SA-H115

LSI-11 Stand-alone Small System Chassis

Manual

Σ Sigma Information Systems

SA-H115

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Manual

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Section 1 - General Information

1.1 INTRODUCTION

This manual provides general installation and maintenance information, including drive and module installation and power supply adjustments, for the SA-H115 system chassis 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 chassis. Specifications are included.

Section 2 - INSTALLATION. This section describes the procedures for mounting drives into the chassis and for installing modules into the backplane.

Section 3 - POWER SUPPLY. This section describes power supply information for maintaining the SA-H115 chassis.

APPENDICES. The appendices include the system schematics and DC power supply schematics for the chassis. Q bus pin assignments are also provided.

REF: H115D.WPS/DM4

1.2 GENERAL DESCRIPTION

The SA-H115 chassis is designed for systems integrators whose site requires a system enclosure to be located under a desk overhang or on an office floor, rather than the traditional tabletop or rackmount type of equipment. The compact cabinet occupies only 12" of horizontal floor space and is 20" deep. Features include:

Compact stand-alone cabinet for floor mounting installation.

Emphasis on serviceability. Modular power supply, backplane assembly, and drive mounting assemblies are easily removed and installed to provide low cost maintenance.

Supports both 5-1/4" and 8" drives.

Includes 8-row, quad-wide Q bus backplane for LSI-11 or MicroVAX system.

Front operator panel provides convenient operator control.

Qualified for FCC compliance using full system configuration of modules and installed drives.

400 watt power supply permits conversion between 115VAC and 230VAC.

The backplane, power supply, and drives are mounted as modular units that are easily removed and installed. The modular units are secured with thumbscrews, and all connections for the front panel, backplane, and installed drives are pluggable at the power supply unit. This modular design ensures convenient servicing and maintenance.

The chassis includes mounting space for an 8" removable media drive and two 5-1/4" Winchester drives - or an 8" removable media drive and a single 8" Winchester drive.

The major subassemblies of the SA-H115 are:

A heavy duty 400 watt power supply with 400 watts of power for the backplane and installed drives.

A front operator's control panel with HALT/RUN, BOOT, LTC ENABLE and power ON/OFF switches, plus LED indicators for system status.

An 8-row, quad-wide Q bus backplane with 16 dual Q22 slots. An optional backplane contains 13 dual 22Q slots and 3 C-D slots wired for MicroVAX applications. The backplane provides 22-bit addressing and Q bus termination. The backplane is built into a card frame assembly that supports installed modules and provides positive pin alignment.

A rear panel provides mounting space for user-configured connectors and for convenient cabling to I/O devices.

An example configuration is shown in Figure 1-1.

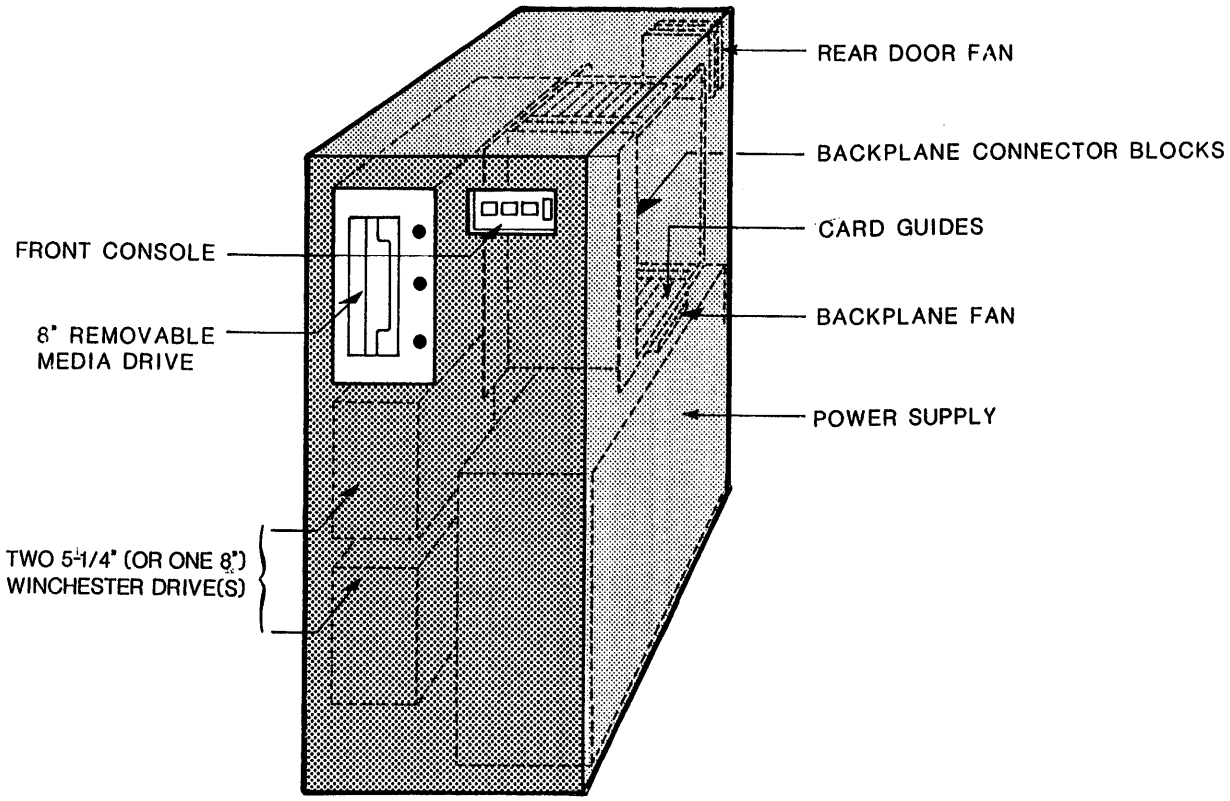


FIGURE 1-1: SA-H115 EXAMPLE CONFIGURATION

1.3 THE FRONT CONSOLE

The LSI-11 operator console consists of four switches and five LED indicators as shown in Figure 1-2.

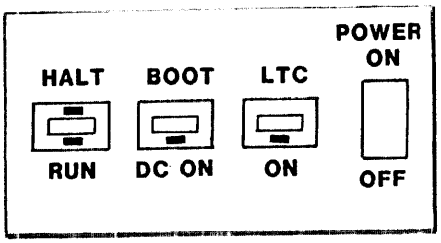


FIGURE 1-2: LSI-11 FRONT CONSOLE

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. The red DC ON LED indicates the presence of +5V.

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

BOOT/DC ON SWITCH. This is a momentary two-position switch. When depressed, the BDCOK line (BA1) is momentarily asserted, causing the CPU to execute one of three power-up options based on CPU type and installed jumpers: (Mode 0) processor executes a power fail routine at vector location 24, (Mode 1) processor drops into ODT, or (Mode 2) processor generates a bootstrap address (normally 773000) and executes instructions at that starting address. Depending on the bootstrap option selected, the system will either boot to a specified device or enter a bootstrap monitor. When the red DC ON LED is lit, +5V is applied to the front panel.

HALT/RUN SWITCH. When in the HALT position (switch in and red LED is lit), the BHALT line (AP1) is asserted, causing the CPU to go into ODT mode. When in the RUN position (switch out and green LED may be lit), a high on the BHALT line is generated, allowing programs to be run. When the green RUN LED is lit, 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. The activity of the RUN LED depends on the type of CPU being used.

1.4 REAR PANEL CONNECTORS

A piano-hinged rear door is mounted on the rear of the chassis. The door contains cutouts for mounting I/O connectors for convenient cabling to peripheral devices. The door also provides convenient access to backplane modules.

The standard door (P/N 500699) contains two B I/O cutouts plus two blank panels. The left-side blank panel provides backplane access by loosening thumbscrews. Both blank panels can be replaced with either a DHV11-compatible distribution panel or an I/O panel containing three additional B I/O cutouts.

An optional rear door (P/N 500351) contains a recessed panel with sixteen cutouts for mounting 25-pin DB25P connectors. The recessed connector panel is accessed by loosening the four screws and raising and lifting off the cover plate from the large end of the screw slots.

The rear covers are shown in Figure 1-3.

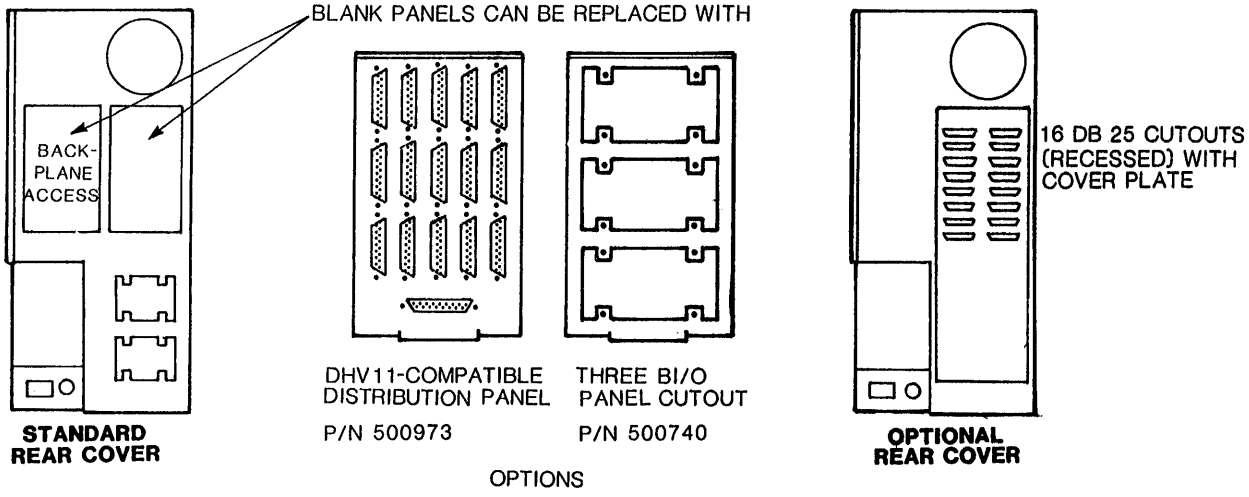


FIGURE 1-3: REAR PANEL CONNECTOR MOUNTING

1.5 DRIVE TYPES

The SA-H115 front panel provides front access to a removable media 8" device such as a tape cartridge transport, floppy disk drive, or one or two slimline floppy disk drives. Mounting space and power are also provided for either two 5-1/4" Winchester disk drives or a single 8" Winchester disk drive. A list of recommended manufactures is shown in Table 1-1. Notify the factory if other drives are to be installed.

MANUFACTURER	DRIVE TYPE	MODEL
Ampex	5-1/4" Winchester	P Series
Rodime	5-1/4" Winchester	R0220 Series
Fujitsu	8" Winchester	M2312,2322,2333
Kennedy	8" Tape Cartridge	6450
Control Data	8" Tape Cartridge	92190/92195
Shugart	8" Floppy	SA801/851
Mitsubishi	Dual 8" Slimline Floppies	M2896-63
Iomega	Removable Media Disk	Alpha 10.5

TABLE 1-1: RECOMMENDED DRIVE MANUFACTURERS

1.6 FCC COMPLIANCE

The SA-H115 has been tested and qualified at an approved FCC Testing Laboratory for conducted and radiated emissions as required to meet CLASS A. The tested chassis configuration included a full complement of disk drives and circuit boards representative of an end-user configuration. For more information regarding configuration, test methods, or test results, consult the factory.

1.7 SPECIFICATIONS

Dimensions: 12"W x 20"D x 26.5"H

Installation Chassis: Stand-alone cabinet can be placed on the floor or under a desk area.

Storage Devices: Mounted on individual brackets and installed using thumbscrews; no tools necessary

Backplane Assembly:	Mounted on separate bracket with thumbscrews for convenient removal.
Capacity:	8-row, quad-wide Q bus backplane with 16 dual Q bus slots
Storage Devices Supported:	8" removable media device such as tape cartridge transport, floppy disk drive, or dual slimline floppy drives. PLUS Two 5-1/4" Winchester drives or single 8" Winchester drive.
Power Supply Assembly:	Modular, heavy duty power supply assembly is easily removed; all wire and cable connections pluggable.
AC Input:	47/63 Hz. Convertible between 115VAC and 230VAC
DC Output:	+5VDC @ 40A, -5VDC @ 5A, +12VDC @ 8A, -12VDC @ 5A, +24VDC @ 7A. Not to exceed 400 watts.
Cooling:	Forced air rear intake with rear exhaust. Separate fans for power supply and installed modules.
Accessibility:	Access to backplane modules and installed drives is from the rear of the chassis. Access to removable media is from the front panel.
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 SA-H115 system chassis and visually inspect it for damage that might have occurred during shipment. Retain the shipping carton in case reshipment is necessary. Open the rear of the chassis 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-H115 chassis assembly with backplane, power supply, and front console.

An SA-H115 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 drives. Drive types must be specified at time of order.

2.2 DRIVE INSTALLATION

The SA-H115 chassis has several combinations of drive configurations. This section describes installation of the devices listed in Table 1-2. Other combinations can be accommodated, and this section is intended to be a guide for general drive installation. If drives other than those listed in Table 1-2 are used, consult the factory.

The drives are mounted on drive mounting brackets and installed over the ledges in locations A, B, and C as shown in Figure 2-1. The 8" Winchester is mounted directly on the chassis and the B and C ledges shown below are not included for this version.

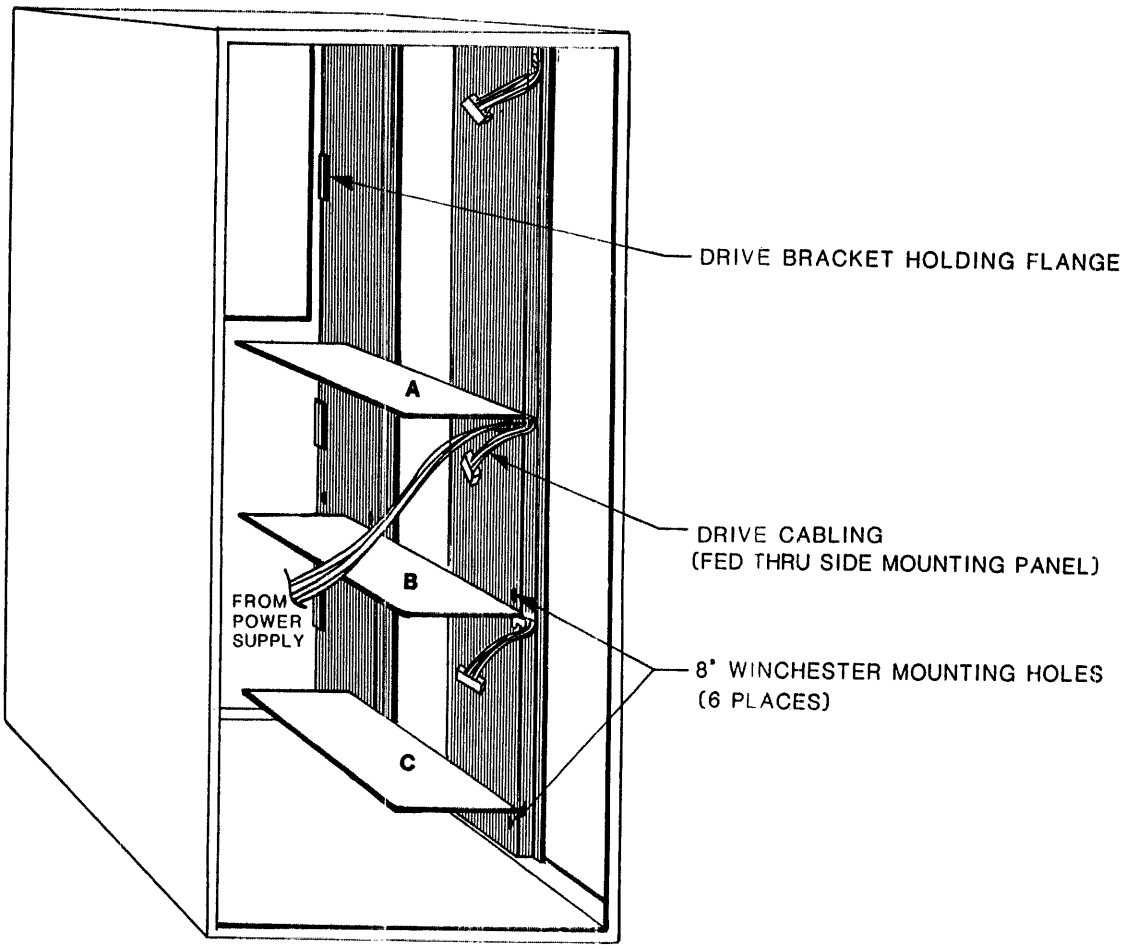


FIGURE 2-1: DRIVE MOUNTING LOCATIONS

Drive location A contains an 8" device that requires front panel access, such as a standard floppy disk drive, dual slimline floppy disk drives, or tape cartridge transport. Drive locations B and C can each contain a 5-1/4" Winchester drive, or they can share a single 8" Winchester drive.

2.3 8" REMOVABLE MEDIA DISK DRIVE(S) MOUNTING (LOCATION A)

The 8" removable media drive is mounted onto the drive mounting bracket P/N 500354 and installed into the chassis in location A (Figure 2-1).

Slimline floppy drives require additional drive brackets, and a tape cartridge drive requires a front bezel. Refer to the following subsections before installing these drives into the chassis.

2.2.1 8" Slimline Floppy Drive Brackets

If dual slimline floppy drives are used the are first secured together. Using the following procedure and Figure 2-3 as a guide prepare the slimline floppy drives for installation into the chassis.

1. Secure the 8" slimline floppy drives together with the supplied mounting brackets using eight (four on each side) 8-32 x 3/8 panhead phillips screws with associated lock and flat washers as shown in Figure 2-3.

2. Two bar brackets are installed on the right side (as viewed from the front of the drive), and a rectangular bracket is installed on the left side of the drive.

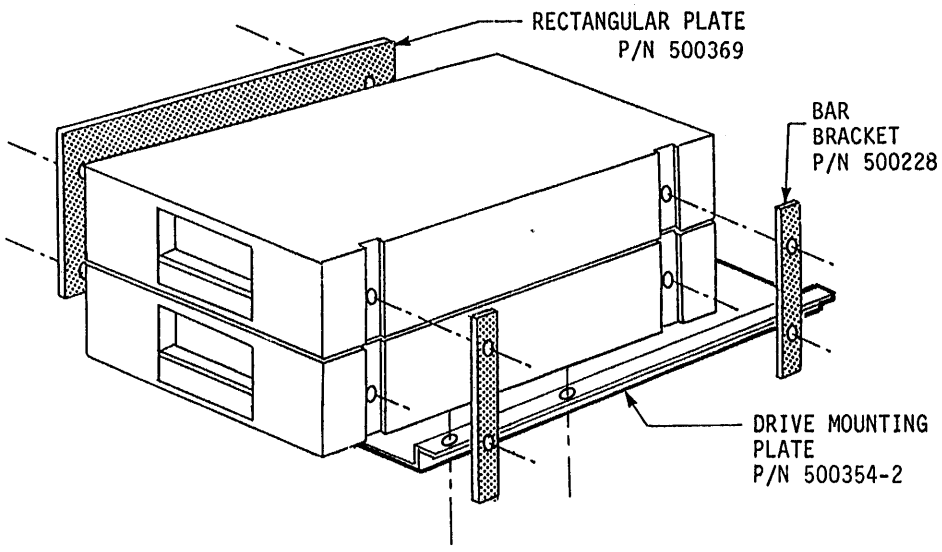


FIGURE 2-3: 8" SLIMLINE FLOPPY DRIVES BRACKETS

3. Mount the drives as a single assembly onto the drive mounting bracket and continue the drive mounting procedure described in Section 2.3.3.

2.3.2 Tape Cartridge Drive Front Bezel

If an 8" CDC Model 92190 or 92195 tape cartridge drive is to be installed a front bezel must first be attached to the drive. Using the following procedure and Figure 2-4 as a guide, prepare the tape cartridge drive for installation into the chassis.

1. Remove the existing front bezel on the tape transport 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 LEDs and a 4-pin connector to the tape drive module. Ensure that pin 1 is correctly aligned when plugging the 4-pin connector on the tape drive module.

3. Install the front bracket with 6-32 hex nuts with flat/lock washers.

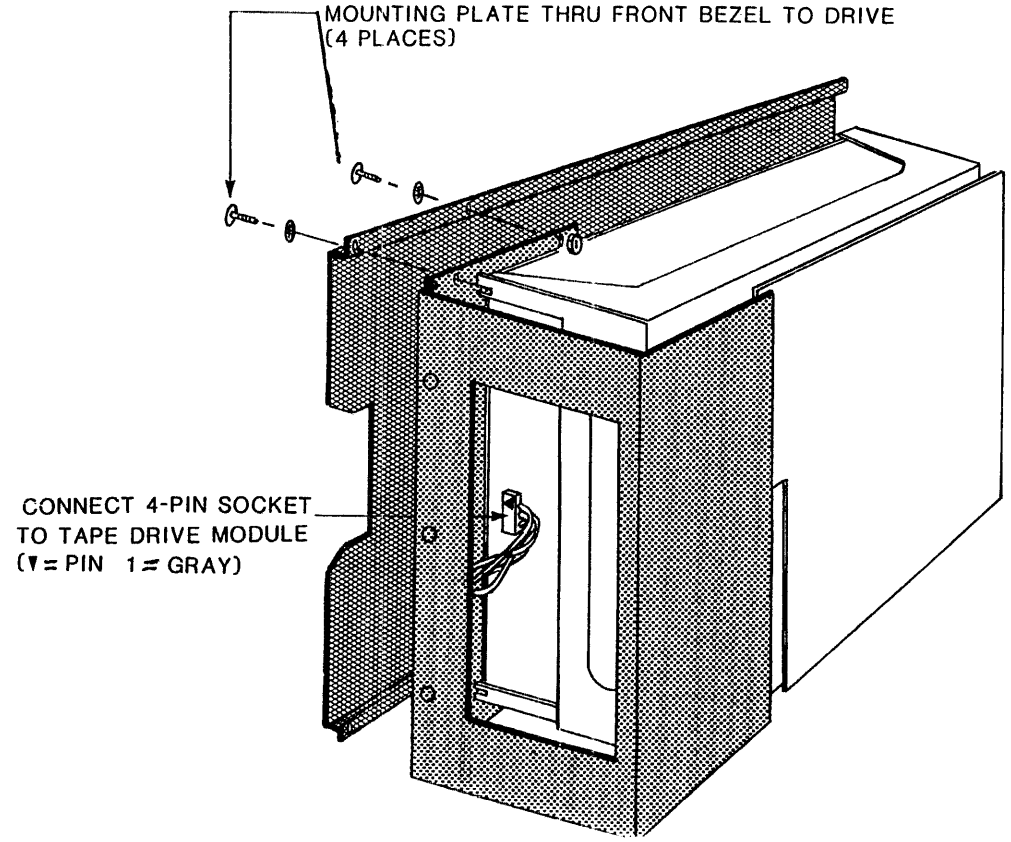


FIGURE 2-4: TAPE TRANSPORT MOUNTING BRACKET

4. Place the tape drive assembly over the mounting plate and secure from the bottom using 8-32 x 3/8 hardware.

5. Continue with the drive mounting procedure described in Section 2.3.3.

2.3.3 8" Drive Installation

Use the following procedure and Figure 2-2 to install the 8" removable media drive into the chassis.

1. Secure the 8" removable media disk drive to the drive mounting bracket using four 8-32 x 3/8 flathead screws.
2. Slide the drive mounting bracket under the front flange.
3. Secure the rear of the bracket with the thumbscrews.

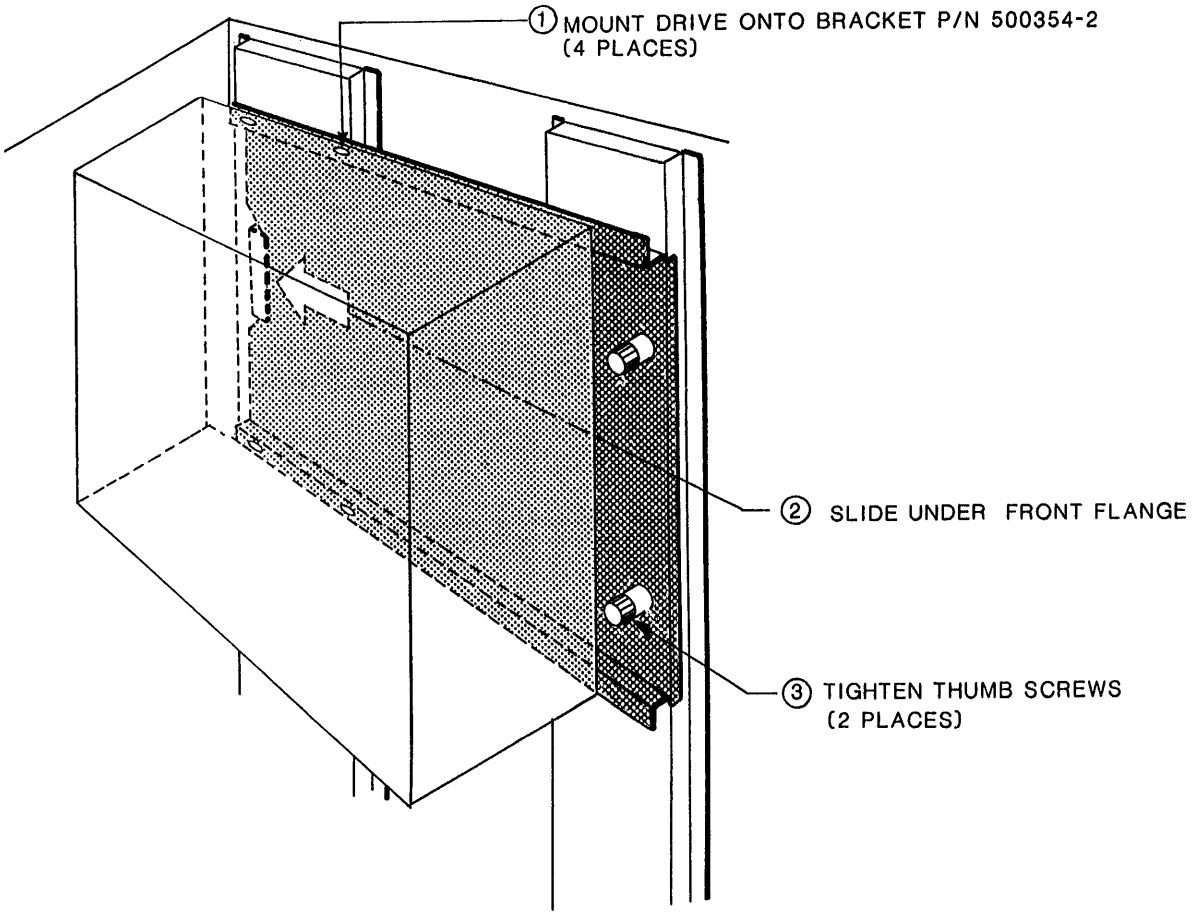


FIGURE 2-2: MOUNTING 8" REMOVABLE MEDIA DRIVES INTO CHASSIS

4. Check that power supply voltages meet manufacturer's specifications before applying power to the drive(s). Section 3.2.1 illustrates and defines drive power connections.
5. Cables are fed through the side chassis rails (Figure 2-1). Cable the 8" removable media drive per manufacturer's specifications.

2.4 WINCHESTER DRIVE MOUNTING (LOCATIONS B AND C)

Either two 5-1/4" Winchester drives or one 8" Winchester Drive can be installed into the SA-H115.

2.4.1 8" Winchester Drive Installation

The 8" Fujitsu Winchester occupies locations B and C and the mounting ledge shown in figure 2-1 is omitted. A fan bracket assembly (P/N 501194-200) must be mounted on the drive. With Figures 2-5 and 2-6 as a guide install the drive using the following procedure.

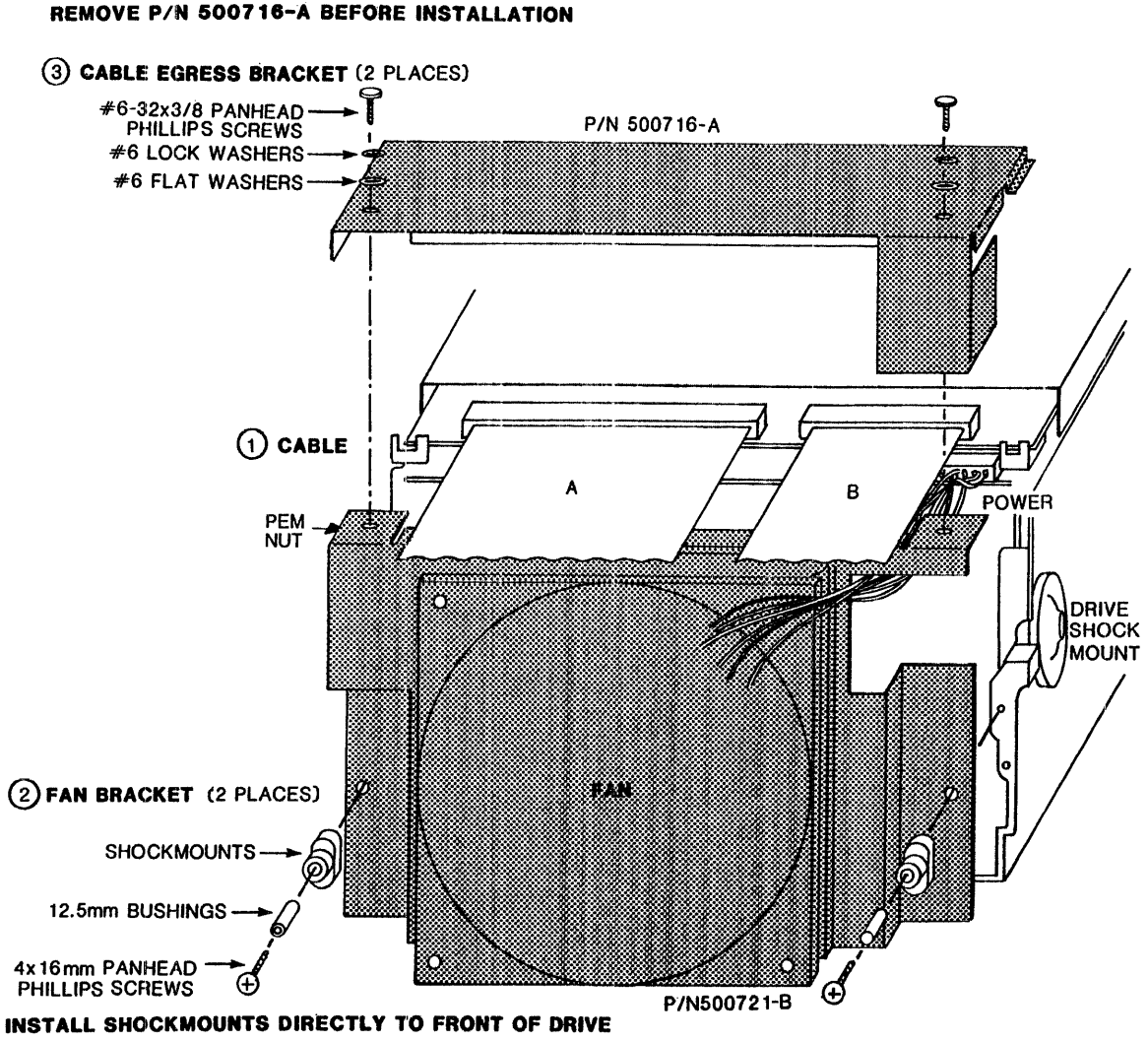


FIGURE 2-5: 8" WINCHESTER DRIVE FAN BRACKET

1. Remove the cable egress bracket (P/N 500716-A) from the fan bracket assembly and cable the drives as shown.

2. Mount fan bracket (P/N 500721-B) and fan to the rear of the chassis with shockmounts and bushing secured by 4mm x 16mm panhead phillips screws. Install shockmounts directly onto the front of the chassis.

3. Replace the cable egress bracket with 6-32 x 3/8 panhead phillips screws and associated lock and flat washers.

4. Mount the drive brackets through the drive shockmounts using 4mm x 10mm screws. Notice that P/N 500866-1 is mounted at the front of the drive and P/N 500866-2 is mounted at the rear.

5. Secure the drive directly to the side of the chassis in drive locations B and C (Figure 2-1) using 10-32 x 5/8 hardware.

6. Check that power supply voltages meet manufacturer's specifications before applying power to the drive. Section 3.2.1 illustrates and defines DC power connections.

7. Drive cables are fed through the side chassis rails as shown in Figure 2-1. Insert the red/white twisted pair cable to the fan. Cable the drive per manufacturer's specifications.

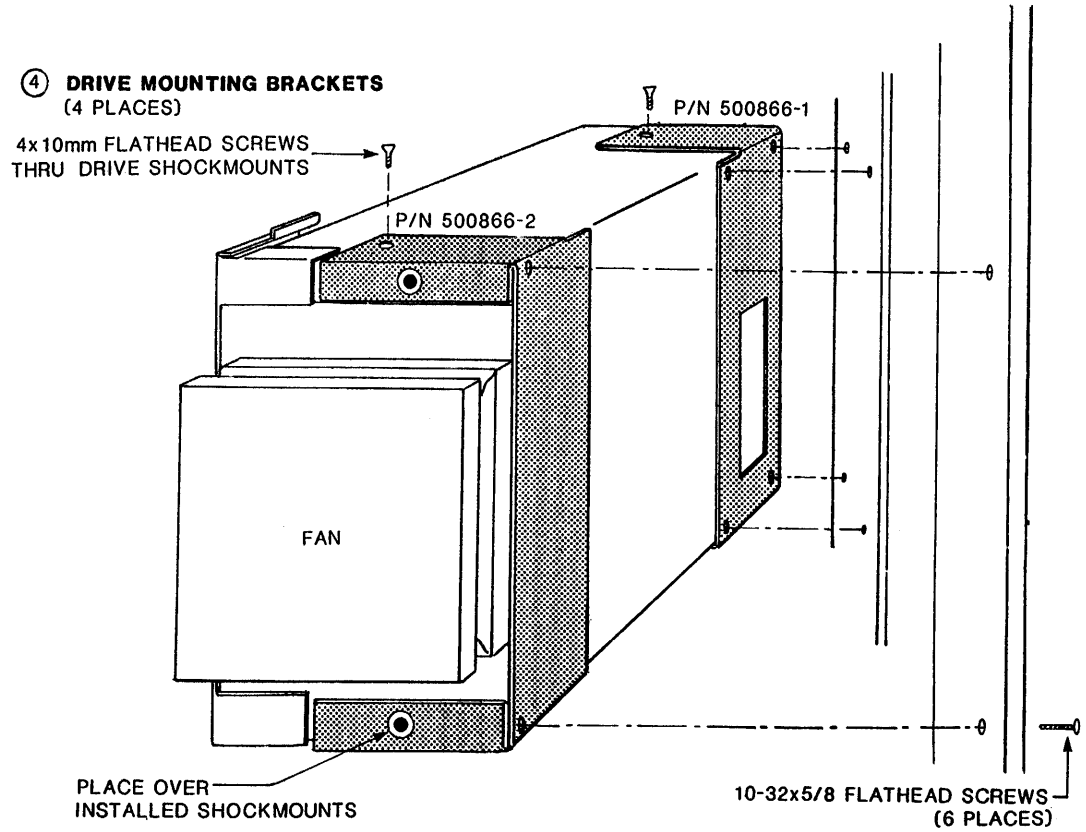


FIGURE 2-6: 8" WINCHESTER MOUNTING BRACKETS

2.4.2 5-1/4" Winchester Drive Installation

Using the following procedure and Figure 2-7 install the 5-1/4" Winchester drives into the chassis.

1. Install the drive on the drive mounting bracket and secure from the bottom using 6-32 x 3/8 panhead phillips screws with associated lock and flathead washers.

2. Slide the mounting bracket under the front flange in drive location B (Figure 2-1).

3. Secure the bracket at the rear with thumbscrews.

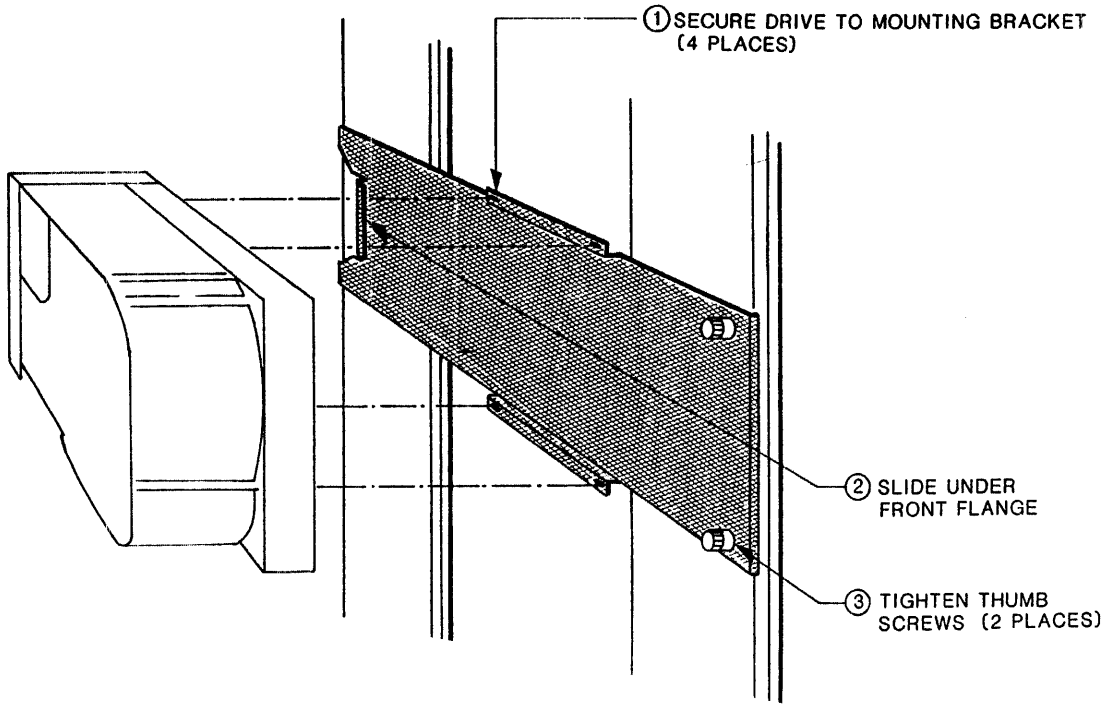


FIGURE 2-7: 5-1/4" WINCHESTER DRIVE INSTALLATION

4. If a second 5-1/4" Winchester drive is used, slide the 2nd mounting bracket under the flange in drive location C (Figure 2-1) and secure the bracket at the rear with thumbscrews.

5. Check that power supply voltages meet manufacturer's specifications before applying power to the drive. Section 3.2.1 illustrates and defines DC power connections.

6. Drive cables are fed through the side chassis rails as shown in Figure 2-1. Cable the drive per manufacturer's instructions.

2.5 MODULE INSTALLATION

The SA-H115 chassis is shipped with 22-bit addressing and Q bus termination unless otherwise specified. Before installing modules into the backplane verify these options are configured properly. This section describes procedures to reconfigure addressing and Q bus termination.

2.5.1 22-Bit Addressing

The backplane provides 22-bit addressing for use with LSI-11/23 modules, memories and DMA devices. These extended address bits are as follows:

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

Since the old style 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. The backplane has four jumpers on row B that provide 22-bit addressing. See Figure 2-8.

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. When used with the old style, quad-wide LSI-11 remove all jumpers W1 through W8.

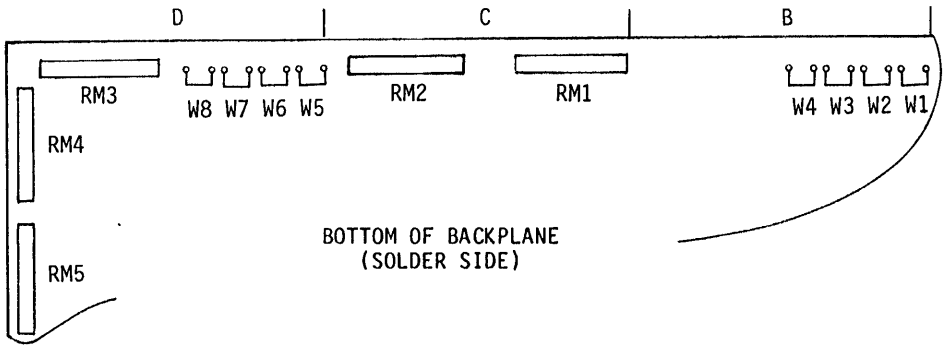


FIGURE 2-8: ADDRESSING JUMPERS AND RESISTOR MODULES

2.5.2 Q Bus Termination

The PCBA includes five terminating resistor modules (RM1 through RM5) that 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. Resistor module locations are shown in Figure 2-8, and pin assignments are defined in Appendix B.

2.5.3 Module Insertion

The SA-H115 backplane uses standard DEC-type connector blocks and provides direct plug-in installation for Q bus* compatible modules. The backplane assembly includes card guides that provide positive pin alignment and extractor mounting holes that secure the modules.

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 2-9 defines the device priorities for the backplane.

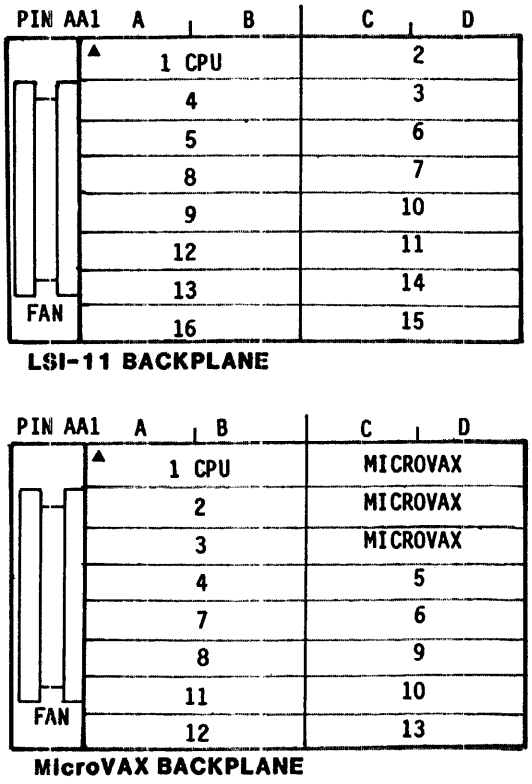


FIGURE 2-9: BACKPLANE DEVICE PRIORITY ASSIGNMENTS

Each connector block accommodates 36 lines per dual slot (18 each on component and solder sides of the board). Each line includes an alphanumeric identifier. Refer to Figure 2-10 for row A through D identifiers. Take special care to ensure that the logic modules are not installed backward. Notice that the CPU commands the highest priority and plugs into slot 1, rows A and B.

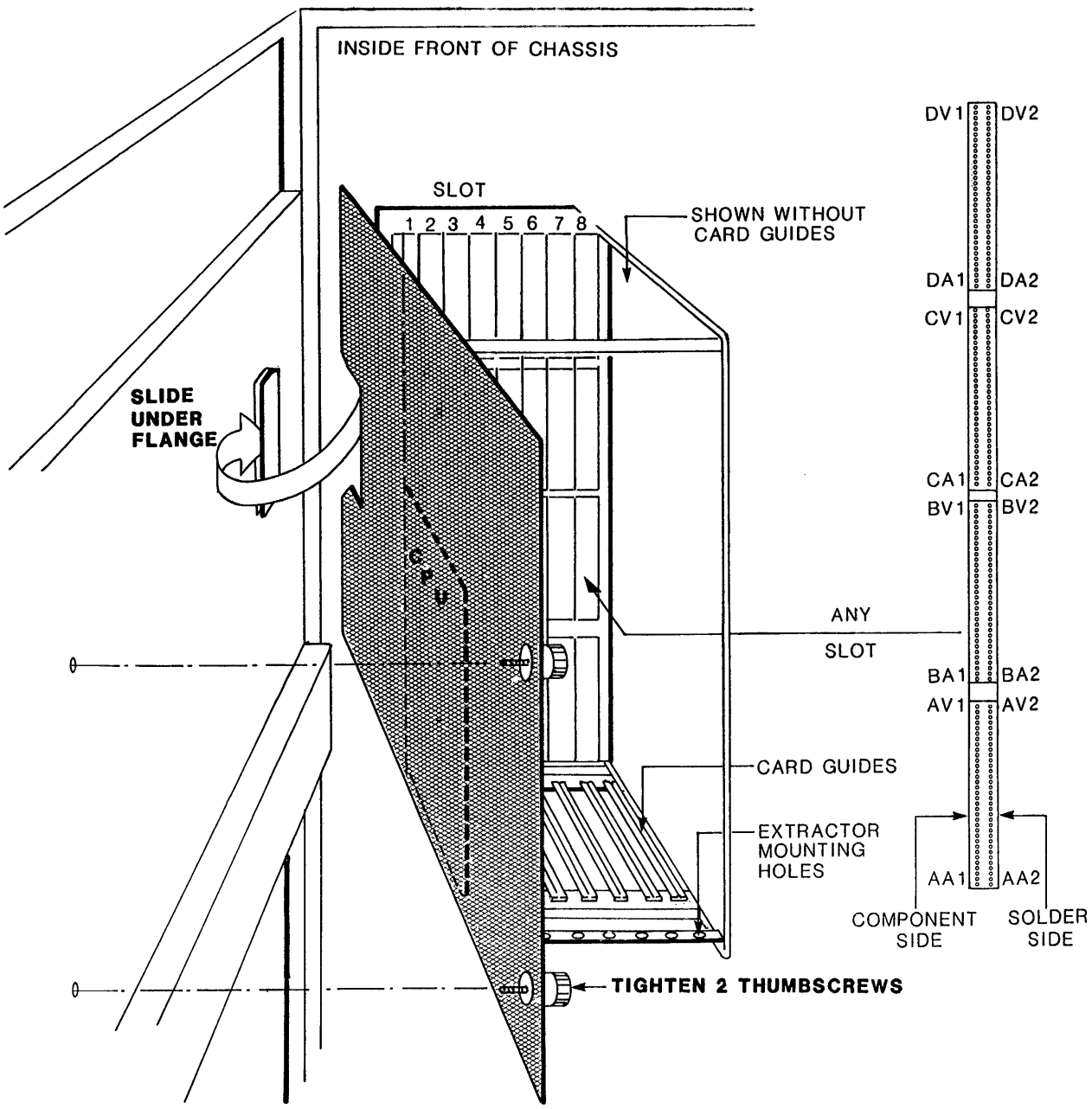


FIGURE 2-10: MODULE INSERTION INTO BACKPLANE

Notes

Section 3 - The Power Supply

3.1 GENERAL INFORMATION

This section contains a detailed description of the SA-H115 power supply. Output power connections are defined, and DC voltage adjustments and AC conversion are described.

The power supply consists of a 400 watt open frame switching power supply module with AC input control, power fail detect circuitry, and regulated and adjustable DC outputs. Power is distributed via connectors for front panel logic and remote ON/OFF, backplane logic and power, and drive power.

Input power is applied via the power cord, through an IEC-compatible connector and fuse to an AC input line filter. Power for three fans is derived from the input windings on the power transformer, allowing the use of 115VAC fans for both 115VAC and 230VAC operation.

The open frame switching power supply provides +5V at 40A output as the primary output. In order for the secondary outputs to function properly, the +5V output must have approximately a 4A load. Each secondary output is regulated via separate linear regulators; thus, none of the secondary outputs are affected by loads on other outputs.

3.2 POWER SUPPLY OUTPUT CONNECTIONS

Power supply output connectors are located on the power distribution panel, which is on top of the power supply unit. Output power can be measured from these connections shown in Figure 3-1.

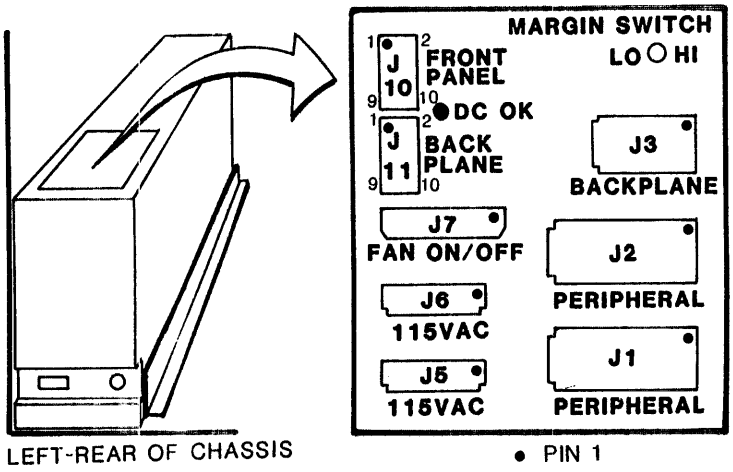
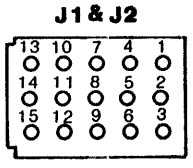


FIGURE 3-1: POWER DISTRIBUTION PANEL

3.2.1 Drive Power Connectors

Power is distributed to devices via power cables that are configured for specific drives. Connectors J1 and J2 distribute DC drive power, and J5 distributes AC drive power, if needed. Before connecting power to any devices, ensure that proper voltage is present on these connectors. The connectors are defined in Figure 3-2.

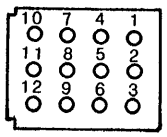


PIN	SIGNAL	PIN	SIGNAL
1	+5V	9	+5V
2	+5V	10	GND
3	+12V	11	GND
4	GND	12	GND
5	GND	13	+24V
6	GND	14	-12V
7	+12V	15	-5V
8	+12V		

FIGURE 3-2: DRIVE POWER CONNECTORS

3.2.2 DC Output Power to Backplane

Attachment of DC power to the backplane is via power cables from J3 for +5VDC, +12VDC, -12VDC, +12V Battery, +5V Battery, and Ground. Figure 3-3 defines the J3 connector.



PIN	SIGNAL	PIN	SIGNAL
1	+5V	7	GND
2	+5V	8	GND
3	+5V	9	GND
4	+5V	10	+12V
5	N/C	11	-5V
6	GND	12	-12V

FIGURE 3-3: J3 BACKPLANE POWER CONNECTOR

The J3 connector applies DC power via power cables to the inner layers of the multilayer PCBA on the backplane. The power tabs for +5VDC can accept up to 45A. Figures 3-4 illustrates the backplane power connections that are derived from J3.

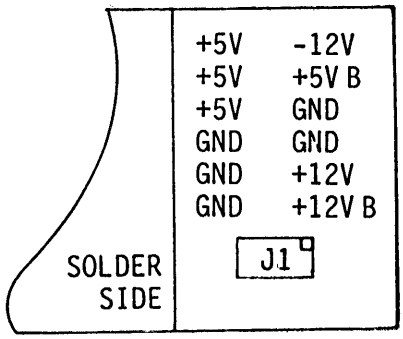


FIGURE 3-4: BACKPLANE POWER TABS

3.2.3 Front Console and Backplane Logic Connectors

The power supply includes two 10-pin connectors for interfacing to the front console (J10) and backplane (J11). The J10 cable plugs into the front console PCBA, and the J11 backplane cable plugs into J1 on the backplane PCBA (Figure 3-4). Pin assignments for J10 and J11 are defined in Tables 3-1 and 3-2, respectively.

PIN	SIGNAL*	DESCRIPTION
1	HALT	From front panel to assert BHALT line for ODT mode.
2	ENABLE	From front panel for high on BHALT line to run programs
3	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 on front panel.
9	LTC	Line frequency signal from power supply to BEVENT line.
10	N/C	No connection

TABLE 3-1: J10 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	Supplied by 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: J11 CONNECTIONS TO BACKPLANE

3.2.4 Remote ON/OFF and Fan Connectors

Two AC power connectors are provided for power to the fans and for the remote ON/OFF switch located on the front console. The fan located on the backplane and the remote ON/OFF switch share connector J7, and power from J6 is distributed to the rear door fan. A third fan is located inside the power supply unit and does not require external power cabling. Figure 3-5 shows the J6 and J7 connectors.

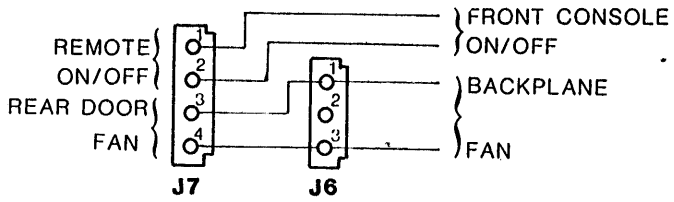


FIGURE 3-5: FAN AND REMOTE ON/OFF CONNECTORS

3.2.5 Margin Switch

Switch SW1 is a 3-position switch used for margining the +5VDC to + 5% of nominal. The marginal voltages should be between 4.75 (low margin) and 5.25 (high margin). Switch SW1 is shown in Figure 3-6.

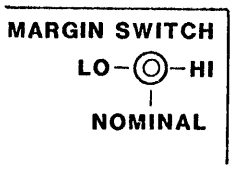


FIGURE 3-6: SWITCH SW1

3.3 POWER SUPPLY ADJUSTMENTS

The voltage settings of each of the power supply outputs is adjustable; however, because of the shock hazard associated with off line open frame switching power supplies, Sigma recommends that such adjustments be performed only by qualified and experienced personnel. Each output is set at the factory and no external adjustments should be necessary.

If adjustment of the power supply output voltages is required, it is necessary to remove the power supply and adjust the outputs with the power supply recabled outside the chassis.

3.3.1 Power Supply Disassembly

If power supply adjustments are necessary, use the following procedure to gain access to the power supply.

1. Switch chassis power off and disconnect the power cord.

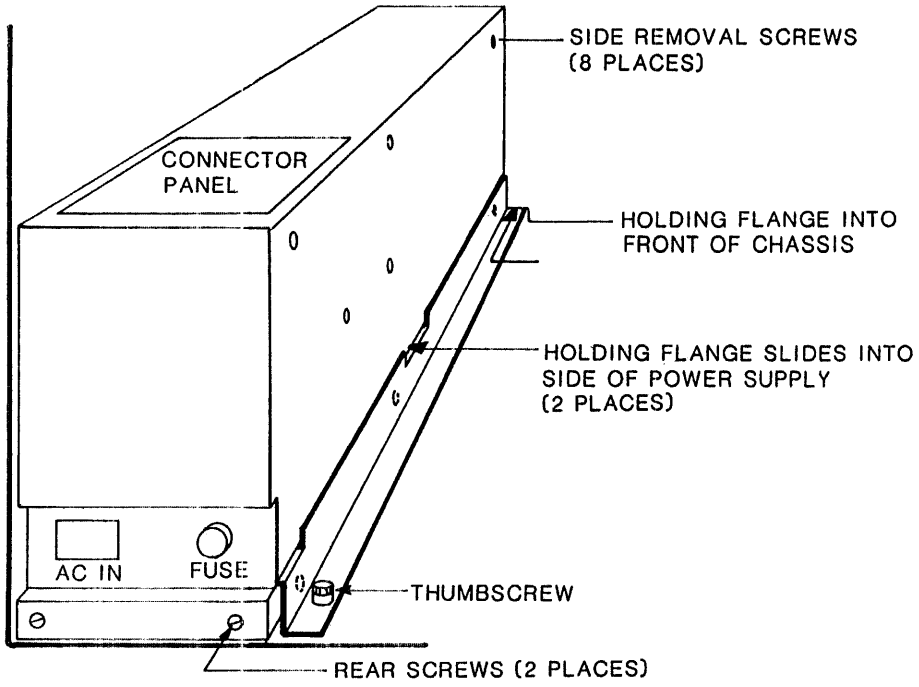


FIGURE 3-7 POWER SUPPLY DISASSEMBLY

2. Remove cabling at the connector panel and carefully note which cables plug into associated positions.

3. Remove the holding bar on the right side (as viewed from the rear of the chassis) of the power supply by loosening the thumbscrew.

4. Remove the two screws at the rear of the power supply

5. Free the power supply by moving gently to the right in the chassis.

6. Slide the power supply out of the chassis and recable.

7. Remove side cover by removing six flathead screws and two roundhead screws on the unit.

8. Refer to Section 3.3.2 for AC conversion and Section 3.3.3 for DC voltage adjustments.

3.3.2 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. The power supply module bracket is connected to DC GND and AC safety GND, and can be used for ground reference in voltage measurements. If any output cannot be brought within the limits, or if the voltage adjustment pot is near its extreme limit when obtaining proper output voltage, the module must be replaced. Refer to Figure 3-8 for location of voltage adjustment pots.

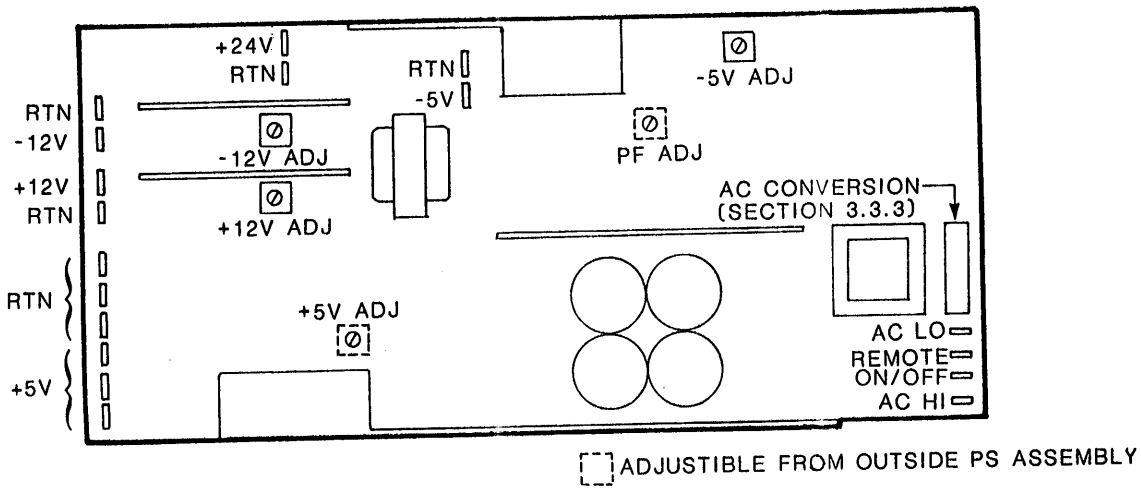


FIGURE 3-8: DC POWER ADJUSTMENTS

+5VDC Adjustment

Adjust +5VDC by turning the pot indicated in Figure 3-9. Measure +5VDC +/- 0.25VDC on pin AA2, BA2, or BV1 of any backplane connector slot (Figure 2-10).

+12VDC Adjustment

Adjust +12VDC by turning the pot indicated in Figure 3-9. Measure +12VDC +/- 0.6VDC on pin AD2 or BD2 of any backplane connector slot (Figure 2-10).

+24VDC Adjustment

Adjust +24VDC by turning the pot indicated in Figure 3-9. Measure +12VDC +/- 0.6VDC on the power tab shown in Figure 3-9.

Power Fail Detect Adjustment

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 3-8 shows the location of the power fail detect pot. Adjustment should be made by monitoring BB1 (Figure 2-10). 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 3-9 shows the timing relationship of BPOKH and BDCOKH as provided by the power supply unit.

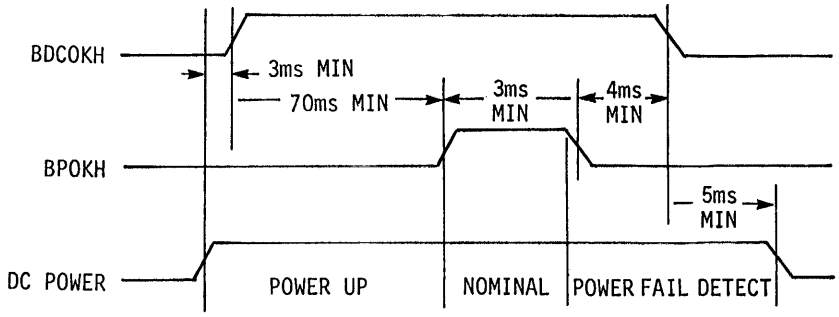


FIGURE 3-9: POWER FAIL DETECT TIMING

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.

3.3.3 115VAC/230VAC Conversion

Conversion between 115VAC and 230VAC requires removing the power supply and disassembling the unit. Refer to Figure 3-7 to gain internal access to the power supply and to Figure 3-8 for AC jumper locations. Figure 3-10 defines AC conversion.

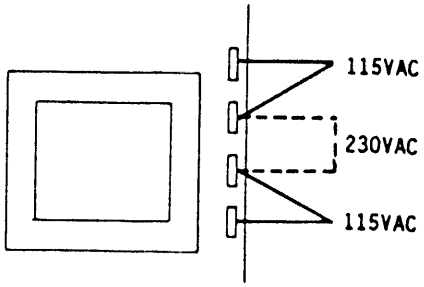


FIGURE 3-10: 115/230VAC CONVERSION

Notes

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

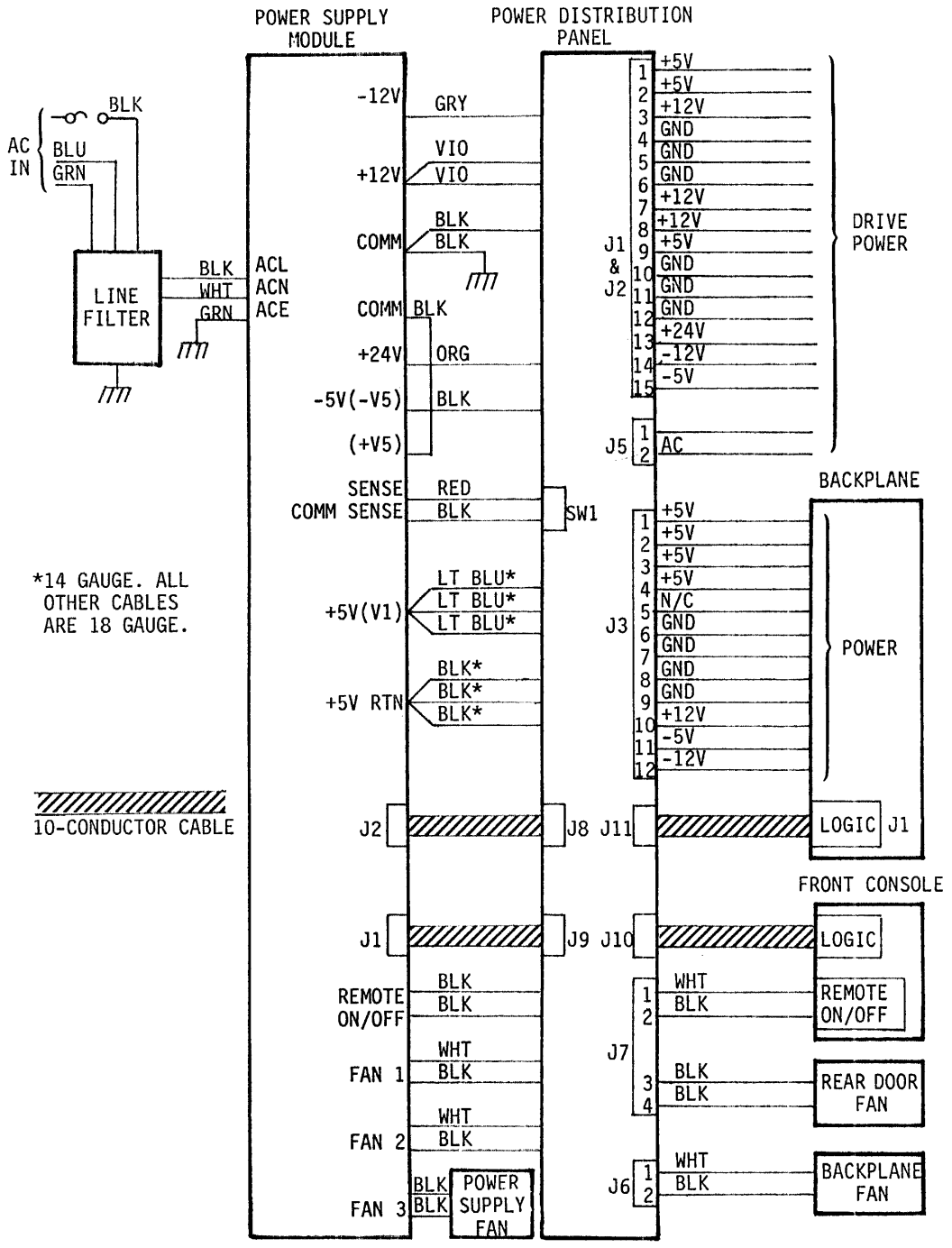
C-D slots for LSI-11/73 and LSI-11/23 are the same as A-B slots. Pin assignments for MicroVAX C-D slots are defined on the next page.

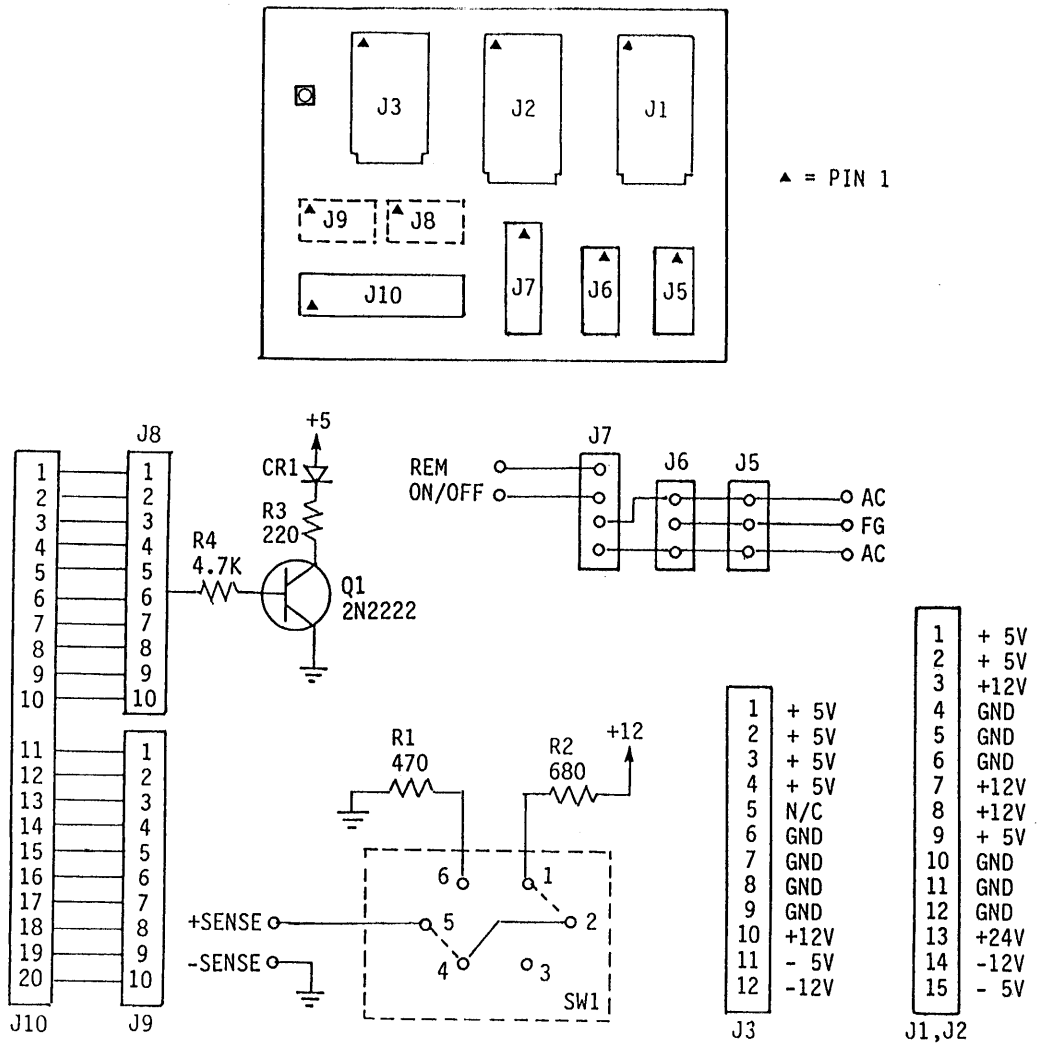
CA1	NOT USED	CA2	+5V	DA1	NOT USED	DA2	+5V
CB1	*MAA<0>L	CB2	MAA<9>L	DB1	*MAA<7>L	DB2	MAA<7>L
CC1	NOT USED	CC2	GND	DC1	NOT USED	DC2	GND
CD1	*RAS<5>H	CD2	RAS<1>H	DD1	*MAA<5>L	DD2	MAA<5>L
CE1	*BMCAS<0>H	CE2	BMCAS<0>L	DE1	*MAA<4>L	DE2	MAA<4>L
CF1	*RAS<1>H	CF2	NOT USED	DF1	*MAA<3>L	DF2	MAA<3>L
CH1	*BMCAS<1>H	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

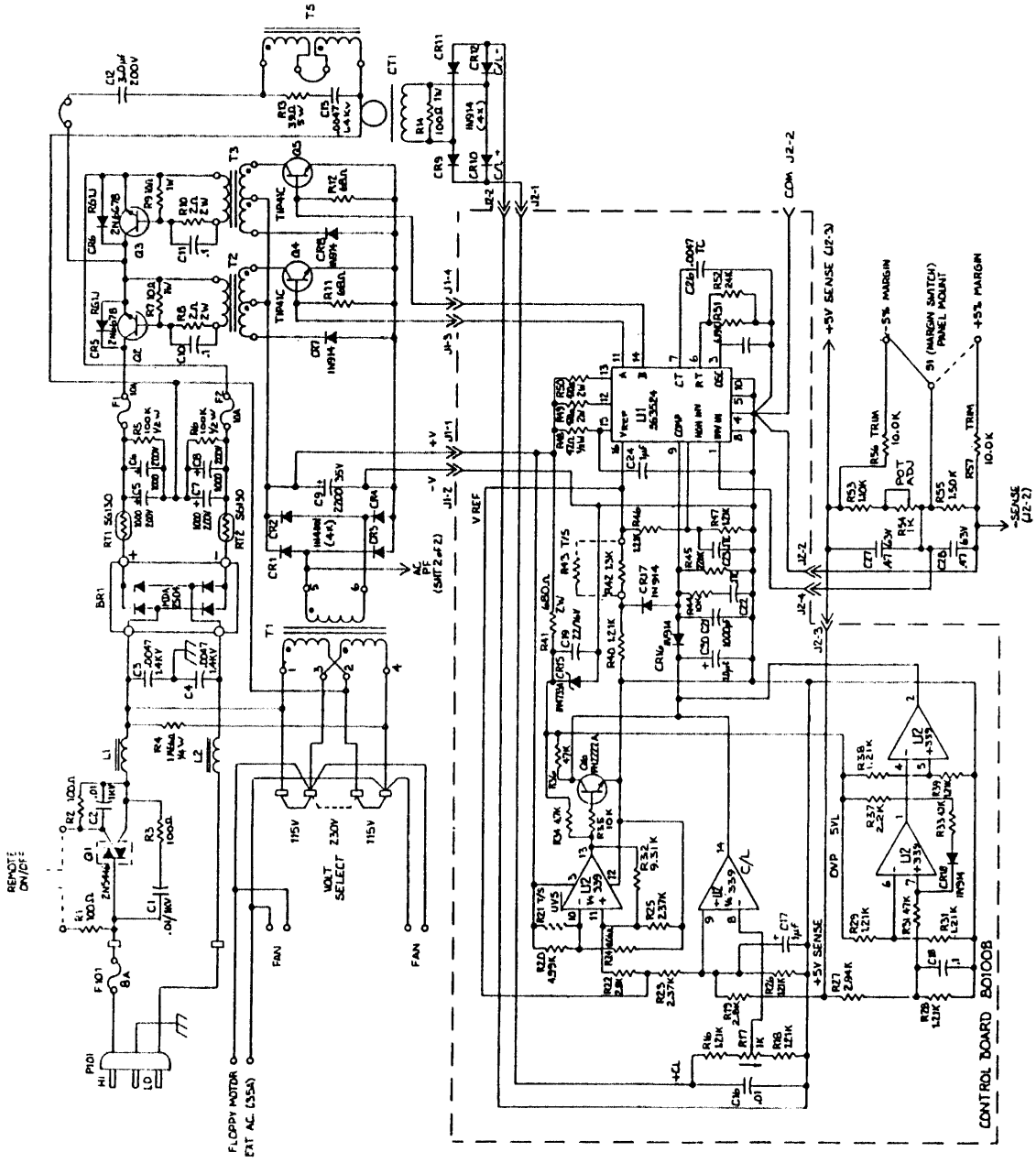
*Used by MSA32 memory module. Not used by CPU.

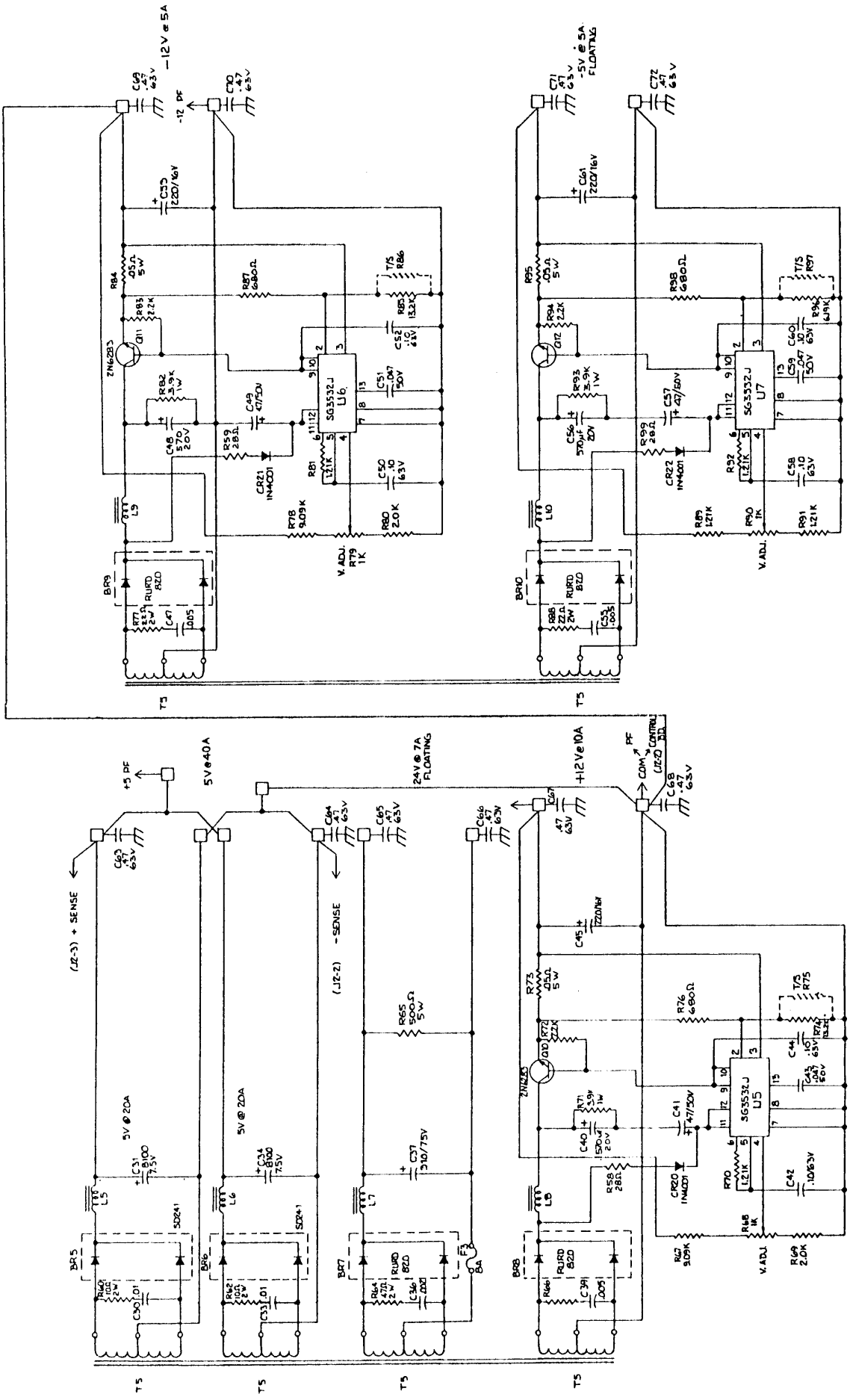
MicroVAX C-D Slot Definitions

BUS SIGNAL	PIN	RESISTOR MODULE PIN	BUS SIGNAL	PIN	RESISTOR MODULE PIN
BIRQ5L	AA1, CA1	RM1-2	BDAL19L	BD1, DD1	RM3-6
BIRQ6L	AB1, CA1	RM1-3	BDAL20L	BE1, DE1	RM3-5
BDAL16L	AC1, CC1	RM1-4	BDAL21L	BF1, DF1	RM3-7
BDAL17L	AD1, CD1	RM1-5	BSACKL	BN1, DN1	RM4-8
BDMRL	AN1, CN1	RM2-4	BIRQ7L	BP1, DP1	RM4-6
BHALTL	AP1, CP1	RM2-6	BEVENTL	BR1, DR1	RM5-3
BREFL	AR1, CR1	RM2-7	BDAL2L	BE2, DE2	RM3-9
BDOUTL	AE2, CE2	RM1-6	BDAL3L	BF2, DF2	RM4-2
BRPLYL	AF2, CF2	RM1-7	BDAL4L	BH2, DH2	RM4-3
BDINL	AH2, CH2	RM1-8	BDAL5L	BJ2, DJ2	RM4-4
BSYNCL	AJ2, CJ2	RM1-9	BDAL6L	BK2, DK2	RM4-5
BWTBTL	AK2, CK2	RM2-2	BDAL7L	BL2, DL2	RM4-7
BIRQ4L	AL2, CL2	RM2-3	BDAL8L	BM2, DM2	RM5-5
BBS7L	AP2, CP2	RM2-5	BDAL9L	BN2, DN2	RM5-9
BINITL	AT2, CT2	RM2-8	BDAL10L	BP2, DP2	RM5-8
BDALOL	AU2, CU2	RM2-9	BDAL11L	BR2, DR2	RM5-7
BDALIL	AV2, CV2	RM3-2	BDAL12L	BS2, DS2	RM5-6
BDCOKH	BA1, DA1	RM3-3	BDAL13L	BT2, DT2	RM5-4
BPOKH	BB1, DB1	RM3-8	BDAL14L	BU2, DU2	RM5-2
BDAL18L	BC1, DC1	RM3-4	BDAL15L	BV2, DV2	RM4-9


POWER SUPPLY MODULE
POWER DISTRIBUTION PANEL
AC IN
BLK
BLU
GRN
LINE FILTER
BLK
WHT
GRN
ACL
ACN
ACE
-12V
GRY
+12V
VIO
VIO
COMM
BLK
BLK
COMM
BLK
+24V
ORG
-5V(-V5)
BLK
(+V5)
SENSE
RED
COMM SENSE
BLK
SW1
+5V(V1)
LT BLU*
LT BLU*
LT BLU*
+5V RTN
BLK*
BLK*
BLK*
*14 GAUGE. ALL OTHER CABLES ARE 18 GAUGE.
10-CONDUCTOR CABLE
J2
J8
J1
J9
REMOTE ON/OFF
BLK
BLK
FAN 1
WHT
BLK
FAN 2
WHT
BLK
FAN 3
BLK
BLK
POWER SUPPLY FAN
J1 & J2
+5V
+5V
+12V
GND
GND
GND
+12V
+12V
+5V
GND
GND
GND
+24V
-12V
-5V
DRIVE POWER
J5
AC
BACKPLANE
J3
+5V
+5V
+5V
+5V
N/C
GND
GND
GND
GND
+12V
-5V
-12V
POWER
J11
LOGIC
J1
FRONT CONSOLE
J10
LOGIC
J7
WHT
BLK
REMOTE ON/OFF
BLK
BLK
REAR DOOR FAN
J6
WHT
BLK
BACKPLANE FAN


J3
J2
J1
▲ = PIN 1
J9
J8
J10
J7
J6
J5
J8
J10
J9
+5
CR1
R3
220
R4
4.7K
Q1
2N2222
REM
ON/OFF
J7
J6
J5
AC
FG
AC
R1
470
R2
680
+12
+SENSE
-SENSE
SW1
J3
+ 5V
+ 5V
+ 5V
+ 5V
N/C
GND
GND
GND
+12V
- 5V
-12V
J1,J2
+ 5V
+ 5V
+12V
GND
GND
GND
+12V
+12V
+ 5V
GND
GND
GND
+12V
+24V
-12V
- 5V


CONTROL BOARD 801008
REMOTE ON/OFF
VOLT SELECT
115V
230V
FAN
FLOPPY MOTOR
FAT AC (35A)
+5V SENSE (J2-3)
COM J2-2
-SENSE (J2-2)
+5% MARGIN
-5% MARGIN
S1 (MARGIN SWITCH) PANEL MOUNT
POT ADJ
VREF
OVP
5VL
+5V SENSE


-12 V @ 5A
-12 PF
-5V @ 5A FLOATING
+5 PF
5V@40A
24V @ 7A FLOATING
+12V@10A
COM
PF
(J2-3) + SENSE
(J2-2) - SENSE
5V @ 20A
5V @ 20A
SG3532J
U16
U17
U5
RURD 820
T5