



HP 7905A Disc Drive

Operator's Manual



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CONTENTS

	Page		Page
Introduction	1	Rear Panel	4
General Description	1	Operating Procedures	5
Storage Media	1	Startup Procedure	5
Accessories	1	Changing a Disc Cartridge	5
Supporting Documentation	1	Changing Logical Unit	
Environmental Considerations	1	Identification	5
Operating Precautions	2	Shutdown Procedure	6
Operator Panel	2	Responding to Disc Drive Faults	6

ILLUSTRATIONS

Title	Page
Operator Panel Controls, Indicators, and Fuse	3
Rear Panel Fuses and Connector	4



TABLES

Title	Page
Disc Drive Environmental Considerations	1
Primary Power Fuse Rating	2

INTRODUCTION

This manual contains operator information for the HP 7905A Disc Drive. Included in this manual are a general description of the HP 7905A Disc Drive and its storage media; a list of available accessories; supporting documentation; environmental considerations; operating precautions; a description of each control, indicator, and fuse; and the basic operating procedures.

GENERAL DESCRIPTION

The HP 7905A Disc Drive is a random-access, mass-storage device for small- and medium-sized computer systems. The disc drive has a fixed disc and provisions for accepting a front-loading removable disc cartridge. Through the use of one data surface on the fixed disc and two data surfaces on the removable disc, this disc drive provides the using system with access to nearly 15 million bytes of formatted information.

STORAGE MEDIA

The storage media consists of two magnetic-oxide-coated discs which are 14 inches (355.6 mm) in diameter by 0.075-inch (1.9 mm) thick. There are 411 concentric recording tracks on each disc surface (11 are used as spares). Each set of three vertically aligned data tracks form a data cylinder. When formatted, each data track is subdivided into 48 data sectors. Each data sector is capable of storing up to 128 words of data. A data word consists of 2 bytes or 16 bits of information. The HP 12940A Formatted Disc Cartridge is formatted in this fashion and it is the only disc cartridge that can be used as the removable storage media for this disc drive.

ACCESSORIES

The following accessories may be ordered with the disc drive or separately from your local Hewlett-Packard Sales and Service Office. A list of HP Sales and Service Offices is provided at the back of this manual.

HP Model Number	Description
HP 12904A	Rack Mount Kit
HP 12940A	Formatted Disc Cartridge
HP 13013A	Multi-Unit Cable (12 feet) (3.65 meters)
HP 13013A-001	Multi-Unit Cable (5 feet) (1.52 meters)
HP 13013A-002	Multi-Unit Cable (18 feet) (5.49 meters)
HP 13013A-003	Multi-Unit Cable (8 feet) (2.44 meters)

SUPPORTING DOCUMENTATION

Installation and service information is provided in the *HP 7905A Disc Drive Installation and Service Manual*, part no. 07905-90007.

ENVIRONMENTAL CONSIDERATIONS

Environmental considerations for operating and nonoperating conditions of the disc drive are specified in table 1.

Table 1. Disc Drive Environmental Considerations

AMBIENT TEMPERATURE	
Operating:	10°C to 40°C (50°F to 104°F)
Nonoperating:	-40°C to 65°C (-40°F to 149°F)
RELATIVE HUMIDITY	
Operating:	8% to 80% noncondensing
Nonoperating:	5% to 95% noncondensing

Special considerations must be taken for storage of disc cartridges. It is highly desirable to have disc cartridges stored in environmental surroundings that are nearly identical with those of the operating area. Storing disc cartridges in the same area where the disc drive is located will avoid the waiting time for disc drive and disc cartridge temperature equalization.

The temperature of the disc drive and disc cartridge must be within $\pm 3^{\circ}\text{C}$ ($\pm 5.4^{\circ}\text{F}$) of each other to ensure optimum performance. If the waiting time is not critical and disc cartridges are stored in another area, the temperature of the storage area should be maintained between -15°C and 60°C (5°F and 140°F) with the relative humidity between 0 and 95 percent. If the relative humidity of the storage area is outside the 8- to 80-percent range of the disc cartridge operating area requirement, the disc cartridges must be allowed 2 hours for environmental stabilization when brought into the operating area.

Disc cartridges should always be stored in a clean, dust-free area and should not be stacked more than two high when lying flat. It is advisable to provide steel storage cabinets with shelves adjusted to the appropriate height. Disc cartridges should not come in contact with any magnetic

material and should not be stored directly on top of the disc drive. A magnetic field with an intensity greater than 50 oersteds near a disc cartridge can cause loss of information.

OPERATING PRECAUTIONS

The operator should observe the following precautions when operating the disc drive:

- a. The disc drive has a strong magnetic field; do not wear a wrist watch when working near the top rear of the disc drive.
- b. Do not place magnetic media on top of the disc drive.
- c. The air inlet screen should not be left open. The longer it is open, the greater the chance of contaminants.
- d. Observe all warning and caution labels affixed to the disc drive.
- e. Minimize head to disc interference (HDI) by operating the disc drive in an environmentally clean area. HDI results when the air cushion between the heads and rotating disc surfaces fails. The main causes of HDI are foreign particles in the air cushion, buildup of contaminants on the heads and disc surfaces, and defective disc surfaces.

OPERATOR PANEL

Figure 1 illustrates the location of each operator panel control, indicator, and fuse and the following paragraphs describe their functions. All indicators (except Unit Select Identification) are backlighted.

① **DRIVE FAULT** indicator — lights in the event a malfunction occurs in the read/write circuitry, or a seek operation is not completed within 90 milliseconds, or a recalibrate operation is not completed within 1,250 milliseconds.

② **PROTECT LOWER DISC** indicator — lights whenever the LOWER DISC PROTECT switch is activated. When lighted, it indicates that the data surface on the lower (fixed) disc is protected from any write operations.

③ **PROTECT UPPER DISC** indicator — lights whenever the UPPER DISC PROTECT switch is activated. When lighted, it indicates that both data surfaces on the upper (removable) disc are protected from any write operations.

④ **DOOR UNLOCKED** indicator — lights whenever the RUN/STOP switch is set to STOP, the spindle has stopped, the door lock solenoid is energized, and it is safe to open the cartridge access door. It also lights when the RUN/STOP switch is set to RUN and the cartridge access door is not closed.

⑤ **DRIVE READY** indicator — lights to indicate that the startup sequence and brush cycle are complete, the spindle has reached operational speed, and the heads have been loaded.

⑥ **Unit Select Identification** seven-segment numerical indicator — displays the selected logical unit address of the disc drive. It also indicates that ac power has been applied to the disc drive power supplies. When the system selects the disc drive, a light-emitting-diode (LED) is lighted in the upper left-hand corner of this indicator.

⑦ **RUN/STOP** toggle switch — initiates the startup sequence and brush cycle, controls the application of power to the spindle motor and door lock solenoid, clears any disc drive faults, and initiates the shutdown sequence.

When set to RUN, the startup sequence and brush cycle are initiated, power is applied to the spindle motor, the door lock solenoid is de-energized, and any disc drive faults are cleared. After the startup sequence and brush cycle are complete, the heads will be loaded at cylinder zero and the DRIVE READY indicator will light.

When set to STOP, the shutdown sequence is initiated, the heads are retracted, the spindle is braked to a stop, and the door lock solenoid is energized to permit safe access to the disc cartridge.

⑧ **UNIT SELECT** eight-position rotary switch — selects the logical unit address of the disc drive. The Unit Select Identification indicator display will correspond to the switch setting.

⑨ **POWER/OFF** toggle switch — controls the application of ac power to the disc drive power supplies and blower motor. The Unit Select Identification indicator will light to indicate that power has been applied.

⑩ **F1** primary power fuse — provides protection from an ac power overload. The current and voltage ratings and the HP part numbers of the required fuse are listed in table 2.

Table 2. Primary Power Fuse Rating

SOURCE VOLTAGE	REQUIRED RATING	HP PART NUMBER
100 Vac	8AT*, 250V	2110-0383
120 Vac	8AT*, 250V	2110-0383
200 Vac	4AT*, 250V	2110-0365
220 Vac	4AT*, 250V	2110-0365
240 Vac	4AT*, 250V	2110-0365

*The T indicates that a time delay or slo-blo fuse must be used.

⑪ **FORMAT** slide switch — allows the program to alter or protect the contents of the sector address field.

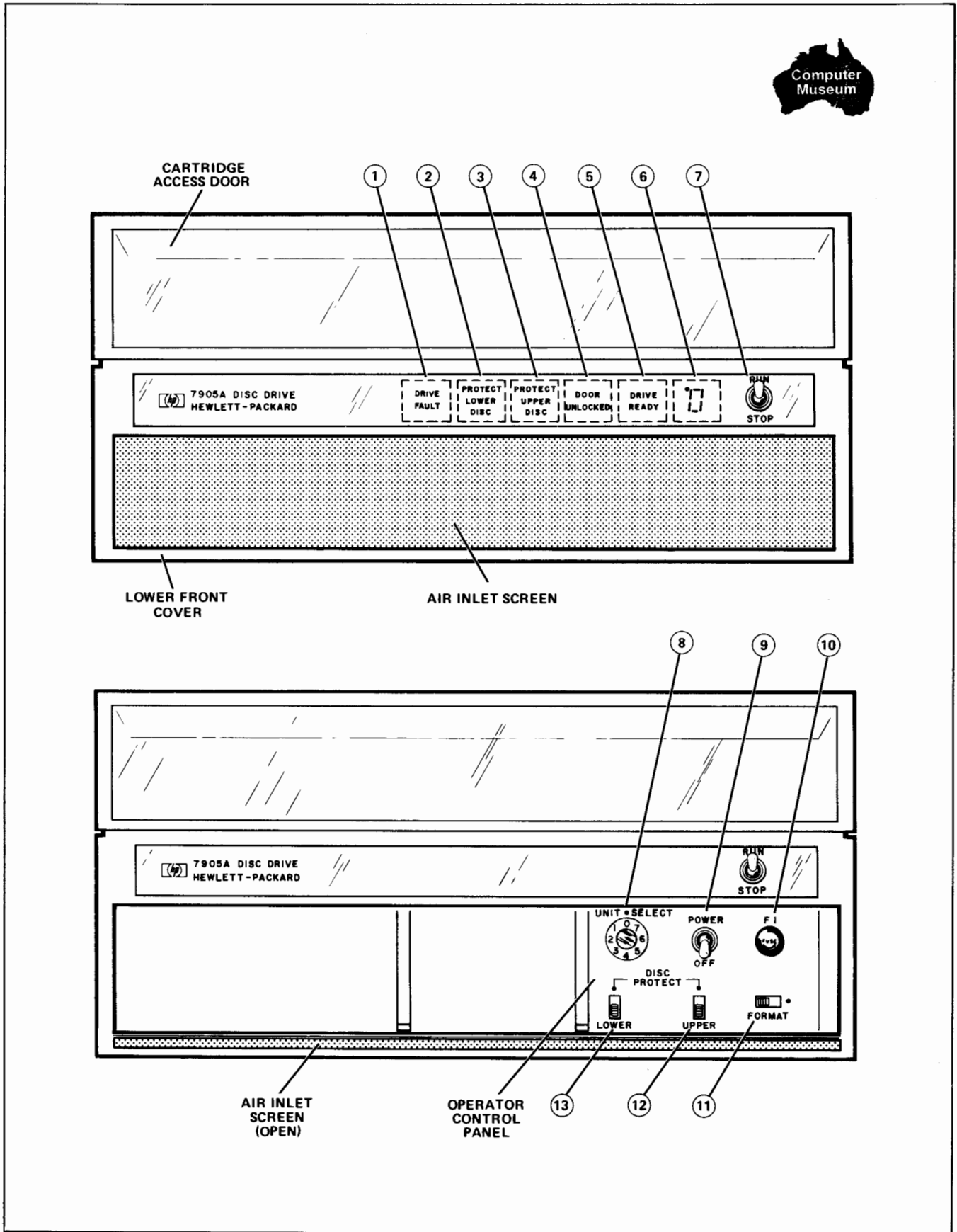


Figure 1. Operator Panel Controls, Indicators, and Fuse

When set to the format position (●), the program can change the contents of the sector address field. This position is used to initialize an unrecorded disc or to selectively set protected track or defective track status bits in the sector address field.

When set to the protected position, the program is prevented from altering the contents of the sector address field.

⑫ **UPPER DISC PROTECT** slide switch — allows the program to protect the data recorded on both surfaces of the upper (removable) disc.

When set to the protected position (●), the data recorded on both surfaces of the upper disc is protected from any write operations. The PROTECT UPPER DISC indicator will light to indicate that the data protection feature is activated.

When set to the unprotected position, the data recorded on both surfaces of the upper disc is not protected from any write operations and therefore it is subject to change.

⑬ **LOWER DISC PROTECT** slide switch — allows the program to protect the data recorded on the data surface of the lower (fixed) disc.

When set to the protected position (●), the data recorded on the data surface of the lower disc is protected from any write operations. The PROTECT LOWER DISC indicator will light to indicate that the data protection feature is activated.

When set to the unprotected position, the data recorded on the data surface of the lower disc is not protected from any write operations and therefore it is subject to change.

REAR PANEL

Figure 2 illustrates the location of each rear panel fuse and connector and the following paragraphs describe their functions.

① **F6** — this 1.5-ampere, 250-volt secondary fuse (part no. 2110-0043) provides overload protection for the -20 Vdc unregulated (-12 Vdc regulated) power supply.

② **F5** — this 1.5-ampere, 250-volt secondary fuse (part no. 2110-0043) provides overload protection for the +20 Vdc unregulated (+12 Vdc regulated) power supply.

③ **F4** — this 8-ampere, 250-volt secondary fuse (part no. 2110-0342) provides overload protection for the +10 Vdc unregulated (+5 Vdc regulated) power supply.

④ **F3** — this 8-ampere, 250-volt, slo-blo secondary fuse (part no. 2110-0383) provides overload protection for the +36 Vdc power supply.

⑤ **F2** — this 8-ampere, 250-volt, slo-blo secondary fuse (part no. 2110-0383) provides overload protection for the -36 Vdc power supply.

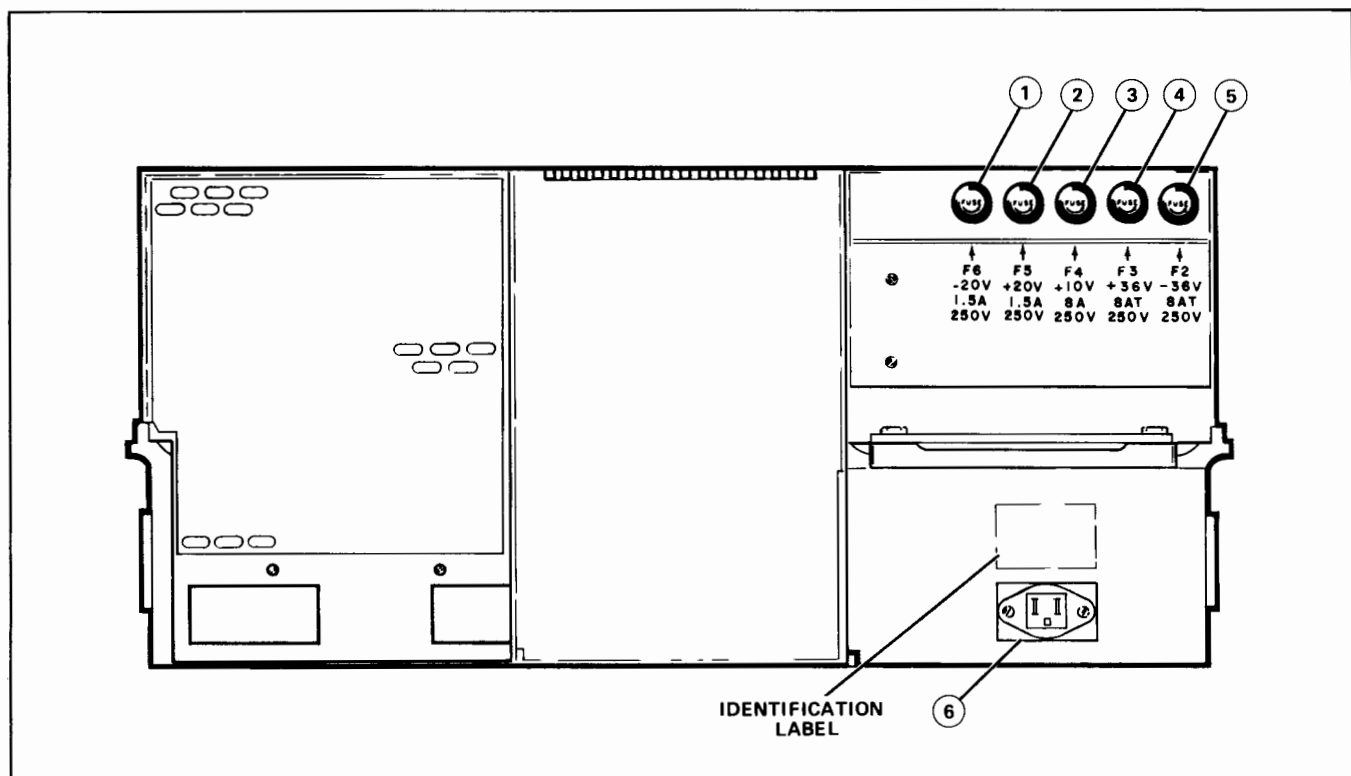


Figure 2. Rear Panel Fuses and Connector

6 AC Line Connector — this three-input power line connector provides the means to connect an ac power source to the disc drive.



OPERATING PROCEDURES

The following paragraphs provide the basic operating procedures for the disc drive. Included is a procedure for startup, changing a disc cartridge, changing logical unit identification, shutdown, and responding to disc drive faults.

STARTUP PROCEDURE

To operate the disc drive, proceed as follows:

- a. Set the RUN/STOP switch to the STOP position.
- b. Push in on the bottom edge of the air inlet screen to open it.
- c. Set the DISC PROTECT switches as desired.
- d. Set the FORMAT switch as desired.
- e. Set the UNIT SELECT switch to correspond to the desired disc drive logical unit address which will permit proper operation with the system.
- f. Set the POWER/OFF switch to the POWER position and observe that the Unit Select Identification and DOOR UNLOCKED indicators light.
- g. Close the air inlet screen.
- h. Open the cartridge access door by pulling out and down on its recessed upper edge.

CAUTION

If head to disc interference (HDI) should occur, do not attempt to retrieve data by putting the damaged cartridge in another disc drive or HDI might occur again. For the same reason, do not put another cartridge in the disc drive with HDI until the unit has been checked by qualified service personnel.

- i. Carefully insert an HP 12940A Formatted Disc Cartridge, access-door end first, until it is seated fully.
- j. Close the cartridge access door.
- k. Set the RUN/STOP switch to RUN. The DOOR UNLOCKED indicator will go out and after the 30-second startup sequence is complete, the DRIVE READY in-

dicator will light indicating that the brush cycle is complete, the spindle has reached operational speed, and the heads have been loaded at cylinder zero. The DRIVE FAULT indicator will only light if a malfunction in the read/write circuitry occurs, or a seek operation is not completed within 90 milliseconds, or a recalibrate operation is not completed within 1,250 milliseconds.

CHANGING A DISC CARTRIDGE

To change a disc cartridge, proceed as follows:

- a. If the disc drive is operating, set the RUN/STOP switch to STOP. The DRIVE READY indicator will go out immediately.
- b. Allow the spindle to halt (approximately 25 seconds). The DOOR UNLOCKED indicator will light indicating that the spindle has stopped, the door lock solenoid is energized, and it is safe to open the cartridge access door.
- c. Open the cartridge access door by pulling out and down on its recessed upper edge.
- d. Firmly grasp the disc cartridge and slowly pull it straight out.
- e. Carefully insert the new disc cartridge, access-door end first until it is seated fully. Use only an HP 12940A Formatted Disc Cartridge.
- f. Close the cartridge access door.
- g. Set the RUN/STOP switch to RUN to resume system operation.

CHANGING LOGICAL UNIT IDENTIFICATION

To change the logical unit identification of the disc drive, proceed as follows:

- a. If the disc drive is operating, set the RUN/STOP switch to STOP. The DRIVE READY indicator will go out immediately.
- b. Push in on the bottom edge of the air inlet screen to open it.
- c. Set the UNIT SELECT switch to correspond to the desired disc drive logical unit address which will permit proper operation with the system.
- d. Close the air inlet screen.
- e. Set the RUN/STOP switch to RUN to resume system operation.

SHUTDOWN PROCEDURE

To shut down the disc drive, proceed as follows:

- a. Set the RUN/STOP switch to STOP. The DRIVE READY indicator will go out immediately.
- b. Allow the spindle to halt (approximately 25 seconds). The DOOR UNLOCKED indicator will light indicating that the spindle has stopped, the door lock solenoid is energized, and it is safe to open the cartridge access door.
- c. Push in on the bottom edge of the air inlet screen to open it.
- d. Set the POWER/OFF switch to the OFF position. The Unit Select Identification and DOOR UNLOCKED indicators will go out.

RESPONDING TO DISC DRIVE FAULTS

Disc drive faults must be referred to your local Hewlett-Packard Customer Engineer or to other qualified service personnel. Conditions which define drive faults are as follows:

- a. No DRIVE READY indication 30 seconds after setting the RUN/STOP switch to RUN. This indicates that the disc drive has not reached operational status.
- b. DRIVE FAULT indicator lights at any time.

Authorized operator responses to disc drive faults are as follows:

- a. If the DRIVE FAULT indicator is not lighted, set the RUN/STOP switch to STOP.
- b. Check for errors, such as an incorrect logical unit address, or an improperly seated disc cartridge.
- c. Report all observed disc drive faults to the supervising operator.

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