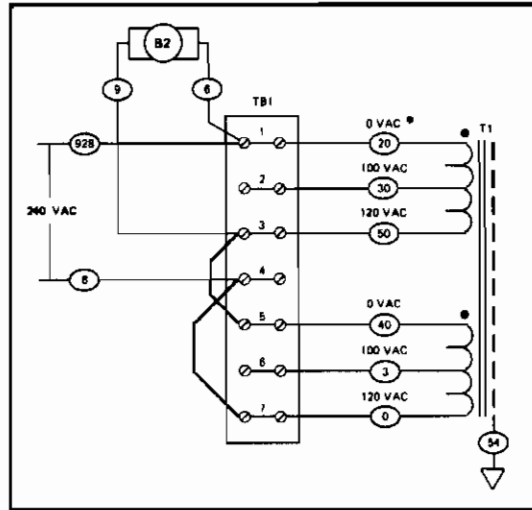
Figure 5. Strapping Configurations for 120 Vac and 100 Vac

IF YOUR DISC DRIVE IS CONFIGURED FOR 240 VAC, THE REVERSIBLE POWER IDENTIFICATION LABEL WILL READ AS FOLLOWS, DEPENDING ON THE TYPE OF DISC DRIVE:

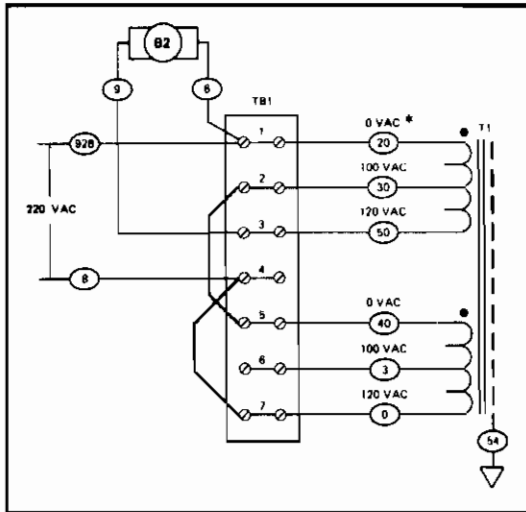
~LINE  
7920S 240V~ 50Hz  
470 WATTS MAX. 2.8A MAX.  
OPERATING RANGE  
218V~ -252V~ 47.5-66Hz

~LINE  
7920M 240V~ 50Hz  
710 WATTS MAX. 4.0A MAX.  
OPERATING RANGE  
218V~ -252V~ 47.5-66Hz

AND TERMINAL BOARD T81 IS STRAPPED LIKE THIS.



TO CHANGE OPERATING VOLTAGES FROM 240 VAC TO 220 VAC, FIRST REMOVE THE POWER IDENTIFICATION LABEL. THEN STRAP TERMINAL BOARD T81 AS SHOWN.



THEN REVERSE AND REPLACE THE LABEL, ENSURING THAT IT READS LIKE ONE OF THESE, DEPENDING ON THE TYPE OF DISC DRIVE.

~LINE  
7920S 220V~ 50Hz  
460 WATTS MAX. 2.9A MAX.  
OPERATING RANGE  
198V~ -231V~ 47.5-66Hz

~LINE  
7920M 220V~ 50Hz  
700 WATTS MAX. 4.3A MAX.  
OPERATING RANGE  
198V~ -231V~ 47.5-66Hz

\* THIS POINT IS NOT AT ZERO POTENTIAL WITH RESPECT TO THE CABINET. THIS POINT IS AT ZERO POTENTIAL WITH RESPECT TO POINT 928.

NOTE ENCIRCLED NUMBERS INDICATE WIRING COLOR CODE AS FOLLOWS



COLOR	1ST DIGIT A	2ND DIGIT B	3RD DIGIT C
BLACK	0	0	0
BROWN	1	1	1
RED	2	2	2
ORANGE	3	3	3
YELLOW	4	4	4
GREEN	5	5	5
BLUE	6	6	6
VIOLET	7	7	7
GREY	8	8	8
WHITE	9	9	9

Figure 6. Strapping Configurations for 240 Vac and 220 Vac



Table 3. Primary Power Fuse Ratings

SOURCE VOLTAGE	REQUIRED RATING	HP PART NO.
100 Vac	8A, 250V, SB*	2110-0383
120 Vac	8A, 250V, SB*	2110-0383
220 Vac	4A, 250V, SB*	2110-0365
240 Vac	4A, 250V, SB*	2110-0365

\* The SB indicates that a slo-blo fuse must be used.

- (1) Set circuit breaker on power distribution unit (see figure 8) to OFF.
- (2) Using a Pozidriv screwdriver, remove four screws securing "WARNING" cover to power panel assembly and remove cover.
- (3) Prepare three-conductor power cable (minimum conductor size no. 14 AWG/1.5 mm<sup>2</sup>) by first stripping off 230 millimetres (9 inches) of outer insulation from end of cable and then removing 13 millimetres (1/2 inch) of insulation from end of each conductor.
- (4) Pass prepared end of power cable through cable clamp into power distribution unit. Do not tighten clamp at this time.
- (5) Using a blade-type screwdriver, attach earth ground conductor of power cable to box lug on earth bus.
- (6) Using a blade-type screwdriver, attach line (L) conductor of power cable to mating terminals on barrier block TB1 as shown in figure 6.

- (7) Dress power cable conductors within power distribution unit and tighten cable clamp on cable jacket.
- (8) Replace "WARNING" cover on power panel assembly.
- (9) Connect power cable to a suitable mains power source.
- (10) Set circuit breaker on power panel assembly to ON.

- c. The power panel assembly, part no. 29425-60003, is supplied with a standard 120 Vac power cord. For the option 015 power panel, part no. 29425-60004, an appropriate power cord is supplied with the disc drive. The various option 015 power cords available are shown in figure 7. To attach a power cord, proceed as follows:

**CAUTION**

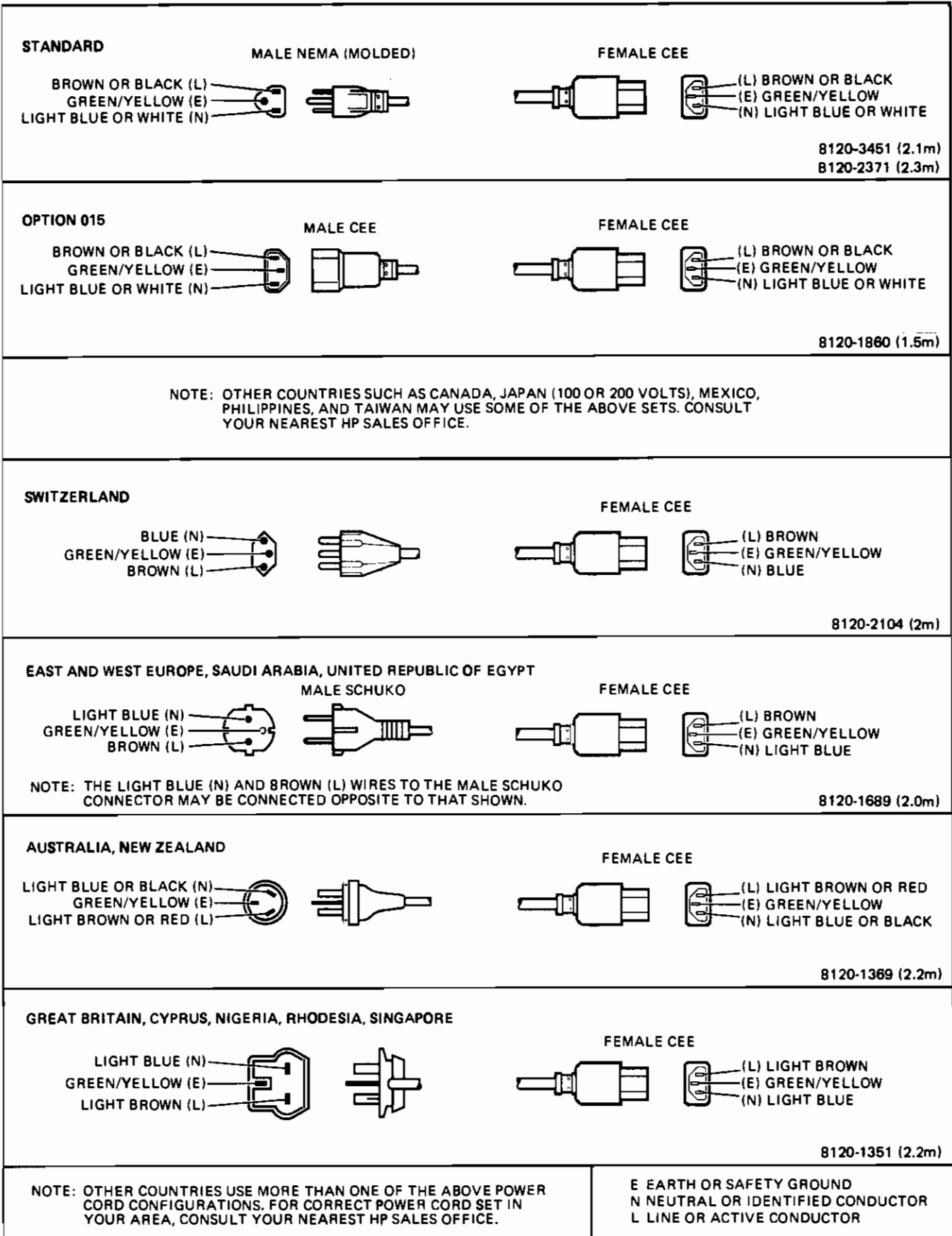
Do not attempt to operate a disc drive configured for 120 Vac on 240 Vac or a disc drive configured for 240 Vac on 120 Vac. Damage to the disc drive may result.

- (1) Set circuit breaker of the disc drive to the OFF position.
- (2) Plug the female end of the power cord into the ac power inlet in the rear of the disc drive.
- (3) Connect power cable to a suitable mains power source.
- (4) Set circuit breaker of the disc drive to the ON position.

Table 4. Secondary Power Fuse Ratings

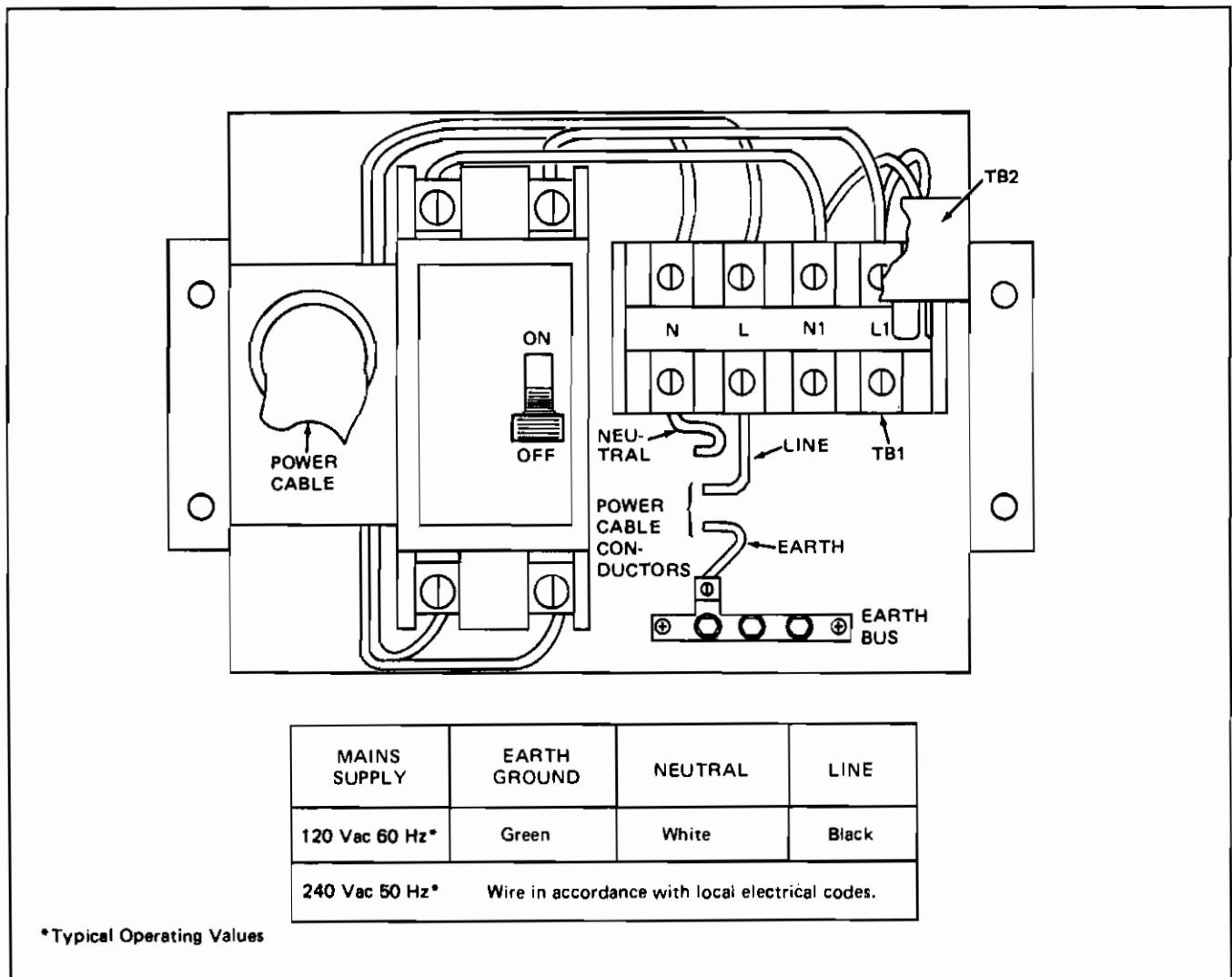
FUSE	REQUIRED RATING	HP PART NO.	SUPPLY VOLTAGE
F2	8A, 250V, SB*	2110-0383	-36 VDC
F3	8A, 250V, SB*	2110-0383	+36 VDC
F4	8A, 250V, SB*	2110-0383	+10 VDC
F5	1.5A, 250V, FB*	2110-0043	+20 VDC
F6	1.5A, 250V, FB*	2110-0043	-20 VDC
F7	20A, 125V, MB*	2110-0098	26 VAC
F8	20A, 125V, MB*	2110-0098	9 VAC
F9	20A, 125V, MB*	2110-0098	17 VAC
A9F1	1A, 125V, FB*	2110-0516	+10 VDC
A9F2	0.125A, 125V, FB*	2110-0513	-36 VDC

\*SB, MB, and FB indicate slow-blo, medium-blo, and fast-blo, respectively. The correct fuses must be used as specified.



7311-1C

Figure 7. AC Power Cord Sets



7301-7A

Figure 8. Power Distribution Unit

## 19. INTERCONNECTION INSTRUCTIONS

Interconnecting the disc drive depends upon the system configuration, that is, whether a single disc drive is to be installed, or whether multiple disc drives are to be connected in series, or whether an add-on disc drive is to be installed in an existing system.

Before connecting the disc drive, ensure that the internally connected data and interconnecting cables are properly installed. Remove the shroud and check that the data cable is connected between drive control PCA-A4 and the termination assembly, and the interconnecting cable is connected between I/O sector PCA-A2 and the termination assembly. (See figure 9 for termination assembly details.)

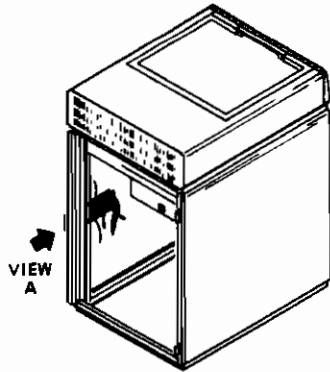
Interconnecting the disc drive may be performed in two steps: first, make the necessary connections to the disc drive and then make the connections to the controller. If this is a multi-unit installation, connect all disc drives before connecting the controller. See figure 9 for disc drive interconnection information.

**20. SINGLE-UNIT INSTALLATION.** A single unit installation involves only one disc drive. Connect the multi-unit cable, HP 13013B, directly to the controller. Ensure that the terminator PCA, part no. 07905-60039, is installed. (Refer to figure 9.) Then, connect the data cable to the termination assembly.

**21. MULTIPLE-UNIT INSTALLATION.** For multiple-unit installations, position each disc drive in the desired locations and proceed with the termination assembly connections at the back of each disc drive. Ensure that the terminator PCA is installed in the last disc drive in the series, and that the cable-to-cable adapter, part no. 07905-80010, is installed in all others. (Refer to figure 9.)

**22. ADD-ON INSTALLATION.** For an add-on installation, remove the terminator PCA from the last disc drive in the existing system and replace it with the cable-to-cable adapter. Ensure that the terminator PCA is installed in add-on drive. Proceed with the termination assembly connections.





INTERCONNECTION INFORMATION

VIEW A	SINGLE-UNIT INSTALLATION	MULTI-UNIT INSTALLATION		ADD-ON INSTALLATION
		UNITS 2 THRU 7	LAST IN SERIES	
I	USE TERMINATOR PCA, P/N 07905-80039	USE CABLE-TO-CABLE ADAPTER, P/N 07905-80010	USE TERMINATOR PCA, P/N 07905-80039	USE TERMINATOR PCA, P/N 07905-80039
II	CONNECT MULTI-UNIT CABLE, HP 13013B, TO CONTROLLER	CONNECT MULTI-UNIT CABLE, HP 13013B, TO PREVIOUSLY CONNECTED DISC DRIVE IN SERIES	CONNECT MULTI-UNIT CABLE, HP 13013B, TO NEXT TO LAST DISC DRIVE IN SERIES	CONNECT MULTI-UNIT CABLE, HP 13013B, TO LAST DISC DRIVE IN SERIES
III	NOT USED	CONNECT MULTI-UNIT CABLE, HP 13013B, TO NEXT DISC DRIVE TO BE CONNECTED	NOT USED	NOT USED

NOTES:

1. THE HP 13013B MULTI-UNIT CABLE IS AVAILABLE IN FOUR LENGTHS AS FOLLOWS:

CABLE	PART NO.	LENGTH
HP 13013B	13013-80013	3.86 m (12 ft)
HP 13013B-001	13013-80011	1.83 m (6 ft)
HP 13013B-002	13013-80014	5.49 m (18 ft)
HP 13013B-003	13013-80012	2.44 m (8 ft)

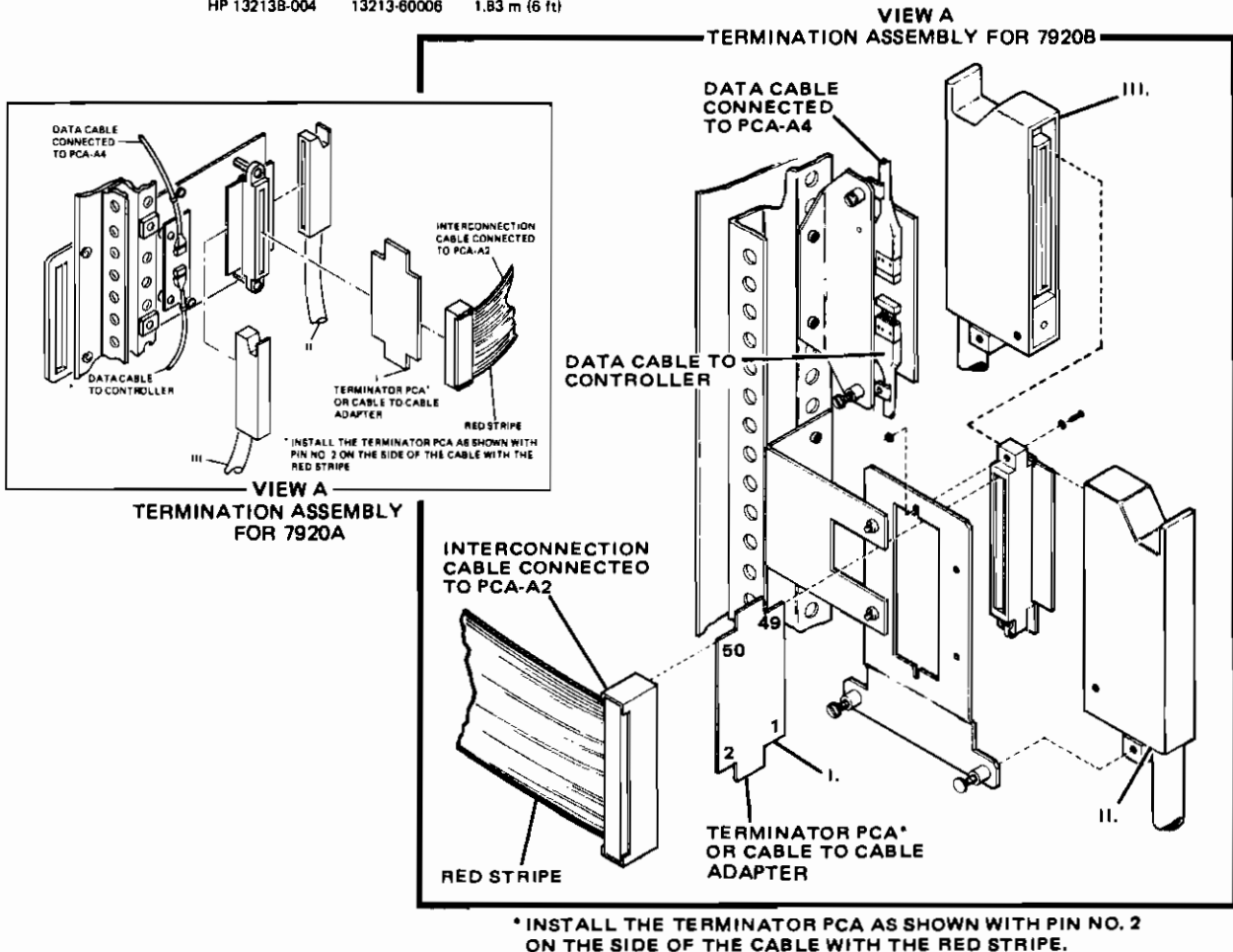
2. THE HP 13213B DATA CABLE IS AVAILABLE IN FIVE LENGTHS AS FOLLOWS:

CABLE	PART NO.	LENGTH
HP 13213B	13213-80007	3.05 m (10 ft)
HP 13213B-001	13213-80008	7.82 m (26 ft)
HP 13213B-002	13213-80009	16.25 m (50 ft)
HP 13213B-003	13213-80010	22.88 m (75 ft)
HP 13213B-004	13213-80006	1.83 m (6 ft)

3. THE TERMINATOR PCA, PART NO. 07905-80039, IS ONLY USED ON THE LAST DISC DRIVE IN THE SERIES.

FOR SINGLE UNIT INSTALLATIONS, THE TERMINATOR PCA IS USED. FOR MULTIPLE UNIT INSTALLATIONS, THE TERMINATOR PCA IS USED ON THE LAST DISC DRIVE IN THE SERIES AND THE CABLE-TO-CABLE ADAPTERS, PART NO. 07905-80010, ARE USED FOR EACH OF THE REMAINING DISC DRIVES.

FOR ADD-ON INSTALLATIONS, THE TERMINATOR PCA MUST BE REMOVED FROM THE LAST DISC DRIVE IN THE EXISTING SERIES AND BE REPLACED WITH A CABLE-TO-CABLE ADAPTER. THE TERMINATOR PCA IS USED ON THE LAST DISC DRIVE IN THE SERIES.



\* INSTALL THE TERMINATOR PCA AS SHOWN WITH PIN NO. 2 ON THE SIDE OF THE CABLE WITH THE RED STRIPE.

Figure 9. Disc Drive Interconnection Diagram

**23. CONTROLLER INTERCONNECTIONS.** After connecting the cables to the disc drive(s), proceed with the controller interconnections as follows:

- a. Remove the top and front covers from the controller.
- b. Pass the free end of the multi-unit cable from the first disc drive through the opening provided at the rear of the controller. (See figure 10.) Connect the cable to the device controller PCA at connector DRVJ3. The cable should be positioned in the channel provided and should lie to the right side of the fan.
- c. For HP 13037A/B Disc Controllers, remove the data cable retainer from the device controller PCA. (See figure 10, view A.)
- d. Pass the free end of each data cable through the opening provided at the rear of the controller. Connect each data cable to the device controller PCA at connectors J4 through J11. The cables should be positioned in the channel provided and should lie to the right side of the fan.

Note: Any data cable may be connected to any of the PCA connectors on the controller.

- e. For HP 13037A/B Disc Controllers, replace the data cable retainer. (See figure 10, view A.) For HP 13037C Disc Controllers, secure each cable to the data cable retainer assembly on the PCA with the attached spring-loaded captive screws. (See figure 10, view B.)
- f. On the controller, ensure that the jumper cable, part no. 13037-60021, is connected between connector J2 on the error correct PCA and connector J2 on the microprocessor PCA.
- g. Ensure that the cable from the computer interface is connected to the device controller PCA at connector IFJ1.
- h. Replace the controller top cover and front panel.
- i. Replace and secure the controller.
- j. Connect the ac power cord from the disc drive to a receptacle on the power panel assembly. Then, connect the ac power cord from each disc drive installed to an appropriate ac power source. For a 7920A disc drive, set the circuit breaker of the disc drive to the ON position.
- k. Close the rear door of the disc drive enclosure.

When one or more disc drives are installed, the logical unit address of each must be specified to the controller. The position of the UNIT SELECT switch determines the logical unit address of the disc drive. Ensure that no two disc drives have the same logical unit address.

## 24. INSTALLATION CHECKS

After the disc drive(s) has been installed and interconnected, visually inspect the installation. Ensure that the interconnecting and data cables are properly routed and anchored, the last disc drive in the series is properly terminated, and the correct logical unit addresses are specified. If there is any evidence of condensation in or on the disc drive, clean the heads as outlined in paragraph 25, otherwise proceed to paragraph 26.

## 25. CLEANING DATA AND SERVO HEADS

An Inspection Mirror, part no. 8830-0005; cleaning sleeves (including cleaning handle), part no. 9310-5074, and filtered 91-percent Isopropyl Alcohol, part no. 8500-0559, are required for head cleaning.

Note: This procedure is to be performed *only* if evidence of condensation in or on the disc drive is present.

### CAUTION

Use only the cleaning materials listed above. Many other brands of material contain contaminating oils and/or lint which may leave a residue that could cause damage.

- a. Place a cleaning sleeve on the end of the cleaning handle. (See figure 11.)

### CAUTION

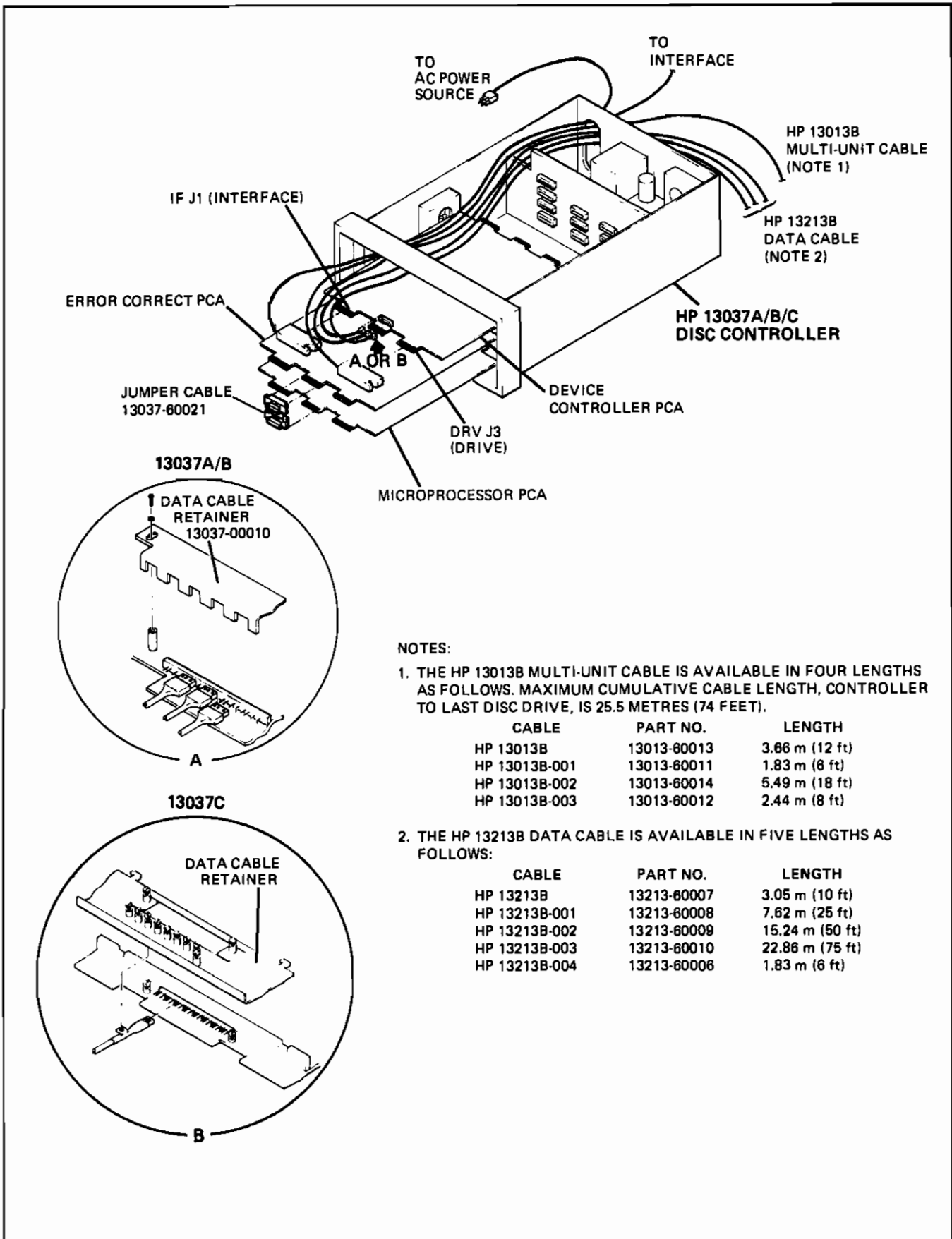
Use only the type of alcohol specified since many other types contain impurities that could cause damage.

- b. Dampen the cleaning sleeve with filtered 91-percent isopropyl alcohol.

### CAUTION

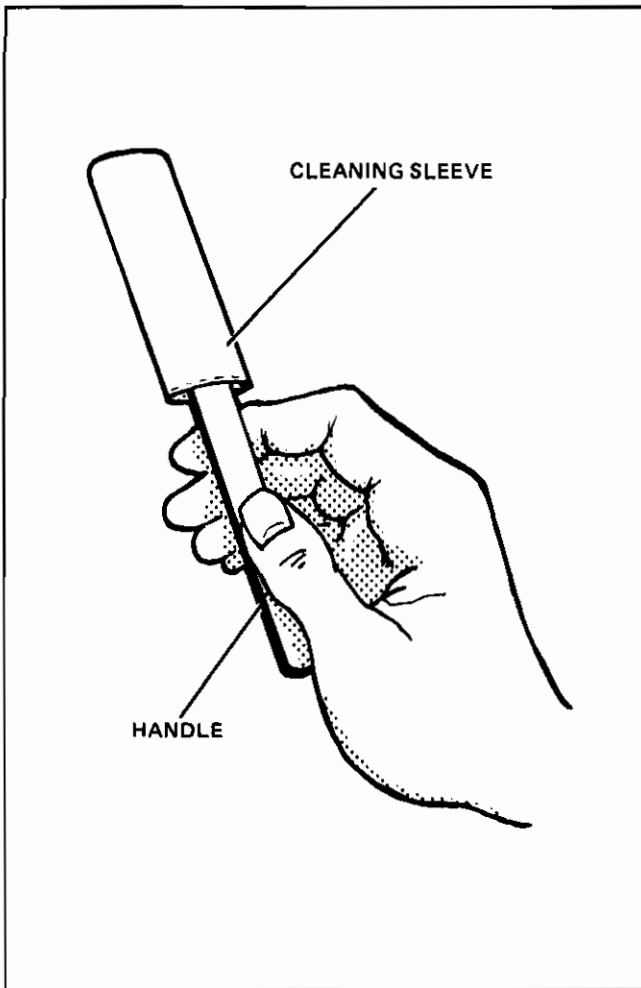
Avoid applying excessive pressure to the gimbal area of the head while cleaning. Excessive pressure may alter the flying characteristics of the head which were precision set at the factory.

- c. Clean each head by placing the prepared head cleaning tool between the surfaces, then gently wipe the head face. Use only sufficient pressure to thoroughly wet the head and remove contamination.



7301-76C

Figure 10. Disc Drive to Controller Interconnection Diagram



7301-15B

Figure 11. Prepared Head Cleaning Tool

- d. Replace the cleaning sleeve on the cleaning handle with a clean, dry cleaning sleeve.
- e. Carefully remove any remaining contamination from the head surfaces by gently wiping the head face with the prepared head cleaning tool.

### CAUTION

Never place an inspection mirror between the heads or allow the mirror to touch the heads. The head flying characteristics may be altered or damaged.

- f. Using an inspection mirror, verify that all signs of contamination have been removed. If the contamination cannot be removed, replace the head. (For the 7920B, refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902. For the 7920A, refer to the *HP 7920A Disc Drive Operating and Service Manual*, part no. 07920-90001.)

## 26. HEAD CAM ALIGNMENT

The head cam alignment procedure is performed whenever a disc drive is installed. To adjust the head cams, proceed as follows:

- a. Remove the power cord from the ac mains power.
- b. Install the head cam alignment tool, part no. 13354-60001, on the spindle hub. (See figure 12.) Ensure that the head cams mate with the head cam alignment tool.
- c. If the head cams require adjustment, perform sub-steps (1) through (3), otherwise proceed to step d.
  - (1) Loosen the two screws on the two head cams. (Refer to figure 13.)
  - (2) Adjust the head cams to position with the head cam alignment tool. (Refer to figure 13.)
  - (3) Torque the head cam securing screws to 7 inch-pounds.
- d. Remove the head cam alignment tool.
- e. Restore ac power to the disc drive.

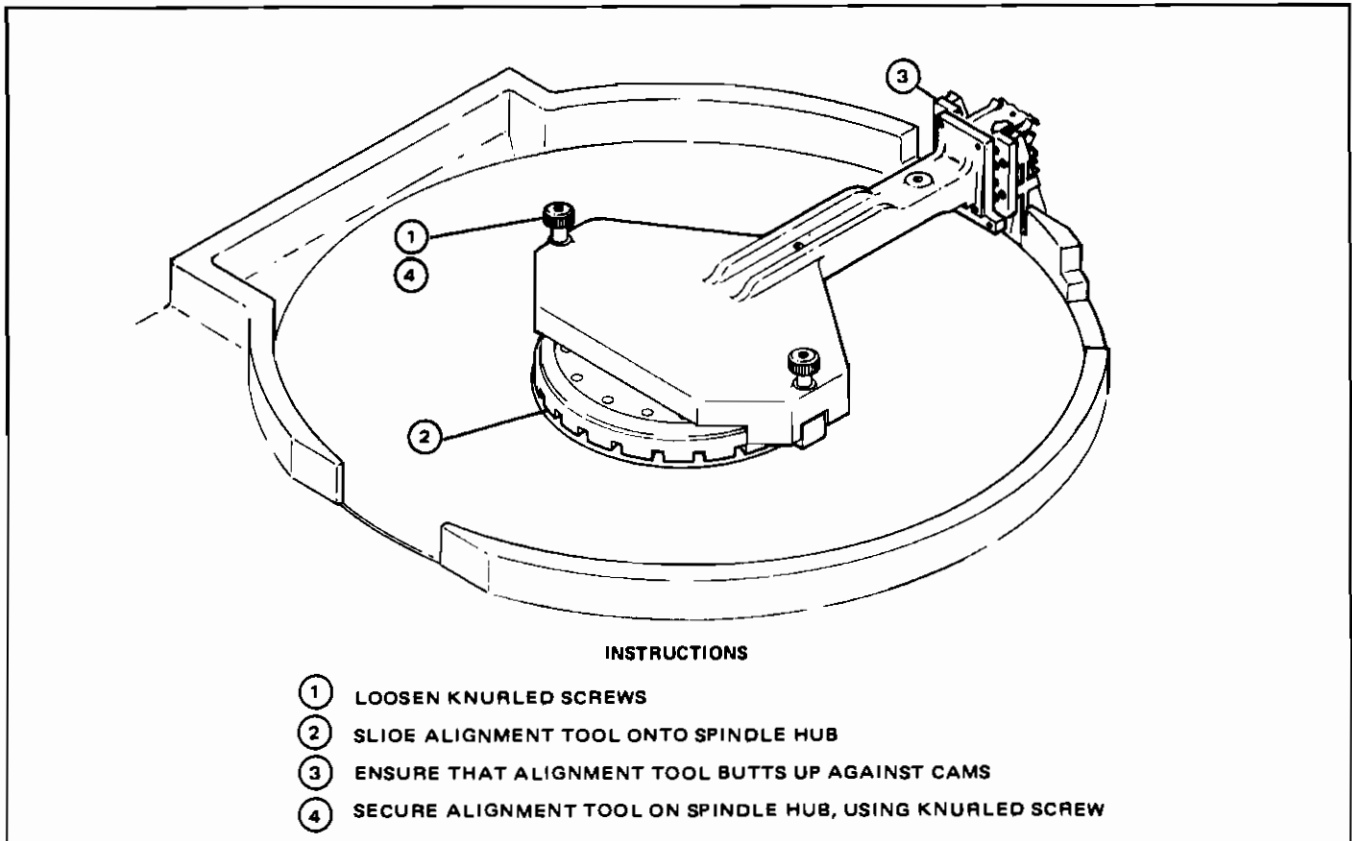
## 27. INSTALLING THE DSU

To install the disc service unit (DSU), proceed as follows:

### WARNING

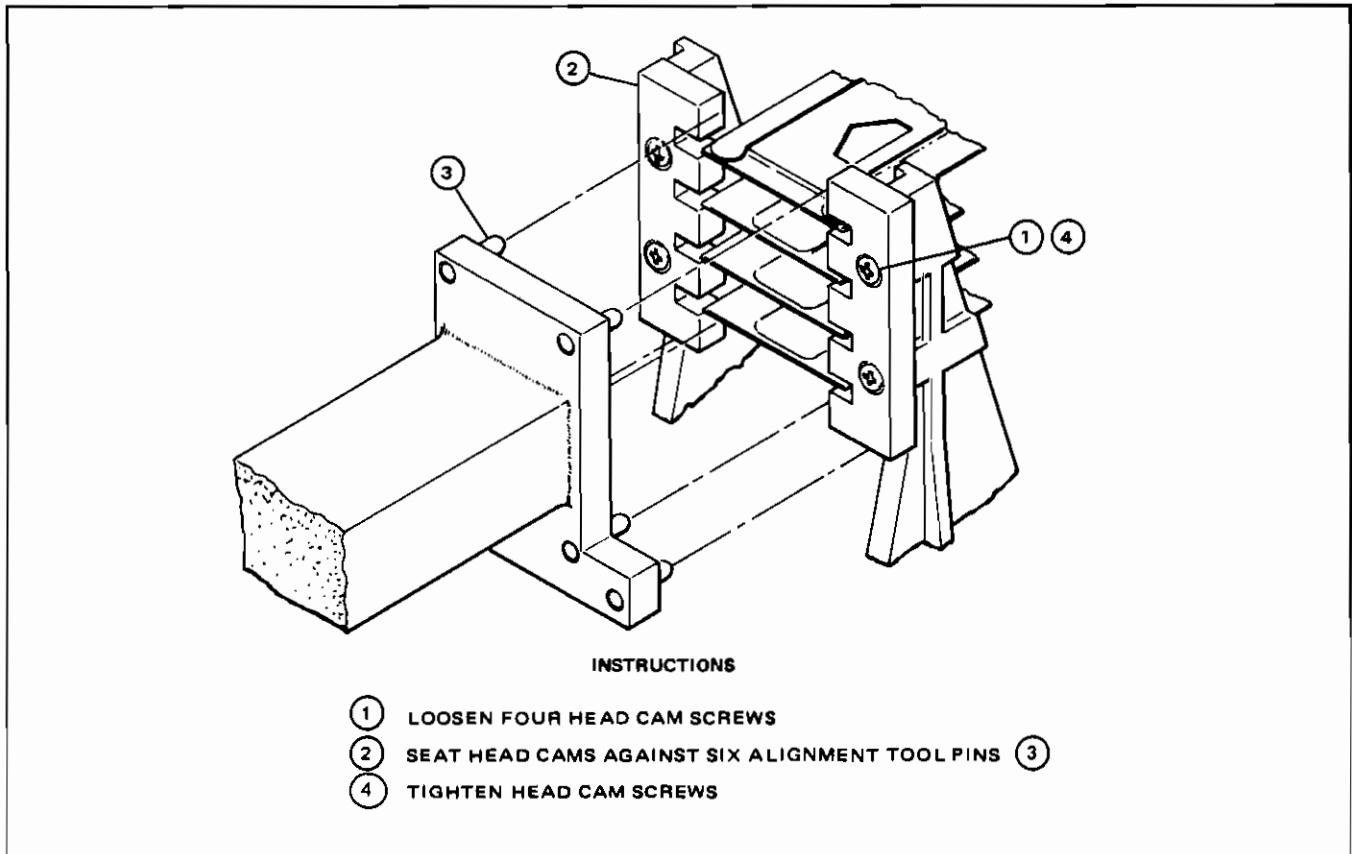
**Adjustments requiring the DSU are performed with power supplied to the disc drive, and protective covers removed. Such maintenance should be performed only by service-trained personnel who are aware of the hazards involved (for example, fire and electrical shock).**

- a. Disconnect the ac power cord from the ac mains power.
- b. Remove the shroud from the disc drive enclosure.
- c. Loosen the screw that secures the PCA retainer to the card cage and remove the retainer.
- d. Insert the head alignment PCA, part no. 13354-60010, into card slot A1. (See figure 14.) Ensure that the PCA is correctly oriented, then firmly seat the PCA in the receptacle. The component side of the PCA must face toward the right side of the card cage as viewed from the front.



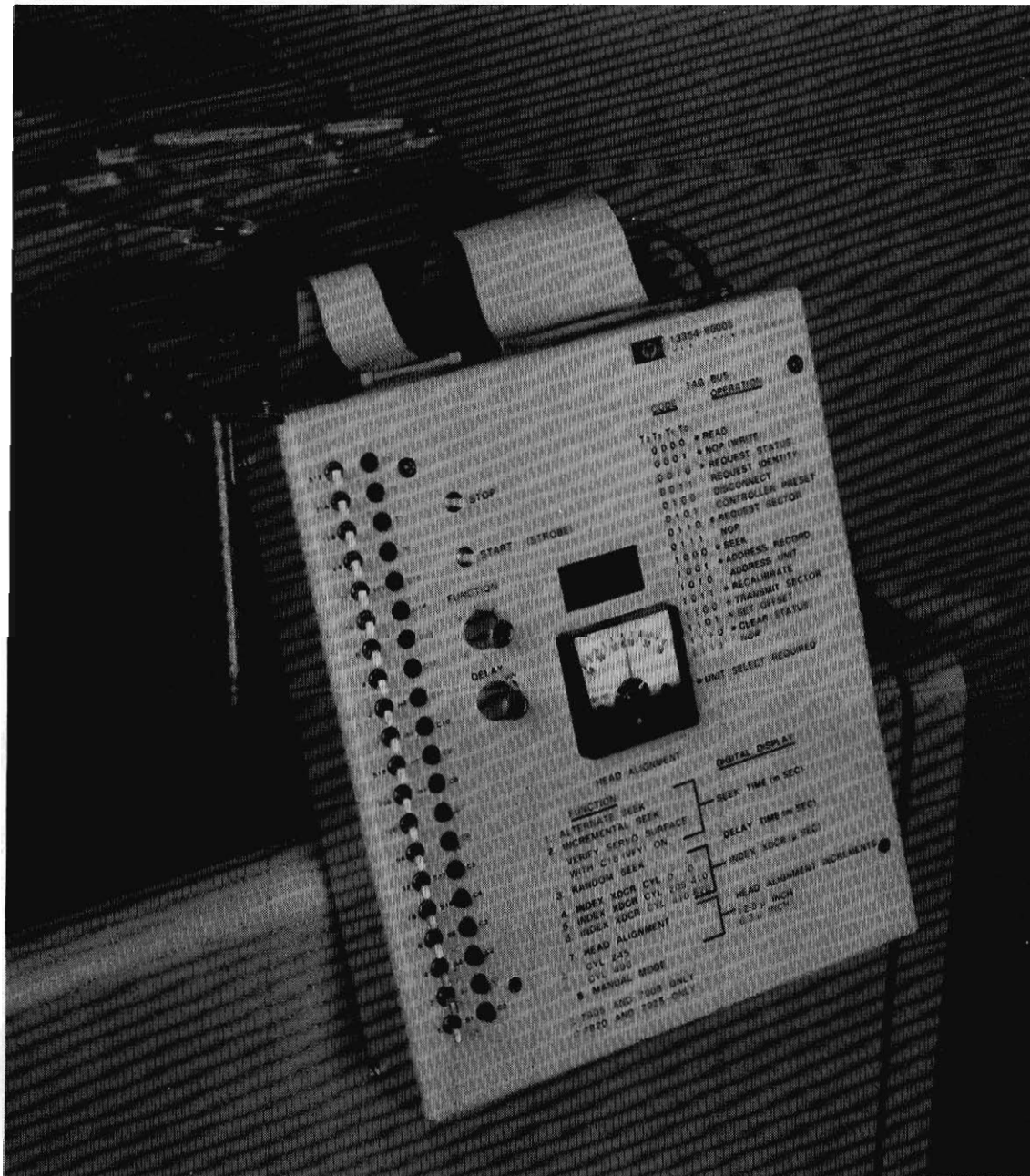
REF 7301-20A

Figure 12. Use of Head Cam Alignment Tool



REF 7301-21

Figure 13. Head Cam Tool Alignment



REF 7301-16A

Figure 14. DSU Installed

- e. Disconnect the interconnect cable from J1 on I/O sector PCA-A2.
- f. Hang the DSU on the top outer edge of the card cage.
- g. Connect the 50-pin jumper cable, part no. 13354-60012, between the 50-pin connector on the DSU and J1 on I/O sector PCA-A2.
- h. Connect the 20-pin jumper cable, part no. 13354-60013, between the 20-pin connector on the DSU and the 20-pin connector on the head alignment PCA.

### CAUTION

Do not plug or unplug any cables from the data heads to read/write preamplifier PCA-A6 or from the servo head to track follower PCA-A5 while the heads are loaded. Incorrect information can be written on the disc.

- i. Connect the head cable connector from the head alignment PCA to the head connector located at the top of read/write preamplifier PCA-A6.

## 28. EXERCISING THE DISC DRIVE

When the DSU has been installed, the disc drive should be exercised to relax any mechanical stresses. This is particularly important after installing a new disc drive. To exercise the disc drive, proceed as follows:

- a. Restore ac power to the disc drive and turn the power switch to the on position.
- b. Install a scratch pack in the pack chamber.
- c. On the disc drive, set the RUN/STOP switch to RUN. Set the unit select switch to 0 (zero).
- d. On the DSU, set the FUNCTION switch to position 3 (RANDOM SEEK).
- e. On the DSU, rotate the DELAY potentiometer fully clockwise to MAX.

Note: With the DELAY potentiometer set to MAX, a maximum delay between seek operations is introduced.

- f. On the DSU, press the START pushbutton and allow the disc drive to perform a series of random seek operations.
- g. After several seek operations have been performed, rotate the DELAY potentiometer fully counterclockwise to MIN.

Note: With the DELAY potentiometer set to MIN, a minimum delay between seek operations is introduced.

- h. Allow the disc drive to run for at least one minute.
- i. Using the air pressure measuring gauge with the air pressure probe assembly, place the probe over the air pressure outlet. (See figure 15).
- j. Observe the air pressure. Check that the air pressure is equal to or greater than the minimum acceptable limits given in substeps (1) or (2). Substep (1) applies to an absolute air filter with a part number 3150-0340 and substep (2) applies to an absolute filter with a part number 3150-0276. The part number is on a label on the front of the absolute filter.



REF 7301-14

Figure 15. Measuring Absolute Filter Air Pressure

- (1) For absolute filters with part number 3150-0340, the minimum acceptable limits are:

LINE FREQUENCY (Hz)	NORMAL OPERATION (Inches of water)	MINIMUM ACCEPTABLE LIMITS (Inches of water)
50	>0.45	0.45
60	>0.45	0.45

- (2) For absolute filters with part number 3150-0276, the minimum acceptable limits are:

LINE FREQUENCY (Hz)	NORMAL OPERATION (Inches of water)	MINIMUM ACCEPTABLE LIMITS (Inches of water)
50	>0.60	0.60
60	>0.60	0.60

Note: Meter may peg when filter is new.

- k. If observed air pressure is less than minimum acceptable limits, refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902. (For the 7920A, refer to the *HP 7920A Disc Drive Operating and Service Manual*, part no. 07920-90001.)
- l. On the DSU, press the STOP pushbutton.
- m. Proceed to paragraph 29.

## 29. VELOCITY COMMAND GAIN ADJUSTMENT

The only electrical adjustment requiring the use of the DSU is the velocity command gain adjustment. To perform this adjustment, proceed as follows:

### WARNING

The following adjustments are performed with power supplied to the disc drive, and protective covers removed. Such maintenance should be performed only by service-trained personnel who are aware of the hazards involved (for example, fire and electrical shock).

- a. Remove the terminal block cover on the power supply.
- b. Using an HP 970 Digital Voltmeter (or equivalent battery-operated voltmeter, for isolation from AC ground paths), measure the voltage across terminals 1 and 4 on TB1 of the power supply (refer to figures 5 and 6). Also note the power supply strapping by comparing the strapping on TB1 with the strapping shown in figures 5 and 6. These measurements will be used to determine the seek time adjustment range.

- c. On the DSU, set the FUNCTION switch to position 1 (ALTERNATE SEEK).
- d. On the DSU, select cylinder address 0 on the top ten switches (all 10 switches set to the left).
- e. With the lower bank of switches, select cylinder address 822 (switches 512, 256, 32, 16, 4, and 2 set to the right).
- f. On the DSU, press the START pushbutton and allow the disc drive to alternately seek between cylinders 0 and 822.
- g. On the DSU, rotate the DELAY potentiometer until the seek time from cylinder 0 to cylinder 822 (forward seek operation) can be differentiated from the seek time from cylinder 822 to cylinder 0 (reverse seek operation).
- Note: The two seek times will probably be different.
- h. For both forward and reverse seek operations, observe the digital displays to ensure that the seek time is in the range specified in table 5 and that the deviation between forward and reverse seek times is 3.0 milliseconds or less. Use the values measured in step b to determine the proper seek time range.

Table 5. Seek Time Ranges

STRAPPING OF THE POWER SUPPLY (Vdc)	LINE VOLTAGE (Vac, refer to step b)	SEEK TIME RANGE (milliseconds)
100	90 to 95	44.0 to 47.0
	96 to 100	43.5 to 48.5
	101 to 105	43.0 to 48.0
120	108 to 110	44.0 to 47.0
	111 to 115	43.0 to 48.0
	116 to 120	42.5 to 45.5
	121 to 128	42.0 to 45.0
220	198 to 200	44.5 to 47.5
	201 to 210	43.5 to 48.5
	211 to 220	43.0 to 48.0
	221 to 230	42.2 to 45.5
240	216 to 220	44.0 to 47.0
	221 to 230	43.0 to 48.0
	231 to 240	42.5 to 45.5
	241 to 252	42.0 to 45.0

Note: The seek time adjustment is set for the best overall operation of the disc drive and this time setting will vary for each disc drive. The best operation of the disc drive does not necessarily mean the shortest seek time. If necessary, adjust VC GAIN potentiometer A3R33 on servo PCA-A3 until the values are within the specified range.



- i. On the DSU, press the STOP pushbutton.
- j. On the disc drive, set the RUN/STOP switch to STOP.
- k. Replace the terminal block cover on the power supply.

### 30. DATA HEAD ALIGNMENT CHECK

The data head alignment check is performed to verify whether any or all data heads are within tolerance. If any data head is out of tolerance, perform the data head alignment procedure. (The alignment procedure is contained in the Service manual. For the 7920B, refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902. For the 7920A, refer to the *HP 7920A Disc Drive Operating and Service Manual*, part no. 07920-90001.) To check data head alignment, proceed as follows:

- a. The following procedure is performed to allow for temperature stabilization of the disc drive.
  - (1) Hook the liquid crystal thermometer to the outside of the door as shown in figure 16.
  - (2) Remove the scratch pack and install the HP 13398A CE Disc Pack.
  - (3) On the disc drive, set the READ ONLY switch to the protected position (●), the unit select switch to 0, and the RUN/STOP switch to RUN.
  - (4) Set the DSU to function 3 and rotate the DELAY control to a position near MIN. Press the START pushbutton and allow the disc drive to perform random seek operations for 5 minutes.
  - (5) Set the DSU to function 7 and press the START pushbutton. Allow the disc drive head to remain positioned at cylinder 490 for 15 minutes before proceeding.

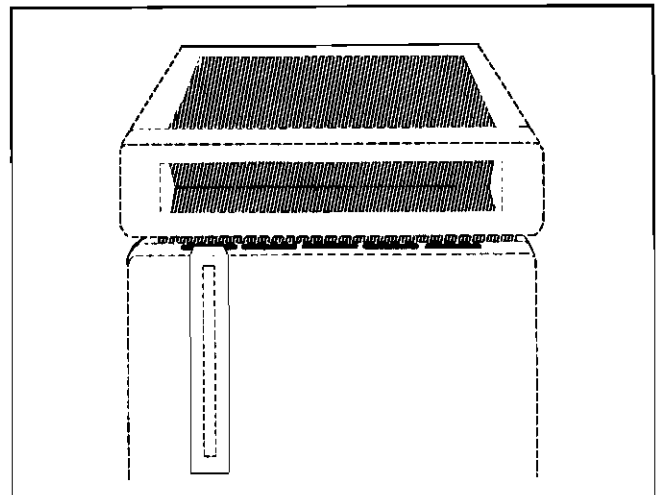
**Note:** Do not stop the spindle while the DSU is set to function 7. If the spindle must be stopped, set the DSU to FUNCTION 1; press the START pushbutton, then the STOP pushbutton; and then set the RUN/STOP switch to STOP.

**Note:** When the DSU is set to function 7 and the START pushbutton is pressed, the meter pointer moves to the far right, then to the far left, and then back again. The time required for this cycle is 5 seconds. This operation is referred to as the 5-second cycle throughout the procedures. If the meter does not perform as stated above, the servo head must be aligned. (For the 7920B, refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902. For the 7920A, refer to the *HP 7920A Disc Drive Operating and Service Manual*, part no. 07920-90001.)

- (6) Read the temperature of the disc drive from the liquid crystal thermometer.

**Note:** To read the disc drive temperature, note the number containing a green color on the liquid crystal thermometer. This number represents the disc drive temperature in degrees Celsius. If only blue and brown colors show, the disc drive temperature is the average of the blue and brown numbers. For proper operation, the disc drive temperature should be within  $\pm 15^{\circ}\text{C}$  ( $\pm 27^{\circ}\text{F}$ ) of the temperature recorded on the head alignment label (located inside of the front door). If the disc drive temperature is not within the  $\pm 15^{\circ}\text{C}$  range, the heads must be aligned. (For the 7920B, refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902. For the 7920A, refer to the *HP 7920A Disc Drive Operating and Service Manual*, part no. 07920-90001.)

- b. On the DSU, press the STOP pushbutton and then select the data head to be checked using the binary combination of toggle switches H4, H2, and H1.
- c. On the DSU, press the START pushbutton, and wait for the completion of the 5-second cycle.
- d. Verify that alignment is within a reading of  $\pm 5$  on the HEAD ALIGNMENT meter.
- e. Repeat steps b through d for each data head.
- f. Perform the data head alignment procedure for each data head that is out of tolerance. (The alignment procedure is contained in the service manual. For the 7920B, refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902. For the 7920A, refer to the *HP 7920A Disc Drive Operating and Service Manual*, part no. 07920-90001.)



REF 7301-80 Figure 16. Thermometer

### 31. DIAGNOSTIC CHECK

If the disc drive is installed in an HP System, run the appropriate diagnostic tests in accordance with the instructions provided in the Diagnostic Reference Manual. If the disc drive is installed in some other system, perform the diagnostic tests in accordance with the instructions provided for that system.

### 32. OPERATOR FAMILIARIZATION

The service-trained person that installs an HP 7920 Disc Drive is responsible for familiarizing the operator with the following:

- Operator control functions and use
- Disc pack removal and replacement
- Response to disc drive fault lights

### 33. REPACKAGING FOR SHIPMENT

#### WARNING

**This disc drive contains magnetic material (spindle assembly and actuator assembly), a potential hazard to personnel during air shipping. The disc drive (with the covers removed) does not exceed aircraft limitations, 2.0 milligauss at 2.13 m (7 ft), and can be shipped into or within the United States provided that all applicable regulations of the U.S. Department of Transportation (DOT) are followed before release to the initial carrier in the U.S. Refer to DOT Regulations, Title 49, parts 171-177 (Hazardous Materials).**

**Note:** If all the covers are *undamaged and in place*, the HP 7920 Disc Drive measures less than 2.0 milligauss at 2.13 m (7.0 ft) and does not require handling as a restricted article as mentioned in the above warning. Whenever magnetic assemblies are shipped, see your restricted articles coordinator.

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 Support Office to obtain a container or instructions for fabricating an acceptable alternate. Before shipment, the container (or equipment) should have an attached tag identifying the owner and the service or repair to be performed. Include the equipment model number and full serial number. The approximate shipping weight for the HP 7920M (with controller) is 202 kg (445 lb) and 188 kg (415 lb) for the HP 7920S (add-on).

If the disc drive is to be shipped with any of the covers removed, follow the procedure outlined in DOT Regulations, Title 49, parts 171-177 (Hazardous Materials). To package the disc drive, proceed as follows:

- a. Place the ramp on the container base. (See figure 2.)
- b. If "M" version, place the vibration damper between the air filter housing and controller.
- c. Cover the disc drive with a plastic bag.
- d. Thread the leveling feet fully into the disc drive to allow freedom of movement of the disc drive.
- e. Roll the disc drive onto the container base via the ramp.
- f. Install the retaining member with the bolt.
- g. Install the foam shipping pads and place the ramp on top of the drive.

#### CAUTION

Do not use metal straps.

- h. Replace the top and secure with strapping material of at least 500-pound strength.
- i. Mark the shipping container "FRAGILE" to ensure careful handling.
- j. In any subsequent correspondence with the factory, refer to the disc components by model number and full serial number.



**APPENDIX A**

**HP 7920H  
DISC DRIVE INSTALLATION**

# PREFACE

This appendix adds installation information for the HP 7920H Disc Drive. In general, the information given in the main manual for the HP 7920B is applicable to the HP 7920H, with the following exceptions:

- Introduction (paragraph 1)
- Test Equipment (paragraph 14)
- Power Requirements (paragraph 15)
- Interconnection Instructions (paragraphs 19 through 23)
- Installation Checks (paragraph 24)
- Installing the DSU (paragraph 27)
- Diagnostic Check (paragraph 31)
- Operator Familiarization (paragraph 32)
- Repackaging for Shipment (paragraph 33)

These exceptions are described in the following paragraphs.

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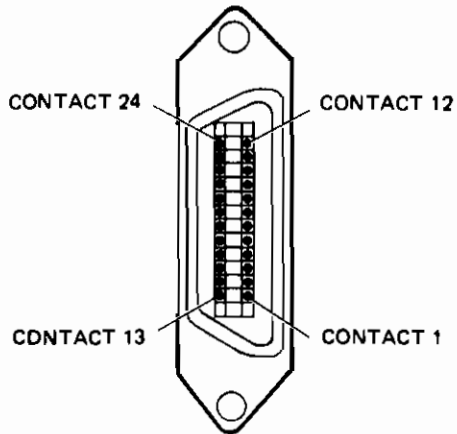
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Table A-2. HP-IB Connector Pin Assignments



CONNECTOR AS VIEWED FROM REAR OF HP 7920H

CONTACT	SIGNAL	CONTACT	SIGNAL
1	DIO 1 — Data In/Out 1	13	DIO 5 — Data In/Out 5
2	DIO 2 — Data In/Out 2	14	DIO 6 — Data In/Out 6
3	DIO 3 — Data In/Out 3	15	DIO 7 — Data In/Out 7
4	DIO 4 — Data In/Out 4	16	DIO 8 — Data In/Out 8
5	EOI — End or Identify	17	REN — Remote Enable
6	DAV — Data Valid	18	GND, (6)
7	NRFD — Not Ready for Data	19	GND, (7)
8	NDAC — Not Data Accepted	20	GND, (8)
9	IFC — Interface Clear	21	GND, (9)
10	SRQ — Service Request	22	GND, (10)
11	ATN — Attention	23	GND, (11)
12	SHIELD — Shield	24	GND, LOGIC

NOTE: GND (n) refers to the signal ground return of the referenced contact.

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**CAUTION**

The HP 7920H uses a short data settling time. To ensure that the disc drive(s) will operate at its specified transfer rate, check that the HP-IB cabling meets the length restrictions described in the "HP-IB Configuration Restriction" label attached to the rear of the disc drive. This label is illustrated in figure A-2. The equivalent load of the HP-IB controller-in-charge (CIC) must also be considered when calculating the total cable length.

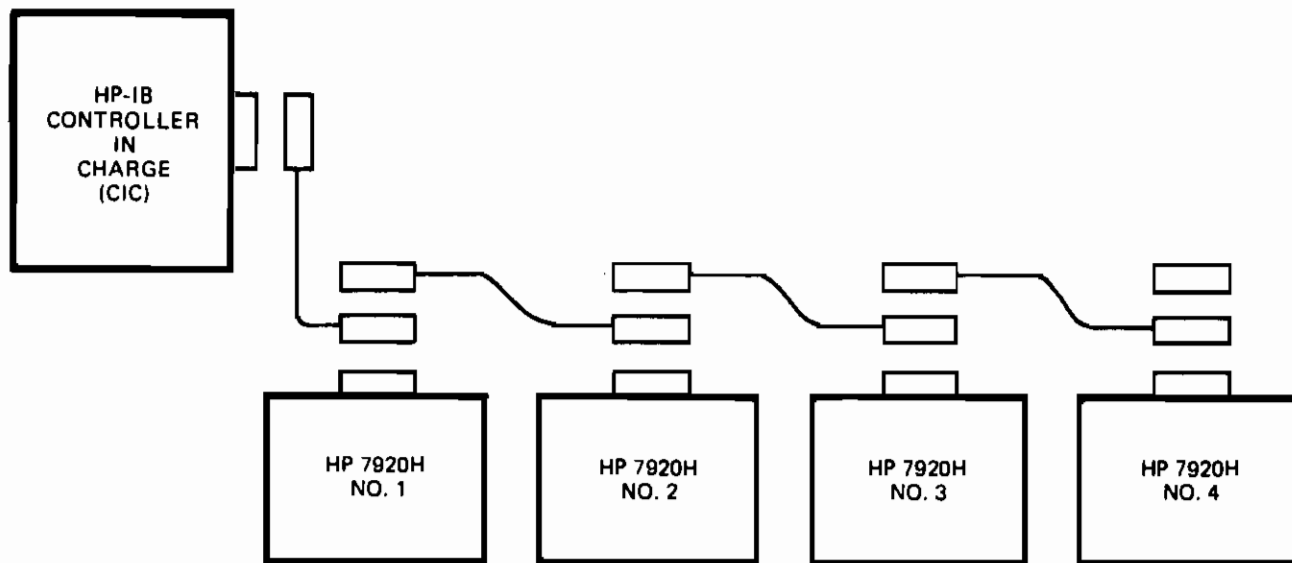
- a. Remove ac power from the disc drive(s). Ensure that the ac power cord is disconnected from the rear frame of the disc drive(s).

- b. If this is a single disc drive installation, connect one end of an HP-IB interface cable assembly, model no. 10833B (part no. 8120-3446), to the HP-IB connector at the rear of the disc drive and the other end of the cable to the HP-IB channel. The pin assignments for the HP-IB connector are shown in table A-2.

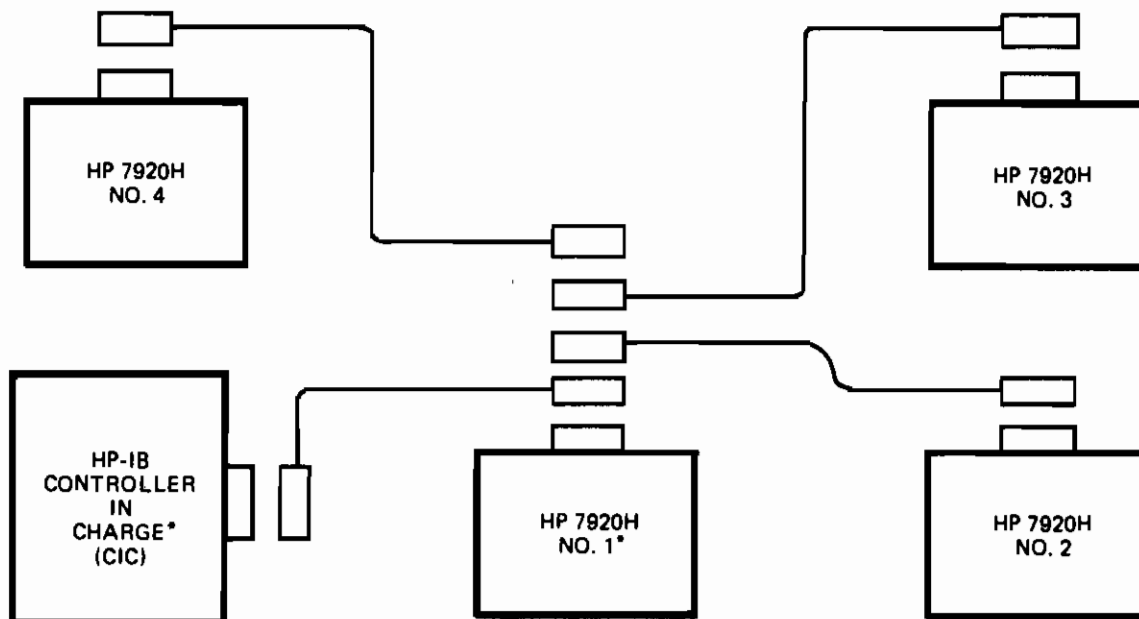
**HP-IB  
CONFIGURATION RESTRICTION**

THIS DEVICE USES A SHORT DATA  
SETTLING TIME. TO ASSURE DATA  
INTEGRITY, LIMIT TOTAL CABLE LENGTH  
OF ANY BUS INCLUDING THIS DEVICE  
TO ONE METRE PER EQUIVALENT LOAD  
CONNECTED (MAXIMUM 15 METRES).  
LENGTH (METRES) = SUM EQUIV LOADS  
THIS DEVICE = 2 EQUIV LOADS

Figure A-2. HP 7920H HP-IB Configuration Restriction Label



a. Linear Configuration



\* Can be interchanged

b. "Star" Configuration

**NOTES:**

1. All interconnecting cables are HP-IB interface cable assemblies, model no. 10833B (part no. 8120-3446). The length of this cable is 2 metres (6.55 feet).
2. Observe the cabling length restrictions detailed in paragraph A-4 and listed on the "HP-IB Configuration Restriction" labels attached to the equipment.
3. Four HP 7920's (maximum) are allowed on one HP-IB channel.

- c. If this is a multiple unit installation, use HP-IB interface cable assemblies, model no. 10833B (part no. 8120-3446), to interconnect the disc drives to the HP-IB controller-in-charge (CIC). The following details should be observed during installation.
- The disc drive can be connected to the HP-IB controller-in-charge in a linear or star configuration. See figure A-3. A combination of the two methods can also be used. The linear configuration is the preferred method.
  - The CIC must preload the HP-IB with six equivalent resistor loads. (The CIC is one load.)
  - Each disc drive places two equivalent loads on each of the HP-IB lines.
  - Four disc drives (maximum) are allowed on each HP-IB channel.
  - The total cable length is limited to 15 metres. No more than one metre of cable should be used for each equivalent load on the HP-IB.
  - Only one disc drive on each HP-IB channel can be powered down without affecting the overall performance of the remaining disc drives on the channel.
- d. Connect the ac power cord from each disc drive installed to the associated power panel assembly.

## A-5. INSTALLATION CHECKS

After the disc drive(s) has been installed, visually inspect the installation. Ensure that a) the HP-IB cable is properly installed, and b) the required HP-IB device address is selected. If there is any evidence of condensation in or on the disc drive, clean the heads as outlined in paragraph 25 of the main manual.

## A-6. INSTALLING THE DSU

### WARNING

Adjustments requiring the DSU are performed with power supplied to the disc drive, and protective covers removed. Such maintenance should be performed only by service-trained personnel who are aware of the hazards involved (for example, fire and electrical shock).

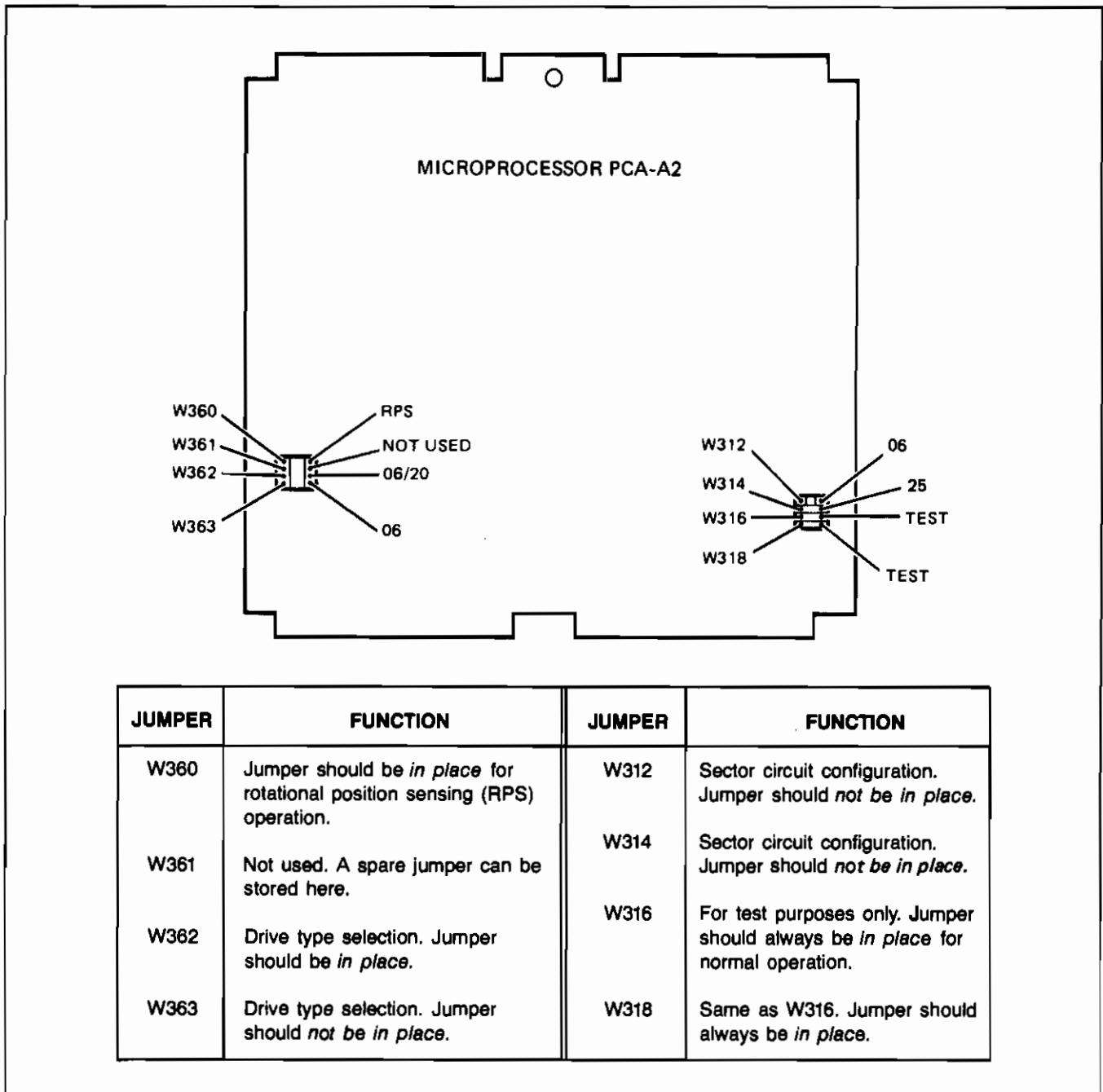
To install the disc service unit (DSU), proceed as follows:

**Note:** When the DSU is installed in the disc drive, the controller circuitry is disconnected — control for the disc drive is furnished solely by the DSU.

- a. Disconnect the ac power cord from the ac mains power.
- b. Remove the shroud from the disc drive enclosure.
- c. Loosen the screw that secures the PCA retainer to the card cage and remove the retainer.
- d. Remove Jumper Cable, part no. 13365-60006, connected between data PCA-A1 and microprocessor PCA-A2.
- e. Disconnect the ribbon cable connector attached to data PCA-A1.
- f. Remove data PCA-A1 and microprocessor PCA-A2 from the card cage chassis.
- g. Insert the head alignment PCA, part no. 13354-60010, into card slot A1. Ensure that the PCA is correctly oriented, then firmly seat the PCA in the receptacle. The component side of the PCA must face toward the right side of the card cage as viewed from the front.
- h. Insert I/O sector PCA, part no. 07925-60001, into the card guides for A2. Ensure that the component side of the PCA is facing in the same direction as the component side of the head alignment PCA. Push the PCA firmly into the connectors on motherboard A7.
- i. Hang the DSU test module on the top outer edge of the card cage. (See figure 14 in the main manual.)
- j. Connect 50-pin jumper cable, part no. 13354-60012, between the 50-pin connector on the DSU and J1 on I/O sector PCA-A2.
- k. Connect 20-pin jumper cable, part no. 13354-60013, between the 20-pin connector on the DSU and the 20-pin connector on the head alignment PCA.

### CAUTION

Do not plug or unplug any cables from the data heads to read/write pre-amplifier PCA-A6 or from the servo head to track follower PCA-A5 while the heads are loaded. Incorrect information can be written on the disc.



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Figure A-4. Microprocessor PCA-A2 Jumper Settings for HP 7920H Operation

1. Connect the head cable connector from the head alignment PCA to the head connector located at the top of read/write preamplifier PCA-A6.

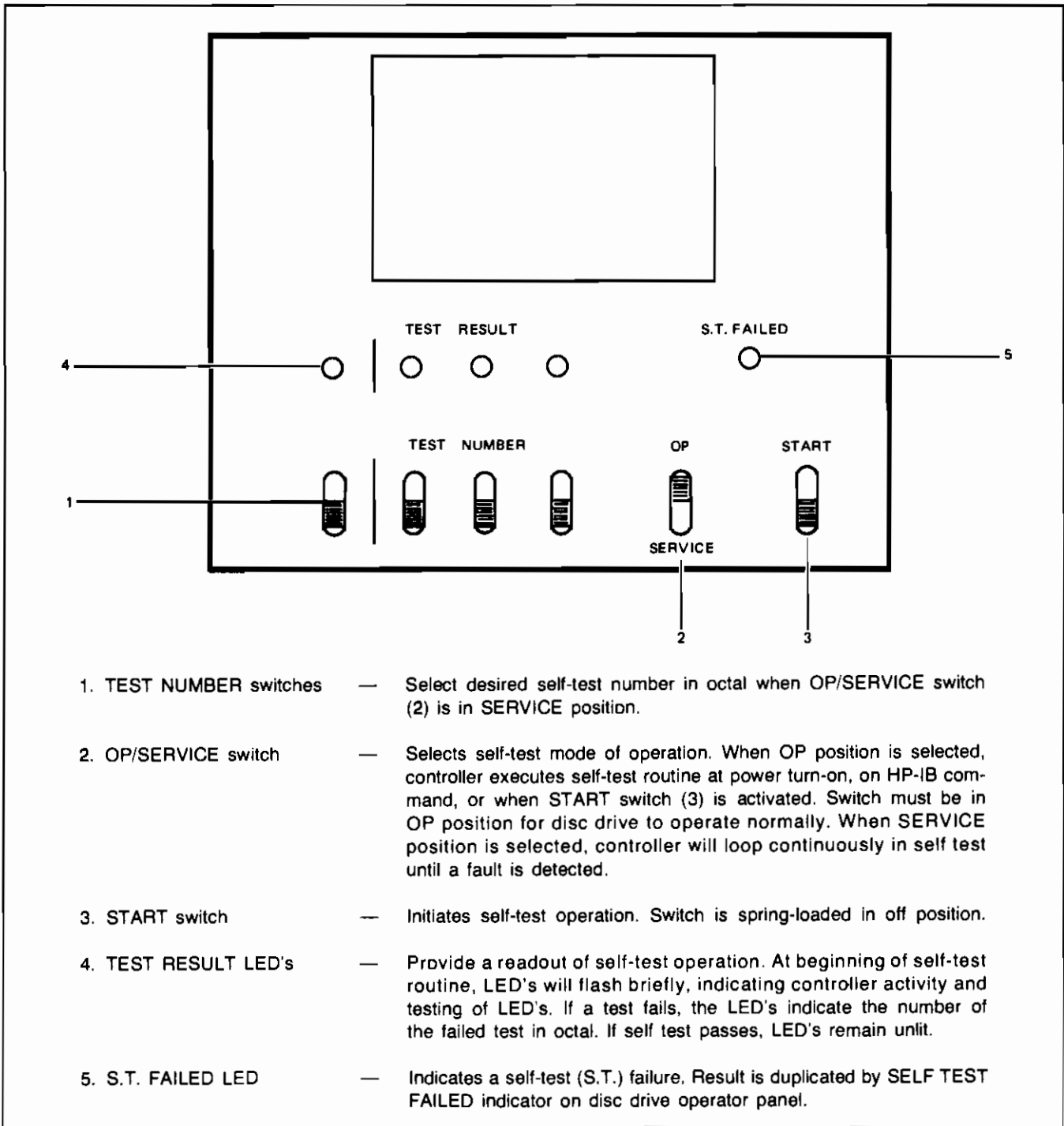
The DSU is removed by reversing the above procedure. Before replacing microprocessor PCA-A2 in the card cage chassis, ensure that the programming jumpers are positioned for HP 7920H operation, as shown in figure A-4.

## A-7. DIAGNOSTIC CHECK

In addition to employing the diagnostic tests described in the main manual, the HP 7920H includes a self-test fea-

ture that provides a go/no-go check of the controller hardware and certain functions of the disc drive. The self-test control panel on the rear frame of the disc drive is shown in figure A-5. Ensure that the OP/SERVICE switch is in the OP (operating) position before applying power to the disc drive. (The SERVICE position is used for maintenance purposes and does not allow the disc drive to respond to HP-IB commands following successful completion of self test.) Self test can be invoked in the following three ways:

- Automatically via a power-on or by setting the disc drive RUN/STOP switch to RUN.



7300-99

Figure A-5. Self-Test Controls and Indicators

- Using the secondary INITIATE SELF-TEST command.
- Manually by activating the START switch on the self-test panel located at the rear of the disc drive (assuming that the controller is in Idle State 2 or 3).

State 2, Idle State 3, and when self test is running. When the LED is lighted, the controller will not respond to the self-test START switch. In the event that the controller is not in Idle State 2 or 3, Idle State 2 can be entered via the END command.

Note: The LED in the upper left-hand corner of the disc drive Unit Select Indicator is unlighted when the controller is in Idle

The self test will start with "power on" and/or "run" but will not complete until "drive ready". In the interim, an octal ten will flash on the TEST RESULT LED's.

Note: If the RUN/STOP switch is not in the RUN position or the disc pack is not in place, the resulting absence of "drive ready" will cause the S.T. FAILED indicator to come on approximately 92 seconds after power on is initiated. If this occurs, proper preparation of the disc drive for operation (disc pack installed and RUN/STOP switch set to RUN) will allow the self-test routine to start again.

At "drive ready", self test will complete in about two seconds. When the self-test routine is executing, the TEST RESULT LED's and the S.T. FAILED LED on the panel will flash briefly indicating controller activity and testing of the LED's. The SELF TEST FAILED indicator on the disc drive operator panel will also flash at this time. If no failures are detected, all of the LED's will remain off at the end of self test. If a test fails, the test number (octal) is displayed continuously on the TEST RESULT LED's. The

S.T. FAILED LED and the SELF TEST FAILED indicator will also remain lit. In the event that a self-test error occurs, table A-3 should be used to determine the nature and probable source of the failure. Refer to the *HP 7920B Disc Drive Service Manual*, part no. 07920-90902 for repair instructions.

## A-8. OPERATOR FAMILIARIZATION

In addition to familiarizing the operator with the features described in the main manual, the service-trained person who installs an HP 7920H should also familiarize the operator with the details of self test.

## A-9. REPACKAGING FOR SHIPMENT

The approximate shipping weight of the HP 7920H is 188 kilograms (415 pounds).

Table A-3. Test Failure Summary

TEST NO.	SECTION NO.	TEST RESULT LED'S	TEST/SECTION FAILURE	PROBABLE SOURCE
17	—	● ● ● ●	MICROPROCESSOR	PCA-A2*, disc drive
16	—	● ● ● ○	RALU, FLAGS	PCA-A2
15	—	● ● ○ ●	PHI	PCA-A1*, PCA-A2
14	17	● ● ○ ○	FIFO's	PCA-A1*, PCA-A2
	16	● ● ● ●	NTORE stuck-at-0.	PCA-A1*, PCA-A2
	15	● ● ● ○	NTORE stuck-at-1.	PCA-A1*, PCA-A2
	14	● ● ○ ●	Upper FIFO data error.	PCA-A1
13	14	● ● ○ ○	Lower FIFO data error.	PCA-A1
		● ○ ● ●	PHI/FIFO HANDSHAKE	PCA-A1
		● ● ● ●	EOT flag stuck.	PCA-A1
	16	● ● ● ○	Write-to-PHI not complete.	PCA-A1
	15	● ● ○ ●	Sector word counter does not handshake.	PCA-A1
14	● ● ○ ○	Read full/write full does not override EOS (read from PHI handshake does not complete).	PCA-A1	
13	● ○ ● ●	EOT not detected.	PCA-A1	
12	● ○ ● ○	Lower NIBBLE data bad.	PCA-A1	
11	● ○ ○ ●	Upper NIBBLE data bad.	PCA-A1	
12	17	● ○ ● ○	FORMATTER/SEPARATOR	Data PCA-A1*, PCA-A2
		● ● ● ●	EOW stuck true.	PCA-A1
		● ● ● ○	No EOW in data test.	PCA-A1
	16	● ● ● ○	Bad data from formatter/separator.	PCA-A1
	15	● ● ○ ●	Overrun stuck true.	PCA-A1*, PCA-A2
	14	● ● ○ ○	Undetected overrun.	PCA-A1*, PCA-A2
	13	● ○ ● ●	No EOW in 8th word test.	PCA-A1
	12	● ○ ● ○	8th word flag stuck true.	PCA-A1*, PCA-A2
11	● ○ ○ ●	8th word flag stuck false.	PCA-A1*, PCA-A2	
10	● ○ ○ ○			

○ = LED "OFF"

● = LED "ON"

\* Most probable source

Table A-3. Test Failure Summary (Continued)

TEST NO.	SECTION NO.	TEST RESULT LED'S	TEST/SECTION FAILURE	PROBABLE SOURCE
11	17 16 15 14	● ○ ○ ● ● ● ● ● ● ● ● ○ ● ● ○ ○	CRC/DATA PATH SWITCH No EOW in test. CRC error stuck false. CRC error stuck true. Bad generated CRC pattern.	PCA-A1*, PCA-A2 PCA-A1 PCA-A1*, PCA-A2 PCA-A1*, PCA-A2 PCA-A1
10	17 16 10	● ○ ○ ○ ● ● ● ● ● ● ● ○ ● ○ ○ ○▲	DRIVE STATUS Drive fault. Drive busy while ready. Drive not ready.	Drive electronics*, PCA-A2 Drive electronics Drive electronics, PCA-A2 Drive electronics
7	17 16 15 14  13 12 11 10  7 6  5 4 3 2	○ ● ● ● ● ● ● ● ● ● ● ○ ● ● ○ ○  ● ○ ● ● ● ○ ● ○ ● ○ ○ ● ● ○ ○ ○  ○ ● ● ● ○ ● ● ○  ○ ● ○ ● ○ ● ○ ○ ○ ○ ● ● ○ ○ ● ○	HEAD/SECTOR LOGIC Illegal drive type. Bad head register. Sector count too large (head 1). Sector count not incrementing (head 1). Sector count not properly cleared (head 1). Sector compare stuck-at-1 (head 1). Sector compare stuck-at-0 (head 1). Sector compare set more than once per revolution (head 1). Sector count too large (head 2). Sector count not incrementing (head 2). Sector count not properly cleared head 2). Sector compare stuck-at-1 (head 2). Sector compare stuck-at-0 (head 2). Sector compare set more than once per revolution (head 2).	PCA-A2*, drive electronics PCA-A2 PCA-A2 PCA-A2 PCA-A2*, drive electronics PCA-A2*, drive electronics PCA-A2 PCA-A2 PCA-A2 PCA-A2 PCA-A2 PCA-A2 PCA-A2 PCA-A2 PCA-A2 PCA-A2 PCA-A2
6	17 16 4 3 2 1	○ ● ● ● ○ ● ● ● ● ● ● ● ● ● ○ ○ ● ○ ○ ○ ○ ● ● ○ ○ ○ ●	RECALIBRATE Recalibrate timeout error. Attention stuck-at-1. Drive busy and attention set. Drive not ready. Seek check. Drive fault.	Drive electronics*, PCA-A2 Drive electronics*, PCA-A2 Drive electronics*, PCA-A2 Drive electronics*, PCA-A2 Drive electronics Drive electronics*, PCA-A2 Drive electronics
5	17 16 15 4 3 2 1	○ ● ○ ● ● ● ● ● ● ● ● ○ ○ ● ○ ○ ○ ○ ● ● ○ ○ ● ○ ○ ○ ○ ●	SEEK Seek timeout error. Attention stuck-at-1. Undetected seek check. Drive busy and attention set. Drive not ready. Seek check. Drive fault.	Drive electronics*, PCA-A2 Disc drive*, PCA-A2 Drive electronics Drive electronics*, PCA-A2 Drive Electronics Drive electronics Drive electronics*, PCA-A2 Drive electronics
		○ = LED "OFF"      ● = LED "ON"	▲ Display flashing	* Most probable source

Table A-3. Test Failure Summary (Continued)

TEST NO.	SECTION NO.	TEST RESULT LED'S	TEST/SECTION FAILURE	PROBABLE SOURCE
4	17	○ ● ○ ○	SET OFFSET	Drive electronics*, PCA-A2
	16	● ● ● ●	Set offset timeout error.	Drive electronics*, PCA-A2
	4	● ● ● ○	Attention stuck-at-1.	Drive electronics
	3	○ ● ○ ○	Drive busy and attention set.	Drive electronics
	2	○ ○ ● ●	Drive not ready.	Drive electronics
	1	○ ○ ○ ●	Seek check.	Drive electronics
3		○ ○ ● ●	VERIFY CYLINDER ZERO	Drive electronics* disc cartridge, PCA-A1
	17	● ● ● ●	Drive status error.	Drive electronics
	16	● ● ● ○	Address miscompare.	Drive electronics
	15	● ● ○ ●	Defective track error.	Disc cartridge
	14	● ● ○ ○	Direct access to spare track.	Disc cartridge
	13	● ○ ● ●	Head 10 data error.	Disc cartridge*, PCA-A6, PCA-A5
	12	● ○ ● ○	Head 9 data error.	Same as section 13
	11	● ○ ○ ●	Head 8 data error.	Same as section 13
	10	● ○ ○ ○	Head 7 data error.	Same as section 13
	7	○ ● ● ●	Head 6 data error.	Same as section 13
	6	○ ● ● ○	Head 5 data error.	Same as section 13
	5	○ ● ○ ●	Head 4 data error.	Same as section 13
	4	○ ● ○ ○	Head 3 data error.	Same as section 13
	3	○ ○ ● ●	Head 2 data error.	Same as section 13
2	○ ○ ● ○	Head 1 data error.	Same as section 13	
1	○ ○ ○ ●	Head 0 data error.	PCA-A1*, disc cartridge, PCA-A6, PCA-A5	
		○ = LED "OFF"      ● = LED "ON"	* Most probable source	



