COLOR CONTROLLER E-650
INSTALLATION AND SERVICE GUIDE

for Ricoh Aficio Color 6010, 6110
Savin SDC410, SDC410E
Gestetner CS210, CS210e
RexRotary CS810, CS810E
nashuatec CS510, CS510e
infotec 7410, 7410E
Lanier 5710 AG, 5710E AG

A guide for service technicians

Part Number: 45007169

FCC Information

WARNING: FCC Regulations state that any unauthorized changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Class B Declaration of Conformity

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful 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:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

Industry Canada Class B Notice

This Class B digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de Conformation Classe B de l'Industrie Canada

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

RFI Compliance Notice

This equipment has been tested concerning compliance with the relevant RFI protection requirements both individually and on system level (to simulate normal operation conditions). However, it is possible that these RFI Requirements are not met under certain unfavorable conditions in other installations. It is the user who is responsible for compliance of his particular installation.

Dieses Geraet wurde einzeln sowohl als auch in einer Anlage, die einen normalen Anwendungsfall nachbildet, auf die Einhaltung der Funk-entstoerbestimmungen geprueft. Es ist jedoch moeglich, dass die Funk-enstoerbestimmungen unter unguenstigen Umstaenden bei anderen Geraetekombinationen nicht eingehalten werden. Fuer die Einhaltung der Funk-entstoerbestimmungen seigner gesamten Anlage, in der dieses Geraet betrieben wird, ist der Betreiber verantwortlich.

Compliance with applicable regulations depends on the use of shielded cables. It is the user who is responsible for procuring the appropriate cables.

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Preface

The *Installation and Service Guide* is intended for certified E-650 and copier service technicians. If you have not received certification, you should not attempt to install or service the E-650. Electronics For Imaging does not warrant the performance of the E-650 if installed or serviced by non-certified personnel.

About this guide

This guide is divided into the following sections:

- "Preface"

  Gives general information about this guide and general information that you should know before you attempt to install or service the E-650.

- Chapter 1, "Introduction."

  Provides general information about the E-650.

- Chapter 2, "Installation."

  Provides detailed instructions for installing the E-650 into the copier.

- Chapter 3, "Using the E-650 Operation Panel."

  Describes the E-650 Operation Panel and how to use it.

- Chapter 4, "Service Procedures."

  Describes removal and replacement procedures for E-650 components.

- Chapter 5, "Troubleshooting Procedures."

  Identifies the source of common problems and suggests ways of correcting them.

- Appendix A, "Specifications."

  Summarizes the hardware and networking features of the E-650 controller.

- Appendix B, "Controller Interface Type F."

  Reprints the Installation Procedure for the Controller Interface Type F kit, which must be installed before installing the E-650.

Customers should not use the technical service documentation. Do not leave this guide behind after you make a service call.

About the illustrations in this guide

Illustrations in this guide reflect the E-650 at the time of publication. Components shown in these illustrations are subject to change. To receive information about any components that do not match illustrations in this guide, contact your authorized service/support center.

Terminology and conventions

The term copier refers to the following copiers in which the Controller Interface Type F kit and the E-650 Controller kit are installed:

Copier	Basic Auto-Duplex Model (A257)	Edit Auto-Duplex Model (A269)
Ricoh	Aficio Color 6010	Aficio Color 6110
Savin	SDC410	SDC410E
Gestetner	CS210	CS210e
RexRotary	CS810	CS810E
nashuatec	CS510	CS510e
infotec	7410	7410E
Lanier	5710 AG	5710E AG

The term “network administrator” refers to the person responsible for maintaining the network at the customer site.

The term “Fiery Operation Panel” describes the area within the copier Operation Panel that is dedicated to the E-650 printer controller. It includes the display window and the surrounding keys and activity lights.

The term “PC” refers to any IBM PC or compatible computer running Windows over MS-DOS.

The term “E-650 board” refers to the E-650 printer controller (the main board in the E-650).

The term “100BaseT” is used throughout this manual to refer to 100BaseTX.

The term “HDD” refers to the hard disk drive that is part of the E-650.

The term “I/F unit” refers to the portion of the controller interface kit that houses the E-650. See the *Controller Interface Type F Installation Procedure* for more information. This document is included in Appendix B, “Controller Interface Type F.”

NOTE: The note indicator highlights important messages and additional information.

The caution icon indicates a need for special care and safety when handling the equipment.

Precautions

Always observe the following general precautions when installing and servicing the E-650:

1. **Report any shipping damage.**

   If there is any evidence of shipping or handling damage to packing boxes or their contents, save the damaged boxes and parts, call the shipper immediately to file a claim, and notify your authorized service/support center.

2. **Never alter an existing network without permission.**

   The E-650 probably connects to an existing Local Area Network (LAN) based on Ethernet hardware. The network is the link between the customer's computer, existing laser printers, and other prepress equipment. Never disturb the LAN by breaking or making a network connection, altering termination, installing or removing networking hardware or software, or shutting down networked devices without the knowledge and express permission of the network administrator.

3. **Never enter an IP address in Network Setup.**

   Only the network administrator should enter an IP address on a network device. Assigning an incorrect IP address to the E-650 can cause unpredictable errors on any or all devices.

4. **Follow standard ESD (electrostatic discharge) precautions while working on the internal components of the copier.**

   Static is always a concern when servicing electronic devices. It is highly unlikely that the area around the copier is static-free. Carpeting, leather-soled shoes, synthetic clothing fibers, silks, and plastics may generate a static charge of more than 10,000 volts. Static discharge is capable of destroying the circuits etched in silicon microchips, or dramatically shortening their life span. By observing standard precautions, you may avoid extra service calls and save the cost of a new board.

   When possible, work on a ground-connected antistatic mat. Wear an antistatic wristband, grounded at the same place as the antistatic mat. If that is not possible:

   - Attach a grounding strap to your wrist. Attach the other end to a good ground.
   - When you remove an electronic component, place it into an antistatic bag immediately. Do not walk across a carpet or vinyl floor while carrying an unprotected board.
   - Leave new electronic components inside their antistatic bags until you are ready to install them.
   - When you unpack the electronic components, touch a metal area of the copier to discharge the static on your body. Place the components on a grounded antistatic surface, component-side up.

5. **Avoid flexing printed circuit boards and handle them by opposing edges (not corners) only.**
6. **Never set a cup of coffee—or any liquid—on or near any components or the copier.**

Tools you will need

To service the E-650, you should bring the following:

- ESD wrist grounding strap
- Antistatic mat
- #0, #1, and #2 Phillips head screwdrivers (non-magnetic)
- 3/16" hex nut driver (recommended)
- Small flat-blade screwdriver (non-magnetic)
- Small needlenose pliers
- Flashlight
- This guide and any technical notes you may have for the E-650.

Chapter 1: Introduction

The E-650 is a high performance embedded color controller that provides computer connectivity and highly efficient color printing capability to digital color copiers. It is optimized for high-speed communications, processing, rasterization, and printing of continuous tone color and monochrome (black and white) pages. Users can print from networked Mac OS computers (version 7.6 or later), from networked PCs running Windows NT, Windows 95, or Windows 98, and from UNIX workstations. In addition, the E-650 parallel port can be used for printing directly from a PC.

Features

As an integral part of the printing system, the E-650 enables users to:

- Send images over AppleTalk, TCP/IP, and Novell networks, or through the parallel port to print on a copier.
- Spool print jobs and select a printing priority for each job. Users can control spooled print jobs sent to the E-650 with user software running on networked Mac OS computers and PCs.
- Print files in color, grayscale, and black and white.
- Use PostScript fonts. The customer can download additional fonts, as needed.
- Use built-in ColorWise™ color management and NetWise™ networking features.

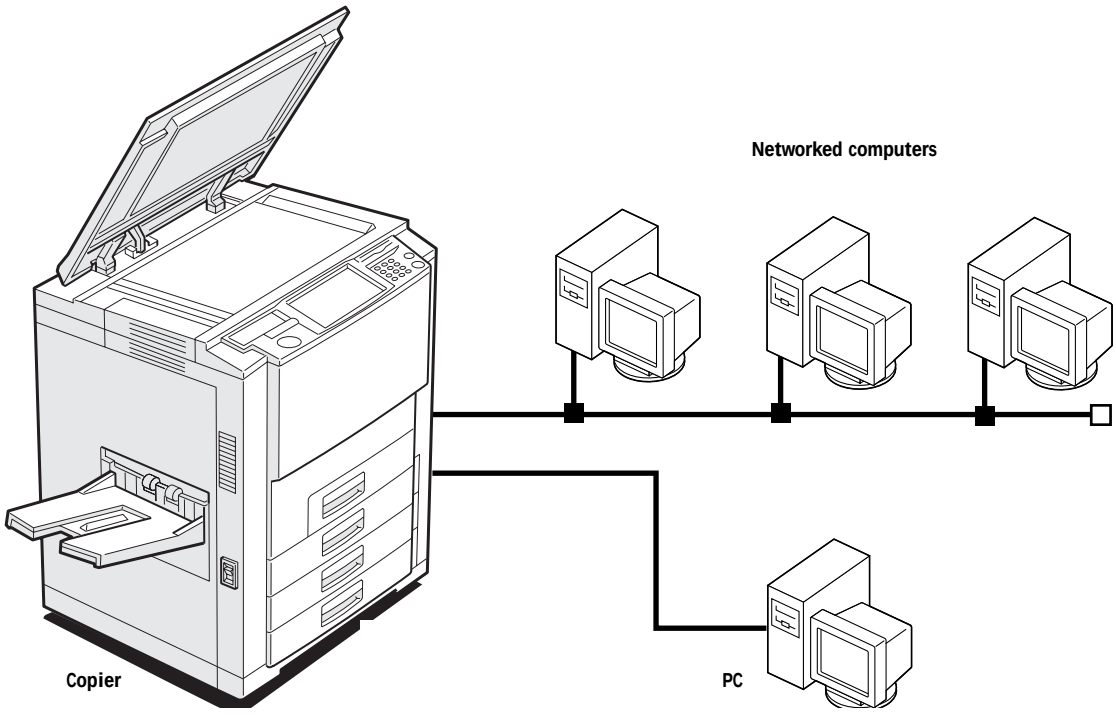


FIGURE 1-1 E-650 printing system

How the E-650 operates

The E-650 provides efficient image processing and printing control. The E-650 board includes a MIPS R5000 RISC (Reduced Instruction Set Computer) CPU with a built-in floating point accelerator that runs the PostScript Interpreter. It interprets a page description file to produce the image pattern in memory. The RipChips™ on the board control data management and other system functions, freeing up the CPU for efficient image data processing.

Two high-speed DIMMs (dual in-line memory modules) on the E-650 board hold image data during printing. The standard memory configuration is 256MB.

With the Fiery Scan TWAIN plug-in, the E-650 acquires RGB (red, green, blue) image data from the copier, stores it in memory, and transmits it to the computer that requested the scan.

The PCI-based video interface board provides communication with the color engine. Image data is sent via the video interface connector on the video interface board that attaches to both the E-650 board and the copier I/F unit. Raster data is supplied to the laser in the copier at full copier rated speeds.

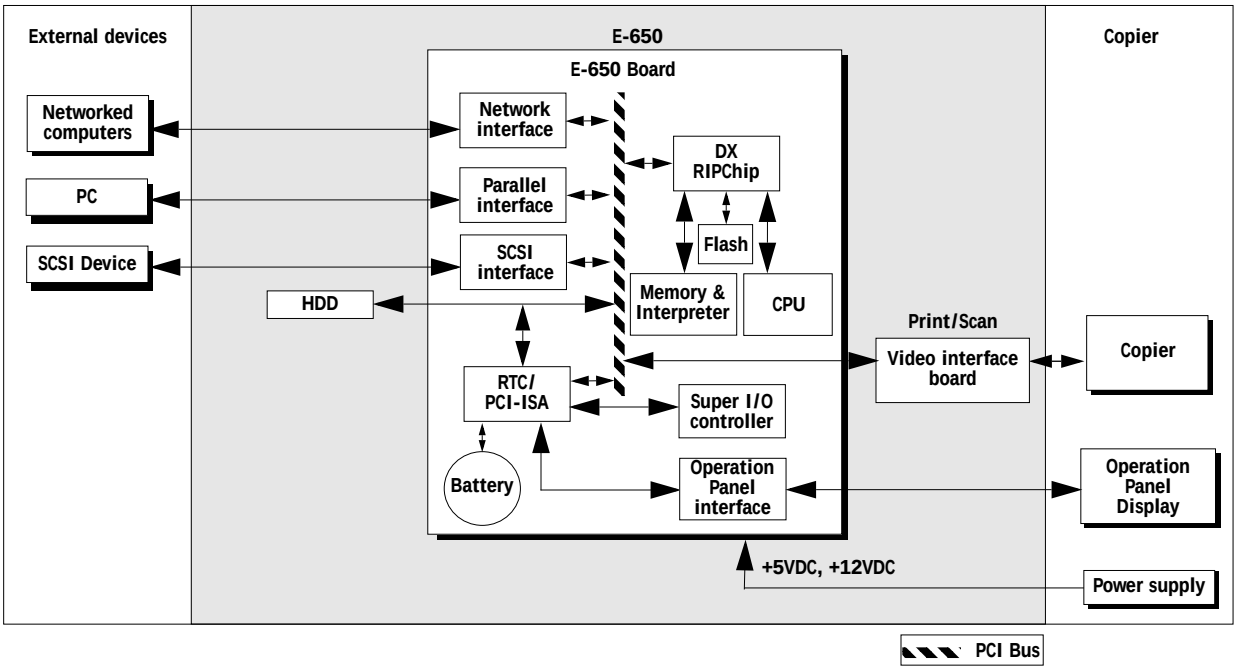


FIGURE 1-2 E-650 functional diagram

E-650 print options

The E-650's efficient PostScript capabilities allow customers to use a variety of applications to create printed color or black and white pages of text and/or images. The E-650 operates both over a network and directly over the parallel port. Since the E-650 has the ability to print an image while processing the next image (RIP-While-Print™), it is capable of printing documents at full copier speeds.

Users can print documents directly from the applications in which they were created. In addition, the E-650 offers an efficient way to print files that have been saved in PostScript, EPS (Encapsulated PostScript), or PDF format. These files can be downloaded directly to the E-650 using the Fiery Downloader, a remote utility provided with E-650.

Through the parallel port, customers can print documents directly from applications running on a stand-alone or networked PC. PostScript files can also be printed to the parallel port from Windows, including the MS-DOS window, without requiring the applications in which the files were created.

User software

User software is provided on the User Software CD. The network administrator or the user at the customer site is responsible for installing software onto computers that will use the E-650 over the network. Installers for the printer files can also be downloaded with the Installer WebTool. See the *Getting Started* manual for details.

The User Software CD includes:

Adobe PS Printer Driver	Enables you to print Postscript files from Windows and Mac OS computers; also supports all special E-650 print features and PostScript 3 features. Windows NT 4.0 users should use the Microsoft PostScript Printer Driver provided with Windows NT 4.0.
PostScript Printer Description files (PPDs)	These files are for use with the PostScript printer driver; they allow the E-650 to appear in popular applications' Print and Page Setup dialog boxes. The PPD files provide information about the E-650 and your particular copier model to the application and printer driver you are using to print.
PostScript 3 Screen Fonts (Mac OS computers only)	Screen fonts for the 136 PostScript printer fonts installed (117 Adobe Type 1 and 19 TrueType). See the *User Guide* for a complete list.
Fiery Downloader	Enables you to print PostScript, Encapsulated PostScript (EPS), and Portable Document Format (PDF) files directly to the E-650 without using the application in which they were created. Fiery Downloader also enables the user to manage the printer fonts installed on the E-650.
Fiery Print Calibrator	Enables the user to calibrate the E-650 from a remote computer. Proper calibration keeps colors consistent.
Fiery Spooler	Enables the user to view the order and priority of print jobs, customize printer settings for jobs, delete jobs, and move jobs between queues. It can also be used to view job accounting information.
Fiery Scan plug-in	A TWAIN plug-in module for PhotoShop that enables the user to scan images from the copier directly into Photoshop.
Color management files	ColorSync and ICM color management files that enable users to maintain consistent color from the original artwork to the display monitor to the printed output.

Color reference files	Reference pages that can be printed to view the range of colors available on the E-650. For the most predictable color results, the user refers to these pages when defining colors in applications.
Separation tables	Allow the user to do RGB-to-CMYK conversions within Photoshop that correspond to conversions performed by color rendering dictionaries on the E-650.

Fiery WebTools

The E-650 can support Internet or intranet access with Fiery WebTools, which include Status, Setup, WebSpooler, Installer, and WebLink. For more information on WebTools, see the *Administrator Guide* and *Getting Started*.

Chapter 2: Installation

This chapter describes the process for installing the E-650 kit in the I/F unit. Topics include setting customer expectations, unpacking the E-650, and performing the installation.

Setting customer expectations

The customer should be informed of the following:

- Some nodes on the network may be unavailable during the installation.
- The network administrator needs to be available during the installation for network connectivity.

  Equipment downtime and impact on the network can be minimized if the network administrator installs a network connector for the E-650 and confirms network functionality with the connector in place before the date scheduled for the installation.
- The network administrator should have a networked computer available during the installation. The appropriate software should already be installed. Documentation for the networked computer and the network operating software should be available.
- The network administrator should install the user software shipped with the E-650 (a package of user documentation is also included) onto networked Mac OS computers and PCs that will print to the E-650.

NOTE: This guide covers E-650 hardware installation and service. It provides general information on connecting the E-650 to the customer's network. Network setup and configuration information go beyond the scope of this guide. For network setup and configuration information, the network administrator should refer to the *Administrator Guide*.

2 Installation

Unpacking the E-650

The E-650 is assembled and shipped from the factory in a box that includes items shown in Figure 2-1.

TO UNPACK THE E-650

1. **Open the shipping box and remove any packing materials.**
2. **Remove the contents of the shipping box and inspect them for visible damage.**

   If you notice shipping damage, have the shipping box ready to show the carrier if necessary. Call the carrier immediately to report the damage and file a claim, then call your authorized service/support center. The shipping box includes the following items:

   - E-650
   - Media package
     - User Software CD (see page 1-4 for contents)
     - User documentation (which includes but is not limited to *Getting Started*, *Administrator Guide*, and *User Guide*)
     - Kodak Color Separation and Gray Scale (small)
   - Parallel IEEE 1284 A-C cable
   - Fiery driven and Adobe PostScript logo decal

     This label needs to be placed on the front of the copier (see Figure 2-6 on page 2-6).

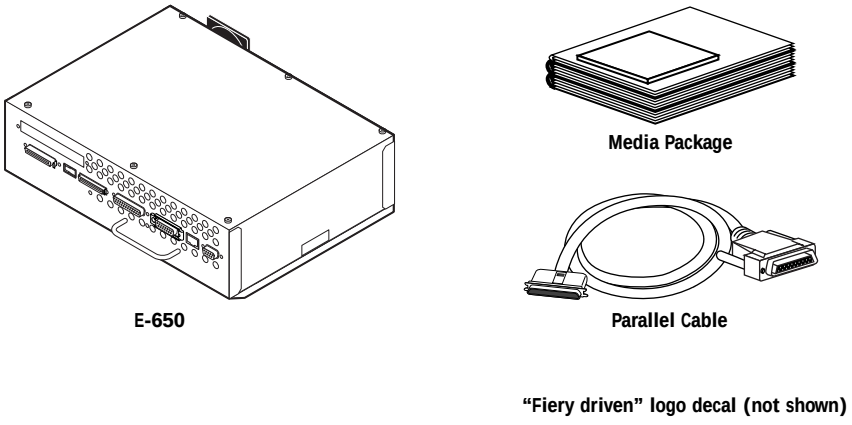


FIGURE 2-1 Contents of shipping box

NOTE: The E-650 requires the Controller Interface Type F kit to be installed. See the installation procedure in Appendix B, "Controller Interface Type F."

3. **Give the media package to the network administrator.**

   Let the network administrator know that in order to take full advantage of the E-650, the user software must be installed on computers that will print to it.

4. **Give the Kodak Color Separation and Gray Scale (small) to a person at the customer site who is responsible for calibration.**

5. **Remove any protectors that may be installed on connectors on the E-650.**

   If a jack is installed in the E-650 RJ-45 connector, grasp the jack with needlenose pliers and pull it straight out of the connector.

Preparing for installation

Before installing the E-650, do the following:

❑ **Test copier functionality.**

Copy the copier test page before you install the E-650.

If the copied image indicates that the copier needs adjustment, inform the customer. After getting approval, complete the copier service needed.

❑ **Check the network.**

Verify that the network is functioning before you attach the E-650.

- Ask the network administrator to print a document on a shared printer over the network.
- Ask the network administrator to verify the computer and network requirements as specified in *Getting Started*, one of the documents provided in the Media Package.

❑ **Install the Controller Interface Type F kit.**

See the installation procedure in Appendix B, “Controller Interface Type F.”

Opening the copier

To gain access to the location inside the copier where the E-650 will be installed, you need to shut down the copier and open the copier from the back.

Follow standard ESD (electrostatic discharge) precautions while handling components.

TO SHUT DOWN THE COPIER

1. **Make sure the copier is not in use and power off the copier using the main power switch on the side.**

2. **Disconnect the copier power cable from the wall outlet and any external cables.**

TO OPEN THE COPIER

1. **Shut down the copier (see page 2-3).**
2. **Remove the I/F unit cover from the back of the copier (4 screws).**

   Set aside the I/F unit cover and screws so you can replace them later.

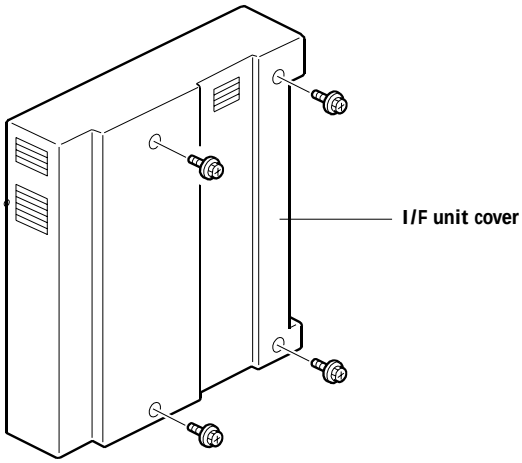


FIGURE 2-2 Removing the I/F unit cover

3. **Remove and set aside the 2 screws that attach the E-650 to the I/F unit.**

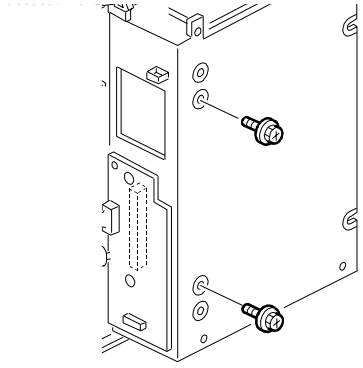


FIGURE 2-3 I/F unit screws

4. **Remove the upper shield cover (2 screws) then the right shield cover (6 screws).**

   Set aside the covers and screws so you can replace them later. For more information and illustrations, see Appendix B, “Controller Interface Type F.”

   The area for the E-650 is now accessible. Make sure the entire Controller Interface Type F kit is installed before attempting to install the E-650. See Appendix B, “Controller Interface Type F.”

Installing the E-650 in the copier

TO INSTALL THE E-650

1. **Observe the top and bottom slide guides inside the I/F unit and on the outside of the E-650.**

   Make sure the slide guides inside the I/F unit have approximately a 30 degree lead-in angle. If necessary, bend them to create the proper angle (see Figure 2-4 on page 2-5).

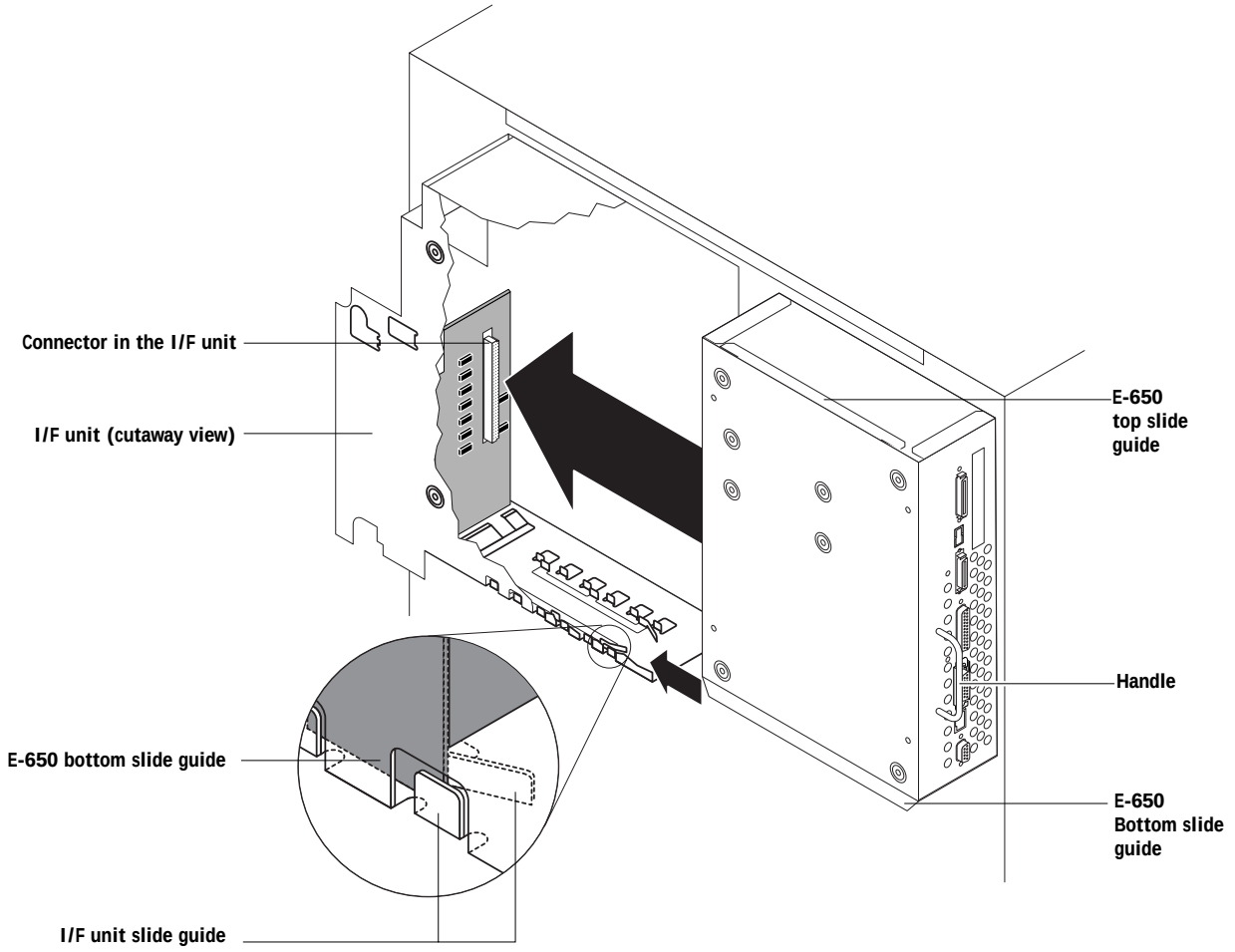


FIGURE 2-4 Installing the E-650 in the I/F unit

2. **Hold the E-650 by the handle and slide it into the I/F unit, using the slide guides on the E-650 and inside the I/F unit to align the E-650.**

   Make sure the E-650 is aligned inside both the top and bottom slide guides. If misaligned, the copier interface connector on the video interface board can be damaged.

3. **Push the E-650 until the connector in the I/F unit and the copier interface connector on the video interface board are securely connected.**

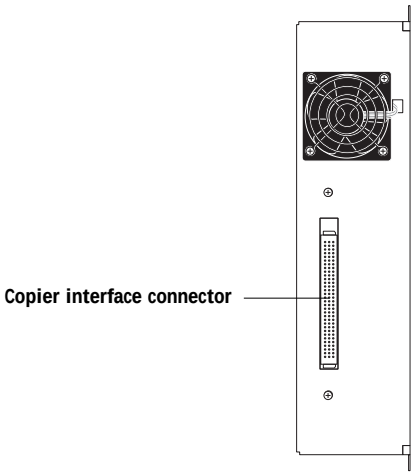


FIGURE 2-5 Copier interface connector

4. **Reassemble the copier as described in the following section.**

5. **Peel the adhesive backing off the Fiery driven and Adobe PostScript logo decal and install it on the front of the copier (see Figure 2-6).**

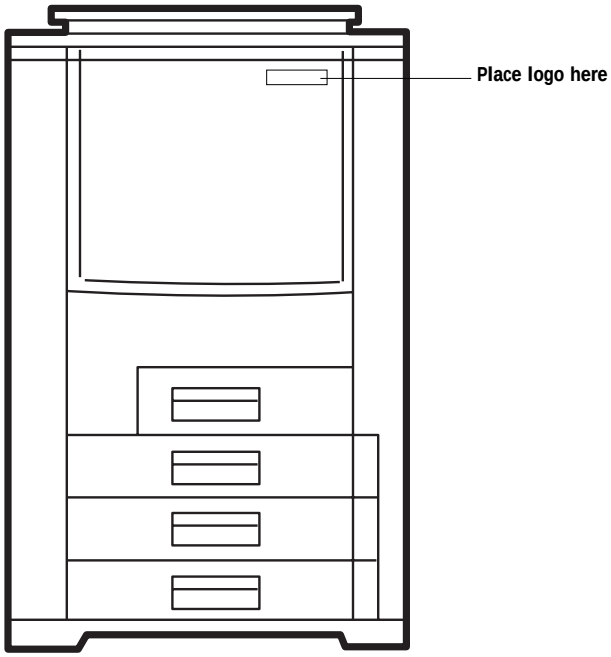


FIGURE 2-6 Installing the logo decal on the copier

Reassembling the copier

It is recommended that you fully reassemble the copier before you apply power to verify E-650 functionality.

TO REASSEMBLE THE COPIER

1. **Attach the E-650 to the I/F unit with the 2 screws you removed earlier.**

   For the screw locations, see Figure 2-3 on page 2-4.

2. **Replace the right cover shield (6 screws) then the upper shield cover (2 screws) that you removed earlier.**

   For more information and illustrations, see Appendix B, “Controller Interface Type F.”

3. **Replace the I/F unit cover (4 screws).**

   See Figure 2-2 on page 2-4.

4. **Connect the main power cable to the wall outlet and to the copier.**

Initial startup

1. **Power on the copier.**

2. **If the Select Language screen is displayed, display the language of your choice, press the Enter key, then wait for the Setup screen to be displayed.**

   The first time the copier is powered on following installation of Controller Interface Type F components and the E-650 (or following the reinstallation of system software), you are prompted to select the language to be used for both the E-650 Operation Panel and special E-650 pages, such as the Configuration page. Use the up and down arrows to cycle through the languages available.

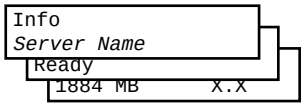
   If you select a different language, the prompt to reboot appears in the language you selected. Press the Enter key to reboot then wait for the Setup screen to be displayed. To change the language again, you must reinstall system software.

3. **If the Setup screen is displayed, select Server, Printer, Network, and Exit Setup.**

   Before you can exit Setup, you must first enter Server Setup, Network Setup, and Printer Setup and save changes. Enter each Setup, press the Cancel key, and when prompted to save changes, select Yes.

   It is the network administrator's responsibility to configure Setup according to the network and user environment. At this stage, default settings in Setup are adequate although they may not be optimal for the user's environment. Refer the network administrator to the *Administrator Guide* for Setup information.

4. **Allow the system to proceed to the Info screen to confirm that the E-650 is operating normally. Scroll down to display E-650 status.**



   Once the E-650 reaches the Info screen, you are ready to print a Test Page and then connect the E-650 to the network (see "Printing a Test Page" on page 2-11).

E-650 startup navigation

Use the diagrams on the following pages to navigate the E-650 system on startup. The startup sequence varies for initial startup and standard startup.

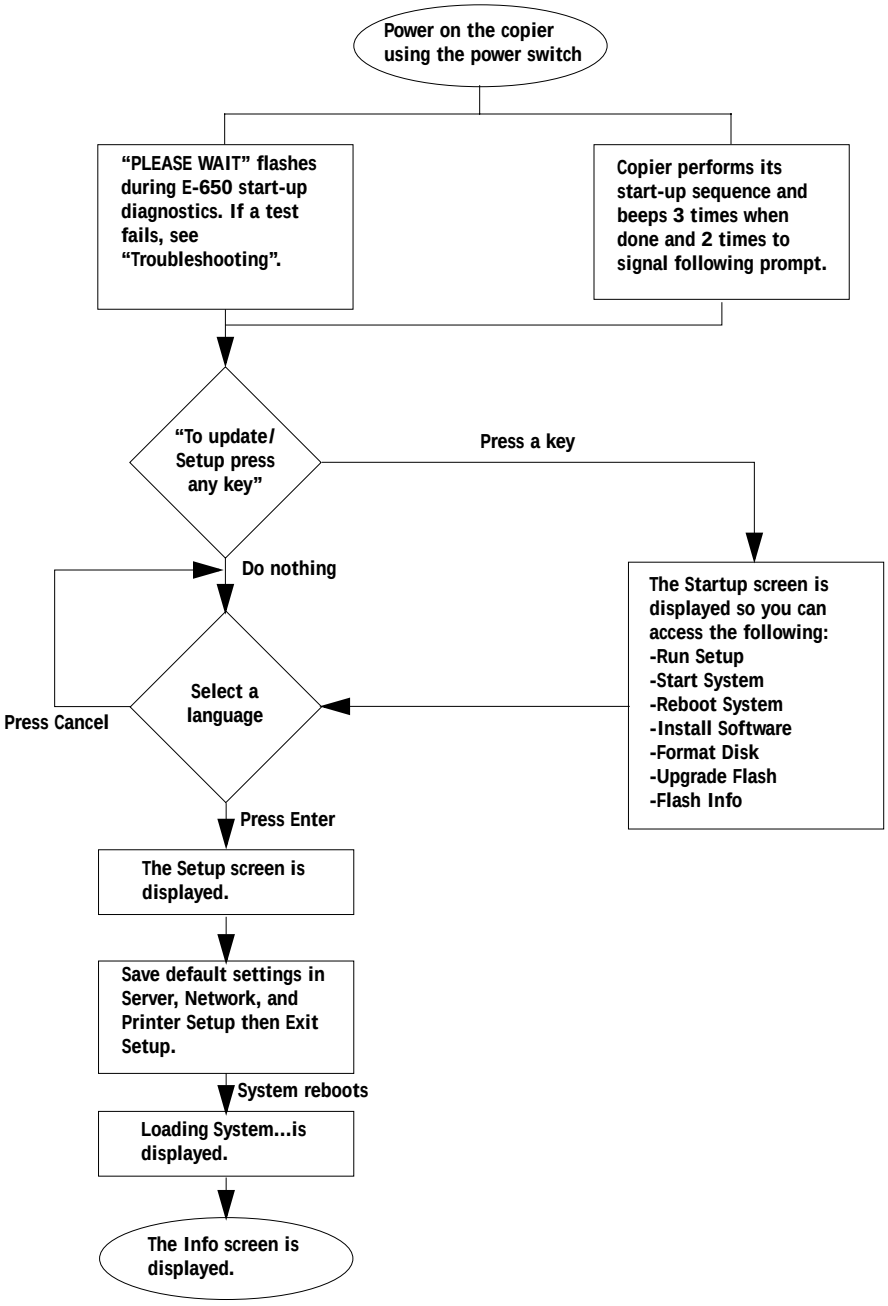


FIGURE 2-7 Initial startup sequence

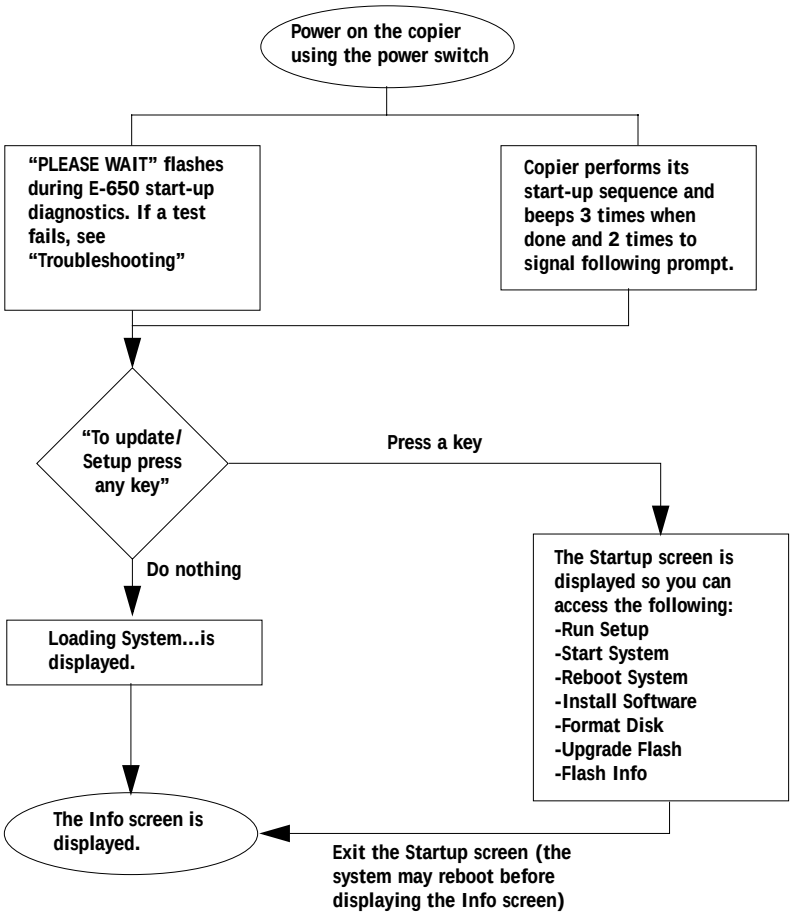


FIGURE 2-8 Standard startup sequence

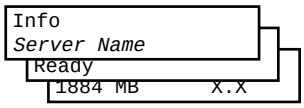
Printing a Test Page

Before connecting the E-650 to the network, print a Test Page to verify that the E-650 is embedded properly in the copier and working. The Test Page is a file that resides on the E-650 hard disk drive.

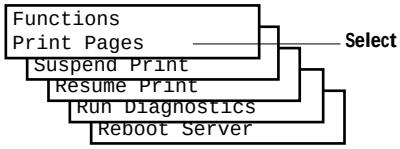
TO PRINT A TEST PAGE

1. **If the copier is powered off, power it on.**
2. **Wait while the E-650 and the copier perform their startup sequences.**

   The E-650 displays the Info screen when ready. The copier beeps when ready. Scroll down to display E-650 status.



3. **Press the Menu key to access the Functions screen.**
4. **Select Print Pages.**



5. **Select Test Page.**
6. **Examine the Test Page.**

   Success in printing the Test Page confirms that the E-650 is functional and connected properly to the copier. Poor quality may indicate a need to service or adjust the copier, not the E-650.

Printing the Configuration page

The Configuration page can be helpful during installation, setup, and service. After installation of the E-650 and before any default settings are changed, you can obtain a record of the defaults by printing the Configuration page.

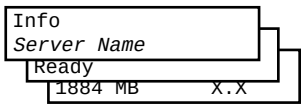
After the physical connection to the network is made, the network administrator can customize Setup options according to the network and user environment. Using the Configuration page as a guide can help speed up this process. For more information, see the *Administrator Guide.*

Before you perform any service procedure, you should print the E-650 Configuration page, if possible, so that you are prepared to return the settings to their former configuration, if necessary.

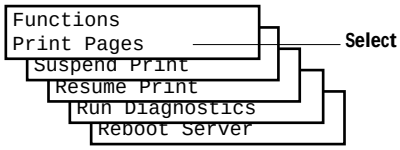
TO PRINT THE CONFIGURATION PAGE

1. **If the copier is powered off, power it on.**
2. **Wait while the E-650 and the copier perform their startup sequences.**

   The E-650 displays the Info screen when ready. The copier beeps when ready. Scroll down to display E-650 status.



3. **Press the Menu key to access the Functions screen.**
4. **Select Print Pages.**



5. **Select Configuration.**
6. **Save the Configuration page for future reference.**

Connecting the E-650 to the network

The E-650 board provides connectivity to an Ethernet network, either thinnet, thicknet, or twisted pair.

Ethernet network connection

The E-650 board has two external Ethernet network connectors:

- A 10BaseT/100BaseT RJ-45 connector for attaching a Category 3 or Category 5 unshielded twisted pair (UTP) network cable (see Figure 2-9). Category 5 is required for 100BaseT.
- A 15-pin D AUI (Attachment Unit Interface) connector for attaching one of the following:
    - An Ethernet transceiver for 10Base2 (thinnet)
    - A thick Ethernet cable for 10Base5 (thicknet)

Only one Ethernet connection can be made to the E-650 board at a time. Use either the AUI connector or the RJ-45 connector, never both.

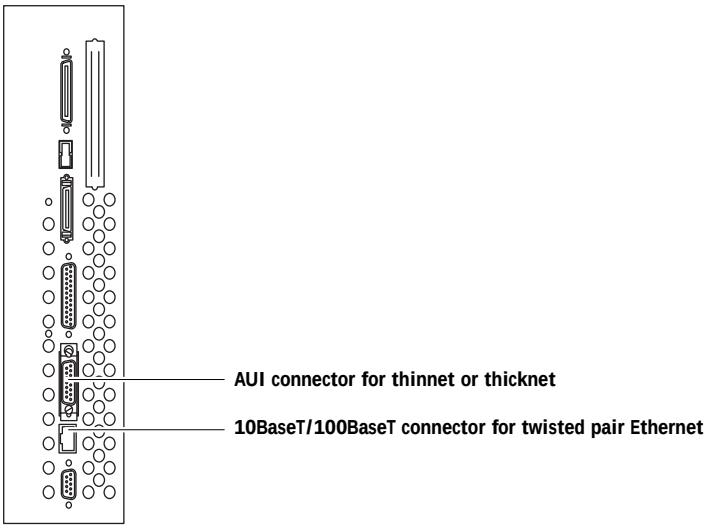


FIGURE 2-9 E-650 network connectors

TO CONNECT A THINNET OR THICKNET CABLE TO THE E-650

A thinnet (coaxial 10Base2 Ethernet cable) connection requires an external transceiver attached directly to the AUI connector on the E-650.

A thicknet (coaxial 10Base5 Ethernet cable) connection requires an external transceiver with an AUI drop cable connected to the AUI connector on the E-650.

1. **Power off the E-650 before connecting it to any network device.**
2. **If installed, remove the dust cover from the AUI connector.**
3. **With the AUI slide latch in the open position, connect the network cable to the AUI connector on the E-650. Slide the latch to lock the connector in place.**
   - To connect a 10Base2 thinnet cable to the E-650, an Ethernet external transceiver must be installed on the E-650 AUI connector. The thinnet cable then connects to the BNC connector on the external transceiver.

     If the transceiver has an SQE switch, make sure the switch is set to OFF.
   - To connect a 10Base5 thicknet cable to the E-650, connect the AUI drop cable directly to the AUI connector on the E-650.
4. **Configure Setup options.**

   It is the network administrator's responsibility to configure Setup according to the network and user environment. Default settings in Setup are adequate although they may not be optimal for the user's environment. Refer the network administrator to the *Administrator Guide* for Setup information.
5. **After configuring Setup options, verify the network connection.**

   Once the network connection has been made and the E-650 has the correct Setup configuration and is Ready, the E-650 should be available on the network.

   If necessary, the network administrator should perform any additional network Setup, verify the network connection, verify that the E-650 appears on the list of printers, and print a few test documents from a networked computer that will use the E-650. (See the *Administrator Guide* for more information.)

TO CONNECT A TWISTED PAIR CABLE TO THE E-650

A Category 5 unshielded twisted pair (UTP) network cable must be used for 100BaseT. It connects to the RJ-45 connector on the E-650.

1. **Power off the E-650 before connecting the E-650 to any network device.**
2. **If installed, remove the dust cover from inside the RJ-45 connector.**

   Grasp the jack with needlenose pliers and pull it straight out of the connector.
3. **Connect the network cable to the RJ-45 connector on the E-650.**
4. **Configure Setup options.**

   It is the network administrator's responsibility to configure Setup according to the network and user environment. Default settings in Setup are adequate although they may not be optimal for the user's environment. Refer the network administrator to the *Administrator Guide* for Setup information.
5. **After configuring Setup options, verify the network connection.**

   Once the network connection has been made and the E-650 has the correct Setup configuration and is Ready, the E-650 should be available on the network.

   The network administrator should perform any additional network Setup, verify the network connection, verify that the E-650 appears in the list of printers, and print a few test documents from a networked computer that will use the E-650. (See the *Administrator Guide* for more information.)

Connecting a PC to the parallel port

On the E-650, the parallel port connector (female 36-pin mini-Centronics) provides a high-speed interface port for connecting directly to the parallel port of a PC. The parallel cable is included in the E-650 kit.

The E-650 can be connected to the network and to a parallel port device at the same time.

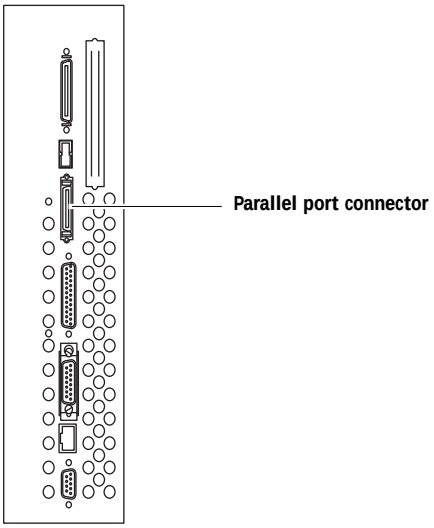


FIGURE 2-10 E-650 parallel port connector

TO CONNECT THE E-650 TO A PC

NOTE: If the PC is for installing system software, make sure it meets the minimum requirements specified in "E-650 system software" on page 4-26.

1. **Power off the copier before connecting the E-650 to a PC.**
2. **Power off the PC.**
3. **Connect the IEEE 1284-C connector of a parallel (Centronics) cable to the 36-pin mini-Centronics connector on the E-650 board.**
4. **If installed, remove the dust cover from the parallel connector.**
5. **Connect the other end of the parallel cable to the parallel port of the PC.**

   If there is more than one parallel port connector on the back of the PC, ask the network administrator to indicate the preferred parallel port to use for the copier.
6. **Power on the PC and the copier.**
7. **Configure Setup options.**

   It is the network administrator's responsibility to configure Setup according to the network and user environment. Default settings in Setup are adequate although they may not be optimal for the user's environment. Refer the network administrator to the *Administrator Guide* for Setup information.
8. **After configuring Setup options, verify the parallel port connection.**

   Once the parallel port connection has been made and the E-650 has the correct Setup configuration and is Ready, the network administrator should print a few test documents from the PC connected to the copier. See the *Administrator Guide* for more information.

Chapter 3: Using the E-650 Operation Panel

This section describes the E-650 functions on the E-650 Operation Panel. The E-650 Operation Panel is an area dedicated to E-650 functions. It is located on the top left side of the copier Operation Panel. The keys on the E-650 Operation Panel allow you to access and monitor different features of the E-650. This guide does not attempt to describe all functions of the Operation Panel, only those functions that pertain to the E-650. For information on installing the E-650 Operation Panel, see the installation procedure in Appendix B, “Controller Interface Type F.”

Overview

Current status and Setup information are displayed on the E-650 Operation Panel. Print activity can be monitored in the display window and specific E-650 functions (such as printing a Test Page and installing or updating system software) are controlled using the keys on the E-650 Operation Panel. Three LEDs assist in providing status information.

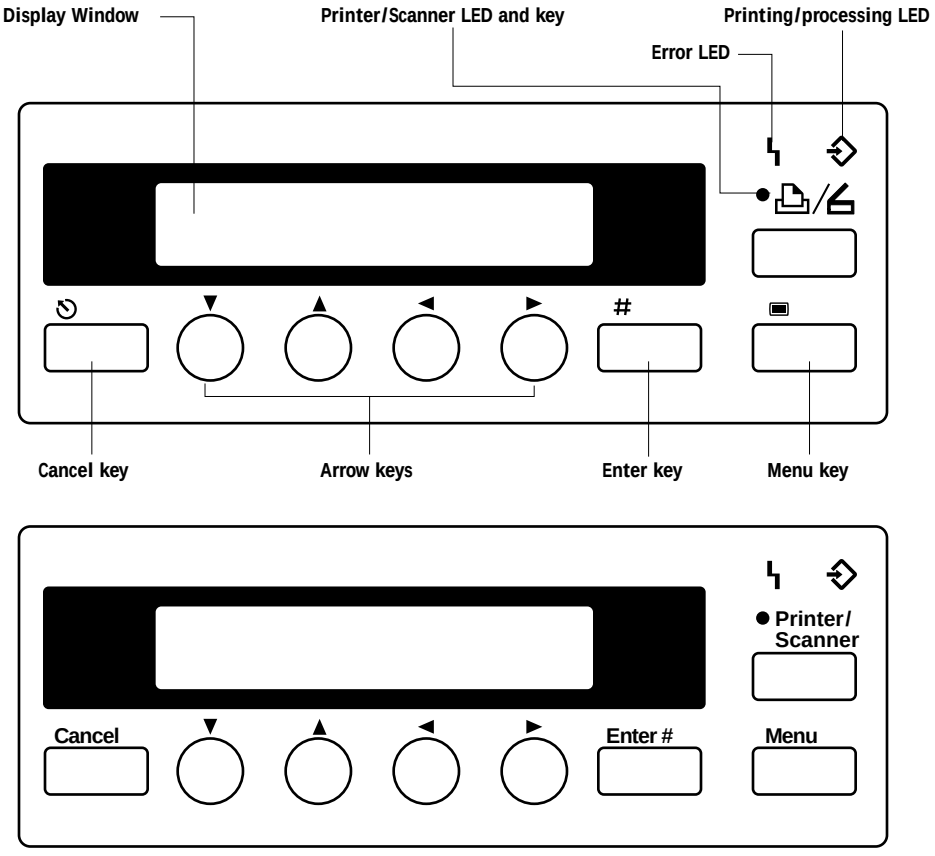


FIGURE 3-1 E-650 Operation Panel (International and U.S. models)

Keys

Once the E-650 board is installed in the copier, use the E-650 keys on the Operation Panel to perform the following functions:

Key (International)	Key (U.S.)	Description
		From the Info screen, display the Functions screen when idle and the run-time screen when a job is in process.
		Select the currently displayed menu item and proceed to the next screen. Cancel a job from the printing or processing screen.
▼	▼	Scroll down the screen to display menu items or part of a text message. After the bottom of the screen is reached, the top of the screen is displayed.
▲	▲	Scroll up the screen to display the previous menu item or part of a text message. When the top of the screen is reached, the bottom of the screen is displayed.
◀	▲	Backspace the cursor to the text-entry position to the left. In a text field, it deletes the character to the left.
▶	▶	Advance the cursor to the text-entry position to the right.
		In the menus, return to previous level.
		Switch from copier mode to Printer/Scanner mode. See the Copier service manual for information.

Activity indicators

Once the E-650 board is installed in the copier, the red and green activity lights on the E-650 Operation Panel turn on and stay solid or flash on and off to indicate the following:

Activity indicator (International)	Activity indicator (U.S.)	Description
↳	↳	• Flashing red—An error prevents the E-650 from processing a job (see the *User Guide* for more information). • Solid red (more than 30 seconds)—A communication error has occurred between the E-650 and the copier.
⇨	⇨	• Flashing green—The E-650 is processing a job or communicating with a remote computer.
⇨/🖶	Printer/ Scanner	• Solid green—The E-650 is using the copier to print or scan a job.

Screens

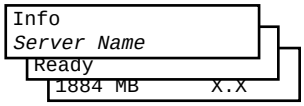
When the copier is idle, E-650 status information and functions available from the E-650 Operation Panel. You can monitor print activity, control E-650 functions (such as printing a Test Page and installing or updating system software), and access the E-650 Setup menus.

When a job is sent to the copier, the E-650 Operation Panel cycles through the RIP and Print screens, and then displays the Info screen. If an error occurs, the Alert screen is displayed with a message describing the error.

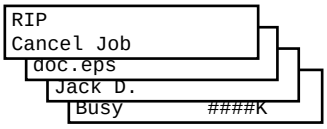
A Startup screen is also available It is made available when the system is powered on or when you reboot the system. It has options for setting up the printer, rebooting the E-650, formatting the hard disk drive, installing system software, and upgrading the flash.

These screens offer the following features:

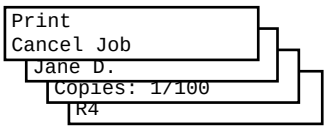
- Info status screen—The first line of this screen displays the printer's name on the network. Scrolling down displays the status of the E-650, the amount of disk space available on the hard disk drive, and the current system software version. Normally, if no jobs are currently being processed or printed, the Info screen displays Ready (a job may be between processing and printing). The Info screen is the default screen. Press the Menu key to display the Functions screen.



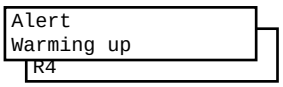
- RIP status screen—Appears when a job is being processed. Displays the name of the file, the name of the user who sent the job, the status, and the amount of the job in kilobytes that has been processed so far. To cancel the job, display Cancel Job and press the Enter key. Press the Cancel key to display the Functions screen.



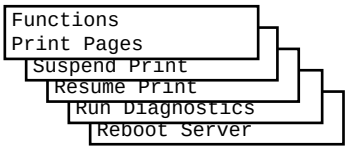
- Print status screen—Appears when a job is being printed. Displays the name of the user who sent the job, the number of copies printed so far, and the number of copies requested. To cancel the job, display Cancel Job and press the Enter key. Press the Cancel key to display the Functions screen.



- Alert screen—Displays a message if an error or other Alert condition arises. Pressing the down arrow key may be necessary to view the entire error message. If other screens are being accessed, the Alert screen is redisplayed frequently until the condition is resolved. Press the Cancel key to display the Functions screen.



- Functions screen—Gives you access to administrative functions not normally performed from a remote workstation (see “Functions screen” below for information on the available functions). Press the Cancel key to display the Info screen.



Functions screen

The Functions screen allows you to perform a variety of administrative functions that do not affect print jobs of other users. Use the up and down arrow keys to scroll through the menu items. Press the Enter key to select the menu item displayed. Press the Cancel key or do nothing to return to the Info screen. The following options are available from the Functions screen:

Print Pages—Enables you to print special pages from the copier:

- Test Page—Prints the Test Page resident on the E-650 hard disk drive. The Test Page confirms that the E-650 is properly installed in the copier and allows you to view information about color and grayscale to troubleshoot E-650 functions. Test Page information includes but may not be limited to: Server name, Printer name, Calibration, Measurements, Target, Date & Time, CMYK Simulation, RGB Source, Rendering Style, Color Mode. For more information see the *User Guide* and the *Administrator Guide*.
- Configuration—Prints the current device configuration, including information about all current Setup settings, calibration profile, and the Ethernet address of the E-650 board.
- Job Log—Prints the log of the last 55 jobs. For more information about the job log, see the *User Guide*.
- Menu Map—Prints the E-650 Menu Map, useful when navigating through the different E-650 Setup screens.
- Color Charts—Prints the color reference charts, including swatches of the RGB, CMY, and Pantone colors available from the E-650.
- Font List—Prints a list of all the fonts resident on the E-650 hard disk drive.

Suspend Printing— This option interrupts the current print job so you can use the copier to make copies. If it has not finished processing, the RIP will continue but the job will not print. You can then select Resume Printing.

Resume Printing—Resumes printing after interrupting the print job in order to make copies.

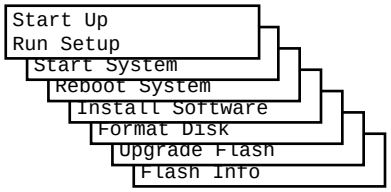
Run Diagnostics—Select this option to access:

- Video Diagnostics— Runs diagnostics on the E-650 video interface (see “Video interface diagnostics” on page 5-10).

Reboot Server—Shuts down all printing activity properly and then restarts the E-650. Access to E-650 Setup options are made available at this time.

Startup screen

- The Startup screen is made available when you reboot the system from the Functions screen or when you power on the copier. For startup navigation, see page 2-9. The following options are available from the Startup screen.



- Run Setup—allows you to access E-650 Setup options in order to configure the network and printing environment. Typically it is the network administrator's responsibility to configure Setup according to the network and user environment. Setup is required the first time the copier is powered on after new E-650 system software is installed. You must enter and save changes to Server, Network, and Printer Setup after installing system software.

  Setup options include: Server, Network, Printer, PS Setup, Color Setup, Job Log Setup, Calibration, Change Password, and Clear Server. See the *Administrator Guide* for detailed information on Setup.

NOTE: Make sure the network administrator is available to customize Setup options according to the network and user environment.

- Start System—Exits the Start Up screen and displays the Info screen.
- Reboot System—Shuts down all E-650 activity in the correct manner and restarts the E-650. Press the Enter key to reboot the E-650. Once the server reboots you can access Setup options.
- Install Software—Allows you to install E-650 system software from the CD to the hard disk drive installed on the E-650.
- Format Disk—Allows you to format the hard disk drive installed on the E-650 so you can install system software. You need to do a standard format of the HDD before installing system software. Options include Standard, Full, and Full & Verify.
- Upgrade Flash—If a Boot ROM file is provided, allows you to upgrade the boot ROM installed on the E-650.

Flash Info—Provides version information about the Boot ROM installed on the E-650.

Chapter 4: Service Procedures

Generally, the E-650 does not require regular maintenance. Use the procedures in this chapter to inspect, remove, reseat, or replace major hardware components and also to install system software.

Overview

This chapter includes information on the following:

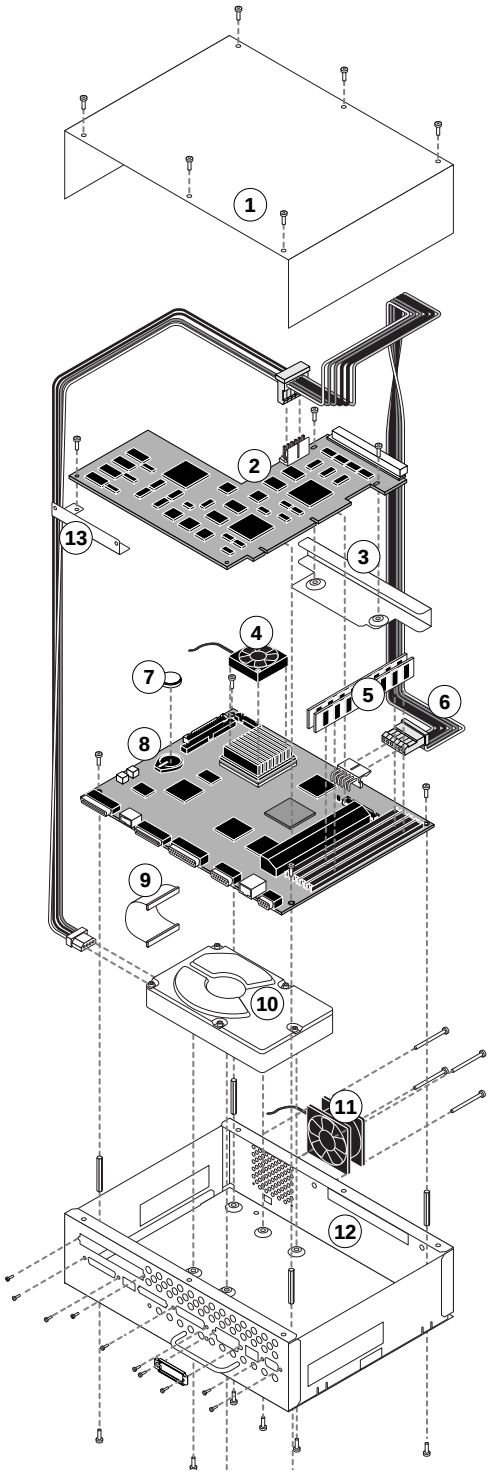
For information on how to remove and replace the I/F unit that encloses the E-650, see the installation procedure in Appendix B, “Controller Interface Type F.”.

See Figure 4-1 on page 4-2 for an overview of E-650 board components. Replacement parts are available from your authorized service representative.

When performing the procedures described in this chapter, see “Precautions” on page xiii and “Tools you will need” on page xiv.

The E-650 system software is installed on the hard disk drive at the factory. You will need to re-install system software if you:

- Replace the hard disk drive
- Replace the motherboard
- Upgrade to a more recent version of the system software



Key
1. Pan cover
2. Video interface board
3. Connector bracket
4. CPU fan
5. DIMMs
6. Power cable
7. Battery
8. E-650 board
9. HDD cable
10. HDD
11. Exhaust Fan
12. Pan
13. Support bracket

FIGURE 4-1 Exploded view of E-650

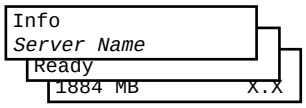
Accessing the E-650

Always use the following procedures when accessing the E-650. Make sure you attach an ESD grounding wrist strap and follow standard ESD (electrostatic discharge) precautions before following this procedure.

TO SHUT DOWN THE COPIER

1. **Make sure that the E-650 Operation Panel is idle.**

   When Printing or Ripping appears on the E-650 Operation Panel, the E-650 is currently processing. Ready appears in the Info screen when the E-650 has finished processing and is idle.



2. **Power off the copier using the power switch on the side of the copier.**

3. **Unplug the power cable from the wall outlet.**

TO ACCESS THE E-650

1. **Shut down the copier (see page 4-3).**
2. **Remove the I/F unit cover from the back of the copier (4 screws).**

   Set aside the I/F unit cover and screws so you can replace them later.

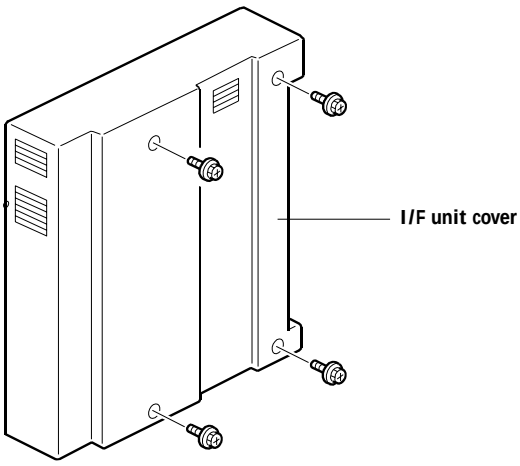


FIGURE 4-2 Removing the I/F unit cover

3. **Remove the upper shield cover (2 screws) then the right shield cover (6 screws).**

   Set aside the covers and screws so you can replace them later. For more information and illustrations, see Appendix B, “Controller Interface Type F.”
4. **Remove the 2 screws that attach the E-650 to the I/F unit.**

   Set aside the screws so you can replace them later.
5. **Use the handle to pull out the E-650 from the I/F unit.**

   Set the E-650 on a stable static-free surface.

6. **Remove the six screws that secure the pan cover. Lift off the pan cover and set it aside.**

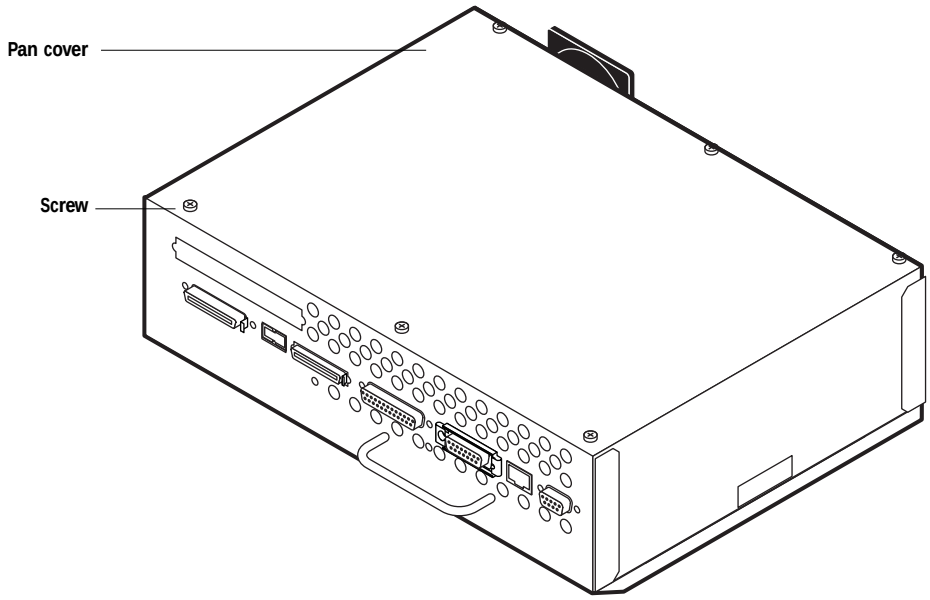


FIGURE 4-3 Removing the pan cover

The E-650 components are now accessible.

Checking E-650 internal connections

The most common causes of hardware problems are faulty and loose connections.Before you conclude that any board or component has failed, remove, inspect, and reseat all appropriate connections, and then verify that the problem still occurs.

TO CHECK BOARD AND CABLE CONNECTIONS

1. **Before you touch any parts inside the E-650, attach a grounding wrist strap. Touching the pan also discharges static electricity.**
2. **Place the E-650 so the internal components of the E-650 are facing up.**
3. **Make sure the DIMMs are properly installed (see "To replace a DIMM" on page 4-17 for the proper procedure).**
4. **Make sure the battery is properly installed (see "To replace the battery" on page 4-18).**
5. **Make sure the video interface board is properly installed (see "To replace the video interface board" on page 4-15).**
6. **Inspect the copier interface connector on the video interface board.**

   If any pins are pushed in or bent, gently fix them with a pair of small needlenose pliers.
7. **Inspect the HDD cable to make sure it is intact.**

   Faulty ribbon cables are easily overlooked. Check the contact point between the cable and the connector to ensure that they have not separated. If a ribbon cable is suspect, substitute it with a tested cable.
8. **Check the fan cables of the exhaust fan and the CPU fan.**

   Make sure the cables are intact. Also, check airflow direction. When the fans are installed properly:

   - An arrow on the exhaust fan points away from the E-650
   - An arrow on the CPU fan points to the CPU
9. **Make sure the power cable is intact and properly connected to the HDD, video interface board, and E-650 board.**

   The power cable has 3 connectors. For the best fit inside the chassis, the middle connector is attached to the video interface board and the 6-wire end connector is attached to the E-650 board. The 4-wire end connector (to the HDD) is keyed, however, the connectors to the video interface board and the E-650 board are not keyed.

Make sure the connectors to the video interface board and the E-650 board are installed so that the lip of the connector fits under the ridge of the board connector. If oriented backwards, the boards can be damaged. See the figures below.

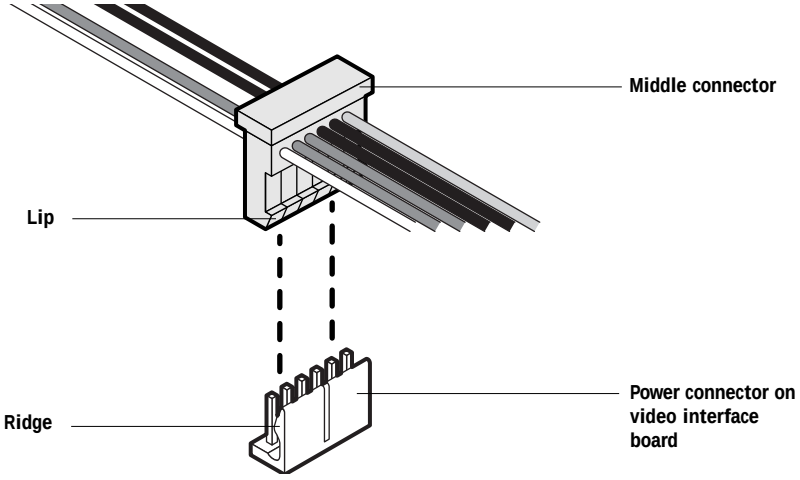


FIGURE 4-4 Power cable middle connection

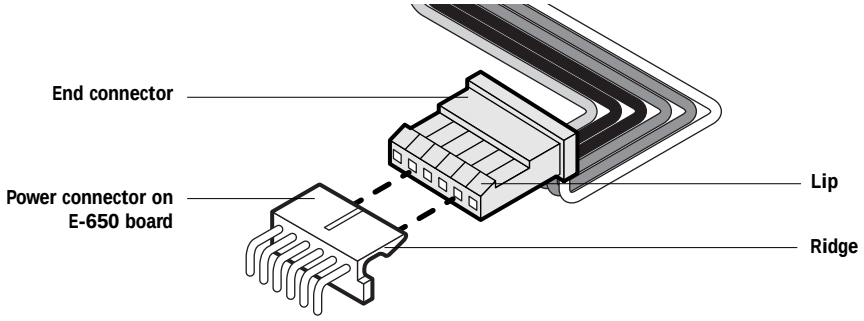
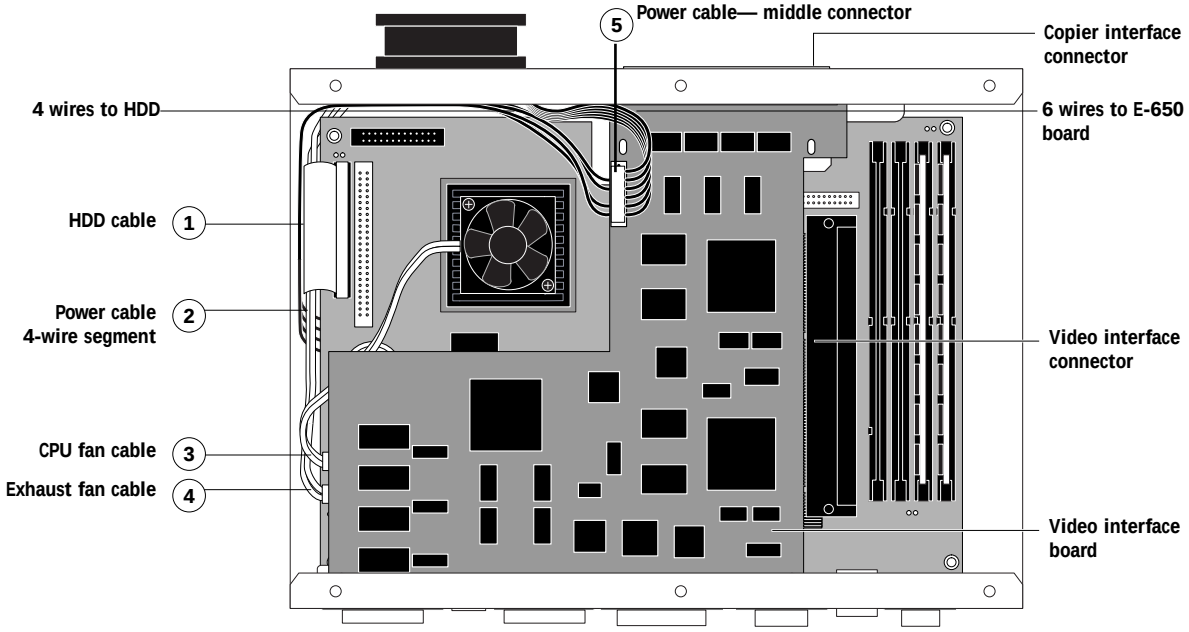


FIGURE 4-5 Power cable end connection

10. Make sure board jumpers have the correct jumper configuration.

One jumper is installed on 2-pin jumper area J25. It allows the flash boot ROM to be upgraded in the field. The other 2-pin jumper areas J14, J15, J21, and J23 have no jumpers installed and are for factory use only. Each is located near a mounting hole. See page 4-10.



Cable key	From	To
1. HDD cable	EIDE connector on HDD	EIDE connector on E-650 board (J3)
2. Power cable—4-wire segment	Power connector on HDD	Power connector on video interface board (J1)
3. CPU fan cable	CPU fan	Fan connector on the E-650 board (J28)
4. Exhaust fan cable	Exhaust fan	Fan connector on the E-650 board (J18)
5. Power cable—middle connector (4 wires to HDD; 6 wires to E-650 board)	Power connector on video interface board (J1)	Power connector on the E-650 board (J16) and Power connector on HDD

NOTE: J18 and J28 on the E-650 board are interchangeable.

FIGURE 4-6 E-650 cable connections

Replacing parts of the E-650

The E-650 board has a 200MHz R5000 CPU. The E-650 board provides the Ethernet networking interface, controls hard disk drive functions, and handles the communication between the E-650 and external devices. With its video interface board it controls the video image data transferred to and from the copier. In the standard configuration, two DIMM sockets hold 256MB of memory (see Figure 4-10 on page 4-16 and also "DIMMs" on page 4-16).

When replacing any of its components, make sure to protect the E-650 board from excessive bending and flexing. When possible, remove the E-650 board from the pan and remove the standoffs from the board's corners and lay the E-650 board flat before servicing.

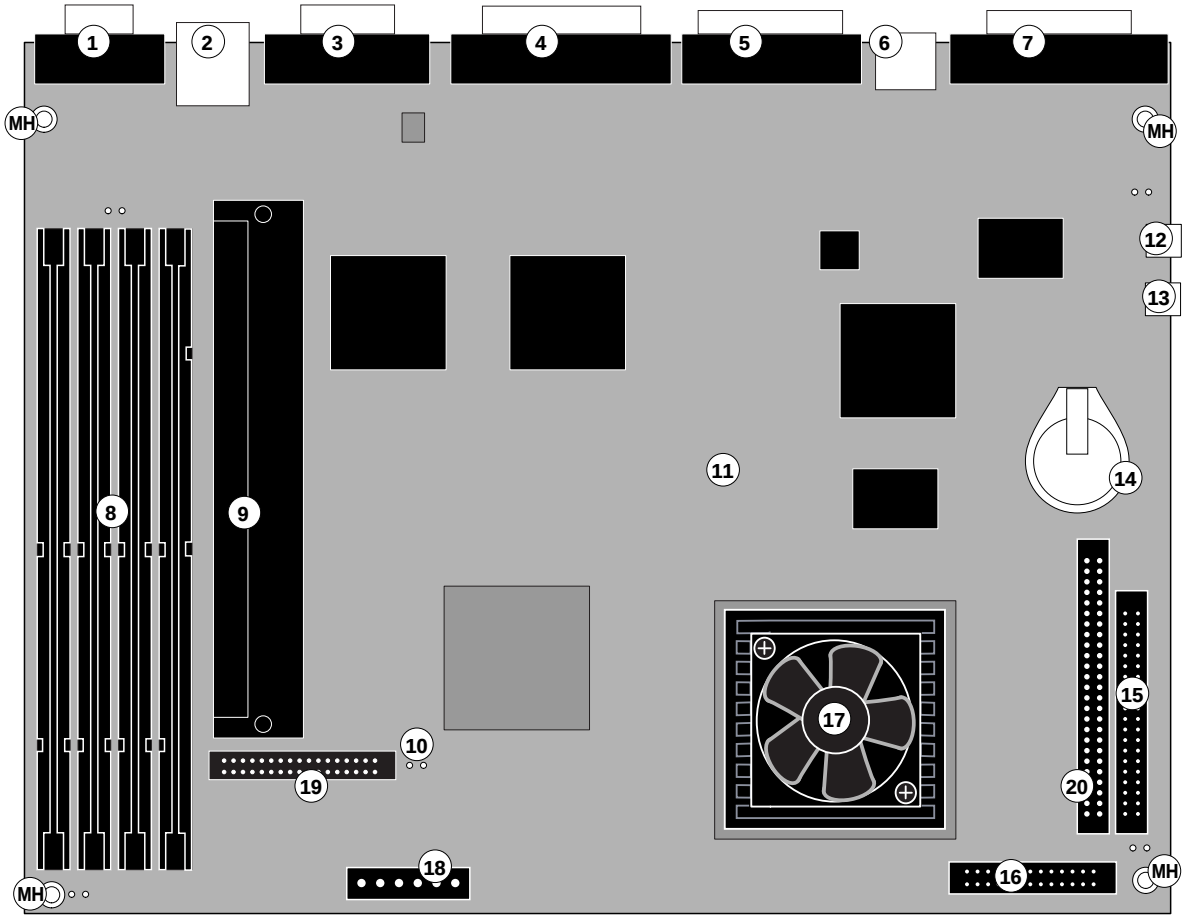
Following are instructions for accessing, removing, and replacing the following parts of the E-650:

- E-650 board
- E-650 board components including
    - Video interface board
    - DIMMs
    - Battery
    - CPU fan
- Exhaust fan attached to the pan
- HDD

Make sure you attach an ESD grounding wrist strap and follow standard ESD (electrostatic discharge) precautions before following this procedure.

E-650 board

The E-650 board is installed in the pan on four standoffs. This section includes instructions for replacing the E-650 board and E-650 board components.



Key

1. Not used (J7)
2. 10/100BaseT Ethernet port (J6)
3. 10Base2/10Base5 Ethernet port (J11)
4. Not used (J12)
5. Parallel port (J2)
6. Not used (U1)
7. SCSI port (J27)
8. DIMM sockets (J26, J17, J9, J10)
9. Video interface connector (J24)
10. J25 (2 pins) Jumper in allows Flash upgrade
11. Not installed/Not used (Board connector J1)
12. Exhaust fan cable connector (J18)
13. CPU fan cable connector (J28)
14. Battery (BT1)
15. HDD cable connector (J3)
16. Not used (J4)
17. CPU, heatsink, and CPU fan (U15)
18. Power cable connector (J16)
19. Not used (J13)
20. Not used (J19)

MH Mounting holes (4)

FIGURE 4-7 E-650 board layout

TO REMOVE THE E-650 BOARD

1. **Print the Configuration page from the Functions menu.**

   If you are replacing the E-650 board, you will need to reinstall system software after the new E-650 board is installed. Setup settings are reset to the default configuration when you reinstall system software. The Configuration page gives you current Setup information.

2. **Print the Font List from the Functions menu.**

   The Font List details what fonts are installed on the E-650 HDD. Along with the fonts that are provided on the System Software CD, the customer may have installed additional fonts that will be deleted when you reinstall system software.

3. **Shut down the copier and access the E-650 as described on page 4-3.**

4. **Remove the video interface board from E-650 board connector J24 (see "Video interface board" on page 4-14).**

5. **Remove the connector bracket from the pan (see Figure 4-1 on page 4-2). Set the two screws and the connector bracket aside so you can replace them later.**

6. **Remove the support bracket from the pan (see Figure 4-1 on page 4-2). Set the two screws and the support bracket aside so you can replace them later.**

7. **Remove the exhaust fan cable from E-650 board connector J18 (see "Exhaust fan" on page 4-20).**

8. **Remove the HDD cable from E-650 board connector J3.**

   Using a ribbon cable connector extractor is recommended.

9. **Remove and set aside the screws (and washers, if present), standoffs, and AUI latch that attach the external connectors to the pan (see Figure 4-8).**

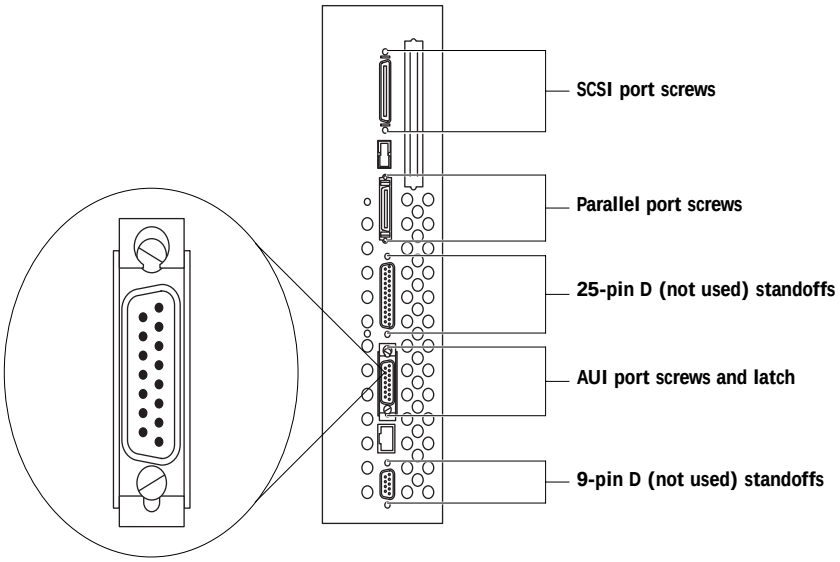


FIGURE 4-8 External connector hardware on E-650 pan

Make sure to keep each set of screws together.

Use a 3/16" hex nut driver to remove the standoffs on the 9-pin D connector and the 25-pin D connector.

Use a #1 Phillips screwdriver for the SCSI connector and the parallel connector.

Use a small flat-blade screwdriver to remove the screws from the AUI slide latch. Note the orientation of the AUI latch so you can reinstall it correctly later.

10. **Remove and set aside the four screws that secure the E-650 board to the standoffs.**

11. **Remove the power cable from E-650 board connector J16.**

    Lift the E-650 board off the standoffs and carefully tilt it out of the pan to access the power cable.

12. **Completely remove the E-650 board from the E-650 pan. Place the board on a stable antistatic work surface or into an antistatic bag.**

    Tilt the board as necessary to make sure the connectors clear the pan as you remove the board.

TO REPLACE THE E-650 BOARD

NOTE: To make sure the copier interface connector (on the video interface board) is properly aligned, make sure not to tighten screws until all components are in place.

1. **Place the E-650 board inside the pan so the external connectors fit into the pan cutouts.**
2. **Connect the end connector of the power cable to E-650 board connector J16.**

   Make sure the HDD is already installed with both cables attached. From the HDD, route the power cable between the pan and the pan standoff. Carefully tilt the E-650 board to make the connection.

   Improper connection of the power cable can damage the E-650. See “Checking E-650 internal connections” on page 4-6 including Figure 4-5 on page 4-7.
3. **Align the E-650 board with the pan standoffs and then replace the four mounting screws into the pan standoffs.**
4. **Insert the screws (and washers, if present), standoffs, and AUI latch that attach the external connectors to the pan (see Figure 4-8 on page 4-12).**

   Use a 3/16" hex nut driver to install the standoffs on the 9-pin D connector and the 25-pin D connector. Use a #1 Phillips screwdriver for the SCSI connector and the parallel connector.

   For the AUI latch, use a small flat-blade screwdriver to install the screws. Orient the AUI latch according to Figure 4-8 on page 4-12. Install one screw almost completely, place the latch over the connector, then install the second screw.
5. **Connect the HDD cable to E-650 board connector J3.**
6. **Connect the exhaust fan cable to E-650 board connector J18.**
7. **Attach the support bracket to the pan (see Figure 4-1 on page 4-2) using the two screws you removed earlier.**
8. **Attach the connector bracket to the pan (see Figure 4-1 on page 4-2) using the two screws you removed earlier.**

   Make sure that the connector bracket is flat against the inside of the pan and the two mounting holes are aligned with the screw holes in the pan.
9. **Install the video interface board in E-650 board connector J24 (see “Video interface board” on page 4-14).**
10. **Reassemble the copier and verify functionality as described in “Restoring E-650 functionality after service” on page 4-24.**
11. **If you replaced the E-650 board with a new one, install system software (see page 4-26). If a startup error occurs when you power on the copier, check E-650 connections. If a startup error still occurs, call your authorized service/support center.**

Video interface board

The video interface board provides the interface between the E-650 and the copier. It connects to video interface connector J24 on the E-650 board and to the connector in the I/F unit (see Figure 4-9 and Figure 2-4 on page 2-5).

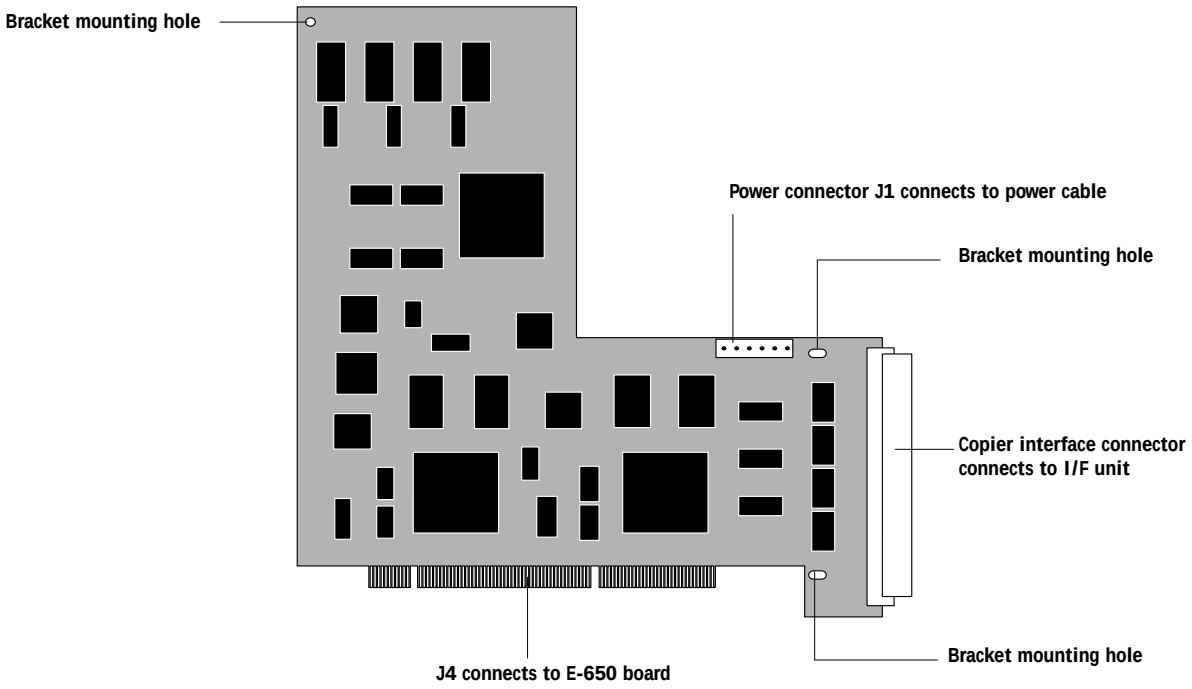


FIGURE 4-9 Video interface board layout

TO REMOVE THE VIDEO INTERFACE BOARD

1. **Shut down the copier and access the E-650 as described on page 4-3.**
2. **Remove the power cable from video interface board connector J1.**
3. **Remove and set aside the one screw that attaches the video interface board to the support bracket (for its location, see Figure 4-1 on page 4-2).**
4. **Remove and set aside the two screws that attach the video interface board to the connector bracket (for its location, see Figure 4-1 on page 4-2).**
5. **Gently remove the video interface board from E-650 board connector J24.**

   Grasp the board at the sides. Gently pull the board straight out of the connector.
6. **Carefully tilt the video interface board out of the pan.**
7. **Place the board in an anti-static bag.**

TO REPLACE THE VIDEO INTERFACE BOARD

NOTE: To make sure the copier interface connector is properly aligned, make sure not to tighten screws until all components of the E-650 are in place.

1. **Remove the board from the anti-static bag.**
2. **Carefully tilt the video interface board into the pan and insert the video interface board into E-650 board connector J24.**

   Grasp the board at the sides. Gently push the board straight into the connector. Check the visible portion of the gold fingers of the connector on the video interface board to determine if the connection is aligned properly and secure.
3. **Align the mounting hole in the video interface board with the hole in the connector bracket and attach the video interface board to the connector bracket (see Figure 4-1 on page 4-2) using the two screws you removed earlier.**
4. **Align the mounting hole in the video interface board with the hole in the support bracket and attach the video interface board to the support bracket (see Figure 4-1 on page 4-2) using the one screw you removed earlier.**
5. **Connect the middle connector of the power cable to video interface board connector J1.**

   To avoid bending and flexing the video interface board, firmly seat the cable connector by pressing from the bottom of the board as you press the cable connector into J1.

   Improper connection of the power cable can damage the E-650. See “Checking E-650 internal connections” on page 4-6 including Figure 4-5 on page 4-7.
6. **Reassemble the copier and restore functionality as described on page 4-24.**

   When you reassemble the E-650, you will tighten all screws completely.

DIMMs

Each DIMM (dual in-line memory module) is held in place by levers at each end of its socket on the E-650 board. Standard shipping configuration for the E-650 is 256MB in two DIMM sockets (see Figure 4-10).

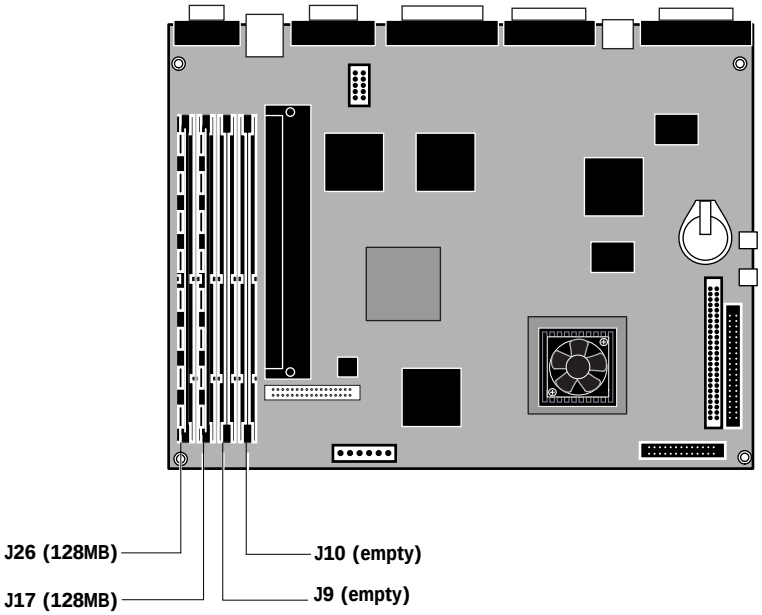


FIGURE 4-10 DIMMs installed on the E-650 board

NOTE: Approved DIMMs are available from your authorized service representative.

TO REPLACE A DIMM

1. **To release a DIMM, push outward on the lever on each side of the DIMM.**

   See the following figure.

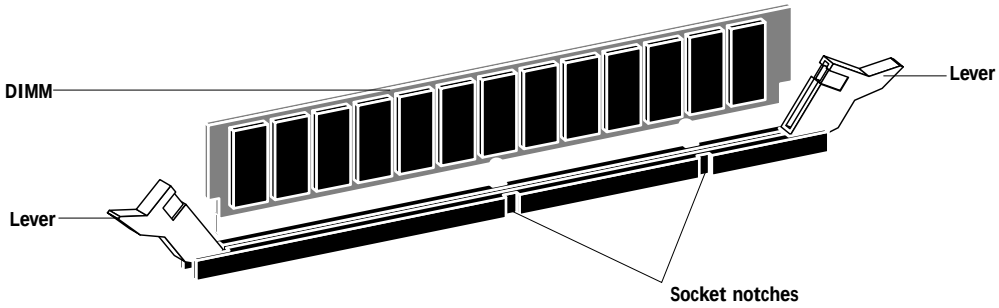


FIGURE 4-11 Releasing a DIMM

2. **Slide the DIMM out of the socket.**

3. **To install a DIMM, slide it into the socket until the levers snap into place.**

   The DIMM fits the socket only one way. The two notches on the bottom of the DIMM should line up with the notches in the socket.

   To avoid bending and flexing the E-650 board, firmly seat the DIMM by pressing from the bottom of the E-650 board as you press the DIMM into its socket.

   Make sure that the levers close securely around the ends of the DIMM and that the DIMM is fully seated in its socket.

4. **Reassemble the copier and verify functionality as described in "Restoring E-650 functionality after service" on page 4-24 or other documentation.**

5. **Print a Configuration page to verify the amount of memory.**

Battery

The battery on the E-650 board is located at BT1. To replace it, use a 3V manganese dioxide lithium coin cell battery (Panasonic CR2032 or equivalent).

TO REPLACE THE BATTERY

1. **Locate the battery on the E-650 board (see Figure 4-7 on page 4-10).**
2. **Carefully lift up the clip that holds the battery.**

   Use caution when lifting up the clip; excessive force could cause the clip to lose its tension.

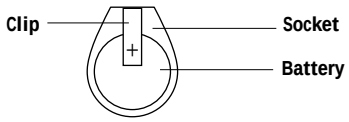


FIGURE 4-12 E-650 battery

3. **Pull the battery out of its socket and release the clip.**
4. **To insert a new battery, slide the battery into the socket under the clip with the positive (+) side facing up.**

   Make sure the clip holds the battery securely in the socket.

5. **Reassemble the copier and verify functionality as described in "Restoring E-650 functionality after service" on page 4-24 or other documentation.**

   NOTE: When you power on, let the Start-up diagnostics complete, then power off and power on again to initialize the realtime clock.

   The date and time of day are lost when the old battery is removed. See the *Administrator Guide* for instructions on entering Server Setup to program the system date and time.

CPU fan

The 12V CPU fan is mounted on the CPU heat sink. Two arrows on the side of the fan indicate fan rotation and airflow direction. One arrow should point to the CPU. The CPU fan cable attaches to the E-650 board at connector J28.

TO REMOVE THE CPU FAN

1. **Shut down the copier and access the E-650 as described on page 4-3.**
2. **Unplug the CPU fan cable from E-650 board connector J28.**
3. **Using a Phillips screwdriver, remove the two screws that fasten the CPU fan to the CPU heatsink. Remove the fan and set aside the screws so that you can replace them later.**

   Do not apply excessive pressure to the board when removing the screws.

TO REPLACE THE CPU FAN

1. **Place the CPU fan on top of the CPU heatsink so that one arrow on the fan is pointing down to the heatsink.**
2. **Attach the CPU fan to the CPU heatsink with two screws.**

   Do not to apply excessive pressure to the board when replacing the screws.
3. **Connect the CPU fan cable to E-650 board connector J28.**
4. **Reassemble the copier and verify functionality as described in "Restoring E-650 functionality after service".**

Exhaust fan

The exhaust fan is mounted on the side of the E-650 pan and pulls warm air out of the E-650. Two arrows on the side of the fan indicate fan rotation and airflow direction. One arrow should point away from the E-650 board. The exhaust fan cable connects to E-650 board connector J18.

TO REMOVE THE EXHAUST FAN

1. **Shut down the copier and access the E-650 as described on page 4-3.**
2. **Remove the video interface board as described on page 4-14.**
3. **Remove the exhaust fan cable from E-650 board connector J18.**
4. **Remove the fan cable from the pan cutout.**

Carefully cut any tie-wraps that join the fan cable to the power cable and to the standoff for the E-650 board. Avoid cutting either cable.

5. **Remove the four screws that secure the exhaust fan to the side of the E-650 pan.**

   Set aside the screws and fan.

TO REPLACE THE EXHAUST FAN

1. **Align the exhaust fan with the four holes in the side of the pan.**

   Make sure that a direction arrow imprinted on the side of the fan is pointing away from the E-650.
2. **Insert the fan cable through the pan cutout.**
3. **Align the fan and replace the four screws through the fan into the side of the pan.**
4. **Replace the exhaust fan cable on E-650 board connector J18.**

5. **Drape the cable low and fully inside the pan to prevent the cable from being cut by the pan cover when you reassemble the E-650.**

   Tie-wraps can be used to join the fan cable to the power cable and to the lower part of the standoff for the E-650 board.
6. **Replace the video interface board as described on page 4-15.**
7. **Reassemble the copier and verify functionality as described in "Restoring E-650 functionality after service" on page 4-24.**

Hard disk drive

The factory-installed hard disk drive (HDD) is formatted and loaded with all E-650 software, including operating software, system software, network drivers, and printer fonts. Because the HDD is used to store spooled print jobs, available disk space is displayed on the Info screen. Disk space is also listed on the Configuration Page (see “Printing the Configuration page” on page 2-12).

If you are replacing the HDD, you will need:

- The appropriate System Software CD and documentation
- The latest version of user software (for networked computers that will be printing to the E-650)

Proper handling

Handle the HDD with care:

- Use proper ESD practices when grounding yourself and the E-650.
- Keep magnets and magnetic-sensitive objects away from the HDD.
- Loosening the screws on the top of the HDD voids the warranty.
- Never drop, jar, or bump the HDD.
- Handle the HDD by its sides and avoid touching the printed circuit board.
- Allow the HDD to reach room temperature before installation.

Before you decide that the HDD needs to be replaced, make sure that all cables are connected properly.

If the HDD needs to be replaced, you’ll need to install the system software on the new HDD. Replacement drives are shipped without E-650 system software installed.

Make sure you attach an ESD grounding wrist strap and follow standard ESD (electrostatic discharge) precautions before handling E-650 components.

TO REMOVE THE HDD

1. **Shut down the copier and access the E-650 as described on page 4-3.**
2. **Remove the video interface board (see "To remove the video interface board" on page 4-14).**
3. **Remove the E-650 board from the pan (see "To remove the E-650 board" on page 4-11).**
4. **With the pan on it side, remove the four screws on the bottom of the pan that secure the HDD (see Figure 4-13).**

   Hold the HDD with one hand while you remove the screws.

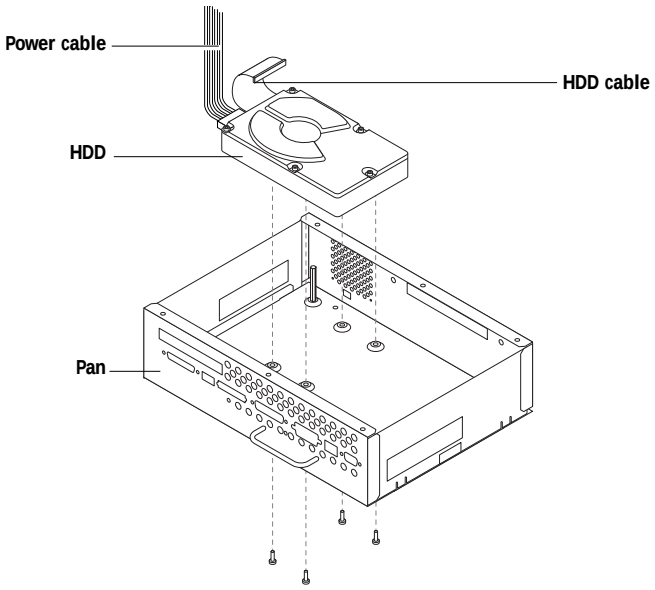


FIGURE 4-13 Replacing the HDD

5. **Remove the power cable from the HDD.**
6. **Remove the HDD from the pan, remove the HDD cable from the HDD, and place the HDD into an antistatic bag.**

   Do not touch the drive with magnetic objects, such as magnetic screwdrivers. Do not place items near the hard disk drive that are sensitive to magnets, such as credit cards and employee ID cards. See "Proper handling".

TO REPLACE THE HARD DISK DRIVE

Make sure you attach an ESD grounding wrist strap and follow standard ESD (electrostatic discharge) precautions before handling E-650 components.

1. **Remove the HDD from the antistatic bag, connect the HDD cable to the HDD, and insert the HDD into the pan.**
2. **Connect the 4-wire connector of the power cable to the HDD.**

   The connector is keyed to fit only when properly oriented.
3. **With the pan on its side, align the four holes in the bottom of the HDD with the holes in the bottom of the pan and replace the four screws you removed earlier (see Figure 4-13 on page 4-22).**
4. **Replace the E-650 board (see "To replace the E-650 board" on page 4-13).**
5. **Replace the video interface board (see "To replace the video interface board" on page 4-15).**
6. **Reassemble the copier and verify functionality as described in "Restoring E-650 functionality after service" on page 4-24 and other copier documentation.**

Improper connection of the power cable can damage the E-650. See "Checking E-650 internal connections" on page 4-6 including Figure 4-5 on page 4-7.

7. **If you replaced the HDD with a new drive, install system software (see page 4-26). If a startup error occurs when you power on the copier, check E-650 connections. If a startup error still occurs, call your authorized service/support center.**

Restoring E-650 functionality after service

TO RESTORE FUNCTIONALITY

1. **Reinstall any boards, cables, connectors, and other parts of the E-650 that you loosened during inspection or service.**

Improper connection of the power cable can damage the E-650. See "Checking E-650 internal connections" on page 4-6 including Figure 4-5 on page 4-7.

2. **Tighten the screws you loosened during inspection or service.**

   Make sure all components are in proper alignment as you tighten the screws.

3. **Replace the pan cover on the pan, fitting the sides of the pan cover into the tabs.**

   Make sure all cables are low and fully inside the pan before you replace the pan cover.

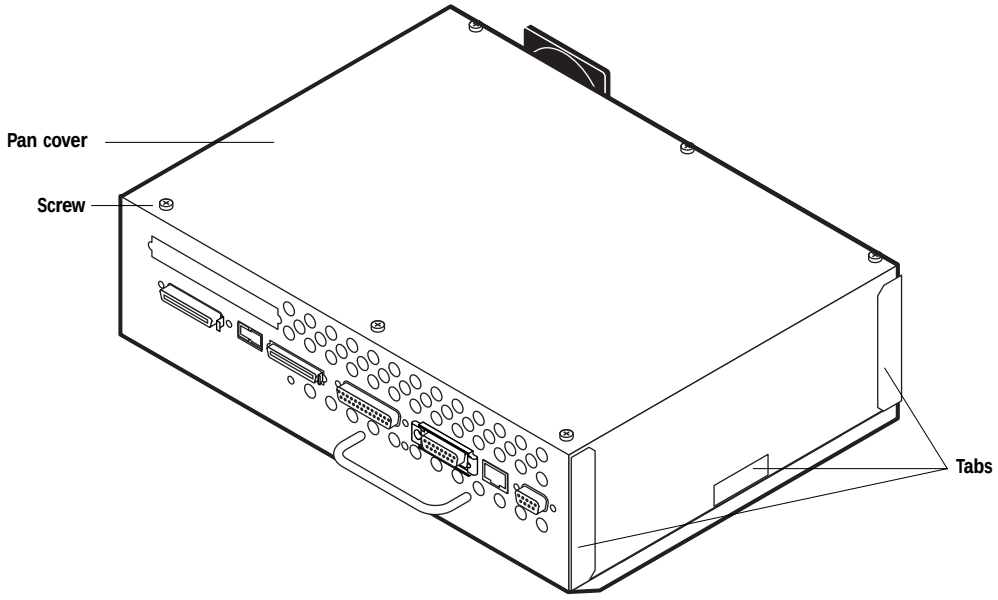


FIGURE 4-14 Replacing the pan cover

4. **Install the six screws you removed earlier.**
5. **Install the E-650 in the I/F unit and reassemble the copier (see "Installing the E-650 in the copier" on page 2-5).**
6. **Connect any external cables that you removed during inspection or service.**
7. **Before you leave the customer site, verify E-650 operation (see Figure 4-15 on page 4-25).**

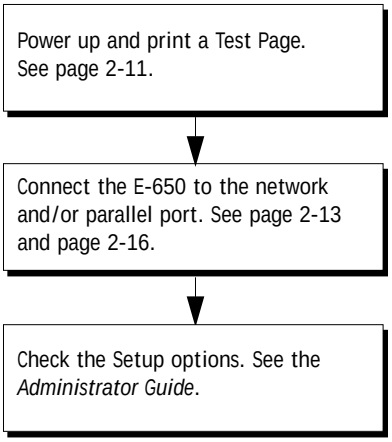


FIGURE 4-15 E-650 connection verification steps

E-650 system software

The E-650 System Software CD includes the system software and fonts. Use the System Software CD when:

- You replace the E-650 HDD
- You replace the E-650 board
- You upgrade to a more recent version of the system software

The latest user software must be installed onto all computers that print to the E-650. Using incompatible versions of the system and user software may result in system problems.

System software can be installed one of two ways:

- From a CD-ROM drive connected to the SCSI interface port (see page 4-28)
- From a prepared PC connected to the parallel port (see page 4-26)

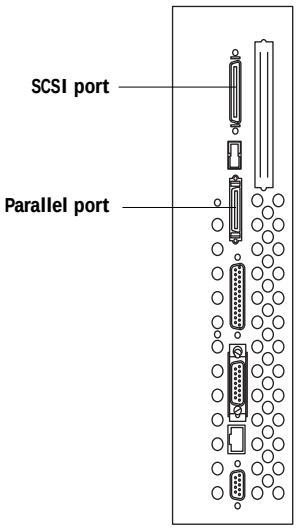


FIGURE 4-16 SCSI and parallel ports

System software installation reminders

Keep in mind the following when installing system software:

- **Job Log**—Formatting the HDD to install system software deletes the list of jobs in the Job Log and any jobs in the queues. The network administrator can use Fiery Spooler to save a current list of jobs (not the actual jobs) from the Job Log.
- **Fonts**—Formatting the HDD to install system software deletes all fonts installed on the E-650 HDD. Resident fonts are restored during system software installation. If any additional fonts were downloaded to the E-650, the network administrator can reinstall the fonts using Fiery Downloader.

  To determine which additional fonts were downloaded to the E-650, print the font list before you format the HDD and again after you complete the system software installation. Any fonts *not listed* after installation will need to be reinstalled. See the *User Guide* for more information.
- **Language**—Screens for installing system software are always displayed in English even if the E-650 is configured for another language.
- **Compatibility**—The latest user software should be installed onto all computers that print to the E-650. Using incompatible versions of the system and user software may result in system problems.

Installing system software using the SCSI interface port

To install system software using the SCSI port on the E-650, you need:

- An external CD-ROM drive, properly terminated, with SCSI ID set to a number other than 0 (zero) or 7
- A SCSI cable to connect the CD-ROM drive to the E-650

NOTE: Make sure that the AOF setting is OFF, using the User Tools on the copier. If the AOF setting is ON, the copier could enter Sleep Mode and the system software downloading could fail.

TO PREPARE FOR INSTALLATION USING THE SCSI INTERFACE PORT

1. **Print the Configuration page from the Functions menu (if possible) to record the customer's Setup Configuration.**

   Setup settings are reset to the default configuration when system software is installed.

2. **Print the Font List from the Functions menu.**

   The Font List details what fonts are installed on the E-650 HDD. Along with the fonts that are provided on the System Software CD, the customer may have installed additional fonts that will be deleted when the HDD is formatted.

3. **Connect the SCSI cable to the CD-ROM drive.**

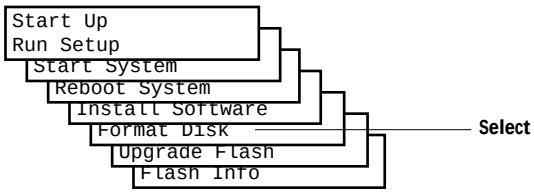
4. **With the copier powered off, connect the other end of the SCSI cable to the SCSI interface port on the back of the E-650.**

5. **Power on the CD-ROM drive, push the eject button, and insert the E-650 System Software CD.**

6. **Make sure the CD-ROM drive is free of activity, power on the copier, and let the E-650 complete its Start-up diagnostics. As soon as you see the message, "To update /setup, press any key," press any key on the E-650 Operation Panel.**

   NOTE: If you do not press a key within a few seconds, the E-650 continues the start-up process. If this occurs, reboot the E-650 and try again.

7. **At the Start Up screen, display Format Disk and press the Enter key.**



8. **At the Format Disk screen, display Internal Drive and press the Enter key to select the HDD inside the E-650.**

9. **At the Format Drive? screen, use the up or down arrow key on the E-650 Operation Panel to display Yes and press the Enter key to confirm the format of the internal HDD.**

10. **At the Select Level screen, display Standard and press the Enter key.**

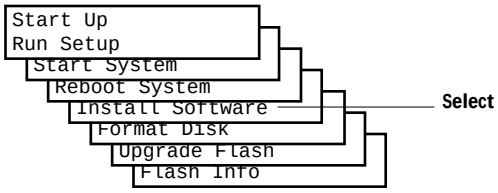
    Wait while status messages appear then press Enter at the message “Format OK” to display the Start Up screen.

    NOTE: The format options Full and Full & Verify are normally not required. If you suspect a problem with the HDD, you can select the Full format method to correct any bad sectors on the disk (30 to 60 minutes). If problems persist, you can select the Full & Verify format as a diagnostic (60 minutes or longer).

TO INSTALL SYSTEM SOFTWARE USING THE SCSI INTERFACE PORT

1. **At the Start Up screen, select Install Software.**

   Make sure the CD-ROM drive is free of activity before you install the software.



2. **To confirm software installation, use the up or down arrow key on the E-650 Operation Panel to display Yes and then press Enter.**

3. **Select From drive to install system software using the SCSI interface port.**

   Do not select From Parallel Port (see “Installing system software using the parallel port” on page 4-31 for directions on using the parallel port to install system software).

   Wait while the E-650 Operation Panel displays status messages then press Enter at the message “Software Install. Completed” to display the Start Up screen. If an error message states that the installation has failed, see “Troubleshooting Procedures”.

4. **At the Start Up screen, press Enter to display the message, "Must reboot after installation." Press the Enter key and wait as the E-650 reboots.**

   NOTE: *Do not* press any keys on the E-650 Operation Panel when the message appears: "To update/setup, press any key."

5. **If the E-650 screen message appears, "New Rom... Upgrade", press the Enter key on the E-650 Operation Panel and then wait.**

   Wait during the E-650 screen message "Updating...Do NOT turn off." Do not turn off the copier during this message. Otherwise, the E-650 will be damaged.

6. **At the Select Language screen, display the language of your choice, press the Enter key, then wait for the Setup screen to be displayed.**

   Use the up or down arrow key to cycle through the languages available.

   If you select a different language, the prompt to reboot appears in the language you selected. Press the Enter key to reboot then wait for the Setup screen to be displayed.

7. **In Setup, reenter the customer's settings from the Configuration page that you printed earlier.**

   Enter settings for Server, Network, and Printer Setup in that order. The E-650 reboots after you save changes and exit Setup. Ignore the settings not included on the Configuration page if it is more appropriate for the network administrator to set them. See the *Administrator Guide* for more information.

8. **After the E-650 reaches the Info screen and the CD-ROM drive is free of activity, press the eject button and remove the System Software CD.**

9. **Power off the E-650 and the CD-ROM drive and remove the SCSI cable from the back of the E-650 and the CD-ROM drive.**

   If the CD-ROM drive was connected to the E-650 before you installed system software, do not disconnect it.

Installing system software using the parallel port

To install system software using the parallel port on the E-650, you need:

- A PC with Windows 95/98
    - A CD-ROM drive built in or attached
    - At least 200MB of disk space free
    - Support for ECP mode on the parallel port
- IEEE 1284 bi-directional parallel cable (short length)

  Use the cable provided in the E-650 kit.

NOTE: Make sure that the AOF setting is OFF, using the User Tools on the copier. If the AOF setting is ON, the copier could enter Sleep Mode and the system software downloading could fail.

The PC will need to be configured so the parallel port mode in the BIOS is set to ECP. When you access the PC BIOS to set the parallel port mode to ECP, you may discover that ECP is the default mode, or you may discover that ECP mode is not supported at all. If ECP is not supported, you can either install an add-in board (not provided), use a different PC, or opt for a much slower installation using Compatibility Mode.

In addition to accessing the BIOS, setting up the PC also requires certain port and printer settings in Windows. Before you begin installing system software, follow the procedure for setting up the PC.

TO SET UP THE PC

1. **Access the PC BIOS and make sure that Parallel Port Mode is set to ECP.**

   Power on the PC and immediately press the key indicated on your monitor for entering the BIOS (or a likely key if it is not indicated). Pressing a likely key repeatedly (ESC, DEL, F1, or a combination) may interrupt the starting of Windows and access the BIOS or give you directions for accessing the BIOS.

   Once in the BIOS, you may have to scroll through several screens to reach the settings for the parallel port. After setting the Parallel Port Mode to ECP, save your changes and exit the BIOS.

2. **Install the PostScript printer driver for the E-650 from the User CD in the Windows subdirectory.**

   This driver supports throughput over an ECP parallel port and allows you to configure all port and spool settings required for a successful installation. You may skip this step if a comparable printer driver is already installed on the PC. See *Getting Started* for directions on installing printer drivers.

3. **In Windows, click the Start button, point to Settings, and click Printers.**

4. **Click the icon for the printer and choose Properties from the File menu.**

5. **Click the Details tab and make sure the box "Print to the following port:" reads exactly as follows: LPT 1: (ECP Printer Port).**

   If this box reads LPT 1: (Printer Port) instead of LPT 1: (ECP Printer Port), the LPT1 port setting in the BIOS for ECP mode has not been configured. Reboot the PC to reenter the BIOS and set the parallel Port Mode to ECP. Compatibility mode will work but the installation will take much longer.

6. **Click Spool Settings and select "Spool print jobs so program finishes printing faster," "Start printing after first page is spooled," and "Disable bi-directional support for this printer". Then click OK.**

   "Start printing after first page is spooled" assures no disruption from a parallel port timeout.

   Disabling Windows support for the bi-directional parallel port helps the system software installation to succeed. Using the PostScript printer driver included in the Windows subdirectory of the E-650 User CD ensures that this option is not grayed out.

7. **Click Port Settings and ensure that "Spool MS-DOS print jobs" and "Check port state before printing" are checked. Click OK.**

8. **Click Apply, then OK to activate the settings and exit from the Printer Properties screen.**

   The PC is properly configured. Now prepare for the installation.

TO PREPARE FOR INSTALLATION USING THE PARALLEL PORT

1. **Print the Configuration page from the Functions menu (if possible) to record the customer's current configuration.**

   Setup settings are reset to the default configuration when system software is installed.

2. **Print the Font List from the Functions menu.**

   The Font List details what fonts are resident on the E-650 HDD. Along with the fonts that are provided on the System Software CD, the customer may have installed additional fonts that will be deleted when the HDD is formatted.

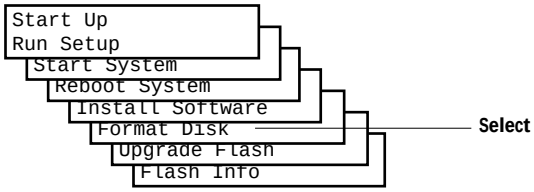
3. **Power off the E-650 and the PC before attaching the cable.**

4. **Connect an IEEE 1284 cable to the LPT1 port on your PC (generally, a 25-pin D-type connector) and to the parallel port connector on the E-650.**

5. **Power on the copier, and let the E-650 complete its Start-up diagnostics. As soon as you see the message, "To update /setup, press any key," press any key on the E-650 Operation Panel.**

   NOTE: If you do not press a key within a few seconds, the E-650 continues the start-up process. If this occurs, reboot the E-650 and try again.

6. **At the Start Up screen, display Format Disk and press the Enter key.**



7. **At the Format Disk screen, display Internal Drive and press the Enter key to select the HDD inside the E-650.**

8. **At the Format Drive? screen, use the up or down arrow key on the E-650 Operation Panel to display Yes and press the Enter key to confirm the format of the internal HDD.**

9. **At the Select Level screen, display Standard and press the Enter key.**

   Wait while status messages appear then press Enter at the message "Format OK" to display the Start Up screen.

   NOTE: The format options Full and Full & Verify are normally not required. If you suspect a problem with the HDD, you can select the Full format method to correct any bad sectors on the disk (30 to 60 minutes). If problems persist, you can select the Full & Verify format as a diagnostic (60 minutes or longer).

   Now you are ready to do the software installation procedure.

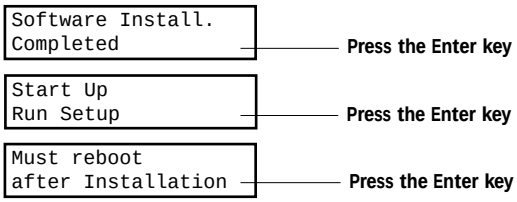
TO INSTALL SYSTEM SOFTWARE USING THE PARALLEL PORT

1. **Power on the PC and then insert the System Software CD into the CD-ROM drive.**
2. **In Windows, open the My Computer folder and the CD-ROM directory, and then find the MS-DOS batch file for system software installation:** loadx2e.bat
3. **At the Start Up screen on the E-650 Operation Panel, display Install Software and press the Enter key. To confirm software installation, display Yes and press the Enter key.**
4. **At the Install Software screen, scroll down to display From parallel port and press the Enter key.**

5. **At the message "Please copy file to parallel port" double-click the PC MS-DOS batch file for system software installation:** loadx2e.bat

   Wait while the E-650 indicates it is receiving the file, clearing the port, and unpacking the file. A message is displayed on the E-650 Operation Panel and in the DOS-type window on the PC when the system software installation is finished.

6. **Press the Enter key at the following screens:**



7. **If the E-650 screen message appears, "New Rom... Upgrade", press the Enter key on the E-650 Operation Panel and then wait.**

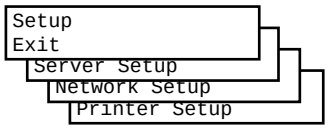
   Wait during the E-650 screen message "Updating...Do NOT turn off." Do not turn off the copier during this message. Otherwise, the E-650 will be damaged.

8. **At the Select Language screen, display the language of your choice, press the Enter key, then wait for the Setup screen to be displayed.**

   Use the up or down arrow key to cycle through the languages available.

   If you select a different language, the prompt to reboot appears in the language you selected. Press the Enter key to reboot then wait for the Setup screen to be displayed.

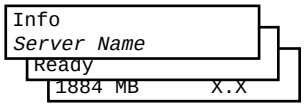
9. **In Setup, reenter the customer's settings from the Configuration page that you printed earlier.**



Enter settings for Server, Network, and Printer Setup in that order. Ignore the settings not included on the Configuration page if it is more appropriate for the network administrator to set them. The E-650 reboots after you save changes and exit Setup. See the *Administrator Guide* for more information.

10. **After the E-650 reaches the Info screen, close the DOS-type window on the PC and remove the System Software CD from the CD-ROM drive.**

Scroll down to display E-650 status.



The DOS-type window on the PC displays a message that one file was copied.

11. **Power off the E-650 and the PC before removing the parallel cable.**

Upgrading the Flash

Perform a Flash upgrade only if you have been informed that a Flash upgrade is necessary and you have received a Flash upgrade file.

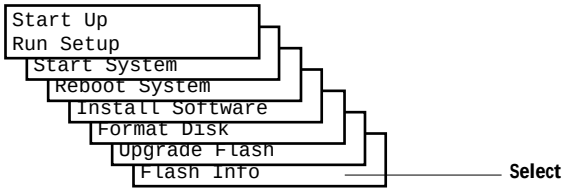
The following procedures describe how to check the Flash version and how to upgrade if required.

To check the Flash version

1. **Power on the copier, and let the E-650 complete its Start-up diagnostics. As soon as you see the message, "To update /setup, press any key," press any key on the E-650 Operation Panel.**

   Note: If you do not press a key within a few seconds, the E-650 continues the start-up process. If this occurs, reboot the E-650 and try again.

2. **At the Start Up screen, select Flash Info.**



3. **At the next screen, display Boot Block and then press the Enter key.**

4. **Verify the version of the Boot Block. If the version displayed is earlier than the version of the Flash upgrade file provided, you will need to perform the procedure "To install the Flash upgrade" on page 4-37.**

5. **Repeat this procedure for the Main Block so that you verify both the Boot Block and the Main Block.**

Before performing the procedure "To install the Flash upgrade":

- Obtain a PC that meets the requirements described on page 4-31.
- Configure the PC for installing a file over the parallel port as described on page 4-32.
- Attach the PC to the parallel port of the E-650 as described on and page 4-33.

Note: If the Setup configuration has been changed from the default or additional fonts have been installed, print the Configuration page and the Font List from the Functions menu before beginning the following procedure. After performing the Flash upgrade use these pages to reconfigure the system if necessary.

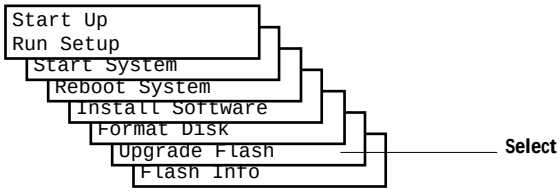
This procedure assumes that you have the Flash upgrade file available for installation.

TO INSTALL THE FLASH UPGRADE

1. **After connecting the PC to the E-650 parallel port, power on the copier and the PC.**
2. **If the Flash upgrade file is on CD or floppy disk, insert the media into the PC. In the Windows Start menu, point to Programs, click MS-DOS Prompt, and then change to the directory with the Flash upgrade file.**
3. **At the MS-DOS prompt, type the following command but *do not* press the enter key yet:**

   copy *filename* lpt1 /b

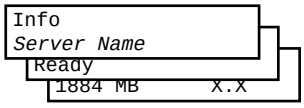
   filename refers to the Flash upgrade file and /b specifies the binary option (not ASCII).
4. **At the Start Up screen, select Upgrade Flash.**



5. **At the E-650 screen message "Please copy flash update file to the parallel port", press the enter (or return) key on the PC and then wait.**
6. **When the E-650 screen message appears, "New Rom... Upgrade", press the Enter key on the E-650 Operation Panel and then wait.**
7. **Wait during the E-650 screen message "Updating...Do NOT turn off."**

   Do not turn off the copier during this message. Otherwise, the E-650 will be damaged.
8. **After the E-650 reaches the Info screen, close the DOS-type window on the PC and remove the System Software CD from the CD-ROM drive.**

   Scroll down to display E-650 status.



   The DOS-type window on the PC displays a message that one file was copied.
9. **Power off the E-650 and the PC before removing the parallel cable.**

   If the Flash upgrade file was on a CD or floppy disk make sure you remove it before powering off the PC.
10. **Check the Flash version to make sure the upgrade was successful (see page 4-36).**

Chapter 5: Troubleshooting Procedures

This chapter focuses on the troubleshooting process and identifies the source of common problems that may occur with the E-650 and suggests ways of correcting them.

The troubleshooting process

The troubleshooting process is designed to eliminate the most obvious causes of failure before progressing to more complex issues. “Where problems occur” on page 5-2 gives an overview of the E-650 components and indicates areas most likely to require troubleshooting.

If the E-650 fails to complete its Start-up sequence and the E-650 Operation Panel does not display the Info screen, the most likely cause is a loose cable or board connection. See “Checking E-650 internal connections” on page 4-6.

- Try a phone check before you go to the customer site.

  “Before you go to the customer site” on page 5-3 suggests areas you should check out before making a service call to the customer site. With a phone call, you can find out if the problem is a simple operating failure or a failure caused by a network or configuration change. You can ask the customer to check for loose cables on the side of the copier and loose connections at a power strip or outlet.

- Check for obvious causes of problems.

  “Preliminary on-site checkout” on page 5-4 takes you through the initial visual checkouts you should make when you arrive at the customer site. You should check the Operation Panel for an error message. Then inspect the copier externally and internally for the most common problems, such as loose or faulty cables or connections.

- Check network connections.

  “Checking network connections” on page 5-13 provides guidelines for checking the network connections between the copier and the computers to which it is connected as well as information on several printing problems.

Where problems occur

- The E-650 is a built-in print server for the copier and is generally part of a configuration like the one shown in Figure 5-1.

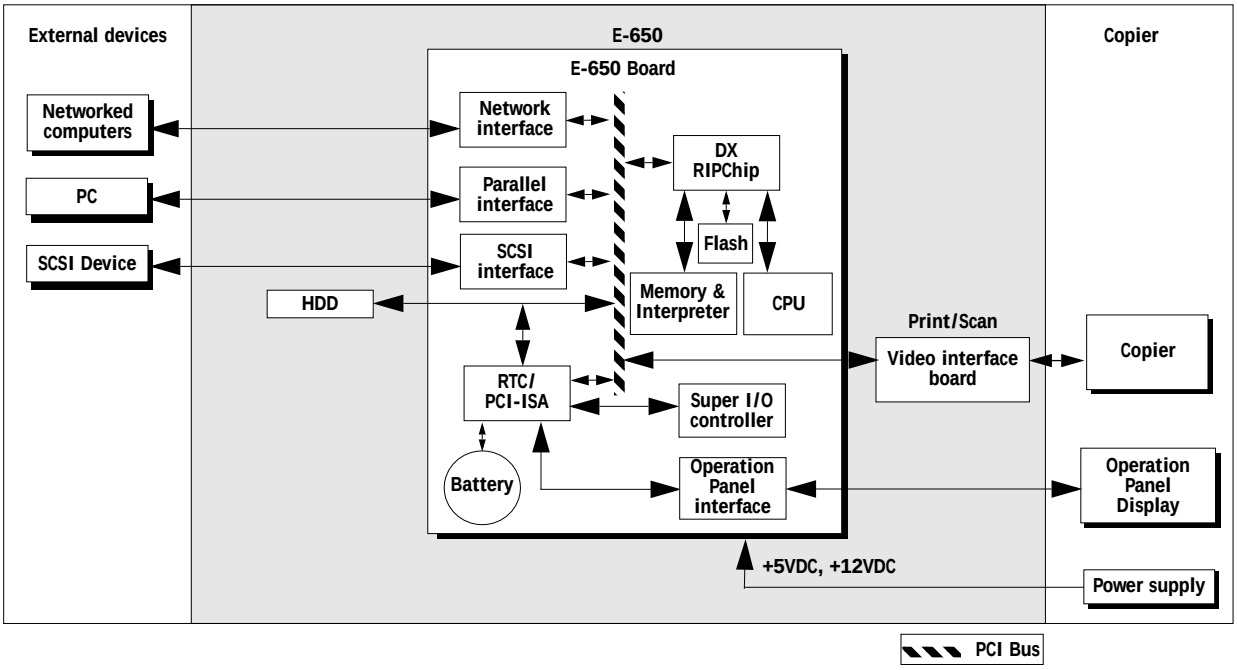


FIGURE 5-1 E-650 functional diagram

This chapter does not attempt to provide troubleshooting information for attached computers such as Windows or Mac OS computers, for copiers, or for extensive networks. You should refer problems in these areas to the appropriate service departments and network administrators.

Before you go to the customer site

Before you make a service call to a customer site, talk to the customer on the phone, and check out the following items:

1. **Does the copier work?**

   If the copier works, but the user cannot print the E-650 Test Page, have the customer check for any error messages on the Operation Panel.

2. **Is the failure caused by a simple operating problem?**

   - Is there a printing problem?
     - Does the E-650 Test Page fail to print?
     - Does the E-650 fail to respond to a print command?
     - Does printing seem to take a long time?
     - Is print quality poor?
     - Does the E-650 fail to appear in the list of printers?
   - Has the customer noted any error messages on the copier or E-650 Operation Panel?

     If the answer to any of these questions is yes, refer the customer to the Troubleshooting Appendix in the *User Guide.*

     If the customer has followed the corrective actions in the *User Guide* and has failed to solve the problem, be prepared to make a service call. Keep a log of the failures and messages the customer has observed.

3. **Has the customer made any network changes?**

   If network changes have occurred, request that the customer's network administrator verify the E-650 network requirements.

4. **Is the user having printing problems with a particular image file?**

   If there are problems with files from particular applications, the user may be more successful using different print settings.

If your telephone call fails to clear up the problem, proceed to the next phase, the preliminary on-site checkout.

Preliminary on-site checkout

Your goal in the preliminary on-site checkout is to eliminate obvious problems, such as loose or missing cables and connectors.

Checking connections

Before you open the copier to inspect cables:

- Check that external interface cables are plugged into the proper connectors.

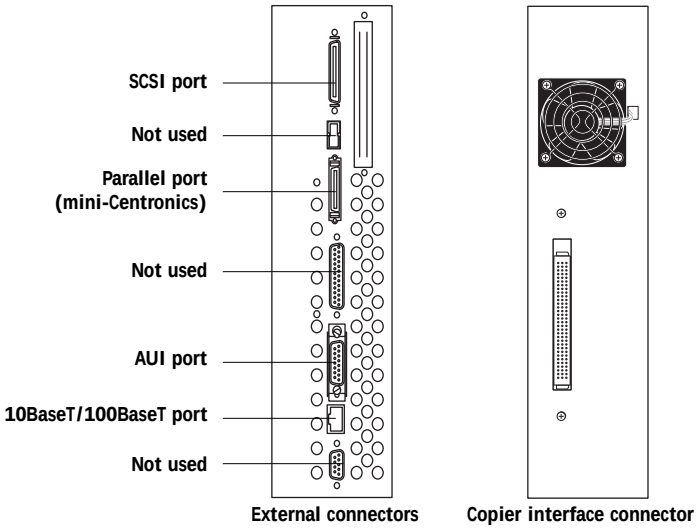


FIGURE 5-2 External connections

- Make sure the external power cable is plugged into the wall outlet and that the copier is powered on.
- Make sure the copier interface connector is correctly aligned and that no pins are pushed in or bent. (For output voltages, see Appendix A, “Specifications.”)

Also, see “Checking E-650 internal connections” on page 4-6 for information on checking internal connections. If all the connectors are in place and the problem still exists when the copier is powered on, then proceed to the next stage of troubleshooting.

Start-up diagnostics

The following table lists the diagnostic self-test performed on the E-650 board when the copier is powered on or rebooted. While Start-up diagnostics are being performed, the E-650 Operation Panel flashes PLEASE WAIT. If all tests pass, the E-650 completes its startup process and displays the Info screen. If the screen displays the message "Powerup Board Diag Failed" you can choose Continue, View fail diags, or Shutdown.

TABLE 5-1 Possible errors during Start-up diagnostics

Test name	Error Number	Area tested on E-650 board	Suggested action
RTC Self Test	700	Realtime Clock chip	• Replace the battery on the E-650 board (see "Battery" on page 4-18). • If the problem persists, replace the E-650 board.
RTC R/W Reg	710		
RTC Start	720, 730		
I2C EEPROM	1100	I2C EEPROM	• Replace the E-650 board.
ENET SLV REG	400, 401	Ethernet controller chip	• Check DIMMs. • Have the network administrator verify the network. • If the problem persists, you may need to replace the E-650 board.
IDE Chip	1001	EIDE controller chip	• Replace the E-650 board.
MEM DIMM INFO	300	DIMMs on the E-650	• Make sure any DIMM installed is approved by Electronics For Imaging. • Reseat DIMMs in their sockets and restart the E-650 in order to run startup diagnostics. • If the problem persists, replace each DIMM one at a time with a good DIMM until you locate the faulty DIMM. • If the problem still persists, you may need to replace the E-650 board.
MEM ADDRESS	301		
SERIAL CHIP	3000, 3001	PCI bus and I/O controllers	• Replace the E-650 board.
BOOTROM	1811, 1813, 1814, 1819	boot ROM (Flash)	• Reinstall system software (includes boot ROM code). • Upgrade the Flash (if provided with a special boot ROM file). • If the problem persists, you may have to replace the E-650 board.
SCSI Reg		SCSI controller chip	• Replace the E-650 board.

General E-650 system errors

When you start up the system or when you install system software, you may encounter error conditions that are not reported during the Start-up diagnostics. Table 5-2 lists some of these error conditions and suggests corrective action. For service procedures, refer to Chapter 4.

Note: When a failure occurs, make sure you also check Controller Interface Type F kit connections and components, such as the LCD harness and the power supply.

Some failures that may appear to be the E-650 board may actually be the result of an Controller Interface kit installation problem or component failure. Table 5-2 does not include detailed troubleshooting procedures for Controller Interface Type F kit components.

TABLE 5-2 General E-650 system error conditions and messages

Symptom	Probable cause	Suggested action
E-650 starts up but CPU fan is not working or overheating.	CPU fan is not properly connected.	• Check CPU fan connection (see “CPU fan” on page 4-19). • If problem persists, replace the CPU fan.
CPU fan is working but does not cool the CPU.	CPU fan is installed upside down.	• Remove the CPU fan and reinstall it in the proper orientation (see “CPU fan” on page 4-19).
Pressing Printer/Scanner key has no effect.	SP 6-910 is not properly set.	• See the Copier service manual for information.
Nothing appears on the E-650 Operation Panel when the copier is powered on	Bad connections	• Check the copier interface connector on the video interface board (see “Checking E-650 internal connections” on page 4-6). • Open the E-650 to make sure that the DIMMs are seated correctly. • If the problem persists, try switching the DIMMs to other slots. • If problem still persists, replace DIMMs (see “DIMMs” on page 4-16).
E-650 hangs at the Loading system... or the Loading settings... screen.	System software is not installed on the hard disk drive.	• Install system software (see “E-650 system software” on page 4-26).
After exiting Setup, the “Rebooting!” screen is displayed, then the E-650 seems to hang at the “Please wait” screen.	No error	• Please wait at least 3 minutes for the system to reboot.
On power up or after Sleep Mode, the copier hangs at the message “PLEASE WAIT” (all capital letters).	Faulty connection between copier and E-650	• Check the copier interface connection (see “Checking E-650 internal connections” on page 4-6)

System software installation errors

During system software installation, error messages may appear on the E-650 Operation Panel and/or PC or other error conditions may arise. Table 5-3 on page 5-7 lists some of these error messages and conditions and then suggests possible causes and solutions.

TABLE 5-3 Software installation error messages and conditions

Error Message or Condition	Probable cause	Suggested action
No readable file system message is displayed on E-650 Operation Panel.	Replacement HDD does not have E-650 system software installed.	• Reboot the E-650 and then install E-650 system software (see "E-650 system software" on page 4-26).
The E-650 hangs at the Scanning devices screen.	Problem with the HDD.	• Reboot the copier using the power switch. • Reinstall system software (see "E-650 system software" on page 4-26). • If the problem persists, check the HDD cable connections (see "Hard disk drive" on page 4-21). • If the problem still persists, contact your authorized service support center.
	Problem with the CD-ROM drive.	Check the following on the CD-ROM drive (see "E-650 system software" on page 4-26): • cable connections • SCSI ID (setting should not be 0) • termination • Reinstall system software. • If the problem persists, contact your authorized service support center.
The E-650 hangs at the Scanning file system or Scanning directories screen.	System software CD is damaged or the wrong CD is inserted in the CD-ROM drive.	• Check the CD inserted in the CD-ROM drive. • If the CD looks dirty, clean it with a lint-free cloth. • If the CD looks damaged, replace it.
	Problem with the CD-ROM drive.	• Check the following on the CD-ROM drive ("E-650 system software" on page 4-26): • cable connections • SCSI ID (setting should not be 0) • termination • Reinstall system software. • If the problem persists, contact your authorized service support center.

TABLE 5-3 Software installation error messages and conditions (Continued)

Error Message or Condition	Probable cause	Suggested action
Functionality error	Unexpected error - cause unknown.	• Reboot the E-650. • Repeat system software installation (see "E-650 system software" on page 4-26). • If the problem persists, check E-650 and PC configuration and connection to attached PC (see "Checking E-650 internal connections" on page 4-6).
Installation file not found	Port selection different from actual hardware setup, for example, with PC connected to parallel port, "From drive" was selected instead of "From Parallel Port" during system software installation.	• Repeat system software installation (see "E-650 system software" on page 4-26). At Install Software screen, scroll down to "From Parallel Port" and press the Enter key.
	Faulty System Software CD or HDD.	• Check internal HDD connections to the E-650 (see "Hard disk drive" on page 4-21). • Repeat system software installation (see "E-650 system software" on page 4-26). • If the problem persists, try installing software using a different System Software CD and/or a different PC. If this does not solve the problem, you may need to replace the HDD.
Not enough disk space	Unnecessary files on E-650 HDD.	• Select the Clear Server option from the Setup menu (see *User Guide*). This clears all jobs on the E-650. • Format the HDD to remove all data and repeat system software installation (see "E-650 system software" on page 4-26). • If the problem persists, you may need to replace the HDD.
Format failed	HDD problem when Standard level formatting of HDD was attempted.	• Reboot the E-650. • At the Select Level screen of the Format Disk option at Start Up, select Full in order to zero every sector on the HDD. • If the problem persists, select Full & Verify to zero every sector and read the value back. This option may take an hour or more. • If the problem still persists, you may need to replace the HDD.
Bad file type	Incorrect Start Up screen option selected, for example, Upgrade Flash instead of Install Software.	• Go back to Start Up screen and select the correct option.
	Wrong or unexpected filename entered or filename misspelled.	• Make sure the correct System Software CD is inserted. • Verify the filename. To continue with system software installation, reenter filename making sure to type the entire filename correctly (see "E-650 system software" on page 4-26). • If the problem persists, try a new System Software CD to install system software.

TABLE 5-3 Software installation error messages and conditions (Continued)

Error Message or Condition	Probable cause	Suggested action
Wrong file size Corrupt file size	Using parallel port for installation, the file transfer was not completed.	• Check cable connection to the E-650 and attached PC. • Check the PC parallel port setup (see "Installing system software using the parallel port" on page 4-31). • Delete unnecessary files on the PC to achieve at least 200MB free disk space. • Repeat system software installation (see "E-650 system software" on page 4-26). • If the problem persists, use a different PC to install software.
Unpacking failed	Using parallel port for installation, unexpected error - cause unknown.	• Check cable connection between the E-650 and PC. • Repeat system software installation (see "E-650 system software" on page 4-26). • If the problem persists, use a different PC to install software.
Creating task failed	Unexpected error - cause unknown.	• Reboot the E-650. • Repeat system software installation (see "E-650 system software" on page 4-26). • If the problem persists, check configuration of E-650 and attached device (see "Checking E-650 internal connections" on page 4-6).
Parallel port timeout	Using parallel port for installation, DOS copy command entered too late.	• During installation, make sure to click the filename or type the correct command on the MS-DOS command line and press the Enter (or Return) key as soon as the E-650 Operation Panel asks that you copy the file (see "To install system software using the parallel port" on page 4-34). • If the problem persists, check the parallel cable connection and PC parallel port setup (see "Checking E-650 internal connections" on page 4-6).
	Using parallel port for installation, installation file spooled too late.	• Before installation, make sure spool setting for PC parallel port is set to print after first page is spooled (see "To install system software using the parallel port" on page 4-34).
	Using a PC running Windows NT to install system software.	• Repeat installation procedure using a PC running Windows 95 or 98 (see "E-650 system software" on page 4-26).
Memory allocation failed	Memory hardware failure.	• Reboot the E-650 and repeat system software installation (see "E-650 system software" on page 4-26). • If the problem persists, run Memory diagnostics if available.
Receiving... appears to hang before completing the file transfer	No error	• Wait longer; the E-650 may be receiving the file.
	Using parallel port for installation, too little disk space on parallel port PC.	• Delete the DOS file from the Windows print queue and wait for the E-650 parallel port timeout (about two minutes). Delete unnecessary files on the PC to achieve at least 200MB free disk space. Repeat system software installation (see "E-650 system software" on page 4-26).

TABLE 5-3 Software installation error messages and conditions (Continued)

Error Message or Condition	Probable cause	Suggested action
E-650 seems to hang at "Please wait..." screen.	No error	• Please wait at least 3 minutes for the system to reboot.
	System software installation performed without formatting internal disk first	• Power copier off and on, press any key to update/setup when prompted, then do Format Disk and Install system software (see "E-650 system software" on page 4-26).

Run Diagnostics function

One of the menu items in the Functions screen on the E-650 Operation Panel is Run Diagnostics. Select Run Diagnostics to check the video interface board installed on the E-650 board.

Video interface diagnostics

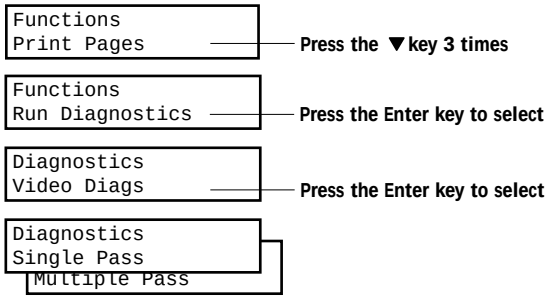
If you suspect there may be a problem with the video interface board (for example, the print quality of output is poor), you can run Video Diagnostics. Video Diagnostics loops data internally, comparing data sent with data received to make sure no errors have occurred. The Printing/processing LED flashes during testing.

TO RUN VIDEO DIAGNOSTICS

1. **Power on the copier. Once the E-650 has reached the Info screen, press the Menu key to view the Functions menu.**

2. **Select Run diagnostics then Video Diags then either Single Pass to run the test once or Multiple Pass to run the tests continuously for a specified amount of time.**

   If you selected Single Pass, the test will start immediately.



3. **If you selected Multiple Pass, enter how long you want the video diagnostics to run, then press the Enter key to start the test.**

   Use the arrow keys if you wish to change the number of minutes from the default of 1. The up and down arrows change the digit (0-9); the left and right arrows move the cursor. If set to zero, the test runs once.

4. **If "Video Diags passed" appears, press the Enter key to return to the Functions menu. However, if "Video Diags failed" appears, then:**

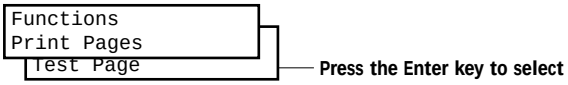
   - Shut down the copier and access the E-650 as described on page 4-3.
   - Inspect the copier interface connector J6 on the video interface board. If any pins are pushed in or bent, gently fix them with a pair of small needlenose pliers.
   - Reinstall the video interface board (see "Video interface board" on page 4-14).
   - Power on the copier and repeat video diagnostics and if the test fails, replace the video interface board.

Printing the Test Page

TO PRINT THE TEST PAGE

1. **Power on the copier and allow it warm up.**
2. **At the Info screen, press the Menu key once to display the Functions menu.**
3. **Select Print Pages then Test Page.**

   Press the Enter key to select the option displayed. Press the down arrow key to display each option.



   The E-650 sends the Test Page to the copier and displays the RIP and Print status screens so you can monitor the job.

4. **Examine the quality of the Test Page from the copier.**

   If the Test Page prints successfully with good image quality, then the E-650 print engine is functional and the connection between the E-650 and the copier is good.

Checking network connections

Printing problems may arise if the network hardware or software is not set up properly or does not match network settings on the E-650. Problems may also arise when printing from a specific application or printing a particular file.

Most of these problems show up as printing problems and do not necessarily indicate a E-650 malfunction. The customer's network administrator can eliminate many printing problems without requiring you to make a service call. The network administrator deals with:

- Print device error conditions
- Network connection problems that result in the copier not appearing in the list of printers on the customer's computers

NOTE: If the copier does not appear in the list of printers on the network, there may be another device on the network with the same Ethernet hardware address.

- Conflicting network settings in Setup and on the customer's computers
- Printing problems caused by inappropriate Setup options
- Application-specific printing errors caused by missing or incorrectly installed printer description files

Printing to the E-650

If the customer can print a E-650 Test Page but cannot print a job from a computer on the network, you may have to make a service call. However, first make sure the network administrator has done the following:

- Checked all components of the network including cables, connectors, terminators, network adapter boards, and network drivers.
- Activated the network and used it to communicate with other printers.
- Checked the corrective actions listed in "E-650 Error Messages" in the *User Guide*.
- Confirmed that the applicable network settings in Setup (such as AppleTalk zone, IP address, Subnet mask, and Gateway address) match the settings used in the network.

When you make a service call, check the E-650 faceplate at the side of the copier to make sure that the appropriate network connection is in place.

Print quality problems are difficult to trace. Before you try to troubleshoot print quality problems, print a Test Page to make sure that the copier does not need servicing or adjusting. Also, make sure the correct paper is being used in the copier.

NOTE: EPS file generation is not completely standardized among applications. Some users may encounter problems while printing certain EPS files.

General printing problems

If the copier is working properly, and the corrective actions listed in the *User Guide* have not solved a printing problem, check the items listed in Table 5-4.

TABLE 5-4 Printing problems - General

Error Message or Condition	Probable cause	Suggested action
E-650 Test Page quality is poor.	Copier and E-650 require calibration.	• Perform copier calibration (see the Copier service documentation for more information). • Perform E-650 AutoCal (see the *User Guide* for information).
E-650 appears in the list of printers on the customer's workstation, but certain jobs do not print.	A PostScript error	• Make sure Print up to PostScript Error in Setup is set to Yes. Check for error messages on the E-650 output.
	An application problem	• Try printing a job from a different application to determine if the problem is associated with a particular application.
A print job stalls.	A PostScript or application error	• Cancel the E-650 print job. • If this fails to clear the problem, reboot the E-650.
Printing stops after one or a few pages.	Faulty DIMM(s)	• Reboot the copier and allow the Start-up diagnostics to run. If faulty DIMMs are detected, replace the faulty DIMMs. • If this fails to clear the problem, try reinstalling the system software.
Color quality is uneven.	A copier problem	• Use the copier to copy a sample copier test page. If the quality is not good, service the copier.
	A file or application problem	• Print a E-650 test page. • If the quality of the E-650 test page is good, there may be a file or an application problem.
Print quality is poor.	A missing or outdated printer description file	• Make sure the appropriate printer description file is installed. See *Getting Started* for a list of printer files used by various applications.
	The application cannot find the appropriate printer description file.	
Job never prints and the RIP screen is active.	The network cable was plugged in when the copier was already on.	• Turn off the copier and turn it back on again. • Make sure Setup is configured correctly.

Appendix A: Specifications

This chapter summarizes the hardware and networking features of the E-650.

Hardware features

- 200MHz R5000 MIPS CPU
- 256MB memory
- Adobe PostScript Level 3
- Parallel port for direct connection printing
- SCSI port for connecting a CD-ROM drive
- Battery—3V manganese dioxide lithium coin cell (Panasonic CR2032 or equivalent)

Networking and connectivity

The E-650 has the following networking features:

- Supports AppleTalk, TCP/IP, and IPX protocols simultaneously
- AUI port for thinnet (10Base2) or thicknet (10Base5) network connection
- RJ-45 port for twisted pair (10BaseT/100BaseTX) network connection

User software

A complete description of E-650 user software is provided in the *User Guide*. For optimal E-650 performance, current versions of the user software should be maintained on every network computer that might print to the E-650.

Safety and emissions compliance

The E-650 board has been certified to meet or surpass the following standards:

Safety approvals

- UL, C-UL
- EN 60950 (TÜV Bauart geprüft)

EMI approvals

- FCC Class B
- VCCI Class A
- EN 55022 Class B
- AS/NZS 3548 Class B
- EN 50082-1
- AS/NZS 42521

Output voltage

On the E-650, the SCSI and USB connectors output +5V DC and the AUI connector outputs +12V DC. (The other external connectors on the E-650 including the copier interface connector have no output voltage.) See Figure A-1.

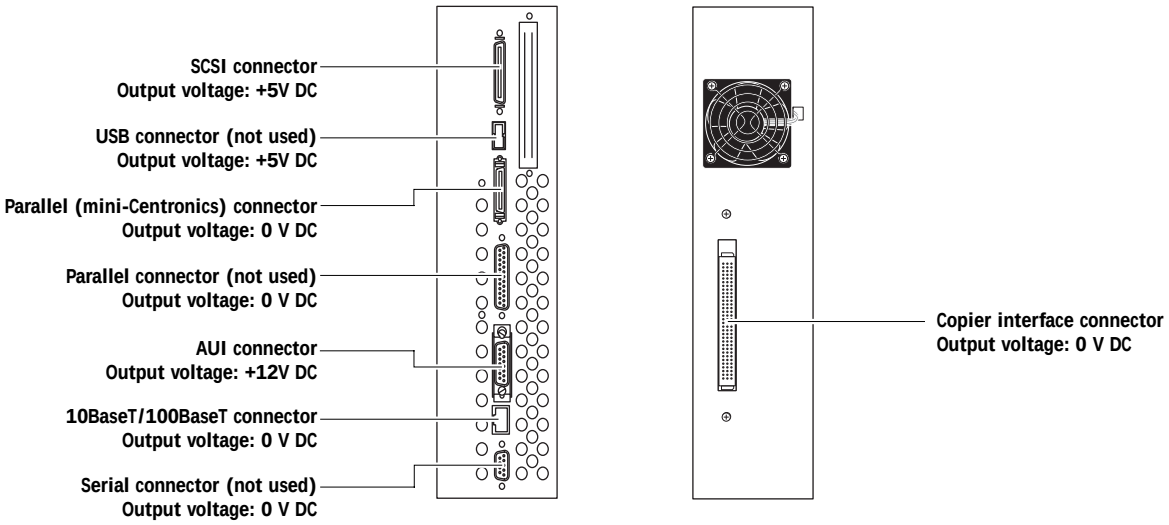


FIGURE A-1 E-650 output voltage

B

Appendix B: Controller Interface Type F

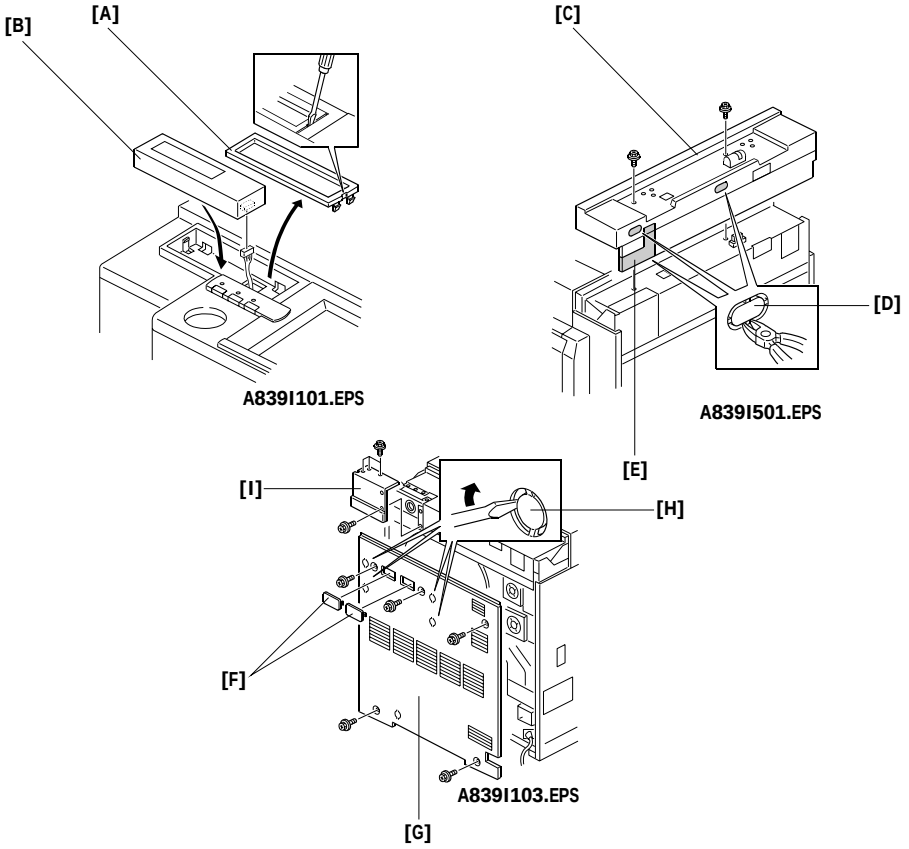
The Controller Interface Type F kit must be installed before installing the E-650.

This appendix provides the *Controller Interface Type F Installation Procedure.*

NOTE: In this procedure, the term “controller box” refers to the E-650 and the term “interface unit” refers to the “I/F unit”. Also note that step 17 is covered in detail in Chapter 2 “Installation.” In particular, see “Installing the E-650 in the copier” on page 2-5.

B

Installation Procedure



Unplug the copier power cord before starting the following procedure.

NOTE: Remove the platen cover or ADF if it is installed.

1. **Remove the cover plate [A] from the Operation Panel with a small blade screwdriver. Then, install the controller LCD panel [B] on the Operation Panel (1 connector).**

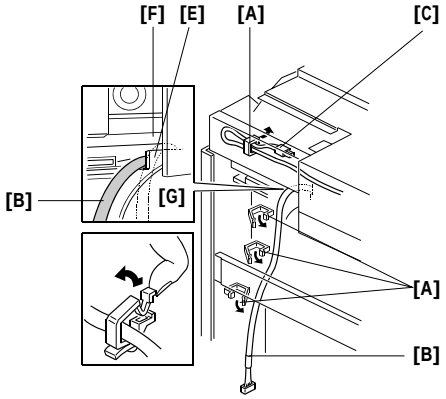
2. **Remove the upper rear cover [C] from the copier (2 screws) and cut out the 2 plastic caps [D] and harness inlet plate [E] from the upper rear cover with cutting pliers.**

3. **Remove the 2 plastic caps [F] from the rear cover [G]; then, remove the 4 metal caps [H] with a blade screwdriver as shown.**

   NOTE: Place a hand over the metal caps as you pry them out in order to control their trajectory.

4. **Remove the rear cover (5 screws) and shield cover [I] (4 screws).**

   (The shield cover will not be used any more.)



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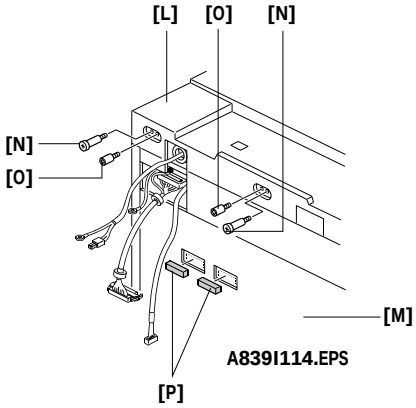

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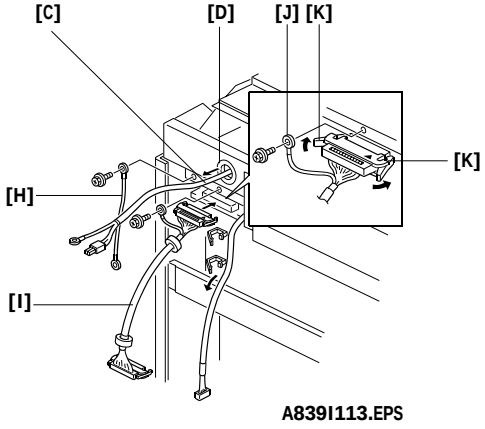

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5. **Open 4 clamps [A] as shown, pull out the harnesses [B] & [C], and close the clamps. Then, put the harness [C] through the harness bushing [D].**

   NOTE: Make sure that the harness [B] is routed as shown. If it is routed in between the bracket [E] and stay [F] as shown in dotted line, the harness may touch the flywheel [G].

6. **Secure the grounding wire [H] (1 screw). (220 ~ 240 V version only)**

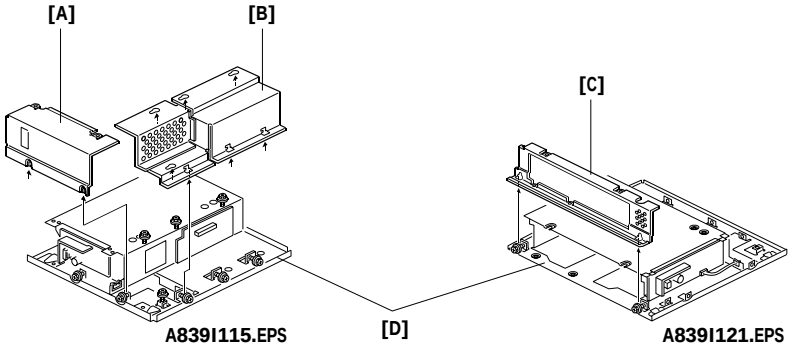
7. **Connect the interface harness [I] (connector which has a grounding wire) to the LD control board and secure the grounding wire [J] as shown (1 screw).**

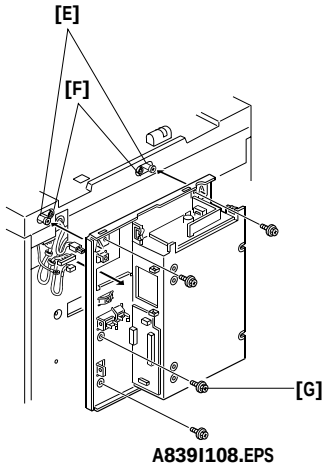
   NOTE: Insert the connector firmly so that the two lock hooks [K] are engaged as shown.

8. **Reinstall the upper rear cover [L] and the rear cover [M] with the three harnesses (3 harnesses and grounding wire on 220 ~ 240 V version) outside the machine as shown.**

9. **Secure the hook stud screws [N] and stand-off stud screws [O] (2 each).**

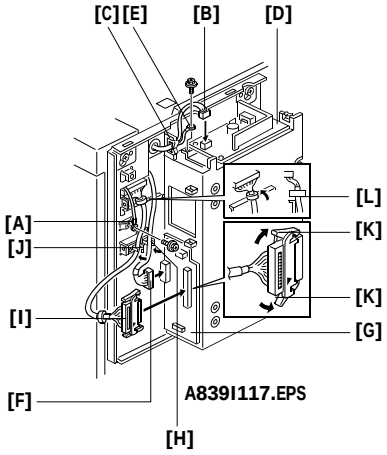
10. **Peel off the seal of two-sided tape and attach the 2 conductive gaskets [P] as shown.**

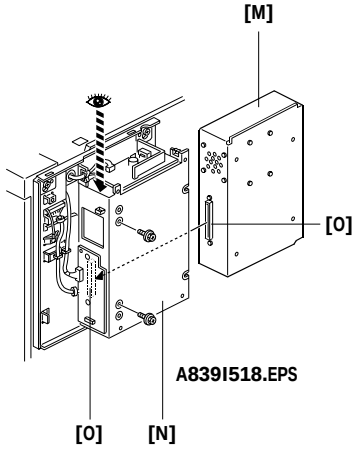




11. **Loosen the screws securing the upper shielding cover [A], left shielding cover [B], and right shielding cover [C]; then, remove them from the interface unit [D].**

12. **Put the 3 harnesses (3 harnesses and grounding wire on 220 ~ 240 V version) through the cut-out of the interface unit and hook the interface unit on the stud screws [E]. Then, secure the 3 screws (2 screws go into the stand-off stud screws [F]) and 1 grounding screw [G].**





13. **Secure the grounding wire [A] (1 screw). (220 ~ 240 V version only)**

14. **Secure the harness [B] in the clamp [C] and connect the 2P connector on the power supply board [D] of the interface unit. Then, secure the grounding wire [E] as shown (1 screw).**

15. **Connect the 24P connector [F] on the interface board [G] and secure the harness in the clamp [H].**

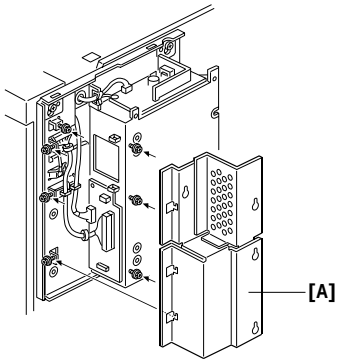
16. **Connect the interface harness [I] to the interface board and secure the harness in the clamp [J].**

    NOTE: Insert the connector firmly so that the lock hooks [K] are engaged as shown.

    Make sure that the ferrite core [L] is placed in the space of the cut out of the interface unit as shown.

17. **Insert the controller box [M] in the interface unit [N] (2 screws) (Look down through the top of the interface unit to see the connectors. The controller box needs to be pulled up slightly to engage the connectors smoothly.)**

    NOTE: Make sure that the connectors [O] are firmly connected.



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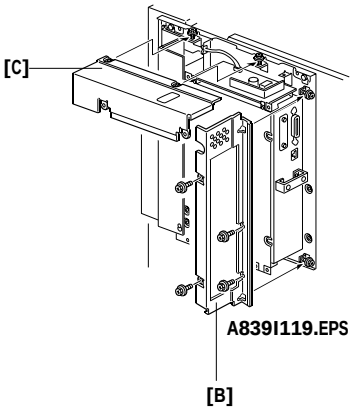

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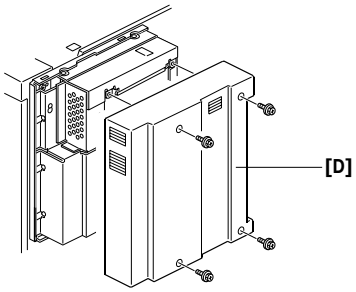

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18. **Reinstall the left shield cover [A] (7 screws).**
19. **Reinstall the right shield cover [B] (6 screws) and upper shield cover [C] (2 screws).**
20. **Install the interface unit cover [D] (4 screws).**
21. **See the *Administrator Guide* for Setup information.**

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