DICK BAILEY

EK-HSC50-IN-001

HSC50

INSTALLATION MANUAL

digital

EK-HSC50-IN-001

HSC50 Installation Manual

Prepared by Educational Services
Digital Equipment Corporation

First Edition, May 1983

Printed in U.S.A.

This document was set on DIGITAL's computerized typesetting system.

- Class A Computing Devices:

Notice: This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user at his own expense may be required to take measures to correct the interference.

CONTENTS

FIGURES (Cont)

TABLES

PREFACE

The *HSC50 Installation Manual* is written for qualified field service maintenance personnel. It describes the HSC50 installation procedure.

Appendix A contains the Field Acceptance HSC50 Off-Line Diagnostic Tests. Appendix B contains the Field Acceptance HSC50 System Tape Tests.

Chapter 1 contains HSC50 site preparation and planning, instructions for HSC50 operation and module set up, and cable installation. Chapter 2 contains the field acceptance and checkout procedure. Option installation is discussed in Chapter 3.

CHAPTER 1
INITIAL PREPARATION

1.1 INTRODUCTION

This chapter contains the following information:

- An HSC50 unpacking and installation checklist
- An HSC50 basic description
- HSC50 site preparation and planning information
- Instructions on preparation of the HSC50 for operation
- Necessary module set up
- HSC50 cabling procedures

Use the following HSC50 unpacking and installation checklist to prepare the HSC50 for operation.

_____ Site preparation and planning
_____ HSC50 unpacking and external inspection
_____ Setting up the HSC50 node address
_____ I/O control processor module (L0105-0) baud rate selection
_____ Power control bus installation
_____ SDI/STI cable installation
_____ CI cable installation
_____ Field acceptance and checkout procedure (Chapter 2)
_____ Add-on installation (Chapter 3)

1.2 HSC50 BASIC DESCRIPTION

The HSC50 is mounted in a cabinet similar to the extended H9642 cross-products series. Refer to Figure 1-1. The HSC50 contains a card cage and six to eleven extended hex modules, dual TU58 cassette drives, a self-contained power controller, power supply, and cooling.

Refer to Figure 1-2 for an overview of the HSC50 subsystem.

The HSC50 contains up to seven types of modules. The module names, module numbers, and the function of each are given below.

- Port Link Module (L0100-0, also known as CI Link) – Communicates over the computer interconnect.
- Port Buffer Module (L0109-0, Pila) – Provides a limited number of high-speed buffers to accommodate the burst data rate of the CI transfers.

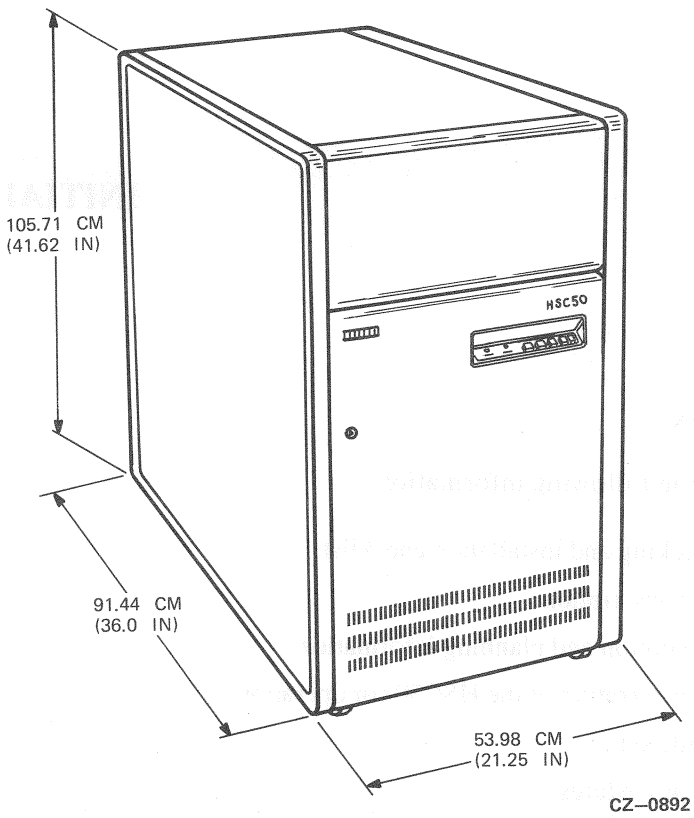

Figure 1-1 HSC50 Floor Space Requirements

- Port Processor Module (L0107-YA, K.pli) – Functions as the interface between the CI transmissions and the HSC50 global memory structures.
- Disk Data Channel (L0108-YA, K.sdi) – Supports up to four SDI disk drives; for example, the RA80, RA81, and/or RA60.
- Tape Data Channel (L0108-YB, K.sti) – Supports up to four STI tape formatters; for example, the TA78.
- Memory Module (L0106-AA, M.std) – Contains 512K bytes of memory in three divisions: global control memory (128K bytes), global data memory (128K bytes), and (P.ioc-local) program memory (256K bytes).
- I/O Control Processor Module (L0105-0, P.ioc) – Sets up and directs all internal processes within the HSC50 subsystem.

The number of each module is stamped on its handle.

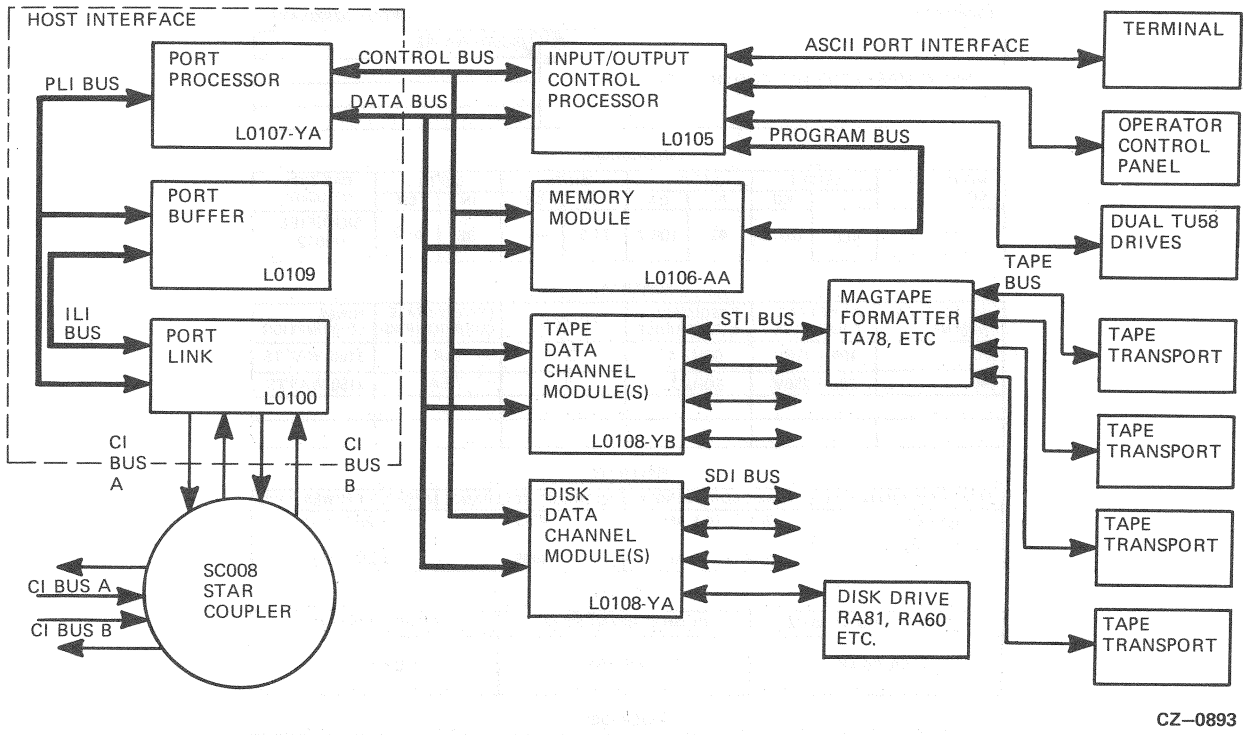

Figure 1-2 HSC50 Subsystem Block Diagram

1.3 SITE PREPARATION AND PLANNING

The HSC50 specifications are listed in Table 1-1.

Preparation and planning are necessary before installing the HSC50. The following paragraphs describe some items that should be considered.

1.3.1 Environmental Considerations

The HSC50 is designed to operate in a business or light industrial environment. Cleanliness is important in the installation of any computer system, and the HSC50 requires the same standards.

Static discharge is a common problem for any electronic device and may cause lost data, system downtime, and other problems. The most common source of static electricity is the movement of people in contact with carpets and clothing materials. Low humidity allows a large amount of static charge to build up. Use the following strategies to minimize problems.

- Maintain more than 40% relative humidity.
- Place the system away from heavy traffic paths.
- Use no carpets, if possible. If a carpet is necessary, choose a good antistatic carpet. If carpets are in place, antistatic mats placed around the system may help decrease the problem.

The HSC50 conforms to Digital Standard 102 (Sections 0-3 and 7) in reference to electrostatic discharge. Refer to this Standard if you need more information.

DESCRIPTION	OPTION DESIGNATION
HSC50 MASS STORAGE CONTROLLER	HSC50–AA/AB

MECHANICAL

MOUNTING CODE	WEIGHT		HEIGHT		WIDTH		DEPTH		CAB TYPE (IF USED)
		KG	IN	CM	IN	CM	IN	CM	
FS	400	181.2	42	106.7	21.3	54.1	36	91.4	MODIFIED H9642

POWER (AC)

AC VOLTAGE NOMINAL	AC VOLTAGE TOLERANCE	FREQUENCY & TOLERANCE	PHASE(S)	STEADY-STATE CURRENT (RMS)	POWER CONSUMPTION
120	104– 128V	60HZ ±1	3	15A	3150 WATTS
240	208– 256V	50HZ ±1	3	7.5A	3150 WATTS

POWER (AC)

PLUG TYPE (NEMA NO.)	POWER CORD LENGTH	INTERRUPT TOLERANCE	APPARENT POWER (kVA)
REFER TO FIGURE 1–3	15 FT. (4.5 M)	4MS	3.25 (kVA)
	15 FT. (4.5 M)	4MS	3.25 (kVA)

POWER (AC)

INRUSH CURRENT 60 HZ	INRUSH CURRENT 50 HZ	SURGE DURATION
175A/PEAK	175A/PEAK	1 CYCLE

POWER (DC)

+5V	–5.2	+12						DATA CABLE LENGTH (STD)

ENVIRONMENT (DEVICE) (NOTE 1)

TEMPERATURE		RELATIVE HUMIDITY		RATE OF CHANGE		HEAT DISSIPATION	
OPERATING	STORAGE	OPERATING	STORAGE	TEMP	HUMIDITY	BTU/HR	KGM CAL/HR
50–104° F	-40–140°F	10–90%	10–90%	36° F/HR	20%/HR	11,050	
10–40° C	-40–+60°C			20° C/HR			

ENVIRONMENT DEVICE

ALTITUDE (MAX)		AIR VOLUME (AT INLET)		AIR QUALITY
OPERATING	STORAGE	FT^3 /MIN	L/SEC	PARTICLE COUNT (MAX)
8000 FT.	30,000 FT.	210		
2.4 KM.	9.1 KM.			

Table 1-1 HSC50 Specifications

1.3.2 Space Requirements

Office space needed for the HSC50 is shown in Figure 1-1. The minimum service clearance required is 92 cm (36 in) for access to both the front and back of the HSC50. No service clearance is required on either side of the HSC50.

1.3.3 Power and Safety Precautions

The HSC50 adds no unusual fire or safety hazards to an existing computer system. The wiring used by Digital Equipment Corporation conforms to UL, CSA, and IEC standards. Each piece of equipment is shipped with a grounding connection on its frame. The main circuit breaker on the power controller will remove ac power from the HSC50 logic, fans, main cooling blower, and power supplies.

The ac plugs and receptacles used on the power controller are shown in Figure 1-3.

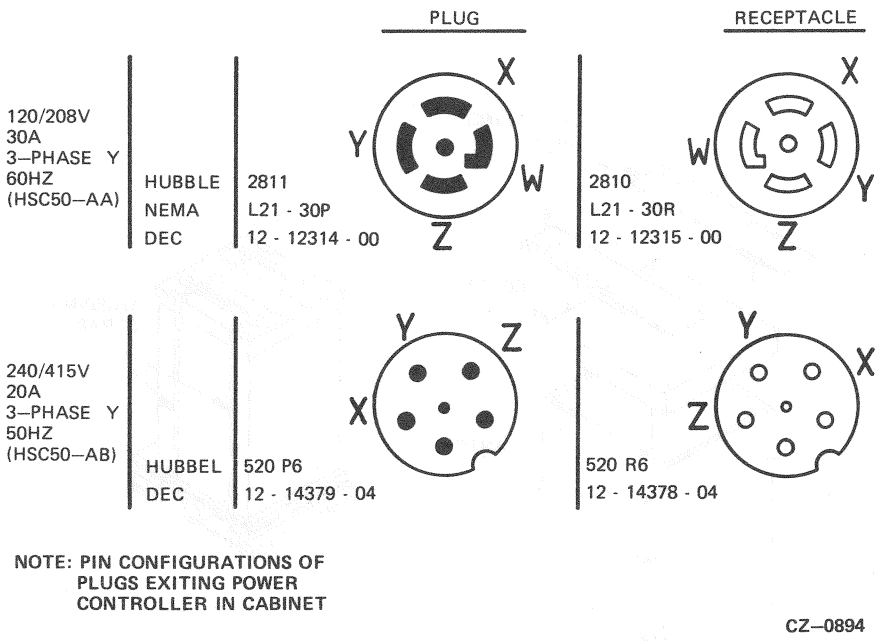

Figure 1-3 HSC50 AC Plugs and Receptacles

WARNING

Hazardous voltages are present inside this equipment. Installation and servicing should be performed by a qualified and trained service representative. Bodily injury or equipment damage may result from improper servicing.

1.4 HSC50 UNPACKING AND EXTERNAL INSPECTION

When delivered, the HSC50 is packed in a cardboard container attached to a shipping skid or pallet. Refer to Figure 1-4. Unpack the HSC50 and remove it from the pallet using the following procedure.

1. Remove the two-part unloading ramp strapped on top of the shipping carton.
2. Remove the shipping carton and all associated packing materials.
3. Check the cabinet and associated equipment for any external shipping damage. Report any damage to the DIGITAL Field Service or Sales Office and to the local carrier. Keep all packing material and receipts when a damage claim is filed.

NOTE

Save all shipping brackets and hardware for future use when moving equipment.

4. Remove the shipping bolt from each shipping bracket that secures the HSC50 cabinet to the pallet. One bolt is shown in the insert of Figure 1-4.
5. Attach the two-part unloading ramp to the pallet by fitting the grooved end of each ramp board over the mating metal strip on the front of the pallet. Refer to Figure 1-5.
6. Screw the HSC50 levelers all the way up towards the cabinet housing. Refer to Figure 1-6.

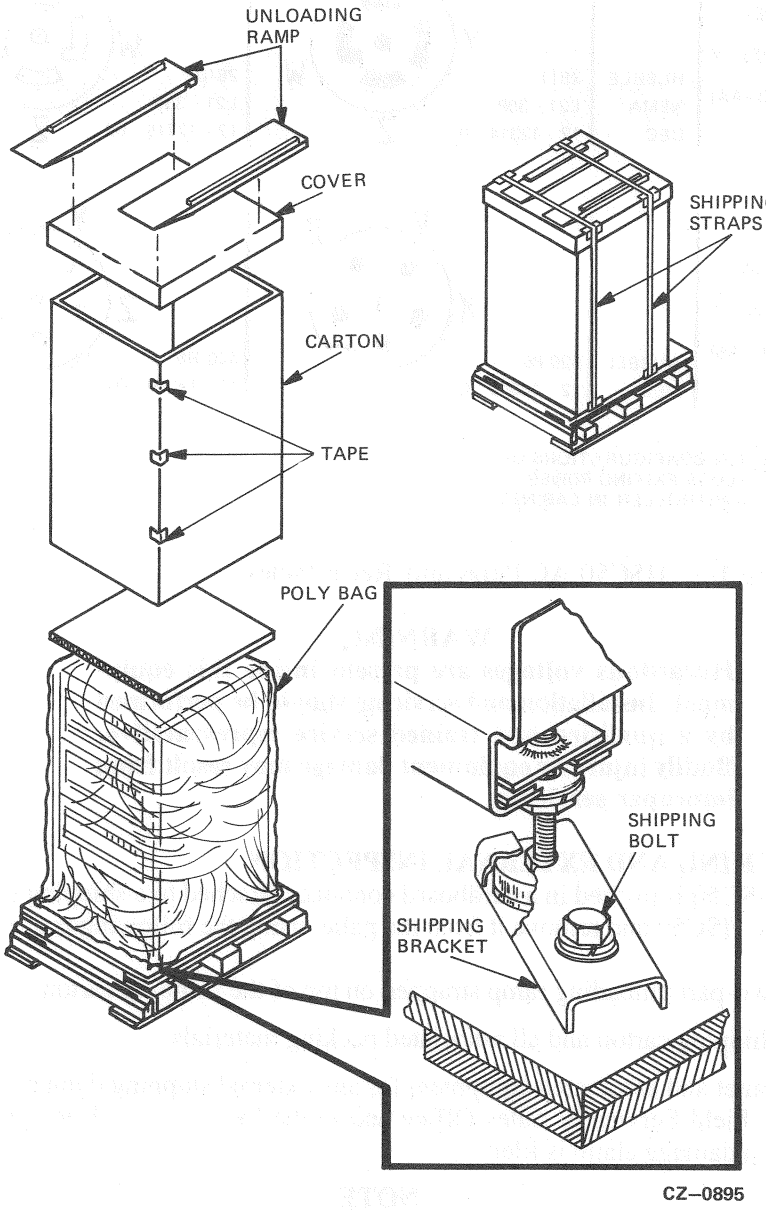

Figure 1-4 Unpacking the HSC50 from a Shipping Pallet

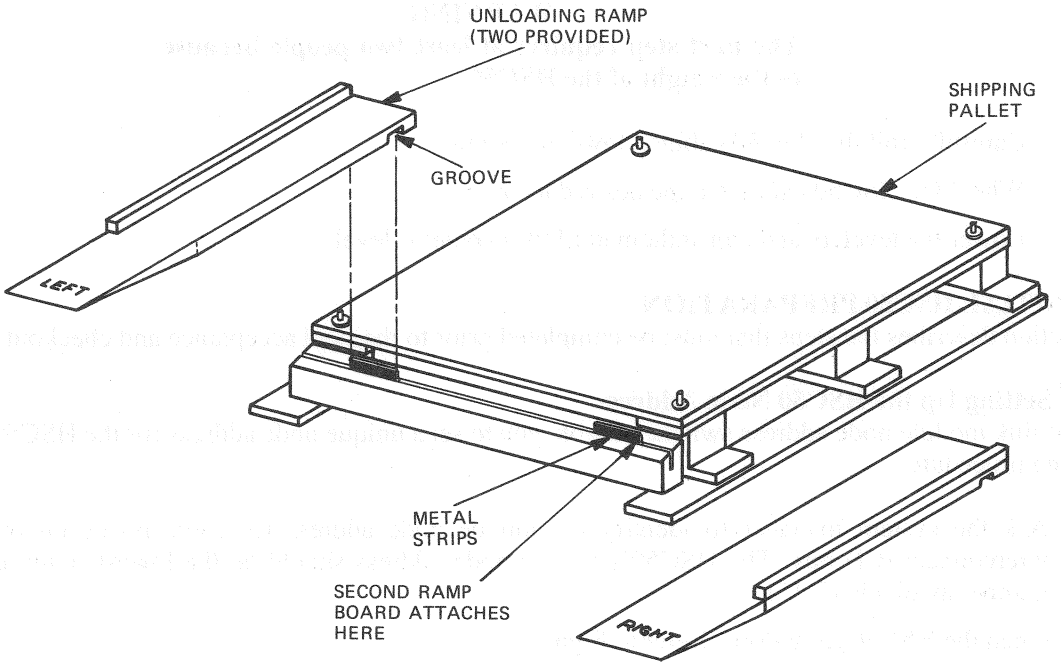

Figure 1-5 Attaching Unloading Ramps to the Pallet

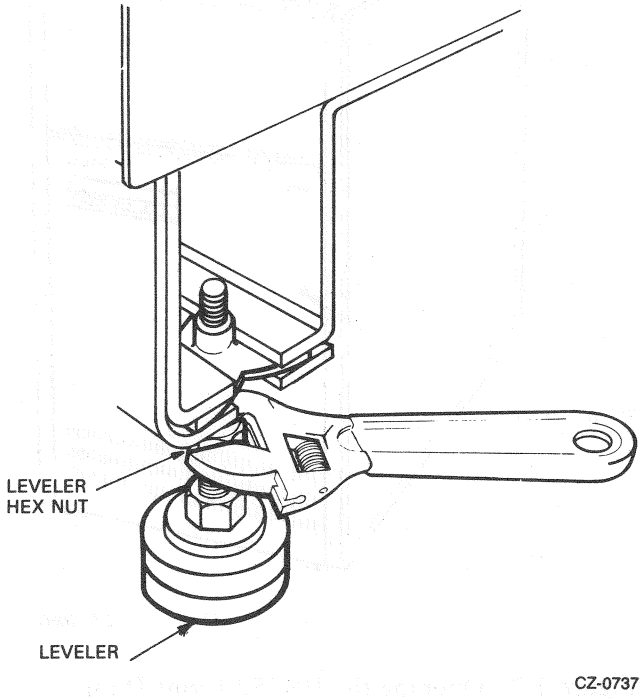

Figure 1-6 Adjusting the Levelers

WARNING
The next step requires at least two people because of the weight of the HSC50.

7. Carefully roll the HSC50 cabinet down the ramps.
8. Wheel the HSC50 cabinet to the desired location.
9. Lower the levelers and adjust them until the cabinet is level.

1.5 INITIAL HSC50 PREPARATION

This section describes the steps that must be completed prior to the field acceptance and checkout procedure.

1.5.1 Setting Up the HSC50 Node Address

The port link module node address switches enable you to set a unique node address for the HSC50 using the following procedure.

1. Ask the system manager to identify the unique node address for each device on the computer interconnect (CI) bus. The HSC50's unique node address should be the lowest, unused sequential number available (0-15).
2. Open the HSC50 front door. Refer to Figure 1-7.

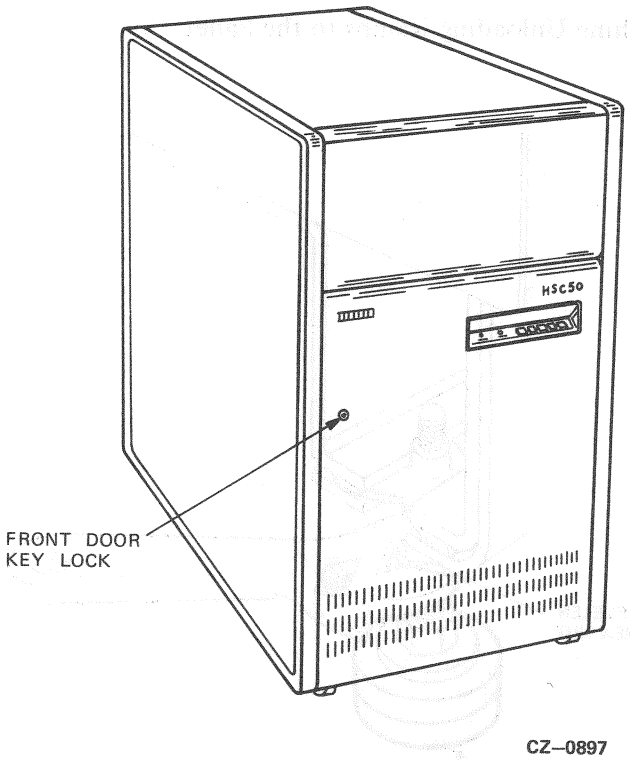

Figure 1-7 Opening the HSC50 Front Door

3. Open the HSC50 card cage cover by turning the card cage cover locks. Refer to Figure 1-8.
4. Locate the card cage label above the card cage. The port link module (L0100-0) is located in the row labeled MOD (module).
5. Locate the port link module in the card cage.

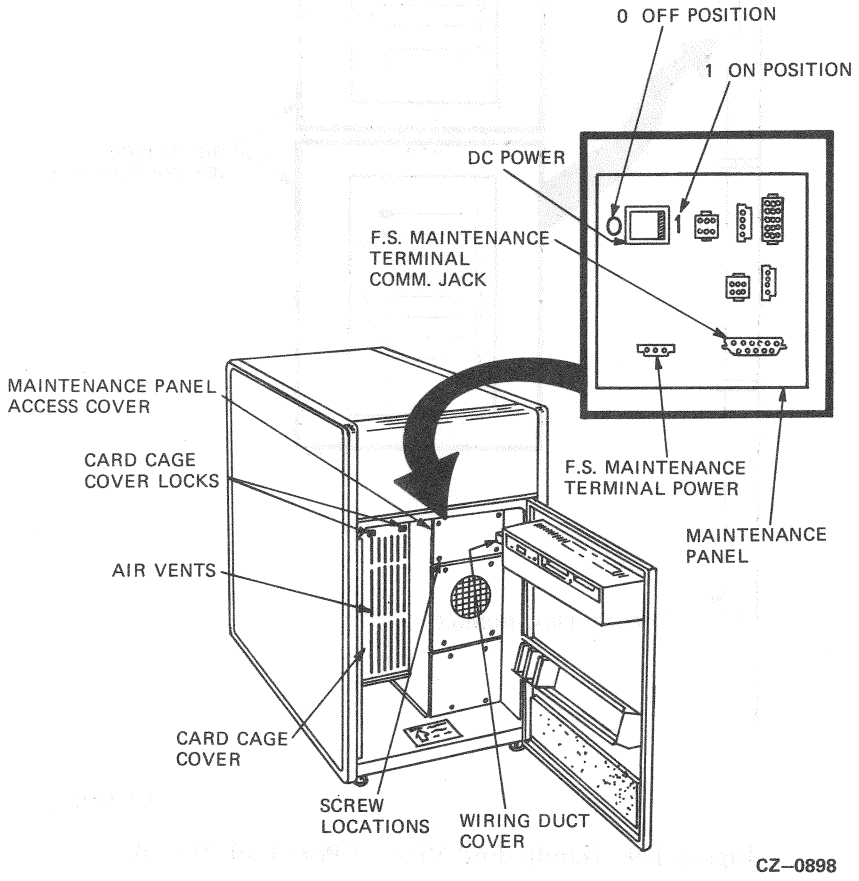

Figure 1-8 HSC50 Front Inside View

6. Locate the two node address switches on the handle edge of the module. Use a pen or pencil to set the same unique binary address for the HSC50 on each DIP switch. This address allows communication across the CI bus. An example for the binary number three is shown in Figure 1-9.

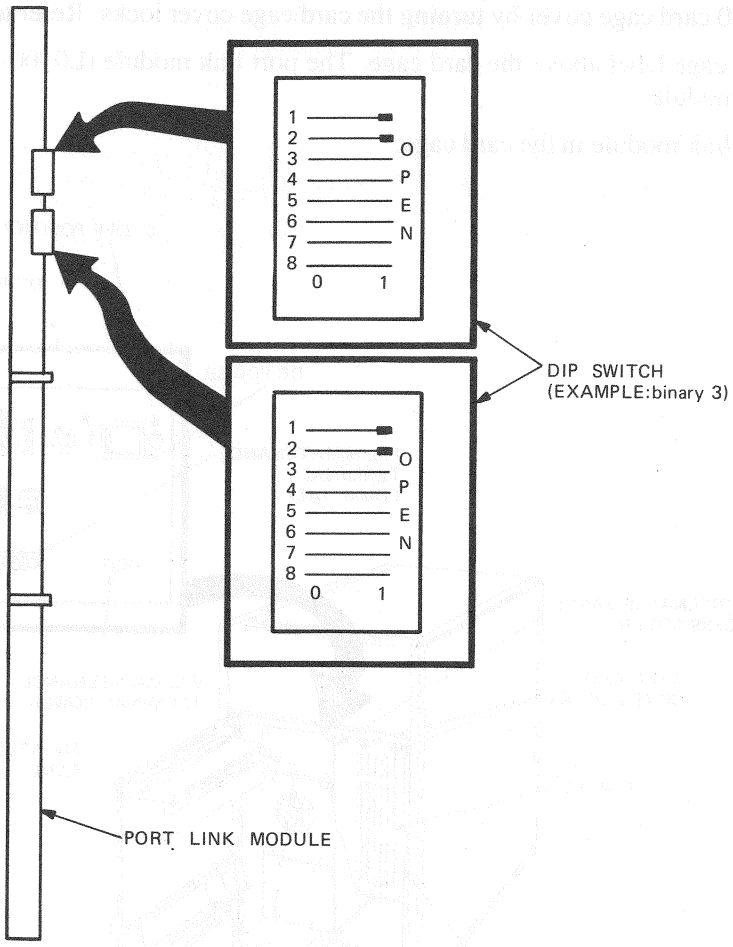

Figure 1-9 Handle End View of Port Link Module

1.5.2 I/O Control Processor Module Baud Rate Selection

Use the following procedures to inspect or select the baud rate for the terminals used to input diagnostic commands or to change operating parameters. The auxiliary terminal is any EIA-compatible terminal set at 9600 baud. The F.S. maintenance terminal is normally found in the controlled distribution (CD) kit and operates at 300 baud.

NOTE
Only one of these terminals can be plugged into the HSC50 at any one time.

Find out if an auxiliary terminal or F.S. maintenance terminal is going to be used with the HSC50.

If an auxiliary terminal is assigned to the HSC50, use the following procedure:

1. Remove the I/O control processor module (L0105-0) from the module rack by pulling the top and bottom module fasteners towards you.

2. Locate the W3 jumper location. W3 is a small, zero ohm resistor with a single black band. Refer to Figure 1-10 for a view of the I/O Control Processor Revision D Module.

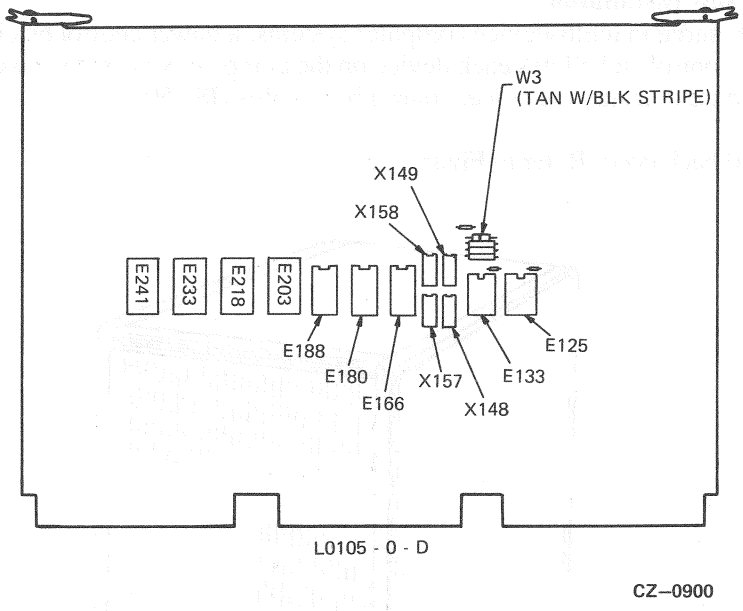

Figure 1-10 I/O Control Processor Module W3 Jumper Location

3. Verify that the W3 jumper is in place. This jumper sets the 9600 baud rate.
4. Replace the I/O control processor module in the module rack and secure the module fasteners.
5. Close the HSC50 front door.

If the F.S. maintenance terminal is going to be used on the HSC50, use the following procedure:

1. Remove the I/O control processor module (L0105-0) from the module rack by pulling the top and bottom module fasteners towards you.
2. Locate the W3 jumper location. W3 is a small, zero ohm resistor with a single black band. Refer to Figure 1-10.
3. Remove the W3 jumper to set the 300 baud rate. Leave the posts intact on the module for possible resoldering of the W3 jumper at a later date. If a slide-on W3 jumper is present, remove it and store it in the tape cartridge storage tray inside the HSC50 front door.

NOTE

The 300 baud rate will be in effect until the W3 jumper is replaced. You must replace the W3 jumper to operate a terminal at 9600 baud.

4. Replace the I/O control processor module in the module rack and secure the module fasteners.
5. Close the HSC50 front door.

CAUTION

Ensure that a baffle card is in each unused module slot and that the module cage cover is replaced to avoid internal overheating.

1.6 HSC50 CABLING INSTALLATION

Use the following procedures to cable up the HSC50.

1.6.1 Power Control Bus Installation

To avoid an initial power surge in multi-device computer systems, a power control bus is used. This bus permits a single point of control and allows each device on the computer system to power up sequentially. Use the following procedure to install the power control bus on this HSC50.

1. Open the HSC50 back door. Refer to Figure 1-11.

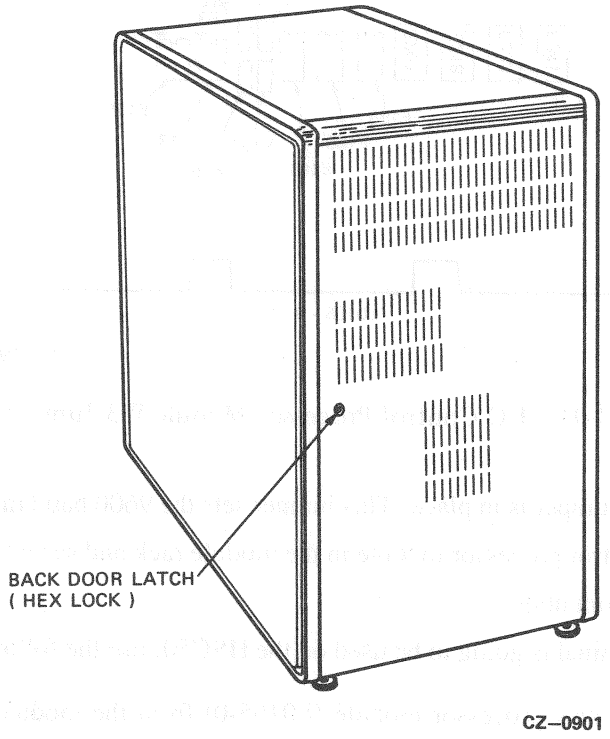

Figure 1-11 Opening the HSC50 Back Door

2. Find the power bus connectors located under the lower rear shield. Refer to Figure 1-12.
3. Connect the power control bus cable from the previous computer system device's delayed output to the connector labeled **DEC Power Control Bus** on the HSC50.
4. If another device is in the computer system, connect its power control bus cable to the connector labeled **Delayed Output** on the HSC50.

NOTE

The REMOTE/OFF/LOCAL ON switch on the HSC50 power controller has three positions. Refer to Figure 1-12. If a power control bus is being used, this switch is left in the REMOTE position. If a power control bus is not being used, this switch is left in the LOCAL ON position. The OFF position shuts off power to the switched outlets on the power controller.

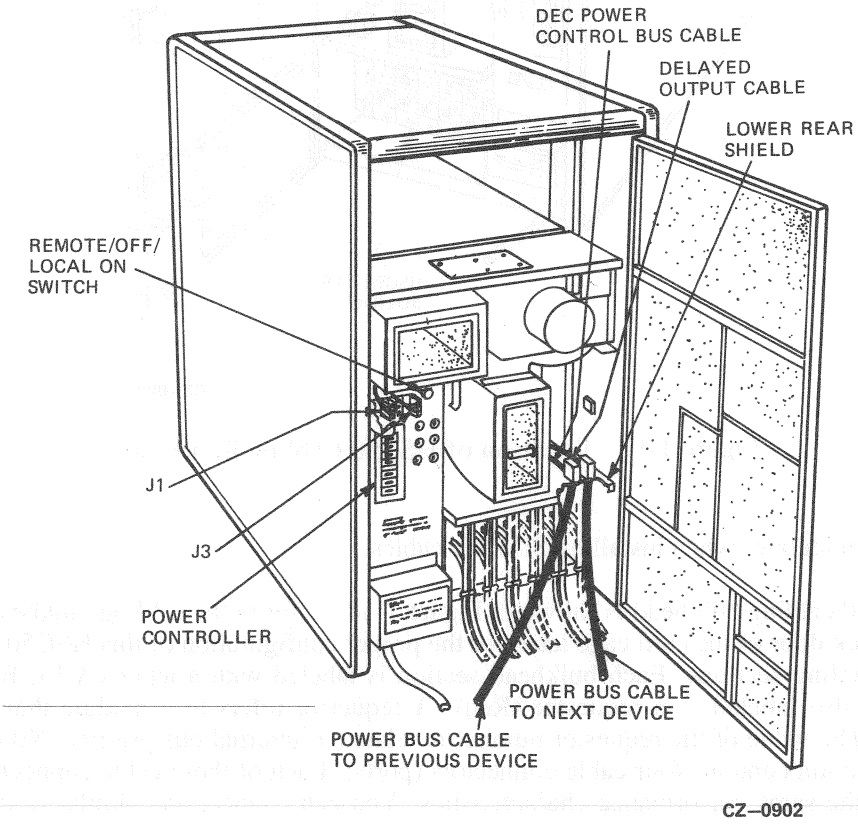

Figure 1-12 HSC50 Back Inside View

1.6.2 SDI/STI Cable Installation

Refer to Figure 1-13 for the location of the HSC50 cabling bulkhead.

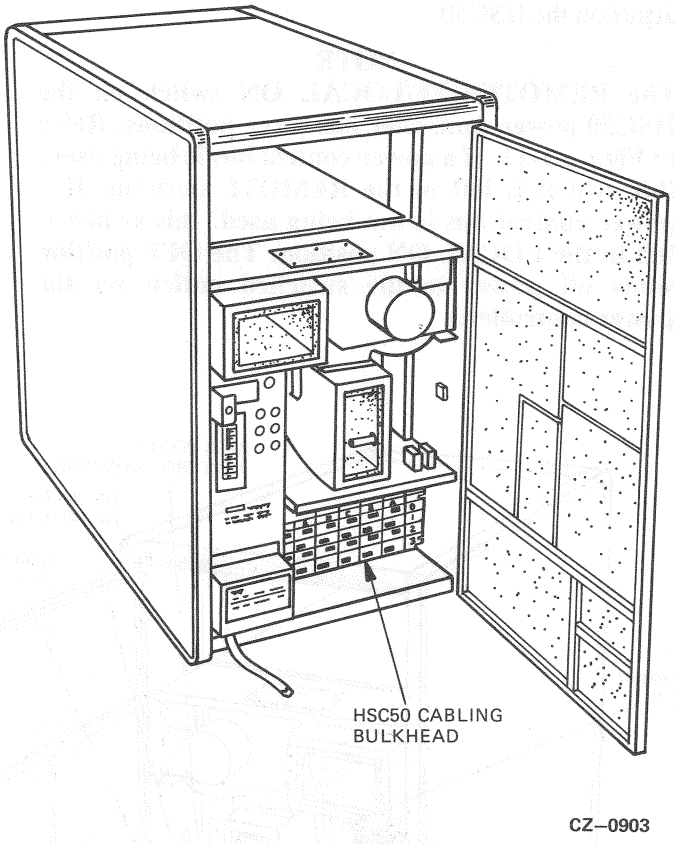

Figure 1-13 Location of HSC50 Cabling Bulkhead

Use the following guidelines when installing SDI/STI cables.

- The HSC50 cabling bulkhead is shown in Figure 1-14. Refer to the cabling bulkhead label inside the HSC50 back door or the card cage label for the proper configuration of this HSC50. There are 6 data channel cabling sections. Each bulkhead section is labeled with a letter (A-F). Each data channel section is also labeled as a requestor (Req). A requestor refers to a module that accesses HSC50 memory. The value of the requestor number is related to internal bus priority. Notice that each data channel section contains four cable connectors (ports). Each of these cable connectors (labeled 0, 1, 2, 3) has the same performance characteristics. You can connect any similar device to any one of these cable connectors.
- Ensure that you are connecting disk drives to disk data channel modules and tape formatters to tape data channel modules.
- If this HSC50 doesn't have a configured cabling bulkhead label use the following guidelines.
  - Install devices with higher transfer rates (drives for the disk-data channel, L0108-YA) in higher numbered requestors. Install devices with lower transfer rates (tapes for the tape-data channel, L0108-YB) in lower numbered requestors. An example follows.

Wrong info. STI on Req. 7 higher Xfer rate to tapes

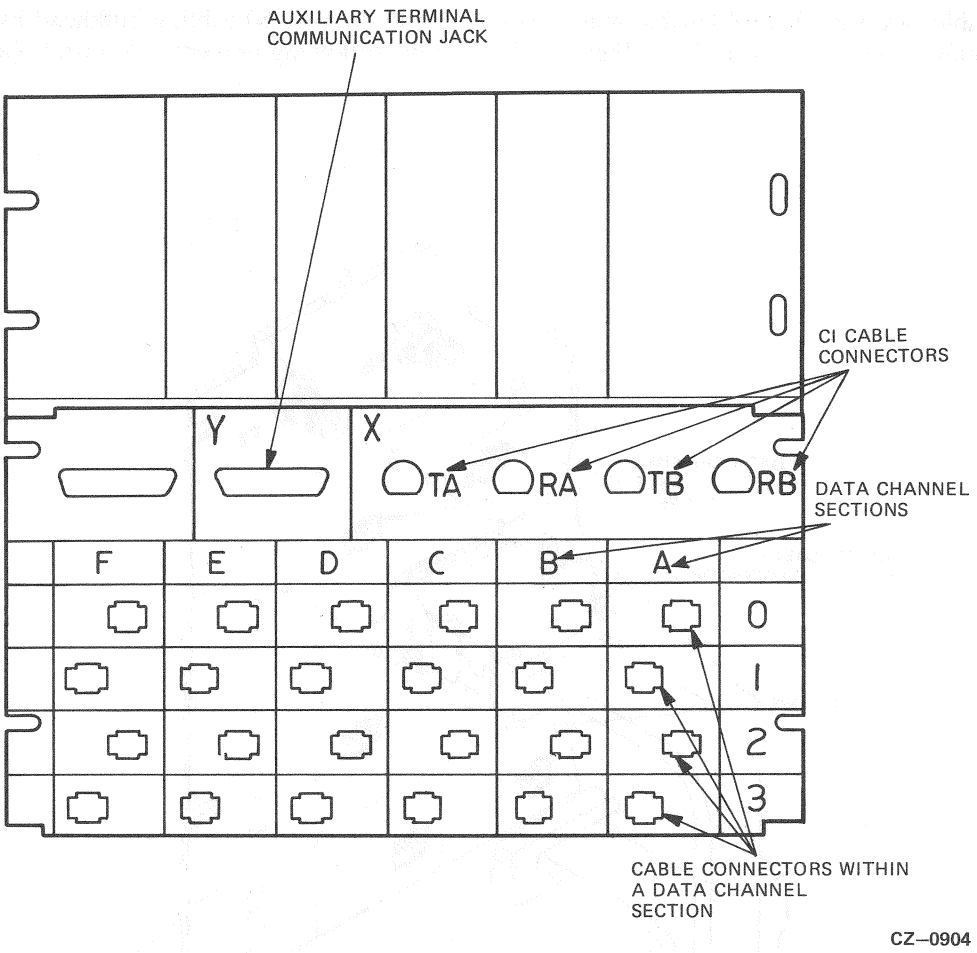

Figure 1-14 HSC50 Cabling Bulkhead

If you have three disk drives and three tape formatters, attach the three disk drives to requestor 7 (0, 1, 2) and the three tape formatters to requestor 2 (0, 1, 2).

- Distribute a series of disk drive or tape formatters as evenly as possible over several requestor numbers. An example follows.

  If you have two disk-data channels and six disk drives, attach three disk drives to each module.

This same guideline applies to the use of multiple tape formatters. However, keep in mind that each tape formatter can control up to four tape transports from an individual requestor cable connector.

NOTE

A data channel can only transfer data from one of its connected devices at a time. Thus, having two data channels for four disk drives (or tape formatters) should result in better performance than having only one data channel for all four devices.

The SDI/STI cables are shielded cables that must be grounded to the HSC50 cabling bulkhead by mounting the shield terminators with screws. Refer to Figure 1-15. Use the following procedure to install these cables.

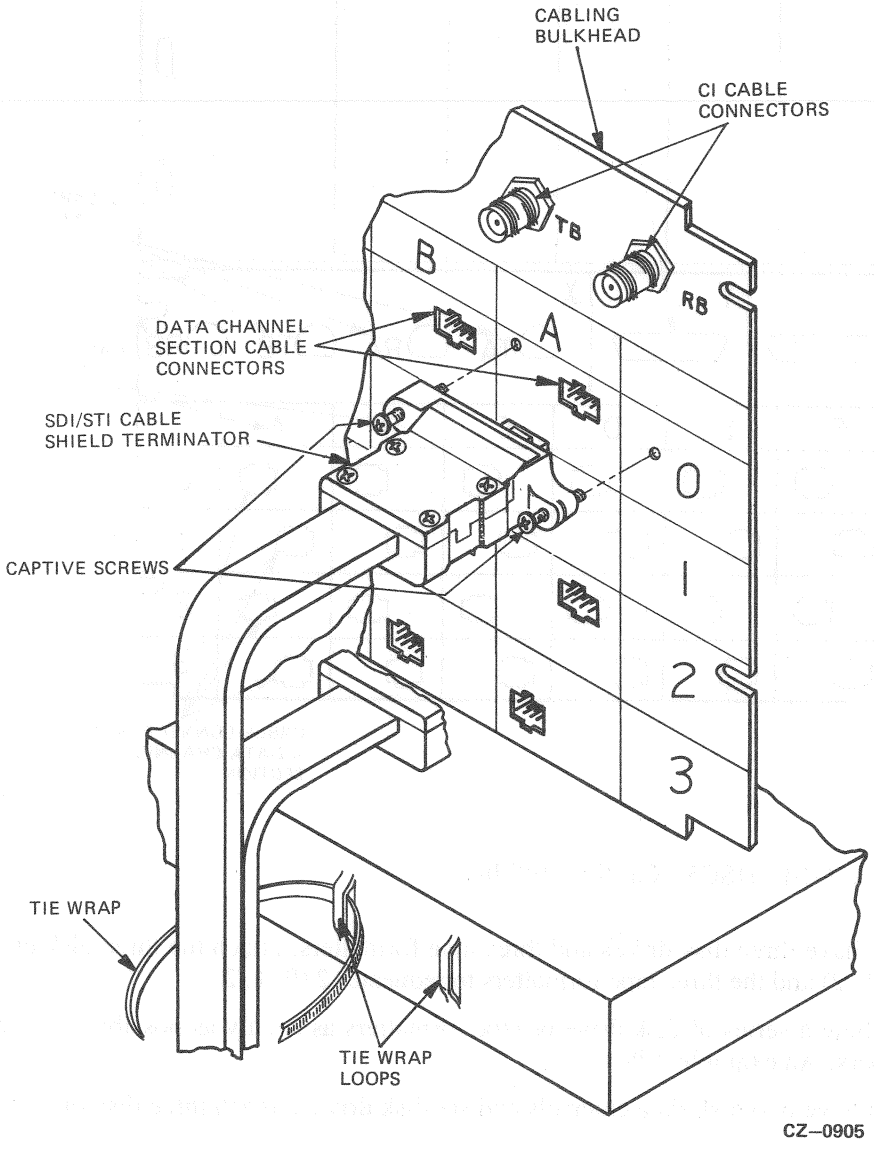

Figure 1-15 SDI/STI Cable Shield Terminator Installation

1. Start at the bottom left side of the HSC50 cabling bulkhead.
2. Install each SDI/STI cable shield terminator working from the left to the right side of the cabling bulkhead.
3. Within a data channel section, tie down odd port numbered SDI/STI cables. Next, tie down even port numbered SDI/STI cables.
4. Install the device end of the SDI/STI cables into each device's bulkhead as described in the appropriate disk drive or tape formatter user guide.

1.6.3 CI Cable Installation

The computer interconnect (CI) cables connect the HSC50 to the Star Coupler. The Star Coupler is a passive, RF-transformer coupling network.

Use the following procedure to install these cables.

1. The four CI cable connectors are in the letter X area of the cabling bulkhead. Refer to Figure 1-14. Both CI paths must be used to connect the HSC50. The A path contains Transmit A (TA) and Receive A (RA). The B path contains Transmit B (TB) and Receive B (RB).
2. Screw each CI connector into the appropriate CI cable connector.
3. Install the Star Coupler end of the CI cables into the Star Coupler bulkhead as described in the installation chapter of the *Star Coupler User Guide* (EK-SC008-UG).

CHAPTER 2
FIELD ACCEPTANCE AND CHECKOUT PROCEDURE

2.1 FIELD ACCEPTANCE AND CHECKOUT PROCEDURE

This chapter describes the field acceptance and checkout procedure for the HSC50.

NOTE

During the field acceptance and checkout procedure, error message(s) may appear. Refer to Chapter 6 in the *HSC50 Service Manual* for fault isolation procedures.

Use the following procedure to power up the HSC50 for the first time.

1. Open the HSC50 back door.
2. Verify that the ac circuit breaker (CB1) on the HSC50 power controller is in the 0 (OFF) position. Also verify that the REMOTE/OFF/LOCAL ON switch is in the OFF position.
3. Plug the ac power cord from the HSC50 power controller into an ac receptacle.
4. If an auxiliary terminal is being used for this installation, use the following procedure.
   a. Refer to the letter Y area in Figure 1-14 for the location of the auxiliary terminal communication jack on the HSC50 cabling bulkhead.
   b. Plug the auxiliary terminal communication cable into the auxiliary terminal communication jack.
   c. Plug the auxiliary terminal power cable into an available power outlet.
   d. Turn the auxiliary terminal on.
   e. Refer to Figure 1-8 for the location of the F.S. maintenance area.
   f. Loosen the four captive screws securing the maintenance panel access cover.
   g. Ensure that the dc Power switch is in the 1 (ON) position. (This dc Power switch may also be used to cut off power to all internal HSC50 assemblies for add-on option installations, etc.)

   If the F. S. maintenance terminal is being used for this installation, use the following procedure.
   a. Open the HSC50 front door.
   b. Refer to Figure 1-8 for the location of the F.S. maintenance area.
   c. Loosen the four captive screws securing the maintenance panel access cover.
   d. Plug the F.S. maintenance terminal power cable into the F.S. maintenance terminal power jack.

e. Plug the F.S. maintenance terminal communication cable into the F.S. maintenance terminal communication jack.

f. Ensure that the dc Power switch is in the 1 (ON) position. (This dc Power switch may also be used to cut off power to all internal HSC50 assemblies for add-on option installations, etc.)

NOTE

The terminal may generate a break character when it is connected/disconnected or powered on/off while the HSC50 is powered on. The I/O control processor may halt as a result.

To prevent the I/O control processor from halting, use the following procedure: Ensure the Secure/ Enable switch is in the SECURE position. Type three spaces.

If the I/O control processor halts, the State indicator will stop pulsing. Use the following procedure after the I/O control processor has halted: Push the Secure/Enable switch to the ENABLE position. Push and release the Init switch to reboot the HSC50. Return the Secure/Enable switch to the SECURE position, if appropriate.

5. Turn the REMOTE/OFF/LOCAL ON switch to LOCAL ON. Refer to Figure 1-12.

NOTE

The CI must be connected to the Star Coupler to boot the HSC50.

6. Turn power controller CB1 to 1 (ON). Figure 2-1 gives a detailed view of the power controller. The three amber indicators should light. If one or more indicators do not light, turn CB1 to 0 (OFF). Check fuses F1, F2, and/or F3. If all three indicators do not light, check the local power source.
7. If this HSC50 power controller is 60 Hz, turn CB2-5 to 1 (ON).
8. Ensure that the main blower and the power supply fans are working by checking the air flow from the ducts shown in Figure 2-1.

NOTE

The HSC50 boot procedure starts each time power is turned on. The HSC50 Fault indicator will light because a TU58 tape cartridge is not inserted.

9. Ensure that the Power indicator on the operator control panel is lit.
10. Ensure that the Online switch is out (in the OFFLINE position).
11. Open the HSC50 front door.
12. Push the Secure/Enable switch into the ENABLE position. Refer to Figure 2-2.
13. Locate the HSC50 OFF-LINE DIAGS tape cartridge in the tape cartridge storage tray inside the HSC50 front door. Refer to Figure 2-2.

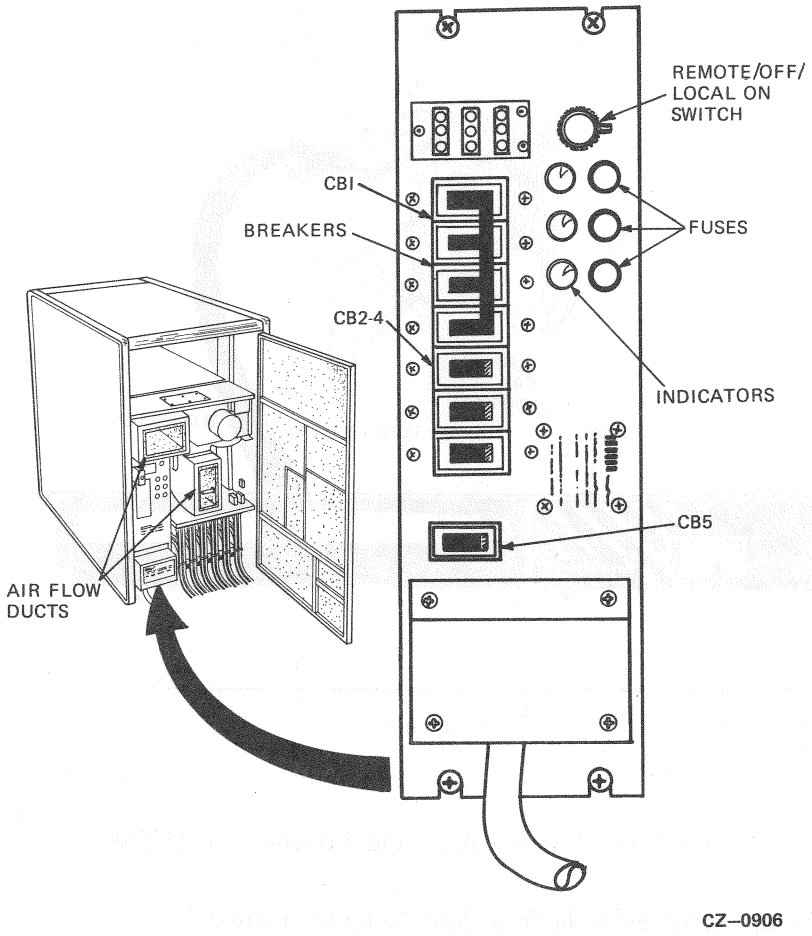

Figure 2-1 HSC50 60 Hz Power Controller

NOTE

Verify that there are two copies of the HSC50 OFF-LINE DIAGS tape cartridge and two copies of the HSC50 SYSTEM TAPE cartridge. If copies of either are missing, refer to the TU58 Duplication Utility in Chapter 3 of the *HSC50 User Guide*. Use these HSC50 SYSTEM TAPE cartridges only on this HSC50.

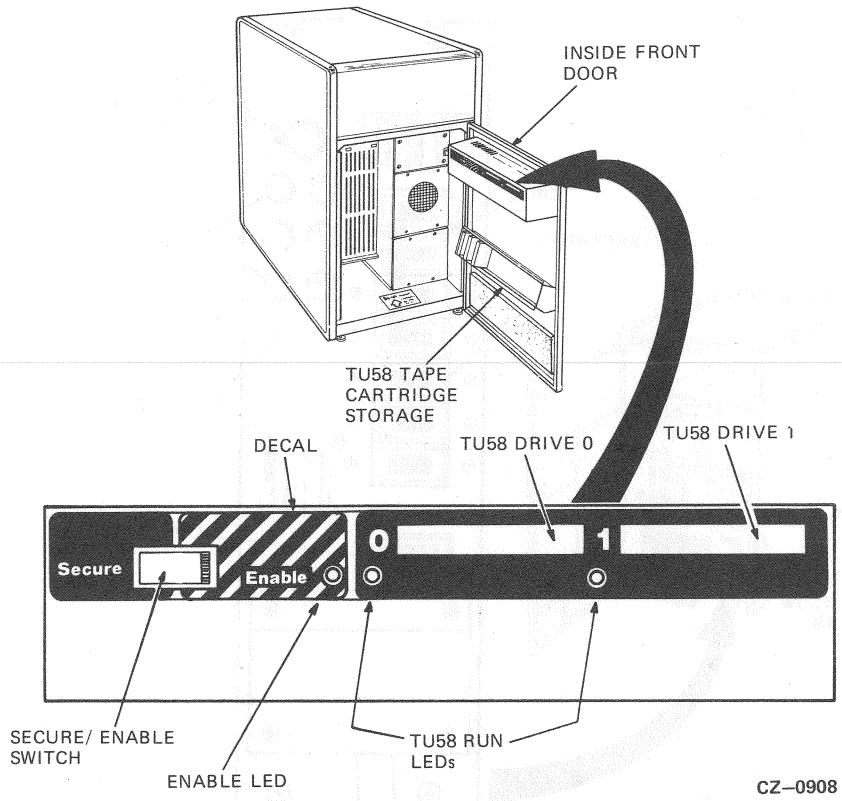

Figure 2-2 Cartridge Storage Area and Location of TU58s

14. Locate the TU58 tape drive inside the front door. Refer to Figure 2-2.
15. Insert the HSC50 OFF-LINE DIAGS tape cartridge into Drive 0 of the TU58. Refer to Figure 2-2.
16. Push and release the Init switch to cancel the FAULT indicator and start the HSC50 boot procedure.
17. The following phases occur during the initial HSC50 OFF-LINE DIAGS boot procedure.

    The State indicator is OFF and the Init indicator is ON. The HSC50 runs the I/O control processor (P.ioc) ROM bootstrap diagnostic. (A diagnostic is sometimes referred to as a "test" in other documentation.)

    After successful completion of this diagnostic, the State indicator will light and the Init indicator will go off. Notice the TU58's Drive 0 run indicator lights. The off-line I/O control processor (P.ioc) diagnostic then begins testing the I/O control processor module.

CAUTION
Data loss can occur if the cassette is removed while the TU58 run indicator is on.

After successful completion of the I/O control processor (P.ioc) diagnostic, the HSC50 off-line diagnostic loader is read into memory. The TU58's Drive 0 run indicator comes on indicating that the HSC50 off-line diagnostic loader is being loaded into memory. When the loader starts executing, the State indicator starts to pulse and the front panel indicators pulse on and off in a rotating pattern to test the functionality of each indicator.

18. Repeat steps 15 through 17 to checkout Drive 1 of the TU58. Be sure to place tape cartridge in Drive 1.

19. Instructions for replacing burnt-out front panel indicators may be found in Chapter 3 in the *HSC50 Service Manual*.

20. Run the following HSC50 routines using these procedures.

NOTE

For any of the following prompts, use the DELETE key to delete mis-typed parameters before the terminating RETURN is typed. If you note an error in a parameter that has already been terminated with a RETURN, type a CTRL C to return to the initial prompt and re-enter all parameters. Type CTRL C a second time to end the routine. (Consult your terminal user guide if your keyboard differs.)

Brackets [] indicate a default for the desired response.

The following printout and prompt examples are subject to change due to future diagnostic revisions. Always follow the actual program directions that are displayed on your terminal.

Refer to Chapter 4 of the *HSC50 Service Manual* for explanations of error printouts.

21. Notice that you have the following display on the auxiliary or F.S. maintenance terminal.

```
HSC50 OFL Diagnostic Loader, Version Vnn-nn
Radix=Octal,Data Length=Word,Reloc=00000000
ODL>
```

The loader prompt is **ODL>**. Enter the name of the specific routine to be executed after this prompt. You will type **RETURN** after each command.

NOTE

If you need assistance running the HSC50 off-line diagnostics, type *HELP*. This file will display a list of all the *ODL>* commands with a short explanation of the function of each.

22. Refer to Appendix A for the Field Acceptance HSC50 OFF-LINE DIAGS Tests.

23. Take out the HSC50 OFF-LINE DIAGS tape cartridge after the off-line bus interaction diagnostic has finished.

NOTE

Do not store this tape cartridge in either drive of the TU58. Reinsert the tape cartridge in its container and return to the TU58 tape storage rack.

24. Ensure that the write protect tab on the HSC50 SYSTEM TAPE cartridge is in the RECORD position. Move the tab towards the edge of the tape cartridge to set the RECORD position.

25. Put the HSC50 SYSTEM TAPE cartridge into Drive 0 of the TU58.

NOTE

If there is only one copy of the HSC50 SYSTEM TAPE cartridge, refer to the NOTE following step 13 above.

NOTE

Only do the following step the first time a new HSC50 SYSTEM TAPE cartridge is booted.

26. Push and release the Init switch while holding in the Fault switch. Continue holding in the Fault switch until the **INIPIO-I Booting...** message appears on your terminal screen. This action causes the software to autoconfigure itself for initializing certain information located on the HSC50 SYSTEM TAPE.

27. The following phases occur during the HSC50 SYSTEM TAPE boot procedure.

    The State indicator is OFF and the Init indicator is ON. The HSC50 runs the I/O control processor (P.ioc) ROM bootstrap diagnostic. (A diagnostic is sometimes referred to as a "test" in other documentation.)

    After successful completion of this diagnostic, the State indicator will light and the Init indicator will go off. Notice that the TU58's drive run indicator lights to indicate that the TU58 is moving. The Init I/O control processor (P.ioc) diagnostic begins testing the I/O control processor module by displaying the following message:

    INIPIO-I Booting....

CAUTION

Data loss can occur if the tape cartridge is removed while the TU58 run indicator is on.

    After successful completion of the Init I/O control processor (P.ioc) diagnostic, the HSC50 operational software is loaded. The TU58's drive run indicator comes on, indicating that the HSC50 operational program is being loaded into memory. When the program starts executing, the State indicator starts pulsing.

    The following message will appear after about 4 minutes.

    HSC50 Version Xnnn (Date Time)

28. Refer to Appendix B for the Field Acceptance HSC50 SYSTEM TAPE Tests.

29. Consult with the system manager to identify the HSC50 system identification number. If this number is going to be different from the default HSC50 identification number, use the SET ID command. Refer to the SETSHO utility found in Chapter 3 of the *HSC50 User Guide* for a description of this command.

30. Repeat steps 25 to 27 to autoconfigure the second HSC50 SYSTEM TAPE.

2.2 FINAL HSC50 INSTALLATION PREPARATION

Use the following procedure to conclude the installation.

1. Ensure that all tools and unnecessary items are taken out of the HSC50.
2. If you are disconnecting an auxiliary terminal, use the following procedure.
   a. Turn the REMOTE/OFF/LOCAL ON switch to OFF. Refer to Figure 1-12.
   b. Unplug the auxiliary terminal communication cable from its jack.
   c. Turn the REMOTE/OFF/LOCAL ON switch to either REMOTE or LOCAL ON.
3. If you are using the F.S. maintenance terminal, use the following procedure to disconnect the terminal.
   a. Turn the dc Power switch to 0 (OFF). Refer to Figure 1-8.
   b. Unplug the F.S. maintenance terminal power cable from the F.S. maintenance terminal power jack.
   c. Unplug the F.S. maintenance terminal communication cable from the F.S. maintenance terminal communication jack.
   d. Turn the dc Power switch to 1 (ON).
   e. Secure the maintenance panel access cover by tightening the four captive screws.
4. Push the Online switch to put the HSC50 online.

CAUTION

Discuss the function of the Secure/Enable switch with the customer. The Secure/Enable switch is left in the SECURE position for system integrity purposes. This position inactivates the operator control panel except for the Fault switch. The SECURE position also inactivates any SET command from the auxiliary or F.S. maintenance terminal. However, the operator control panel indicators display the state of the HSC50 and the SHOW commands are still operable. The ENABLE position activates the operator control panel and SET commands from the auxiliary or F.S. maintenance terminal.

The terminal may send a break character if the customer connects/disconnects it or powers it on/off while the HSC50 is powered on. This may cause the HSC50 to halt. If the HSC50 does halt, reboot it.

The customer should use the following procedure to ensure that the HSC50 does not halt: Ensure that the Secure/Enable switch is in the SECURE position. Type three space bars. Change the state of the auxiliary terminal.

If you or the customer want to connect/disconnect or power on/off the auxiliary terminal while the HSC50 power is off, use the following procedure: Change the state of the auxiliary terminal and power up the HSC50.

5. Close the HSC50 front and back doors.
6. Give the two front door keys to the customer.
7. Turn the REMOTE/OFF/LOCAL ON switch to the appropriate position. If a power control bus is being used, turn this switch to REMOTE. Otherwise, turn this switch to LOCAL ON.

CHAPTER 3
ADD-ON INSTALLATION

3.1 ADD-ON INSTALLATION

This chapter describes the procedures for the installation of an add-on HSC50.

Use the following procedure for add-on installations.

1. Use one of the following two methods to remove dc power to the HSC50. Turn the REMOTE/OFF/LOCAL ON switch to OFF. Refer to Figure 3-1. Or, push the dc Power switch on the maintenance panel to the 0 (OFF) position. Refer to Figure 3-2.

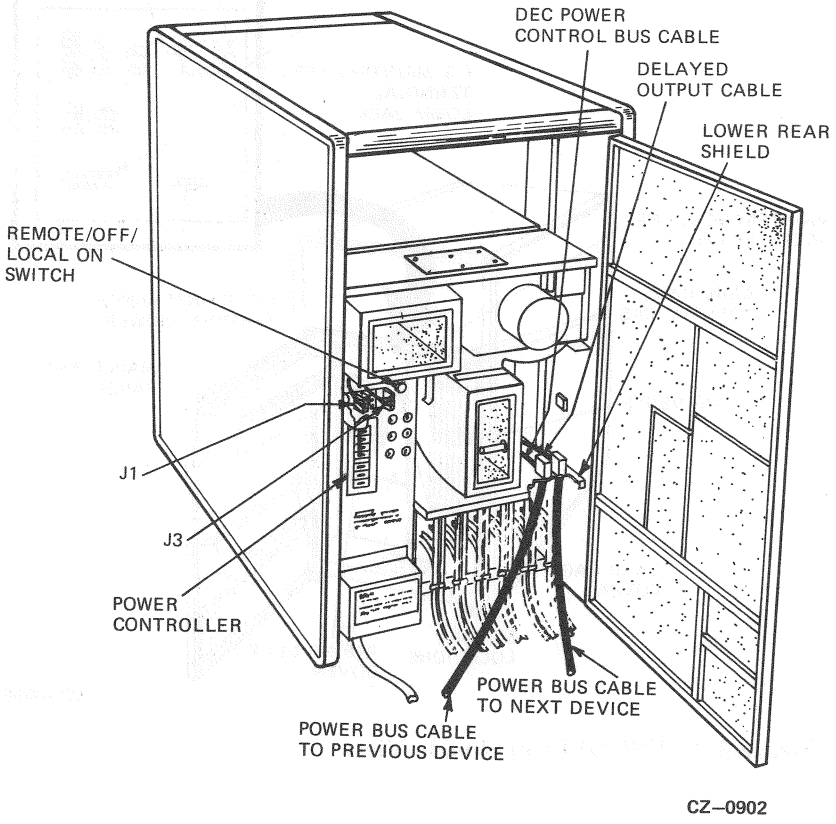

Figure 3-1 HSC50 Back Inside View

2. Open the HSC50 card cage cover by releasing the card cage cover locks. Refer to Figure 3-2.
3. Redistribute data channel modules and their respective external cables according to the guidelines in the SDI/STI cable installation (Chapter 1, Section 1.6.2).
4. Replace the appropriate module(s) in the module rack.

   If there are now eight or more modules in this HSC50, a second (auxiliary) power supply must be installed. Refer to the auxiliary power supply installation procedure in Section 3.2.

CAUTION

Ensure that a baffle card is in each unused module slot and that the module cage cover is replaced to avoid internal overheating.

5. Replace the card cage cover and close the card cage cover locks.
6. Close the HSC50 front door.
7. Repeat the necessary steps in the field acceptance and checkout procedure in Chapter 2.

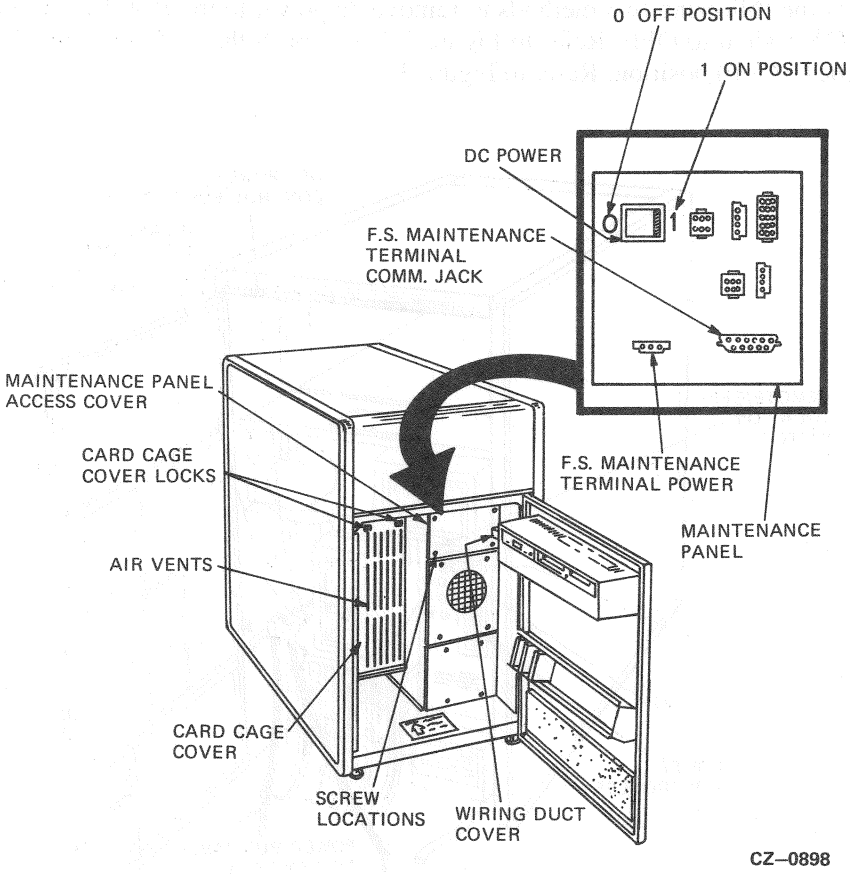

Figure 3-2 HSC50 Front Inside View

3.2 AUXILIARY POWER SUPPLY INSTALLATION

Ensure that auxiliary power supply HSC5X-EA is only used on HSC50-AA (60 Hz) and that auxiliary power supply HSC5X-EB is only used on HSC50-AB (50 Hz). Use the following procedure to install the auxiliary power supply.

1. Open the HSC50 back door.
2. Turn power controller CB1 to 0 (OFF).
3. Unplug the ac line cord from the power source.
4. Remove the DEC power control bus cable (J1) and delayed output cable (J3) from the power controller. Refer to Figure 3-1.
5. Remove the back door lock assembly.
6. Remove the top two screws securing the power controller to the cabinet. Refer to Figure 3-3.
7. Remove the bottom two screws. As you remove the bottom two screws, lift up on the power controller to take the weight off of the screws. Refer to Figure 3-3.
8. Pull the power controller out far enough to remove the power supply, cooling blower line cords, and air flow sensor cable (J8) from the back of the power controller. Refer to Figure 3-3.

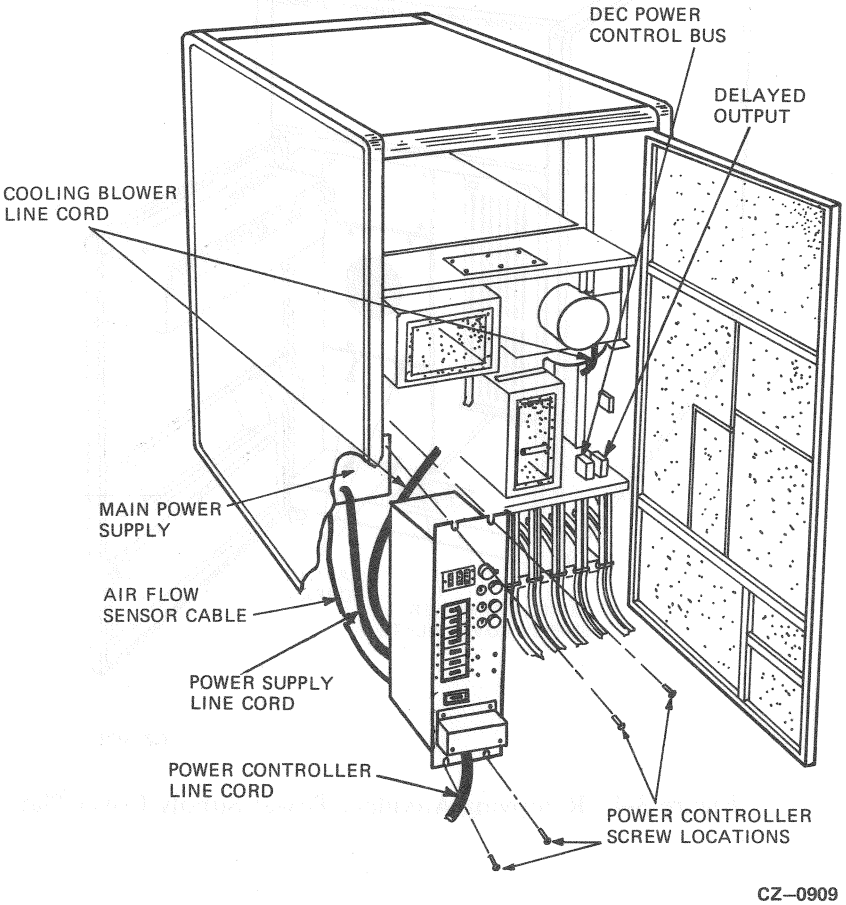

Figure 3-3 Power Controller Removal

9. Pull the power controller out entirely and set it on the floor.
10. Open the HSC50 front door.
11. Remove the maintenance panel access cover. Refer to Figure 3-2.
12. Remove the wiring duct cover. Refer to Figure 3-2.
13. Remove the OCP plug (P40) and TU58 plugs (P41, P42) from the maintenance panel.

WARNING
When performing the following step, take care not to damage the front door spring fingers.

14. Remove the HSC50 front door by pulling down on the spring-loaded rod on the top hinge inside the door and then lifting the door off its bottom pin.
15. Remove the auxiliary power supply cover plate by loosening the four captive screws. Refer to Figure 3-4. This cover plate may be discarded.

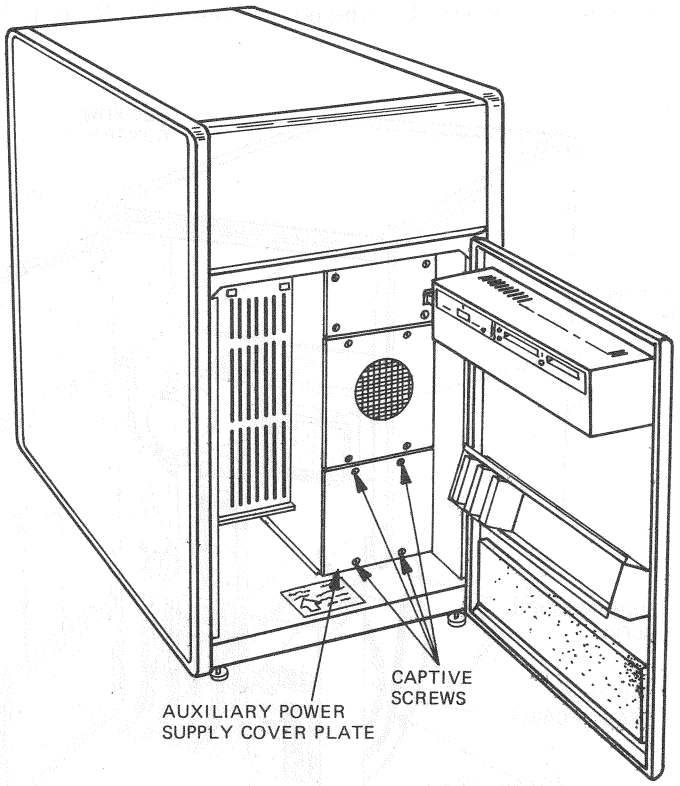

Figure 3-4 Removing Auxiliary Power Supply Cover Plate

16. Remove the two screws that secure the L-shaped baffle plate in the auxiliary power supply cavity. This baffle plate may be discarded.

17. Insert the auxiliary power supply by guiding the lower left and right edges of the power supply into the guidance tracks on the chassis floor. Refer to Figure 3-5. Take care not to pinch the line cord between the chassis and auxiliary power supply.

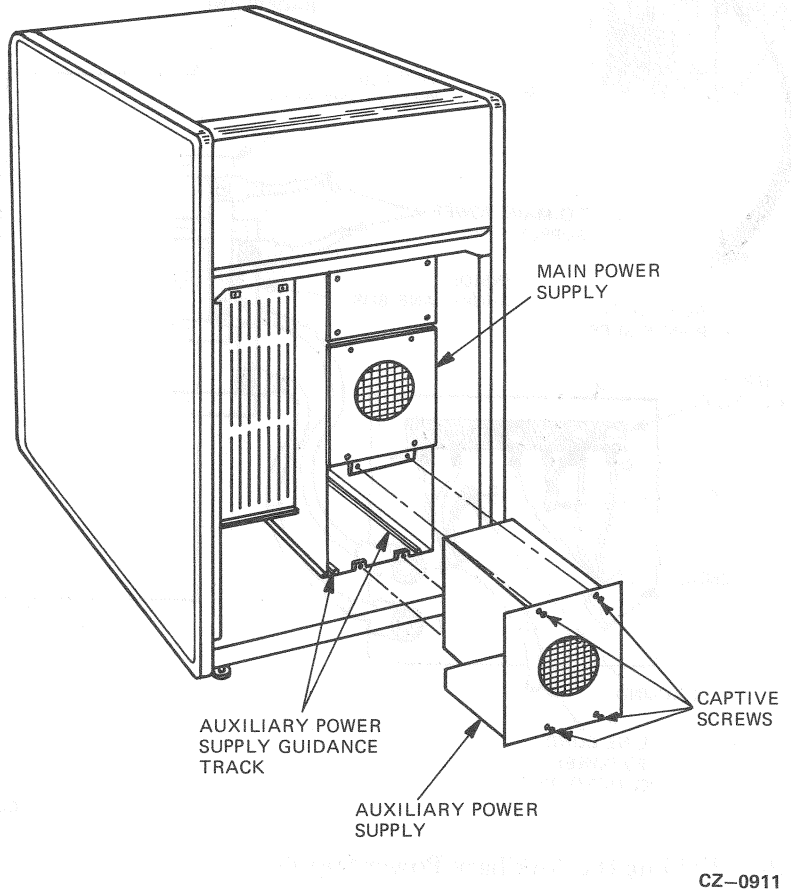

Figure 3-5 Inserting the Auxiliary Power Supply

18. Tighten the four captive screws on the front of the auxiliary power supply. Refer to Figure 3-5.

19. Replace P40, P41, and P42 on the maintenance panel.

20. Replace the wiring duct cover.

21. Ensure that the dc Power switch is in the 1 (ON) position.

22. Replace the maintenance panel access cover.

23. Replace the HSC50 front door.

24. Move to the back of the HSC50.

25. Locate the 2-gauge cable with black heat shrink on its ends. Install one end of the cable to the V1 (–) stud on the auxiliary power supply. Install the other end of the cable to the bottom of the inside backplane bus. Refer to Figure 3-6.

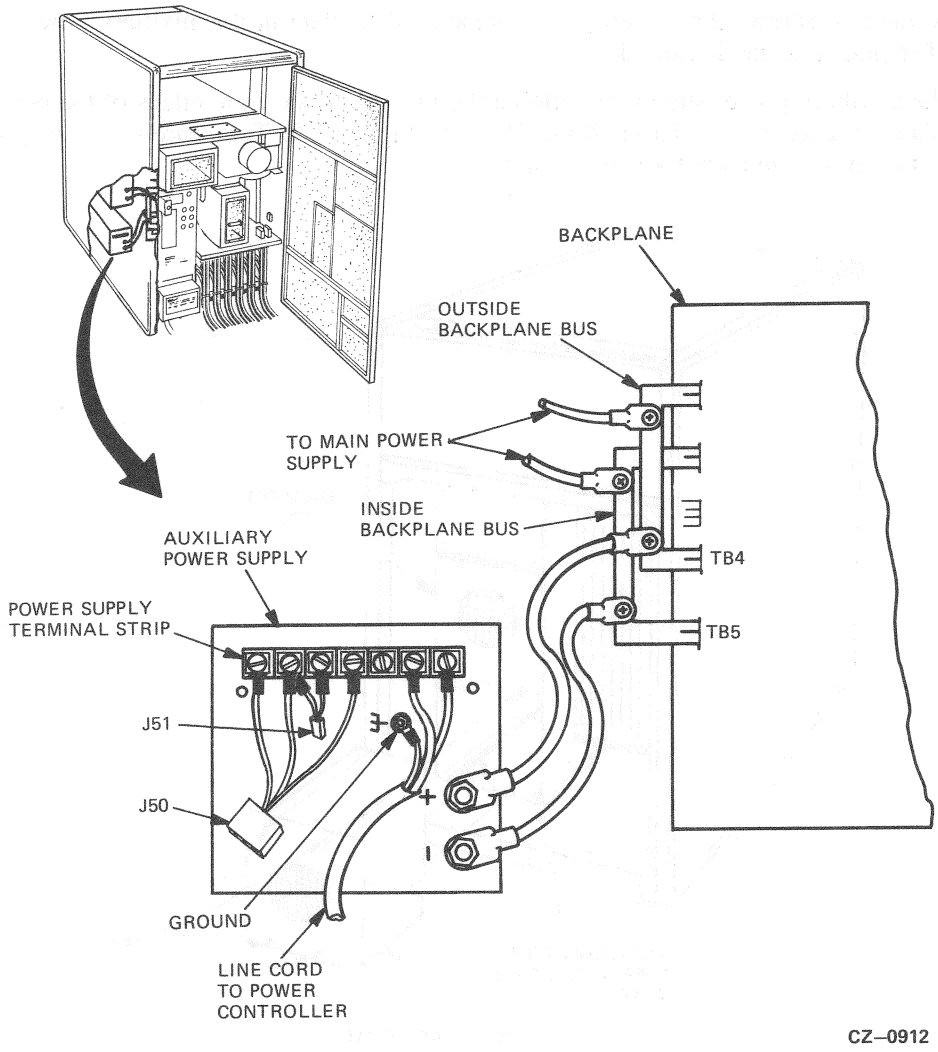

Figure 3-6 Cabling the Auxiliary Power Supply

26. Locate the 2-gauge cable with red heat shrink on its ends. Install one end of the cable to the V1 (+) stud on the auxiliary power supply. Install the other end of the cable to the bottom of the outside backplane bus. Refer to Figure 3-6.

27. Insert the J50 jack from the power supply terminal strip into the P50 plug tied to the chassis floor. Refer to Figure 3-6.

28. Insert the dc on/off jumper (J34) hanging from the main power supply into P34. Insert the dc on/off jumper (J51) hanging from the auxiliary power supply into J51.

29. Insert the main cooling blower line cord into one of the J11 switched outlets on the back of the power controller.

30. Insert the main power supply line cord into one of the J12 switched outlets. Insert the auxiliary power supply line cord into one of the J13 switched outlets. Insert the air flow sensor cable into the J8 outlet.

NOTE

Check all the other connectors inside the HSC50 to ensure that they are firmly seated.

31. Insert the power controller back into the HSC50 chassis. Take care not to pinch the line cords and air flow sensor cable between the chassis and the power controller.
32. Replace the four screws that secure the power controller in place.
33. Replace the back door lock assembly.
34. Replace the DEC power control bus cable into J1 on the power controller. Replace the delayed output cable into J3. Refer to Figure 3-1.
35. Ensure that the REMOTE/OFF/LOCAL ON switch is in the appropriate position. Refer to the note in Chapter 1, Section 1.6.1.
36. Plug the ac line cord into the appropriate outlet.
37. Turn CB1 on the power controller to 1 (ON).
38. Ensure that the **Power** indicator on the operator control panel is on. If this indicator is not on, refer to Chapter 6 in the *HSC50 Service Manual*.
39. Close the HSC50 back door.

APPENDIX A
FIELD ACCEPTANCE HSC50 OFF-LINE DIAGS TESTS

Use the following HSC50 OFF-LINE DIAGS tests for field acceptance. Type **Help** to view the abbreviations for each of the following test names.

1. Type

```
TEST OCP
```

in response to **ODL>**. This command loads and starts the Operator Control Panel (OCP) Test. The TU58 Drive 0 run indicator will light as the OCP test is loaded. After the diagnostic is loaded, you will receive the following display.

```
HSC50 OFL OCP TEST, Version Vnn-nn
```

The OCP test first checks the position of the **Secure/Enable** switch. If the switch is in the **SECURE** position, the following prompt is issued. Otherwise the test skips to the second prompt.

```
Put Secure/Enable switch into ENABLE position
```

NOTE
If the Secure/Enable switch is in the ENABLE position, and the above prompt is issued anyway, refer to Chapter 6 in the *HSC50 Service Manual*.

The program waits until the **Secure/Enable** switch is changed to the **ENABLE** position, then issues the following prompt:

```
(Enable LED should be lit, State LED should be blinking)
```

Check that the Enable LED is on and that the State LEDs are pulsing. There are two State LEDs. One is to the left of the **Init** switch on the HSC50 front panel. The other is located on the L0105 module (the top LED). Refer to the HSC50 card cage label for the location of this module in this HSC50. If either of the LEDs are not pulsing, refer to Chapter 6 in the *HSC50 Service Manual*. The test will now prompt for a lamp test.

```
Press Fault (all OCP lamps should light) (Y/N) [Y]?
```

Press the **Fault** switch and observe that all the OCP LEDs light. If none light, refer to the *HSC50 Service Manual* Fault Isolation Chapter 6. If one or more LEDs fail to light, replace the OCP before proceeding with the test. (Refer to the *HSC50 Service Manual,* Removal and Replacement Procedures Chapter 3.) If all the LEDs light properly, type a **RETURN** to continue the test.

Now the program checks that all OCP switches are OFF (OUT position). If any switches are set to the IN position, the following prompt will appear.

```
Put all lit switches in OFF (out) position (Y/N) [Y]?
```

If the **Fault** or **Init** lamps are lit (non-locking switches), there is a problem with the wiring in those switches or with their respective bits in the Switch/Display register. Otherwise, press all lit switches to release their mechanical locks, and type a **RETURN**. If the message repeats, and one or more lamps remain lit even though the switches are OFF (in the OUT position), refer to the *HSC50 Service Manual* Fault Isolation Chapter 6.

The program will now test each of the OCP switches, one at a time.

NOTE

The OCP Init and Fault controls are momentary contact switches. The Online and two unmarked controls are in/out two-position switches.

When a switch is lit, the operator will be prompted:

```
Press and release the lit switch
```

Press the switch that is lit. The program will allow about one second for the switch to be released after it is pressed and then will continue to the next prompt. If the program fails to respond when a switch is pressed, refer to the *HSC50 Service Manual* Fault Isolation Chapter 6. For those switches that lock in the ON position (**Online** and the two unmarked switches), the program will prompt:

```
Press and release the lit switch again
```

Press the switch again to return it to the OFF (OUT) position. If the **Online** switch or either of the unmarked switches fail to lock in the ON position, the switch is defective and should be replaced.

After the OCP switch tests are completed, several features of the Secure/Enable switch are tested. The program will begin these tests by prompting:

```
Put Secure/Enable switch into SECURE position
```

The program will wait until the Secure/Enable switch is in the proper position before continuing. If the program fails to respond when the switch is moved to the **SECURE** position, refer to the *HSC50 Service Manual* Fault Isolation Chapter 6. Once the program detects that the switch is in the **SECURE** position, it will prompt:

```
(Enable LED should turn off)
```

Check that the Enable LED is off. If this LED fails to go off when the switch is in the **SECURE** position, a short or wiring problem is likely.

The program will then prompt:

```
Press Init (HSC should not re-boot) (Y/N) [Y]?
```

Press the **Init** switch. When the Secure/Enable switch is in the **SECURE** position, pressing the **Init** switch should have no effect. (Do not press any other switch or an error message will result.) If the HSC50 starts to perform a bootstrap (the **Init** lamp turns on, a green LED on the I/O control processor turns off, the TU58 starts moving), the Secure/Enable switch is not disabling the action of the **Init** switch. Refer to the *HSC50 Service Manual* Fault Isolation Chapter 6. After pressing the **Init** switch, type a **RETURN** to continue. The test will respond with the following prompt:

```
Press terminal BREAK key (HSC should not halt) (Y/N) [Y]?
```

Press the BREAK key as directed. When in SECURE mode, the BREAK key should not cause the I/O control processor module's F-11 processor to halt (enter ODT). If the terminal displays the ''@'' character when BREAK is pressed, the Secure/Enable switch is not disabling the action of the BREAK key. Refer to the *HSC50 Service Manual* Fault Isolation Chapter 6. After pressing the BREAK key, type a **RETURN** to continue the test. The final prompt of the test is:

```
Put Secure/Enable switch into ENABLE position
```

The test will wait until the Secure/Enable switch is returned to the ENABLE position, then the test will terminate and return to the offline loader prompt **ODL>**.

2. Type

```
SIZE
```

to display the type of modules, Port Processor (K.ci), Disk Data Channel (K.sdi), and/or Tape Data Channel (K.sti), and the status of each. The **SIZE** command also displays the size of the HSC50 memories. An example of the SIZE printout follows.

```
HSC50 OFL System Sizer, Version Vnn-nn

Req.   Status Value   Meaning
----   ------------   -------
 001        001        K.ci
 002        377        Empty requestor
 003        377        Empty requestor
 004        377        Empty requestor
 005        377        Empty requestor
 006        003        K.sti
 007        002        K.sdi
```

```
RESPONDING          ADDRESS              DECIMAL
MEMORY               RANGE               WORDS      KWORDS
------              -----                -----      ------
Program      00000000-00777777           0131072    00128
Data         14000000-14377777           0065536    00064
Control      16000000-16377777           0065536    00064
```

The **Req.** column refers to requestor. The OFL System Sizer identifies the requestors installed in the HSC50.

The **Meaning** column prints the name of the requestor installed in the HSC50. The **Meaning** column may print a test failure message in place of the module name. Refer to the card cage label for the identity and location of the faulty module.

An example follows:

The OFL System Sizer prints a requestor 7 error message. The card cage label shows that requestor 7 is in slot 4. Replace the faulty module in slot 4.

Use the following procedure to replace the faulty module.

a. Turn the dc Power switch to 0 (OFF). Refer to Figure 1-8.

b. Open the HSC50 card cage cover by releasing the card cage cover locks. Refer to Figure 1-8.

c. Remove the faulty module and replace it with a new module.

d. Turn the dc Power switch to 1 (ON).

e. Replace the HSC50 card cage cover.

The **Status Value** column lists the codes that describe the module status within the HSC50.

The **Address Range** column contains octal addresses you will use during the following HSC50 off-line diagnostics.

Fill in the following chart if a hardcopy of your printout is not available.

```
 HSC50 OFL System Sizer, Version Vnn-nn

Req.        Status Value          Meaning
----        ------------          -------

001           ------              ----------------------

002           ------              ----------------------

003           ------              ----------------------

004           ------              ----------------------

005           ------              ----------------------

006           ------              ----------------------

007           ------              ----------------------
```

RESPONDING MEMORY	ADDRESS RANGE	DECIMAL WORDS	KWORDS
Program	----------	-------	------
Data	----------	-------	------
Control	----------	-------	------

You will also use requestors during the following HSC50 off-line diagnostics.

NOTE

Verify that the actual placement of these modules reflects your size printout. If the printout still doesn't correspond with the actual placement of the modules, check that each module is properly seated in its appropriate requestor slot. Turn the dc Power switch to 0 (OFF). Refer to Figure 1-8. Reseat the faulty module. Turn the dc Power switch to 1 (ON).

Now run the next five HSC50 off-line diagnostics.

3. Type

```
TEST K
```

in response to **ODL>**. This command loads and starts the off-line K test selector. The TU58 Drive 0 run indicator will light as the test is loaded.

After the diagnostic is loaded, you will receive the following display.

```
HSC50 OFL K Test Selector, Version Vnn-nn
```

The off-line K test selector first prompts:

```
Requestor # (1 thru 7) [ ]?
```

Answer this question with a requestor number using your HSC50 OFL System Sizer Chart. This chart specifies the available requestors to be used in this test. Terminate the response by typing **RETURN**. After the requestor number is supplied, a control memory area is assigned and tested. This area is required for communicating with the requestor that will test its microdiagnostics. The test then prompts:

```
Test # (1 thru 11) (0) [ ]?
```

If the port processor module is the selected requestor, run octal test numbers 1 thru 4, 6, 7, 10, and 11.

NOTE
Octal test 11 requires that one CI channel be looped back with an attenuator.

If a disk or tape data channel module is the selected requestor, run octal test numbers 1 thru 4, 6, 7, and 10.

The test then prompts:

```
# of passes to perform (D) [ ]?
```

Answer with a 1 and a **RETURN.**

The I/O control processor now instructs the requestor to perform the selected test. If the requestor fails to complete the test within the allotted time, the I/O control processor will display a requestor error message. Refer to Chapter 4 of the *HSC50 Service Manual*.

The following prompt will ask you if you want to repeat this diagnostic.

```
Re-use parameters (Y/N) [Y]?
```

If you don't want to re-use the parameters, type a **N**.

Run each test one time on each requestor.

Type a **CTRL C** to end this routine.

4. Type

```
TEST MEMORY BY K
```

in response to **ODL>**. This test checks memory by using one of the available data channel modules. If no data channel modules are available, the port processor module can be used to check memory. The **TEST MEMORY BY K** command loads and starts the off-line K/P memory diagnostic. The TU58 Drive 0 run indicator will light as the memory diagnostic is loaded. After the diagnostic is loaded, you will receive the following display.

```
HSC50 OFL K/P Memory Test, Version Vnn-nn
```

The off-line K/P memory diagnostic first prompts:

```
Requestor # (1 thru 7) [ ]?
```

Answer this question with a requestor number using your HSC50 OFL System Sizer Chart. This chart specifies the available requestors to be used in this test. Terminate the response by typing **RETURN**. After the requestor number is supplied, a control memory area is assigned and tested. This area is required for communicating with the requestor that will perform tests of either data or control memory. The test then prompts:

```
Control (0) or Data (1) memory [0]?
```

NOTE

Run the rest of the parameters for this diagnostic two times: once for control memory and once for data memory.

Type a **0** to test control memory, or type a 1 to test data memory. After typing the desired digit, type **RETURN** to terminate your response. The memory test next prompts for the first address to test.

```
First (min=XXXXXXXX) [min]?
```

Type a **RETURN** to begin testing at the first address. Addresses are eight octal digits in length. The test now prompts for the last address to test.

```
Last (max=XXXXXXXX) [ ]?
```

Type the last address to be tested. Refer to your HSC50 OFL System Sizer Chart to get the last address. Finally, the memory test prompts:

```
# of passes to perform (D) [ ]?
```

Enter the number **10**, indicating the number of times the memory specified should be tested. The memory test will now begin. The memory test should run for a minimum of five minutes. It can be aborted at any time by typing a **CTRL C**.

The following prompt will ask you if you want to repeat this diagnostic.

```
Re-use parameters (Y/N) [Y]?
```

If you don't want to re-use the parameters, type an **N**.

Type a **CTRL C** to end this routine.

5. Type

```
TEST MEMORY
```

in response to **ODL>**. This command loads and starts the off-line memory diagnostic. The TU58 Drive 0 run indicator will light as the memory diagnostic is loaded. After the diagnostic is loaded, you will receive the following display.

```
HSC50 OFL Memory Test, Version Vnn-nn
```

The off-line memory diagnostic first prompts:

```
Control (0), Data (1), Program (2) Memory [ ]?
```

Type a **2** to test program memory. The control and data memories have already been tested during the off-line K/P memory diagnostic.

After typing the desired digit, type a **RETURN** to terminate your response. The memory test next prompts for the first address to test:

```
First (min=XXXXXXXX) [min]?
```

Type a **RETURN** to begin testing at the first address. Addresses are eight octal digits in length. The test now prompts for the last address to test.

```
Last (max=XXXXXXXX) [ ]?
```

Type the last address to be tested. Refer to your HSC50 OFL System Sizer Chart to get the last address. Now the test prompts:

```
# of passes to perform (D) [1]?
```

Answer with a **RETURN**. Entering a 0 or a 1 will also result in one pass. The program memory test will now begin.

NOTE

The program memory test could take up to four hours for one complete pass. Run for approximately five minutes to do a survey of program memory.

The test can be aborted at any time by typing a **CTRL C**.

The following prompt will ask you if you want to repeat this diagnostic.

```
Re-use parameters (Y/N) [Y]?
```

If you don't want to re-use the parameters, type an **N**.

Type a **CTRL C** to end this routine.

6. Type

```
TEST REFRESH
```

in response to **ODL>**. This command loads and starts the off-line memory refresh test. The TU58 Drive 0 run indicator will light as the memory refresh test is loaded. After the test is loaded, you will receive the following display:

```
HSC50 OFL Memory Refresh Test, Version Vnn-nn
```

The Offline Memory Refresh Test first prompts:

```
# of passes to perform (D) [1]?
```

Answer with a **RETURN**. This test will take three minutes to run.

The test can be aborted at any time by typing a **CTRL C**.

The following prompt will ask you if you want to repeat this test.

```
Re-use parameters (Y/N) [Y]?
```

If you don't want to re-use the parameters, type an **N**.

Type a **CTRL C** to end this routine.

7. Type

```
TEST BUS
```

in response to **ODL>**. This command loads and starts the off-line bus interaction diagnostic. The TU58 Drive 0 run indicator will light as the bus interaction diagnostic is loaded. After the diagnostic is loaded, you will receive the following display.

```
HSC50 OFL Bus Interaction Test, Version Vnn-nn
```

After displaying the program name and version, the program, control and data memories are sized. The bounds of each memory are displayed on the terminal. Then you will select the requestors that should be used for the diagnostic. Use your HSC50 OFL System Sizer Chart to answer the following prompts.

```
Use Requestor #001, K.ci (Y/N) [Y]?
```

Answer with a **RETURN** if the host interface (k.ci) should be used as a requestor for this test.

Answer with an **N** followed by a **RETURN** if the host interface should not be used. If you answer N, the next available requestor number will be prompted. Continue this process until all the requestors have been covered.

At least two working requestors must be used to run the bus contention test since one requestor cannot generate bus contention by itself. The program will display the following error message if fewer than two requestors have been chosen after the user has indicated which requestors should be used.

```
Not Enough K's Available for Test
```

If you have chosen enough requestors and the above prompt is displayed, refer to your HSC50 OFL System Sizer Chart. If enough requestors are present, check that each module is correctly seated in its slot.

Next the program will ask if I/O control processor (P.ioc) interaction with memory is desired.

```
P.ioc Memory Interaction desired (Y/N) [Y]?
```

Answer the prompt with a **RETURN** if interaction between the I/O control processor and memory is desired. Answer with an **N** followed by a **RETURN** if I/O control processor interaction with memory is not desired.

If the prompt is answered with an **N**, the next three prompts will be skipped. If the prompt is answered with a **RETURN**, the following prompts are displayed.

```
Interact with Program Memory (Y/N) [Y]?
```

```
Interact with Control Memory (Y/N) [Y]?
```

```
Interact with Data Memory (Y/N) [Y]?
```

Answer with a **RETURN** if interaction is desired between the I/O control processor and the specified memory. During this interaction, the selected requestors are generating contention on the control and data buses. Answer with an **N** followed by a **RETURN** if you do not want the I/O control processor to interact with the specified memory.

The program now prompts for OCP interaction.

```
OCP Interaction Desired (Y/N) [Y]?
```

If I/O control processor interaction with the operator control panel (OCP) is desired, answer with a **RETURN**. If OCP interaction is not desired, answer with an **N**, followed by a **RETURN**. The test will now prompt for TU58 interaction.

```
Interact with TU58 (Y/N) [Y]?
```

If I/O control processor interaction with the TU58 is desired, answer with a **RETURN**. If TU58 interaction is not desired, answer with an **N**, followed by a **RETURN**. The program will now prompt:

```
# of passes to perform (D) [1]?
```

Answer with a **5**. The bus contention test will now begin. This test will take eight minutes if two requestor slots are filled. It will take 27 minutes if all requestors are filled.

The test can be aborted at any time by typing a **CTRL C**. (The test may continue running for a few seconds after **CTRL C** is typed.)

The following prompt will ask you if you want to repeat this diagnostic.

```
Re-use parameters (Y/N) [Y]?
```

If you don't want to re-use the parameters, type an **N**.

Type a **CTRL C** to end this routine.

APPENDIX B
FIELD ACCEPTANCE HSC50 SYSTEM TAPE TESTS

Use the following HSC50 SYSTEM TAPE tests for field acceptance.

1. Type

   ```
   CTRL Y
   ```

   then the

   ```
   HSC50>
   ```

   prompt will appear.

2. If you have disk drives to diagnose, type

   ```
   RUN IDDD
   ```

   to run the In-line Disk Drive Diagnostic. One drive at a time is tested with this program.

   You will only see error reports returned from **IDDD**. Chapter 4 in the *HSC50 Service Manual* contains descriptions of the IDDD error reports.

   The system will load the program from the TU58 tape system. This may take as much as a minute to complete. When the program has been successfully loaded, the following prompt will appear.

   ```
   IDDD > D > (Time) Execution Starting.
   ```

   IDDD will now ask you:

   ```
   DRIVE UNIT NUMBER (U) [ ]?
   ```

   You will enter the unit number of the disk drive to be tested. The unit number consists of a **D** followed by the unit plug number of the desired disk drive. **D1** is an example of a valid response to this prompt. The range of unit numbers possible is 0 to 254. There is no default for the above prompt.

   ```
   # OF PASSES TO PERFORM (1 TO 32767) (D) [1]?
   ```

Type a RETURN to make one pass. This pass will take about five minutes.

Type a **CTRL Z** to run the complete set of disk drive resident diagnostics one time.

When **IDDD** has completed all tests requested and has reported any errors found, it will conclude with the following message.

```
IDDD > D > (Time) Execution Complete
```

3. Type

   ```
   CTRL Y
   ```

   then the

   ```
   HSC50>
   ```

   prompt will appear.

4. Repeat the **RUN IDDD** procedure for each disk drive connected to the HSC50.

   Refer to the **RUN OMDEXR** section of this appendix if you do not have tape formatters to diagnose

5. Type

   ```
   CTRL Y
   ```

   then the

   ```
   HSC50>
   ```

   prompt will appear.

6. If you have tape formatter(s) to diagnose, type

   ```
   RUN ITDD
   ```

   to run the In-line Tape Drive Diagnostic. One tape formatter at a time is tested with this program.

   You will only see error reports returned from **ITDD**. Chapter 4 of the *HSC50 Service Manual* contains descriptions of the ITDD error reports.

   The system will load the program from the TU58 tape system. This may take as much as a minute to complete. When the program has been successfully loaded, the following prompt will appear.

   ```
   ITDD > D > (Time) Execution Starting.
   ```

   ITDD will now ask you:

```
DRIVE UNIT NUMBER (U) [ ]?
```

Respond with **X0** to run tape formatter diagnostics.

NOTE

Tape transport(s) can also be tested with this program. Options include generating and storing a unique sequence for I/O, tape position, etc. Refer to Chapter 4 of the *HSC50 Service Manual.*

Answer the following prompts by opening the HSC50 back door and finding which requestor and port each tape formatter is attached to.

```
ENTER REQUESTOR NUMBER (2-7) [ ]?

ENTER PORT NUMBER (0-3) [ ]?
```

Finally, **ITDD** prompts:

```
# OF PASSES TO PERFORM (1 TO 32767) (D) [1]?
```

Type a RETURN to make one pass. This pass will take a minute or two.

When **ITDD** has completed all tests requested and has reported any errors found, it will conclude with the following message.

```
ITDD > D > (Time) Execution Complete
```

7. Type

   ```
   CTRL Y
   ```

   then the

   ```
   HSC50>
   ```

   prompt will appear.
8. Repeat the **RUN ITDD** procedure for each tape transport or formatter connected to the HSC50.
9. Type

   ```
   CTRL Y
   ```

   then the

```
HSC50>
```

prompt will appear.

10. Type

```
RUN OMDEXR
```

to run the Multi-Drive Exerciser Program. You can exercise from one to ten disk drives or tape transports simultaneously with this test.

OMDEXR has three basic forms of user output. They are the data transfer error report, the performance summary, and the OMDEXR communications error report. The data transfer error report will be printed each time an error is encountered in one of the drives being tested. The performance summary will be printed when OMDEXR completes one pass on each drive being tested or if you terminate the pass prematurely. The OMDEXR communications report will be sent anytime OMDEXR is unable to establish communications with a drive selected to be exercised. Error and performance summaries will be issued every 30 seconds. The *HSC50 Service Manual* Diagnostic Chapter 4 contains descriptions of the performance summary, data transfer error report, and communications error report.

The system will load the program from the TU58 tape system. This may take as much as a minute to complete. When the program has been successfully loaded, the following prompt will appear.

```
OMDEXR >D> (Time) Execution Starting.
```

OMDEXR will now begin with the following prompt.

```
DRIVE UNIT NUMBER (U) [ ]?
```

You will enter the unit number of the disk drive or tape transport to be exercised. The unit number for a disk drive consists of a **D** followed by the unit plug number of the desired disk drive. **D1** is an example of a valid response to this prompt. The unit number for a tape transport consists of a **T** followed by the unit plug number of the desired tape transport. **T1** is an example of a valid response to this prompt. The range of possible unit numbers is 0 to 254 for disk drives and 0 to 255 for tape transports. There is no default for the above prompt. **OMDEXR** will determine if the selected drive is a disk drive or a tape transport and issue the appropriate prompts.

If you are exercising a disk drive use the following procedure.

a. Type a **CTRL Z** to default the remaining prompts for this selected drive. Refer to the *HSC50 Service Manual* Diagnostic Chapter 4 if you want a description of the OMDEXR prompts.

b. Answer the following final disk drive prompt.

```
ANOTHER DRIVE (Y/N) [ ]?
```

If you answer with a **Y**, the **DRIVE UNIT NUMBER** prompt will repeat again. If you answer with an **N**, refer to the OMDEXR global prompts below.

If you are exercising a tape transport use the following procedure.

a. Answer the following prompts with a **Y**.

```
IS A SCRATCH TAPE MOUNTED (Y/N) [N]?

ARE YOU SURE (Y/N) [N]?
```

b. Answer the following prompt with a **RETURN**

```
DATA PATTERN NUMBER (D) [21]?
```

c. Select the density to be used on the tape. Choose 800, 1600, or 6250. Any other response is illegal and the prompt will be repeated. Once you have defined the tape density, you will have also selected the recording mode by implication (800-NRZI, 1600-PE, 6250-GCR).

```
DENSITY (800,1600,6250) [1600]?
```

d. Type a **CTRL Z** to default the remaining prompts for this selected drive. Refer to the *HSC50 Service Manual* Diagnostic Chapter 4 if you want a description of the OMDEXR prompts.

e. Answer the following final tape transport prompt.

```
ANOTHER DRIVE (Y/N) [ ]?
```

If you answer with a **Y**, the **DRIVE UNIT NUMBER** prompt will be repeated. If you answer with an **N**, you will receive the OMDEXR global prompts below.

Answer each of the following OMDEXR global prompts with a **RETURN**.

```
AVERAGE DISK TRANSFER LENGTH IN SECTORS (1 TO 32) [32]?

RUN TIME IN MINUTES (D) [10]?

HARD ERROR LIMIT (D) [20]?
```

If you are using the F.S. maintenance terminal answer the following prompt with a **Y**. If you are not using the F.S. maintenance terminal answer with a **RETURN**. Refer to the *HSC50 Service Manual* Diagnostic Chapter 4 for a sample narrow format report.

```
NARROW REPORT (Y/N) [N]?
```

Type a **CTRL Z** to default the remaining prompts. Refer to the *HSC50 Service Manual* Diagnostic Chapter 4 if you want a description of the remaining OMDEXR global prompts.

After ten minutes, all testing will terminate and a final performance summary will be issued. **OMDEXR** will conclude with the following message.

```
OMDEXR > D > (Time) Execution Complete
```

HSC50 Controller
Installation Manual
EK-HSC50-IN-001

Reader's Comments

Your comments and suggestions will help us in our continuous effort to improve the quality and usefulness of our publications.

What is your general reaction to this manual? In your judgment is it complete, accurate, well organized, well written, etc.? Is it easy to use? _____

_____

_____

_____

What features are most useful? _____

_____

_____

_____

What faults or errors have you found in the manual? _____

_____

_____

_____

Does this manual satisfy the need you think it was intended to satisfy? _____

Does it satisfy *your* needs? _____ Why? _____

_____

_____

_____

☐ Please send me the current copy of the *Technical Documentation Catalog*, which contains information on the remainder of DIGITAL's technical documentation.

Name _____ Street _____
Title _____ City _____
Company _____ State/Country _____
Department _____ Zip _____

Additional copies of this document are available from:

Digital Equipment Corporation
444 Whitney Street
Northboro, Ma 01532
Attention: Communications Services (NR2/M15)
Customer Services Section

Order No. EK-HSC50-IN-001

CX

Fold Here

Do Not Tear - Fold Here and Staple

digital

No Postage Necessary if Mailed in the United States

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 33 MAYNARD, MA.

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL EQUIPMENT CORPORATION
EDUCATIONAL SERVICES/QUALITY ASSURANCE
12 CROSBY DRIVE (BUO/E08)
BEDFORD, MA 01730

Digital Equipment Corporation • Colorado Springs, Colorado 80919