SA-H125
Small System Enclosure for LSI-11 or MicroVAX System
Manual

ΣSigma Information Systems

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Manual

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Contents

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Section 1 - General Information

1.1 INTRODUCTION

This manual provides general information, drive and module installation, and power supply adjustments for the SA-H125 small systems enclosure manufactured by Sigma Information Systems, Anaheim, California. The material is arranged into the following sections.

Section 1 - GENERAL INFORMATION. This section provides a general description of the 5.25" chassis. Specifications are included.

Section 2 - INSTALLATION. This section describes the procedures for mounting drives into the chassis. Module insertion into the LSI-11 or MicroVAX *Q bus backplane is included.

Section 3 - POWER SUPPLY ADJUSTMENTS. This section provides the adjustments necessary for maintaining proper operation.

APPENDICES. The appendices consist of the front panel schematic and DC power supply schematics. Q bus pin assignments are also provided.

*DEC and Q bus are registered trademarks of Digital Equipment Corporation.

1.2 GENERAL DESCRIPTION

The SA-H125 is an attractive 5.25" high system chassis that can be the foundation of a compact, yet powerful, LSI-11 or MicroVAX computer system. It is available in tabletop or rackmount versions and includes a heavy duty power supply, an operator's console, and an 8-row, quad-wide Q bus backplane. The backplane contains 16 dual Q bus slots. An optional backplane, with 13 dual Q bus slots and 3 C-D MicroVAX slots, is available. The enclosure provides mounting space and power for a combination of 5-1/4" and 8" drives.

An example configuration is shown in Figure 1-1.

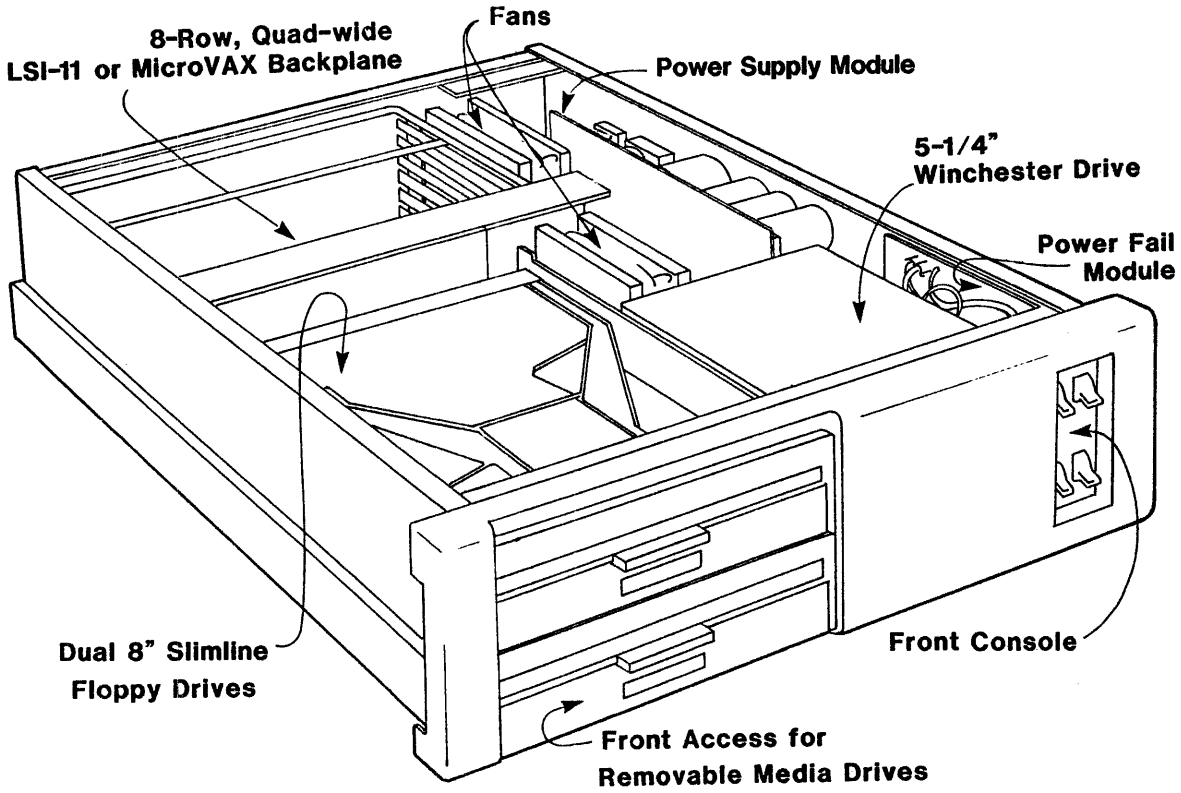


FIGURE 1-1: SA-H125 EXAMPLE CONFIGURATION

1.3 FEATURES

Includes an 8-row, quad-wide LSI-11 backplane with 16 dual *Q bus slots - or an optional backplane with 13 Q bus slots and three C-D MicroVAX slots.

22-bit addressing provides full utilization of LSI-11 and MicroVAX devices.

Backplane includes on-board Q bus termination.

Heavy duty, reliable 350W power supply has configurable 115/230VAC

Tabletop or rackmount versions available.

Front operator panel provides convenient operator control.

1 4 DRIVE TYPES

The SA-H125 front panel provides front access for combinations of 5-1/4" winchester and 8" removable media drives. A list of recommended drive manufacturers is shown in Table 1-1. Consult the factory for customized configurations using user-defined drive combinations.

MANUFACTURER	PERIPHERAL TYPE	MODEL
Ampex	5-1/4" Winchester	P Series
Rodime	5-1/4" Winchester	R0200 Series
Iomega	8" Removable Media Drive	Alpha-10.5
Shugart	8" Floppy	SA801/851
Mitsubishi	Dual 8" Slimline Floppies	M2896-63
Kennedy	8" Cartridge Tape Drive	6450
Control Data (CDC)	8" Cartridge Tape Drive	92190/92195
Cipher	5-1/4" Streaming Tape Drive	Series 540
DMA Systems	5-1/4" Fixed/Removable Disk	Micro-Magnum 5/5

TABLE 1-1: RECOMMENDED PERIPHERAL MANUFACTURERS

Figure 1-2 shows the front bezels available for mounting various drive combinations.

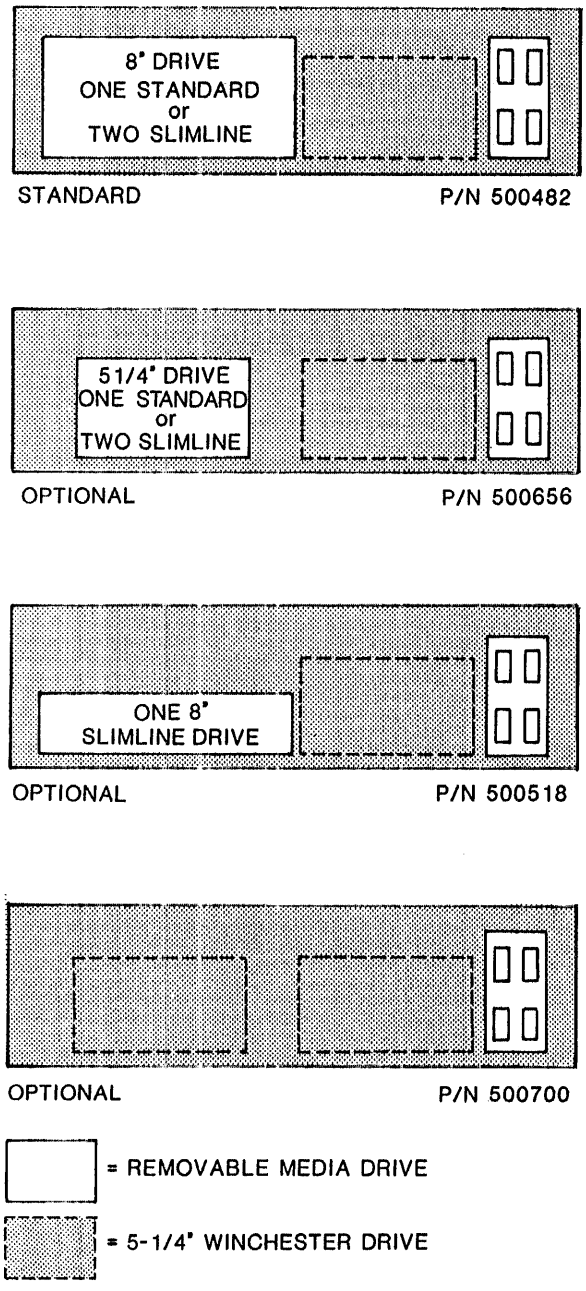


FIGURE 1-2: FRONT BEZELS

1.5 REAR I/O CONNECTOR PANEL

Module access is from the rear via a hinged rear access cover. The backplane cover includes a rear connector panel with four cutouts for B I/O panels. Optional rear panels provide either twelve horizontally mounted DB25 cutouts, or two cable strain reliefs and no I/O connector cutouts. Figure 1-3 shows the standard and optional rear panels.

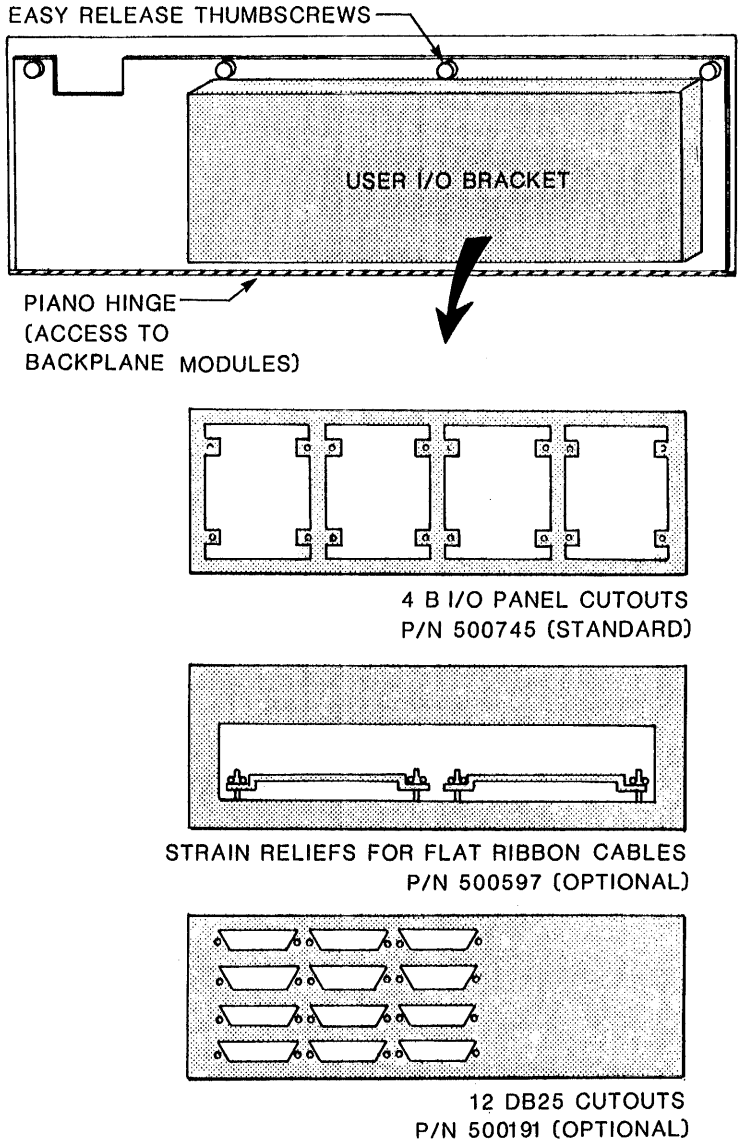


FIGURE 1-3: REAR I/O PANELS

1.6 FRONT CONSOLE

The operator console assembly is mounted on the front of the chassis and consists of four switches and two LED indicators as shown in Figure 1-4 below.

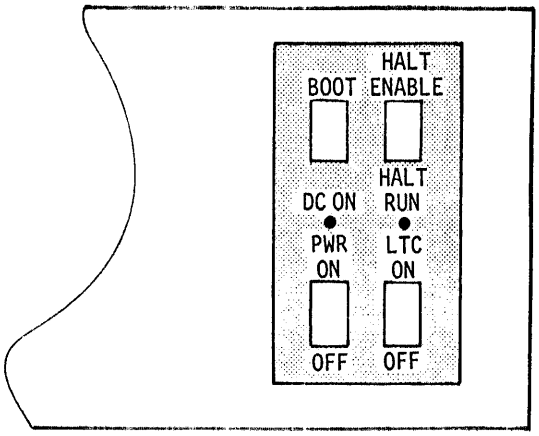


FIGURE 1-4: FRONT CONSOLE

ON-OFF SWITCH. The power supply includes a remote ON/OFF solid state relay. When the ON/OFF switch is in the ON position, the relay is enabled. AC is supplied to the power supply and fans and DC to the backplane is enabled.

LTC ENABLE SWITCH. When in the ON (up) position, a line frequency square wave is impressed upon the B EVENT line (BR1), causing the LSI-11 CPU to be interrupted at line frequency (50 or 60Hz).

BOOT SWITCH. This is a momentary two-position switch. When depressed, the BDCOK line (BA1) is momentarily asserted, causing the CPU to address the location of the bootstrap PROM (173000), depending on the bootstrap option selected. The system will either boot to a specified device or enter a bootstrap monitor.

HALT/ENABLE SWITCH. When in the HALT position, the B HALT line (AP1) is asserted, causing the CPU to go into ODT mode. When in the ENABLE position, a high on the B HALT line is generated, allowing programs to be run.

DC ON LED. When on, this LED indicates +5V is applied to the front panel.

RUN LED. When on, this LED indicates that the SRUN line is asserted and a program is being executed from main memory. When off, either the CPU is in ODT or it is in a Programmed Wait state.

1.7 SPECIFICATIONS

Backplane: 8-row, quad-wide Q bus backplane with 16 dual Q bus slots. Includes supporting frame and card guides.

Accessibility

- **Modules:** From the rear via hinged access door.
- **Drives:** Via front panel access area (removable media drives).

Power Supply

- **Input:** 115VAC 60Hz/4.0A OR 230VAC 50Hz/2.0A - Jumper configurable.
- **Output:**

Model	V1	V2	V3	V4
1222	+5VDC 40A	+12VDC 7A/8A Peak	-12VDC 5A	+12VDC 5A
1224	+5VDC 40A	+12VDC 7A/8A Peak	-12VDC 5A	+24VDC 5A

Not to exceed 350W total.

Installation: Tabletop or standard 19" RETMA rackmount.

Dimensions: 19"W x 24"D x 5.25"H

Drive Mounting: Horizontally, side-by-side.

Drive Configurations: One 5-1/4" winchester & two 8" slimline floppy drives

One 5-1/4" winchester & one 8" removable media drive (e.g., standard floppy drive or tape cartridge drive).

One 5-1/4" winchester & one 5-1/4" removable media device, e.g., streaming tape or fixed/removable drive.

One 5-1/4" winchester & two 5-1/4" slimline removable media drives.

Temperature

- **Operating:** 0°C to 50°C
- **Storage:** -45°C to 85°C

Humidity: 0% to 95% noncondensing

Altitude

- **Operating:** 0 ft to 10,000 ft
- **Storage:** 0 ft to 30,000 ft.

Notes

Section 2 - Installation

2.1 UNPACKING AND INSPECTION

Unpack the 5.25" system chassis and visually inspect it for damage that might have occurred during shipment. Retain the shipping carton in case reshipment is necessary. Remove the chassis covers and inspect the backplane, power supply, etc., for component damage. If any damage has occurred, notify Sigma Information Systems immediately.

Each shipping container should include the following:

An SA-H125 chassis assembly with backplane, power supply, and front console. The front panel has access space for removable media devices. See Section 1.4.

An SA-H125 system chassis manual with logic diagrams for power supply modules.

An AC power cord.

An optional hardware kit containing mounting brackets with required hardware for mounting dual slimline floppy drives, tape cartridge transport, and/or winchester formatter module. Must be specified at time of order.

2.2 DRIVE MOUNTING LOCATIONS

This section describes installation of the drives listed in Table 1-1 and is intended to be a guide for general drive installation. If drives other than those listed in Table 1-1 are used, consult the factory.

Drives are mounted over rails in locations A or B shown in Figure 2-1. Fixed media drives are mounted in location B, and removable media drives are mounted in location A. The front panel includes a removable media access area for the specified devices to be installed in location B.

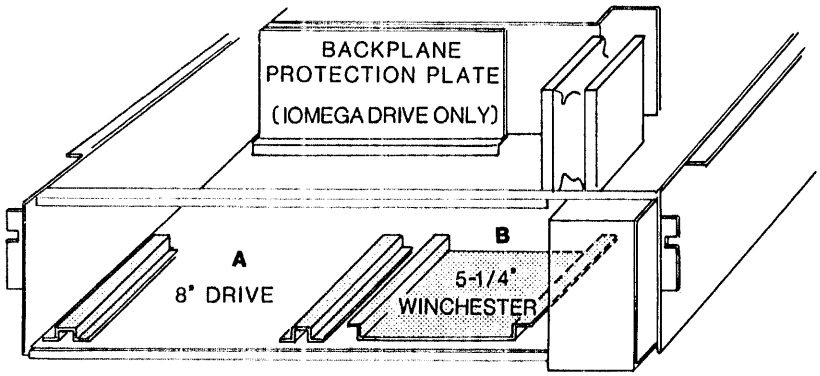


FIGURE 2-1: DRIVE MOUNTING LOCATIONS

2.3 REMOVABLE MEDIA DRIVE INSTALLATION - LOCATION A

Several types of removable media drives can be installed in location A. A single full height or dual slimline 8" devices, such as floppy, cartridge tape, can be accommodated. Alternatively, single or dual slimline 5-1/4" removable devices can be installed; the 5-1/4" devices are mounted on a bracket different from the one shown in Figure 2-1..

The types of drives to be installed must be specified at time of order so that the correct drive mounting hardware and front bezel are shipped.

2.3.1 8" Floppy Drive(s) Installation

Use the following procedure to install floppy drives in location A.

1. If dual slimline floppy drives are used, secure them together with the supplied mounting brackets using 8 (4 on each side) 8-32 x 3/8 panhead phillips screws with associated lock and flat washers (Figure 2-2).

2 Mount the single 8" floppy drive or the dual slimline floppy drive assembly over the mounting rails in location A. Secure from the bottom of the chassis using four 8-32 x 3/8 flathead screws.

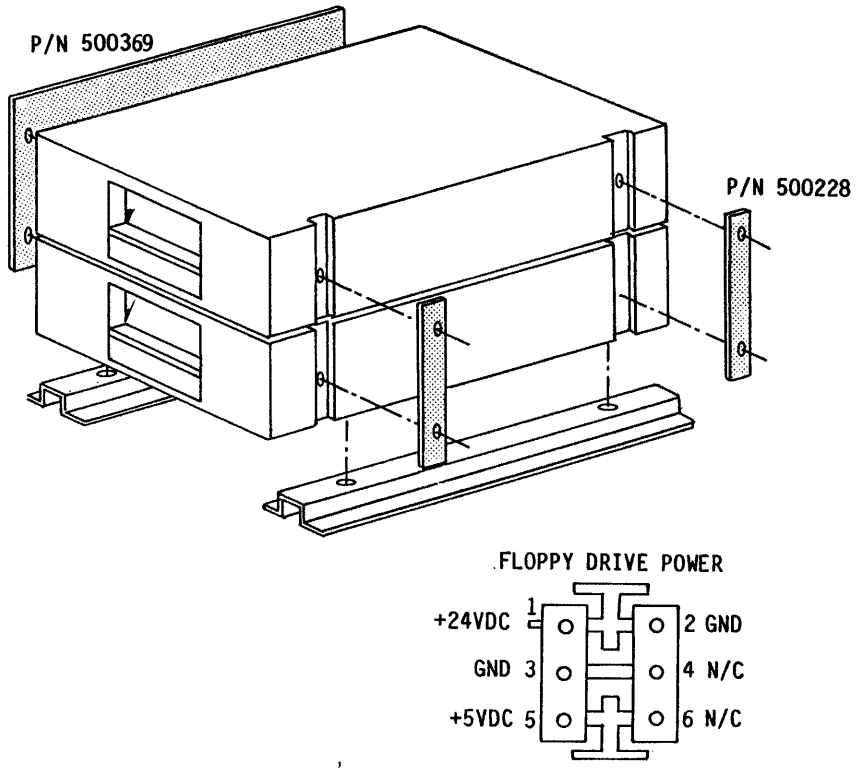


FIGURE 2-2: 8" FLOPPY DRIVE INSTALLATION

3. Check that power supply voltages meet manufacturer's specifications before applying power to the drive(s).

4 Cable the drive(s) per manufacturer's specifications.

2.3.2 8" Cartridge Tape Drive Installation

With Figure 2-3 as a guide, install the cartridge tape drive using the following procedure.

1. Remove the existing front bezel on the cartridge tape drive by removing the two screws at the top and two hex nuts at the bottom of the standoffs.

2. The CDC bracket includes an assembly with LED indicators and a 4-pin connector to the cartridge tape drive module. Ensure that pin 1 is correctly aligned when plugging the 4-pin connector on the cartridge tape drive module.

3. Install the front mounting bracket using 6-32 hex nuts with flat and lock washers.

4. Place the cartridge tape drive assembly over mounting rails in drive location A.

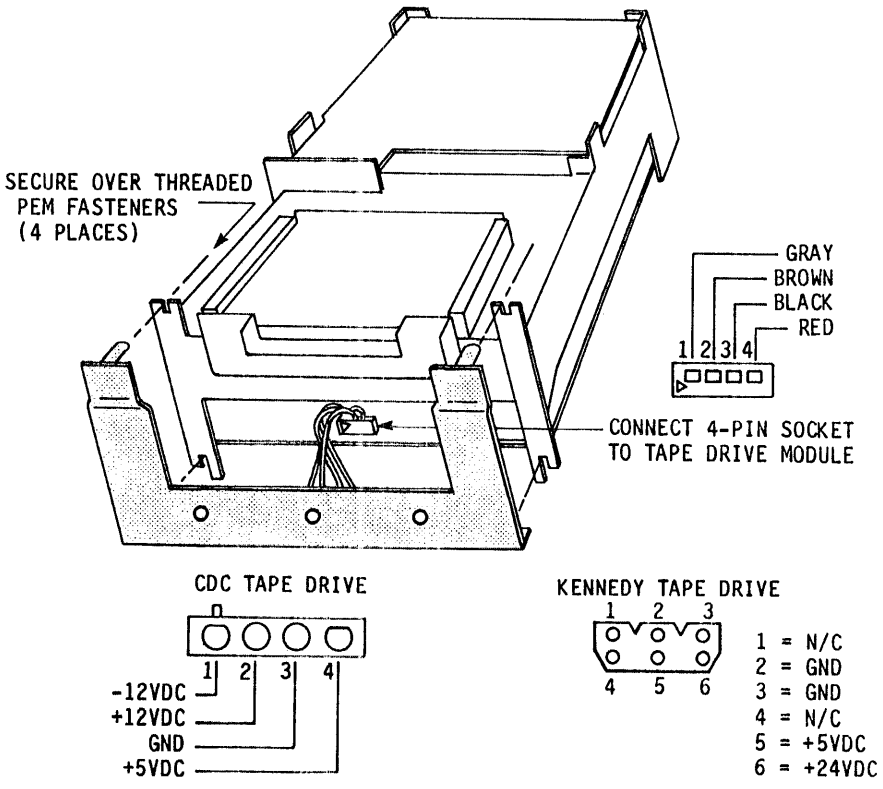


FIGURE 2-3: 8" TAPE DRIVE INSTALLATION

5. Secure the cartridge tape drive assembly from the bottom of the chassis using four 8-32 x 3/8 screws.

6. Check that power supply voltages meet manufacturer's specifications before applying power to the transport.

7. Cable the cartridge tape drive per manufacturer's specifications.

2.3.3 8" Iomega ALPHA-10.5 Drive Installation

Using Figure 2-4 as a guide, install the Iomega ALPHA-10.5 removable media drive.

1. Mount the 8" removable media drive over the mounting rails in location A using four 8-32 x 3/8 flathead screws. The drive has additional rear support on the ledge of the backplane bottom protection plate.

2. Check that power supply voltages meet manufacturer's specifications before applying power to the drive(s).

3. Cable the drive per manufacturer's specifications.

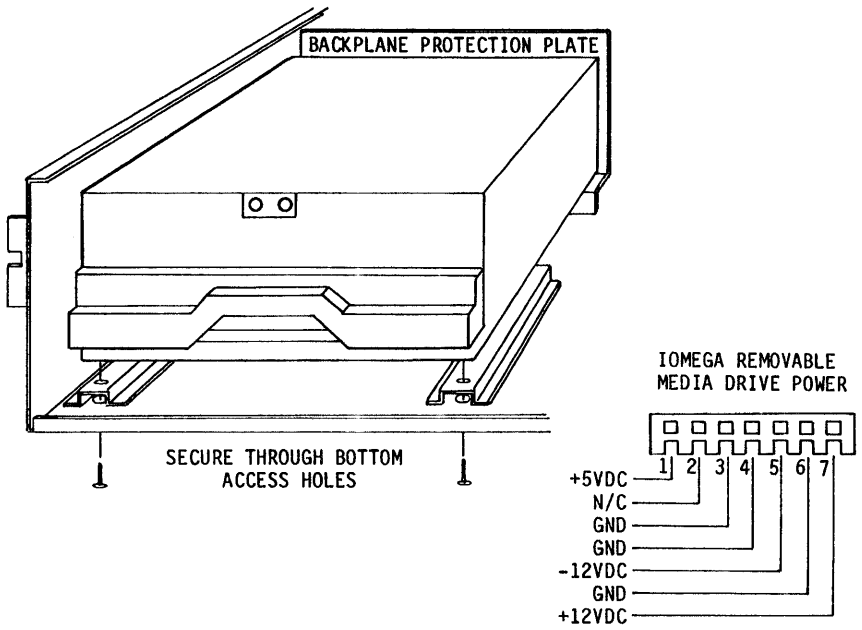


FIGURE 2-4: 8" REMOVABLE MEDIA DRIVE INSTALLATION

2.3.4 5-1/4" Removable Media Drive Installation

The 5-1/4" removable media device is generally a cartridge tape or fixed/removable disk drive. With Figure 2-5 as a guide, install the 5-1/4" removable media device using the following procedure.

1. Mount the 5-1/4" removable media drive over the mounting bracket in location A. Notice that the mounting bracket (P/N 500655) is different from the one shown in Figure 2-1.

2. Secure the drive from the bottom access holes using four 6-32 x 3/8 flathead screws.

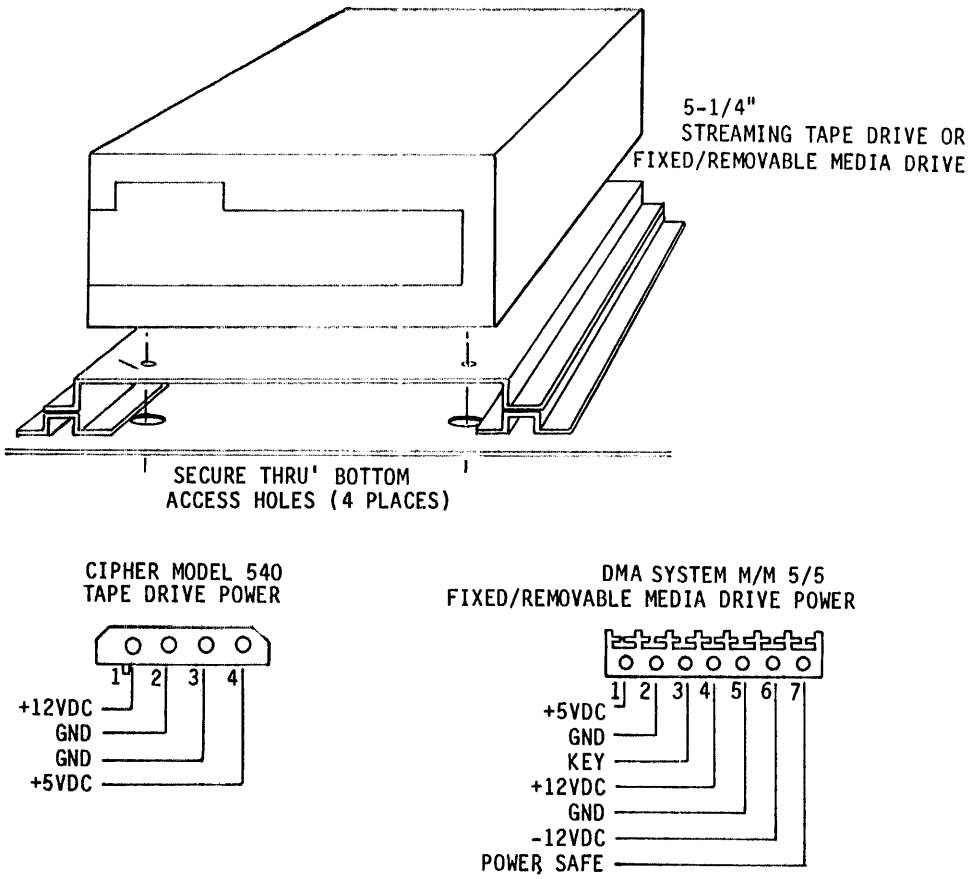


FIGURE 2-5: 5-1/4" REMOVABLE MEDIA DRIVE MOUNTING

3. Check that power supply voltages meet manufacturer's specifications before applying power to the drive. Figure 2-5 defines the DC power connectors for the 5-1/4" cartridge tape and for the fixed/removable media drives.

4. Cable the drive per manufacturer's specifications.

2.4 5-1/4" FIXED MEDIA DRIVE INSTALLATION - LOCATION B

Use the following procedure to install 5-1/4" winchester drives in location B.

1. Some winchester drive controllers (e.g., SDC-RLV112) require a formatter module that is secured to the drive mounting bracket. Using Figure 2-6 as a guide, use the following procedure to install the formatter module. If the controller does not require a formatter module (e.g., SDC-RQD11-B) proceed to step 2 below.

   a. Insert the mylar sheet between the formatter module and the mounting bracket. The insulating spacers are inserted between the module and the mylar sheet.

   b. Attach the formatter module to the inside of the mounting bracket using four nylon screws.

   c. Mount the bracket to the sides of the winchester drive using four (two on each side) 6 x 3/8 screws with lock washers.

   d. Cable the formatter to the drive as shown.

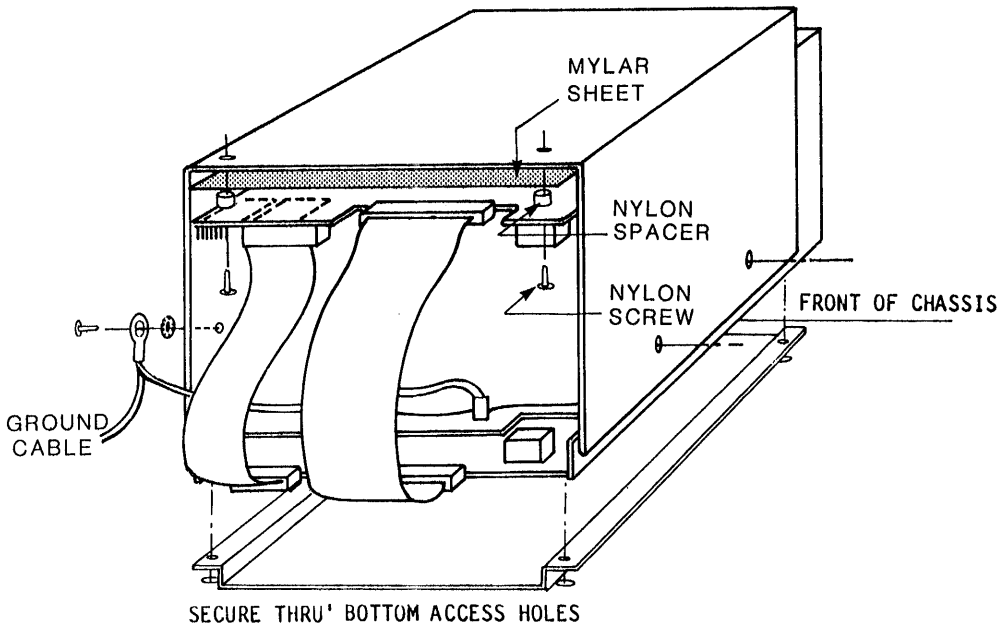


FIGURE 2-6: 5-1/4" WINCHESTER FORMATTER MOUNTING

2. Install the ground cable on the side of the mounting bracket using supplied hardware. Connect the shorter end of the ground cable to drive ground (location may vary), and the longer ground cable to logic ground on the backplane (Figure 3-2).

3. Mount the drive assembly in location B and secure from the bottom using four 8-32 x 3/8 panhead phillips screws with associated lock and flathead washers.

4. Check that power supply voltages meet manufacturer's specifications before applying power to the drive.

5. Cable the winchester drive controller module per manufacturer's specifications. Ensure pin 1 connections are correctly aligned.

2.5 MODULE INSTALLATION

Before installing modules into the backplane, ensure 22-bit addressing and far-end Q bus termination is selected, if needed.

2.5.1 22-Bit Addressing

The backplane provides 22-bit addressing for use with LSI-11 series modules and DMA devices designed to accommodate 22-bit addressing. These extended address bits are assigned as follows:

BADL18L	BC1, DC1	BDAL20L	BE1, DE1
BDAL19L	BD1, DD1	BDAL21L	BF1, DF1

Since the quad LSI-11 and the dual LSI-11/2 both use these signal lines internally, the extra address bits should not be connected when the system is not being used as a 22-bit system.

When the system is to be used with 22-bit addressing, install W1, W2, W3 and W4. When used with the LSI-11/2, remove W1 through W4. If used with the quad-wide LSI-11/2, remove W1 through W8. See Figure 2-7 for the location of jumpers W1 through W8.

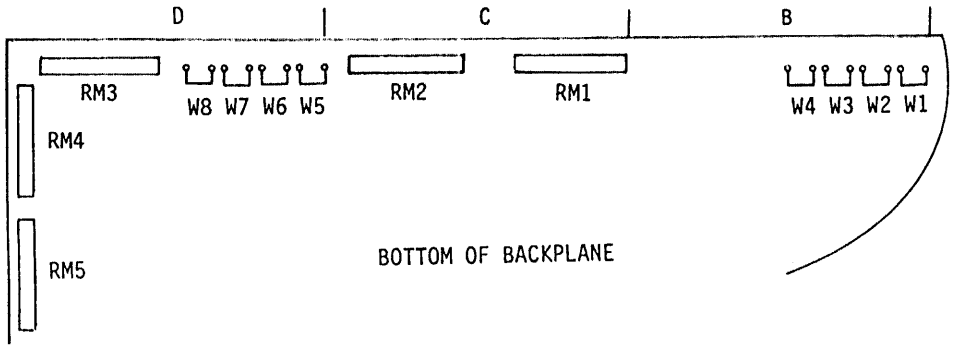


FIGURE 2-7: 22-BIT ADDRESS JUMPERS

2.5.2 Q Bus Termination

The PCBA also includes five terminating resistor modules; RM1 through RM5 are normally installed in the backplane to provide full termination of all Q bus lines. If the system is already using a bootstrap/terminator, and no termination is required, remove resistor modules RM1 through RM5. Connection to resistor modules is shown in Appendix B.

2.5.3 Module Insertion

The SA-H125 backplane provides direct plug-in installation for Q bus* compatible modules. The backplane is built into a cardframe assembly that supports installed modules; the assembly includes card guides that provide positive pin alignment and extractor mounting holes that secure the modules.

The Q bus backplane uses standard DEC-type connector blocks and has a multilayer mother board with +5VDC and GND inner layers.

Modules plug directly into the backplane with priorities determined by the interrupt level of the module and by its distance from the CPU (backplane priority). When more than one device with the same interrupt level requests interrupt service, the device that is closest to the CPU (lowest backplane priority) will receive the interrupt grant first.

Figure 2-8 defines the backplane priority structure for the LSI-11 and the MicroVAX backplanes.

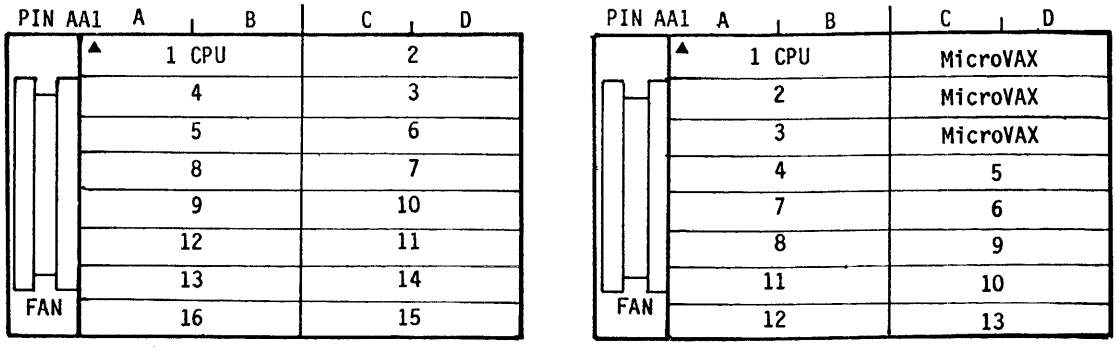


FIGURE 2-8: BACKPLANE PRIORITIES

The LSI-11 processor plugs into slot J1A. Each slot includes an alphanumeric identifier. Refer to Figure 2-9 for row A through D identifiers. Take special care to ensure that the logic modules are not installed backward.

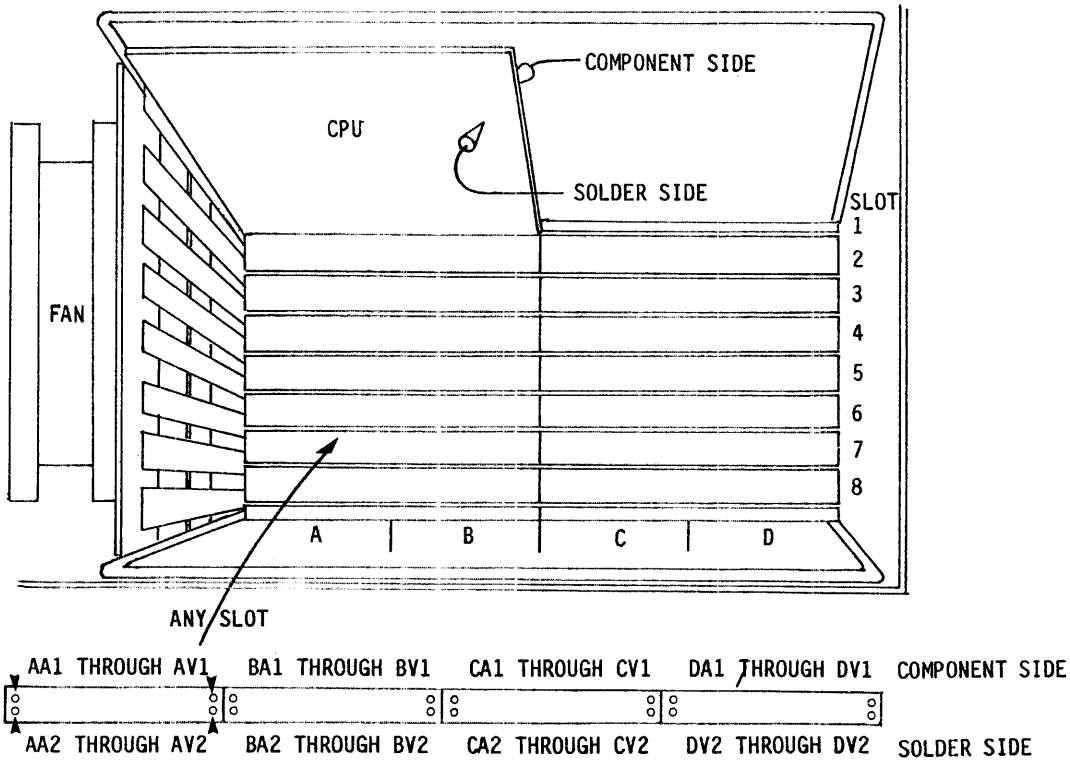


FIGURE 2-9: MODULE INSTALLATION INTO BACKPLANE

2.6 CHASSIS INSTALLATION

Use the following procedure to install the SA-H125 into a standard 19" RETMA rack and to apply AC input power.

1. Remove the slides from the chassis by sliding the chassis out until the rear retaining spring buttons engage. Depress the springs and slip the slides free from the chassis. Set the chassis aside.

2. Place the slides in the rack, marking the intended position of the mounting holes both on front and rear of the rack. Bolt the front of the slides into place using 10-32 x 1/2" screws. Bolt the rear of the slides to the rack side rails using four 10-32 x 3/8" screws. All screws use flat washers, with locking washers next to the hex nut.

3. Check the AC receptacle for proper input power (Section 1.8).

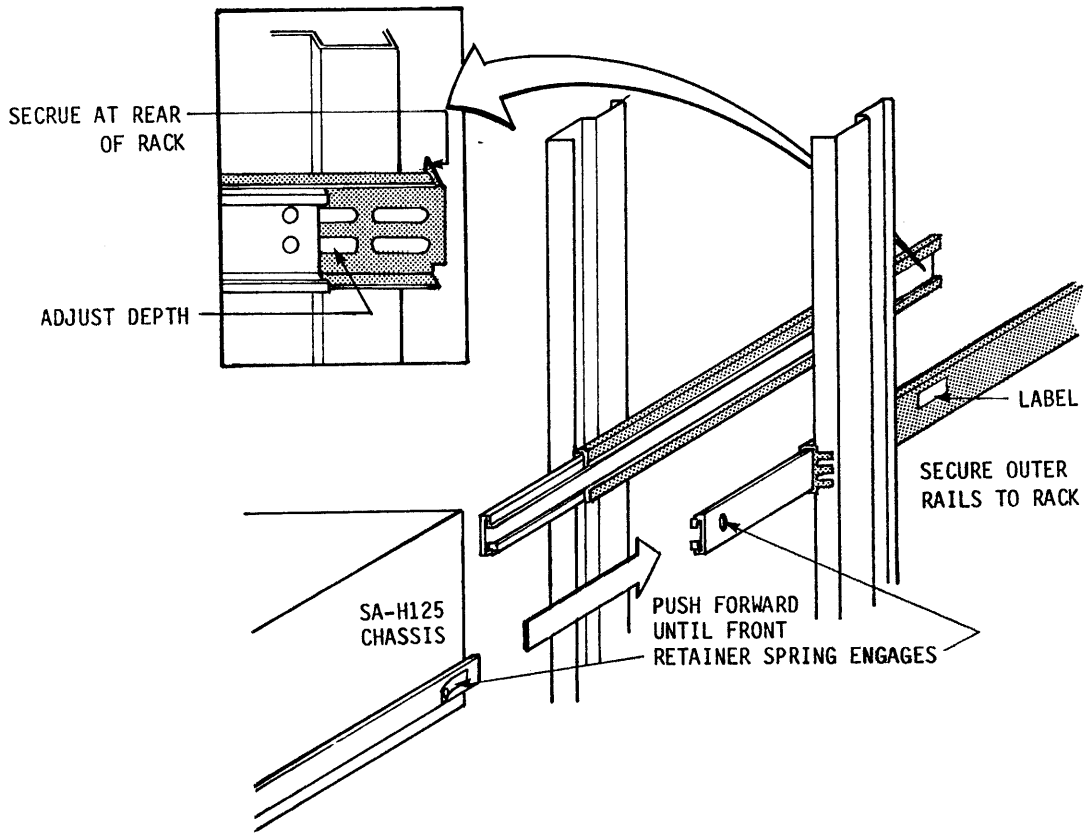


FIGURE 2-10: RACKMOUNT INSTALLATION

4. Install the chassis on the slides. Plug the AC cord into a proper main receptacle and switch the power ON/OFF switch to the ON position. Check DC voltages as defined in Table 2-2. The voltages should be measured on the backplane. See Appendix for Q bus pin assignments.

VOLTAGE	MEASUREMENT SOURCE
+5VDC +/- 0.25VDC	AA2,BA2,BV1
+12VDC +/- 0.60VDC	AD2,BD2
-12VDC +/- 0.60VDC	AB2,BB2

TABLE 2-2: DC VOLTAGE MEASUREMENTS

Notes

Section 3 - The Power Supply

3.1 GENERAL INFORMATION

Two different power supplies, depending on type of drives to be installed, are available for the SA-H125 system chassis. In addition to the standard voltages (+5V, +12V, and -12V), the power supply also includes either +24V or an additional +12V output. Both power supplies provide power fail detect circuitry, +5VDC at 40A with overvoltage (OVP) and current limit protection, and front panel logic.

The power supply is easily converted between 115VAC and 230VAC. Two fans provide cooling for the power supply and installed modules.

The power supply consists of two major subassemblies:

A 350 watt switching power supply module distributes DC power to the drives and backplane.

A combined AC input control/power fail detect module distributes AC power to fans, provides the power fail detect circuitry, and distributes front panel and backplane signals via two 10-wire cables.

3.2 POWER SUPPLY OUTPUT CONNECTIONS

The power supply provides power and logic for the backplane and front console. Drive power connectors are described under the associated drive types in Section 2. A complete diagram of the SA-H125 system wiring can be found in Appendix C.

3.2.1 DC Output Power to Backplane

Attachment of DC power to the backplane is via power cables from the DC distribution module. The power cables provide +5VDC, +12VDC, -12VDC, and Ground. The power tabs for +5VDC can accept up to 45A. Figures 3-1 illustrates the backplane power connections.

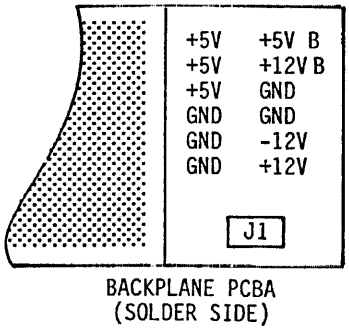


FIGURE 3-1: BACKPLANE POWER CONNECTIONS

3.2.2 Front Panel and Backplane 10-Pin Connectors

The AC distribution/power fail detect module contains two 10-pin connectors for interfacing to the front console (J1) and backplane (J2). The J1 cable plugs into the front console PCBA and the J2 cable plugs into the backplane PCBA (Figure 3-1). The 10-pin connector is illustrated in Figure 3-2. Pin assignments for J1 and J2 are defined in Tables 3-1 and 3-2, respectively.

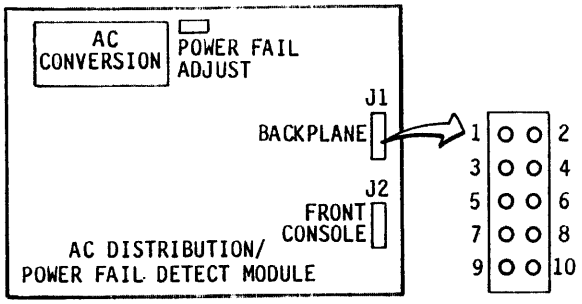


FIGURE 3-2: J1 AND J2 CONNECTOR

PIN	SIGNAL	DESCRIPTION
1	HALT	From front panel to assert BHALT line for ODT mode
2	ENABLE	From front panel to generate high on BHALT for running programs
3	$\overline{\text{BOOT}}$	Normal position of BOOT switch on front panel
4	BOOT	From front panel to assert BDCOK line for bootstrapping
5	N/C	No Connection
6	RUN	From processor to assert SRUN during program execution
7	GND	Ground
8	PWR	From power supply to indicate +5V presence on front panel
9	LTC	Line frequency signal from power supply to BEVENT line
10	N/C	No Connection

TABLE 3-1: J1 CONNECTIONS TO FRONT PANEL

PIN	SIGNAL	DESCRIPTION
1	N/C	Option Pad
2	N/C	Option Pad
3	BDCOKH	From power supply to indicate DC voltage out of tolerance
4	BHALTL	From front panel switch
5	BEVENTL	Line frequency signal from power supply to BEVENT line
6	BPOKH	From power supply to indicate AC power condition
7	N/C	Option Pad
8	SRUN	From processor to indicate RUN status on front panel
9	GND	Ground
10	GND	Ground

TABLE 3-2: J2 CONNECTIONS TO BACKPLANE

3.3 DC VOLTAGE ADJUSTMENTS

Voltages can be adjusted to within +/-10% of nominal by turning potentiometers clockwise for a decrease and counterclockwise for an increase in voltage. Refer to Figure 3-3 for location of voltage adjustment pots on the power supply module. The power fail detect adjustment is located on the AC distribution/power fail detect module (Figure 3-2). The power supply bracket is connected to DC GND and AC safety GND, and can be used for ground reference in voltage measurements.

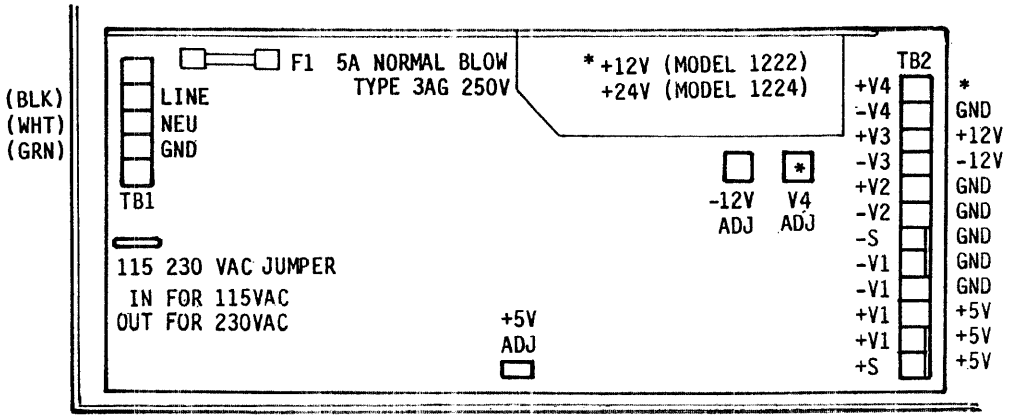


FIGURE 3-3: DC POWER ADJUSTMENTS

Notice that the output voltages on V4 tabs of TB2 are dependent on the drives that are installed. Some drives may require +24V while other drives may require +12V.

Voltages can be measured from any backplane slot, except for +24V which must be measured from TB2 on the DC distribution module or from the appropriate drive connector (See Section 2). Voltage ranges and measurement sources are listed in Table 3-3.

OUTPUT VOLTAGE	TOLERANCE	MEASUREMENT SOURCE (BACKPLANE)
+5V	+/- -.25V	AA2,BA2,BV1
+12V	+/- 0.6V	AD2,BD2
-12V	+/- 0.6V	AB2,BB2
+24V	+/- 1.2V	*TB2

*Measure from power distribution module.

TABLE 3-3: DC POWER MEASUREMENT SOURCES

The power supply includes a power fail detect circuit which provides BPOKH and BDCOKH signals in the proper timing sequence to the Q bus. The power supply also provides the LTC signal which is connected to the BEVENT line (BR1) and controlled by the LTC front panel switch. This signal is used by the Q bus as timing for a line time clock.

The power fail circuitry is designed to detect a 1/2 cycle drop-out on the AC line. The detection is done via a retriggerable one-shot that is retriggered on zero crossing and whose dwell slightly exceeds the duration of 1/2 cycle line frequency. Since line frequency can be either 50Hz or 60Hz, adjustment of the power fail detect signal should be checked at time of installation.

Figure 3-2 shows the location of the power fail detect pot. Adjustment should be made by monitoring BB1 (Figure 2-4). Note that pin BB1 should be high. If +5VDC and +12VDC are present and within tolerance, BPOKH should be high. If not, adjustment is necessary. Using a VOM, adjust the pot until pin BB1 can be observed going low. Then back off until pin BB1 remains high. Continue slightly beyond this point to provide extra margin.

Figure 3-4 shows the timing relationship of BPOKH and BDCOKH as provided by the power supply unit.

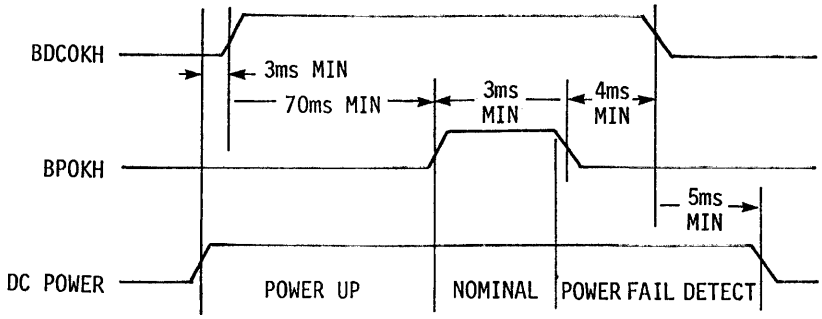


FIGURE 3-4: POWER FAIL DETECT TIMING

BPOKH A signal signifying the status of AC power. If power fails in a 1/2 cycle drop-out or longer power outage, BPOKH is asserted on BB1. Both BPOKH and BDCOKH remain asserted (low) after power is off.

BDCOKH A signal signifying the status of DC power on the Q bus, pin BA1. The signal must be asserted before DC power is lost and becomes valid after DC power is restored.

3.4 AC CONVERSION

Input power is applied via the power cord, through an IEC compatible connector, line filter and fuse to the power supply voltage regulator PCBA. The input power is also filtered at the transformer inputs by 0.01uf capacitors. Transient voltage suppressors protect the power supply from transient voltage spikes. The input also provides power to three fans. Power for these fans is derived from the input windings on the power transformer, allowing the use of 115VAC fans for both 115VAC and 230VAC operation.

AC input power can be converted easily between 115VAC and 230VAC. AC conversion requires reconfiguring the power supply module and the AC distribution/power fail detect module.

On the power supply module the jumper should be installed for 115VAC operation and removed for 230VAC operation. On the AC distribution module the two jumpers must be relocated to the correct positions. Figure 3-5 shows AC configurations for both modules.

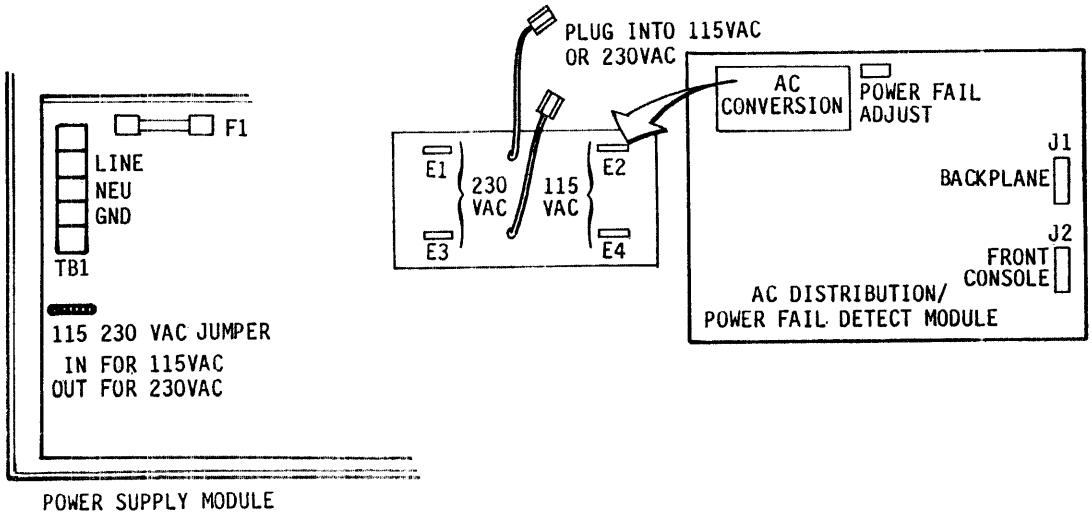


FIGURE 3-5: AC CONFIGURATION

NOTE

If AC input power in reconfigured the fuse located at the rear of the chassis must be replaced. 115VAC operation requires a 4A fuse, and 230VAC requires a 2A fuse.

PIN	SIGNAL	Micro VAX	LSI-11/73	LSI-11/23	PIN	SIGNAL	Micro VAX	LSI-11/73	LSI-11/23
AA1	BIRQ5L				AA2	+5V			
AB1	BIRQ6L				AB2	-12V	N/U	N/U	
AC1	BDAL16L				AC2	GND			
AD1	BDAL17L				AD2	+12V		N/U	
AE1	*SSPARE1	N/U	N/U	SINGLE STEP	AE2	BDOUTL			
AF1	*SSPARE2	SRUNL	SRUNL	SRUNL	AF2	BRPLYL			
AH1	*SSPARE3	N/U	N/U	SRUNL	AH2	BDINL			
AJ1	GND				AJ2	BSYNCL			
AK1	*MSPAREA	N/U	N/U	N/U	AK2	BWTBTL			
AL1	*MSPAREB	N/U	N/U	N/U	AL2	BIRQ4L			
AM1	GND				AM2	*BIAK1L		N/U	MMUSTRH
AN1	BDMRL				AN2	*BIAKOL		BIAKL	
AP1	BHALTL				AP2	BBS7L			
AR1	BREFL		N/U	N/U	AR2	*BDMG1L		N/U	UBMAAPL
AS1	+12VB	N/U	N/U		AS2	*BDMGOL			
AT1	GND				AT2	BINITL			
AU1	PSPARE1	N/U	N/U		AU2	BDALOL			
AV1	+5VB	N/U			AV2	BDAL1L			
BA1	BDCOKH				BA2	+5V			
BB1	BPOKH				BB2	-12V	N/U	N/U	
BC1	*SSPARE4	BDAL18L	BDAL18L	MMUDAL18H	BC2	GND			
BD1	*SSPARE5	BDAL19L	BDAL19L	MMUDAL19H	BD2	+12V		N/U	
BE1	*SSPARE6	BDAL20L	BDAL20L	MMUDAL20H	BE2	BDAL2L			
BF1	*SSPARE6	BDAL21L	BDAL21L	MMUDAL21H	BF2	BDAL3L			
BH1	*SSPARE8	N/U	N/U	CLKDISL	BH2	BDAL4L			
BJ1	GND				BJ2	BDAL5L			
BK1	*MSPAREB	N/U	N/U	N/U	BK2	BDAL6L			
BL1	*MSPAREB	N/U	N/U	N/U	BL2	BDAL7L			
BM1	GND				BM2	BDAL8L			
BN1	BSACKL				BN2	BDAL9L			
BP1	BIRQ7L				BP2	BDAL10L			
BR1	BEVNTL				BR2	BDAL11L			
BS1	PSPARE4	N/U	N/U	+12VB	BS2	BDAL12L			
BT1	GND				BT2	BDAL13L			
BU1	PSPARE2	N/U	N/U		BU2	BDAL14L			
BV1	+5V				BV2	BDAL15L			

*NOT BUSSED
N/U = NOT USED

NOTE

C-D slots for LSI-11/73 and LSI-11/23 are the same as A-B slots. Pin assignments for MicroVAX C-D slots are defined on the next page.

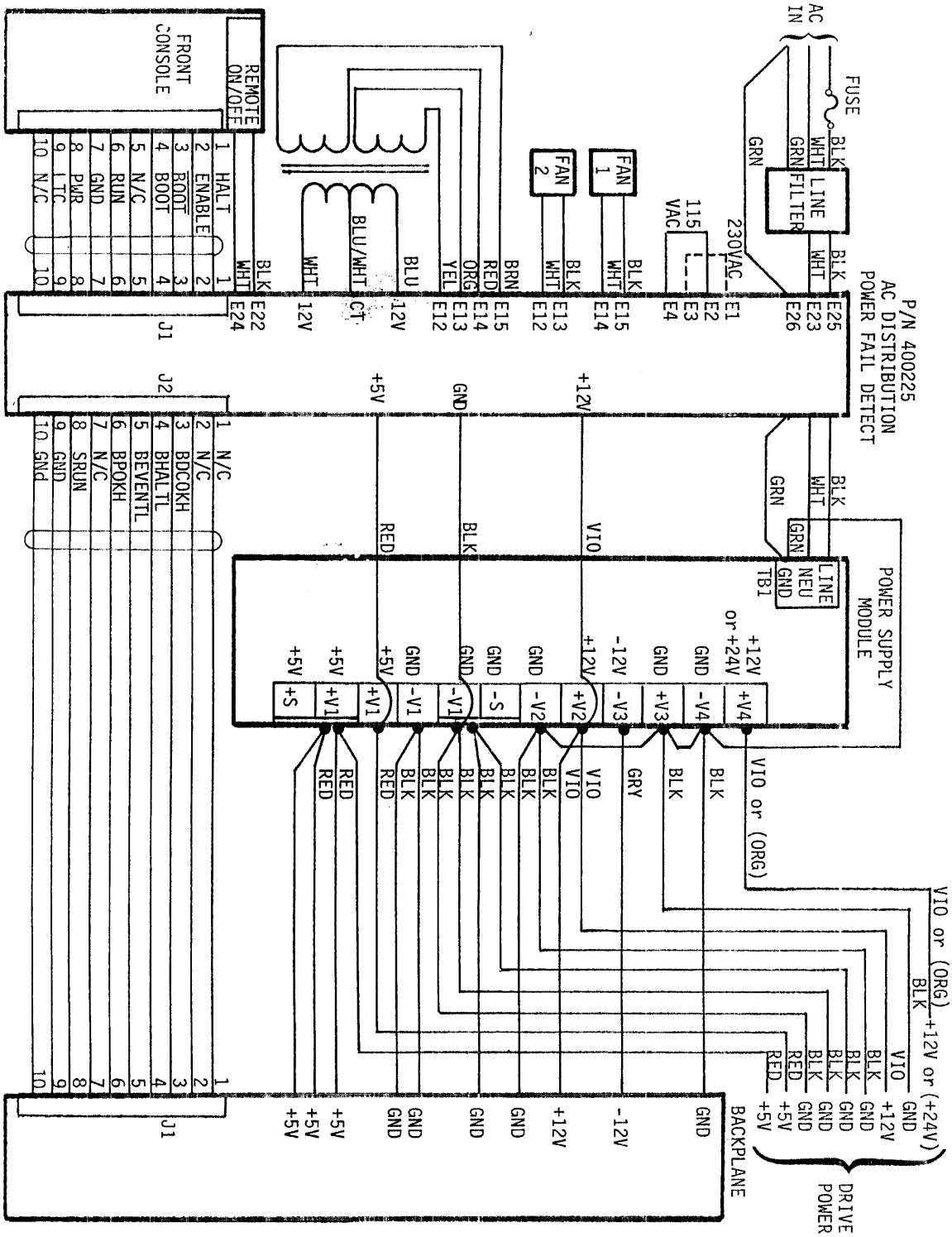
CA1	NOT USED	CA2	+5V	DA1	NOT USED	DA2	+5V
CB1	*MAA<0>L	CB2	MAA<9>L	DB1	*MAA<7>L	DB2	MAA<7>L
CC1	NOT USED	CC2	GND	DC1	NOT USED	DC2	GND
CD1	*RAS<5>H	CD2	RAS<1>H	DD1	*MAA<5>L	DD2	MAA<5>L
CE1	*BMCAS<0>H	CE2	BMCAS<0>L	DE1	*MAA<4>L	DE2	MAA<4>L
CF1	*RAS<1>H	CF2	NOT USED	DF1	*MAA<3>L	DF2	MAA<3>L
CH1	*BMCAS<1>H	CH2	BMCAS<1>H	DH1	*MAA<6>L	DH2	MAA<6>L
CJ1	*MSID<0>L	CJ2	MSID<2>L	DJ1	*MSID<2LL	DJ2	NOT USED
CK1	*MSWT<1>H	CK2	MSWT<1>H	DK1	*RAS<3>H	DK2	NOT USED
CL1	*RAS<4>H	CL2	RAS<0>H	DL1	*RAS<7>H	DL2	RAS<3>H
CM1	*MSID<1>L	CM2	MSID<3>L	DM1	*MSID<3>L	DM2	NOT USED
CN1	*MAA<1>L	CN2	MAA<1>L	DN1	*RAS<2LH	DN2	NOT USED
CP1	*MAA<2>L	CP2	MAA<2>L	DP1	*BMCAS<2>H	DP2	BMCAS<2>H
CR1	*MAA<0>L	CR2	MAA<0>L	DR1	*BMCAS<3>H	DR2	BMCAS<3>H
CS1	*MAA<8>L	CS2	MAA<8>L	DS1	*MSWT<2>H	DS2	MSWT<2>H
CT1	GND	CT2	MSID<4>L	DT1	GND	DT2	*MSID<4>L
CU1	*RAS<0>H	CU2	NOT USED	CU1	*RAS<6>H	DU2	RAS<2>H
CV1	NOT USED	CV2	NOT USED	DV1	NOT USED	DV2	NOT USED

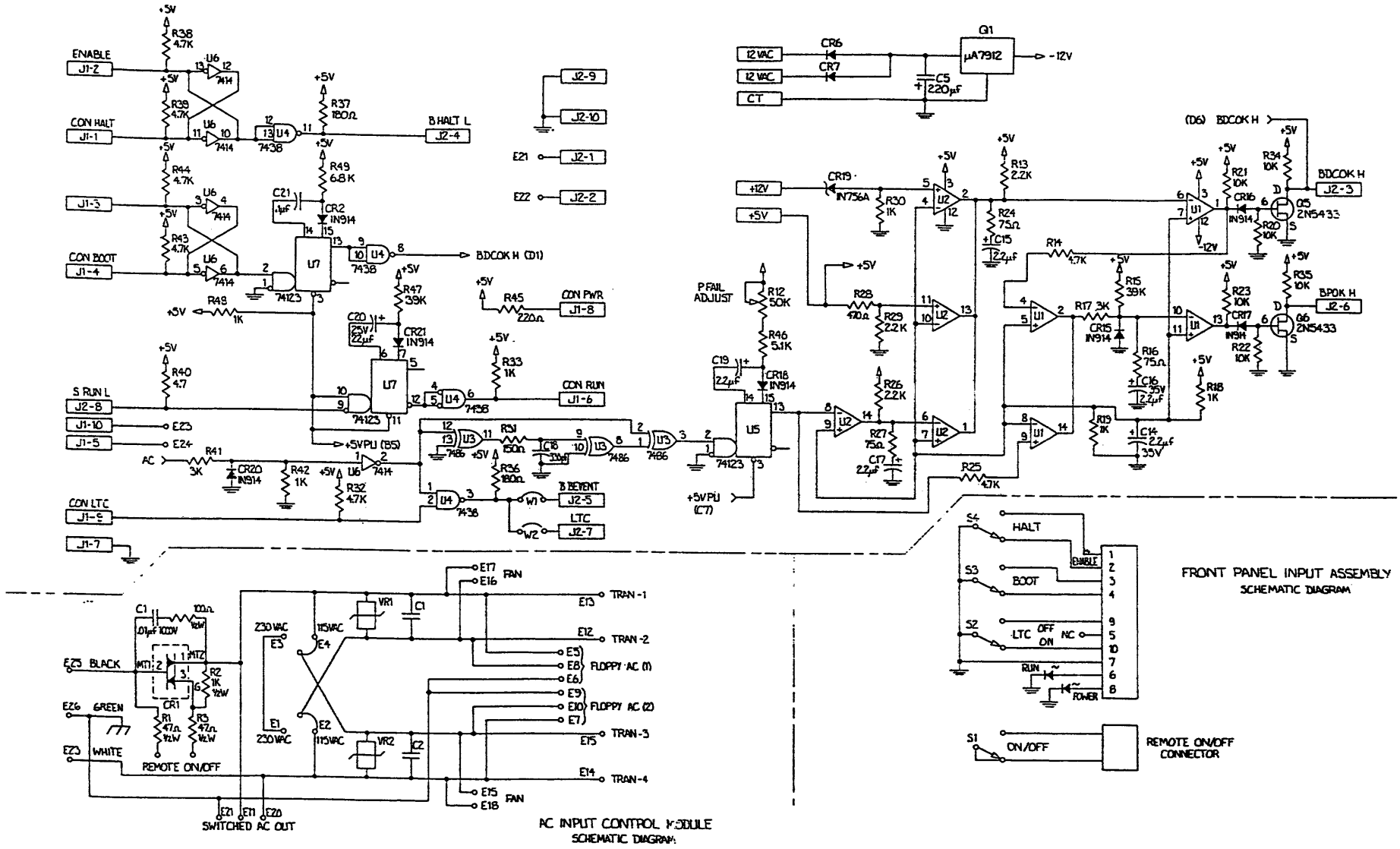
*Used by MSA32 memory module. Not used by CPU.

MicroVAX C-D Slot Definitions

BUS SIGNAL	PIN	RESISTOR MODULE PIN
BIRQ5L	AA1, CA1	RM1-2
BIRQ6L	AB1, CA1	RM1-3
BDAL16L	AC1, CC1	RM1-4
BDAL17L	AD1, CD1	RM1-5
BDMRL	AN1, CN1	RM2-4
BHALTL	AP1, CP1	RM2-6
BREFL	AR1, CR1	RM2-7
BDOUTL	AE2, CE2	RM1-6
BRPLYL	AF2, CF2	RM1-7
BDINL	AH2, CH2	RM1-8
BSYNCL	AJ2, CJ2	RM1-9
BWTBTL	AK2, CK2	RM2-1
BIRQ4L	AL2, CL2	RM2-3
BBS7L	AP2, CP2	RM2-5
BINITL	AT2, CT2	RM2-8
BDALOL	AU2, CU2	RM2-9
BDALIL	AV2, CV2	RM3-2
BDCOKH	BA1, DA1	RM3-3
BPOKH	BB1, DB1	RM3-8
BDAL18L	BC1, DC1	RM3-4

BUS SIGNAL	PIN	RESISTOR MODULE PIN
BDAL19L	BD1, DD1	RM3-6
BDAL20L	BE1, DE1	RM3-5
BDAL21L	BF1, DF1	RM3-7
BSACKL	BN1, DN1	RM4-8
BIRQ7L	BP1, DP1	RM4-6
BEVENTL	BR1, DR1	RM5-3
BDAL2L	BE2, DE2	RM3-9
BDAL3L	BF2, DF2	RM4-2
BDAL4L	BH2, DH2	RM4-3
BDAL5L	BJ2, DJ2	RM4-4
BDAL6L	BK2, DK2	RM4-5
BDAL7L	BL2, DL2	RM4-7
BDAL8L	BM2, DM2	RM5-5
BDAL9L	BN2, DN2	RM5-9
BDAL10L	BP2, DP2	RM5-8
BDAL11L	BR2, DR2	RM5-7
BDAL12L	BS2, DS2	RM5-6
BDAL13L	BT2, DT2	RM5-4
BDAL14L	BU2, DU2	RM5-2
BDAL15L	BV2, DV2	RM4-9


AC IN
FUSE
LINE FILTER
115 VAC
230VAC
P/N 400225
AC DISTRIBUTION
POWER FAIL DETECT
FAN 1
FAN 2
FRONT CONSOLE
REMOTE ON/OFF
HALT
ENABLE
ROOT
BOOT
N/C
RUN
GND
PWR
LTC
N/C
J1
J2
POWER SUPPLY MODULE
TB1
LINE
NEU
GND
+12V or +24V
-12V
+5V
+S
-S
-V1
-V2
-V3
-V4
BACKPLANE
DRIVE POWER
VIO or (ORG)
+12V or (+24V)
BDCOKH
BHALTL
BEVENTL
BPOKH
SRUN



1. RESISTOR VALUES ARE IN OHMS ±5%, ¼W.