



OWNER'S MANUAL

7957B, 7958B and 7959B DISC DRIVES

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MODELS COVERED

This manual covers the following models: HP 7957B, HP 7958B and HP 7959B.

OPTIONS COVERED

In addition to the standard model, this manual covers the following options: 015, 550.



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Warning: This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: re-orient the receiving antenna; relocate the computer with respect to the receiver; move the computer away from the receiver; plug the computer into a different branch circuit. If necessary, the user should consult the dealer or authorized field service representative for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "Interference Handbook." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00450-7.

Herstellerbescheinigung

Hiermit wird bescheinigt, daß das Gerät/System HP 7957B, 7958B and 7959B in Übereinstimmung mit den Bestimmungen von Postverfügung 1046/84 funktentstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes/Systems angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Manufacturer's Declaration

This is to certify that the product(s) HP 7957B, 7958B and 7959B is in accordance with the Radio Interference Requirements of Directive FTZ 1046/1984. The German Bundespost was notified that this equipment was put into circulation; the right to check the series for compliance with the requirements was granted.

Additional Information for Test and Measurement Equipment

If Test and Measurement Equipment is operated with unscreened cables and/or used for measurements on open setups, the user has to assure that under operating conditions the Radio Interference Limits are still met at the border of his premises.

For Japan

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This apparatus is a class 2 ITE (information apparatus which may be used in residential and adjacent areas) which meets the VCCI standards to prevent radio interference in residential and adjacent areas. However, this apparatus may become a source of radio interference if used within close range of radio or television receivers. To ensure compliance, this apparatus must be operated according to instructions included with the product.

Printing History

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition or a new update is published. No information is incorporated into a reprinting unless it appears as a prior update; the edition does not change when an update is incorporated.

A software code may be printed before the date; this indicates the version level of the software product at the time the manual or update was issued. Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

Edition 1	JANUARY 1988
Edition 2	OCTOBER 1989

Safety Considerations

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.

WARNING

The WARNING sign denotes a hazard. It calls attention to a procedure or practice that, if not correctly performed or adhered to, could result in personal 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 or practice that, 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 according to the input power configuration instructions provided in this manual.

If this product is to be operated with an autotransformer make sure that 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 after the product has been disconnected from the main power source.

To avoid a fire hazard, fuses with the proper current rating and of the specified type (normal blow, time delay, etc.) must be used for replacement. To install or remove a fuse, first disconnect the power cord from the device. Then, using a small flat-bladed screw driver, turn the fuseholder cap counterclockwise until the cap releases. Install either end of a properly rated fuse into the cap. Next, insert the fuse and fuseholder cap into the fuseholder by pressing the cap inward and then turning it clockwise until it locks in place.

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Introduction

The Hewlett-Packard 7957B, 7958B and 7959B Disc Drives are random access, data storage devices designed for use with small- and medium-sized computer systems. The formatted storage capacities of the HP 7957B, 7958B and 7959B are 81 megabytes, 152 megabytes and 304 megabytes, respectively. In this manual, unless otherwise specified, "disc drive" refers to all three models.

The disc drive employs two (HP 7957B), three (HP 7958B) or six (HP 7959B) nonremoveable 130-millimetre (5.12-inch) thin-film discs with thin-film heads for storage media. Each disc surface contains both data and embedded servo information. The servo data is used to ensure the precise positioning of the read/write heads.

A sophisticated actuator design combines the performance of a linear actuator with reliability and cost benefits of the traditional rotary actuator. Contamination protection for the heads, actuator and media is achieved by enclosing these components in a sealed head-disc module having a built-in air filter.

Also included in the disc drive are a Hewlett-Packard Interface Bus (HP-IB) controller and a dc power supply. The controller-disc drive interface conforms to the Enhanced Small Device Interface (ESDI) industry standard.

The disc drive contains internal self-test diagnostics and a fault-finding system which exercise key functions of the drive. Self-test is performed automatically at power on and can also be initiated by the host computer. Go/no-go test results are indicated by a green/red indicator on the front panel.

An auto-sparing function incorporated in the drive electronics automatically spares out marginal or unrecoverable media defects which may occur during normal operation of the drive. A further enhancement of this auto-sparing feature allows service personnel to perform offline media maintenance and self-test repetition.

The disc drive is packaged in a stand-alone desktop cabinet. Accessories available include a desk-height stand-alone cabinet designed to hold the disc drive and other desktop stack modules. A kit for rack mounting the disc drive in a standard EIA equipment rack is also available.

This manual provides the information needed to install and operate the disc drive. Details of the control functions provided by the host computer are described in the computer's documentation.

Accessories

- HP 92211-Series Cabinets. A desk-height standalone cabinet series for the disc drive and other desktop stackable peripherals and systems.
- HP 19500B Rack Mount Kit. Allows the disc drive to be mounted in a standard 19-inch EIA equipment rack.

Options

- Option 015. For non-U.S. shipments. Voltage Selector switch set for 230 Vac operation.
- Option 550. Deletion of the HP 10833A 1-metre HP-IB Interface Cable Assembly.

Characteristics

Characteristics of the disc drive, including physical dimensions and power requirements, are listed in Table 1-1, Disc Drive Characteristics. Detailed specifications for the disc drive, including environmental requirements, are listed in the *Site Environmental Requirements for Disc/Tape Drives Manual*, part no. 5955-3456. This publication is supplied with the disc drive.

Supporting Documentation

The following documentation may be ordered from a Hewlett-Packard Sales and Support Office:

- *CS/80 Instruction Set Programming Manual*, part no. 5955-3442.
- *CS/80 External Exerciser Manual*, part no. 5955-3462.

Table 1-1. Disc Drive Characteristics

Safety

Meets all applicable safety standards of IEC 380 and IEC 435.

UL Listed UL 114 and UL 478.

CSA Certified to CSA C22.2 No. 154 and No. 220.

Power Requirements

Specified source (selected by rear panel VOLTAGE SELECTOR switch)

Voltage (true RMS): 115V range; 100V, 115V, 120V, single phase
(inclusive tolerance range is 90V to 132V)

230V range; 220V, 240V, single phase
(inclusive tolerance range is 180V to 264V)

Frequency: 47.5 to 66 Hz

Typical current: 115V range; 1.0A (true rms at 115V, 60 Hz)
230V range; 0.6A (true rms at 230V, 50 Hz)

Typical power: 115V range; 65 watts (115V, 60 Hz)
230V range; 65 watts (230V, 50 Hz)

Size/Weight

Height: 132 mm (5.2 in.) with cabinet feet
129 mm (5.1 in.) without cabinet feet

Width: 325 mm (12.8 in.)

Depth: 285 mm (11.2 in.)

Net weight: 10.6 kg (23.2 lb)

Shipping weight: 13.6 kg (29.9 lb)



NOTICE: BEFORE CONNECTING POWER, READ THESE INSTRUCTIONS CAREFULLY.

Introduction

This chapter provides instructions on how to place your disc drive in operation. These instructions include unpacking instructions, a check of equipment supplied, and how to connect the disc drive to a line voltage source and the Hewlett-Packard Interface Bus (HP-IB).

NOTE

Refer to Figure 2-2, Controls and Connectors, for the location of the controls and connectors identified by numbers (for example: HP-IB connector **4**) in the text.

Unpacking Your Disc Drive

CAUTION

The disc drive is delicate and should be handled with care. Also, the drive is heavier (10.6 kilograms/23.2 pounds) than its size would indicate.

The disc drive is shipped in a reusable shipping container. (See Figure 2-1, Packaging Details.) 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.

Remove the unit from the shipping container and inspect the unit for any mechanical damage that may have occurred during shipment. If any damage is observed, you should immediately notify your dealer or Hewlett-Packard Sales and Support Office and file a claim with any carrier involved.

A list of Hewlett-Packard Headquarters Offices is provided at the back of this manual.

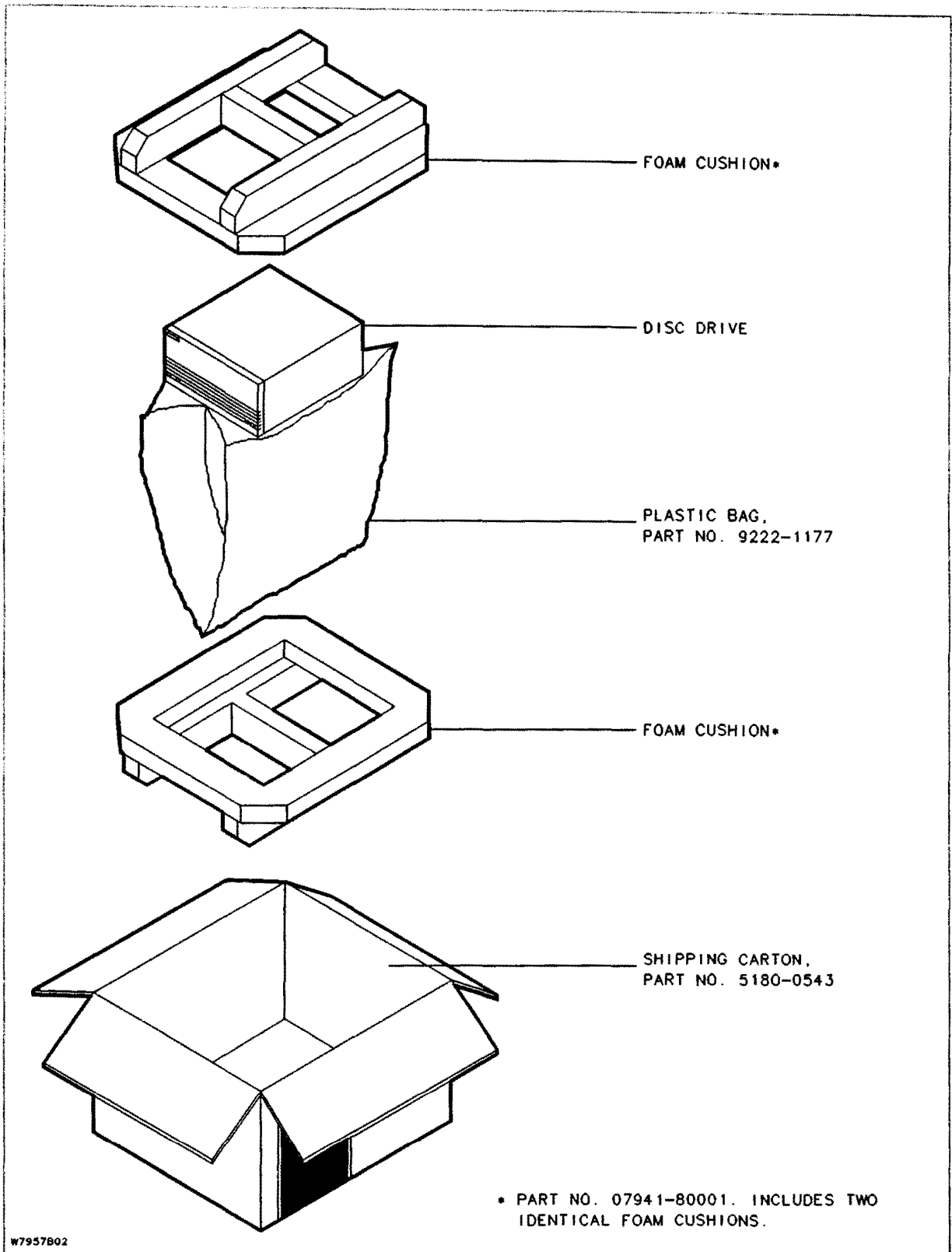


Figure 2-1. Packaging Details

Handling

Although the disc drive has been designed to withstand a certain shock level, it is still a delicate device. Care should be taken when handling or transporting the product. The following precautions should be observed when handling or transporting the disc drive. Failure to observe these handling precautions could result in loss of data or damage to the product.

Handling Precautions

- Avoid sharp shocks to the disc drive.
- Always repackage the disc drive in approved packaging when transporting the product from one area to another.
- To ensure continuous successful operation of this product in a carpeted office environment, Hewlett-Packard recommends the use of anti-static mats and/or carpets with this product. Refer to the *Hewlett-Packard Computer Users Catalog* for a complete listing of static control and anti-static mats and carpets.

NOTE

A static charge of 39,000 volts can be generated on a carpeted floor. This exceeds the limits of this product and can cause unsatisfactory operation.

Design Plus Cabinet Installation

When installing the disc drive into one of Hewlett-Packard's Design Plus Cabinets (HP 92211 Series Cabinets), remember to remove the plastic feet from the front and rear of the disc drive to ensure a good ground contact between the drive and the cabinet. This will guard against electrostatic problems. Refer to the installation documentation supplied with the cabinet for detailed installation instructions.

Equipment Supplied

Check to ensure that all of the standard equipment supplied with the disc drive has been received. This equipment is listed below.

- Power Cable (part number depends on location).
- *Site Environmental Requirements for Disc/Tape Drives Manual*, part no. 5955-3456.
- *HP 7957B, 7958B and 7959B Disc Drives Owner's Manual*, part no. 07959-90901.

- HP 10833A 1-metre HP-IB Interface Cable assembly.
- Fuse, 3-ampere, 250-volt, non time-delay, part no. 2110-0003. Quantity: 2.

If any items are missing, contact your dealer or Hewlett-Packard Sales and Support Office.

Power Requirements

Refer to Table 1-1, Disc Drive Characteristics.

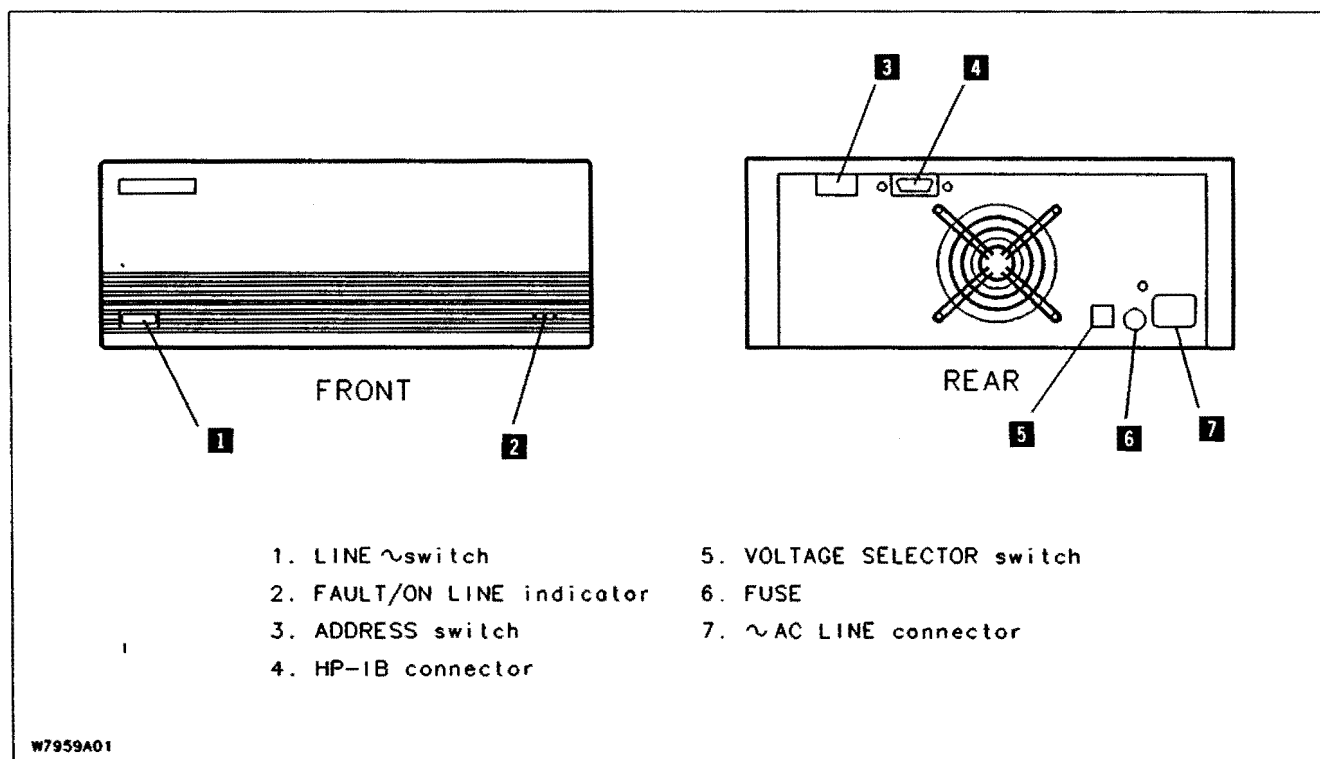


Figure 2-2. Controls and Connectors

Configuring Power

The following instructions should be followed to ensure that your disc drive is properly adjusted to operate on the line voltage available in your area.

Setting the VOLTAGE SELECTOR Switch

CAUTION

Make sure that the power cord is disconnected from the disc drive ~AC LINE connector **7** before changing the VOLTAGE SELECTOR switch **5** setting. Failure to disconnect the power cord could result in damage to the unit.

Your disc drive should already be adjusted to operate on the line voltage available in your area. Check that the VOLTAGE SELECTOR switch **5** is set to this voltage level (115V or 230V). To change the switch setting, disconnect the power cord from the ~AC LINE connector **7**. Then place the tip of a small flat-blade screwdriver in the slot on the switch and slide the switch sideways to the proper setting.

FUSE Value

The value of the FUSE **6** is the same for both settings of the VOLTAGE SELECTOR switch **5**. Use only a 3-ampere, 250-volt, non time-delay fuse. The HP part number for this fuse is 2110-0003.

WARNING

Make sure that the power cord is disconnected from the disc drive before installing or replacing the FUSE **6**. Failure to disconnect the power cord could result in electrical shock or damage to the unit. Refer to the "Safety Considerations" page in the front of this manual before doing anything with the fuse.

WARNING

For continued protection against fire hazard, replace only with a fuse of the same type and rating.

Installing the Power Cord

CAUTION

- Positions 8 and 9 on the ADDRESS switch 5 select diagnostics for use by service personnel only. If the drive is powered on with 8 or 9 selected, possible loss of data may occur.
 - Use UL/CSA approved power cord, SVT type, rated for suitable voltage and current. (Refer to Appendix D in the *Site Environmental Requirements Manual*, part no. 5955-3456.)
 - Check the input ac voltage, the value of the fuse 6, and the setting of the VOLTAGE SELECTOR switch 5 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 Appendix D of the *Site Environmental Requirements for Disc/Tape Drives Manual*, part no. 5955-3456.
 - Do not attempt to operate the disc drive configured for 115 Vac on 230 Vac, or vice versa. Damage to the disc drive may result.
- a. Set the LINE~ switch 1 to the 0 (out) position.
 - b. Plug the female end of the power cord into the ~AC LINE connector 7 at the rear of the disc drive.

Connecting the Disc Drive to Your System

The disc drive is connected to the system host via an HP-IB cable attached to the HP-IB connector 4 on the rear panel of the disc drive. It is also necessary to set the ADDRESS switch 5 to the HP-IB device address selected for the disc drive. Details of these two operations are provided in the following paragraphs.

NOTE



This unit must be connected to the system host by a shielded HP 10833 Series HP-IB Cable Assembly, or its equivalent.

Checking the HP-IB Cable

CAUTION

Ensure that the LINE~ switches on all units of your system are set to the 0 (out) position before connecting (or disconnecting) HP-IB cables.

A 1-metre (3.3-foot) HP-IB cable assembly is supplied with the disc drive. Before using this cable to connect the disc drive to the system host, ensure that the proposed cabling conforms with the following HP-IB cabling standards. (See figure 2-3.)

- Cabling is limited to 1 metre per HP-IB load. Typically, the central processing unit (CPU) is 7 equivalent loads and the disc drive is 1 equivalent load. Refer to the host *Configuration Guide* for specific information regarding the CPU equivalent load.
 - The CPU adheres to an HP standard which allows 7 metres of HP-IB cable between the CPU and the nearest device connected to it, and 1 metre of cable connected between each additional device.
 - The maximum is eight devices (excluding the CPU) per HP-IB channel or a maximum of 15 metres or 15 equivalent loads.
 - The maximum number of devices which can be connected to a single HP-IB channel is host dependent. This information is provided in the appropriate host *Configuration Guide*.
 - There are no restrictions on how the devices can be connected together on the HP-IB channel. However, do not connect more than three cable connectors to the HP-IB connector on a device. Additional cable connectors could result in enough force being exerted on the HP-IB connector to damage it.
- a. Set the LINE~ switch  to the 0 (out) position.
 - b. Connect one end of the HP-IB cable to the HP-IB connector  on the rear panel of the disc drive. Tighten the two securing screws on the connector.
 - c. Connect the other end of the HP-IB cable to the HP-IB data bus on the CPU.

Setting the HP-IB Device Address

Each device in a Hewlett-Packard Interface Bus (HP-IB) system requires a unique device address. A thumbwheel ADDRESS switch **3** on the rear panel of the disc drive is provided for this purpose. The switch can be set to any one of eight addresses, ranging from decimal 0 through 7.

CAUTION

Ensure that the disc drive LINE~ switch **1** is set to the 0 (out) position before changing the ADDRESS switch **3** settings. Failure to observe this precaution may result in loss of data or no system response.

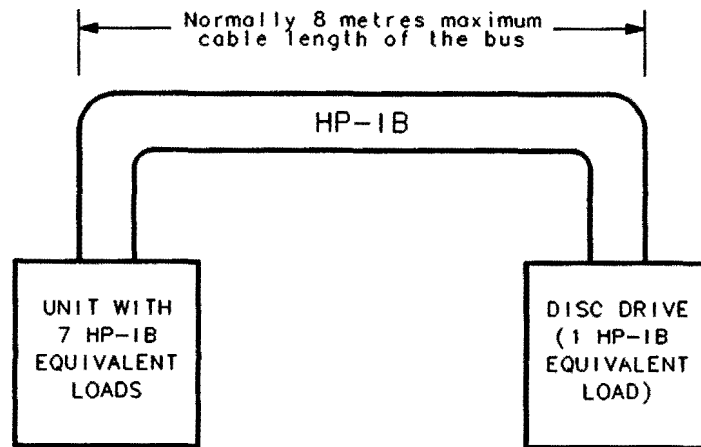
CAUTION

Positions 8 and 9 on the ADDRESS switch **3** select offline media maintenance and self-test repetitive operations for use by service personnel only. If the drive is powered on with 8 or 9 selected, possible loss of data may occur.

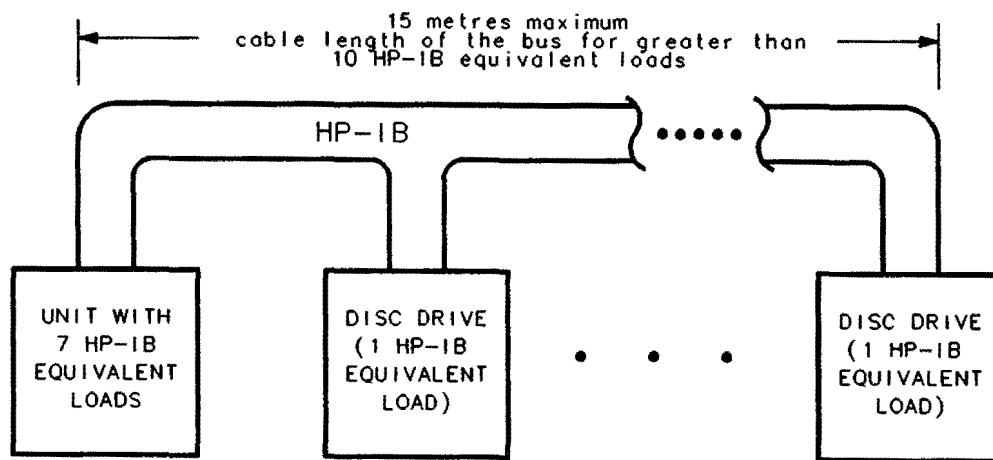
- a. Set the LINE~ switch **1** to the 0 (out) position.
- b. Set the ADDRESS switch **3** on the rear panel to the desired HP-IB device address.

System Configuration

Refer to the appropriate configuration section of your system manual(s) to ensure that the disc drive is properly configured into your system.



SINGLE DRIVE INSTALLATION



1 metre X n loads = cable length in metres (up to 15 metres maximum)

MULTIPLE DRIVE INSTALLATION

NOTES:

1. The maximum number of drives that can be connected to a single HP-IB channel is host dependent. This information is contained in the appropriate host configuration guide.

17937A11

Figure 2-3. Maximum HP-IB Cable Length

Introduction

This chapter contains operating instructions for the disc drive. Included are operating precautions, a description of the operating controls, self-test information, and line voltage application and removal procedures.




Warnings and Precautions



WARNING

Observe all warnings and cautions in this manual and affixed to the equipment.

CAUTION

- Positions 8 and 9 of the ADDRESS switch  select diagnostics for use by service personnel only. If the disc drive is powered on with 8 or 9 selected, possible loss of data may occur.
- Do not turn the LINE~ switch  on or off when your system is transferring data on the Hewlett-Packard Interface Bus (HP-IB).
- Do not cycle the LINE~ switch  on and off unnecessarily.
- Do not connect or disconnect the HP-IB cable(s) from the disc drive when your system is transferring data on the HP-IB.

Environmental Limits

To ensure proper operation, the disc drive must be operated within the environmental limits specified in the *Site Environmental Requirements for Disc/Tape Drives Manual*, part no. 5955-3456. This publication is supplied with the disc drive.

Controls and Connectors

Figure 3-1, Controls and Connectors, shows the location of the switches, indicators and connectors on the front and rear panels of the disc drive. The functions of these components are described in the following paragraphs.

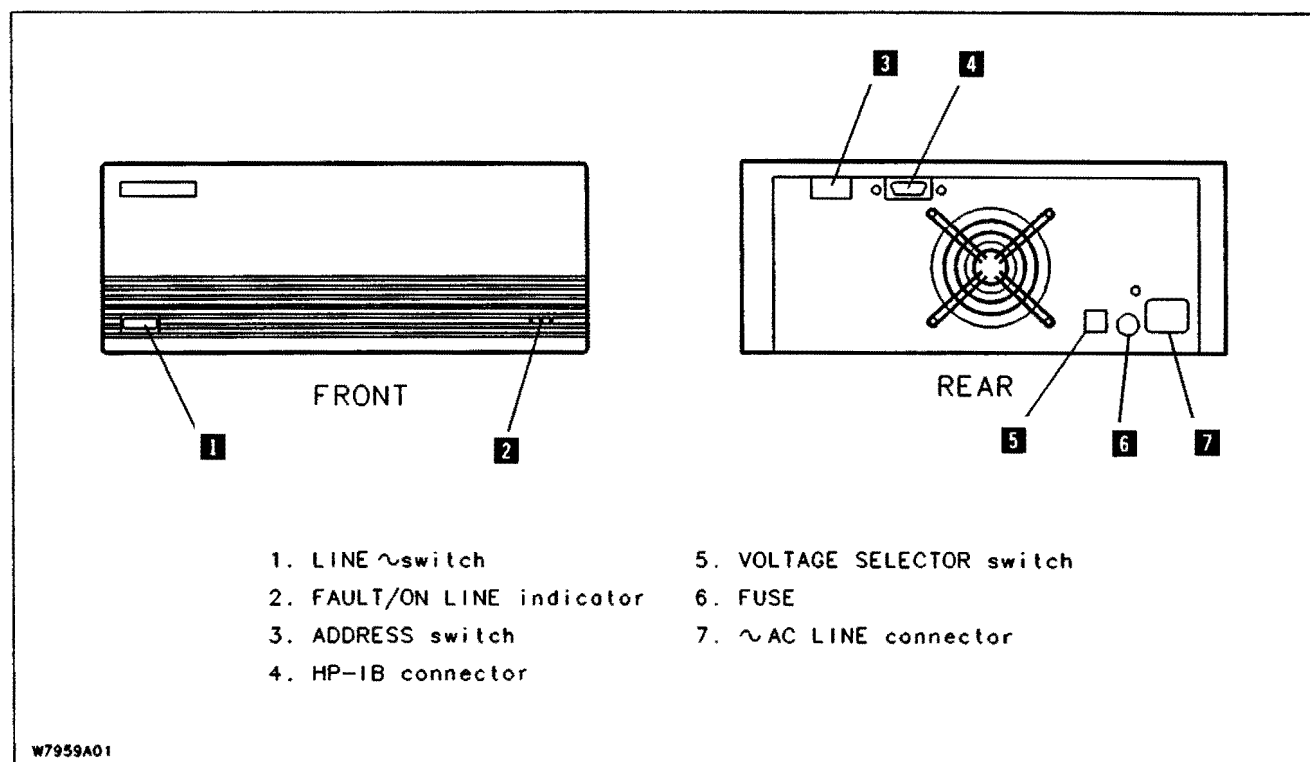


Figure 3-1. Controls and Connectors

LINE~ Switch

The LINE~ switch **1** controls the application of line voltage to the disc drive.

~AC LINE Connector

The ~AC LINE connector **7** allows the disc drive to be connected to a line voltage source.

FUSE

The FUSE **6** protects the disc drive from a line voltage overload. The fuse value (3-ampere, 250-volt, non-time delay) is the same for 115 and 230 Vac operation.

VOLTAGE SELECTOR Switch

The VOLTAGE SELECTOR switch **5** is a 2-position slide switch which selects a line voltage of 115 or 230 Vac for the disc drive.

HP-IB Connector

The HP-IB connector **4** allows the disc drive to be connected to the host computer via an HP-IB cable assembly. Connection instructions are given in chapter 2.

ADDRESS Switch

The ADDRESS switch **5** is a thumb-wheel switch which programs the drive's HP-IB device address (0-7). Positions 8 and 9 of the switch select offline media maintenance and self-test repetitive operations for use by service personnel only. Instructions on how to set the HP-IB address are given in chapter 2.

FAULT/ON LINE Indicator

The FAULT/ON LINE Indicator **2** is a red/green display which shows the operating status of the disc drive (see figure 3-2).

When line voltage is applied to the disc drive, the FAULT (red) and ON LINE (green) portions of the display are illuminated for two (2) seconds while the disc drive controller is tested and the disc drive mechanism spins up. If both the red and green indicators remain lit for longer than two seconds after power is applied, an error state exists caused by a failure in either the controller or the disc drive mechanism.

Following successful completion of the first part of the self-test routine, the red indicator is extinguished and the green indicator flashes for approximately 10 seconds (HP 7957B), 20 seconds (HP 7958B) or 30 seconds (HP 7959B) while a test of the disc drive mechanism takes place. If the disc drive mechanism passes this test, the green indicator changes from a flashing green to a solid green display. This indicates that the disc drive has successfully passed the entire self-test routine and is in a ready state.

If the disc drive mechanism fails self-test, the green indicator is extinguished and the red indicator is lit to signal the failure. However, at this time, the disc drive can still be accessed by the host CPU to run diagnostics.

After a successful completion of the entire power on self-test routine, a solid green display indicates that the disc drive is idle and a flashing green display indicates that the disc drive is active.

Line Voltage Application

- a. Set the LINE~ switch **1** to the 1 (in) position and observe the action of the FAULT/ON LINE indicator **2**. A normal sequence of events on the indicator will be a solid red and green display for two seconds, indicating controller self-test and disc drive spin up. Next, the green indicator will flash for up to 30 seconds during the mechanism self-test, followed by a solid green display (self-test complete, disc drive is in a ready state).

- b. If the sequence ends with a solid red display (disc drive mechanism self-test failed), or the display remains a solid red and green (controller failed self-test or the disc drive mechanism did not spin up), the malfunctioning assembly may be identified by consulting figure 3-2.

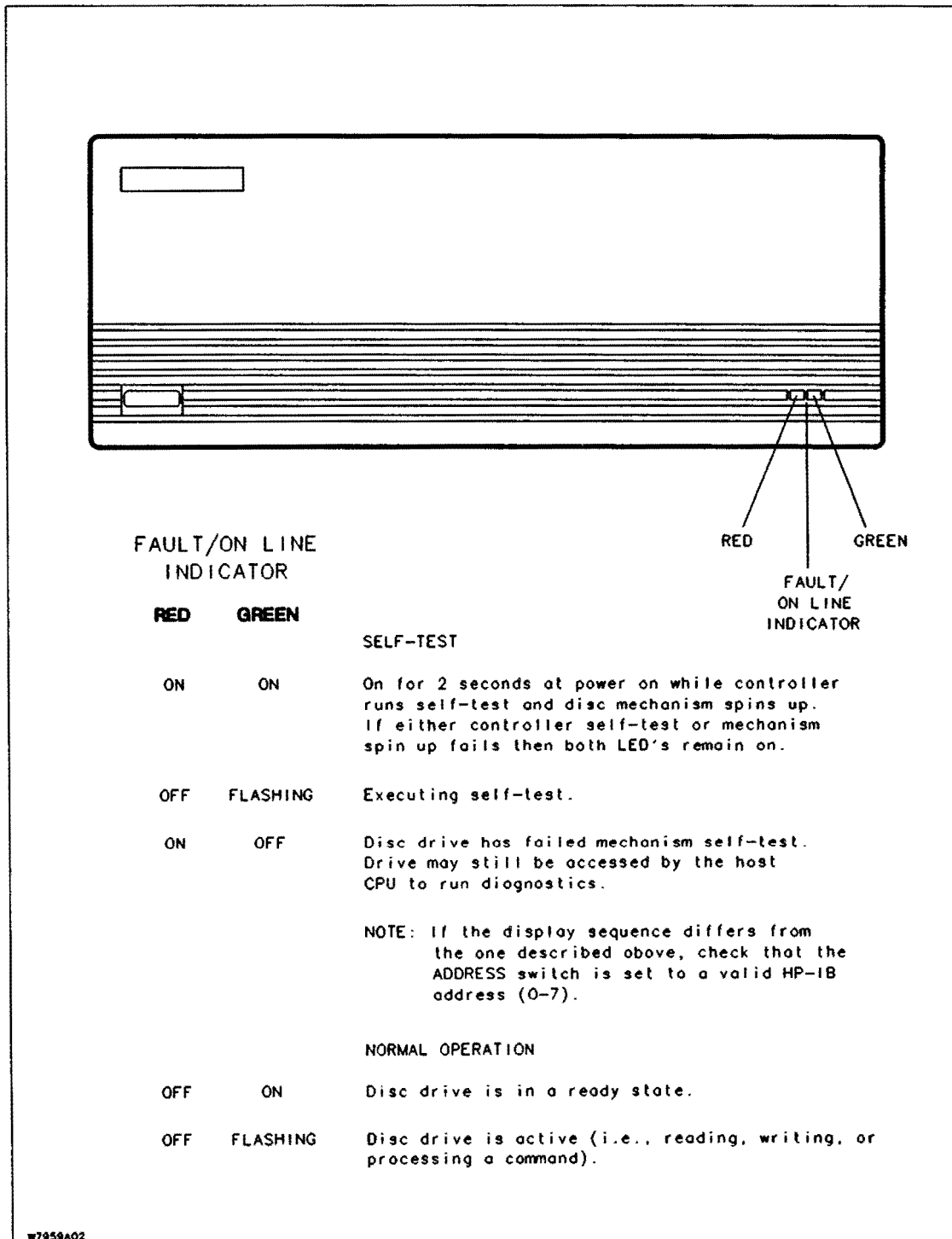


Figure 3-2. FAULT/ON LINE Indicator

Serial Number

Each disc drive has a serial number recorded on the rear panel. It is a good idea to keep a record of this serial number. Should your disc drive be stolen or lost, the serial number is often necessary for tracing and recovery, as well as any insurance claims. Hewlett-Packard does not maintain cross-reference records of customer names and disc drive serial numbers.

Shipping

When the disc drive needs to be repacked for shipment, use the original container and packaging material supplied with the disc drive. Pack the disc drive as shown in figure 2-1, Packaging Details. Seal the container securely with adhesive tape. If the original container is not available, consult your local dealer or Hewlett-Packard Sales and Support Office for information on how to obtain replacement packaging material.

Before shipment, the container should have an attached tag identifying the owner and the service or repair needed. Include the equipment model number and full serial number. The shipping weight of the disc drive is 13.6 kilograms (29.9 pounds). Also, we recommend that all shipments be insured.

Disc Drive Maintenance

No regularly scheduled preventive maintenance is required for the disc drive.

HEADQUARTER OFFICES
If there is no HP Sales Office in your area,
contact one of these headquarter offices.

FAR EAST

Hewlett-Packard Asia Headquarters
26 Harbor Rd.
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