Sun Ultra™ 30 Reference Manual

THE NETWORK IS THE COMPUTER™

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Preface

The *Sun Ultra 30 Reference Manual* contains information about the use and maintenance of a Ultra 30 system.

How This Book Is Organized

Chapter 1, “Back Panel Connectors,” shows the location of each back panel connector and gives the pinouts for each connector.

Chapter 2, “10BASE-T Twisted-Pair Ethernet Link Test,” presents a full tutorial about connecting the system to a 10BASE-T twisted-pair Ethernet local area network.

Chapter 3, “Modem Setup Specifications,” gives modem settings for Ultra 30 systems used in specific network telecommunication applications.

Chapter 4, “Main Logic Board Jumpers,” gives the locations and pin definitions of user-configurable main logic board jumpers.

Chapter 5, “Physical Specifications,” gives system requirements about power and environment, and also gives system dimension, weight, memory mapping, and Peripheral Component Interconnect (PCI) card slot specifications.

Related Documents

The following documents contain topics that relate to the information in the *Sun Ultra 30 Reference Manual*.

TABLE P-1 Related Documents

Application	Title	Part Number
Installation	Sun Ultra 30 Hardware Setup Instructions	802-7714
Installation	Sun Ultra 30 *Installation Guide*	802-7716
Service	Sun Ultra 30 *Service Manual*	802-7719

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CHAPTER 1

Back Panel Connectors

1.1 Connector Layout

Figure 1-1 shows the locations of Ultra 30 system back panel switches and connectors.

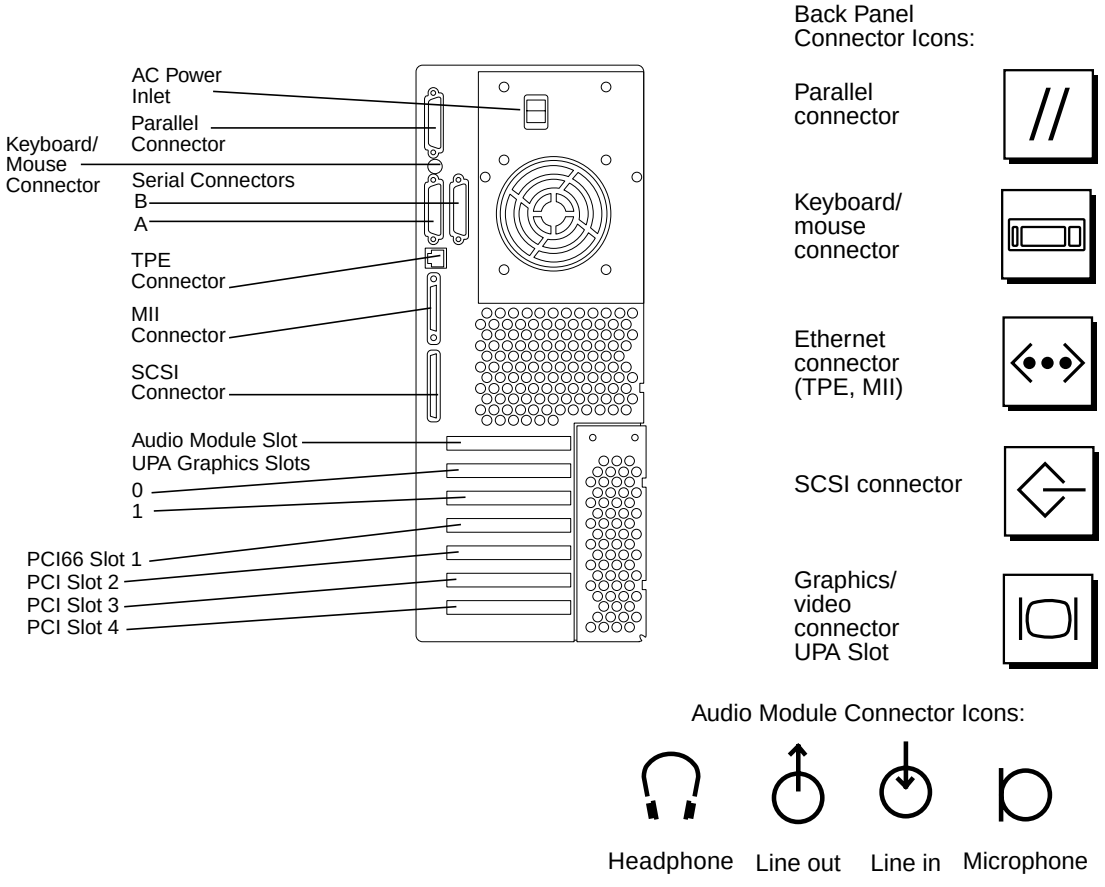

FIGURE 1-1 Back Panel Switches and Connectors

1.2 Serial Connectors

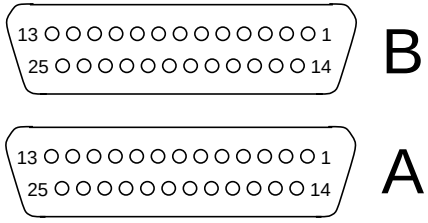

FIGURE 1-2 DB-25 Serial Connectors

TABLE 1-1 Serial Connector Pinouts, RS-423/RS-232

Pin	Function	I/O	Signal Description
1	none	none	Not connected
2	TxD	O	Transmit Data
3	RxD	I	Receive Data
4	RTS	O	Ready To Send
5	CTS	I	Clear To Send
6	DSR	I	Data Set Ready
7	Gnd		Signal Ground
8	DCD	I	Data Carrier Detect
9–14	none	none	Not connected
15	TRxC	I	Transmit Clock
16	none	none	Not connected
17	RTxC	I	Receive Clock
18–19	none	none	Not connected
20	DTR	O	Data Terminal Ready
21-23	none	none	Not connected
24	TxC	O	Transmit Clock
25	none	none	Not connected

Note – For information about serial port jumpers on the Ultra 30 system main logic board, see section 4.1, “Identifying Jumpers,” and section 4.3, “Serial Port Jumpers.”

1.3 Parallel Connector

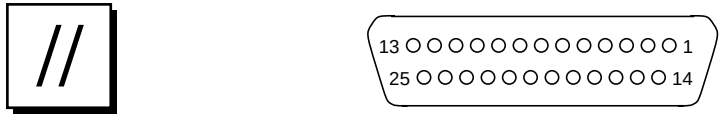

FIGURE 1-3 DB-25 Parallel Connector

TABLE 1-2 Parallel Connector Pinouts

Pin	Description	Pin	Description
1	Data_Strobe_L	14	AFXN_L
2	Data0	15	ERROR_L
3	Data1	16	RESET_L
4	Data2	17	IN_L
5	Data3	18	Ground
6	Data4	19	Ground
7	Data5	20	Ground
8	Data6	21	Ground
9	Data7	22	Ground
10	ACK_L	23	Ground
11	BUSY	24	Ground
12	PERROR	25	Ground
13	SELECT_L		

1.4 Keyboard / Mouse Connector

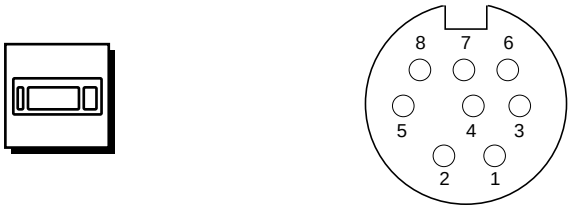

FIGURE 1-4 DIN-8 Keyboard / Mouse Connector

TABLE 1-3 Keyboard / Mouse Connector Pinouts

Pin	Description	Pin	Description
1	Ground	5	Keyboard_Data_ Out_L
2	Ground	6	Keyboard_Data_ In_L
3	Power	7	Poweron_L
4	Mouse_Data_In_L	8	Power

Note – All signals are standard TTL levels. The +5V supply is fuse-protected.

1.5 Media Independent Interface (MII) Connector

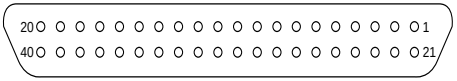

FIGURE 1-5 40-Pin Miniature-D MII Connector

TABLE 1-4 MII Connector Pinouts

Pin	Function	Pin	Function
1	+5V	18	COL
2	MDIO	19	CRS
3	MDC	20	+5V
4	RXD<3>	21	+5V
5	RXD<2>	22	Signal Ground
6	RXD<1>	23	Signal Ground
7	RXD<0>	24	Signal Ground
8	RX_DV	25	Signal Ground
9	RX_CLK	26	Signal Ground
10	RX_ER	27	Signal Ground
11	TX_ER	28	Signal Ground
12	TX_CLK	29	Signal Ground
13	TX_EN	30	Signal Ground
14	TXD<0>	31	Signal Ground
15	TXD<1>	32	Signal Ground
16	TXD<2>	33	Signal Ground
17	TXD<3>	34	Signal Ground

TABLE 1-4 MII Connector Pinouts *(Continued)*

Pin	Function	Pin	Function
35	Ground	38	Signal Ground
36	Ground	39	Signal Ground
37	Ground	40	+5V

1.5.1 MII Cable-Type Connectivity

The following types of Ethernet cables can be connected to the 40-pin MII connector when using specific interface conversion devices:

- Shielded twisted-pair (STP)
- Unshielded twisted-pair (UTP)
- Fiber (connected to an external transceiver)

1.5.2 External Cable Lengths

TABLE 1-5 MII External Cable Lengths

Cable Type	Application(s)	Maximum Length (Metric)	Maximum Length (English)
40-conductor (20 signal-ground twisted-pair) shielded (STP)	All external MII	0.5 meter	20 inches
Unshielded twisted-pair category 5 (UTP-5, “data grade”)	10BASE-T	100 meters[1]	109 yards[1]
Unshielded twisted-pair category 5 (UTP-5, “data grade”)	100BASE-T	100 meters[1]	109 yards[1]

1. IEEE 802.3

1.5.3 External Transceivers

TABLE 1-6 Ultra 30 MII Connectivity: Supported Transceivers

Cable Type	Transceiver Model and Application	Transceiver Manufacturer
Thick coaxial-cable Ethernet	XF467A, MII to AUI, 10BASE-5	Sun MII-to-AUI
UTP-3, “voice grade”	CT4-1030, 100BASE-T4	Canary Communications
Fiber	6211 Micro, Fast Ethernet, 100BASE-FX	Transcast Corporation
Fiber	CFX-107X, Fast Ethernet 100BASE-FX	Canary Communications

1.6 Twisted-Pair Ethernet (TPE) Connector

FIGURE 1-6 RJ-45 TPE Connector

TABLE 1-7 TPE Connector Pinouts

Pin	Description	Pin	Description
1	Transmit Data +	5	Common Mode Termination
2	Transmit Data -	6	Receive Data -
3	Receive Data +	7	Common Mode Termination
4	Common Mode Termination	8	Common Mode Termination

1.6.1 TPE Cable-Type Connectivity

The following types of twisted-pair Ethernet cables can be connected to the 8-pin TPE connector:

- For 10BASE-T applications, unshielded twisted-pair (UTP) cable:
  - Category 3 (UTP-3, “voice grade”)
  - Category 4 (UTP-4)
  - Category 5 (UTP-5, “data grade”)
- For 100BASE-T applications, unshielded twisted-pair category 5 (UTP-5, “data grade”) cable

1.6.2 External UTP-5 Cable Lengths

TABLE 1-8 TPE UTP-5 Cable Lengths

Cable Type	Application(s)	Maximum Length (Metric)	Maximum Length (English)
Unshielded twisted pair category 5 (UTP-5, “data grade”)	10BASE-T	100 meters[1]	109 yards[1]
Unshielded twisted pair category 5 (UTP-5, “data grade”)	100BASE-T	100 meters[1]	109 yards[1]

1. IEEE 802.3

1.7 SCSI Connector

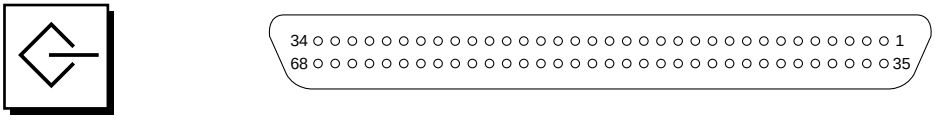

FIGURE 1-7 68-Pin SCSI Connector

TABLE 1-9 68-Pin SCSI Connector Pinouts

Pin	Signal Name	Pin	Signal Name
1	Ground	27	Ground
2	Ground	28	Ground
3	Ground	29	Ground
4	Ground	30	Ground
5	Ground	31	Ground
6	Ground	32	Ground
7	Ground	33	Ground

TABLE 1-9 68-Pin SCSI Connector Pinouts

Pin	Signal Name	Pin	Signal Name
8	Ground	34	Ground
9	Ground	35	-DB<12>
10	Ground	36	-DB<13>
11	Ground	37	-DB<14>
12	Ground	38	-DB<15>
13	Ground	39	-PAR<1>
14	Ground	40	-DB<0>
15	Ground	41	-DB<1>
16	Ground	42	-DB<2>
17	TERMPWR	43	-DB<3>
18	TERMPWR	44	-DB<4>
19	Not connected	45	-DB<5>
20	Ground	46	-DB<6>
21	Ground	47	-DB<7>
22	Ground	48	-PAR<0>
23	Ground	49	Ground
24	Ground	50	TERM.DIS
25	Ground	51	TERMPWR
26	Ground	52	TERMPWR
53	Reserved	61	-SEL
54	Ground	62	-CD
55	-ATN	63	-REQ
56	Ground	64	-IO
57	-BSY	65	-DB<8>
58	-ACK	66	-DB<9>
59	-RST	67	-DB<10>
60	-MSG	68	-DB<11>

Note – All signals shown in Table 1-9 are active low.

1.7.1 SCSI Implementation

- SCSI-3 Fast-20 (UltraSCSI) parallel interface
- 16-bit SCSI bus
- 40 Mbytes/s data transfer rate
- Supports 16 SCSI addresses:
  - Target 0-6 and 8-F for devices
  - Target 7 reserved for SCSI host adapter on main logic board
- Supports up to 4 internal SCSI devices (including the host adapter):
  - SCSI disk drive target 0 (lower drive slot)
  - SCSI disk drive target 1 (upper drive slot)
  - SCSI CD-ROM drive target 6 *or* SCSI tape drive target 5
- External 8-bit and 16-bit SCSI devices supported via 68-pin SCSI connector

1.7.2 SCSI Cabling and Configuration

The SCSI-3 Fast-20 (UltraSCSI) specification requires that the SCSI bus length be limited to 3 meters (10 feet) for less than 5 devices (internal and external), and 1.5 meters (5 feet) for 5 to 8 devices (internal and external). To be compliant with the SCSI-3 Fast-20 (UltraSCSI) specification, the Ultra 30 system supports an external SCSI cable with a maximum length of 0.8 meter (32 inches). When SCSI-3 and SCSI-2 devices are connected to the Ultra 30 system SCSI bus, the system enables each device to operate at its respective data transfer rate. The last external SCSI device in a daisy-chain must be terminated internally (active termination) or with an external terminator according to Forced-Perfect Termination (FPT) technology.

1.7.3 SCSI Cabling Procedure

1. **Count the number of SCSI devices on the system SCSI bus.**

   Be sure to count the host adapter as a SCSI device.

2. Determine the total SCSI bus length.

TABLE 1-10 Determining SCSI Bus Length

SCSI Implementation	Bus Width	Data Transfer Rate, Mbytes/s	Number of Devices	SCSI Bus Length
SCSI-2 Fast	8 bits	10	1–8	6.0 meters
SCSI-2 Fast / Wide	16 bits	20	1–8	6.0 meters
SCSI-3 Parallel Interface, Fast-20 Wide (UltraSCSI) (WideUltra)	16 bits	40	1–4	3.0 meters[2]
SCSI-3 Parallel Interface, Fast-20 Wide (UltraSCSI) (WideUltra)	16 bits	40	5–8[1]	1.5 meters[2]

1. The maximum number of single-ended / differential SCSI devices is 16.
2. The effective internal SCSI bus length of the Ultra 30 system unit is 0.9 meter.

3. Verify the cable type used to connect external SCSI devices.

You must use Fast-20 SCSI cable(s).

4. Ensure that the total SCSI cable length does not exceed the permissible total SCSI bus length.

A fully-equipped Ultra 30 system with four internal SCSI devices (one CD-ROM drive, two hard disk drives, one host adapter) enables use of a single 0.8 meter (32-inch) Fast-20 SCSI cable to a single external SCSI-3 Parallel Interface, Fast-20 Wide (UltraSCSI, WideUltra) device or device cluster.

1.7.4 SCSI-2 (Fast Wide SCSI) External Devices

If you connect SCSI-2 (Fast Wide SCSI, 20 Mbytes data transfer rate) external devices to a Ultra 30 system, follow these cabling and configuration guidelines to ensure proper device addressing and operation:

- If all external mass storage devices use 68-pin connectors, connect all non-Sun devices to the Ultra 30 system first and follow them with Sun devices. Sun devices use autotermination.

- If external mass storage devices consist of 68-pin Sun devices and 50-pin devices, connect the Sun 68-pin devices to the Ultra 30 system first and terminate the daisy chain with the 50-pin device and its terminator.
- The total SCSI bus length for all SCSI devices (internal and external) is 6.0 meters (19.7 feet).

See Figure 1-8 for a summary of cabling and configuration guidelines.

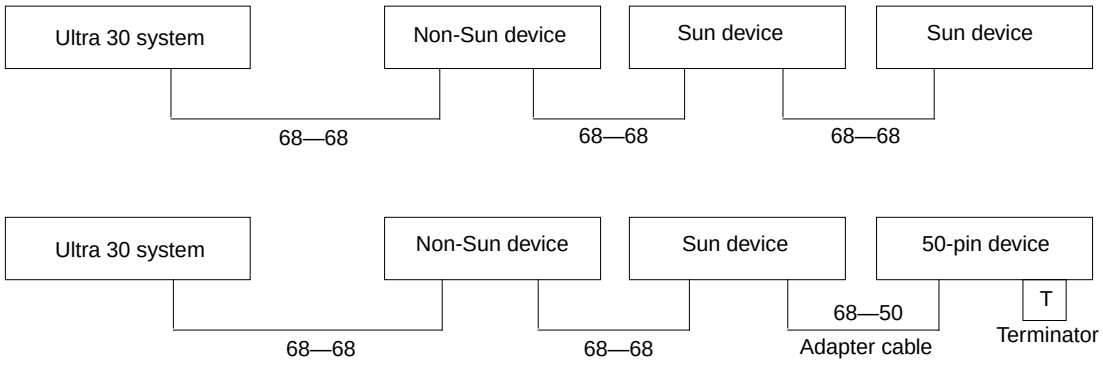

FIGURE 1-8 Connecting External Mass Storage Devices

1.8 Audio Ports

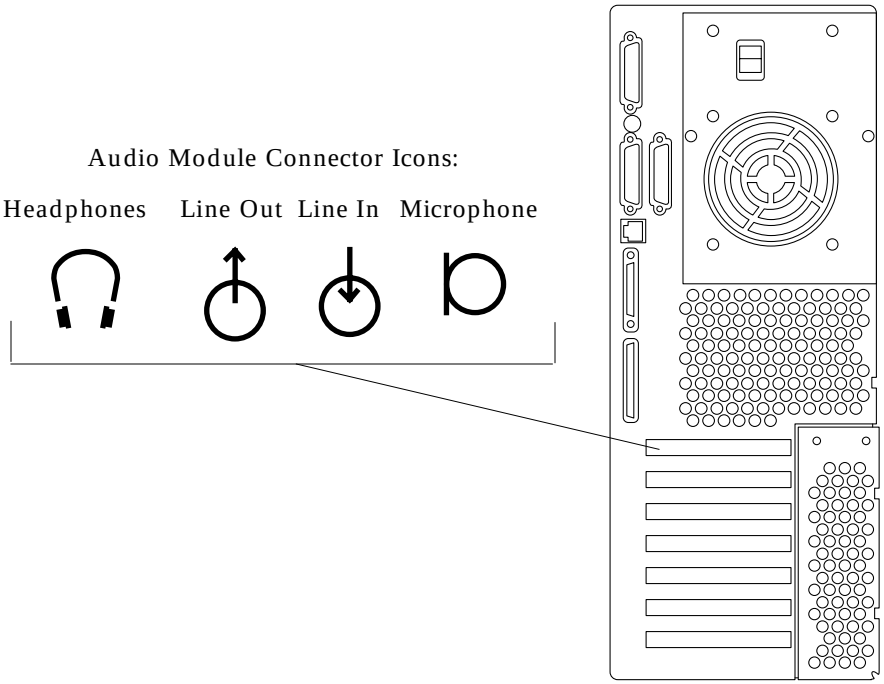

FIGURE 1-9 Audio Port Locations

All audio ports use EIA standard 3.5-mm / 0.125-inch jacks.

TABLE 1-11 Audio Port Signals

Plug	Headphones	Line Out	Line In	Microphone
Tip	Left Channel	Left Channel	Left Channel	Left Channel
Ring (Center)	Right Channel	Right Channel	Right Channel	Right Channel
Shield	Ground	Ground	Ground	Ground

TABLE 1-12 Audio Port Functions

Port	Function
Headphones	Connects stereophonic headphones for private listening of audio output
Line Out	Connects the system audio output to an external stereophonic amplifier
Line In	Connects external stereophonic audio sources such as a compact disc player or cassette tape player to the system
Microphone	Connects the SunMicrophone™ II (or other suitable microphone[1]) to the system

1. The Ultra 30 system microphone port accepts stereophonic input; however, the Sun Microphone II is a monophonic device. Note also that the older SunMicrophone is not compatible with the Ultra 30 system.

1.9 Audio Specifications

The microphone input specifications are designed for the SunMicrophone II or equivalent.

TABLE 1-13 Audio Inputs and Output

Stereo I/Os	Specifications
Line In	3.3 V peak (nominal), 9.2 k ohm input impedance
Frequency Response	20 Hz–17 kHz +/- 1 dB
Microphone Input	35 mV peak (nominal), 2.21 k ohm input impedance
Headphones Output	0.84 V peak (nominal), 9 ohm output impedance; headphone impedance may vary from 9 ohm to 1 k ohm.
Line Out	1.4 V peak (nominal), 220 ohm output impedance

TABLE 1-14 Internal Monaural Speaker Specifications

Speaker	Specifications
Power Output	1W average, 2W peak
Distortion	0.02%, typical at 1 kHz
Impedance	16 ohm +/- 15%
Frequency Response	170 Hz–20 kHz +/- 6 dB

1.10 Graphics Card 13W3 Video Connector

FIGURE 1-10 13W3 Video Connector

The graphics card for your system provides the 13W3 video connector for transmitting video output signals from the system unit to the monitor.

See Table 1-15 for 13W3 video connector pinouts.

TABLE 1-15 13W3 Video Connector Pinouts

Pin	Function	I/O	Level
A1	Red	O	Analog
A2	Green	O	Analog
A3	Blue	O	Analog
1	Serial Read		TTL
2	Vert Sync	O	TTL
3	Sense <0>	I	TTL
4	Ground		GND
5	Comp Sync	O	TTL

TABLE 1-15 13W3 Video Connector Pinouts

Pin	Function	I/O	Level
6	Horiz Sync	O	TTL
7	Serial Write		TTL
8	Sense <1>	I	TTL
9	Sense <2>	I	TTL
10	Ground		GND

CHAPTER 2

10BASE-T Twisted-Pair Ethernet Link Test

Read this chapter if you are connecting your Ultra 30 system to a 10BASE-T twisted-pair Ethernet (TPE) network. This chapter contains important information for getting your system to communicate correctly over a TPE network. If you have no experience with TPE networks, ask your system or network administrator to perform the procedures in this chapter.

Note – This chapter does not apply to 100BASE-T networks. In such networks, the link test function must be enabled at both the host and the hub. If your host is connected to a 100BASE-T network, you must not disable the host link test function.

2.1 Overview

- The twisted-pair Ethernet link integrity test is a function defined by the IEEE 802.3 10BASE-T specification.
- For a networked workstation (host) to communicate with a network hub, the link test state (enabled or disabled) must be the same on the host and hub.
- If either the host or hub does not share the link test enabled / disabled state of the other, then the host cannot communicate effectively with the hub, and the hub cannot communicate effectively with the host.

Figure 2-1 gives an example of a star configuration local area network (LAN), showing the relationship of hosts to a hub.

Figure 2-2 shows the importance of ensuring that the host and hub link test settings match in a 10BASE-T network.

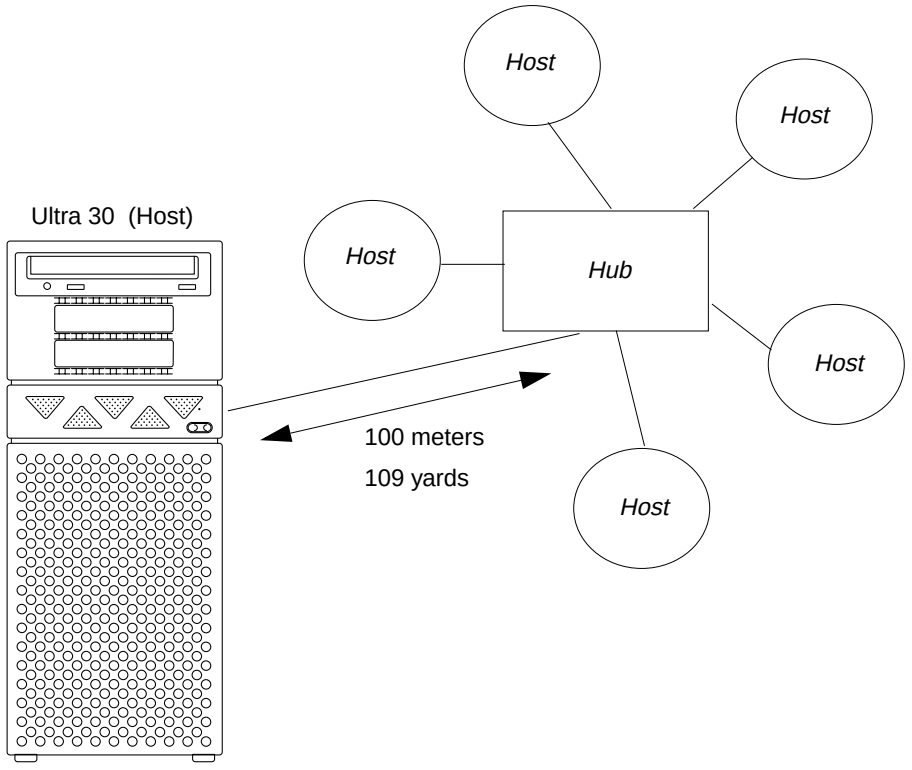

FIGURE 2-1 Hosts and Hub in a Local Area Network

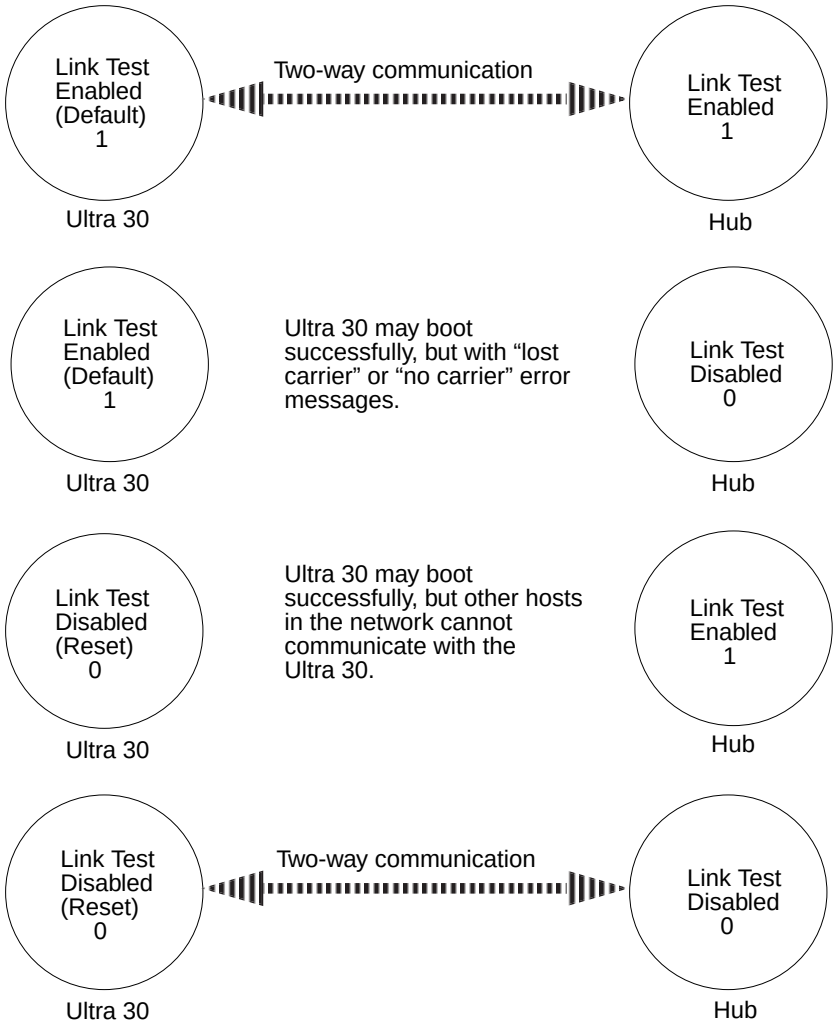

FIGURE 2-2 Ensuring Host-Hub Communication in a 10BASE-T Network

2.2 Technical Discusssion

The twisted-pair Ethernet link integrity test determines the state of the twisted-pair cable link between the host and the hub in a network. Both the host and hub regularly transmit a link test pulse. When either the host or hub has not received a

link test pulse within a certain amount of time (50–150 ms), it makes the transition from the link-pass state to the link-fail state and remains in the link-fail state until it once again receives regular link test pulses.

The link integrity test is specific to twisted-pair Ethernet and is not applicable to the other physical layer implementations of IEEE 802.3 such as 10BASE5 (”thicknet”) or 10BASE2 (“thinnet”).

The link test function at the host or hub is either enabled (link test enabled or 1) or disabled (link test disabled or 0). The IEEE 802.3 10BASE-T specification requires that the link test be enabled at both the host and the hub.

Although link test disabled does not conform to the specification, it is often encountered in real-world 10BASE-T network installations. Some hubs from various vendors can exhibit any of the following:

- Link test is “hardwired” enabled—link test is always enabled.
- Link test is “hardwired” disabled—link test is always disabled.
- Link test is configurable—the network administrator may enable or disable link test.

2.3 Troubleshooting

If you have connected a Ultra 30 host to a hub using twisted-pair Ethernet cable and observe either “no carrier” messages or failure to communicate effectively with another host in the same network, look first at the hub. If it supports configurable link test, then make sure “link test enabled” is configured. This is usually done by setting a hardware switch.

If the hub does not support configurable link test, then refer to the hub manufacturer’s documentation. Check to see if your hub is hardwired for link test disabled. If it is, you must follow the procedure in section 2.5, “Checking or Disabling the Link Test,” to disable the link test at your Ultra 30 host.

2.4 Moves and Changes

If the Ultra 30 host is physically moved to another network location or if the hub is reconfigured, remember to refer back to Figure 2-2. Unless the new network relationship between the host and the hub is functional (that is, 1-1 link test enabled-link test enabled or 0-0 link test disabled-link test disabled), there will be no full, regular two-way communication between the host and the hub.

2.5 Checking or Disabling the Link Test

To check the link test state of a Ultra 30 host:

1. **If you do not see the** `ok` **prompt, press the Stop (L1)-a keys.**
2. **At the** `ok` **prompt, type:**

```
ok printenv tpe-link-test?
tpe-link-test?        true                true
ok
```

The output shows the current link test state (true, or enabled), followed by the default state (true, or enabled).

To disable the host's link test function:

1. **Type the following commands:**

```
ok setenv tpe-link-test? false
tpe-link-test? =    false
ok reset-all
```

2. **Boot the host and verify that the transceiver cable problem messages do not appear by typing either** `boot net` **or** `boot disk` **and pressing Return.**

2.6 Enabling the Link Test

1. **If you do not see the** `ok` **prompt, press the Stop (L1)-a keys.**
2. **At the** `ok` **prompt, type:**

```
ok printenv tpe-link-test?
tpe-link-test?        false               true
ok
```

The above screen shows the current link test state (false, or disabled), followed by the default state (true, or enabled).

1. **To enable the host's link test function, type the following commands:**

```
ok setenv tpe-link-test? true
tpe-link-test? =    true
ok reset-all
```

2. **Boot the host and verify that the transceiver cable problem messages do not appear by typing either** `boot net` **or** `boot disk` **and pressing Return.**

CHAPTER 3

Modem Setup Specifications

3.1 Setting Up the Modem

Any modem compatible with CCITT V.24 can be connected to the Ultra 30 serial ports. Modems can be set up to function in one of three ways:

- Dial out only
- Dial in only
- Bidirectional calls

To set up your modem:

1. **Become superuser and type** `admintool`**.**

```
% su
Password:
# admintool
```

2. **Click Serial Port Manager.**
3. **Select Port a or Port b for your modem connection.**
4. **Click Edit.**

   The Serial Port Manager: Modify Service window is displayed.

5. **Choose the Expert level of detail.**
6. **From the Use Template menu, choose one of the following:**
   - Modem - Dial-Out only
   - Modem - Dial-In Only

- Modem - Bidirectional

7. **Click Apply.**
8. **Set your modem auto-answer switch to one of the following**:
   - Off – Dial-Out Only
   - On – Dial-In Only
   - On – Bidirectional

3.2 Serial Port Speed Change

To change the speed of a serial port, you must edit the `/etc/remote` file as follows:

1. **Become superuser, and type** `cd /etc`**.**

```
% su
Password:
# cd /etc
```

2. **Type** `vi remote`**.**
3. **Type** `tip` *speed device-name***.**

   Typical speeds are 9600, 19200 to 38400 bps. The device name is the serial port name — for example, `/dev/tty[a,b]` or `/dev/term/[a,b]`.

Note – The Ultra 30 serial ports are tested to a maximum of 460,000 bps. As of March 1997, Ultra 30 systems have not been tested with 56,000 bps V.34 modems.

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4. **Press Esc and type** `:wq` **to save your file change(s) and to exit from the** `vi` **text editor.**

3.3 Recommendations

3.3.1 Cable

For a modem-to-host (system) connection, use an RS-423/RS-232 straight-through cable with DB-25 male connectors at both ends.

3.3.2 Modem Switch Settings (AT Commands)

- Enable transmit flow control (AT&H1) [suggested setting] (Required for sending binary/8-bit data.)
- Set link rate to fixed
  (Will not track modem data rate, AT&Bn; n = menu choice in modem manual.)
- Set display result codes (ATQ0)
- Set verbal result codes (ATV1)
- Set result code subset (ATXn; n = option choice)
- Save settings in NVRAM (AT&W)

Note – The above settings are guidelines to help you get started quickly. These guidelines may change depending on your site requirements and the modem you are using.

For additional information about modem switch settings, see the manual that came with your modem.

CHAPTER **4**

Main Logic Board Jumpers

The jumper settings given in this chapter refer to the etchings on the main logic board. The jumpers are labeled with the letter "J" followed by a four-digit number (Figure 4-1).

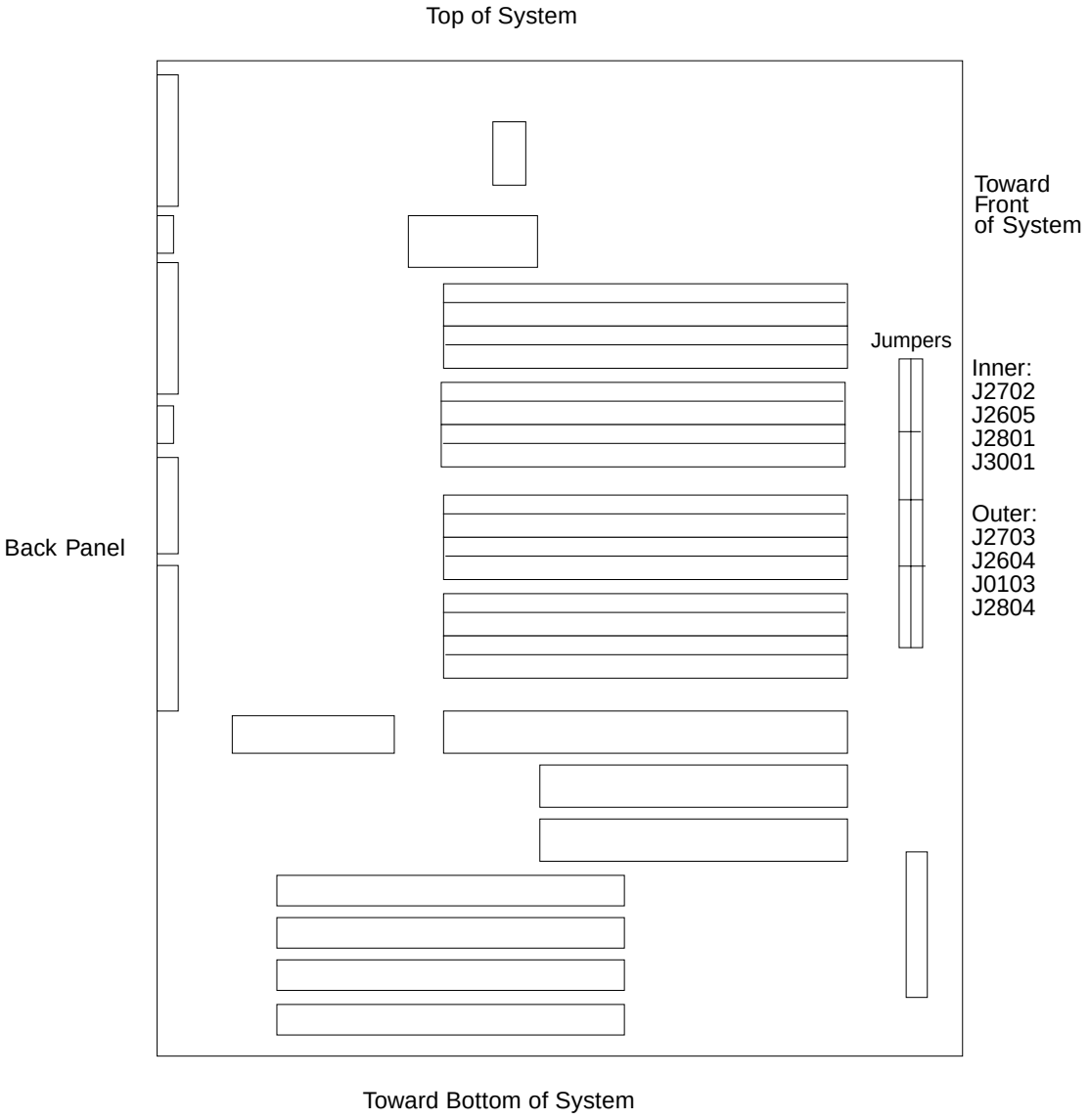

FIGURE 4-1 Jumper Locations on the Main Logic Board

4.1 Identifying Jumpers

Jumpers are marked on the main logic board with part numbers. For example, the serial port jumpers are marked J2604 and J2605. Jumper pins are located immediately adjacent to the part number. Pin 1 is marked with an asterisk in the position shown in Figure 4-2.

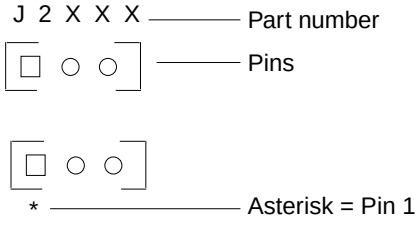

FIGURE 4-2 Identifying Jumper Pins

TABLE 4-1 User-Configurable Jumpers

Jumper	Functionality
J2703	Flash PROM Write Protect / Write Enable
J2605 J2604	Serial Ports B & A RS-423 & RS-232
J2804	Flash PROM Hi-Lo Booting
J3001	UltraSPARC Module Clocking Select

4.2 Flash PROM Jumpers

The Ultra 30 system uses flash PROMs. Flash PROMs enable:

- Reprogramming of specific code blocks
- Remote reprogramming of the PROM chip by a system administrator over a local area network

The default shunt setting of J2703 is on pins 1 and 2. This disables the flash PROM chip from being reprogrammed. Placing the shunt on pins 2 and 3 enables reprogramming of the flash PROM chip. See Table 4-2.

Note – After reprogramming your system flash PROM, make sure you return the flash PROM Write Protect/Enable jumper (J2703) to the Write Protect position to increase system security.

TABLE 4-2 Flash PROM Jumper Settings

Jumper	Pins 1 + 2 Select	Pins 2 + 3 Select	Default Jumper on Pins	Signal Controlled
J2703	Write Protect	Write Enable	1 + 2	FLASH PROM PROG ENABLE
J2804	High Half Booting	Normal Booting	2 + 3	XOR LOGIC SET

4.3 Serial Port Jumpers

The serial port jumpers on the main logic board enable you to configure the two DB-25 serial ports on the system unit back panel for either RS-423 or RS-232 signal levels. RS-423 levels are the default standard for North American users. RS-232 levels are required for telecommunication in nations of the European Community. See Table 4-3.

TABLE 4-3 Serial Port Jumper Settings

Jumper	Pins 1 + 2 Select	Pins 2 + 3 Select	Default Jumper on Pins	Signal Controlled
J2604	RS-232	RS-423	2 + 3	RS232/RS423 SEL
J2605	RS-232	RS-423	2 + 3	RS232/RS423 SEL

4.4 UltraSPARC Module Clocking Select Jumper

TABLE 4-4 UltraSPARC Module Clocking Select Jumper Settings

Jumper	Pins 1 + 2 Select	Pins 2 + 3 Select	Default Jumper on Pins
J3001	250 MHz, 1 Mbyte external cache; and 300 MHz, 2 Mbytes external cache UltraSPARC-II modules.	All 167 MHz and 200 MHz UltraSPARC-I modules.	1 + 2

CHAPTER 5

System Specifications

5.1 Power Specifications

TABLE 5-1 Power Specifications

Input/Output	Specifications
AC power input	100–240 volts AC nominal, 47–63 Hz
DC power output	300 watts maximum

TABLE 5-2 Power Supply Outputs

Output	DC Voltage (Volts)	Maximum Current (Amperes)	Voltage Regulation Range
1[1]	3.3	50	3.23–3.43
2	5	30	4.85–5.25
3[1]	12	6	11.65–12.60
4	-12	0.4	-12.6 to -11.4
5	2.5–3.5	16	+/-2%

1. The combined power of Outputs 1 and 3 must be less than 235 watts.

5.2 Environmental Specifications

The specifications in Table 5-3 comply with the *International Electrotechnical Commission (IEC) Standards*, 5th ed., 1990–1994.

TABLE 5-3 Environmental Specifications—Operating

Altitude	0 meters (0 feet) [sea level] to 3000 meters (9840 feet) —IEC 68-2-13
Humidity	20% to 80% relative humidity (RH), wet bulb limit of 27°C —IEC 68-2-02, 68-2-03
Shock	5.0G, 11 milliseconds, half sine pulse —IEC 68-2-27

TABLE 5-3 Environmental Specifications—Operating

Vibration	0.2G, 5 to 500 to 5 Hz, 5 sweeps in 3 mutually perpendicular axes —IEC 68-2-06
Temperature without removable tape media	10°C to 40°C (50°F to 104°F) —IEC 68-2-01, 68-2-02
Temperature with removable tape media	10°C to 35°C (50°F to 95°F) —IEC 68-2-01, 68-2-02

TABLE 5-4 Environmental Specifications—Nonoperating

Altitude	0 to 12,000 meters (0 to 39,360 feet) —IEC 68-2-13
Humidity	5%-93% relative humidity (RH) at 40°C (104°F) —IEC 68-2-03
Shock	30G peak, 11 milliseconds, half sine pulse —IEC 68-2-27
Vibration	1.0 G, 5 to 500 to 5 Hz, 5 sweeps in 3 mutually perpendicular axes —IEC 68-2-06
Temperature	-20°C to 60°C (-4°F to 140°F) —IEC 68-2-01, 68-2-02

5.3 Physical Specifications

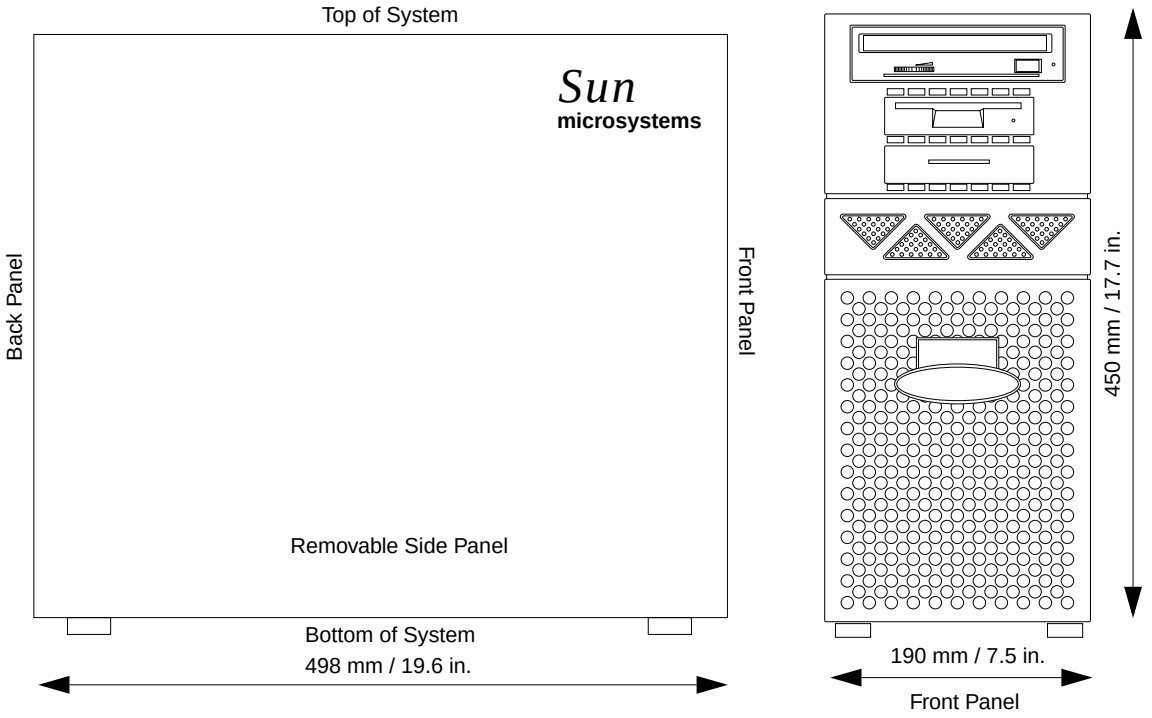

FIGURE 5-1 Ultra 30 System Enclosure Physical Dimensions

TABLE 5-5 Dimensions and Weight

Height	Width	Depth	Weight
450 mm (17.7 in.)	190 mm (7.5 in.)	498 mm (19.6 in.)	17.63 kg (38.87 lb)[1]

1. This weight is an approximation for a system equipped with four dual inline memory modules (DIMMs), two UPA graphics cards, two hard disk drives, and one CD-ROM drive.

5.4 Memory Mapping

5.4.1 DIMM Installation Guidelines

- Dual inline memory modules (DIMMs) are installed in pairs and are mapped in banks of four DIMMs.
- Each pair must be of the same memory size and speed.
- For best system performance (*recommended*), install each bank with four DIMMs of the same memory size and speed
- If DIMMs of different memory size are installed together as a pair, the system will read both DIMMs at the lower of the two memory sizes.
- DIMM sizes of 16-, 32-, 64-, and 128-Megabytes are supported.
- A minimum of one pair (two DIMMs) must be installed in a mapped pair of slots in order for the system to boot.

5.4.2 DIMM Banks and Slot Pairs

Table 5-6 lists the DIMM banks and slot pairs, and Figure 5-2 shows the paired slots on the main logic board. Bank 3 is the default location for factory-installed DIMMs.

TABLE 5-6 DIMM Banks and Slot Pairs

Bank	Slot Pairs
0	U0701 + U0801
0	U0901 + U1001
1	U0702 + U0802
1	U0902 + U1002
2	U0703 + U0803
2	U0903 + U1003
3	U0704 + U0804
3	U0904 + U1004

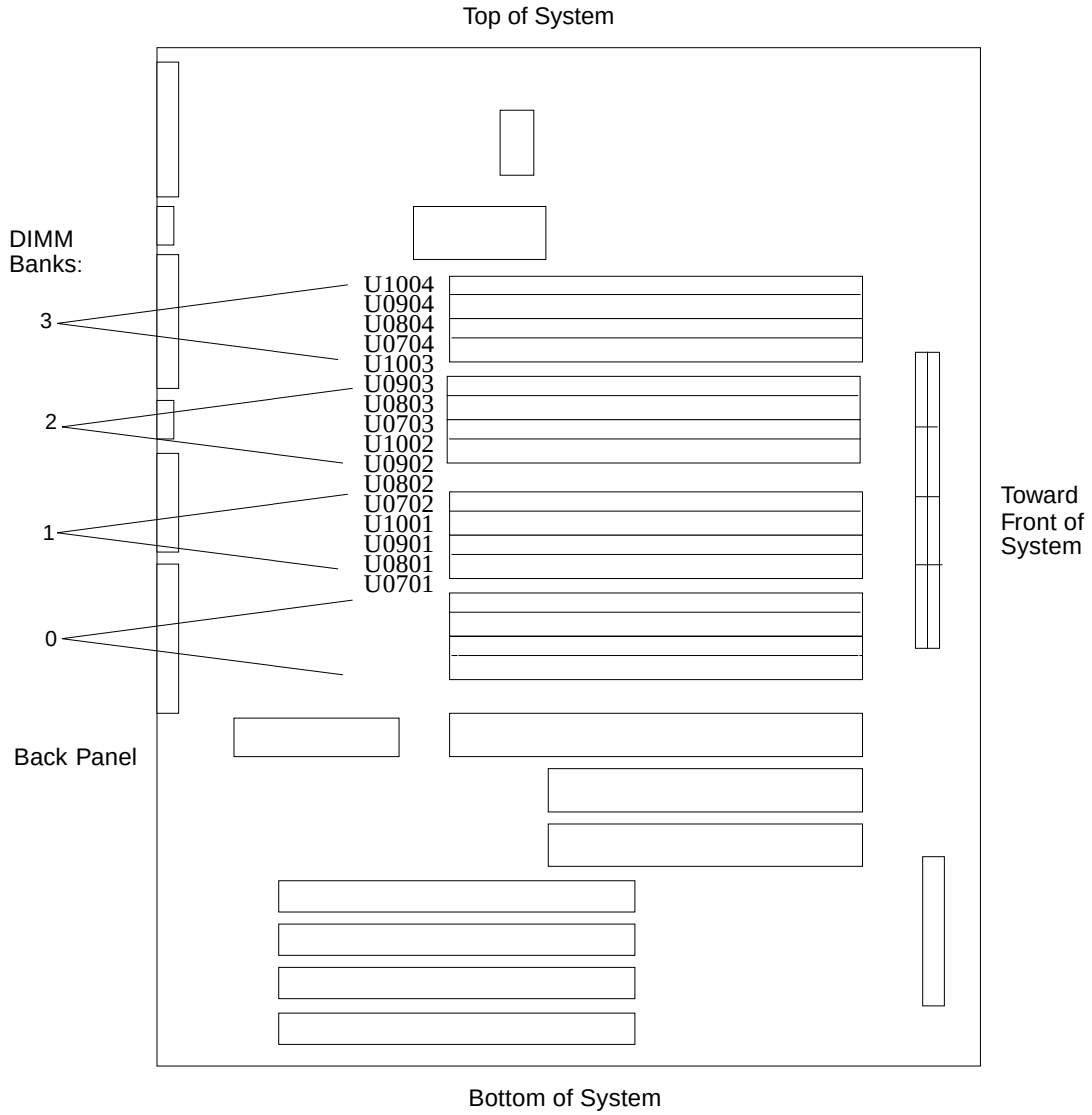

FIGURE 5-2 Map of DIMM Slot Pairs on Main Logic Board

5.5 PCI Card Slot Specifications

The Ultra 30 system uses the Peripheral Component Interconnect (PCI) local bus architecture to connect PCI accessory cards (printed circuit boards). PCI cards plug into Ultra 30 system PCI slots. PCI cards come in different physical sizes, operate at different frequencies, and provide many different types of functionality.

5.5.1 Locating the PCI Card Slots

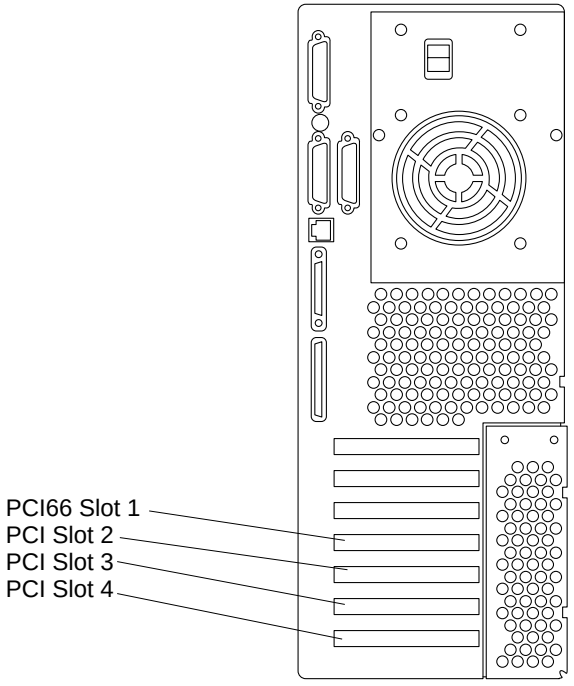

FIGURE 5-3 PCI Card Slot Locations on the System Unit Back Panel

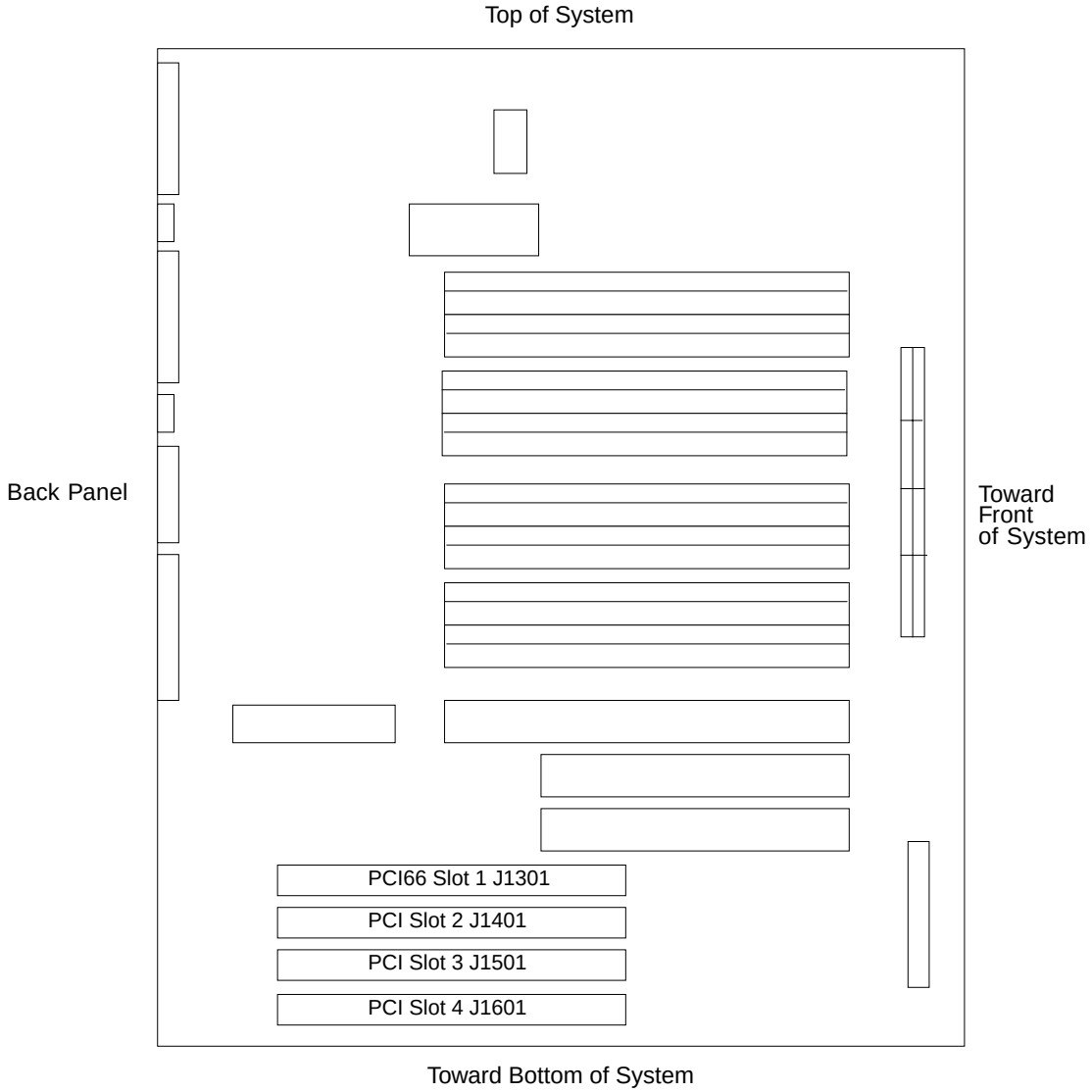

FIGURE 5-4 PCI Card Slot Locations on the Main Logic Board

5.5.2 PCI Card Slot Operating Frequencies

TABLE 5-7 PCI Card Slot Operating Frequencies

PCI Card Slot	Operating Frequency or Frequencies	Input/Output Signaling Level
PCI66 Slot 1 J1301	66 MHz 33 MHz	3.3 volts 3.3 volts
PCI Slot 2 J1401	33 MHz	5.0 volts
PCI Slot 3 J1501	33 MHz	5.0 volts
PCI Slot 4 J1601	33 MHz	5.0 volts

- All Ultra 30 system PCI card slots operate at 32-bit or 64-bit bus widths.
- Most PCI cards operate at 33 MHz.
- Cards designed to operate at 66 MHz must be installed in the PCI66 slot.

Note – If you install a 33 MHz PCI card in PCI66 Slot 1, see the card manufacturer's documentation and verify that the card will operate with an I/O signaling level of 3.3 volts.

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