Britton Lee, Inc.

BL700 INSTALLATION MANUAL

Part Number 200-1077-004

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This document supersedes all previous documents.

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Preface

This manual is designed for use by the person responsible for initial installation and subsequent configuration upgrades of the Britton Lee database server. It describes hardware and software installation procedures involving the BL700 and its peripheral devices.

System requirements are:

BL700 database server

release 40 or higher IDM/RDBMS

The following documents should be available to the person installing the BL700 system.

Referenced Documents

System Administrator's Manual (SAM)

This document is central in understanding the Britton Lee database server from a System Administrator's viewpoint. It describes backup and restore procedures, security, the system tables and troubleshooting techniques.

Operations Manual

This manual covers the operator utilities CKDB and DFU.

Maintenance Manual

The scope of this manual includes general preventive maintenance procedures, self-diagnostic features, and the removal and replacement of components. A troubleshooting section describing problem symptoms and solutions is also included.

Ethernet Controller Board Configuration

This document provides a description and examples of how to configure the Ethernet interface using either XNS or TCP protocols. It is a requirement for anyone who plans on installing the Ethernet interface using one of these protocols.

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1. Site Preparation

1.1. Introduction

Britton Lee database server installation is easy if your site has been carefully prepared. This chapter describes the steps you must take before the installation procedure.

1.2. Tools and Equipment Needed

The following list describes the tools needed to install the Britton Lee database server.

Tool	Purpose
cutters	to cut the packing straps
digital voltmeter	to verify voltages
set of screwdrivers	rack mounting the Britton Lee system
small wrenches	rack mounting the Britton Lee system

1.3. Environmental Requirements

The Britton Lee database server works best in a standard computer room environment with the following things:

- raised floor
- air filtration
- anti-static conditioning
- temperature control
- humidity control

	English	Metric
altitude	-1000 to +9000 ft.	-305 to +2740 meters
temperature	50 to 95 F	10 to 35 C
rel. humidity	20 to 80	20 to 80

Table 1-1 Environmental Requirements

1.4. Space Requirements

The installation site must have room for

- the Britton Lee database server (preferably rack-mounted, as described in Chapter 3)
- one or more terminals (supplied by the customer)
- disk drive(s) and optional tape drive(s)
- any software load devices or host computers also associated with the Britton Lee system.

	English	Metric
height	17.50 in.	44.5 cm
width (without slides)	16.60 in.	42.2 cm
depth (with front bezel)	26.75 in.	67.9 cm
weight	170 lbs.	77 kg

Table 1-2 Physical Dimensions

1.5. Britton Lee Database Server Service Clearances

There must be sufficient room around the rack to allow access to the Britton Lee database server when service is required. If slides are ordered, 27 inches of forward clearance is required when the Britton Lee database server is fully extended from the rack. There should be 36 inches of clearance to the left and to the right of the extended Britton Lee database server to allow access to the circuit boards and power supplies.

1.5.1. Air Flow

To allow proper air flow, the back of the Britton Lee database server should be at least twelve inches from any wall. Doors or panels should be at least 12 inches from the air intake on the front bezel or the fans on the rear panel, unless vents are provided that are at least 80 square inches in area.

1.6. Britton Lee Database Server Rack Mount Requirements

The Britton Lee database server is designed to fit into a standard 19-inch wide rack, via universal slide mounts attached to the rack and the Britton Lee database server. Two slide types are available: standard 28-inch and VAX-type 24 inch slides. Both allow 27 inches of forward travel, giving access to the circuit boards, internal cable connections, and power supplies. Regardless of slide length, the cabinet should be 29 inches deep to leave room for air flow and the I/O cables that extend from the rear of the Britton Lee database server.

The rack should have the following features:

- RS-310-C specification for racks, panels, and associated equipment
- cabinet depth of at least 29 inches (internal distance from front vertical frame members to rear door)
- available vertical panel space of 17.5 inches
- 21 to 29 inches from front vertical frame members to rear vertical frame (to accommodate the optional slides)
- anti-tip legs or other measures to prevent tipping when units are extended from the rack.

NOTE

A power control and distribution unit for 19-inch racks is available through special order from Britton Lee.

Britton Lee mounts this unit in a number of standard RETMA racks according to customer needs. Ask your Britton Lee representative for specifications.

1.7. Power Requirements

1.7.1. AC Power Cord

The Britton Lee database server comes with a 10 foot long (3 meter long) power cord. In FCC models, the cord is not removable. For all models, the "wall" end has a Hebell twist-lock plug (rated at 250V and 15A). The receptacle or wall outlet at the installation site must be of the NEMA L6-15R type. Should this plug be unsuited to local power receptacles, it should be replaced with a locally conforming connector by an authorized electrician.

1.7.2. Input Power Requirements

The input power requirements for the Britton Lee database server are listed in the following table.

Power	Requirement
voltage	200 to 240 Vac
frequency	47 to 63 Hz
current	10 Amps maximum* (15A breaker)
phasing	single phase

Table 1-3 Input Power Requirements

* This amount in required assuming thedatabase accelerator (DAC) is included in the system.

1.7.3. Power Consumption

The maximum power consumption of the Britton Lee database server is 2000 watts, which occurs when all sixteen slots are filled (including a DAC) and all boards are at maximum load. This represents a maximum of heat loading of 6700 BTU's per hour.

WARNING

The Britton Lee database server generates radio frequency energy. FCC models comply with the requirements in part 15 of FCC rules for a Class A computing device but Pre FCC models may not have it. FCC compliance is indicated by an appropriate label on the rear of the Britton Lee database server. In any case, operation of the Britton Lee database server in a residential area may cause unacceptable interference to radio and TV reception, requiring the operator to take whatever steps are necessary to correct the interference.

1.8. Cabling Requirements

1.8.1. Internal Cabling

The Britton Lee database server is shipped with all internal cabling connected. Internal cabling consists of the connections between the circuit boards and the interface panels on the rear of the Britton Lee database server. See Chapter 9 for the addition of circuit boards and related internal cabling.

1.8.2. External Cables

The Britton Lee database server rear panel contains modular interface panels for all ordered options requiring connections to the Britton Lee database server. Blank panels can be replaced by additional interface panels as required.

Chapter 4 contains illustrations of the Britton Lee database server's rear panel. Appendix B contains cable schematics.

1.8.3. Cables Supplied by Britton Lee

The following cables are shipped with your Britton Lee database server.

- POWER CORD: This is for Britton Lee database server's requiring a separate power cord, the cord is shipped with the system.
- CONSOLE CABLE: This is a modified male-to-male null-modem RS-232 cable for connecting the Console Terminal to the Britton Lee database server's Console Port during disk formatting and system boot. The Britton Lee part number is 113-0170.
- ADAPTER CABLE: One female-to-female jumper cable for matching customer equipment to RS-232 connectors if necessary is shipped with the Britton Lee database server. The Britton Lee part number is 113-0169.

1.8.4. Customer Supplied Cables

The cable(s) needed to connect the Britton Lee database server to a host processor are not supplied by Britton Lee, and must be provided by the customer. The cables needed to connect the Britton Lee database server to disk and tape drives may be obtained from Britton Lee if so desired. All B cables should be shielded, and A cables should be a twisted pair; FCC models have provisions for shield grounding on the connector panel.

The individual external SMD A and B cables, used to connect disk drives to the Britton Lee database server, should be no longer than 46 feet (14 meters). The **total** maximum length of the external daisy-chained SMD A cables is 96 feet per disk controller.

The external cables used to connect a tape drive to the Britton Lee database server should be shielded and no longer than 20 feet (6 meters).

Any system equipment frame ground terminals should be interconnected with chassis grounding cable or straps.

1.9. Customer Supplied Equipment

This section describes the requirements for customer-supplied equipment. Chapter 5 provides instructions for connecting these devices to the Britton Lee database server.

1.9.1. Disk Drives

The disk drives to which the Britton Lee database server is connected should be SMD-compatible. Table 1-4 lists the drives that have been qualified by Britton Lee. The list is subject to change, so consult your Britton Lee representative regarding models that are not on this list.

Manufacturer/Model	Size	Capacity*	Type
Ampex DM980CD	14"	76MB	pack
APS (Dastek) 4830	14"	36MB	fixed
Century Data T306	14"	288MB	pack
CDC 9410-24	8"	22MB	fixed
CDC 9730	14"	152MB	fixed
CDC 9762	14"	76MB	pack
CDC 9766	14"	288MB	pack
CDC 9775	14"	621MB	fixed
Fujitsu M2282	14"	61MB	fixed
Fujitsu M2283	14"	121MB	fixed
Fujitsu M2284	14"	152MB	fixed
Memorex 677-300	14"	288MB	pack
Ball BD80A	14"	76MB	pack
Ball BD100A	14"	94MB	pack
Ampex Capricorn 330	14"	302MB	fixed
Century Data AMS315	14"	296MB	fixed
Tecstor 166	14"	152MB	fixed
Tecstor 332	14"	303MB	fixed
Disc Tech One 3306	14"	78MB	fixed

Table 1-4 Qualified Disk Drives

* Capacity shown is after formatting.

NOTE

Index and sector pulses MUST be GATED on the A cable. Disk drives must be optioned for "daisy chain" configuration.

1.9.2. Tape Drives

The Britton Lee database server's optional Tape Controller (TPC) supports the most popular industry standard tape formats.

At least four major tape drive producers build tape drives that are compatible with the Pertec PCC microformatter that is supported by the tape controller: CDC, Pertec, Kennedy, and Cipher Data. They all offer a variety of traditional and streamer type transports.

The tape controller supports industry standard 1600 BPI, PE, 9-track tape. The tape controller can read any tape that conforms with the ASCII, standard document X3.39-1973, even if it was not generated on a Britton Lee database server. 800 BPI NRZI format and 3200 BPI PE format are also supported, but without any assurance of industry level compatibility.

The tape controller supports tape velocities of up to 100 IPS and data transfer speeds up to 160 kbytes per second.

Table 1-5 lists the drives that have been qualified by Britton Lee. The list is subject to change, so consult your Britton Lee representative for models that are not on this list.

Manufacturer/Model	Speed Ips	Density (Bpi)
----Streamers---		
Cipher F880 I	25/100	1600 PE
Cipher F880 II	25/100	1600 PE
	50	3200
Ampex TMS-B	12.5/100	1600 PE
Kennedy 6809	12.5/100	1600 PE
----Start/Stop----		
IDT TD1054	45	800 NRZI/1600 PE
CDC 92144	45	800 NRZI/1600 PE
Pertec FT8640A-98	45	800 NRZI/1600 PE

Table 1-5 Compatible Tape Drives

NOTE

The recording density can only be changed at BOT (beginning of tape).

1.9.3. The Console Terminal

One ASCII terminal is required as the operator interface to the Britton Lee database server. This terminal is called the console terminal and is connected to the Britton Lee database server at the console port on the rear panel. The Console Terminal is used for the following things:

- entering commands such as those for loading or updating software
- displaying status information during system boot
- displaying system error messages.

It may be more convenient to connect the Britton Lee database server console port to the host computer, providing a virtual console device. This is acceptable as long as all console messages are stored in a file for Britton Lee Product Support personnel.

CAUTION

> Terminals and the cable used to connect them to the Britton Lee database server must meet RS-232 specifications. The pins used are 2, 3 and 7. The four modem control lines are attached to pins 4, 5, 8 and 20. Faults may occur during the power up sequence of the Britton Lee database server if the interface voltage levels or the pins used vary from the specification.

The requirements for the console terminal are:

transmission/reception	300 baud
send/receive mode	full duplex
interface standard	RS-232C
word format	10-bit word (1 start, 8 data, 1 stop, parity off)
erase/backspace	set to CTRL h

A printing terminal should be used as the Console Terminal. This generates a hard copy of the console messages which is quite useful during the initial database development period.

CAUTION

> Important diagnostic messages may be lost if the console terminal is not connected. Entering "control-C" after reconnecting the console terminal repeats the last message(s) generated while the system was running. The full message may not appear due to the size of the message buffer.

1.9.4. Modem, Modem Cable and Phone Line

Britton Lee can support customers directly with remote diagnostic facilities. A 300-baud answer or answer/originate modem is required to run diagnostics at a remote site. An answer/originate modem is preferable, since it allows calls to be placed as well as received. The direct-connect type is preferred over the acoustic-coupled type.

A direct-dial outside telephone line that does not go through a PBX should be provided for use with the modem. Insure that the phone line physically reaches the modem.

This modem capability is the only way to diagnose software problems and certain hardware problems in the Britton Lee database server. Failure to keep a modem and suitable phone line in the computer room will hinder support, should it be needed.

A full-modem cable is used to connect the modem to the Britton Lee database server (see Chapter 5). A full-modem cable is a standard RS-232-C ribbon cable with all pins connected straight through.

NOTE

Britton Lee Inc. is unable to provide remote diagnostic support outside of the United States and Canada. Please check with your sales representative for the current support status.

1.10. Pre-installation Checklist

Review this chapter, and be sure the following things are ready before starting the installation:

_____air conditioning

_____verify proper line voltage, power frequency and condition.

_____verify power receptacles: for Britton Lee database server, disks, terminals, software load devices, etc.

_____rack with anti-tip legs for Britton Lee database server

_____tools and digital voltmeter

_____space and service clearances

_____disk drive(s), cables, terminator

_____tape drive(s) and cables (optional)

_____terminal(s)

_____modem

_____phone lines

Chapter 3 includes an outline describing the steps required to perform the initial installation.

2. Unpacking and Inspection

2.1. Introduction

This chapter describes how the protective shipping material is used, how to unpack it and the procedure for detecting damage that may have occurred during shipment.

2.2. Shipping Container For A Britton Lee Database Server Without A Cabinet

The shipping container consists of a corrugated assembly mounted on a wooden pallet. The total weight of the Britton Lee database server, container and pallet weighs approximately 210 lbs. At least *two people* are required to unpack the unit. Britton Lee, Inc. is not responsible for any accidents.

All of the container parts are corrugated with the exception of the two end cushions. These are foam rubber mounted on a corrugated backing.

The shipping container consists of the following things for each system.

1 corrugated section
2 hexel assemblies
2 hexel pads
2 foam assemblies
1 filler panel
1 wooden pallet

2.3. Unpacking The Britton Lee database server

Before unpacking the Britton Lee database server, check the outside carton for shipping damage. Check the shock indicator on the side of the carton. *If damage is indicated, contact the shipper before proceeding.*

1. Remove the banding, open the top of the box and remove the accessories.
2. Remove the filler panel and the two foam assemblies.
3. Lift the outer container from the unit.
4. Remove the Britton Lee database server from the container.

WARNING

The Britton Lee database server weighs approximately 170 pounds. *Never* attempt to lift it unassisted.

2.4. Inspecting The Britton Lee Database Server

Before installing the Britton Lee database server, inspect it carefully for any shipping damage. If damage is found, contact the carrier immediately. In this case, it is important to save all of the packaging materials for the carrier's evaluation.

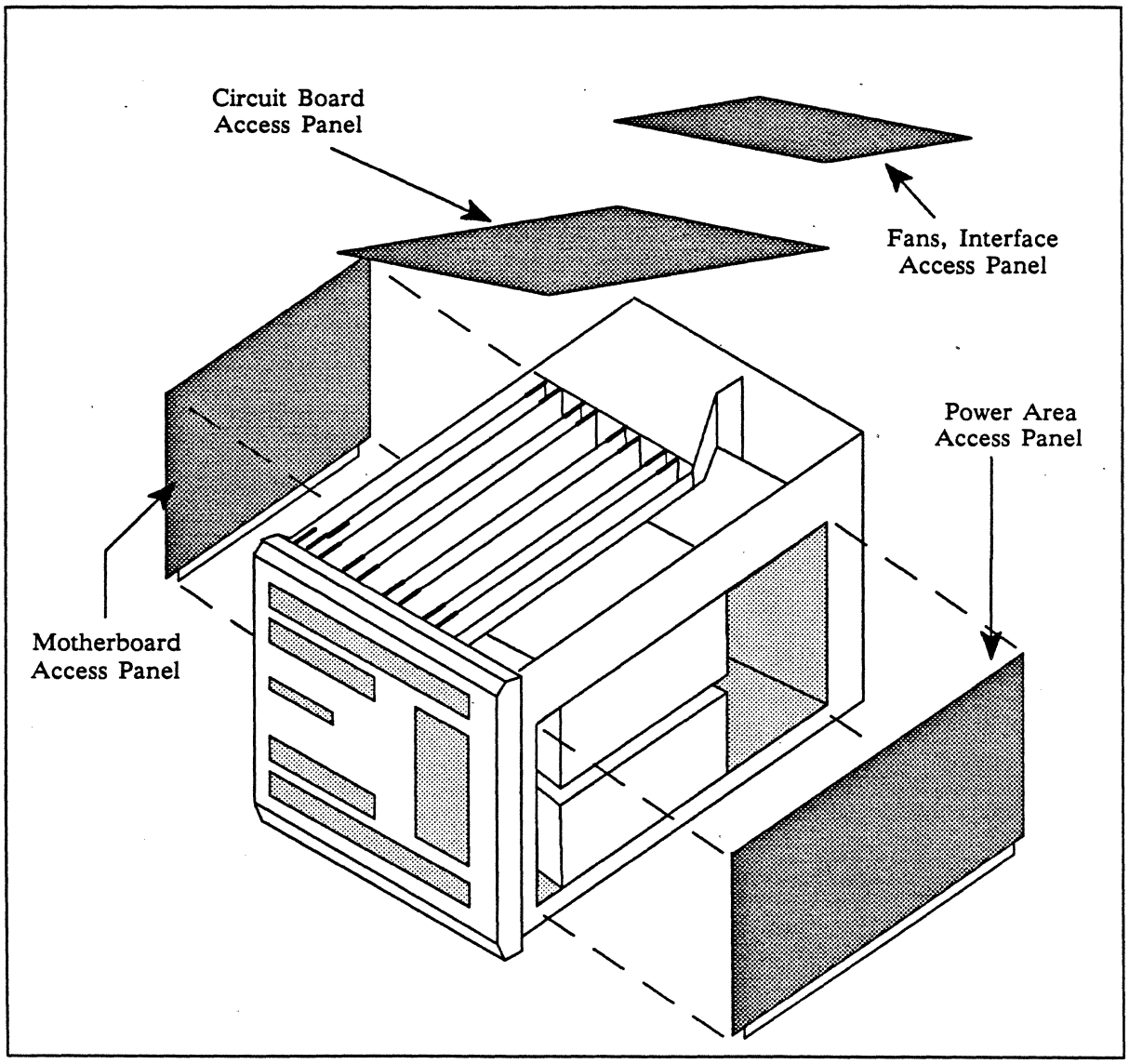

Figure 2-1 Britton Lee database server Access Panels

1. Remove the access panels from the Britton Lee database server (see Figure 2-1).
2. Remove all internal packing materials and save it with the external packing materials to protect it when you need to move it again.
3. Be sure all circuit boards are seated firmly in the backplane. Use the card ejectors to release and reset the PCBs.

4. Carefully check the Britton Lee database server for any foreign matter that may cause an electrical short.

2.5. Packing The Britton Lee Database Server For Reshipment

If the Britton Lee database server needs to be shipped to another location, it should be packaged in its original state. If the packing material is lost or damaged, additional material may be purchased from Britton Lee.

Install the foam circuit board retaining pad inside the Britton Lee database server. Repack the unit in reverse order of the unpacking procedure at the beginning of this chapter.

3. System Installation

3.1. Introduction

This chapter outlines the initial system installation and describes installing the Britton Lee database server in a standard 19-inch rack. Refer to Chapter 9 for upgrades or installation of new features.

It is assumed that the procedures in Chapters 1 and 2 have been completed. Read this entire chapter and all chapters referenced in the outline before starting the installation. Familiarize yourself with the controls and indicators described in Chapter 4.

WARNING

Due to the weight of the Britton Lee database server, it is strongly recommended that the system be located near the bottom of the rack. Anti-tip devices should be used during installation.

3.2. Installation Outline

Proceed with the installation using the following outline as a guide to the applicable chapters in this manual.

1. To ensure that the site power is correct see Chapter 1.
2. To connect the console terminal to see status messages see Chapter 1.
3. To apply AC power and to check and adjust DC power see Chapter 4.
   a. Power up the Britton Lee database server and check results of the Britton Lee database server's self-test.
   b. After warm-up, perform the voltage checks (and adjustments if required). DO NOT attempt to adjust voltages without proper training and equipment.
4. To rack-mount the Britton Lee database server see Chapter 3.
5. To connect peripherals and host see Chapter 5.
   a. Reconnect the console terminal to enter commands and display results and status.
   b. Connect the disk drive(s).
   c. Connect the host computer.
6. To format the system disk and any additional disks using DFUs ee the Operation Manual.
7. To load system software see Chapter 6.
8. To boot the System Software and perform the System Confidence Test see Chapter 7.
9. To configure the system see Chapter 8 and the System Administrator's Manual for information on configuring the system.

3.3. Rack Mounting Procedure

If the Britton Lee database server is equipped with slide mounts, use the following procedure to install the unit in a standard 19-inch rack.

1. If the slide rails are not already installed on the Britton Lee database server, attach the inner rails to the Britton Lee database server chassis with four 10-32 flathead screws per side (three for the 24-inch slides).

CAUTION

Ensure that the left rail is on the left side of the Britton Lee database server and that the right rail is on the right side. The milled-out slot on the outer rail of the slides must face down. Otherwise, the mechanism that prevents the Britton Lee database server from coming completely out of the slides will not work properly, and injury may result. If the slides can be pulled all the way out without the latch stopping them, they are incorrectly installed.

2. Measure the inside distance between the front and rear vertical frame members and of the rack. Attach the rear brackets to the outer rails. Use the screws, flat washers, lock washers, and nuts as shown in Figure 3-1. The rear brackets may face either the front or the rear, as determined by the measurements taken.
3. Secure the outer rails to the front and rear vertical frame members of the back. Be sure that the rails are level front to back and side to side. Use all four blinder head screws at each junction. Barnuts have been provided in case the vertical members are not threaded.
4. Extend the center rails fully, lift the Britton Lee database server to the correct height, and slide the inner rails into the center rail. While pressing the center rail lock mechanisms, carefully push the Britton Lee database server into the rack. Current models have a cabinet latch mounted on the right lower corner of the bezel. A small screwdriver, Allan wrench, or similar tool is required to actuate the latch through the hole in the front bezel.
5. Check for interference with other devices mounted above or below the Britton Lee database server. The slides can be adjusted vertically to improve clearance. Remove the Britton Lee database server before adjusting height.
6. Check slide action carefully. Be sure the slide lock mechanisms (and the cabinet latch, if present) operate correctly, and that all threaded connections are secure.

When installing external cables later, ensure that they do not restrict movement of the Britton Lee database server on its slides or air flow out of the Britton Lee database server.

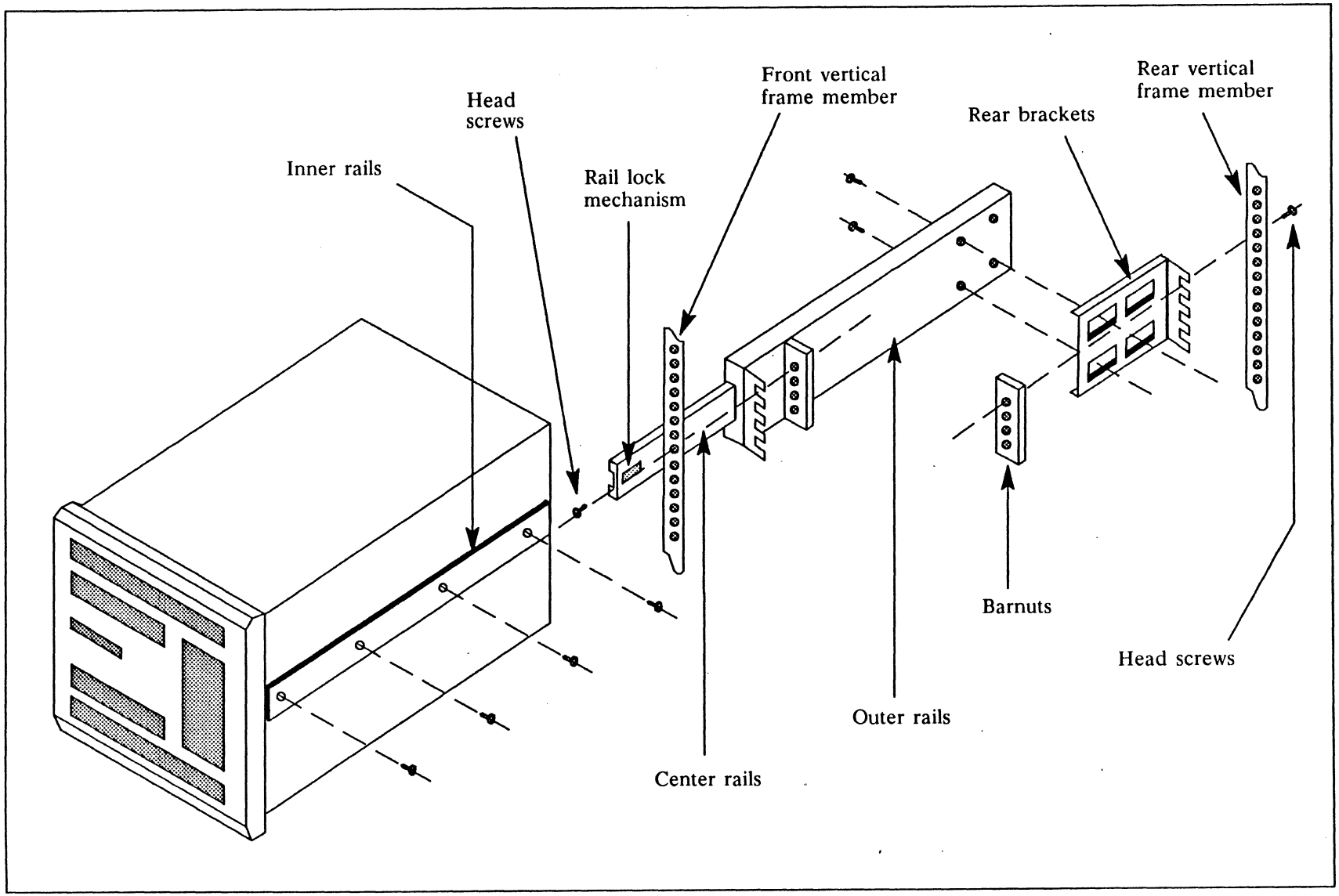

Figure 3–1 Rack Mounting

4. Applying Power to the Britton Lee Database Server

4.1. Introduction

This chapter explains the initial power-up sequence, Britton Lee database server self-test, verification and adjustment of power supply voltages.

4.2. Electrical Safety Cautions

Removal of an access cover from the Britton Lee database server may expose the operator to line voltage even when the Britton Lee database server's main power switch is off. Unless power must be on during a service procedure in the power supply compartment, the power cord should be unplugged. Use appropriate precautions to prevent injury from electrical shock. Figure 4-1 lists the areas where line voltage is present. Table 4-1 shows these areas in the FCC production model, and Figure 4-2 shows a Pre-FCC version of the Britton Lee database server.

Main Circuit Breaker Off	Main Circuit Breaker On
Line Filter	Line Filter
Main Circuit Breaker	Main Circuit Breaker
	Fuseholder (if present)
	terminal Strip
	Power Supplies
	Transformer & Connector
	Fans

Table 4-1 Electrical Caution Areas

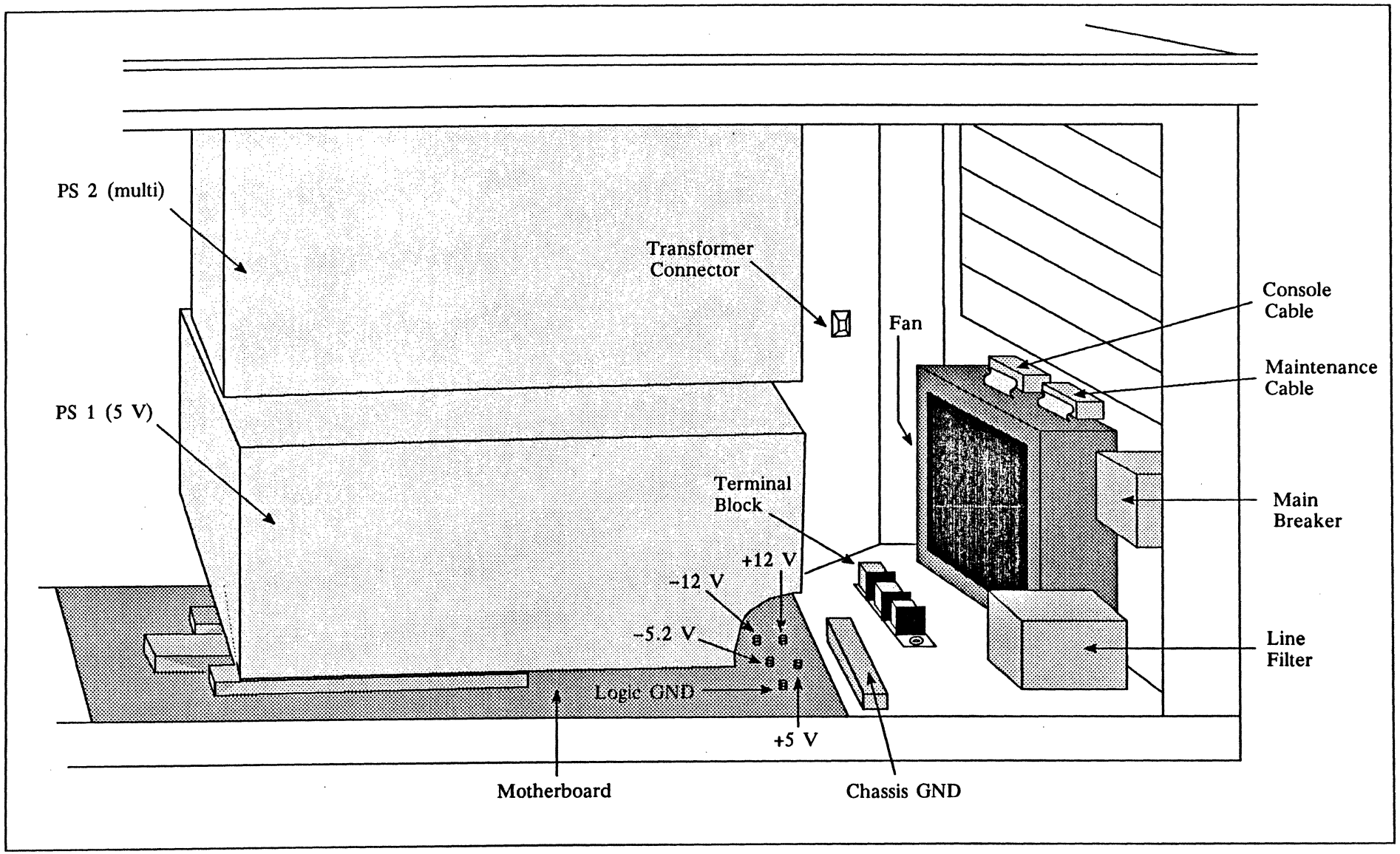

Figure 4-1 Power Area, FCC Model

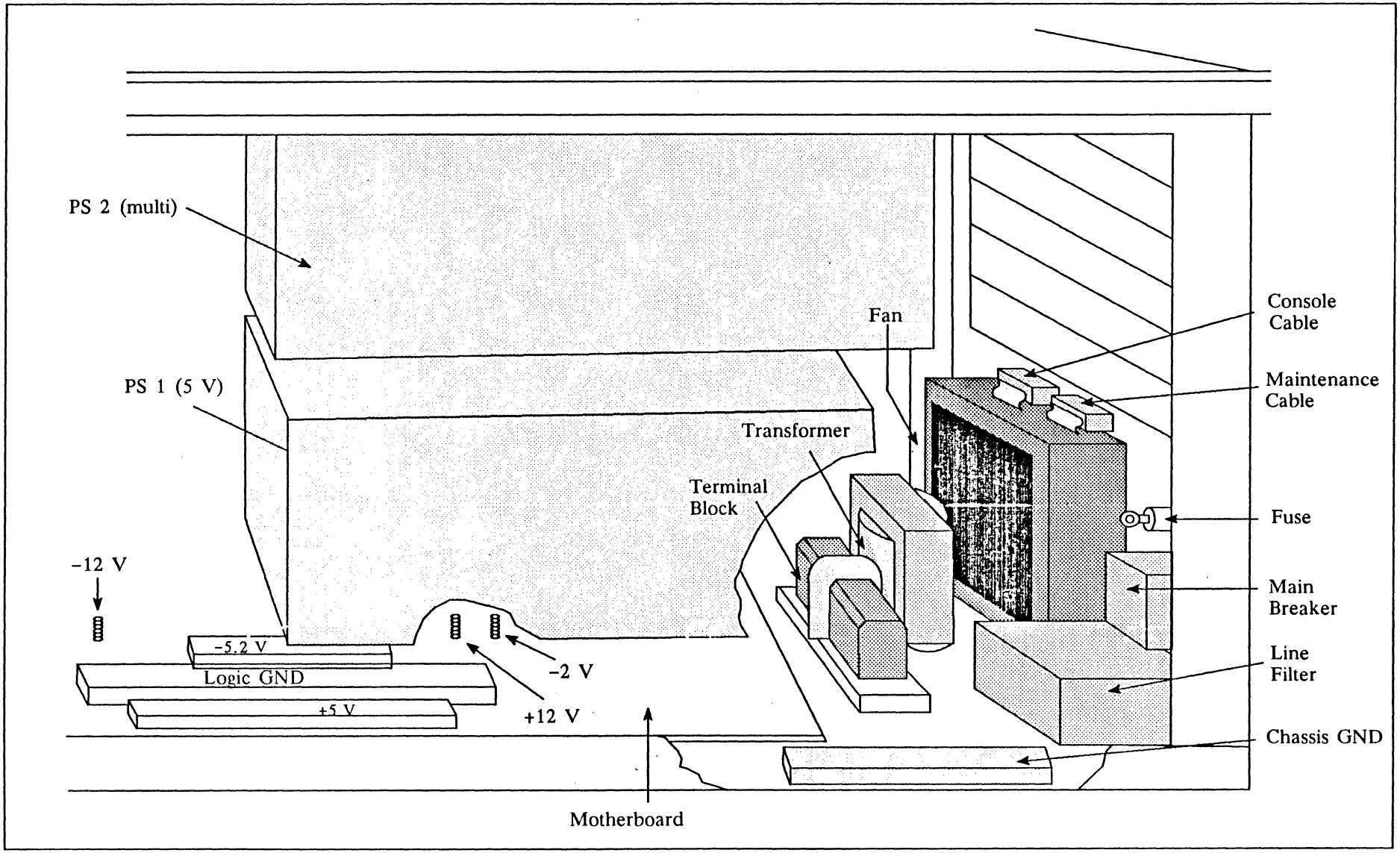

Figure 4-2 Power Area, Pre-FCC Model

4.3. Initial Power-on Sequence

Follow the steps listed below to power-on your Britton Lee database server.

1. Confirm that the Britton Lee database server's main circuit breaker (AC power rocker switch on the rear panel) is OFF.
2. Confirm that the Britton Lee database server's front panel function switch is in the OFF position.
3. Plug the Britton Lee database server into the wall outlet (see Chapter 1 for details).

   WARNING

   In the Pre-FCC versions of the Britton Lee database server, the detachable power cord resembles that of many 115V devices. To avoid damage to equipment, do not connect the female end of this power cord to any 115V device. In addition, do not attach the female end of any other cord to the male receptacle in the Britton Lee database server rear panel.

4. Connect the console terminal to the Britton Lee database server's console port with the console Cable.
5. With the key-operated function switch in the OFF position, toggle the circuit breaker locker switch at the rear of the Britton Lee database server to the ON position. A red light on the circuit breaker switch appears, indicating that AC power is being applied to the Britton Lee database server. The fans at the rear of the Britton Lee database server come on. DC power is not yet applied to the PC boards.

   Verify that all rear panel fans are operating. The Britton Lee database server must not be used unless all fans are working.
6. While observing the indicator lights on the Britton Lee database server's front panel, use the key to turn the function switch from OFF to MAINT. This applies DC power to the PC boards, causing the database processor (DBP) to perform a self-test. DC power is on when the POWER light in the front panel appears.

   If the DBP passes the self-test, the READY, SAFE, and SERVICE lights flash once briefly.

   If the DBP fails the self-test, the SERVICE light goes on and remains steady. If, in addition to the SERVICE light, one or both of the READY and SAFE lights blink on and off continuously, call for service immediately. Table 4-2 lists the combinations of lights that indicate severe hardware failures of the 10MHz DBP. If all lights remain off, it could mean that the database processor is defective or missing, or that the ribbon cable from the DBP to the front panel is not connected securely.

Front Panel Lights**	Hardware Failure
READY flashes	MMU failure
SAFE flashes	On-board RAM failure
READY and SAFE flash together	SIO failure
READY and SAFE flash alternately	bad battery back-up RAM

** SERVICE light remains steady in all four cases.

Table 4-2 10MHz self-test fail and light indicators

If the FAULT light appears, a message describing the fault appears on the console, and the SERVICE light also appears. Examine the console message to determine corrective action.

7. If the DBP passed the self-test and the FAULT light does not appear, the following message is displayed on the console:

   IDM DBP rev n

8. The Britton Lee database server polls all of its slots to determine which boards are there. This is similar to the "slots" console command. Memory boards are listed by slot and name. Other circuit boards are listed by slot, name, and revision number:

   slot 0: <board name> rev n
   slot 1: <board name> rev n
   slot 2: <board name> rev n

   ...

   slot X: <board name> rev n

   If any board is defective, the message

   *** DEFECTIVE BOARD ***

   appears after the description of the board. Chapter 9 contains instructions for adding/changing circuit boards.

9. The database server software prompts for a filename, indicating that the initial power-up sequence is finished and that the Britton Lee database server is operational with the message:

   <BL series> - Filename:

If the Britton Lee database server is being powered up for the first time, perform the voltage checks described on the following pages and then continue with the remainder of the installation. If the Britton Lee database server has already been powered up at a previous time, put the function switch in the RUN position; the system will boot and will be ready to run.

4.4. Voltage Checks

If the Britton Lee database server is being powered on for the first time, check the voltages as follows, being sure to observe the electrical safety cautions described in the beginning of this chapter.

1. With the Britton Lee database server extended on the slides, open the right side panel to gain access to the power supplies and bus bars.
2. Put the function switch in the MAINT position.
3. Verify that all rear panel fans and power supply fans are operating.
4. After the power supplies have had time to stabilize (about ten minutes), check voltages. All voltage checks should be taken at the test points located on the backplane behind the supplies (see Figure 4–1). In Pre–FCC versions, these test points are absent, and the voltages are checked on the bus bars themselves (see Figure 4–2).

NOTES

Use caution to avoid shorting voltages. If a short occurs, the affected power supply(ies) will shut down. After the short is corrected, power may be restored by turning the front panel function switch to OFF, then back to MAINT.

It may be convenient to remove the power supplies from the chassis before adjusting voltages. See Chapter 9 for details of this procedure.

Alternatively, the front bezel can be removed and the Control Panel assembly tilted out of the way to gain access to the power supply potentiometers.

Use a digital voltmeter with sufficient resolution and accuracy to verify the following ranges then adjust it if necessary. See Figure 4–3 for the location of adjustment ports.

Power Supply 1 (+5V)

Voltage should be +5.00V +/– .05V

Power Supply 2 (multi–voltage)

V1 on power supply 2 should be –5.20V +/– .05V
V2 on power supply 2 should be +12.00V +/– .20V
V3 on power supply 2 should be –12.00V +/– .20V

In Pre–FCC versions, PS 2 has a –2 V output as well. In these systems, the following settings should be used:

V1 on power supply 2 should be –5.20V +/– .05V
V2 on power supply 2 should be +12.00V +/– .20V
V3 on power supply 2 should be – 2.00V +/– .02V
V4 on power supply 2 should be –12.00V +/– .20V

NOTE

Never attempt to adjust the current limit potentiometers; these are preset at the factory.

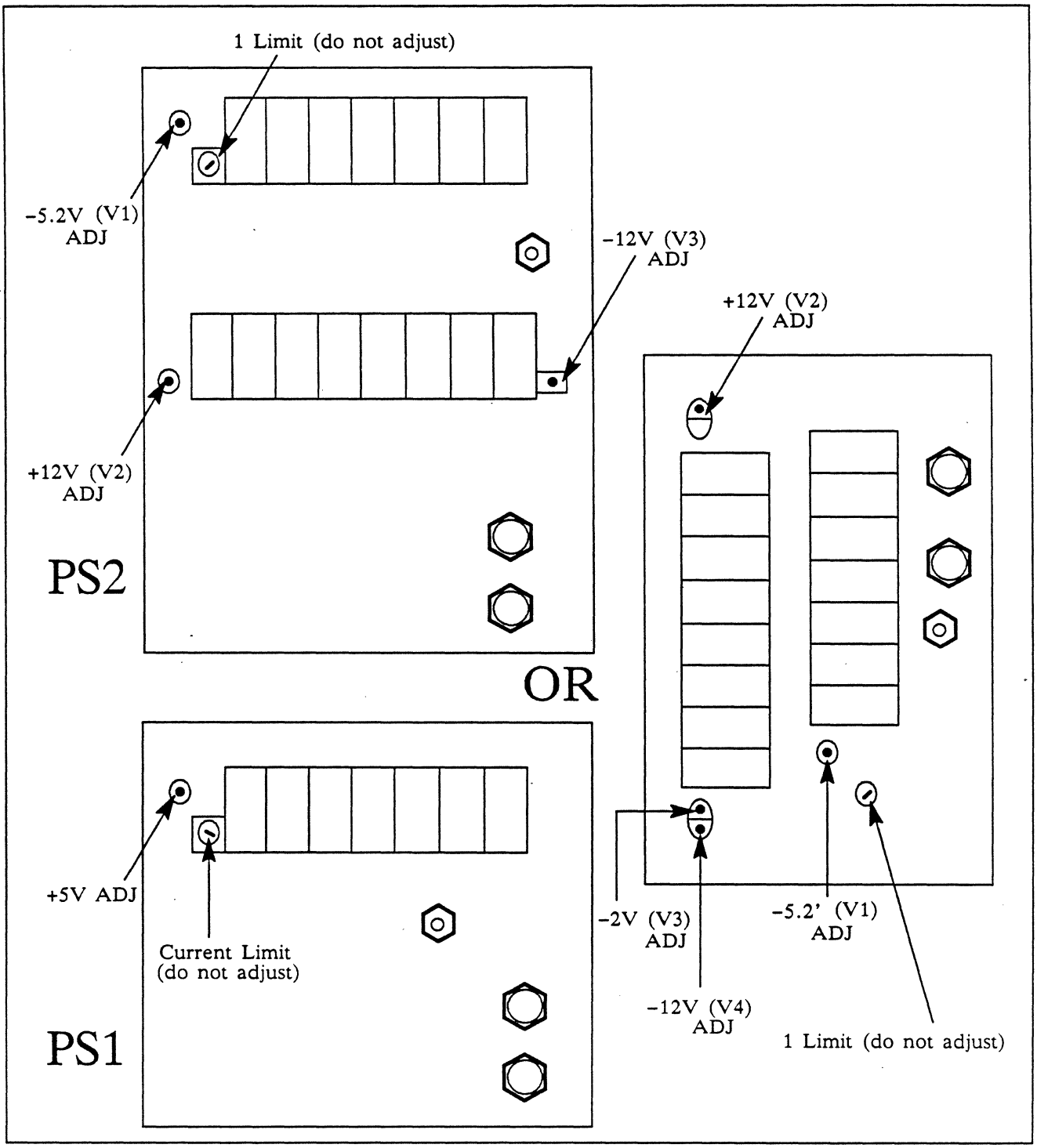

Figure 4-3 Power Supply Adjustments

For instructions on routine powering up, system confidence test and powering down, see Chapter 7.

Once the Britton Lee database server is powered up, in MAINT mode and has a console attached, console commands can be entered. For a list of these commands, see Appendix A.

5. Connecting Peripherals and Host Computers

5.1. Introduction

This chapter describes how to connect Britton Lee database server to the disk drives(s), the tape drive(s), the host computer, via either the RS-232 serial interface or the IEEE-488 parallel interface and a modem for remote diagnostics.

NOTES

Appendix B includes required cable schematics and reference pinouts for the Britton Lee database server rear panel I/O connectors.

All cables connecting the Britton Lee database server with other equipment must be routed so as not to interfere with airflow out of the Britton Lee database server rear panel.

5.2. Connecting Disk Drives to the Britton Lee Database Server

All disk drives used with the Britton Lee database server should be SMD-compatible. The Maintenance Manual lists drives that have been qualified by Britton Lee for use with the Britton Lee database server.

Up to four disk controller boards may be used in the Britton Lee database server. For each disk controller in the system, an SMD interface panel (Figure 5-1) is installed in the Britton Lee database server rear panel. Each disk controller can interface with a maximum of four disk drives.

1. Connect the first disk drive's A cable (60-pin ribbon cable) to the 60-pin receptacle (labeled "A cable 0") on the lowest-numbered SMD interface panel.
2. Connect the first disk drive's B cable (26-pin ribbon cable) to the 26-pin receptacle (labeled "B cable 0") on the same SMD interface panel.

NOTE

It is essential that the disk cables be inserted correctly. A small wedge-shaped indentation on the upper right corner of each plastic connector on the Britton Lee database server indicates the location of pin 1.

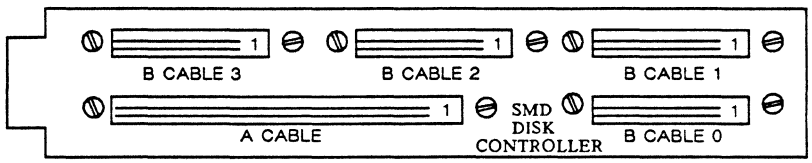

Figure 5-1 SMD Disk Interface Panel

3. Connect the B-cables of additional disk drives to the B cable connectors on the interface panel. Connect these drives' A cables in a "daisy-chain" with the first drive as shown in Figure 5-2. If more than four disk drives are to be connected, use additional SMD interface panels. A cables are always daisy-chained in groups of a maximum of four groups for each additional interface panel.

   All B cables should be shielded, and A cables should be a twisted pair; current models have provision for shield grounding on the connector panel.

   The individual external SMD A and B cables, used to connect disk drives to the Britton Lee database server, should be no longer than 46 feet (14 meters). The total maximum length of the external daisy-chained SMD A cables is 96 feet per disk controller.

4. Insert a terminator in the last drive.

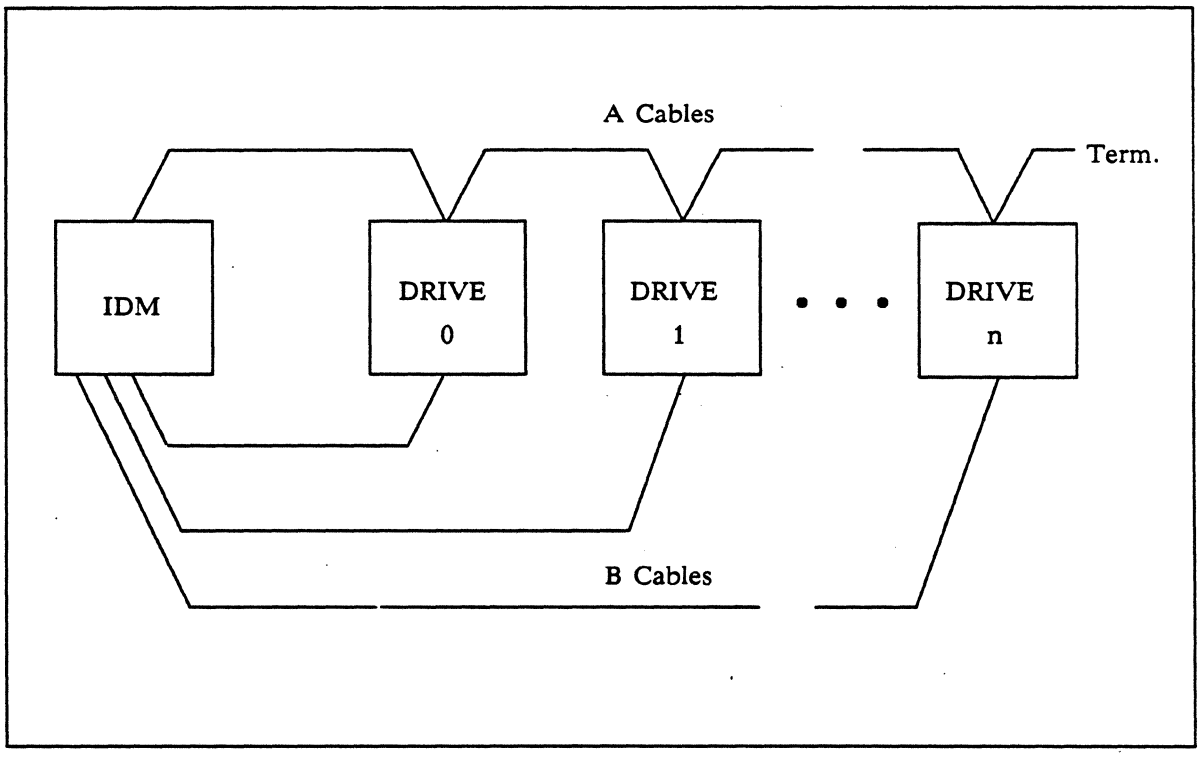

Figure 5-2 Connecting Disk Drives to Britton Lee database server

Before a disk can be formatted, two things must be done to the drive:

1. The logical unit address must be assigned and selected by switches or jumpers on the drive itself. The unit address must be in the range 0 to 7.

2. The sector select switches must be set to determine the number of sectors per track. (See the drive manual for detailed switch setting procedure.)

CAUTION

The Britton Lee system software requires a minimum of 2240 bytes per sector. In selecting the number of sectors, ensure that each sector contains at least 2240 bytes.

For a detailed description of the disk formatting procedure, see DFU in the Operation Manual.

5.3. Connecting a Host Computer

The Britton Lee database server can be connected to a host computer by either the RS-232 host interface , the IEEE-488 host interface, the Ethernet Interface or the block mux interface.

5.3.1. RS-232 Interface

There are eight ports on a single RS-232 host interface, which may be connected in many ways to up to eight hosts. For example, each host interface could be connected to a separate host; alternatively, all eight host interfaces could be connected to a single host; or four could be connected to host 0, three to host 1 and one to host 2. Use the configuration that best suits your needs.

The connections are made with RS-232 cables (not supplied by Britton Lee), which must be 50 feet or less in length for maximum baud rate. Cable wiring is determined by the modem control for which each RS-232 port is configured. See Appendix B of this manual, RS-232 host interface Cables, and Chapter 8, Configuring The RS-232 host interface.

The RS-232 connection between the host(s) and the Britton Lee database server is made in one of two ways. A single RS-232 host interface Channel (eight ports) can be distributed at the rear of the Britton Lee database server using the RS-232 Distribution Box. Alternatively, the ribbon cable(s) from up to four channel boards (32 ports total) can be taken intact through the RS-232 interface panel and distributed using the rack-mounted RS-232 Distribution Rack Option. Both of these methods are shown in Figure 5-3.

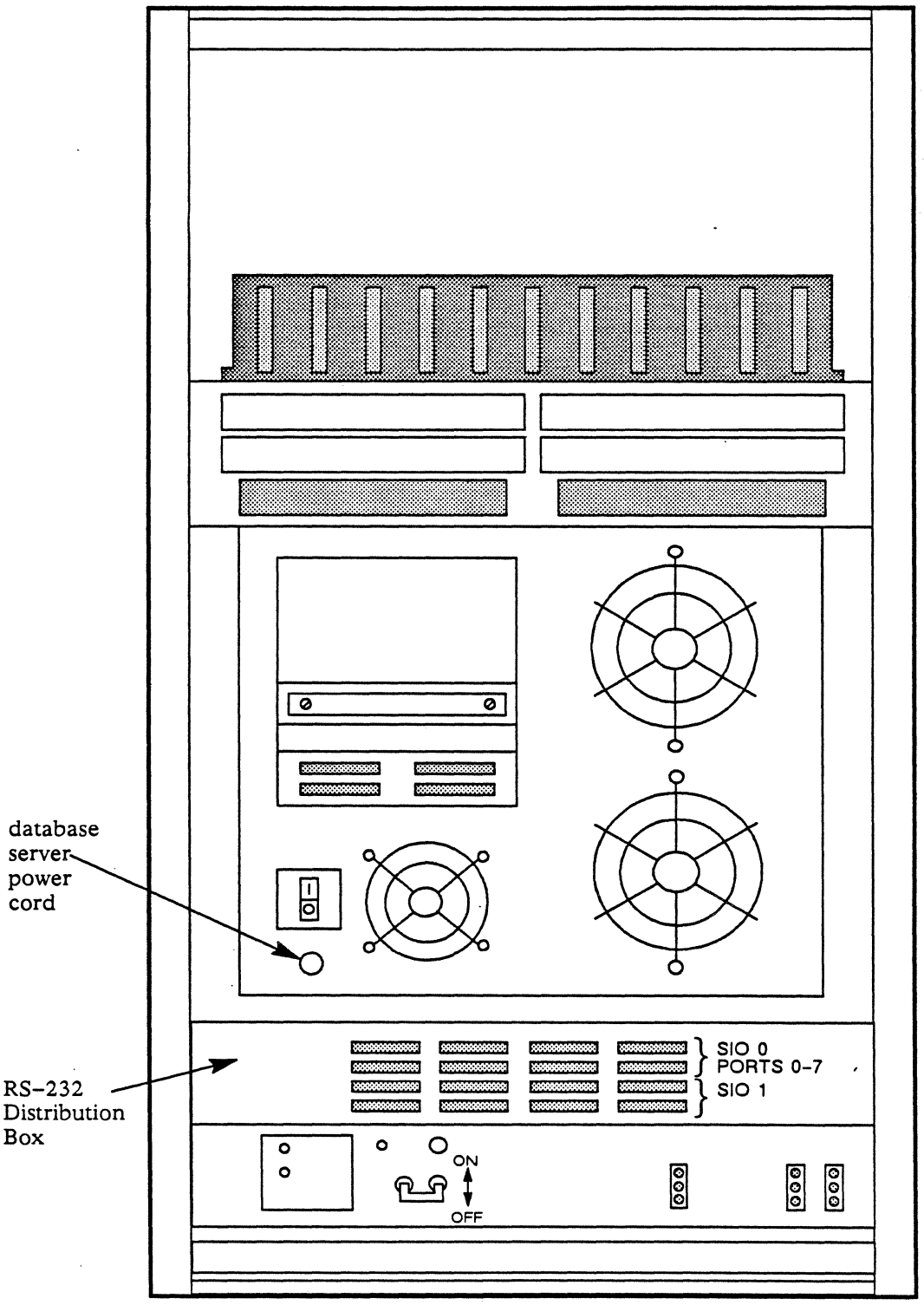

Figure 5-3 RS-232 Connection
Britton Lee database server Cabinet Rear View (2nd feature)

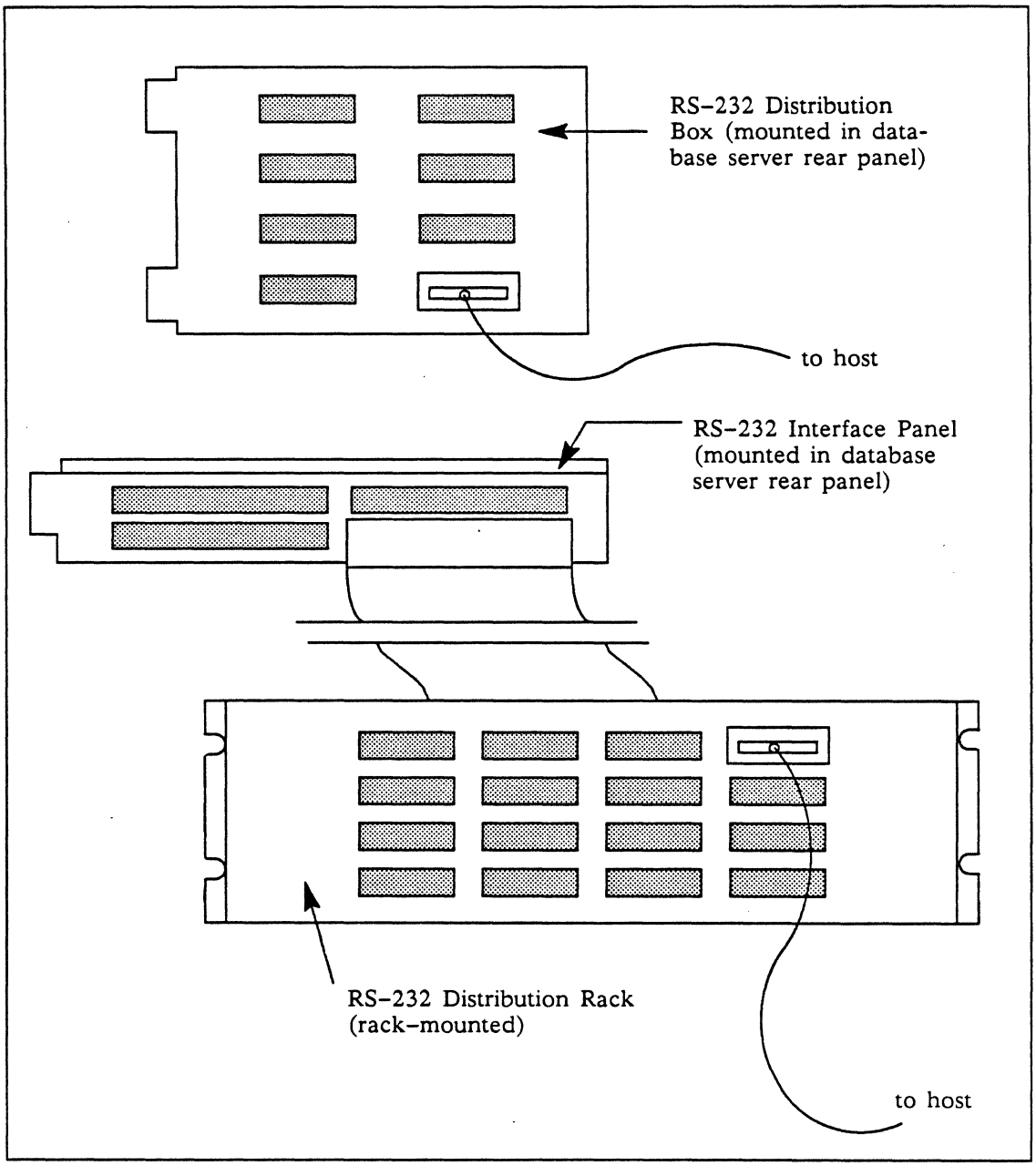

Figure 5-4 RS-232 Host Interface Connection

NOTE

With reference to the RS-232 interface, the Britton Lee database server is a DTE (Data Terminal Equipment) device.

5.3.2. IEEE-488 Interface (GPIB)

There are two ways to connect up to eight host computers to a Britton Lee database server via the IEEE-488 interface:

1. Connect Host 0 to one of the Britton Lee database server's IEEE-488 ports via a GPIB cable, then connect additional hosts in daisy chain fashion (see Figure 5-5). Each host must be equipped with an IEEE-488 interface.

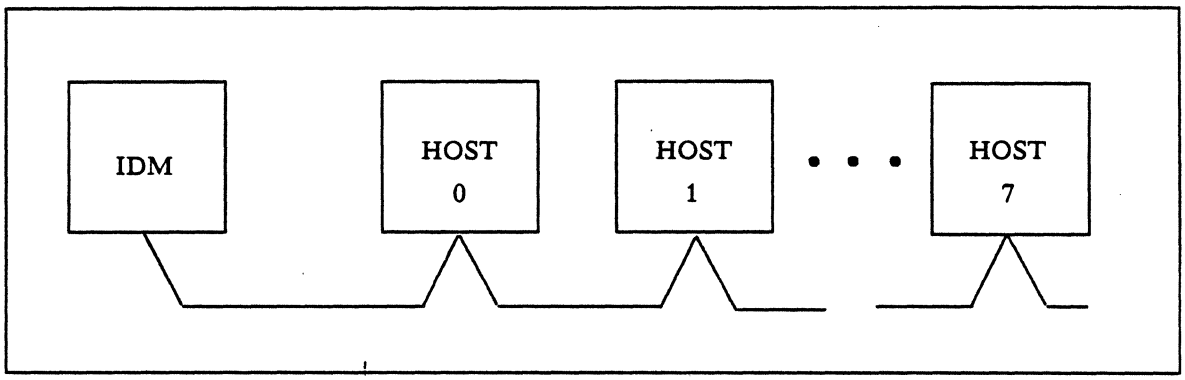

Figure 5-5 IEEE-488 Interface, Example A

2. Hosts can also be connected in a star fashion (see Figure 5-6).

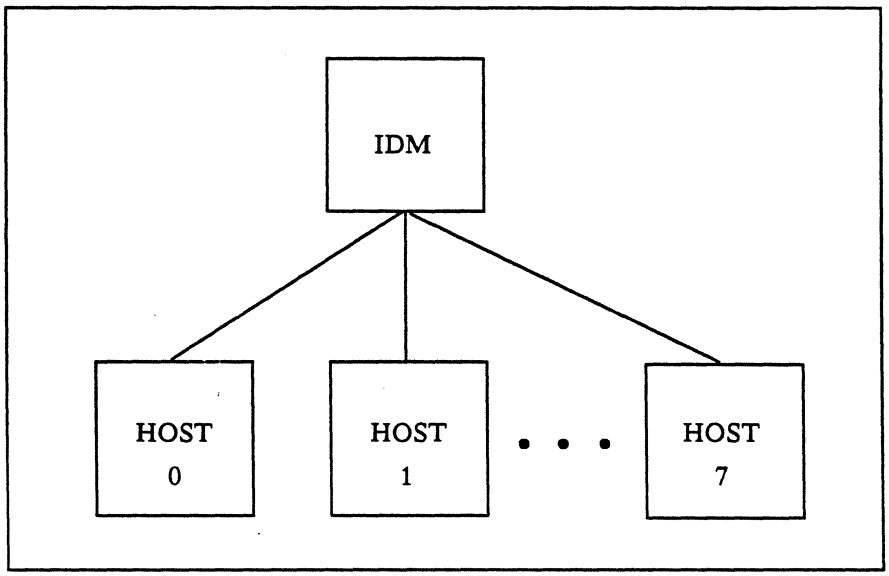

Figure 5-6 IEEE-488 Interface, Example B

For both methods, the maximum total length of all the cables is either 20 meters or 2 meters times the number of devices, whichever is less. In addition, caution is advised if any device-to-device cable length exceeds 4 meters.

Figure 5-6 shows the IEEE-488 interface panel, also labeled GPIB or PIO (Parallel I/O).

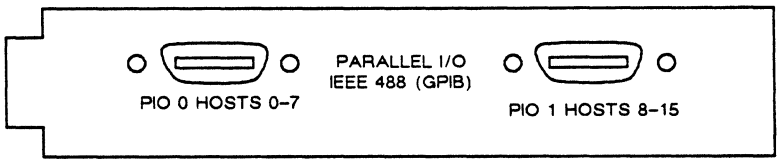

Figure 5-7 IEEE-488 Interface Panel

5.3.3. Ethernet Interface

The Ethernet host interface Package Option includes:

- Ethernet Adapter PC Board (part number 133-0812)
- Ethernet Mechanical Interface Assembly (part number 112-1215)
- transceiver unit (part number 428-1246-xxx)
- 15.25m (50') transceiver cable (part number 428-0010-xxx)
- Ethernet XNS Software magnetic tape (part number 142-1230)

The customer must provide:

- coax cable cutting tool
- (2) N-series, 50Ω, male plugs

The Ethernet Mechanical Interface Assembly mounts with two (2) 6-32x0.25 screws (included) in the interface area of the Britton Lee database server rear panel, see Figure 5-8. The attached internal transceiver cable (0.91m [3'] long, round) should be routed in the Britton Lee database server cable trough and connected to the Ethernet Adapter PC Board in the Britton Lee database server card cage (see Figure 5-8). The connection to the PC board is polarized for correct insertion.

A standard transceiver unit and 15.25 meter long transceiver cable are included in the Ethernet Package. The transceiver supplied by Britton Lee requires cutting of the Ethernet coax cable at the installation point of the transceiver. Some Ethernet coax cables have marks at regular 2.5 meter intervals; a transceiver may be placed at any such mark on the cable.

After cutting the Ethernet coax cable, install appropriate N-series, 50Ω, male plugs, on the just cut ends. Connect the Ethernet coax to both sides of the transceiver unit (see Figure 5-8). Install the 15.25 meter long transceiver cable between the transceiver unit and the interface panel on the back of the Britton Lee database server. Sliding lock mechanisms at both connection points prevent the cable from pulling free of the connectors.

The Ethernet XNS Software should be loaded into Britton Lee database server using the procedures described in the Britton Lee database server Operation Manual (part number 201-1078), Appendix F, "Loading from Britton Lee database server Tape Drive" or Appendix G, "Loading from Host Tape Drive".

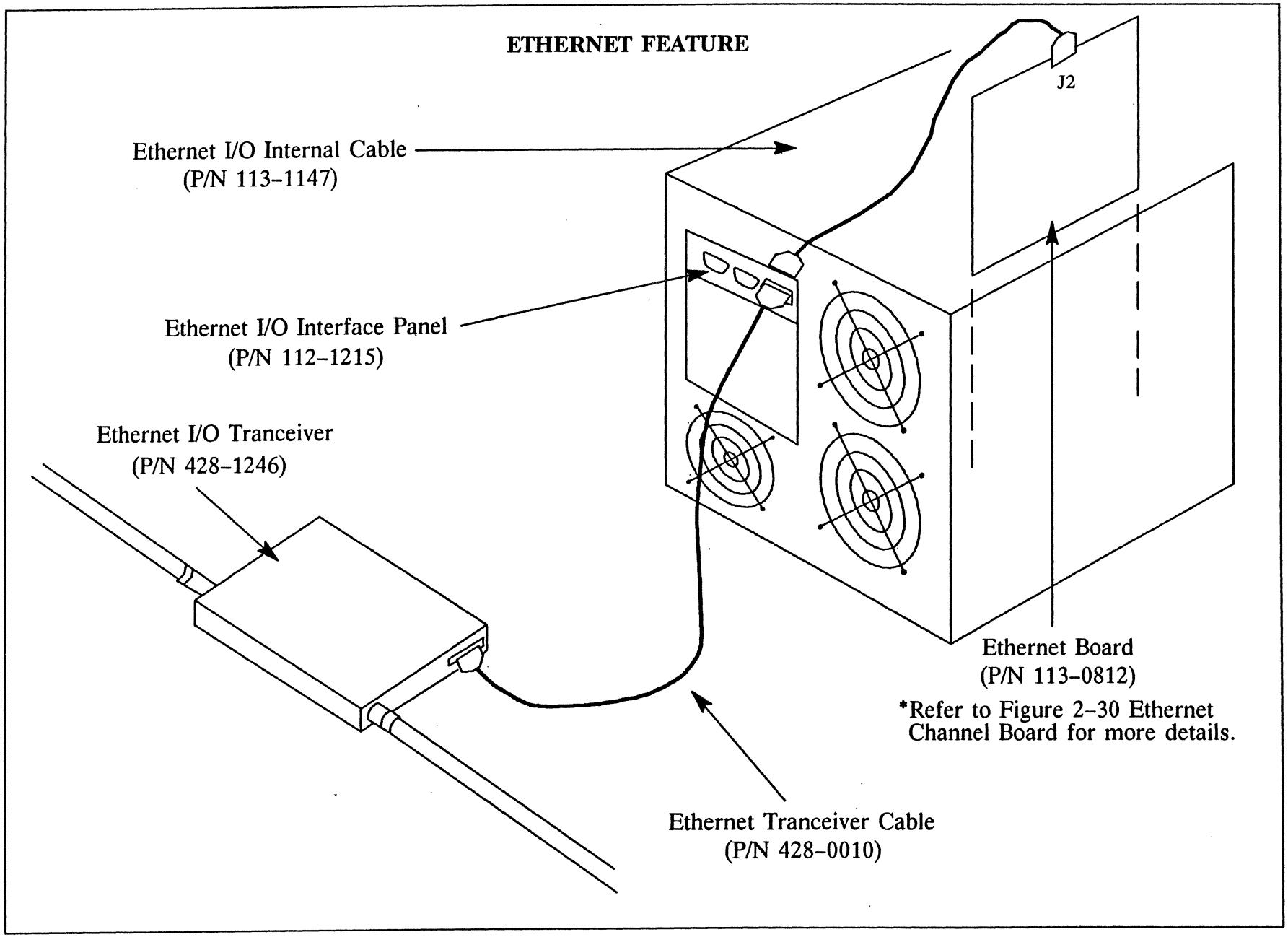

Figure 5-8 Ethernet Interface

5.4. Ethernet Interface Installation Verification

This diagnostic procedure is utilized to isolate and verify the installation of the Ethernet board, transceiver chip, internal and external cables and when communication via Ethernet is lost and Ethernet board passed the "slots" test.

To begin the procedure:

1. Power down.
2. Set the console device to 9600 baud. Attach the device to the console port with the standard console cable.
3. Remove front bezel.
4. Remove the console cable from the DBP board J2, and place on J2 of the Ethernet board.
5. Place the Britton Lee database server in MAINT, apply AC power.

NOTE

The argument given to the loopback test described below will cause the test to run until interrupted by a carriage return.

Press the carriage return on the console device to receive the following prompt.

```
>
```

Test One: verify the board.

In response to the prompt enter:

```
> testether
E>
```

Note the prompt changed; you are in an alternate mode. Initiate the test with the following command.

```
E> loopback 0
```

Each time the diagnostic test is passed, a "." will be displayed. A successful test will result in the following display:

```
. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Press return to end the test.
```

If any error message is displayed the Ethernet board should be replaced.

Test Two: verify the external cable, transceiver chip and internal cable. You will isolate the board, reset the board, and reset a test parameter before re-entering the loopback test.

1. Disconnect the external transceiver cable from the transceiver amd replace it with a loopback fixture.

2. Enter:

```
E> reset
E> setchip
```

In response to the "setchip" command, the diagnostic firmware displays a list of parameters. Accept the default to each one **except tmode.**

```
xmit stat: A0x: <press return>
xmit mask: 0x: <press return>
rec stat: 0x: <press return>
ec mask:  80x: <press return>
tmode: 2x enter:2 <press return>
r rmode: @9x: <press return>
node: 0: <press return>
node: 2: <press return>
node: 3: <press return>
node: 4: <press return>
node: 5: <press return>
```

Initiate the test with the command:

loopback 0

Each time the diagnostic is passed, a "." is displayed. A successful test will result in the following display.

```
. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Press return to end the test.
```

With a successful test result the board, transceiver chip, internal and external cables have been verified. The lack of communications via Ethernet is not due to the Britton Lee database server hardware.

If an error is encountered, you will remove the external transceiver cable from the Britton Lee database server Ethernet port. Place the loopback fixture directly on the Ethernet port then repeat Test Two.

NOTE

A successful test at this point localizes the Ethernet problem in the external cable. An error message isolates the problem in the internal cable or Ethernet board. Replace the Ethernet board.

When testing is complete, replace the console cable from the Ethernet board to the DBP. Return the console terminal to 300 baud.

5.4.1. Block Mux Interface

The fourth way the Britton Lee database server can be connected to a host computer is by block mux. The Britton Lee database server, IBM and Sperry systems must be powered down before installing block mux. Follow your sites procedures for installing a control unit on a channel or your system may crash.

CAUTION

Before doing anything inside the Britton Lee database server, you must first open the lower, front panel of the cabinet.

When you open the panel and there is only one on-line/off-line switch then you will only have four block mux channels. If there are two on-line/off-line switches then you will have eight block mux channels. Turn off all of the switches.

If the lights next to the switch(es) remain on after one minute then shut down the driver because it is still doing activity. Doing anything while the lights are still on may crash your system.

1. Connect the block mux cables (part number 113-1722-xxx). Connect the cables so that both ends match on the block mux and the Britton Lee database server (e.g., J1 on the block mux should be connected to J1 on the Britton Lee database server).

Previous Device	Britton Lee database server Block mux
bus out	bus in
tag out	tag in

Bus in runs to a bus terminator (a special terminator if it is the last bus in the chain) or to bus in for the next device. Tag in runs to a tag terminator (a special terminator if it is the last tag in the chain) or to tag in of the next device.

CAUTION

Be sure that the flat, wide, blue ribbon cables that connect to J1 and J2 are connected correctly and to the proper jumper. If it is incorrectly connected, it will not work and it may damage the PCB in the connector. See Figure 5-9 for further details.

3. Turn the switch(es) on to put your system on-line. If you have two switches, you may turn them on in any order.

4. Now, the block mux is physically connected and is ready for software installation. See the Block Multiplexor Installation Manual part number 205-1466-xxx for more details about software installation.

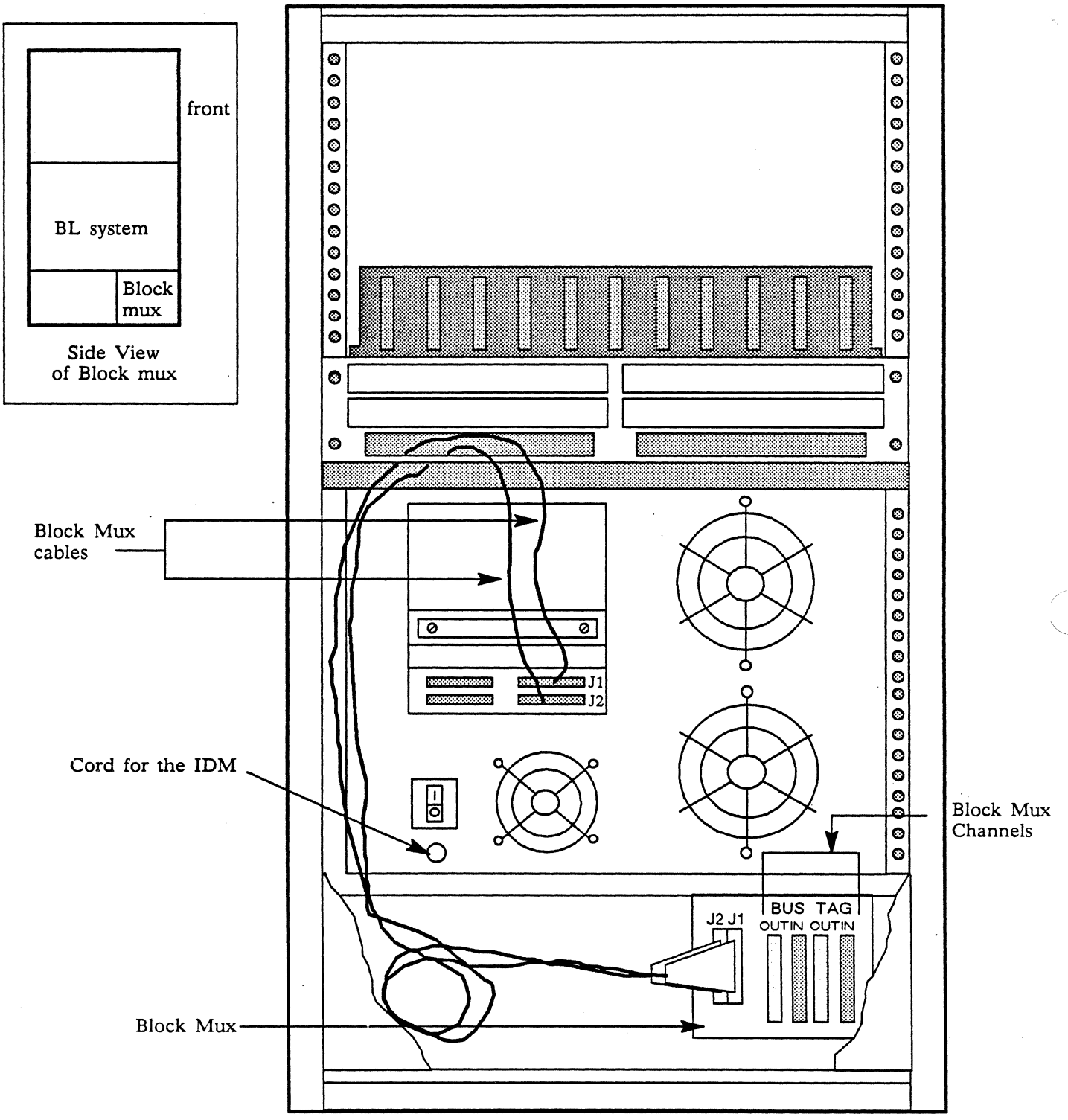

Figure 5-9 Block Mux Interface
(BL System Cabinet Rear View)

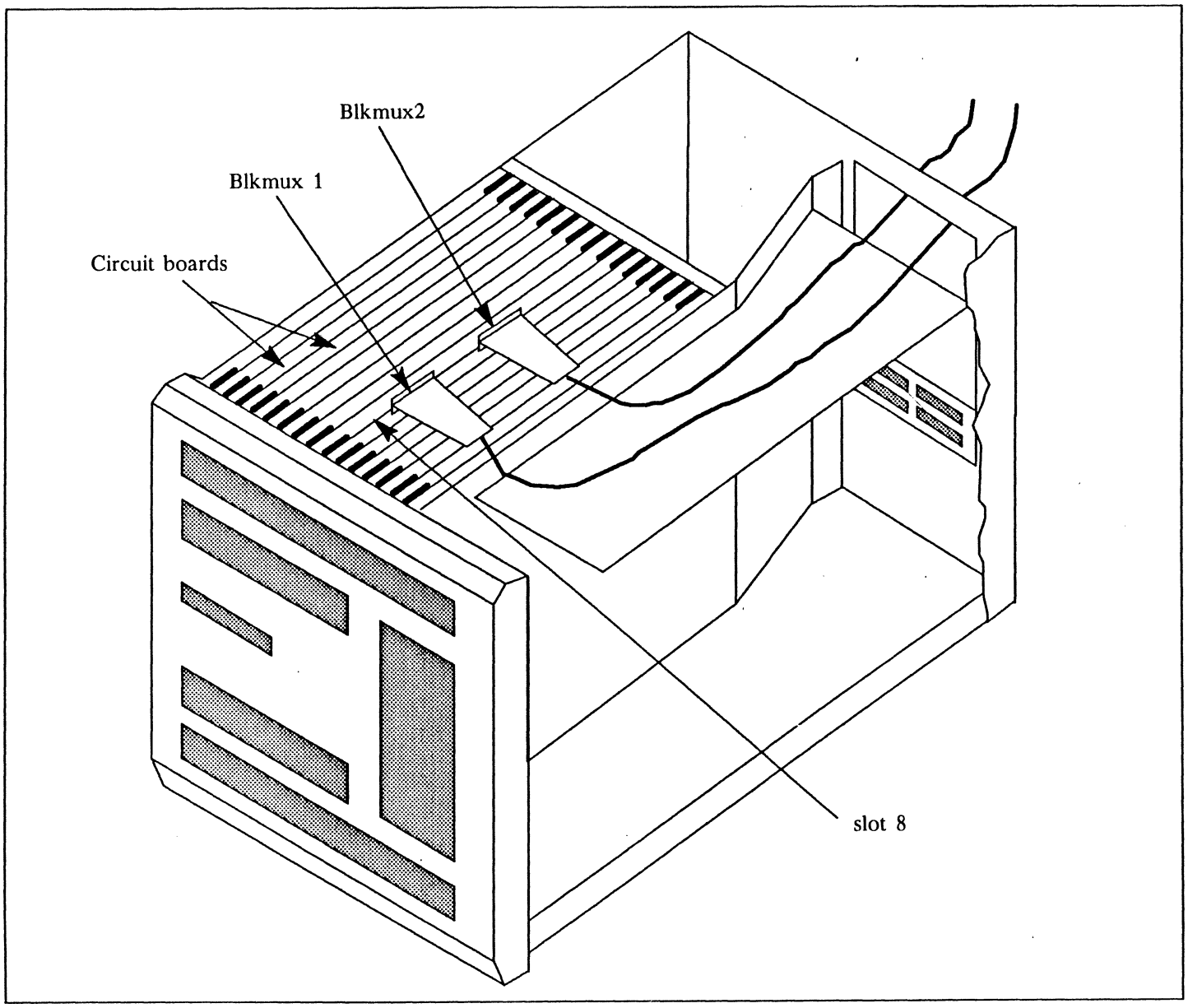

Figure 5-10 Block Mux Interface
(BL System Side View)

5.5. Connecting Tape Drives to the Britton Lee Database Server

When the Tape Controller Option is ordered, the rear panel must include a Tape interface panel containing the two receptacles J1 and J2 for the tape drive's two 50-pin ribbon cables. These cables should be shielded, and should be no longer than 20 feet (6 meters). If they are daisy-chained, the total length is limited to 20 feet.

The tape controller can be connected to two microformatters, each of which can be connected to four drives. Thus, up to eight tape drives can be supported.

Figure 5-11 illustrates daisy-chaining eight tape drives together with the two cables. The circuit boards shown are the Pertec PCC microformatters within the drives.

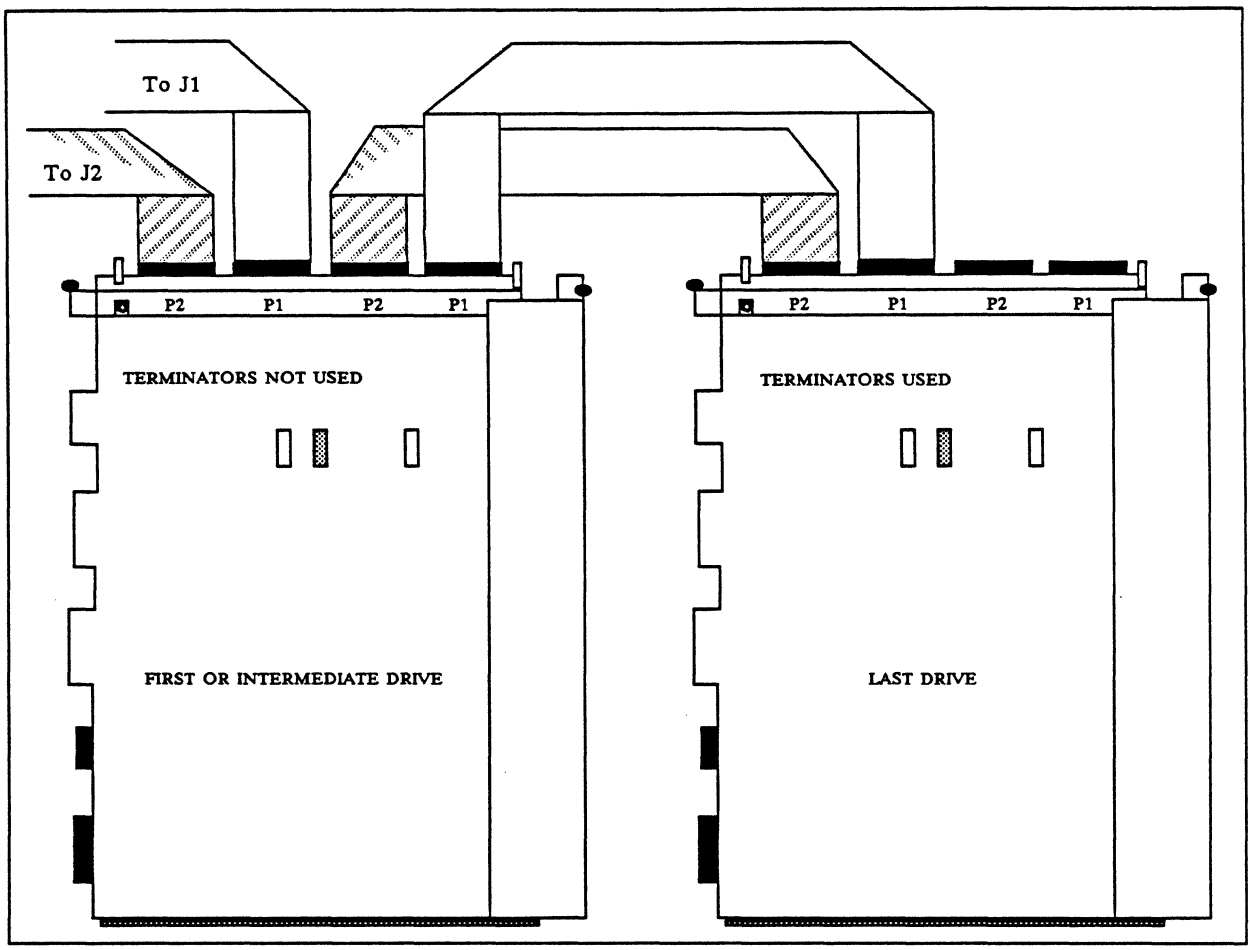

Figure 5-11 Connecting Tape Drives to the Britton Lee database server

Figure 5-12 shows the Tape interface panel. Observe connector "J" number and "pin 1" orientation when installing cables.

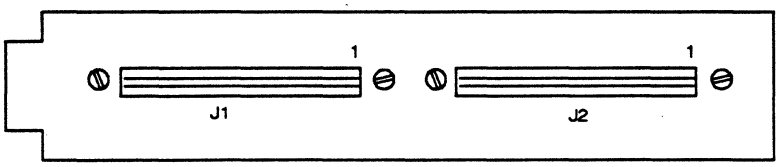

Figure 5-12 Tape Interface Panel

5.6. Connecting Modem For Remote Diagnostics

The configuration described below allows Britton Lee personnel to troubleshoot your Britton Lee database server over telephone lines.

1. An answer-type or answer/originate-type full-duplex modem (300 baud) is connected to the Britton Lee database server's Maintenance Port via an IEEE-488 full-modem cable.

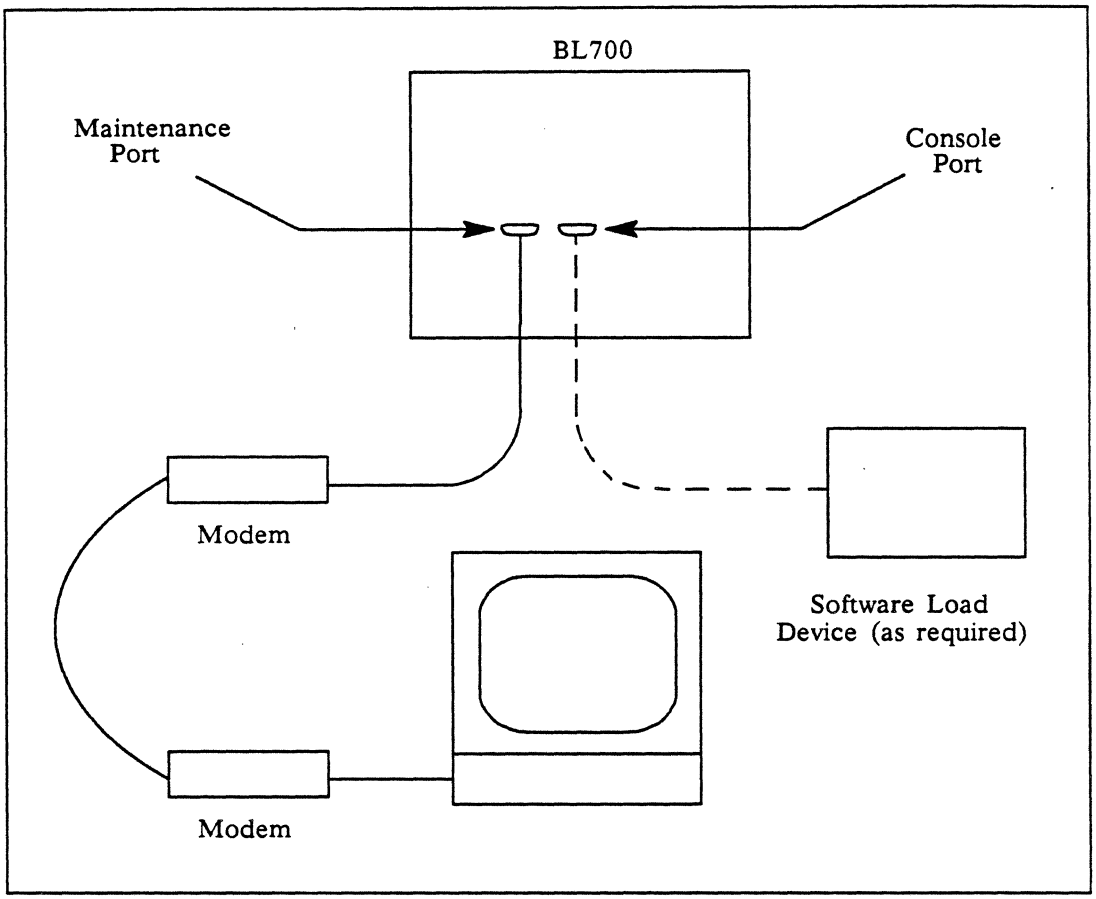

Figure 5-13 Connecting Modem to the Britton Lee database server

2. The REMOTE pushbutton on the Britton Lee database server's front panel must be depressed. The ENABLE indicator on the front panel will light up.

   If remote assistance is required, do not disturb the state if the Britton Lee database server beyond that stated above.

The connection of a software load device to the console port makes it possible to load utilities and diagnostics as required during the remote maintenance procedure. The loading of such maintenance utilities will be simpler if they have previously been transferred to the System Disk using the 'fileload' or 'fileload -t' commands. In systems with a tape controller board, this loading could also be accomplished with a tape drive connected to the Tape interface panel.

Detailed procedures for the loading of software and utilities are given in the appendicies of this manual.

6. Section Six – Loading Software

6.1. Introduction

There are two groups of software loading procedures. One procedure covers loading the system software set, which would be done for new installations and software upgrades. The other procedure is designed to load single files or single utilities composed of multiple files (for example; ethernet is a single file, while DFU is a single utility composed of three files, DFU, DFU2, AND DFU3), which include hardware diagnostics, DBA utilities, optional communications software, and, in special cases, members of the system software set as directed by Britton Lee console commands are covered in Appendix A of this manual, but a short description of idmboot, load, loadtape, list, listtape, and fileload is given here.

idmboot	establishes software connection of Britton Lee database server maintenance port to a load device other than Britton Lee tape and DSC-3.
load	directs the Britton Lee database server to read system software set from host tape, or from first software diskette and writes to system disk. Used with <filename> directs the Britton Lee database server to load a single utility into MEMORY ONLY and execute it.
loadtape	same as preceding, but accesses Britton Lee tape.
list	lists the contents of the load device media.
listtape	same as preceding, but accesses Britton Lee tape.
kernal fileload	used to continue loading software diskettes; when used with <filename>, loads single files, or single utilities, onto system disk after the system software set has been loaded.
kernal fileload –t	same as preceding, but accesses Britton Lee tape.

NOTE

The 'kernal fileload <filename>' and 'kernal fileload –t <filename>' commands should not be used to transfer individual members of the system software set, including the files KERNAL, SYSCALLS, FRONT, GRYPROC, SUPPORT, SORT, DUMP, LOAD, COMPILE, EXECUTE,

RECOVER and LISTEN. These files should be transferred only as a group, as described in the appropriate Appendix.

If these files are not transferred as a group, the system will diagnose it as a problem at boot time and disallow operation of the Britton Lee database server until all system files are present.

6.2. Part 1 - Loading System Software Set

To format the system disk, use DFU prior to starting the load process. See the Operation Manual for instructions on using DFU. If upgrading your software to a new release, you might want to extend your system database before transferring the system software set. Refer to *extend database* in the IDL Reference Manual or *alter database* in SQL Reference Manual. After the load, it is a simple matter to de-extend the database to reclaim the unused space.

1. Use the same command with a negative "demand".
2. If you did not extend the system database before the load and it ran out of space during a load, just go into your query language and extend it.
3. Turn the key to RUN to use IDL or SQL.
4. Extend the system database.
5. Turn the key to SAFE and wait for the safe indicator to light before turning it back to MAINT to continue loading the system software.

You DO NOT have to start the loading from the beginning.

WARNING

When updating system software, DO NOT reformat the system disk.

The Britton Lee database server performs a self-test each time it is reset. This occurs several times during the loading process. The self-test is evident by the flashing of the front panel READY, SAFE, and SERVICE indicators and by the display of "slots" information on the console terminal.

Error messages may appear during the self-test. If any board is defective, the "***DEFECTIVE BOARD***" message appears and the SERVICE light comes on. Chapter 9 describes adding and changing circuit boards. See the "slots" command in Appendix A for explanations of messages.

6.2.1. Preliminary

1. Schedule some down time for your Britton Lee database server. It takes about a minute to load the system software set from Britton Lee Tape, and closer to thirty minutes when using host tape, IBM PC, or DSC-3.
2. Connect a console terminal to the Britton Lee database server that has lower case character set. Remember all Britton Lee database server console commands are entered in lower case.
3. Connect the load device to the Britton Lee database server's maintenance port, or, if from Britton Lee tape, to the Britton Lee's tape interface (Host tape requires appropriate software; Britton Lee tape requires Tape Controller option and DBP Revision 27 or higher). If the DBP has revision level 29 or higher, it is also possible to load from host by sending the appropriate embedded command(s), along with the actual software to be transferred, over the same port.
4. If Britton Lee database server is up and running, turn key switch to SAFE, wait for SAFE light, then turn switch to MAINT. The Britton Lee database server must be in MAINT to load software.

6.2.2. Ready To Start

Depending on load device, the software distribution will arrive on IDM tape, diskettes, or host tape. The console command "loadtape" directs the Britton Lee database server to the tape drive and reads in the software. Host tape and IBM PC need two commands to do the same thing. "idmboot" issued at the load device (host or PC is used to establish communication between the Britton Lee database server and the load device, and "load" issued at the console is a procedure that does the read of software diskette A or host tape. DSC-3 requires a reset and "load" to read the System Boot Diskette. Succeeding software diskettes are loaded with the appropriate "fileload". You are now ready to turn to the Appendix that corresponds to your load device for the procedures of loading the system software set. However, it is strongly recommended that you read Part 2 regarding the loading of the hardware diagnostic utilities, the DBA utilities and the optional communication software before turning to the appendices.

6.3. Part 2 - Loading Single Files And Utilities

After finishing the load of your system software set, you may want to consider loading the following utilities (the DFU and CKDB utilities may or may not be loaded during the system software set load while the other files are never automatically loaded with the system software set and must, therefore, be loaded explicitly.) Once they are loaded onto disk, however, they may not be subsequently removed. Any software upgrades in the future, therefore, require that you load these files explicitly again to overwrite any old versions that are on disk (this may not apply to DFU and CKDB because they may be loaded during the system software upgrade. See "DBA Utilities" below for details.)

These files and utilities are mainly used as tools for maintenance of Britton Lee database server software and hardware. Over time they will probably vary in size, but at the moment each file and utility approximately needs:

File or Utliity	# of 2K blocks needed
dfu	34
dfu2	16
dfu3	17
ckdb	36
ckdb2	18
td	9
dd	13
memtest	5
ethernet	17
blockmux	

Table 6-1 File and Utility Block Requirements

If you choose to conserve space on your system disk, you may also load these files into memory directly from the load media and execute them. DFU in particular is always loaded into memory directly when formatting the system disk for the first time during a new installation. The Optional Communications Software may NOT be loaded into memory directly.

6.3.1. DBA Utilities

Since disk space may be limited on your Britton Lee system, we have made transfer of some files contingent on space being available during the system software set load covered in Part 1 of this

chapter. Although part of the system software set, CKDB, CKDB2, DFU, DFU2, and DFU3 will not be loaded if the system database does not have sufficient space.

NOTE

> The warning message "not enough space" encountered while loading your system software means that there is not enough space for the system software set, DFU, and CKDB excluded. The only way to tell whether DFU and CKDB are loaded is to read the console messages saying which files are loaded. Refer to the appendix corresponding to your loading device for details of console messages displayed during the loading session.

These sets of files are treated as one unit so that sufficient disk space must exist for both files of a set for either to be loaded. By the same token, only the filename DFU or CKDB needs to be typed in when loading the set. DFU and CKDB are documented in the Operation Manual.

6.3.2. Optional Communications Software

Ethernet and Block mux are not part of the system software set and so must be loaded explicitly.

6.3.3. Hardware Diagnostic Utilities

Dd, td, and memtest are also not part of the system software set, and must be loaded explicitly. Dd, td, and memtest are described in the Maintenance Manual Disk Diagnostics, Tape Diagnostics, and Memtest respectively.

You may now turn to the Appendix corresponding to your load device for the procedures of loading single files and utilities.

7. System Boot And Confidence Test

7.1. Introduction

This section describes the Britton Lee database server power up, System Boot and Confidence Test procedures. These operations make the Britton Lee database server fully operational. Be sure the system disk has been correctly formatted and the Britton Lee system software has been loaded as described elsewhere in this manual. This section includes the Britton Lee database server power down sequence.

The automatic system boot process loads the Britton Lee system software from the system disk into the Britton Lee database server's memory and executes it. This is done in two steps. First, the RECOVER program is loaded. RECOVER checks that all databases are in a consistent or safe state. Next, the main body of the Britton Lee database server software is loaded. This software consists of several programs that are loaded individually.

The messages displayed by your Britton Lee database server may differ from those given in the following examples. The number and order of system boot messages depend on the following:

- which boards are in the system
- which slots the boards occupy
- the software revision level
- the names of the disks
- the states, names and number of databases.

7.2. Booting the System

1. Power up the terminal connected to the Britton Lee database server's Console Port and set it to 300 baud. Use of the Console Terminal is highly recommended. The messages described in this section can only be seen with a console terminal or 'virtual console' on the host. (See the CAUTION at the end of this section.)
2. Confirm that the AC (alternately current) power switch on the rear panel and the Function Switch on the front panel are in the OFF position.
3. Turn on AC power to each disk or tape drive to be used, pausing 30 seconds between drives. Wait for the drives' READY indication. FAULT lights (if any) should be OFF.
4. Place all disk or tape drives on-line one at a time.
5. Turn on AC power to the Britton Lee database server.
6. Turn the Britton Lee database server's Function Switch to RUN position. The database processor performs a self-test and loads the KERNAL file if the test is passed.
7. If the DBP self-test is passed, the RUN, SAFE, and SERVICE lights on the front panel flash briefly. If the test fails, the SERVICE light comes on solid. If, in addition to the SERVICE light, one or both of the READY and SAFE lights blink on and off continuously, call for service immediately. Table 4-1 lists the combinations of lights that indicate severe hardware failures of the 10MHz DBP. If the lights do not flash at all, the database processor may be defective, missing, or improperly connected to the front panel.

Front panel lights**	Hardware failure
READY flashes	MMU failure
SAFE flashes	On-board RAM failure
READY and SAFE flash together	SI/O failure
READY and SAFE flash together	bad battery back-up RAM

Table 7-1 10 MHz DBP Self-Test Fail and Light Indicators

**SERVICE light remains steady in all four cases.

8. If the FAULT light comes on, an explanatory message appears on the console. The SERVICE light also comes on.

9. If the DBP self-test is passed and the FAULT light does not come on, the following message appears on the console:

   IDM/<n> DBP rev n

10. The Britton Lee database server performs a self-test of all circuit boards. (This is the equivalent of the "slots" console command.) The Britton Lee database server's memory boards are listed by slot number, and the other circuit boards are listed by slot, name, and revision number:

    Slot 0: <board name> rev n
    Slot 1: <board name> rev n
    Slot 2: <board name> rev n
    Slot 3: <board name> rev n
    ...
    ...
    Slot n: <board name> rev n

    Error messages may appear during the self-test. If any board is defective, the message:

    *** DEFECTIVE BOARD ***

    appears and the SERVICE light comes on. For explanations of other messages, see the "slots" command of Appendix A.

11. The boot process begins now. Messages similar to those listed below appear on the System Console:

Message	Meaning
<BL series> - Filename:	The system disk has been located.
System disk: Ctlr a cable b drive name x	
KERNAL n:<day> <date> <time>	The KERNAL program has been loaded from the system disk and is running. The compilation date and disks on-line are displayed.

KERNAL n: <day> <date> <time>
Accessible Disks:

Name	Ctlr	Drive	Low	High	Status
'disk 1 '	x	y	m	n	<status 1>
'disk 2 '	x	y	m	n	<status 2>

"disk n " x y m	n <status n>
loading <file name>	Britton Lee system software is loading<file name>being loaded into main ...memory. loading <file name>
number of available dbins: x	x logins are available for user processing.
Free process pages: y	How much memory is available as workspace for dbins. (The average dbin uses 5 pages; the maximum is 10 pages.)
RECOVER Version n: day date time	The RECOVER program is running.
Recovering <name>: already safe Recovering <name>: already safe Recovering <name>: already safe Recovering <name>: already safe Recovering <name>: already safe Recovering <name>: recovered Recovering <name>: recovered Recovering <name>: already safe	RECOVER checks whether all databases are consistent or safe. Databases that have not not been opened since RECOVER last ran are "already safe."
IDM Version n: day date time SYSTEM release <rev>	The System Software of revision <rev> has been loaded and the system code is running.
CONFIGURE to channel x CONFIGURE to channel y	host interfaces have been enabled. Users can now access the Britton Lee database server. ("x" and "y" are slot numbers.)

NOTE

The RECOVER program may take anywhere from a few seconds to several hours to complete. Recovery time depends on the number and size of entries in the transaction log since the last safepoint. A short checkpoint interval reduces the size of the transaction log.

12. After the above messages and before the CONFIGURE messages appear, the Britton Lee database server's SAFE and READY lights come on. Turn the Function Switch to the RUN position. If the SAFE, READY, and POWER lights stay on, system boot is complete. The Britton Lee database server's clock must be reset via the host after power-up. See your host-resident software documentation for information on setting the Britton Lee database server time.

If your results approximate those above, then your Britton Lee database server is fully operational and ready for use. Run the following confidence test to confirm the Britton Lee database server's operation.

CAUTION

All console messages will be lost without a console terminal attached to the Britton Lee database server's maintenance port (or a 'virtual

console' host file if a host computer). If the console becomes disconnected during the boot procedure, enter "control-C" after reconnecting it. The current state of the Britton Lee database server and the last message(s) generated while the Britton Lee database server was running will appear. (Because of the size of the message buffer, the full message(s) may not be available.)

7.3. System Confidence Test

This procedure can be used to ensure that the Britton Lee database server is operational according to a host computer connected to the Britton Lee database server's RS-232 or IEEE-488 host interface. The following is a general example.

1. Connect the host computer with its query terminal to the Britton Lee database server as described in Chapter 5.
2. Power up the host system and the Britton Lee database server.
3. Perform the System Boot procedure of the previous section unless it has just been done. The Function Switch should now be in the RUN position and the READY light should be on.
4. Load and start execution of the SQL Query Language on the host.
5. Open the system database and retrieve the names of the system relations:

```
1) select name from relation
2) where type = "S";
```

NOTE

The front panel SAFE light goes out as soon as a database has been opened.

6. A list of all the system relations should appear, beginning with:

```
name

relation
attribute
indices
protect
<n> rows affected
```

7. Type "exit" in response to the SQL prompt:

```
1) exit;
```

The Britton Lee database server is fully operational through the chosen interface if this test is completed successfully.

7.4. Power Down Sequence

This sub-section describes how to power the Britton Lee database server down from a fully operational state:

1. Turn the Britton Lee database server front panel Function Switch to the SAFE position.

2. Wait for the SAFE light to go on. This occurs after all active transactions are complete. All databases have been brought to a consistent state, new transactions are rejected, and all users have logged off.

   The waiting period depends on the number and size of the transactions to be completed, the size of the databases involved. A host process may delay the safe state indefinitely. The state of the Britton Lee database server in the SAFE position may be ascertained by viewing the console messages.

   Turning the Function Switch back to RUN at this point allows the Britton Lee database server to continue normally.

3. When the SAFE light comes on, turn the Function Switch to the OFF position.

   NOTE

   If the front panel switch is turned from RUN to MAINT or from SAFE to MAINT without waiting for the SAFE light to come on, the database server software aborts all active transactions and ignores all signals. If required, this is the preferred method of taking down the system with users still logged in. After all transactions have been backed out, the Britton Lee database server will reboot and then be in maintenance mode. At this point early production Britton Lee database servers will have their SAFE light come ON and can be restarted by simply turning the Function Switch to OFF and then back to SAFE or RUN.

   If the switch is moved to the OFF position without waiting for the SAFE light to appear, the Britton Lee database server acts as if an AC power failure occurred. Although recovery is automatic when the Function Switch is returned to the SAFE or RUN position, this method of powering down should be avoided. (Refer to section 7, sub-sections titled, "ac Power Failure" and "Auto Restart", for further information.)

4. Place the On-Line/Off-Line Switch (if provided) on all disk drives to the Off-Line position.

5. Turn off AC power to the Britton Lee system and to the console terminal.

6. Turn off AC power to all disk drives.

8. System Configuration

8.1. Introduction

The Britton Lee database server database contains several Data Dictionary tables. One of these is the "configure" table, which controls or records the following system parameters:

- Baud rate and modem control for RS-232 host interface ports. The baud rate of an interface must match that of the processor connected to it. "Modem control" specifies what EIA signals are monitored. "Cancel aged results" may be specified for RS-232 host interfaces of Revision 38 or above.
- The unique addresses of each GPIB host processor attached to the Britton Lee database server. "Cancel aged results" and "host timeout" may also be specified for GPIB host interfaces of Revision 16 or above.
- Character representation, system security, Ethernet address, byte/word ordering and time intervals for a host processor attached to the Britton Lee database server via an Ethernet port.
- Tape drive speed
- The interval between checkpoints
- The unique Britton Lee system ID if multiple Britton Lee database servers are used together

The revision level of the system software may be determined by a retrieval from the "configure" table. (See the sub-section titled, "VERIFYING THE CONFIGURATION".)

NOTE

The query language used in the examples in this chapter is SQL. The examples must be translated if another query language is implemented on your host computer.

The term "host number" used in the following discussions is analogous to a port number, and is not to be confused with the "Host ID" which identifies the host to the Britton Lee system.

Please refer to the *System Administrator's Manual* for further discussion of the data dictionary "configure" table.

The default values (summarized in Table 8-1) are assumed if no rows are inserted to the "configure" table.

Type	Default (when row absent)
RS-232 host interface	9600 baud, no modem control, no "cancel host", and no "cancel aged results"
IEEE-488 host interface	one host (host 0) with GPIB address of 1, no "cancel aged results", and (if Revision 16) "host timeout" set.
Ethernet host interface (XNS)	trustworthy host 1024 byte data packet address = 0x08002c000000, (hex) retry = 15 identify = 5 host id = -1 hello interval = 10 min. retry interval = 1
Ethernet host interface (TCP)	trustworthy host retry = 100 retry interval = 2
Checkpoint Interval	10 minutes
RS300 ID	1
Enable data read during dump	true
Britton Lee database server tape interface	Drive's low speed
Checkpoint Interval	10 minutes
Britton Lee system ID	0

Table 8-1 Configuration Default Values

8.2. The Configure Table

Initially, the "configure" table contains no host interface configuration rows. The absence of rows enforces the default values in Table 8-1.

Two SQL commands are required to specify a non-default value:

1. either an **insert into** or an **update** depending on whether the row was already in the "configure" table and
2. the **reconfigure** command.

If a non-default value has been configured by inserting a row, this value can only be changed by using the **update** command, followed by the **reconfigure** command.

If an invalid row is added to the "configure" table, the following error message appears at the console terminal when the system is booted or reconfigured:

```
Tuple ignored during reconfigure command:
type <x>, number <y>, value <z>
```

The "configure" table has three columns:

type (fixed character, 1 byte): defines to what kind of system parameter the row refers. The following information is a partial list of the of the allowable types:

"S" = RS-232 host interface (serial interface)
"P" = IEEE-488 host interface (parallel interface)
"T" = Britton Lee database server Magnetic Tape interface
"C" = Checkpoint interval
"I" = Britton Lee system ID
"R" = System Software Revision

number (smallint): For an RS-232 host interface, this is the port number. For an IEEE-488 host interface, this is the host number. For a magnetic tape interface, this is the tape drive number.

value (smallint): contains the configuration value specific to the system parameter.

8.3. Configuring The RS-232 Host Interface

Summary:

"type" = "S"
"number" = port number (0 - 63) for up to eight channels
"value" = sum from Table 8-2, Table 8-3 and Table 8-4

The RS-232 host interface variables (baud rate, modem control, "cancel host", and "cancel aged results") are configured with one row per port.

A row must be added for each port to be configured with a non-default value.

Each RS-232 host port on the Britton Lee database server can be configured to operate at a baud rate defined in Table 8-2. Unused ports can also be set to OFF, reducing the likelihood of spurious interrupts. Ports are numbered sequentially from zero. The first RS-232 host interface (PCB in lowest-numbered slot) is associated with ports 0 through 7, the second with ports 8 through 15, and so on. This corresponds to the labeling on the RS-232 host connectors on the Britton Lee database server's rear panel.

CAUTION

All unused ports should be configured OFF. Use caution when executing the **reconfigure** command. You can lock yourself out by configuring all ports OFF. Should this happen, use CONFIGURE mode of DFU to correct the "configure" table.

Changing the PCB slot number or cable assignment of channel PCB's will also require corrections to the "configure" table.

8.3.1. Baud Rate

Table 8-2 lists the value specifying each standard baud rate.

Baud Rate	Value
illegal	0
illegal	1
150	2
300	3
600	4
1200	5
1800	6
2400	7
4800	8
9600	9
19200	10
OFF	11

Table 8-2 Baud Rate Values

8.3.2. Modem Control and Cancel Host

The Britton Lee database server's RS-232 host interfaces can be configured for modem control. Four lines are used:

CTS	Clear to Send
DCD	Data Carrier Detect
RTS	Request to Send
DTR	Data Terminal Ready

When the Britton Lee database server is powered up, it asserts RTS and DTR to show that it is ready to start communication with a host. This happens whether the host is using modem control or not. When modem control is used, the Britton Lee database server observes CTS and DCD to determine the state of the host.

1. The host asserts DCD and CTS and the Britton Lee database server assumes that the host is ready to communicate.
2. If the host does not assert CTS, the Britton Lee database server stops sending data until CTS is reasserted.
3. If the host does not assert DCD, the Britton Lee database server does one of two things, depending on the contents of the "configure" table. If the interface is not configured for "cancel host", the Britton Lee database server treats the transaction of DCD as it would treat a break. The current command is aborted and the Britton Lee database server prepares to read the next communication packet. If the interface is configured for "cancel host", the current command is aborted and all pending commands from the host are canceled.

CAUTION

The configuration of a given RS-232 interface determines the wiring of the RS-232 cable. For ports not configured OFF, any unused modem control lines *must be tied back* to prevent spurious interrupts. Refer to Appendix B for cable schematics and "tie-back" methods for unused modem control lines.

Modem Control Selection	Value
NO modem control or "cancel host"	0
DCD (Data Carrier Detect) only	16
DCD plus CTS (Clear to Send)	48
"Cancel host" plus DCD	80
"Cancel host" plus DCD plus CTS	112

Table 8-3 Modem Control Values

8.3.3. Cancel Aged Results

If the serial channel is Revision 38 or above, it can be configured to cancel output that has not been requested by the host after a certain period time. This configuration parameter is "cancel aged results".

Cancel Results Selection	Value
never cancel results	0
wait ONE minute	16384
wait FIVE minutes	-32768
wait TWENTY minutes	-16384

Table 8-4 Cancel Aged Results Values

NOTE

Table 8-1 applies to both the RS-232 host interface Revision 38 and above and to the IEEE-488 Host interface Revision 16 and above.

8.3.4. RS-232 Configuration Example

To configure Port 7 for 300 baud (the 'value' for 300 baud is from Table 8-2):

```
1) insert into configure (type, number, value)
2) values ('S', 7, 3);
1 row affected
1)reconfigure;
```

The message "1 row affected" appears on the Query Terminal, and is not entered by the operator. (Note that the **open system** command must be given before performing operations on the " configure" table.)

Be sure the host computer is set for the same rate as the channel through which it communicates. To change the baud rate of an existing row, use the SQL command **update**. To "reconfigure" Port 7 from the 300 baud to 1200 baud:

```
1) update configure set value = 5
2) where type = 'S' and number = 7;
```

```
1 row affected
1) reconfigure;
```

To configure modem control as well as baud rate, simply add the modem control value frc Table 8-3 to a baud rate value from Table 8-2.

For example, to configure port 0 for 300 baud with both CTS and DCD complete the following li

1. Find the value in Table 8-2 that corresponds to 300 baud.
2. value = 3
3. Find the appropriate value in Table 8-3 for CTS plus DCD modem control.
4. value = 48
5. Add 48 to 3, giving 51.
6. insert a row containing the value 51 to the "configure" table.

```
1) insert into configure (type, number, value)
2) values ('S', 0, 51);
1 row affected
1) reconfigure;
```

To include "cancel aged results after one minute", add the value 16384 (Cancel Aged Results Val ues) to the appropriate values from the baud rate and modem control tables. Perform an **insert** o **update** with the resulting value.

8.4. Configuring The IEEE-488 Host Interface

Summary:

"type" = "P"
"number" = host number (0 - 63) for up to eight channels
"value" = sum values from Table 8-2 and Table 8-3

The IEEE-488 host interface variables (host GPIB address, "host timeout", and "cancel aged results") are configured with a single row per host in the "configure" table.

One row must be added for each host to be configured with a non-default value.

8.4.1. GPIB Address

Unless the default configuration applies (a single host numbered 0, GPIB address 1), each host on the IEEE-488 bus must be configured for its GPIB address on the bus. The IEEE-488 host interface in the lowest numbered slot is associated with hosts 0 through 7, the next with hosts 8 through 15, etc. Assign a bus address between 0 through 30 for each host.

8.4.2. Host Timeout

If Revision 16 or above, the IEEE-488 host interface should normally timeout if the host stops communicating with the Britton Lee database server. If the host does not respond to its address on the bus within two seconds, the channel sends an interface clear (IFC) and waits for a request from the host. The default timeout is two seconds.

Host Timeout	Value
set short timeout (2 seconds)	0
no timeout	32
set long timeout (20 seconds)	64
illegal	96

Table 8-5 Host Timeout Values

8.4.3. Cancel Aged Results

If Revision 16 or above, the parallel channel can be configured for "cancel aged results". Refer to NO TAG for applicable values.

8.4.4. IEEE-488 Configuration Example

To configure host number 4 as GPIB address 27 with no "host timeout" and "cancel aged results" after 20 minutes:

```
    27    for GPIB address 27
    32    for no "host timeout" (Table 8-5)
-16384    for cancel results = 20 minutes (Table 8-4)
------
-16325    "value" for "configure" row
```

The commands are:

```
1) insert into configure (type, number, value)
2) values ('P', 4, -16325);
1 row affected
1) reconfigure;
```

If we want "host timeout" set for host 4 while keeping the rest of the configuration:

(value is 27 + 0 + (-16384) = -16357)

```
1) update configure set value = -16357)
2) where type = 'P' and number = 4;
1 row affected
1) reconfigure;
```

8.5. Configuring the Ethernet Host Interface

The BL700 supports communication via the XNS or TCP protocol suites over a special communic tions board. The Ethernet controller board will run only one protocol at a time. If you wish to u your controller board for both TCP and XNS communications, you must reconfigure the BL700 f each time you change protocols, or have multiple controller boards.

More than one Ethernet board may be installed in a single BL700. The "configure" table mu contain configuration information for each.

To use either protocol, you must

- have the Ethernet controller board installed,
- add configuration information to the "configure" table in the "system" database,
- issue a **reconfigure** command or reboot the BL700

The Britton Lee document *Ethernet Controller Board Configuration* (part number 205-2017-XXX describes the procedure for configuring both the XNS and TCP protocol interfaces. Please refer t this document for complete instructions on the Ethernet configuration.

8.6. Selecting a Checkpoint Interval

Summary:

"type" = "C"
"number" (not used)
"value" = 0 - 65535 as desired

A checkpoint interval is the number of minutes between disk updates. All transactions entered during the interval are stored to the Britton Lee database server disk at the end of each checkpoint interval. A short checkpoint interval updates data more often and shortens the time needed for RECOVER during a system boot. The value "0" PREVENTS checkpoints from occurring and is NOT recommended. The default is 10 minutes.

To select a checkpoint interval of five minutes:

```
1) insert into configure
2) (type, value)
3) values ("C", 1);
1 rows affected
1) reconfigure ;
1)
```

8.7. Read Database During Database Dump

Summary:

"type" = L
"number" = not used
"value" = 0 or 1

If an "L" row is not present, as in the default configuration, or if value = 0 the Britton Lee database server will allow **selects** on a database while it is being dumped.

If the value = 1, the files will be locked during dump, user access will be denied.

8.8. Configuring The Block Mux Host Interface

Summary:

"type" = "B"
"number" = 0, 8, 16 or 24
"value" =

"type" = "B"
"number" = 1, 9, 17, 25
"value" = number from the default value = 256 (256 concurrent users coming through channel)

4	control unit address
1024	host send trustworthy host user names (IBM/VM driver)
1028	value column of that row

NOTE

It takes two bytes of storage in the block mux channel for each user.
If it is configured to 256, then 512 bytes are set aside for that.

The block mux host interface variables (host control unit address, "host timeout", and "cancel aged results") are configured with a single row per host in the "configure" table.

One row must be added for each host to be configured with a non-default value.

8.8.1.Control Unit Address

Unless the default configuration applies (a single host numbered 0, control unit address 1), each host on the block mux bus must be configured for its control unit address on the bus. The block mux host interface in the lowest numbered slot is associated with hosts 0 through 7, the next with hosts 8 through 15, etc. Assign a bus address between 0 through 30 for each host.

bits 0-3 = the control unit address

See your Driver Installation Manual for how to set this bit.

8.9. Trustworthy and Untrustworthy Hosts

bit 10 =host sends untrustworthy host user names
bit 11 = host sends untrustworthy host user ids
bits 12 & 13 = 0
bits 14 & 15 = cancel user output where
0 - never cancel
1 - cancel if not read in 1 minute
2 - cancel if not read in 5 minutes
3 - cancel if not read in 20 minutes

Table 8-6 Cancel User Output Values

8.9.1. Cancel Aged Results

If Revision 16 or above, the parallel channel can be configured for "cancel aged results". Refer to Table 8-6 for applicable values.

8.9.2. Block Mux Configuration Example

To configure host 4 with control unit address 6 with no "host timeout" and "cancel aged results" after 20 minutes:

```
     6    for control unit address 6
    32    for no "host timeout" (Table 8-5)
-16384    for cancel results = 20 minutes (Table 8-4)
------
-16346    "value" for "configure" row
```

The commands are:

```
1) insert into configure (type, number, value)
2) values ('B', 4, -16346);
1 row affected
1)reconfigure ;
```

NOTE

Changes to the "configure" table for block mux channel for 'B' rows only do not take affect until the Britton Lee database server is powered off and then powered back on.

8.10. Configuring The Britton Lee Database Server Tape Interface

Summary:

"type" = "T"
"number" = drive number (0 - 7)
or drive number (0 - 7) + 8
"value" = value from Table 8-7

The Britton Lee database server tape interface drive speed is determined by a single row per drive in the "configure" table. One row must be added for each tape drive that is to be configured differently from the default "low speed".

Drive speed and performance rewind information are stored in the same row for each drive. Information on the number of extra blocks to be appended at the end of tape is stored in a separate row for each drive.

8.10.1. Tape Drive Speed

Tape Option	Number	Value
Low speed, rewind tapes	drive #	0
High speed, rewind tapes	drive #	4
Low speed, don't rewind	drive #	16
High speed, don't rewind	drive #	20
Extra blocks at end of tape	drive #+8	#blocks

Table 8-7 Tape Speed Values

8.11. Configuration Examples

To configure tape drive number three to write eight extra blocks at the end of the tape:

```
1) insert into configure (type, number, value)
2) values ('T', 11, 8);
1 row affected
1) reconfigure;
```

To configure tape drive number seven for high speed:

```
1) insert into configure (type, number, value)
2) values ('T', 7, 4);
1 row affected
1) reconfigure;
```

8.12. Selecting Checkpoint Interval

Summary:

"type" = "C"
"number" (not used)
"value" = 0 - 65535 as desired

The "value" of the checkpoint interval is the number of minutes between checkpoints (disk updates to reflect all changes to tables). The value "0" PREVENTS checkpoints from occurring and is NOT recommended.

To select a checkpoint interval of five minutes:

```
1) insert into configure (type, value)
2) values ('C', 5);
1 row affected
1) reconfigure;
```

8.13. Verifying The Configuration

To examine the contents of the "configure" table:

1) **open system;**
2) **select type, number, value from configure;**

The default values of Table 8-7 are effective for a given system parameter unless the "configure" table contains a correct row for that parameter.

To determine the revision of the system software currently residing on the system disk:

1) **open system;**
2) **select value from configure**
3) **where type = "R";**

8.14. Summary

When your system is configured you will have one row for each RS-232 port where the host being supported requires a setting different from the defaults listed on page two of this chapter. For the Ethernet channel you will have up to eight rows. A host can override the Ethernet configuration using an IDENTIFY command. If the default values for checkpoint, and Britton Lee database server ID are not adequate, you will have a row for each of these. When you have configured your system, verify the configuration rows as described in the section called Verifying The Configuration in this chapter.

9. Hardware Upgrade And Maintenance

9.1. Introduction

The Britton Lee database server has been designed with ease of upgrade and maintenance in mind. This chapter gives general descriptions of the functions of the various circuit boards in the Britton Lee database server, as well as instructions for adding and changing circuit boards and their connections.

In addition, procedures are given for replacement of certain components, including fans, motherboard, PROM's, and memory chips.

For software-related upgrades, such as updating System Software, loading of maintenance programs, see the Operation Manual.

9.2. Determining System Revisions

When upgrading the system, either by adding a new feature or installing a Field Change Order (FCO), observe the part number and revision requirements specified in the documentation accompanying the feature or upgrade.

9.2.1. Circuit Board (firmware) Revision

A console listing of the Britton Lee database server circuit board revisions may be obtained by using the console "slots" command. Note that the revision listed for most boards is that of the "on board" proms (firmware revision). The console commands can only be entered when the front panel Function Switch is in the MAINT position.

9.2.2. System Software Revision

The present system software revision may be determined by one of the following methods:

1. A message giving the System Software revision occurs every time the system software is booted. After the "recover" program completes the Britton Lee database server prints out the message:

   <BL series> version n: day date time
   SYSTEM release <rev>

Where the <rev> is the system software revision. This message occurs when the front panel Function Switch is placed in the RUN or SAFE position from the OFF or MAINT position.

2. The console commands list (using the load device connected to the maintenance port) or listtape (using the database server tape drive) print out a listing of the "contents" of the media.

   Contents of load device
   File 1: directory revision <rev> size <z>
   File 2: .....

Where the <rev> for the directory is the system software revision.

3. The fileload program records the system software revision as a row in the "configure" table. This may be accessed (through the host interface) with a retrieval similar to the following:

```
1) open system;
1) select value from configure
2) where type = "R";
```

The "value" returned by the Britton Lee database server is the IDM/RDBMS software revision.

The "configure" table may also be accessed using the Configure mode of DFU (Disk Formatting Utility). See the Operation Manual for details.

9.3. Circuit Boards

The Britton Lee database server can accommodate up to sixteen circuit boards. The minimum configuration is:

one database processor board (DBP)
one timing and control board (T&C)
one disk controller board (DC)
one host interface board, RS-232 or IEEE-488 (SIO or PIO)
one 1MB memory board (smaller increments were available in the past)

The remaining eleven slots can be used to add memory, host interface boards, disk or tape controllers, or a database accelerator (DAC).

9.3.1. Maximum Configuration

The table below shows the maximum number of boards of a given type:

database processor	1
timing & control	1
memory boards	6 (1MB boards)
host interface boards	8 (total of IEEE-488 and RS-232)
disk controller boards	4*
tape controller boards	1
database accelerator	1

Table 9-1 Input Power Requirements

* If a tape controller is present and disk controllers are revision 27 or lower, only three disk controllers can be used.

9.3.2. Board Descriptions

This section describes each type of circuit board in the Britton Lee database server.

The **database processor** manages all system resources and executes most of the software in the system.

The **memory timing and control** board provides the control and timing necessary to move data in and out of memory.

The **memory boards** hold IDM/RDBMS code and user work space. In the past, memory boards have been available in .25MB and .5MB capacities. In FCC production models, only the 1MB version is available. If memory is expanded, it is used for caching disk data or storing user commands.

Each **disk controller** board manages up to four SMD-type disk drives, via one daisy chain A cable and up to four individual B cables.

The **tape controller** board controls up to eight tape drives. A tape controller board is connected to up to two microformatters, which are in turn connected to up to four tape drives each.) The tape controller board requires the presence of disk controller board(s) of revision 26 or higher.

Each **host interface** board has either eight independent RS-232-compatible lines (baud rate: 150 to 19,200) or one IEEE-488 GPIB bus.

The **database accelerator** is a high speed processor (10 million instructions per second) specifically designed to support a relational database management system.

9.4. Circuit Board Installation

The Britton Lee database server is shipped with ordered features installed. If it is necessary to install additional features in the field (another disk controller, more memory, etc.) the procedures described in this section should be followed.

External I/O connections between the Britton Lee database server and its attached equipment is accomplished via the interface panel area on the rear of the Britton Lee database server. Chapter 5 of this manual describes the various interface panels in detail.

When the Britton Lee system is powered up, the software interrogates each card slot to determine the hardware configuration. To enable this configuration effort to proceed correctly, boards should be installed and connected as described in the following pages.

CAUTION

Do not remove or insert circuit boards or cable connections when power is on. Circuit boards are easily damaged by transient voltage spikes that may be generated during removal or installation of circuit boards or cable connections.

9.4.1. General Instructions

The following are general instructions for the installation of new options. Instructions for the specific board types are found in a later section.

1. If the Britton Lee database server is in use, put the front panel Function Switch in the SAFE position. Wait for the SAFE light to come on before proceeding with the next step. All users must be logged off before the SAFE light will come on, which indicates that all transactions are complete.

2. Put the Function Switch, then the Main Circuit Breaker, in the OFF position.
3. For safety, disconnect AC power to the Britton Lee database server.
4. If the Britton Lee database server is rack-mounted, ensure that the cabinet is properly stabilized before extending the Britton Lee database server.
5. Release the cabinet latch if present, and slide the Britton Lee database server out of the cabinet.
6. Remove the circuit board cover. If cables are to be installed, remove the rear cover as well.
7. Disconnect any ribbon cables obstructing the relevant card slot. Be sure the cables are labeled for ease of reconnection. Handle ribbon cables carefully.
8. If you are replacing a board, remove the defective or obsolete board.
9. Insert the new circuit board in its card slot. If you are replacing a board with an equivalent board type, be sure the part numbers of the old and new boards match (or, if different, that the numbers match those given on the documentation supplied with the replacement board). Take care not to bend or break any pins or connectors.
10. The bus structure of the motherboard would suggest that any circuit board can be plugged into any slot. However, for optimum board cooling and internal cable routing it is recommended that the following sequence be used, starting with slot 15, the slot nearest the power supplies:

PCB Name	Slot
DBP	Slot 15
Disk Cntrlrs	Slot 15
DAC (if present)	Slot 11
Tape and/or Disk Cntrlr	Slot 11
All Channels	Slot 11
memory timing/Cntrlr	Slot 11
All Mem Brds	Slot 11
	Slot 0

** Slot 15 is reserved for the 10MHz DBP. The 10MHz DBP board may be installed in another slot, but no other board installed in slot 15 will be recognized by the 10MHz DBP.

Leave open slots for planned additional boards. Leave an open slot on both sides of the DAC board (slot 11) if available. Distribute evenly any remaining open slots between all pcbs to balance air flow through them.

11. Install any necessary interface panels on the rear panel, and make the necessary connections between the new boards and their interface panels.
12. Be sure all ribbon cables are installed and routed correctly. Reset all circuit boards and connections.
13. Replace the cover(s).
14. Boot the Britton Lee database server and run the "slots" command to be sure the new board is functioning properly.

9.4.2. Disk Controller

The first disk controller (highest-numbered slot) must be connected to the lowest interface panel. On the disk controller board, the cable that starts at connector J5 (Cable "B0") must go to the B Cable 0 position on the interface panel. J6 (Cable "B1") must go to the B Cable 1 position, J7 to B cable 2 position and J8 to B Cable 3 position. The 60-pin J4 cable (A cable) must be connected to the A cable position on the same interface panel. If a second disk controller is present, its interface panel should be located immediately above the first, and connected in the same manner as described above. See Chapter 5 for further details.

NOTE

Remember that disk controller 0 is always the disk controller in the lowest-numbered card cage slot.

9.4.3. Tape Controller

The tape controller board has two connectors, J4 and J5. To install a tape controller board, make the following connections:

J4 on the tape controller to J1 on the connector panel
J5 on the tape controller to J2 on the connector panel

Be sure that both ends of each cable have pin 1 lined up with the pin 1 mark on the mating connector.

9.4.4. Database Processor

The database processor Board has two 26-pin connections for the Console and Maintenance ports located on the Britton Lee database server rear panel. J5 on the DBP is connected to the Console Port, and J6 to the Maintenance port. The 20-pin J4 is connected to the front panel. J7 (40-pin) is intended for factory diagnostics only.

10MHz DBP has 256K bytes of local memory. If there are any defective RAM ics (chips), the console message

DBP Ram failure ic <xy>, <xy>
Slot <n>: <m>K ram mapped out

will be displayed, and power up sequence continues.
For instructions on replacing ram chips, reference the section Memory Chips later in this chapter.

9.4.5. IEEE-488 Host Interface

If an IEEE-488 host interface is present, connection is made via the 26-pin J5 connector on the board. J5 should be cabled to one of the two connector positions on the GPIB interface panel which should be located immediately above the disk controller panel(s).

9.4.6. RS-232 Host Interface

If an RS-232 host interface board is present, connection is made via the 50-pin J4 connector on th board. For undistributed RS-232 connections, J4 must be cabled to the lowest-numbered location o the RS-232 interface panel. If a second RS-232 host interface is installed, its J4 must be cabled t the next higher-numbered location on the same interface panel. One RS-232 interface panel ca accommodate four RS-232 host interface boards.

If an RS-232 Distribution Box has been ordered, the J4 cable should be connected directly to the rea of the Distribution Box, giving 8 separated RS-232 connections on the Britton Lee database serve rear panel. See Chapter 5 for further details.

CAUTION

All channels of a given type are configured by the system software in ascending order of their slot number in the card cage. For example, if the only RS-232 interface board is in slot 6, this board is called channel 0. The "configure" table contains information (baud rate, modem control, etc.) on this channel 0. If a second RS-232 interface board is added in a slot with a number lower than 6, then this new board becomes channel 0. This causes all data in the "configure" table that applied to the original channel 0 to be applied to the new channel 0. The original channel may subsequently appear to be defective.

This problem can be avoided by adding channels only in slots numbered higher than the existing channels, moving boards to lower-numbered slots if necessary to create vacancies. Alternatively, channels may be added in lower-numbered slots if the "configure" table is appropriately modified as described in Chapter 8.

9.4.7. Database Accelerator

The database accelerator (if present) has no external cable connections.

9.4.8. Memory Boards

The memory boards have no cable connections.

If the 6MB storage limit is exceeded, the console message

too much memory

will be displayed, and the excess will be disallowed.

For instructions on replacing memory chips, see the section titled *Memory Chips* later in this chapter.

9.4.9. Memory Timing and Control

The timing and control board has no cable connections.

9.5. Other Maintenance Procedures

To replace a front panel board:

1. Remove the six screws holding the bezel assembly to the chassis. Lay the Bezel on a piece of foam or cloth to avoid scratches.
2. Disconnect the following cables from the Front Panel:

   front panel J4 (from database processor board J4) front panel J5 (from motherboard J5 or ribbon connector on upper power supply) front panel J9 (Molex connector from power harness)
3. Remove the four screws holding the Front Panel assembly mounting brackets into the chassis. The Front Panel assembly, with brackets attached may now be removed from the chassis for repair or replacement.
4. If desired, the board may be separated from the Control Panel sheet metal by removing the four screws installed in the standoffs on the Control Panel sheet metal. (These four screws also hold the mounting brackets).

Reassemble the system by reversing the sequence above. Use caution to avoid pinching or otherwise damaging the cables to the front panel board.

After reinstalling the Front Panel assembly in the chassis, verify that the PC-mounted "FAULT OVERRIDE" toggle switch is on the OFF or normal position.

9.5.1. Motherboard

To replace a motherboard:

1. Remove the Britton Lee database server from the rack, remove the bezel, side panels, and circuit boards, and set the Britton Lee database server on a work surface with the Rear Panel down.
2. Remove all mechanical connections between the Bottom Plate assembly (the sheet metal to which the motherboard is mounted) and the rest of the Britton Lee database server chassis. These include connections to the right and left Side Panels, and to the Internal Bulkhead.
3. Remove all electrical connections to the motherboard. Bus bars should be removed from the motherboard with their harness connections still attached. FCC models have nuts on top of the bus bars; earlier models have screws from underneath the motherboard.
4. Remove the Bottom Plate assembly and set it down in the work surface.
5. Remove the screws holding the motherboard to the Bottom Plate. The motherboard can now be repaired or replaced. Avoid scraping the insides of the clearance holes when lifting the motherboard over the long threaded studs on the Bottom Plate.
6. Reverse the above procedure to reinstall the motherboard and Bottom Plate assembly in the Britton Lee database server. Use caution to avoid pinching or otherwise damaging the wires and cables.

In FCC production models, the bus terminator chips (R-packs) are socketed, and therefore replaceable. Some boards may need to be removed to accomplish this, and care is required to avoid pin damage or misalignment.

9.5.2. Air Filter

Your Britton Lee database server may have an aluminum mesh wire filter located behind the fror Bezel. It is most easily removed for cleaning or replacement by first removing the Bezel. The filte can be washed in warm, soapy water, or in a mild solvent such as alcohol to remove grease and dust

WARNING

An excessively dirty air filter can seriously diminish the flow of air through the Britton Lee database server, and may cause overheating of the PC boards. *Keep the air filter clean!*

9.5.3. Fans

To replace a cooling fan:

1. Verify AC power is off and the power cord disconnected (see previous section), then remove the rear cover.
2. Disconnect the fan cord and the ground connection, the green and yellow wire, from the fan(s) to be removed.
3. Remove the screws holding the fan. The fan and EMI screen can be removed from inside the chassis. The finger guard will unmount from the outside of the chassis.
4. Reinstall new fan, making sure the air flow is directed out of the chassis. Air flow is directed out of the chassis. Air flow direction arrows are marked on the fan body.

Reconnect the fan cord and ground connection. Use caution to avoid pinching or otherwise damaging the wires and cables.

9.5.4. Power Supplies

For power supply adjustment and illustrations applicable to the power supplies, see Chapter 4.

To replace a power supply:

1. Verify that power is off and the AC power cord disconnected. Slide the Britton Lee database server out of the cabinet and remove the right side cover.
2. In FCC models, each power supply is mounted on a plate which is in turn mounted with four screws to the side of the card cage. Loosen (but do not remove) the four screws to the side of the card cage. Loosen (but do not remove) the four screws holding the supply in question. Slide the power supply forward and remove it from the chassis with wires still attached. The wire bundles attached to the supply have enough slack for the supply to be set down on a work surface next to the Britton Lee database server.
3. If the supply must be repaired or replaced, remove the plate and all electrical connections to detach the supply completely.
4. Reassemble by reversing the sequence above. Use caution to avoid pinching or otherwise damaging the wires.

In earlier versions of the Britton Lee database server, all supplies are mounted to a single plate which is in turn mounted with two screws to the side of the card cage. Remove these two screws (at the top of the plate), tilt the plate with supplies attached.

9.5.5. Logic Ground Connection

The Britton Lee database server comes from the factory with logic ground connected to internal chassis ground. In some systems, the ground loop so formed may cause noise problems. To eliminate this loop, remove the green and yellow wire connecting the motherboard ground bus bar to the chassis ground block.

9.5.6. PROM's (firmware)

If the proms are to be replaced, remove and reinstall the circuit board on which they reside using the procedure in the previous section. After the board has been removed, replace the proms, observing the following things:

1. Prom labeling may vary with the size of the prom package. The markings typically include the matrix location on the board where the prom is to be installed, and also the prom part number (where the last 3 digits are the prom revision, and the "140–" prefix deleted).

   WARNING

   DO NOT ATTEMPT PROM REPLACEMENT unless you are trained or qualified to perform this task.

2. Refer to the drawing (accompanying the FCO) which identifies the location and orientation of the replaceable proms on the circuit board.

   CAUTION

   Use proper handling procedures to avoid static damage to the IC's.

3. Using a IC removal tool, carefully remove the down-level proms.
4. Insert the proms. Insure proper orientation (pin 1) and that all pins are fully inserted into the socket. Note the prom location data on each prom label.

Reinstall the board and verify proper operation. This should include using the "slots" command to verify that the board reports the new revision.

9.5.7. Memory Chips

Any one of the following messages will appear on the console

correctable memory error slot <n>, pg <z>, ic <xy>

or

DBP Ram failure ic <xy>, <xy>
Slot <n>: <m>K ram mapped out

These console messages specifies the memory board's slot number and the location, by board matrix, of the defective IC (chip). If a memory chip (from the main memory, not from the DBP memory) is to be replaced, turn the power off and remove the storage board in slot "n" using the procedure in the previous section. After the board has been removed, replace the defective chip "xy" observing the following:

1. DO NOT ATTEMPT CHIP REPLACEMENT unless you are trained or qualified to perform this task.

2. The console message specifies the defective chip by its letter–number location on the memory board.

   The board's memory chip sockets occupy rows labeled "D, E, F, H, J, & K" and are grouped into two arrays with columns labeled "1–12" and "21–32".
   Whereas the DBP board's memory chips occupy rows labeled "B, D, E, G, H, & J" and columns labeled "16–26".

   CAUTION

   Use proper handling procedures to avoid static damage to the memory IC's.

3. Using an IC removal tool, carefully remove the defective memory chip.
4. Insert the new memory chip. Be sure pin 1 is properly oriented and all pins are fully inserted into the socket.

Reinstall the board and verify proper the operation.

Appendix A: Console Commands

Introduction

The commands and utilities listed below are entered at the console port after the prompt:

BL<series> - Filename:

When the Britton Lee database server is powered up and in the MAINT mode. With early production systems, if the system is in the RUN or SAFE mode it must be turned OFF and then to MAINT before it will accept console commands.

The LOAD, LIST, and FILELOAD commands (without the -1 flag) require a load device connected to the maintenance port. This device is typically a DSC-3 or IBM PC software loader, but may also be a host equipped for download.

The LOADTAPE, LISTTAPE, and "fileload -t" commands require a Britton Lee database server Tape Controller and drive.

NOTE

This appendix applies to DBPs (database processors) with firmware Revision 27 or higher. The -1 flag for the LOAD, LIST, and FILELOAD commands is available only with DBP Revision 28 or higher. (The appropriate load device software is also required.)

After typing a command, press the <carriage return> key to enter it.

The use of the Maintenance and Console Ports is interchanged when performing remote diagnostics with a modem.

Console Commands

Load

This command loads the first file (after the directory) from the associated storage medium into the Britton Lee database server main memory for execution by the DBP. The file can be loaded from either the DSC-3 or IBM PC load devices, or host tape. The file will not be written onto the system disk. The "load -1" command is given when the file is to be sent on the same port as the command. Here, the baud rate of the appropriate port must first be established, using the "conport 9600" or "maintport 9600" command. The console displays the message:

Loading <filename>

This command is also used for loading system software, in which case the first file on the medium is FILELOAD. The execution of the FILELOAD file transfers the system software files to the system disk. See the messages listed under the FILELOAD command for more information.

load <filename>

Loads <filename> from the load device diskette or host tape into the DBP for execution. The "load -1 <filename>" command is given when the file is to be sent on the same port as the command. Here, the baud rate of the appropriate port must first be established, using the "conport 9600" command.

If <filename> is not found on the load device the console displays:

File <filename>: not on load device

list

This lists the file in the load device on the console. The console displays the messages:

Contents of load device:
File 1 : directory revision <rev> size <z>
File 2 : <filename> revision <rev> size <z>
...
File <n>: <filename> revision <rev> size <z>

The "list -1" command is given when the file is to be sent on the same port as the command. Here, the baud rate of the appropriate port must first be established, using the "conport 9600" or "maintport 9600" command.

loadtape

This command loads the first file (after the directory) from IDM tape into main memory for execution. The file is not written onto the system disk. The console displays the message:

Loading <filename>

This command is also used for loading system software, in which case the first file on the medium is FILELOAD. The execution of the FILELOAD file transfers the system software files to the system disk. See the messages listed under the FILELOAD command for more information.

loadtape <filename>

Loads <filename> from IDM tape into main memory for execution. <filename> is not written onto the system disk. If <filename> is not found the console displays the message:

File <filename>: not on load device

listtape

This lists the contents of IDM tape at the console. The console displays the messages:

```
Contents of load device:
    File 1  : directory revision <rev> size <z>
    File 2  : <filename> revision <rev> size <z>
    ...
    File <n>: <filename> revision <rev> size <z>
```

filename>

Loads the specified file from the Britton Lee database server disk into main memory for execution. <filename> must have been previously written onto the system disk by use of the FILELOAD (or 'fileload -t') program.

If the file is not executable the console displays the message:

```
Not executable: x,x
```

where 'x,x' shows the internal Britton Lee file type.

If the file is not on the system disk, this console message appears:

```
<filename> : file not found
```

kernal fileload or kernal fileload -t

Loads the FILELOAD program from the system disk into main memory for execution. The FILELOAD program copies files from the load device onto the system disk. If -t option is specified, the FILELOAD program copies files from IDM tape onto the system disk.

The FILELOAD command is typically used for loading the remaining portions of system software after the LOAD command has been used to load the first diskette.

All files after the directory will be transferred, up to and including the LISTEN file. The CKDB and DFU utilities will also be transferred if space permits. If LISTEN is not on the medium, then all files on the medium will be transferred.

The "kernal fileload -1" command is given when the file is to be sent on the same port as the command. Here, the baud rate of the appropriate port must first be established, using the "conport 9600" or "maintport 9600" command.

During execution, the files on the load device are first listed on the console, then a console message appears for each file transferred to the system disk:

```
<filename>, size n, file y
creating idm file <filename>
file assigned relid z
<filename> loaded
```

where 'n' is the file size in bytes, 'y' is the file number, and 'z' is the table id assigned by the Britton Lee database server.

For files that are already on the system disk, the message is:

<filename>, size n, file y
<filename> loaded

If there is insufficient space in the system database for all the files to be transferred, NO transfer occurs, and the following console message appears:

system database has n too few free blocks to load files

FILELOAD resets the Britton Lee database server on completion. Refer to Chapter 6 for more information on loading system software.

kernal fileload <filename> or kernal fileload -t <filename>

Loads the FILELOAD program from the system disk into the main memory for execution. FILELOAD copies the specified file from the load device (IDM tape if -t option is specified) onto the system disk. This can be used to copy utilities or diagnostics onto the system disk so they can be used in the absence of a load device at a later time.

First the files on the load device are listed, then the following console message appears:

scanning for <filename>
<filename>, size n, file y
creating idm file <filename>
file assigned relid z
<filename> loaded

If there is insufficient space in the system database for the entire file to be transferred, NO transfer occurs, and the following console message appears:

system database has n too few free blocks to load files

The "kernal fileload -1 <filename>" command is given when the file is to be sent on the same port as the command. Here, the baud rate of the appropriate port must first be established, using the "conport 9600" command.

CAUTION

Do not attempt to load individual system software files with this command. They must be loaded as a group with the LOAD, LOADTAPE, or KERNAL FILELOAD commands. (System software includes the following: KERNAL, SYSCALLS, FRONT, QRYPROC, SUPPORT, SORT, DUMPLOAD, COMPILE, EXECUTE, RECOVER, and LISTEN.) Once a file has been loaded onto the system disk, it cannot be removed without destroying the system database with DFU.

conport <baud> or maintport <baud>

These commands set the baud rate of the Britton Lee database server's Console Port or Maintenance Port to the specified rate and save the baud rate in the battery back-up RAM. During power up or reset, the Britton Lee database server is assuming these saved baud rates unless they are invalid or the W3 jumper is being set. The Britton Lee database server resets itself at the completion of fileload and most other programs. If an invalid rate is specified, the console displays:

unknown baud rate <baud>

NOTE

Be sure the terminal baud rate matches that of the port to which it is attached. Since booting the system code sets the baud rate at 300, all console messages will be lost unless the console terminal is also set at 300 baud.

These commands cause a delay of about 4 seconds before returning the Britton Lee database server prompt, to allow for the corresponding baud rate change on the attached device.

slots <n>

Causes the Britton Lee database server to do a self-test of all circuit boards n times. The test is done once if n is not specified. If n is minus 1, the test is repeated indefinitely (turn Britton Lee database server off, then back on, to stop). The console displays a list that can include the following:

Slot <m>: serial chan rev <n>
Slot <m>: parallel chan rev <n>
Slot <m>: tc rev <n>
Slot <m>: dc rev <n>
Slot <m>: tpc rev <n>
Slot <m>: 10MHz dbp rev <n>, <k>K RAM
Slot <m>: da rev <n>
Slot <m>: 256K Mem
Slot <m>: 512K Mem
Slot <m>: 1meg Mem

NOTE

In this self-test, a parallel channel revision level above 100 indicates a non-controller parallel channel.

New possibilities with Revision 28 are as follows:

Slot <m>: non-controller parallel chan rev <n>
Slot <m>: ethernet chan rev <n>
Slot <m>: block mux chan rev <n>
Slot <m>: synchronous chan rev <n>

Note that the appearance of this list depends on the order in which the boards are inserted into the backplane. The list starts with the board in the lowest numbered slot. Any of the messages above can be followed by a fault message:

.....Fault code <x>

A fault code of 1 indicates that the board previously failed, but is now functional.

If the fault code is other than 1, the board in inoperable. The additional message

DEFECTIVE BOARD

appears, and the SERVICE indicator on the Britton Lee database server's control panel comes on.

If the board being tested does not respond to the slots command, the following message appears:

board not responding

loopback <slot number>

This command starts a loopback test on the given slot number. A loopback connector must be installed for that board. This command is only appropriate for the RS-232 Host Interface (Revision 37 or greater), the Ethernet Interface, and the Tape Controller. The console may display any of the following messages:

```
no slot specified
bad slot specified
Port <m> failed - code <n>
board not responding
BL<series> - Filename:
```

The absence of any error message shows successful completion of the test.

The RS-232 Loopback connections are shown in Appendix B. If desired, the connections may be applied to only one port at a time.

A loopback test fixture may be obtained from Britton Lee for the IDM Tape Interface or the RS-232 Host Interface.

<carriage return>

Pressing the carriage return key on the console lists the names and connections of all disks in the system. It also lists all the files on the system disk. The list may vary from the following, depending on the files included in each software release.

```
system disk:Ctlr x cable y drive name <name>
fileload
kernal
syscalls
front qryproc
support
sort
dumpload
compile
execute
recover
wcs
listen
dfu
dfu2
```

If there is no system disk, the console displays:

```
No system disk available
```

Additional carriage returns will display the list of files on the system disk without listing the names and connections of all disks in the system.

conmsg

This command prints out the last 1024 characters of console messages that are saved in the battery back-up RAM.

Appendix B: Cable And Connector Details

Console Terminal Cable

The cable supplied by Britton Lee (part number 113-0170) is a modified three-conductor RS-232-C null-modem cable for connecting the Britton Lee database server to the Console Terminal:

Console Port Signal	Pin	Pin	Console Terminal Signal
transmit data	2 <---->	3	received data
signal ground	7 <---->	7	signal ground
received data	3 <---->	2	transmit data
request to send	4 <--+		
	|		
clear to send	5 <--+		
data terminal ready	20 <--+		
	|		
data carrier detect	8 <--+		

The recommended maximum length of this cable is 50 feet (15 m). Longer cables are allowed only if the resulting load capacity does not exceed 2500 pF.

Maintenance Cable

The Maintenance Cable is a full-modem cable, and is supplied by Britton Lee to customers who order the DSC-3 for software loading. The Maintenance Cable has no separate Britton Lee part number.

Adapter Cable

This is a female-to-female RS-232 cable for connecting customer equipment to RS-232 connectors. (Britton Lee part number 113-0169.)

IBM PC Cable

The cable supplied by Britton Lee (part number 113-1016) is an RS-232C null-modem cable for connecting the Britton Lee database server\ to the IBM PC.

Port Signal	Pin	Pin	PC Port Signal
transmit data	2	3	received data
signal ground	7	7	signal ground
received data	3	2	transmit data
request to send	4	5	clear to send
clear to send	5	4	request to send
data terminal ready	20	8	data carrier detect
data carrier detect	8	20	data terminal ready

RS-232 Host Interface Cables

The RS-232 Host Interface cables are used to connect hosts (other than the load device) to the Britton Lee database server\'s RS-232 ports. These cables are null-modem or "flip" type cables and are wired as shown in the diagrams on the next page.

The cable shown in (3) is preferred for most installations.

The cables in (1) and (2) show the minimum connections required when some modem control signals are not used. The host pins, indicated with an asterisk, should be jumpered as shown, disabled, or otherwise connected as specified in the host computer's documentation.

Note that if the Britton Lee database server\ is connected to a host via a modem, a full-modem cable (described later in this appendix) is used.

Port Configured For No Modem Control

RS-232 Port Signal	Pin	Pin	Host Signal
transmit data	2	3	received data
signal ground	7	7	signal ground
received data	3	2	transmit data
request to send	4	4	request to send
clear to send	clear to send		*
data terminal ready	20	20	data terminal ready
data carrier detect	8	8	data carrier detect *

Port Configured for DCD Only

RS-232 Port Signal	Pin - Pin	Host Signal
transmit data	2 <----> 3	received data
signal ground	7 <----> 7	signal ground
received data	3 <----> 2	transmit data
request to send	4 <-+ +-> 4	request to send
clear to send	5 <-+ +-> 5	clear to send
data terminal ready	20 <----> 8	data carrier detect
data carrier detect	8 <----> 20	data terminal ready

Port Configured for Both DCD and CTS

RS-232 Port Signal	Pin - Pin	Host Signal
transmit data	2 <----> 3	received data
signal ground	7 <----> 7	signal ground
received data	3 <----> 2	transmit data
request to send	4 <----> 5	clear to send
clear to send	5 <----> 4	request to send
data terminal ready	20 <----> 8	data carrier detect
data carrier detect	8 <----> 20	data terminal ready

Full-Modem Cables

Full-modem cables are used to connnect the teminal and Britton Lee database server\ to the load device (except for the IBM PC, which uses a null-modem cable), and to connect the Britton Lee database server\ to a modem. A full-modem cable is a standard 25-pin RS-232-C ribbon cable with all pins connected straight through (no "flip" of the signals).

```
pin      1 <----------> pin   1
pin      2 <----------> pin   2
                . . .
                . . .
                . . .
pin     24 <----------> pin  24
pin     25 <----------> pin  25
```

Note that the only RS-232C signal lines used by the Britton Lee database server\ are those on pins 3, 4, 5, 7, 8 and 20. Any cable with these lines connected straight through will satisfy the Britton Lee database server\'s requirements.

RS-232 Host Interface (50-pin Connector)

Pin	Signal	Pin	Signal
PORT 0			
1	transmitted data (BA)	26	received data (BB)
2	request to send (CA)	27	clear to send (CB)
3	data terminal ready (CD)	28	received line signal detect (CF)
PORT 1			
4	transmitted data (BA)	29	received data (BB)
5	request to send (CA)	30	clear to send (CB)
6	data terminal ready (CD)	31	received line signal detect (CF)
PORT 2			
7	transmitted data (BA)	32	received data (BB)
8	request to send (CA)	33	clear to send (CB)
9	data terminal ready (CD)	34	received line signal detect (CF)
PORT 3			
10	transmitted data (BA)	35	received data (BB)
11	request to send (CA)	36	clear to send (CB)
12	data terminal ready (CD)	37	received line signal detect (CF)
PORT 4			
13	transmitted data (BA)	38	received data (BB)
14	request to send (CA)	39	clear to send (CB)
15	data terminal ready (CD)	40	received line signal detect (CF)
PORT 5			
16	transmitted data (BA)	41	received data (BB)
17	request to send (CA)	42	clear to send (CB)
18	data terminal ready (CD)	43	received line signal detect (CF)
PORT 6			
19	transmitted data (BA)	44	received data (BB)
20	request to send (CA)	45	clear to send (CB)
21	data terminal ready (CD)	46	received line signal detect (CF)
PORT 7			
22	transmitted data (BA)	47	received data (BB)
23	request to send (CA)	48	clear to send (CB)
24	data terminal ready (CD)	49	eceived line signal detect (CF)
25	signal ground	50	signal ground

SMD Disk Controller, A Cable

NOTE

Index and sector pulses must be provided on the "A" cable. Disk drives must be configured for the "daisy chain" option.

Pin	Signal	Pin	Signal
- +		- +	
1,31	tag 1	17,47	on cylinder
2,32	tag 2	18,48	index
3,33	tag 3	19,49	unit ready
4,34	bit 0	20,50	not used (adr mark fnd)
5,35	bit 1	21,51	busy
6,36	it 2	22,52	unit select tag
7,37	bit 3	23,53	unit select bit 0 ("1")
8,38	bit 4	24,54	unit select bit 1 ("2")
9,39	bit 5	25,55	sector
10,40	bit 6	26,56	unit select bit 2 ("4")
11,41	bit 7	27,57	unit select bit 3 ("8")
12,42	bit 8	28,58	write protected
13,43	bit 9	29	power seq pick
14,44	open cable detector	30,60	not used (bit 10)
15,45	fault	59	power seq holdr
16,46	seek error		

SMD Disk Controller, B Cable

Pin	Signal	Pin	Signal
- +		- +	
1,4,7,11, 15,18,21, 25	ground	8,20	write data
2,14	servo	22,9	unit selected
3,16	read data	10,23	seek end
5,17	read clock	12,24	eserved for index
6,19	write clock	13,26	reserved for sector

Tape Interface Connector J1 (Write)

Signal	Ground	Name	Description	Source *
2	1	IFBY	formatter busy	T
4	3	ILWD	last word	C
6	5	IW4	write data 4	C

8	7	IGO	initiate command	C
10	9	IW0	write data 0	C
12	11	IW1	write data 1	C
14	13	–	(reserved)	T
16	15	–	(reserved)	C
18	17	IREV	reverse	C
20	19	IREW	rewind	C
22	21	IWP	write data parity	C
24	23	IW7	write data 7	C
26	25	IW3	write data 3	C
c28	27	IW6	write data 6	C
30	29	IW2	write data 2	C
32	31	IW5	write data 5	C
34	33	IWRT	write	C
36	35	–	(reserved)	C
38	37	IEDIT	edit	C
40	39	IERASE	erase	C
42	41	IWFM	write file mark	C
44	43	–	(reserved)	C
46	45	ITAD0	transport address 0	C
48	47	IR2	read data 2	T
50	49	IR3	read data 3	T

* signal source = Transport (T) or Tape Controller (C)

Tape Interface Connector J2 (Read)

Signal	Ground	Name	Description	Source *
1	–	IRP	read data parity	T
2	–	IR0	read data 0	T
3	–	IR1	read data 1	T
4	–	ILDP	load point	T
6	5	IR4	read data 4	T
8	7	IR7	read data 7	T
10	9	IR6	read data 6	T
12	11	IHER	hard error	T
14	13	IFMK	file mark	T
16	15	IDENT	identification	T
18	17	IFEN	formatter enable	C
20	19	IR5	read data 5	T
22	21	IEOT	end of tape	T
24	23	IRWU	rewind/unload	C
26	25	–	(reserved)	T
28	27	IRDY	ready	T
30	29	IRWD	rewinding	T
32	31	IFPT	file protect	T
34	33	IRSTR	read strobe	T
36	35	IWSTR	write strobe	T
38	37	IDBY	data busy	T
40	39	ISPEED	high-speed status	T
42	41	ICER	corrected error	T
44	43	IONL	on line	T
46	45	ITAD1	transport address 1	C
48	47	IFAD	formatter address	C
50	49	IHISP	high speed select	C

* signal source = Transport (T) or Tape Controller (C)

IEEE-488 HOST INTERFACE, GPIB STANDARD

Pin	Signal	Pin	Signal
1	DIO 1	13	DIO 5
2	DIO 2	14	DIO 6
3	DIO 3	15	DIO 7
4	DIO 4	16	DIO 8
5	EOI	17	REN
6	DAV	18	BND 6
7	NRFD	19	GND 7
8	NDAC	20	GND 8
9	IFC	21	GND 9
10	SRQ	22	GND 10
11	ATN	23	GND 11
12	shield	24	LOGIC GND

The maximum IEEE-488 cable is either 20 meters or the number of devices times two meters, whichever is less. For example, if the connection involves one Britton Lee database server\ and two hosts, the cable should be no more than 6 meters long.

Console And Maintenance Ports, And RS-232 Distribution Panel

Pin	Signal
2	transmitted data (BA)
4	request to send (CA)
20	data terminal ready (CD)
3	received data (BB)
5	clear to send (CB)
8	data carrier detect (CF)
7	signal ground (AB)

RS-232 Host Interface Loopback Connector

To perform the "loopback" test on the serial channel, each RS-232 port should be looped back (jumpered) as follows:

(TDATA)	pin 2 -to- pin 3	(RDATA)
(RTS)	pin 4 -to- pin 5	(CTS)
(CD)	pin 8 -to- pin 20	(DTR)

Interface Voltage Levels

RS-232 Port(s)

Logical State	Voltage Level
1	< -3V
0	> +3V

IEEE-488 Port

Logical State	Voltage Level
1	< +0.8V
0	> +2V

Logical State	Voltage Level
1	< +0.5V
0	> +2.5V

Disk Port (s)

SMD interface uses differential signals.
See SMD specification for details.

RS-232 Distribution Box

```
J1-01 ..... pin 2          TXD  |
J1-02 ..... pin 4          RTS  |
J1-03 ..... pin 20         DTR  |
J1-26 ..... pin 3          RXD  |  -- Port 0
J1-27 ..... pin 5          CTS  |
J1-28 ..... pin 8          DCD  |
  •--------- pin 7          GND  |

J1-04 ..... pin 2          TXD  |
J1-05 ..... pin 4          RTS  |
J1-06 ..... pin 20         DTR  |
J1-29 ..... pin 3          RXD  |  -- Port 1
J1-30 ..... pin 5          CTS  |
J1-31 ..... pin 8          DCD  |
  •---------- pin 7         GND  |
```

```
J1-07 ..... pin 2        TXD  |
J1-08 ..... pin 4        RTS  |
J1-09 ..... pin 20       DTR  |
J1-32 ..... pin 3        RXD  |  -- Port 2
J1-33 ..... pin 5        CTS  |
J1-34 ..... pin 8        DCD  |
       •----pin 7        GND  |
```

```
J1-10 ..... pin 2        TXD  |
J1-11 ..... pin 4        RTS  |
J1-12 ..... pin 20       DTR  |
J1-35 ..... pin 3        RXD  |  -- Port 3
J1-36 ..... pin 5        CTS  |
J1-37 ..... pin 8        DCD  |
       •---- pin 7       GND  |
```

```
J1-25--•---|___  to GND
J1-50--•---|
```

```
J1-13 ..... pin 2        TXD  |
J1-14 ..... pin 4        RTS  |
J1-15 ..... pin 20       DTR  |
J1-38 ..... pin 3        RXD  |  -- Port 4
J1-39 ..... pin 5        CTS  |
J1-40 ..... pin 8        DCD  |
       •---- pin 7       GND  |
```

```
J1-16 ..... pin 2        TXD  |
J1-17 ..... pin 4        RTS  |
J1-18 ..... pin 20       DTR  |
J1-41 ..... pin 3        RXD  |  -- Port 5
J1-42 ..... pin 5        CTS  |
J1-43 ..... pin 8        DCD  |
       •---- pin 7       GND  |
```

```
J1-19 ..... pin 2        TXD  |
J1-20 ..... pin 4        RTS  |
J1-21 ..... pin 20       DTR  |
J1-44 ..... pin 3        RXD  |  -- Port 6
J1-45 ..... pin 5        CTS  |
J1-46 ..... pin 8        DCD  |
       •---- pin 7       GND  |
```

J1-22 ..... pin 2	TXD		
J1-23 ..... pin 4	RTS		
J1-24 ..... pin 20	DTR		
J1-47 ..... pin 3	RXD	-- Port 7	
J1-48 ..... pin 5	CTS		
J1-49 ..... pin 8	DCD		
•---- pin 7	GND		

Appendix C: IDMBoot Console Utility For The IBM PC

Introduction

The IBM PC can be used as a loading device to load utilities and system software onto the Britton Lee system disk. This utility also acts as a console terminal and if desired it can log all console messages to a PC file.

There are two methods to load the Britton Lee system software from the IBM PC, One Port Load method and the Two Port Load method. With the Two Port Load method, you must have a terminal in addition to the PC.

One Port Load

Acts as a console as well as loads the system software through the console port. Only one connection is needed.

Two Port Load

Is NOT a console but loads the system software through the maintenance port. A terminal must be connected to the Britton Lee database server's console port.

NOTE

> The connections described apply both to loading the system software or utilities; however, the loading procedure in this document only applies to loading the system software. A detailed description of the loading process and the use of the Sys-Format and Format modes of DFU is given in the Operation Manual.
>
> This document also assumes basic familiarity with the IBM PC and with MS-DOS.
>
> **PLEASE READ THE ENTIRE DOCUMENT BEFORE LOADING YOUR SYSTEM SOFTWARE!**

Hardware And Connections

The following list will explain the things you need to load the Britton Lee system software from the IBM PC.

One Or Two Port Load

1. PC MS-DOS 2.0 or higher installed on your IBM PC; 128K memory with an asynchronous communications card

2. The PC/Britton Lee database server Interface Cable (part number 113-1016) or equivalent null-modem cable to connect the IBM PC RS-232 asynchronous port to the Britton Lee database server's Console Port is needed. If you are using Two Port Load, then connect your PC port to the Britton Lee database server's Maintenance Port and a terminal to the Console Port.
3. Britton Lee's IDMBOOT utility
4. the three Britton Lee's system software diskettes labeled A, B, and C

Two Port Only

1. Terminal

NOTE

Both One Port Load and Two Port Load are supported in case any customers prefer the older Two Port Load method. There is no apparent reason why anyone should choose one method over the other.

Options

IDMBOOT [-1] [-L] [-b]

-1: This option specifies One Port Load is to be used; the default is Two Port Load.

If you want the PC to act as a console, type "IDMBOOT -1". If you have a 10MHz board, follow the steps in the *Special Notes* section.

To format your system disk so IDMBOOT will load the system software, type "idmboot - 1". When the filename prompt appears, type "load -1 kernal dfu".

-L: This option will log your console messages to a PC file. The utility will prompt you for a filename. The filename should reside on either your hard disk or on a different disk drive from the one you will be using to load the software. For example: When loading from disk drive "A:", the file for logging should be on either "C:" or "B:". If the file exists on the PC the console messages will be appended to the end of the file. This can only be used in conjunction with the -1 option.

-b: The IDMBOOT Console utility will read the PC diskettes from the default drive "a:". This option changes it to the "b:" drive.

If the PC stops after the monitor reads "Loading kernal", reset the jumper on the DBP board. Remove the jumper and begin the IDMBOOT Console Utility again. If you do not know how to remove the jumper, then find the Britton Lee database server operator in your company for assistance.

NOTE

The IDMBOOT Console utility will also accept "B:" instead of "-b".

Commands

These commands can be entered at any time.

NOTE

When the PC is busy loading files, these commands will not be executed until the current file is finished loading.

break

The command break will send a break to the Britton Lee database server. It will reset your Britton Lee database server if your PC is connected to the maintenance port of the Britton Lee database server and the remote is enabled. You might have to enter the break command two to three times in order to reset the Britton Lee database server. The Britton Lee database server takes a minute or so to recognize the break command. Allow approximately one minute for each trial.

REMINDER

The remote is a button on the front panel of the Britton Lee database server.

exit

To exit the IDMBOOT program type "exit". If you type "exit" while loading the system software, be sure to reset the Britton Lee database server *before* running the IDMBOOT utility.

port [speed]

The port command will change your IBM PC port's baud rate to the specified speed. Valid speeds are 300, 600, 1200, 2400, 4800, and 9600. The port command is useful when your IBM PC is not the same baud rate as the Britton Lee database server's console port.

NOTE

You can expect to receive garbage characters when changing your baud rate. We suggest using this command sparingly.

restart

The command restart will restart your PC port to either 300 baud or 9600 baud. If you have set "DBP=1" in your autoexec.bat file then "restart" will set your PC port to 9600 baud. If "set DBP=1" is not set, then restart will set you PC port to 300 baud.

NOTE

Setting up your autoexec.bat file will be explained under the SPECIAL NOTES section number six. When DFU exits, the Britton Lee database server resets itself and does not alert your IBM PC. When the above occurs, the command restart is especially useful.

Special Notes

10MHz Board-One Port Load Only

The 10MHz board has battery backup memory. It allows the Britton Lee database server to reset at the console ports last baud rate.

When you first receive a new DBP, the factory sets the Britton Lee database server's console port to 300 baud. This needs to be changed to 9600 baud in order for the utility to work properly. The following steps will set your IBM PC and Britton Lee database server console port to default at 9600 baud. Subsequently, this conport command will change the battery backup memory to 9600 baud.

1. Turn on the Britton Lee database server to maintenance mode.
2. Insert your BRITTON LEE IDMBOOT Console Utility diskette in disk drive A or B.
3. On the PC type "IDMBOOT -1" or "IDMBOOT -1". If you inserted your IDMBOOT Utility diskette into drive B then be sure you type "b:" at the DOS prompt before you execute the Console Utility. If you failed to do this, DOS will give you a "Bad command or filename" error message.
4. When you get the "<BL series> Filename:" prompt type "exit" on your PC. The Utility program will issue a conport 9600 command. This changes the baud rate and also changes the battery backup memory on the 10MHz processor.
5. Turn the switch off on the Britton Lee database server then turn it back to maintenance mode. This forces the baud rate change to be stored in the battery backup memory.
6. Enter the line "set DBP=1" in your autoexec.bat file. If you do not understand what the autoexec.bat file does, then please refer to your DOS manual (command section under batch files).

NOTE

If you have a 10MHz DBP board, the Britton Lee database server will set its console port to 9600 when it resets. Setting "DBP=1" will alert the PC to reset its port to 9600 baud instead of 300 baud.

7. Reboot your IBM PC by pressing the Alt, Ctrl and Del keys simultaneously. This forces the "set DBP=1" option to take affect. You are now ready to execute IDMBOOT again.

CAUTION

Load will not work with jumpers on either a 6MHz or a 10MHz DBP board!

Sample Session

This is a general sample session on a 6MHz DBP. It illustrates loading a new software release. The revision numbers on the system software, dates, size etc. will vary from Britton Lee database server to system. The sample session with the 10MHz board is basically the same as the 6MHz DBP sample session, except the PC Console Utility will not issue a conport command. This is because the Britton Lee database server's console port is already at 9600 baud.

One Port Load- 6MHz DBP

Boot your IBM PC. If you have a 10MHz DBP board on your Britton Lee database server, follow any steps the SPECIAL NOTES section specifies.

NOTE

Insert your Britton Lee IDMBOOT console utility diskette into the appropriate disk drive.

C: IDMBoot -1 -L

```
**PC - set to 300 baud**
slots
Slot 0:1Meg Mem
Slot 2:t&c rev 3
Slot 4:serial chan rev 37
Slot 5:dbp rev 30M
Slot 6:dc rev 26
```

NOTE

The console utility changes the baud rate to 9600 on the PC and the Britton Lee database server. Load will only work at 9600 baud!

```
<BL series> - Filename:conport 9600
**PC - set to 9600 baud**
```

NOTE

Insert your Britton Lee diskette labeled "A" into the appropriate disk drive. Type in "load -1" to load the new software release.

```
<BL series> - Filename:load -1
load -1
Loading kernal
KERNAL 39: 7/23/85 16:14:56

Accessible Disks:
    Name  Ctlr    Drive      Low        High       Status
'p6fuji160'  0       0          1          73260      System

loading syscalls
```

```
loading fileload
number of available dbins: 126
Free process pages: 91
Console port version
Fileload version 21 Thu Mar 8 17:49:40
kernal      rev 039 size 77824
syscalls    rev 039 size 24576

fileload    rev 021 size 68608
dfu         rev 009 size 84992
dfu2        rev 009 size 29696
wcs         rev 016             size 17408
kernal      , size 77824        , file 2
kernal      loaded
syscalls    , size 24576        , file 3
syscalls loaded
fileload    , size 68608        , file 4
fileload loaded
dfu , size 84992    , file 5
dfu loaded
dfu2        , size 29696        , file 6
dfu2 loaded
wcs , size 17408    , file 7
wcs loaded
fileload done
```

NOTE

The Britton Lee database server is resetting itself. This is normal when fileload is done.

```
Mirrored IDM DBP rev 30
Slot 0:1Meg Mem
Slot 2:t&c rev 3
Slot 4:serial chan rev 37
Slot 5:dbp rev 30M
Slot 6:dc rev 26
```

NOTE

Change the baud rate to 9600.

```
<BL series> - Filename:conport 9600
**PC - set to 9600 baud**
```

NOTE

Insert Britton Lee diskette labeled "B" into your disk drive. The next command you enter is "kernal fileload"

```
<BL series> -- Filename:kernal fileload
kernal fileload -1
```

NOTE

The -1 flag is put in for you in case you forget.

```
System disk:
Ctlr 0      cable  0          drive       name
p6fuji 160 KERNAL39: 7/23/85 16:14:56
```

```
Accessible Disks:
    Name  Ctlr     Drive        Low        High       Status
'p6fuji160'  0        0          1         73260      System

loading syscalls
loading fileload
number of available dbins: 126
Free process pages: 91
Console port version
Fileload version 21 Thu Mar 8 17:49:40
front         rev 030 size 76800
qryproc       rev 030 size 45056
support       rev 030 size 44032
sort rev 030 size 45056
dumpload      rev 030 size 44032
compile       rev 030 size 45056
front         , size 76800         , file 2
front         loaded
qryproc       , size 45056         , file 3
qryproc       loaded

support       , size 44032         , file 4
support       loaded
sort, size 45056     , file 5
sort loaded
dumpload      , size 44032         , file 6
dumpload      loaded
compile       , size 45056         , file 7
compile       loaded
fileload done
```

Britton Lee database server is resetting itself.

```
Mirrored IDM DBP rev 30
Slot 0:1Meg Mem
Slot 2:t&c rev 3
Slot 4:serial chan rev 37
Slot 5:dbp rev 30M
Slot 6:dc rev 26
```

Change the baud rate to 9600.

```
<BL series> - Filename:conport 9600
**PC - set to 9600 baud**
```

Insert your Britton Lee Diskette labeled "C" into your disk drive. The last command to enter is "kernal fileload -1". This completes the load.

```
<BL series> - Filename:kernal fileload -1
kernal fileload -1
System disk:Ctlr 0 cable 0 drive name p6fuji160
KERNAL 39: 7/23/85 16:14:56

Accessible Disks:
    Name  Ctlr     Drive        Low        High       Status
'p6fuji160'  0        0          1         73260      System
```

```
loading syscalls
loading fileload
number of available dbins: 126
Free process pages: 91
Console port version
Fileload version 21 Thu Mar 8 17:49:40
execute     rev 030 size 45056
recover     rev 028 size 45056
listen      rev 017 size 6144
ckdb        rev 006 size 68608
ckdb2       rev 006 size 34816

memtest     rev 024 size 8192
dd  rev 012 size 18432
td  rev 002 size 15360
execute     , size 45056        , file 2
  execute     loaded
recover     , size 45056        , file 3
  recover     loaded
listen      , size 6144         , file 4
  listen      loaded
ckdb        , size 68608        , file 5
  ckdb        loaded
ckdb2       , size 34816        , file 6
  ckdb2       loaded
fileload done
```

Once again the Britton Lee database server is resetting itself.

```
Mirrored IDM DBP rev 30
Slot 0:1Meg Mem
Slot 2:t&c rev 3
Slot 4:serial chan rev 37
Slot 5:dbp rev 30M
Slot 6:dc rev 26
```

Change to 9600 baud again.

```
<BL series> -- Filename:conport 9600
**PC - set to 9600 baud**
```

You are done. Quit.

```
<BL series> - Filename:exit
Exiting
```

Summary

1. When you get a "filename prompt" and you want to load a new software release, type "load -1". This command will load diskette labeled "A". Be sure you insert diskette A into your disk drive.
2. When the load command is finished, the Britton Lee database server will reset itself and display a "filename prompt". Insert the diskette labeled B into your disk drive. You should type "kernal fileload -1". Press the return key.
3. When fileload is done insert the diskette labeled C into your disk drive. Enter "kernal fileload -1" at the "filename prompt" to complete the loading process.

4. Type "exit" when you are done with the IDMBOOT Console Utility.
5. If you encounter any problems that you cannot solve, call BLI support.

Appendix D: Loading From Britton Lee Tape

Introduction

The Britton Lee database server Tape Drive can be used to load Britton Lee database server Utilities and System Software into the Britton Lee database server. For any such loading procedures, the IDMBOOT program must be present in the host, and the System Boot and Maintenance Tape is required on the Britton Lee database server Tape Drive.

The procedures given in this appendix apply to the loading of system software and utilities. Detailed descriptions of the use of the SysFormat and Format mode of DFU and the use of CKDB are given in the Operation Manual.

Loading Procedure

1. The Britton Lee database server Tape Drive must be connected to the Tape Interface panel on the rear of the Britton Lee database server.
2. Mount the Software and Diagnostics Tape of tape drive 0.
3. Power up the tape drive and place it on-line, set to 1600 bpi and at load point.
4. Power up the disk drive(s) on the Britton Lee database server.
5. Power up the Britton Lee database server. Turn the Function Switch from OFF to SAFE so that the Britton Lee database server can run recovery (this is a precautionary step.) Wait for the SAFE indicator to light, then turn the Function Switch to MAINT. (If this is the initial installation of the Britton Lee database server, the switch can be turned directly from OFF to MAINT.)
6. When the Britton Lee database server's self-test is complete and the prompt

   <BL series> - Filename

   appears on the console, enter

   loadtape <cr>

   at the Britton Lee database server console.

   loading kernal

The Britton Lee database server console will then display:

```
loading kernal
KERNAL n: <date> <time>
Accessible Disks:
    Name  Ctlr    Drive     Low       High      Status
"disk 1 "   x       y         m         n         <status 1>
    .
    .
"disk n "   x       y         m         n         <status n>
loading syscalls
loading fileload
```

```
number of available dbins: x
Free process pages: y

Fileload version n <day> <date> <time>
kernal              revision <m> size <n>
syscalls            revision <m> size <n>
fileload            revision <m> size <n>
    ...
    ...
```

This means that kernal is first loaded into the Britton Lee database server to be executed. Kernal will then load FILELOAD into memory, which will in turn load the system software onto the system disk.

7. When FILELOAD starts loading the system software onto the system disk, the following message appears at the Britton Lee database server console for each file copied to disk. This continues until all files on the tape are copied to the system disk. The Hardware Diagnostic utilities td, dd, and memtest are not automatically loaded onto the system disk and must be explicitly loaded if you want them to reside on disk. For the loading of these utilities, please see the section /*"Single Utilities Loading Procedures" in this appendix.

```
<filename>, size n, file y
creating idm file <filename>
file assigned relid n
    <filename> loaded
```

If a file is already present on the system disk, (for example, when updating software), the following message appears for the file:

```
<filename>, size n, file y
    <filename> loaded
```

8. When load is complete, the Britton Lee database server resets itself, performs a self-test, and displays the following prompt at its console.

```
<BL series> - Filename:
```

9. The loading of system software is complete at this point. It is recommended that you read the following section on loading single files.

10. The Britton Lee database server's clock must be reset via the host after power-up. See your host-resident software documentation for details on setting the Britton Lee database server time. Once the software is loaded, refer to Chapter 7 for System Boot and Confidence Test.

Single Utilities Loading Procedures

When loading single files or utilities, follow steps 1-6 of SYS-SOFTWARE LOADING PROCEDURES. When the Britton Lee database server completes its self-test andgives you the "<BL series> - Filename:" prompt at the console, follow A or B below depending on where you want the file to be loaded.

A. Loading onto system disk:

1. Type:

kernal fileload -t <filename> <cr>

at the Britton Lee database server console.

2. FILELOAD is loaded into memory from the system disk and lists the files on the tape. The following message appears on the Britton Lee database server console:

```
KERNAL n: <date> <time>
Accessible Disks:
    Name   Ctlr    Drive     Low      High     Status
"disk 1 "   x       y         m        n        <status 1>
    .
    .
"disk n "   x       y         m        n        <status n>
loading syscalls
loading fileload
number of available dbins: x
Free process pages: y
Fileload version n <day> <date> <time>
front                revision <m> size <n>
qryproc      revision <m> size <n>
support      revision <m> size <n>
sort         revision <m> size <n>
    ...
    ...
```

NOTE

The files listed may be different depending on which diskette the file that you specified is located.

3. Fileload then searches the tape for the file you specified and loads it onto system disk. The following message appears at the Britton Lee database server console:

```
scanning for <filename>
<filename>, size n, file y
creating idm file <filename>
file assigned relid z
    <filename> loaded
```

If the file is already present on the system disk, as when updating the file, the following message appears instead:

```
scanning for <filename>
<filename>, size n, file y
    <filename> loaded
```

4. When the load is complete, the Britton Lee database server resets itself, performs a self-test and displays at the console the prompt:

```
<BL series> - Filename:
```

B. Loading directly into memory for execution without copying onto system disk:

1. For DFU and CKDB, type:

loadtape kernal <filename> <cr>

2. For the Hardware Diagnostic Utilities, type:

loadtape <filename> <cr>

Appendix E: Loading From Host Tape

Introduction

The Host Tape drive can be used to load utilities and system software into the Britton Lee database server. For any such loading procedures, the Britton Lee database server Software and Diagnostics Tape is required on the Host Tape Drive. The procedures given in this appendix apply to the loading of system software and utilities. Detailed descriptions of the use of the SysFormat and Format mode of DFU and the use of CKDB are given in the Operation Manual.

The Britton Lee database server's maintenance port must be connected to the host system as shown in Figure F-1.

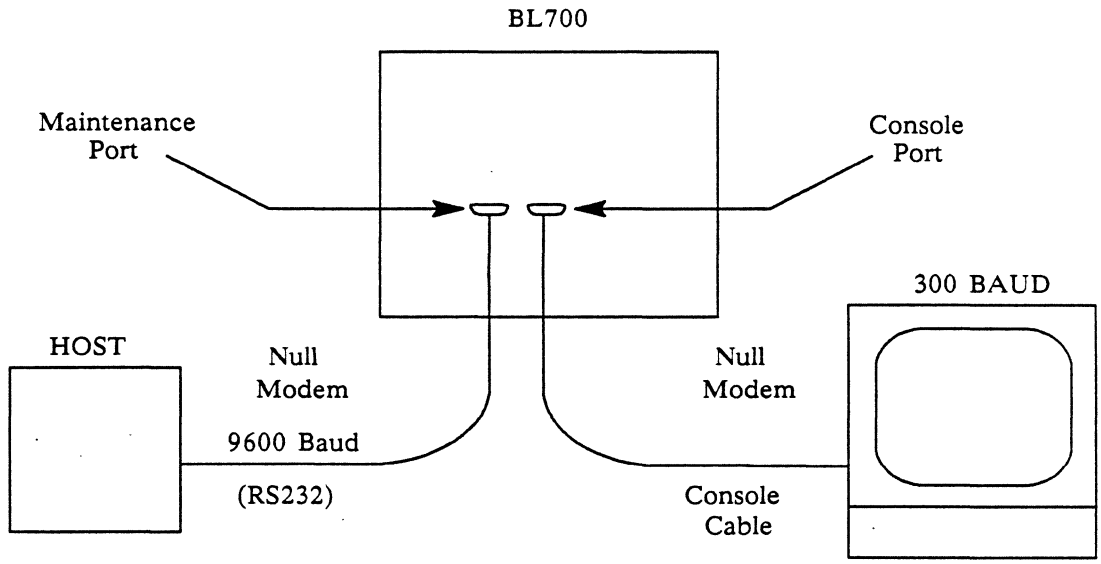

Figure F-1 Connecting Host as Load Device

The link must be 9600 baud 8-bit data path with neither echo, parity checking, character transformation, or similar tty processing.

System Software Loading Procedures

1. Power up the disk drives on the Britton Lee database server. Power up the Britton Lee database server. Turn the Function Switch from OFF to SAFE so that the Britton Lee database server can run recovery (this is a precautionary step.) Wait for the SAFE indicator to light, then turn the Function Switch to MAINT. (If this is the

initial installation of the Britton Lee database server, the switch can be turned directly from OFF to MAINT.)

2. Mount the Britton Lee database server Software and Diagnostics tape on the host. The drive should be on-line, set to 1600 bpi and at load point.

3. Execute the IDMBOOT program (supplied with Britton Lee database server host-resident software on the host system, indicating on the command line the serial device connection to the Britton Lee database server and the host tape device. For a complete description of the IDMBOOT program, see your host-resident software documentation.

4. Reset the Britton Lee database server. When the Britton Lee database server's self-test is complete and the prompt:

   <BL series> - Filename:

   appears on the Britton Lee database server console, enter:

   load <cr>

   at the Britton Lee database server console.

5. The Britton Lee database server console will then display:

```
loading kernal
KERNAL n: <date> <time>
Accessible Disks:
    Name  Ctlr    Drive      Low       High      Status
"disk 1 "  x       y          m         n         <status 1>
    .
    .
"disk n "  x       y          m         n         <status n>
loading syscalls
loading fileload
number of available dbins: x
Free process pages: y
Fileload version n <day> <date> <time>
kernal              revision <m> size <n>
syscalls            revision <m> size <n>
fileload            revision <m> size <n>
    ...
    ...
```

   This means that kernal is first loaded into the Britton Lee database server to be executed. Kernal will then load FILELOAD into memory, which will in turn load the system software onto the system disk.

6. When FILELOAD starts loading the system software onto the system disk, the following message appears at the Britton Lee database server console for each file copied to disk. This continues until all files on the diskette are copied to the system disk. The Hardware Diagnostic utilities td, dd, and memtest are not automatically loaded onto the system disk and must be explicitly loaded if you want them to reside on disk. For the loading of these utilities, please see the section /*"Single Utilities Loading Procedures" in this appendix.

```
<filename>, size n, file y
creating idm file <filename>
file assigned relid n
    <filename> loaded
```

   If a file is already present on the system disk, (for example: when updating software), the following message appears for the file:

```
<filename>, size n, file y
    <filename> loaded
```

7. When load is complete, the Britton Lee database server resets itself, performs a self-test, and displays at its console the prompt:

   <BL series> - Filename:

8. The loading of system software is complete at this point. It is recommended that you read the following section on loading single files.

9. The Britton Lee database server's clock must be reset via the host after power-up. See your host-resident software documentation for information on setting Britton Lee database server time. Once the software is loaded, refer to Chapter 7 for System Boot and Confidence Test of the Britton Lee database server.

Single Utilities Loading Procedures

When loading single files or utilities, follow steps 1-3 of SYSTEM SOFTWARE LOADING PROCEDURES. When the Britton Lee database server completes its self-test and gives you the "<BL series> - Filename:" prompt at the console, follow A or B below depending on where you want the file to be loaded.

A. Loading onto system disk:

1. Type:

   kernal fileload <filename> <cr>

   at the Britton Lee database server console.

2. FILELOAD is loaded into memory from the system disk and lists the files on the tape. The following message appears on the Britton Lee database server console:

```
KERNAL n: <date> <time>
Accessible Disks:
   Name   Ctlr    Drive      Low       High      Status
"disk 1 "  x       y          m         n         <status 1>
   .
   .
"disk n "  x       y          m         n         <status n>
loading syscalls
loading fileload
number of available dbins: x
Free process pages: y
Fileload version n <day> <date> <time>
front                revision <m> size <n>
qryproc      revision <m> size <n>
support      revision <m> size <n>
sort         revision <m> size <n>
   ...
   ...
```

NOTE

The files listed may be different depending on which diskette the file that you specified is located.

3. Fileload then searches the tape for the file you specified and loads it onto system disk. The following message appears at the Britton Lee database server console:

```
scanning for <filename>
<filename>, size n, file y
```

```
creating idm file <filename>
file assigned relid z
    <filename> loaded
```

If the file is already present on the system disk, (for example, when updating the file), the following message appears instead:

```
scanning for <filename>
<filename>, size n, file y
    <filename> loaded
```

4. When the load is complete, the Britton Lee database server resets itself, performs a self-test and displays at the console the prompt:

   <BL series> - Filename:

B. Loading directly into memory for execution without copying onto system disk:

1. For DFU and CKDB, type:

   load kernal <filename> <cr>

2. For the Hardware Diagnostic Utilities, type:

   load <filename> <cr>

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