

PM-1150/2  
Expansion Chassis  
Manual



**Plessey  
Peripheral  
Systems**

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REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
-	REL FOR PROD PER ERO 500413	6 JUNE 74	<i>JB</i>
A	INCORP EO 1013	9 JAN 75	<i>JB</i>

APPLICATION	
NEXT ASSY	USED ON
	PM-1150/2

**PRODUCTION RELEASE**

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SHEET																	6-1	6-2	6-3	6-4	6-5	6-6								
REV LTR																	-	-	A	-	-	-	-	-	-	-	-	-		
SHEET																	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	5-12	5-13	5-14
REV LTR	A	-	A	-	-	-	A										-	A	A	-										
SHEET	3-3	3-4	3-5	3-6	3-7	3-8	3-9										4-1	4-2	4-3	4-4										
REV LTR																	A	A	A	A	A							-	-	
SHEET																	2-1	2-2	2-3	2-4	2-5							3-1	3-2	
REV LTR	A	A	A	A	A	A											A	A	A	A	-									
SHEET	I	II	III	IV	V	VI											1-1	1-2	1-3	1-4	1-5									

DO NOT SCALE DRAWING		CONTRACT NO.			<b>Plessey Memories Incorporated</b>	
SCREW THREADS PER HANDBOOK H-28		DRAWN T. Githens 6/6/74			Santa Ana, California	
COUNTERBORE AND SPOTFACE FILLET RADII TO BE .010 MAXIMUM		CHECK <i>JB</i> 6/6/74		DWG TITLE		
REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .010R		DESIGN		MANUAL		
ROUGHNESS OF MACHINED SURFACES 125 / PER USAS B46.1		PROJ. ENGR. <i>Blm Kot</i> 6/9/74		PM-1150/2		
STANDARD HOLE TOLERANCE PER AND 10387				MEMORY EXTENSION BOX		
TOLERANCES ON: .XX = ± .03, .XXX = ± .010, ANGLES = ± 0° 30'				SIZE	CODE IDENT NO.	DWG NO.
INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5				A	52648	MA 700350
DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH		OTHER		SCALE:		SHEET I OF
UNLESS OTHERWISE SPECIFIED		APPROVALS				DISTR NO.

PM-1150/2  
EXTENSION BOX FOR PDP 11 COMPUTERS

DESCRIPTION OF THE MANUAL

This manual presents the description, installation, theory of operation, maintenance, troubleshooting procedure and drawings for the PM-1105/2 system manufactured by:

PLESSEY MEMORIES, INCORPORATED  
1674 Mc Gaw Avenue  
Santa Ana, California 92705  
USA

The Manual is arranged as follows:

Section 1 - GENERAL DESCRIPTION. Scope: Brief electrical and physical description of PM-1150/2.

Section 2 - INSTALLATION AND OPERATION. Provides information for installation and operation of the PM-1150/2.

Section 3 - INTERFACE INFORMATION . Interface information are provided in this section.

Section 4 - MAINTENANCE AND TROUBLESHOOTING. Recommended general maintenance procedure and troubleshooting information are described.

Section 5 - POWER SUPPLY. Specifications, schematics and troubleshooting information on Power Supply are provided in this section.

Section 6 - Schematics and Drawings.

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SIZE

**A**

SCALE

CODE IDENT NO.

52648

DWG NO.

MA 700350

REV

**A**

SHEET

**II**

LIST OF CONTENTS

SHEET

SECTION 1	- GENERAL DESCRIPTION	1-1
1.0	Introduction	1-1
1.1	Description	1-1
1.1.1	Configuration I for Non-Parity Memories	1-1
1.1.2	Configuration II for Parity Memories	1-4
1.1.3	Additional Components	1-4
1.2	Description Mechanical	1-5
SECTION 2	- INSTALLATION AND OPERATION	2-1
2.0	Introduction	2-1
2.1	Unpacking and Inspection	2-1
2.2	Part Numbers	2-1
2.2.1	PM-1150/2 Non-Parity Configuration I	2-1
2.2.2	PM-1150/2 Parity Configuration II	2-1
2.2.3	I/O Cable	2-1
2.2.4	Terminator Card PM-930.	2-2
2.2.5	Memory Cards (Non-Parity)	2-2
2.2.6	Memory Cards (Parity)	2-2
2.2.7	Address Strapping Plug	2-2
2.3	Rack Mounting Instructions	2-2
2.4	Access to Sub Units	2-3
2.4.1	Memory Card Cage	2-3
2.4.2	Power Supply	2-3
2.5	Control and Adjustment of the Power Supply	2-3
2.6	Installation of the Memories	2-4
2.6.1	Non-Parity Memories	2-4
2.6.2	Parity Memories	2-4
2.7	Installation of the I/O Cable and Termination	2-4
2.8	PM-1150/2 Operational	2-5
SECTION 3	- INTERFACE INFORMATION	3-1
3.0	Introduction	3-1
3.1	Mode of Operation and Interface Timing	3-1
3.2	Logic Level Definitions	3-1
3.3	I/O Cable	3-3
3.4	Terminations	3-3
3.5	Interface Pin Assignments	3-4
3.6	Memory System Interface Signals	3-6
3.7	Power Supply	3-8
3.8	Memory Card Power Requirements	3-9

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SIZE

**A**

SCALE

CODE IDENT NO.

52648

DWG NO.

MA 700350

REV

**A**

SHEET

III

	SHEET
SECTION 4 - MAINTENANCE AND TROUBLESHOOTING	4-1
4.0 Introduction	4-1
4.1 Air Filter Cleaning	4-1
4.2 Printed Circuit Board Cleaning	4-1
4.3 Repairs on Power Supply	4-2
4.4 Repairs on the System	4-2
4.5 Fault Isolation Procedure	4-2
SECTION 5 - POWER SUPPLY	5-1
5.0 Introduction	5-1
5.1 Maintenance Procedures	5-1
5.2 Troubleshooting	5-1
5.3 Controls	5-1
5.4 Power Supply Input Voltage Conversion Procedure	5-2
5.4.1 To Convert From 115VAC to 230VAC	5-2
5.4.2 To Convert From 230VAC to 115VAC	5-2
5.5 Aclo Adjustment Procedure	5-3
5.6 Power Supply Type 96799 Specifications	5-6
5.7 Component Parts List	5-12
SECTION 6 - SCHEMATICS AND DRAWINGS	6-1
PM-1150/2 Signal Flow Diagram	6-2
PM-1150/2 Mechanical Outline	6-3
Installation Control Drawing	6-4
Pin Assignment PMF-11 Backplane Non Parity Configuration I	6-5
Pin Assignment PMF 11P Backplane Parity Configuration II	6-6

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SIZE

**A**

CODE IDENT NO.

52648

DWG NO.

MA 700350

SCALE

REV

**A**

SHEET

IV

## LIST OF FIGURES AND DRAWINGS

FIGURE		SHEET
1.1	PM-1150/2 Front View	1-2
1.2	PM-1150/2 Rear View	1-3
5.1	Power Supply Input Voltage Conversion	5-2
5.2	AC Power Supply Schematic Diagram	5-4
5.3	AC Power Supply	5-5
5.4	Power Supply Schematics - Type 96799	5-9
5.5	Printed Circuit Boards Power Supply Schematics	5-10
5.6	Printed Circuits Board Power Supply Layout	5-11
6.1	PM-1150/2 Signal Flow Diagram	6-2
6.2	PM-1150/2 Mechanical Outline	6-3
6.3	Installation Control	6-4
6.4	Pin Assignment PMF-11 Backplane for Non Parity Configuration I	6-5
6.5	Pin Assignment PMF-11P Backplane for Parity Configuration II	6-6

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SIZE

**A**

SCALE

CODE IDENT NO.

52648

DWG NO.

MA 700350

REV

**A**

SHEET

**V**

LIST OF TABLES

TABLE		SHEET
3.1	Receivers and Transmitters Characteristics	3-2
3.2	Terminations for the Unidirectional Bus Lines	3-2
3.3	Unibus Terminations	3-3
3.4	Interface Pin Assignments	3-4/5
3.5	Memory System Interface Signals	3-6/7
3.6	Power Supply Output Plug	3-8
3.7	Memory Card Power Requirements	3-9
3.8	Memory Card Power Supply Connections	3-9
4.1	Address Conversion Decimal to Octal	4-4

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SIZE

**A**

CODE IDENT NO.

52648

DWG NO.

MA 700350

SCALE

REV

**A**

SHEET

**VI**

SECTION I

GENERAL DESCRIPTION

1.0 INTRODUCTION

This section contains a brief electrical and physical description of the PM-1150/2.

1.1 DESCRIPTION

The PM-1150/2 is a memory extension box for PDP 11 computers (see Fig. 1.1 and 1.2).

The PM-1150/2 consists of a card cage containing 9 Hex card slots, a power supply for +5 and -15V and a cooling system. The PM-1150/2 is available in two (2) different configurations with different backplanes. The PM-1150/2 can be mounted in a standard 19 inch rack.

1.1.1 Configuration I for non-parity memories.

	MEMORY CARDS	CARD CAPACITY	MAX. NO. OF CARDS	MAX. SYS. CAPACITY
Configuration I 700350 Using PM-F11 Backplane	PM-1105	8K x 16	5	40Kx16
	PM-1116	16K x 16	5	80Kx16
	DEC MM11-L	8K x 16	3	24Kx16

VERSION	INPUT POWER	AIRFLOW
VERSION I - 100	115VAC	Rear intake - Rear exhaust. Solid Front Panel
VERSION II - 101	115VAC	Front intake - Rear exhaust. Filter front panel.
VERSION III - 102	230VAC	Rear intake - Rear exhaust. Solid front panel.
VERSION IV - 103	230VAC	Front intake - Rear exhaust. Filter front panel.

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SIZE	CODE IDENT NO.	DWG NO.
<b>A</b>	52648	MA 700350
SCALE	REV	SHEET
	A	1-1



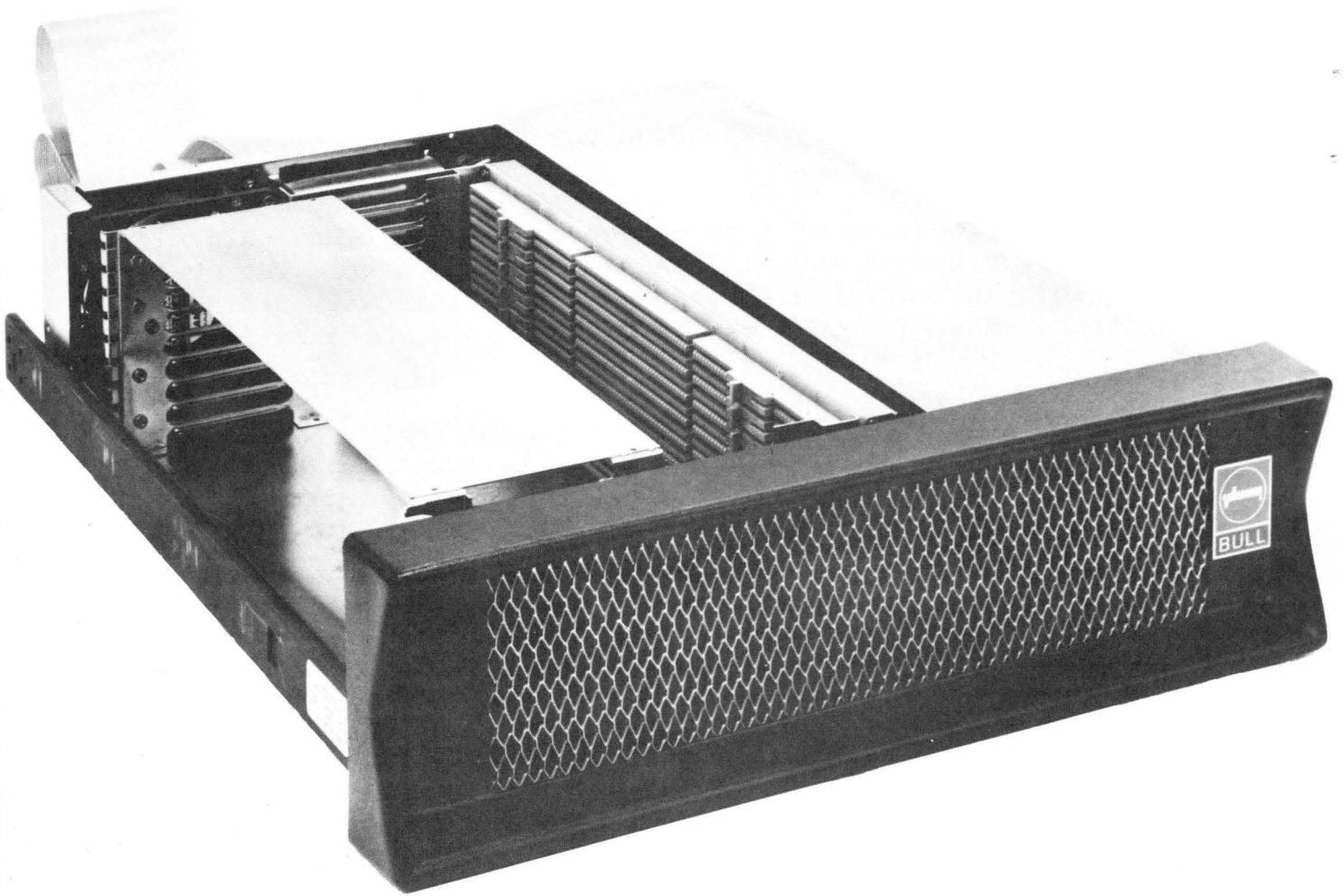


FIG. 1.1

PM1150/2 EXPANSION BOX FRONT VIEW SHOWING  
CARD CHASSIS AND BACKPLANE

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SIZE	CODE IDENT NO.	DWG NO.
<b>A</b>	52648	MA 700350
SCALE	REV	SHEET
	—	1-2



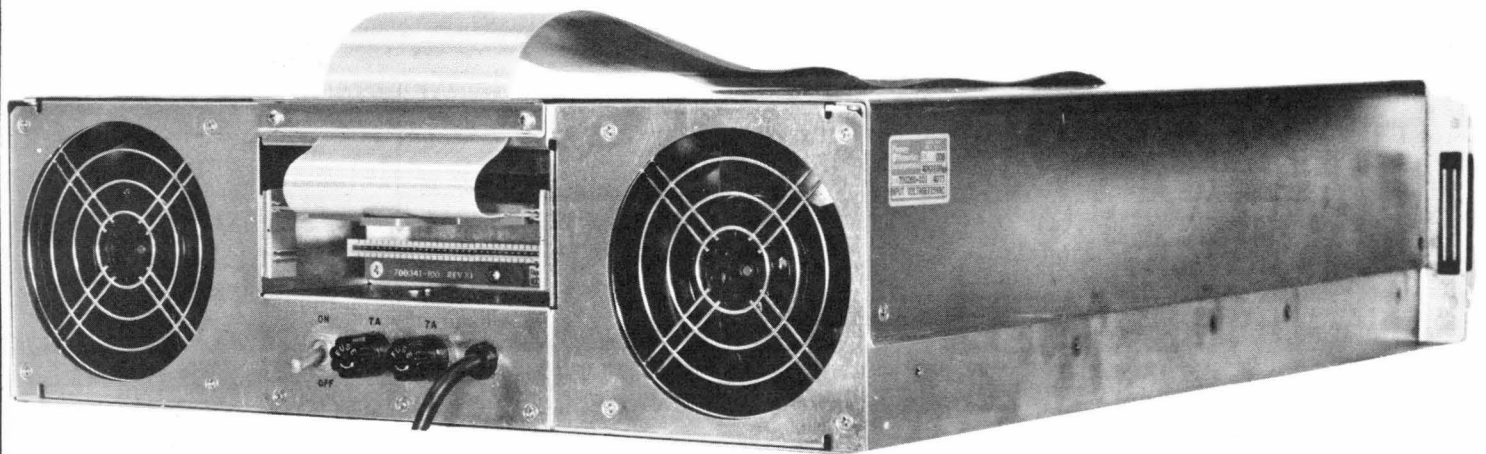


FIG. 1.2

PM 1150/2 REAR VIEW SHOWING  
UNIBUS CABLE CONNECTION TO INTERCONNECTION MODULE

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SIZE	CODE IDENT NO.	DWG NO.
<b>A</b>	52648	MA 700350
SCALE	REV	SHEET
	—	1-3

1.1.2 Configuration II for parity memories

	MEMORY CARDS	CARD CAPACITY	MAX.NO. OF CARDS	MAX.SYS. CAPACITY
Configuration II 700450	PM-1105/P	8K x 18	4	32K x 18
Using PM-F11P Backplane	DEC MM11-LP	8K x 18	3	24K x 18

The parity controller card PM-7259 or DEC Parity Controller plugs in slot 7A and B of the PM-1150/2.

If non-parity memories have to be used in configuration II the Bus Continuation Card PM-G7271 can be plugged in slot 7A and B of the PM-1150/2 instead of the PM-7259.

VERSION	INPUT POWER	AIRFLOW
VERSION I -100	115 VAC	Rear intake - Rear exhaust. Solid front panel.
VERSION II - 101	115 VAC	Front intake - Rear exhaust. Filter front panel.
VERSION III - 102	230 VAC	Rear intake - Rear exhaust. Solid front Panel.
VERSION IV - 103	230 VAC	Front intake - Rear exhaust. Filter front panel.

1.1.3 Additional Components

To connect the PM-1150/2 to the DEC Unibus it is necessary to use an I/O cable, P/N: 700144-XXX.

If the PM-1150/2 is not the last device on the Unibus, it has to be terminated. Use PM-930 (P/N: 700430-100) or DEC M930 terminator card.

If the PM-1150/2 is not the last device on the Unibus,

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SIZE

**A**

CODE IDENT NO.

52648

DWG NO.

MA 700350

SCALE

REV

**A**

SHEET

1-4

another Unibus cable is required to connect it to the next device.

## 1.2 DESCRIPTION MECHANICAL

The system contains two fans for forced air cooling, a card chassis to provide mechanical support, a prewired backplane containing 9 Hex connector slots, top and bottom covers to provide part of the air plenum and to prevent debris from falling onto the modules, +5V supply at 12.5A maximum, -15V supply at 13A maximum and -5V supply at 1.5A maximum. There is also an interconnection plug that allows the Unibus to be terminated if the system is at the end of the Unibus lines or to be continued if the system is not at the end of the Unibus lines.

The system box is fabricated from gold colored cadmium plated steel to resist corrosion.

The internal routing of PDP-11 Unibus signals are performed by the I/O Internal cable . DC power is routed from the power supply plug into the backplane board.

The memory module is 15.69" long with edge fingers on one edge of the board to mate with the back plane module. The memory width will extend approximately .35" from both sides of the printed circuit board. All major heat dissipating elements and the stack are away from the back plane to allow for a maximum air flow over these elements.

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SIZE

**A**

CODE IDENT NO.

52648

DWG NO.

MA 700350

SCALE

REV

—

SHEET

1-5

SECTION 2

INSTALLATION AND OPERATION

2.0 INTRODUCTION

This section provides information for installation and operation of the PM-1150/2.

2.1 UNPACKING AND INSPECTION

Remove any packaging material and visually inspect for physical damage. The PM-1150/2 shipment consist of four (4) items:

- PM-1150/2 box
- Front panel
- Mounting equipment
- I/O cable

2.2 PART NUMBERS

2.2.1 PM-1150/2 non-parity Configuration I

P/N:	700350	- 100	115VAC	Solid front panel
		- 101	115VAC	Filter front panel
		- 102	230VAC	Solid front panel
		- 103	230VAC	Filter front panel

2.2.2 PM-1150/2 parity Configuration II

P/N:	700450	- 100	115VAC	Solid front panel
		- 101	115VAC	Filter front panel
		- 102	230VAC	Solid front panel
		- 103	230VAC	Filter front panel

2.2.3 I/O Cable

Defines a DEC compatible cable which is available in following lengths:

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SIZE

**A**

SCALE

CODE IDENT NO.

52648

DWG NO.

MA 700350

REV

**A**

SHEET

2-1

P/N: 700144 - 100	9 Ft. 6" Standard Cable
- 101	2 Ft. 0"
- 102	5 Ft. 0"
- 103	8 Ft. 6"
- 104	10 Ft. 0"
- 105	13 Ft. 6"
- 106	25 Ft. 0"

2.2.4 Terminator Card PM-930

Part Number 700430-100

2.2.5 Memory Cards (Non-parity)

PM-1105 P/N: 700096-100

PM-1116 P/N: 700290-100

2.2.6 Memory Cards (Parity)

PM-1105/P P/N: 700400-100

Parity Controller  
Card

PM-7259, P/N: 700385-100

Bus Continuation  
Card

PM-G7271, P/N: 700420-100

2.2.7 Address Strapping Plug

P/N: 700066-XXX

(XXX for the different configurations see memory manual)

2.3 RACK MOUNTING INSTRUCTIONS

The PM-1150/2 can be mounted in a standard 19 inch rack, each unit is shipped with rack slides attached and all necessary mounting hardware.

1. Remove the left and the right slide brackets from the system box. Pull slide bracket all the way out, then push on the spring bar to release the slide bracket.
2. Mount rear mounting brackets on to the back end of the slide brackets. Use Pan head 10-32 screws.

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SIZE	CODE IDENT NO.	DWG NO.
<b>A</b>	52648	MA 700350
SCALE	REV <b>A</b>	SHEET 2-2

3. Mount right and left slide brackets, both front and back on to the standard 19 inch rack.
4. Lift the PM-1150/2 and align it with the mounted slide brackets, then slide it into the rack until the spring bars lock-in. The magnets (one on each side of the box) will keep the box from sliding out.

## 2.4 ACCESS TO SUB UNITS

### 2.4.1 Memory card cage

Remove the six (6) screws on the L shaped top/left side cover.

Screws: 100° flat head, countersunk, 6-32 x ¼ Long.

### 2.4.2 Power Supply

Remove the seven (7) screws on the approx. 6" width right side top cover.

Screws: 100° Flat head, countersunk, 6-32 x ¼ Long.

## 2.5 CONTROL AND ADJUSTMENT OF THE POWER SUPPLY

- Check if the PM-1150/2 is properly fused. Two (2) main fuses on the back of PM-1150/2. One (1) fuse on the front of the power supply.

For 115VAC, 3 fuses at 10A 250V Slow Blow

For 230VAC, 3 fuses at 5A 250V Slow Blow

- Connect the AC power supply. (AC line frequency 47 HZ to 440 HZ). For input Power Supply voltage conversion 115VAC/230VAC or 230VAC/115VAC. See sheet 5-2.
- Switch the power switch on the back of the PM-1150/2 to "ON".
- Check the DC Voltage on the terminal points on the front side of the power supply.
  - +5V ± 1% Adjustment with R122 ) See Sheet 5-11
  - 15V ± 1% Adjustment with R222 )
  - (For ACLO Adjustment Procedure see sheet 5-3.)
- Switch the power switch to "OFF".

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SIZE	CODE IDENT NO.	DWG NO.
<b>A</b>	52648	MA 700350
SCALE	REV <b>A</b>	SHEET 2-3

## 2.6 INSTALLATION OF THE MEMORIES

### 2.6.1 Non-Parity Memories (See Sheet 6-3)

PM-1105 8K x 16 Bits  
PM-1116 16K x 16 Bits  
(DEC MM11-L 8K x 16 Bits)

- Address memories with proper address strapping plug,  
P/N: 700066-XXX.

PM-1105 and/or PM-1116 can be installed in any slot J1 through J9 of the card cage of the PM-1150/2, however, one empty slot is needed between two memories due to the width of the memory cards (up to 5 memories can be installed in a PM-1150/2.)

- The connectors are keyed, all memory cards are always plugged in with the components side up.

### 2.6.2 Parity Memories (See Sheet 6-4)

PM-1105/P 8K x 18 Bits  
(DEC MM11LP) 8K x 18 Bits

- Address memories with proper address strapping plug,  
P/N: 700066-XXX.

- PM-1105/P can be installed in any slot J2 through J6 and J8 of the card cage of the PM-1150/2, however- one empty slot is needed between two Memories due to the width of the memory cards. No PM-1105/P can be plugged in J6, if J7 is used for the Parity controller card PM-7259 (up to 4 PM-1105/P can be installed in a PM-1150/2). Slots J1-A, B and J9-A, B are Unibus slots.

- The connectors are keyed, all memory cards are always plugged in with the components side up.

- The parity controller card PM-7259 plugs into slot 7A and B of the PM-1150/2.

## 2.7 INSTALLATION OF THE I/O CABLE AND TERMINATION

The Unibus cable (P/N 700144) is used to connect the PM-1150/2 to and from the processor. The Unibus cable is a one to one cable and therefore either end could be used. Both cable plugs are keyed and extra care must be taken to make sure that they are properly aligned when installed. Failure to align keys will not cause damage but will cause the system to malfunction.

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SIZE

**A**

SCALE

CODE IDENT NO.

52648

DWG NO.

MA 700350

REV **A**

SHEET 2-4



On the back side of the PM-1150/2 are two parallel I/O connectors.

- Install a I/O cable in the keyed I/O connector of the PM-1150/2 and connect the other end of the I/O cable to the PDP 11 Unibus (A and B).
- In general, the Unibus cable from the PM-1150/2 may be plugged in any slot at the processor where a Unibus connection exists.
- If the PM-1150/2 is the last device on the Unibus, it has to be terminated. Use PM-930 (P/N 700430-100) or DEC M930 terminator card. Put the termination card in the second slot on the rear of the PM-1150/2.
- If the PM-1150/2 is not the last device on the Unibus, another Unibus cable is required to connect it to the next device.
- The I/O cable can be fixed with the bracket on the back of the PM-1150/2.

## 2.8 PM-1150/2 OPERATIONAL

- Fasten the cover on the right top side of the PM-1150/2 with 7 screws.
- Fasten the L shaped cover (top left side) with 6 screws.
- Fasten the front panel with 4 screws.
- Put switch on back side of PM-1150/2 to "ON".

The PM-1150/2 is now ready for operation.

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SIZE <b>A</b>	CODE IDENT NO. 52648	DWG NO. MA 700350
SCALE	REV <b>A</b>	SHEET 2-5

SECTION 3

INTERFACE INFORMATION

3.0 INTRODUCTION

This section provides interface information.

3.1 MODE OF OPERATION AND INTERFACE TIMING

See Memories Manual and Processor Manual.

3.2 LOGIC LEVEL DEFINITIONS

Logic levels are defined as follows:

High (logic "0") +2.5V to 5.0V  
 Low (logic 1) 0V to 0.8V

The last letter in the logic symbols indicates the active state of the signal, the letter L indicates that it is active when in low state, The letter H indicates that it is active when in the high state.

RECEIVER	CHARACTERISTICS
SP380	Input High Threshold 1.7V Typ.
	Input Low Threshold 1.0V Typ.
	Input Current at 2.7V 180 $\mu$ a Max.
TRANSMITTER	CHARACTERISTICS
SN7438	Input High Voltage 2.0V Min.
	Input Low Voltage 0.8V Max.

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DWG NO.

**A**

52648

MA 700350

SCALE

REV

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SHEET 3-1

Transmitter (continued)	Characteristics
Input "1" Current	40 $\mu$ a ma max.
Input "0" Current	-1.0 ma max.
Output Low Voltage (at 48 ma sink)	+0.4 V max.
Output High Current	250 $\mu$ a max.
Propagation Delay (low to high level)	14 ns typ.
Propagation Delay (high to low level)	11 ns typ.

TABLE 3.1

RECEIVERS AND TRANSMITTERS CHARACTERISTICS SPECIFICATIONS

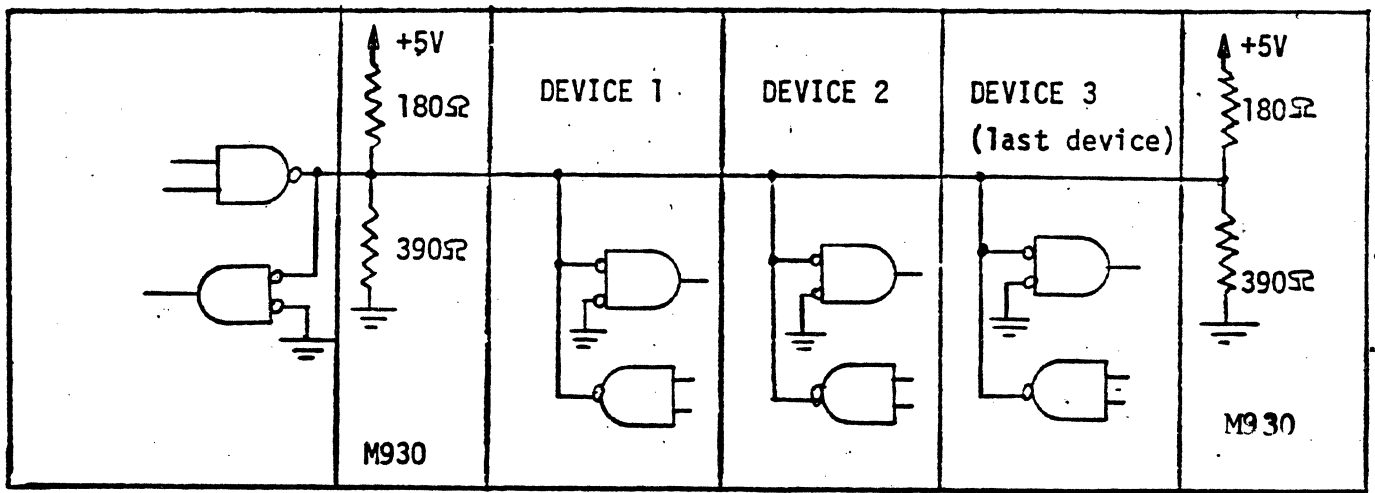


TABLE 3.2

TERMINATIONS FOR THE UNIDIRECTIONAL BUS LINES

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SCALE	REV —	SHEET 3-2



### 3.3 I/O CABLE

All signals between the memory cards and the Unibus are carried via a flat transmission cable. The flat transmission cable offers improved predictability of performance to increase reliability. This is due to the uniformity of the distance between each conductor.

The characteristics of the I/O cables are:

Characteristic impedance : 150 ohms @ 1 MHz  
DC Resistance : .05 ohm per Foot

### 3.4 TERMINATIONS

A optional PM-930 card is available to terminate the Unibus in the memory enclosure, if required.\* All lines are terminated with 180 ohms  $\pm$  5% to +5V and 390 ohms  $\pm$  5% to ground except for the following:

PIN ASSIGNMENT	NAME OF LINE	TYPE OF TERMINATION
BF1 BF2	ACL0L DCL0L	390 ohms In Parallel with .001 MF to +5V
AV1 AU1 BA1 BB1 BE2	BG7H NPGH BG6H BG5H BG4H	180 ohms to +5V

UNIBUS TERMINATIONS

TABLE 3.3

\* NOTE : Not all the Unibus control lines are used in the memory system. Termination of the lines are required only at the last device on the Unibus.

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SCALE

CODE IDENT NO

52648

DWG NO.

MA 700350

REV

A

SHEET

3-3

3.5 INTERFACE PIN ASSIGNMENT

PIN NO. I/O INTERFACE	SIGNAL NAME	PIN NO. I/O INTERFACE	SIGNAL NAME
AA1	INITI	AA2	+5V
AB1	INTRL	AB2	GND
AC1	DOOL	AC2	GND
AD1	DO2L	AD2	DO1L
AE1	DO4L	AE2	DO3L
AF1	DO6L	AF2	DO5L
AH1	DO8L	AH2	DO7L
AJ1	DO10L	AJ2	DO9L
AK1	DO12L	AK2	DO11L
AL1	DO14L	AL2	DO13L
AM1	PAL	AM2	DO15L
AN1	GND	AN2	PBL
AP1	GND	AP2	BBSYL
AR1	GND	AR2	SACKL
AS1	GND	AS2	NPRL
AT1	GND	AT2	BR7L
AU1	NPGH	AU2	BR6L
AV1	BG7H	AV2	GND
BA1	BG6H	BA2	+5V
BB1	BG5H	BB2	GND

TABLE 3.4

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SCALE

CODE IDENT NO

52648

DWG NO.

MA 700350

REV

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SHEET

3-4



INTERFACE PIN ASSIGNMENTS (Continued)

PIN NO. I/O INTERFACE	SIGNAL NAME	PIN NO. I/O INTERFACE	SIGNAL NAME
BC1	BR5L	BC2	GND
BD1	GND	BD2	BR4L
BE1	GND	BE2	BG4H
BF1	ACL0L	BF2	DCL0L
BH1	A01L	BH2	A00L
BJ1	A03L	BJ2	A02L
BK1	A05L	BK2	A04L
BL1	A07L	BL2	A06L
BM1	A09L	BM2	A08L
BN1	A11L	BN2	A10L
BP1	A13L	BP2	A12L
BR1	A15L	BR2	A14L
BS1	A17L	BS2	A16L
BT1	GND	BT2	CTL
BU1	SSYNL	BU2	COL
BV1	MSYNL	BV2	GND

Connector for Unibus on the rear of the PM-1150/2 J1-A/J1-B and J2-A/J2-B.

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DWG NO.

**A**

52648

MA 700350

SCALE

REV

**A**

SHEET

3-5

NAME	SYMBOL	INPUT/OUTPUT LINES	FUNCTION
MASTER SYNC (Memory initiate)	MSYNL	INPUT	Initiates all memory cycles provided the memory is available (memory not busy)
MASTER SYNC A (PM1116 only)	MSYNA L	INPUT	Enables the processor to internally initiate a memory cycle. This is NOT a Unibus line.
SLAVE SYNC	SSYNL	OUTPUT	An acknowledgement PULSE from the memory to the processor (usually a response to MSYNL)
INITIALIZATION (Memory Reset)	INITL	INPUT	This signal is asserted by the processor when the START key on the console is depressed, when a RESET instruction is executed, or when the power fail sequence occurs. In the latter case, INIT is asserted following the power fail service routine while power is going down, and again when power comes up. INIT may also be used to clear and initialize peripheral devices by means of the RESET instruction.
CONTROL LINES	CØL, C1L	INPUT	Select the various mode of operation

TABLE 3.5

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SCALE

CODE IDENT NO.

52648

DWG NO.

MA 700350

REV

—

SHEET

3-6

NAME	SYMBOL	INPUT/OUTPUT LINES	FUNCTION
DATA LINES	D001L	INPUT/OUTPUT	The 16 data lines are used to transfer information between the memory and the master device. Data input to the memory and data output from the memory are transferred on the same lines.
ADDRESS LINES	A00L-A17L	INPUT	The address lines are used by the master device to select a memory with which it will communicate.
DC LINE	DCLOL	INPUT/OUTPUT	Input to the memory and output from the power supply. This signal, which emanates from the power supply, is wired from the power connector card slot to the UNIBUS on all system units. This signal remains cleared as long as all dc voltages are within specified limits. If an out of tolerance voltage condition occurs, DC LO is asserted by the power supply. Devices such as core memories use the DCLO signal to inhibit further operations.
PARITY ERROR FLAG	PBL	OUTPUT	Generated by parity controller to indicate parity error has occurred

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52648

DWG NO.

MA 700350

REV

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SHEET

3-7





### 3.7 POWER SUPPLY

See Section 5

Power Supply Output Plug on the back of the Power Supply.

PIN NO.	FUNCTION
A	AC
B	AC Neutral
C	Spare
D	Chassis Gnd
E	Fan return
F	Fan (AC switched)
H	-15V return
J	-5V
K	-15V
L	-15V return
M	ACLO
N	-15V
P	+5V return
R	DCLO
S	+5V
T	+5V return
U	-15V parallel
V	+5V
W	-5V and logic return
X	+5V parallel

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DWG NO.

MA 700350

SCALE

REV

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SHEET

3-8

3.8 MEMORY CARD POWER REQUIREMENTS:

The power requirement for the various memory cards are shown below:

MEMORY	POWER SUPPLY VOLTAGE	STAND-BY CURRENT	OPERATING		TERMINATOR CARD CURRENT STAND-BY	TERMINATOR CARD CURRENT	
			WORSE	CASE		WORSE	CASE
PM-1105 AND PM-1105/P	+5V	1.9A	3.	2A	.4A	.7A	
	-15V	.25A	5.3A		-	-	
PM-1116	+5V	2.1A	3.4A		.4A	.7A	
	-15V	.3A	5.3A		-	-	

TABLE 3.7

MEMORY CARD POWER SUPPLY CONNECTIONS ARE AS FOLLOWS:

0V	PINS:	C-C, D-C, E-C, F-C
+5V	PINS:	C-A, D-A, E-A, F-A,
-15V	PINS:	C-B, D-B, E-B, F-B

TABLE 3.8

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52648

DWG NO.

MA 700350

REV

**A**

SHEET 3-9

SECTION 4

MAINTENANCE AND TROUBLESHOOTING

4.0 INTRODUCTION

This section provides maintenance and troubleshooting instructions for periodic maintenance and for efficiently locating faults.

4.1 AIR FILTER CLEANING

The air filter is located on the cabinet front panel and should be removed at least once every 300 operating hours for cleaning.

After the air filter is removed, tap the filter (dirty side down) to loosen accumulated particles. Then reverse flush under running water. After cleaning, shake out excess water and reinstall when dry.

4.2 PRINTED CIRCUIT BOARD CLEANING

The printed circuit contacts should be cleaned when dust or dirt has built up on the surfaces. LPS Instant Contact Cleaner, alcohol, and Freon TMC have been approved for cleaning contacts. When printed circuit contacts must be cleaned, hold the card so the contacts are pointed down. Thoroughly saturate contact area. While the contacts are still wet, scrub with a soft natural bristle brush.

**CAUTION:** Under no circumstances should an eraser or other abrasive be used on gold plated contacts.

To remove dust from printed circuit boards, a soft brush should be used. Clear, oil-free, pressurized air (5 psi max) can then be sprayed over the board.

**CAUTION:** Do not spray pressurized air directly inside the core matrices.

When baseplate connector contacts require cleaning, remove printed circuit board, then clean and rewet the contact area. Insert and withdraw the board several times or until contacts seem clean. Rewet the contacts and the connector and using a soft cloth, wipe any residue from the board contacts. Repeat this sequence if necessary. Use only alcohol on baseplate connectors.

**CAUTION:** Insertion of objects other than printed circuit boards may destroy contact surface or pressure characteristics.

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SCALE

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52648

DWG NO.

MA 700350

REV

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SHEET

4-1

#### 4.3 REPAIR ON POWER SUPPLY

See Section 5

#### 4.4 REPAIRS ON THE SYSTEM

If a failure in the PM-1150/2 system occurs, steps should be taken to locate the source of failure. The failure might be caused by the electro-mechanical portion of the system, cables, power supply, backplane connections etc., or it may be caused by a malfunction in one of the memory modules itself. Memory type failures may be further defined as follows:

- A. Operation failures, which are caused by faulty reference control, input logic, or timing.
- B. Partial data word failures which are caused by faulty drive and sink switches, drive control, memory register, inhibit driver, stack decoding logic or line driver circuits of the memory card.

It is very strongly recommended that all assemblies requiring repair be returned to the factory for rework. All return units should be accompanied with as much detail as possible describing the failure mode.

#### 4.5 PROCEDURE TO LOCATE A FAULTY MEMORY

The information contained in this section is designed to help locate a malfunction in a specific memory card. It is strongly recommended that the memory card be sent back to the factory for repair. This will ensure that the unit is tested to meet its specifications before being used again.

NOTE: After isolating the malfunction card, enclosed as much data as possible describing the specific condition of the failure.

The most common and useful method to locate a failure, providing there is more than one memory card in the system, is to "walk" the error. This is accomplished by inter-exchanging the memory cards and observing the error mode again.

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CODE IDENT NO

52648

DWG NO.

MA 700350

REV

**A**

SHEET

4-2

NOTE: Address strapping plug must be swapped when memory cards are swapped. If the error moved when the cards were swapped, it is very likely that the memory card is faulty. If the error did not move, the malfunction is not very likely to be in the memory card. The recommended procedure is as follows:

1. Check all cables in and out of the PM-1150/2, make sure all lines are not cut, broken or shorted to each other.
2. Check all DC voltages to the memory card.
3. Check all terminations (for the last device on the Unibus).
4. Inspect visually to ensure no physical damage to the PM-1150/2 or the memory cards themselves.
5. Inspect all plugs for misaligned pins, dirty contacts or broken wires. Make sure all memory card plug connectors align properly when mating.

CAUTION: IT IS VERY IMPORTANT TO MAKE SURE THAT ALL CONNECTORS, MALE AND FEMALE PLUGS, ARE PROPERLY ALIGNED.

#### ADDRESS DECODE

Address decoding should be employed in order to isolate a malfunction to a specific memory card.

The lower order address (bits 1 through 13) define a specific location within the 8K address block of each card.

Address bit 0 selects one of two Bytes. (A byte is defined as 8 data bits).

NOTE: For further information on troubleshooting on Memory Cards see Memory Card Manual.

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SCALE

CODE IDENT NO.

52648

DWG NO.

MA 700350

REV **A**

SHEET 4-3

ADDRESS CONVERSION DECIMAL TO OCTAL

DECIMAL (approximation)	OCTAL EQUIVALENT
32K	200000
31K	174000
28K	160000
24K	140000
20K	120000
16K	100000
12K	060000
8K	040000
4K	020000

TABLE 4.1

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SHEET

4-4

SECTION 5  
POWER SUPPLY

5.0 INTRODUCTION

This section contains all information about the Power Supply.

5.1 MAINTENANCE PROCEDURES

Periodic maintenance should consist only of careful visual inspections accompanied by cleaning. Particular attention should be devoted to cleaning the heat sink area around the semi-conductors so that accumulations of dust and dust retaining films are removed.

The visual inspection should include checking for loose connections and for discolored parts and wires. If the supply is operating properly, the visual inspection should be performed without the use of tools for prying and moving parts and harnesses for inspection. The safest procedure is to clean with compressed air and soft brushes.

5.2 TROUBLESHOOTING

Troubleshooting, if required, should be attempted only by technically qualified persons. Generally, if replacement of a plug-in part will not correct the problem, returning the supply to the factory for repair will prove to be the least expensive and most expedient procedure.

5.3 CONTROLS

The Controls and indicators are mounted on the front of the Power Supply.

TEST POINTS: Four test points are provided for DC output voltage monitoring purposes.

LED INDICATOR: One LED indicator for DC output OK.

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## 5.4 POWER SUPPLY INPUT VOLTAGE CONVERSION PROCEDURE

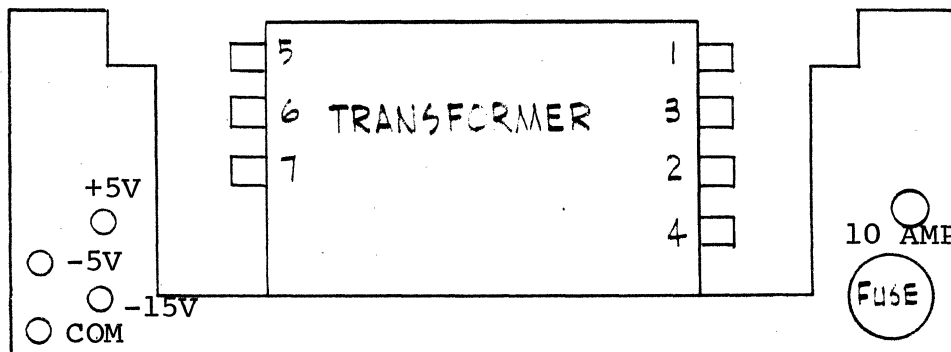
### 5.4.1 To Convert From 115VAC to 230VAC

1. Locate power transformer primary pins. They are marked 1,3,2,4 in that order from top to bottom. These pins are located next to the 10A (5A) fuse housing and the LED indicator.
2. Remove jumper between pins 1-3 and 2-4.
3. Install jumper between 2-3.
4. Change the 3 fuses to 5A (2 fuses on the rear and 1 fuse on the front of the Power Supply).
5. Change the writing on the rear to 230VAC and 5A.

### 5.4.2 To Convert From 230VAC to 115VAC

Analog to 5.4.1 item 1 change to:

1. Remove jumper between 2-3.
2. Install jumper between 1-3 and 2-4.



Power Supply Transformer

FIG. 5.1

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DWG NO.

MA 700350

REV

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SHEET 5-2



## 5.5 ACLO ADJUSTMENT PROCEDURE

ACLO signal is factory adjusted. It is asserted ( $\emptyset$ V) when the input AC voltage drops below 105V AC on the 115VAC version, and below 210 VAC on the 230VAC version.

Should the ACLO signal need adjustment, use the following procedure.

1. Remove the seven bottom screws that fastens the power supply in the PM-1150/2.
2. Set the power supply on its back with the heat sink on the bottom.
3. Plug the PM-1150/2 through an AC variac to the AC input.
4. Under full load condition, vary the AC input voltage and monitor ACLO on the system backplane.
5. Adjust ACLO pot (R402) so that ACLO signal drops from +5V to  $\emptyset$ V when AC input is approximately 105VAC. (Adjust always when AC voltage is nominal and then decrease AC Voltage.

ACLO pot (R402) is located on the component side of top assembly board. Third pot from the power transformer.  
See sheet 5-11

Control: Set AC voltage to 115 VAC, ACLO has to be +5V.  
decrease AC voltage, ACLO should drop to  $\emptyset$ V when AC voltage is 105VAC.

## 5.6 DC VOLTAGES ADJUSTMENT

+5V supply voltage adjustment is achieved with potentiometer R122.

-15V supply voltage adjustment is achieved with potentiometer R222.

See sheet 5-11 for locations of above pots.

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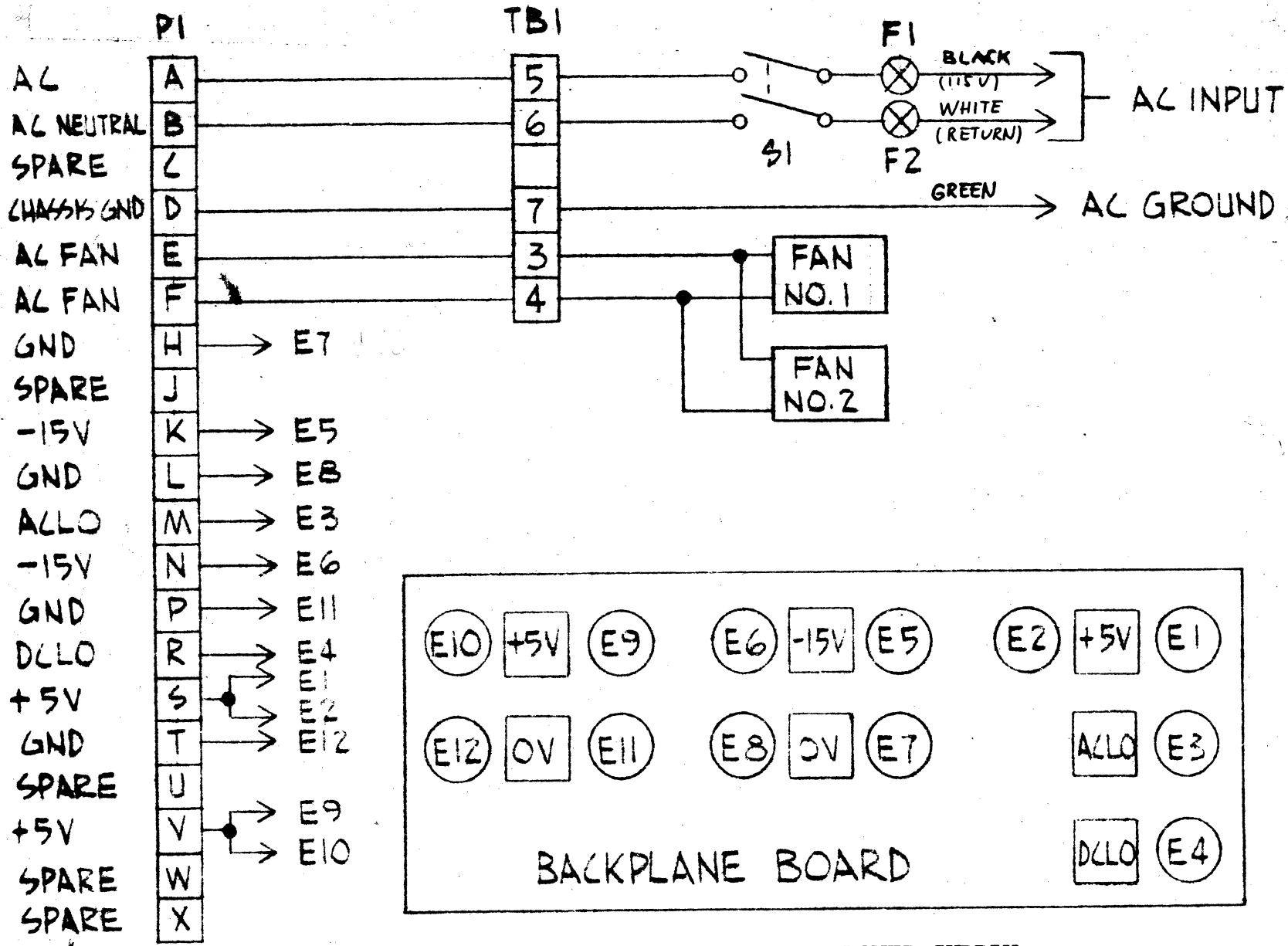
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5-3

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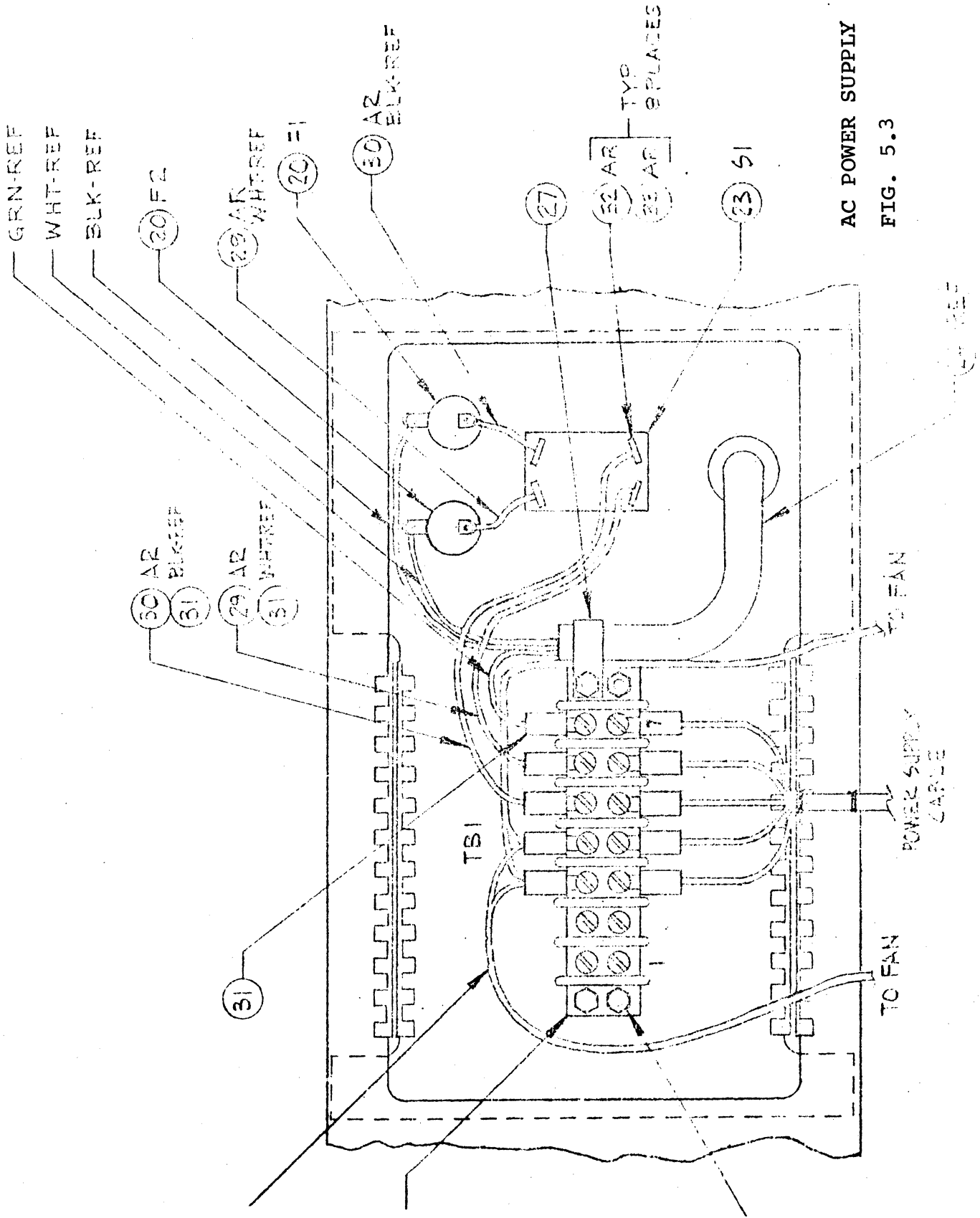


POWER SUPPLY  
INTERFACE CONNECTOR

AC POWER SUPPLY

**SCHEMATIC DIAGRAM**

FIG. 5.2



AC POWER SUPPLY

FIG. 5.3

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SIZE <b>A</b>	CODE IDENT NO. 52648	DWG NO. MA 700350
SCALE	REV —	SHEET 5-5

POWER SUPPLY - TYPE 96799  
SPECIFICATIONS

## 1.0 INPUT

105 - 129 VAC OR 210 - 258 VAC, 47-440 HZ, 1 $\phi$ .

## 2.0 OUTPUTS

+ 5 VDC @ 12.5A  
-15 VDC @ 13.0A  
- 5 VDC @ 1.5A

## 3.0 ADJUSTMENT ALL OUTPUTS

$\pm 5\%$  MINIMUM

## 4.0 REGULATION

LINE AND LOAD  $\pm 1\%$

## 5.0 RIPPLE

5 mV RMS MAXIMUM

## 6.0 TEMPERATURE COEFFICIENT

0.02%/°C MAXIMUM

## 7.0 TRANSIENT RESPONSE

OUTPUT WILL RETURN TO REGULATION LIMITS WITHIN 50 MICROSECONDS FOR A 50% LOAD CHANGE. THE LOAD CURRENT CHANGE VERSUS TIME SHOULD BE LESS THAN ONE AMPERE PER MICROSECOND.

## 8.0 OUTPUT IMPEDANCE

DC - 1KHZ: 0.001  $R_L$  OR 0.005 OHMS  
1KHZ - 100KHZ: 0.005  $R_L$  OR 0.5 OHMS  
( $R_L$  IS THE RATED LOAD)

## 9.0 PARALLEL OPERATION

THE OUTPUTS CAN BE CONNECTED IN PARALLEL WITH AN IDENTICAL SUPPLY TO SHARE A LOAD OF DOUBLE THE RATED OUTPUT. THE SUPPLIES SHOULD SHARE WITHIN  $\pm 10\%$  ASSUMING EQUAL CONNECTIONS.

## 10.0 OVERVOLTAGE PROTECTION

OVERVOLTAGE PROTECTION IS PROVIDED ON ALL OUTPUTS. THE VOLTAGE SET POINTS ARE:

+ 5V OUTPUT; +6V MIN., +7V MAX.  
-15V OUTPUT; -16.5V MIN., -18.5V MAX.  
- 5V OUTPUT; -6V MIN., -7V MAX.

11.0 OVERLOAD AND SHORT CIRCUIT PROTECTION

THE OVERLOAD CURRENT LIMIT IS 120 - 130% AT NOMINAL RATED OUTPUT VOLTAGE. ALL OUTPUTS WILL TOLERATE A CONTINUOUS SHORT CIRCUIT.

12.0 AC POWER FAILURE DETECTOR

THRESHOLD RANGE 100-110 VAC, 200-220 VAC RMS (ADJUSTABLE). A 3 VAC RMS HYSTERESIS IS INCORPORATED IN THE DETECTOR.

13.0 DC UNDERVOLTAGE DETECTORS

A. 5V UNDERVOLTAGE DETECTORS SET AT 4.75V  $\pm$  0.25%.

B. 15V UNDERVOLTAGE DETECTOR SET AT 13.5V  $\pm$  1%.

BEFORE ANY OF THE OUTPUT VOLTAGES GO OUT OF TOLERANCE, THE DCLO SIGNAL WILL GO TO LOGIC "0" AND REMAIN AT LOGIC "0" UNTIL THE -15V OUTPUT REACHES 3.0V.

14.0 POWER ON SEQUENCE

DURING POWER TURN-ON DCLO SIGNAL SHALL BE MAINTAINED AT LOGIC "0" (AFTER THE -15V REACHES 3V) UNTIL ALL OUTPUT VOLTAGES HAVE STABILIZED WITHIN THEIR SPECIFIED TOLERANCE.

15.0 POWER DOWN SEQUENCE

DURING POWER TURN-OFF (UNDER MAXIMUM LOAD) THE ACLO SIGNAL SHALL GO TO LOGIC "0" AT LEAST ONE MILLISECOND BEFORE THE DCLO SIGNAL GOES TO LOGIC "0".

16.0 TEMPERATURE

OPERATING 0 TO 60°C  
NON-OPERATING -55 TO +85°C

17.0 HUMIDITY

95% MAXIMUM WITHOUT CONDENSATION

18.0 ALTITUDE

OPERATING 0 TO 10,000 FEET  
NON-OPERATING 0 TO 50,000 FEET

19.0 SHOCK AND VIBRATION

DESIGNED TO MEET NORMAL SHIPPING AND BENCH HANDLING.

20.0 AC OVERLOAD PROTECTION

A TEN AMPERE FUSE (LOCATED ON THE FRONT PANEL) PROVIDES PRIMARY OVERLOAD PROTECTION.

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CODE IDENT NO

52648

DWG NO.

MA 700350

REV

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SHEET

5-7

21.0 THERMAL PROTECTION

TEMPERATURE SENSING IS TO BE PROVIDED IN ORDER TO TURN OFF THE POWER SUPPLY IF THE AMBIENT TEMPERATURE EXCEEDS 60°C.

22.0 SAFETY STANDARDS

THE POWER SUPPLY WILL BE DESIGNED TO MEET UL STANDARD 478.

23.0 COOLING

THE POWER SUPPLY PACKAGE IS DESIGNED FOR CONDUCTION AND FORCED AIR COOLING. THE FAN SHOULD BE A PAMOTOR 4500 OR EQUIVALENT AND LOCATED AS SHOWN ON THE SPECIFICATION CONTROL DRAWING.

24.0 TERMINATION

WINCHESTER ELECTRONICS "MRA" SERIES

MRA 20P-J6

THE TERMINATIONS ARE AS FOLLOWS:

PIN NUMBER

FUNCTION

A  
B  
C  
D  
E  
F  
H  
J  
K  
L  
M  
N  
P  
R  
S  
T  
U  
V  
W  
X

AC  
AC NEUTRAL  
SPARE  
CHASSIS GND  
FAN RETURN  
FAN (AC SWITCHED)  
-15V RETURN  
-5V  
-15V  
-15V RETURN  
ACLO  
-15V  
+5V RETURN  
DCLO  
+5V  
+5V RETURN  
-15V PARALLEL  
+5V  
-5V AND LOGIC RETURN  
+5V PARALLEL

25.0 FINISH

CHEMICAL FILM PER MIL-C-5541

26.0 WEIGHT

20 LBS.

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SIZE

**A**

SCALE

CODE IDENT NO

52648

DWG NO.

MA 700350

REV

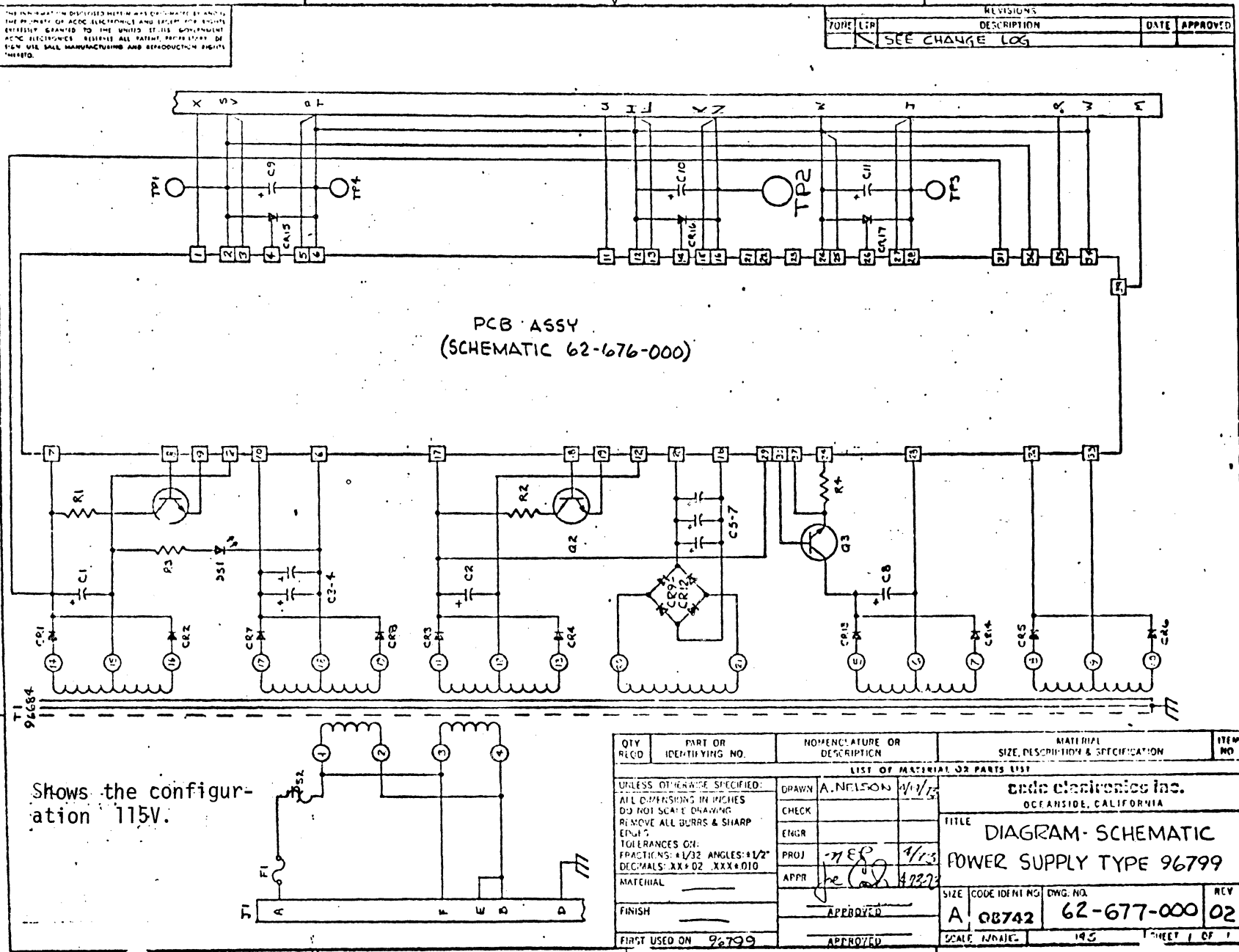
—

SHEET

5- .8

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FIGURE 5.4



REVISIONS		DATE	APPROVED
ZONE	DESCRIPTION		
1	SEE CHANGE LOG		

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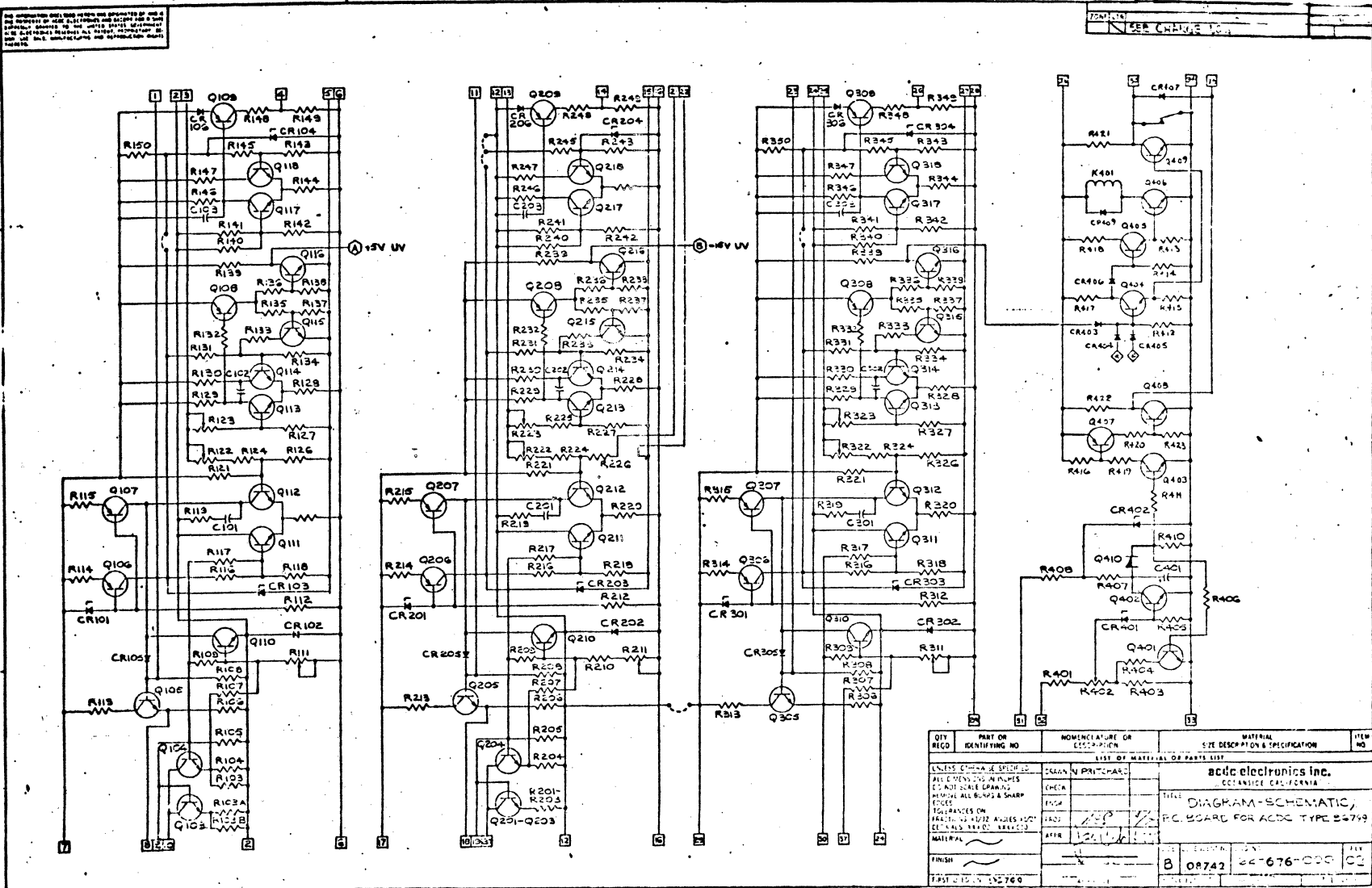
QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SIZE, DESCRIPTION & SPECIFICATION	ITEM NO
LIST OF MATERIAL OR PARTS LIST				
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN INCHES DO NOT SCALE DRAWING REMOVE ALL BURRS & SHARP EDGES TOLERANCES ON: FRACTIONS: ±1/32 ANGLES: ±1/2° DECIMALS: XX ± 0.2 XXX ± 0.10		DRAWN A. NELSON 4/1/53	adc electronics inc. OCEANSIDE, CALIFORNIA	
FINISH	APPROVED	PROJ. M.E.P. 4/1/53	TITLE DIAGRAM - SCHEMATIC POWER SUPPLY TYPE 96799	
FIRST USED ON 96799	APPROVED	APPR. [Signature] 4/23/53	SIZE CODE IDENT NO. DWG. NO.	REV
			A 08742 62-677-000	02
			SCALE 1/8"=1"	SHEET 1 OF 1

SIZE CODE IDENT NO. DWG NO. REV SHEET 5-9

SCALE **A** 52648 MA 700350

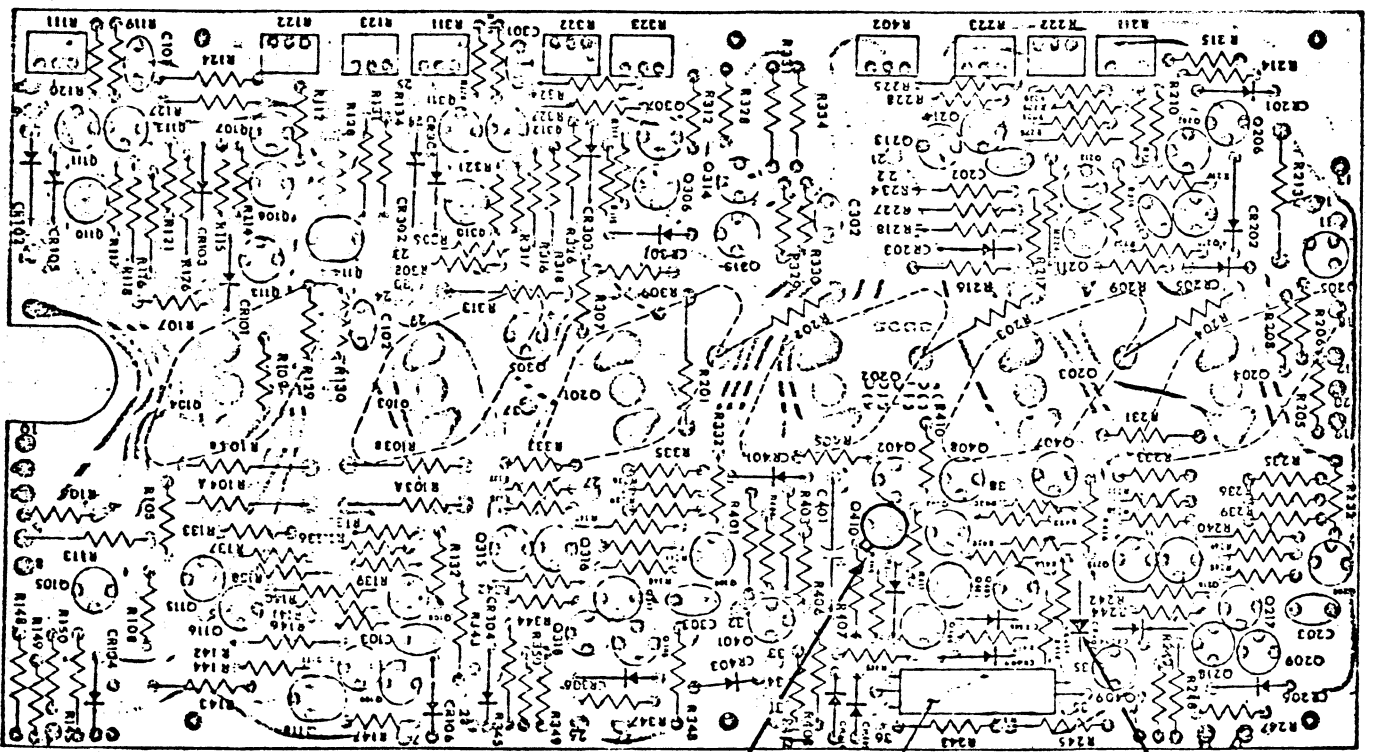
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FIG. 5.5



SCALE **A** SIZE CODE IDENT NO. 52648 DWG NO. MA 700350 REV SHEET 5-10





TITLE ASSEMBLY-  
PRINTED CIRCUIT BOARD,  
TYPE 96799

POWER TRANSFORMER

COMPONENT SIDE

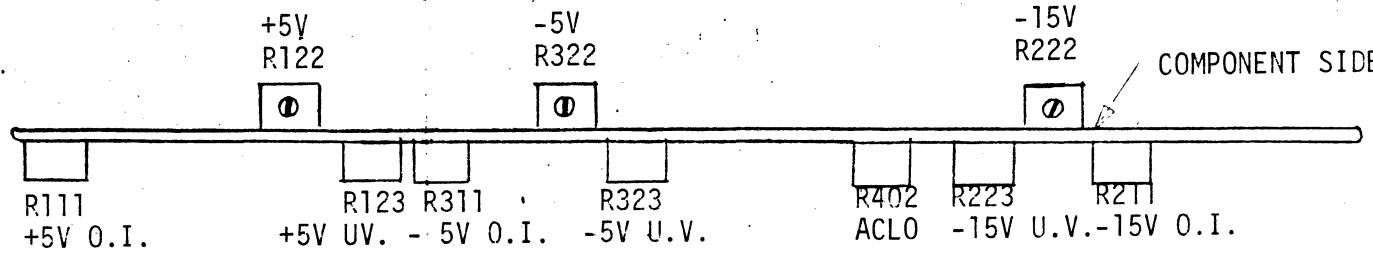


FIG. 5.6 Printed Circuit Board Power Supply Layout

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SIZE	CODE IDENT NO	DWG NO.
A	52648	MA 700350
SCALE	REV	SHEET
		5-11

## SECTION V POWER SUPPLY

## COMPONENT PARTS LIST.

MODEL 96799

SCHEMATIC 62-676-000  
62-677-000

CKT. SYMBOL	DESCRIPTION	MFR. TYPE**
C1,2	CAPACITOR 1200MFD/15V	SPRAGUE 39D
C3,4	CAPACITOR 28,000MFD/15V	STM 91S
C5-7	CAPACITOR 10,000MFD/40V	STM 91S
C8	CAPACITOR 16,000MFD/15V	STM 91C
C9	CAPACITOR 4800MFD/6V	STM 33C
C10	CAPACITOR 1500MFD/25V	STM 33C
C11	CAPACITOR 250MFD/12V	SPRAGUE 500D
C101	CAPACITOR 0.022MFD/500V	RMC TA-122
C102,201,202,302	CAPACITOR 0.005MFD/500V	RMC SM-250
C103,203,303	CAPACITOR 0.1MFD/10V	SPRAGUE HY-320
C301	CAPACITOR 0.0015MFD/500V	RMC SM-215
C401	CAPACITOR 3.9MFD/50V	CSI3BG395K
CR1-6,106,206,306,409	DIODE 1N4004	MOTOROLA
CR7-12	DIODE 1N1200	WESTINGHOUSE
CR13,14	DIODE 1N4720	SEMTECH
CR15,16	SCR 2N682	G.E.
CR17	SCR 2N4441	MOTOROLA
CR101,201,301	ZENER 1N748A	MOTOROLA
CR102,202,302	DIODE 1N5624	SEMTECH
CR103,203,303	ZENER 1N823A	MOTOROLA
CR104,204,304	ZENER 1N753A	T.I.
CR105,205,305,403-406	DIODE 1N4454	T.I.
CR401,402	ZENER 1N758A	MOTOROLA
RI,2	RESISTOR 10Ω 3% 10W	DALE RH10
R3	RESISTOR 330Ω 5% 1/2W	RC20
R4	RESISTOR 0.3Ω WW 2W	IRC BWH
RI01,102	NOT USED	
RI03(A,B),104(A,B), 201-204	RESISTOR 0.15Ω WW 3W	RW69
RI05,119	RESISTOR 100Ω 5% 1/4W	RC07
RI06,206	RESISTOR 560Ω 5% 1/4W	RC07
RI07	RESISTOR * 5% 1/4W	RC07
RI08,208	RESISTOR 27K 5% 1/4W	RC07
RI09,146,209,219,246,309, 319,346	RESISTOR 470Ω 5% 1/4W	RC07
RI10	NOT USED	
RI11,123,211,223,311,323, 402	POTENTIOMETER 5K	BOURNS 3389T
RI12,132,232,332	RESISTOR 1.5K 5% 1/4W	RC07
RI13,213	RESISTOR 470Ω 5% 1W	RC32
RI14,214,314	RESISTOR 330Ω 5% 1/4W	RC07
RI15,215,312,315,410	RESISTOR 2K 5% 1/4W	RC07

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SIZE

A

CODE IDENT NO

52648

DWG NO.

MA 700350

SCALE

REV

SHEET

5-12

CKT. SYMBOL	DESCRIPTION	MFR. TYPE**
R116, 118, 131, 134, 142, 143, 145, 231, 234, 316, 318, 326, 327, 331, 334, 342, 343, 345, 403	RESISTOR 2.49K 1% 1/8W	RN60C
R117	RESISTOR * 5% 1/4W	RC07
R120, 128, 228, 320, 328	RESISTOR 820Ω 5% 1/4W	RC07
R121	RESISTOR * 5% 1/4W	RC07
R122, 222, 322	POTENTIOMETER 5K	BOURNS 3389W
R124, 324	RESISTOR 1.00K 1% 1/8W	RN60C
R126, 127, 227, 242	RESISTOR 5.62K 1% 1/8W	RN60C
R129, 130, 229-230, 329, 330	RESISTOR 3K 5% 1/4W	RC07
R133, 233, 333	RESISTOR 56K 5% 1/4W	RC07
R135, 136, 139, 339	RESISTOR 6.2K 5% 1/4W	RC07
R137, 138, 237, 238, 337, 338, 404, 405, 412-416, 423	RESISTOR 47K 5% 1/4W	RC07
R140, 340	RESISTOR 2.74K 1% 1/8W	RN60C
R141	RESISTOR * 5% 1/4W	RC07
R144, 344	RESISTOR 430Ω 5% 1/4W	RC07
R147, 247, 347	RESISTOR 220Ω 5% 1/4W	RC07
R148, 248, 348	RESISTOR 100Ω 5% 1/2W	RC20
R149, 249, 349	RESISTOR 68Ω 5% 1/4W	RC07
R150, 216, 244, 245, 406, 411, 417-420	RESISTOR 1K 5% 1/4W	RC07
R205	RESISTOR 47Ω 5% 1/4W	RC07
R207	RESISTOR * 5% 1/4W	RC07
R210	RESISTOR 5.6K 5% 1/4W	RC07
R212	RESISTOR 3.3K 5% 1/4W	RC07
R217	RESISTOR * 5% 1/4W	RC07
R218	NOT USED	
R220, 350	RESISTOR 1.8K 5% 1/4W	RC07
R221	RESISTOR * 5% 1/4W	RC07
R224	RESISTOR 2.15K 1% 1/8W	RN60C
R225	RESISTOR 18.2K 1% 1/8W	RN60C
R226	RESISTOR 1.78K 1% 1/8W	RN60C
R235, 236, 239	RESISTOR 10K 5% 1/4W	RC07
R240	RESISTOR 10K 1% 1/8W	RN60C
R241	RESISTOR * 5% 1/4W	RC07
R243	NOT USED	
R250	NOT USED	
R301-305	NOT USED	
R306	RESISTOR 200Ω 5% 1/4W	RC07
R307	RESISTOR * 5% 1/4W	RC07
R308	RESISTOR 4.7K 5% 1/4W	RC07
R310	NOT USED	
R313	RESISTOR 200Ω WW 2W	IRC BWH
R317	RESISTOR * 5% 1/4W	RC07
R321	RESISTOR * 5% 1/4W	RC07
R325	NOT USED	
R335, 336	RESISTOR 8.2K 5% 1/4W	RC07
R341	RESISTOR * 5% 1/4W	RC07
R401	RESISTOR 100Ω 1% 1/8W	RN60C
R407	RESISTOR 1.5K 5% 1/2W	RC20
R408	RESISTOR 390Ω 5% 1/2W	RC20

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SIZE

A

SCALE

CODE IDENT NO

52648

DWG NO.

MA 700350

REV

—

SHEET 5-13

<u>CKT. SYMBOL</u>	<u>DESCRIPTION</u>	<u>MFR. TYPE**</u>
R421,422	RESISTOR 55Ω 5% 1W	RC32
Q1,2	TRANSISTOR 40250	RCA
Q3	TRANSISTOR 2N3055	RCA
Q101,102,301-304	NOT USED	
Q103,104	TRANSISTOR 2N3771	RCA
Q105,205,305	TRANSISTOR 2N2219	MOTOROLA
Q106-109,206-209,306-309, 407	TRANSISTOR 2N2907A	MOTOROLA
Q110-118,210-218,310-318, 401-406	TRANSISTOR 2N2222A	MOTOROLA
Q201-204	TRANSISTOR 2N3772	RCA
Q408,409	TRANSISTOR 2N2219A	MOTOROLA
Q410	SUS 2N4985	G.E.
TI	TRANSFORMER 96684	ACDC
DS1	DIODE-LIGHT EMITTING	MONSANTO MV5024
F1	FUSE 10A	LITTLEFUSE 314010
J1	CONNECTOR - MRA20P-J-FM	WINCHESTER
K401	RELAY 1C 5A	ELECTRONICS APPLICATIONS CO.
S2	SWITCH, THERMAL	ELMWOOD 3450

\* VALUES SELECTED IN TEST OR MAY BE OMITTED.

\*\* SUGGESTED SOURCE. ACDC ELECTRONICS, INC. RESERVES THE RIGHT TO SUBSTITUTE EQUIVALENT VALUE COMPONENTS FROM OTHER APPROVED SOURCES WITHOUT FURTHER NOTICE.

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SIZE

CODE IDENT NO

DWG NO.

**A**

52648

MA 700350

SCALE

REV

SHEET 5-14

SECTION 6  
SCHEMATICS AND DRAWINGS

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SIZE

**A**

CODE IDENT NO

52648

DWG NO.

MA 700350

SCALE

REV

—

SHEET 6-1

REVISIONS			
ZONE LTR	DESCRIPTION	DATE	APPROVED
-	REL TO PROD PER ERO 500 241	10 OCT 73	[Signature]

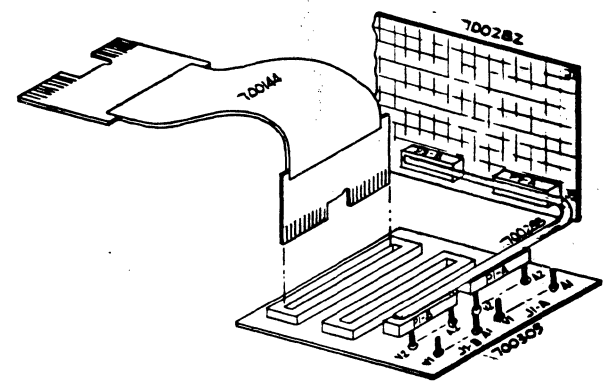
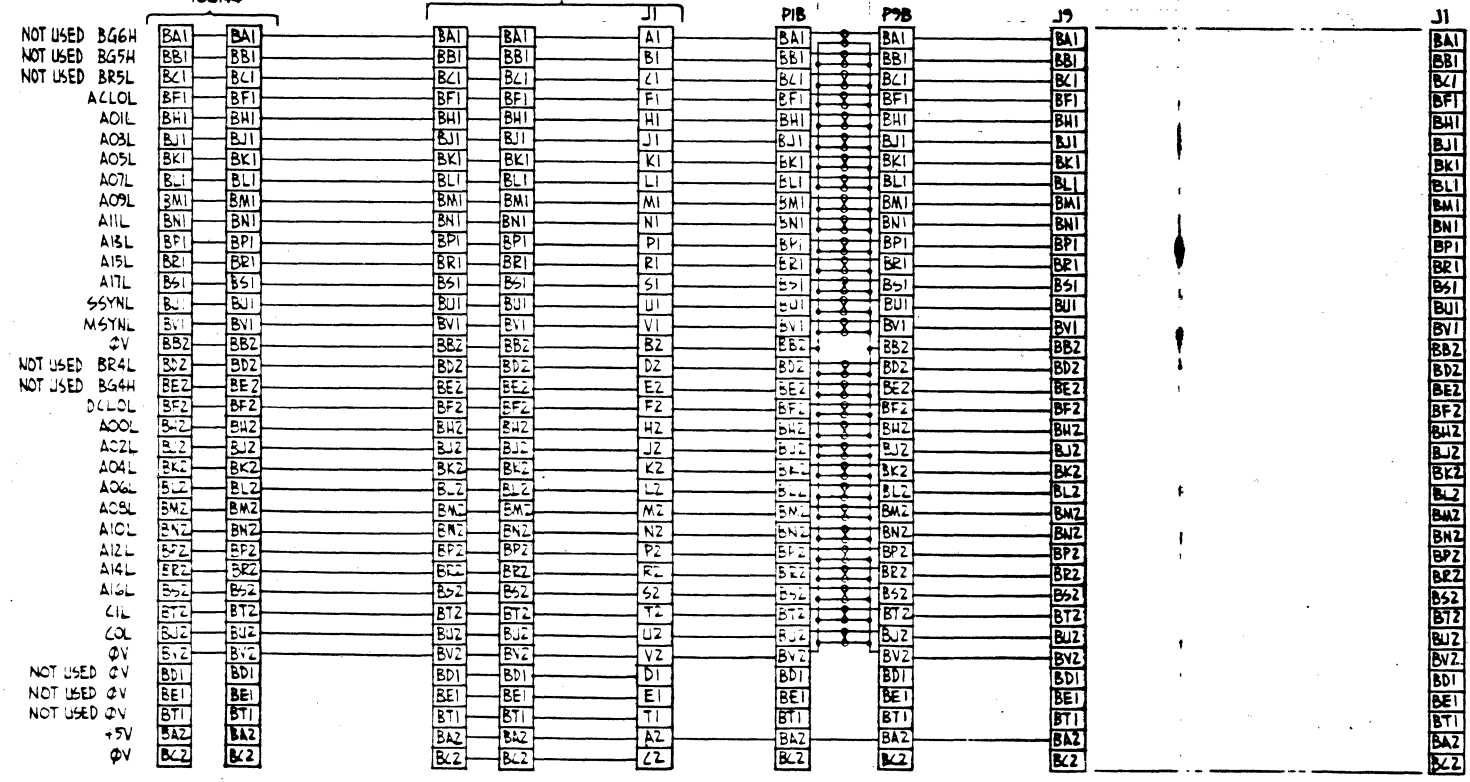
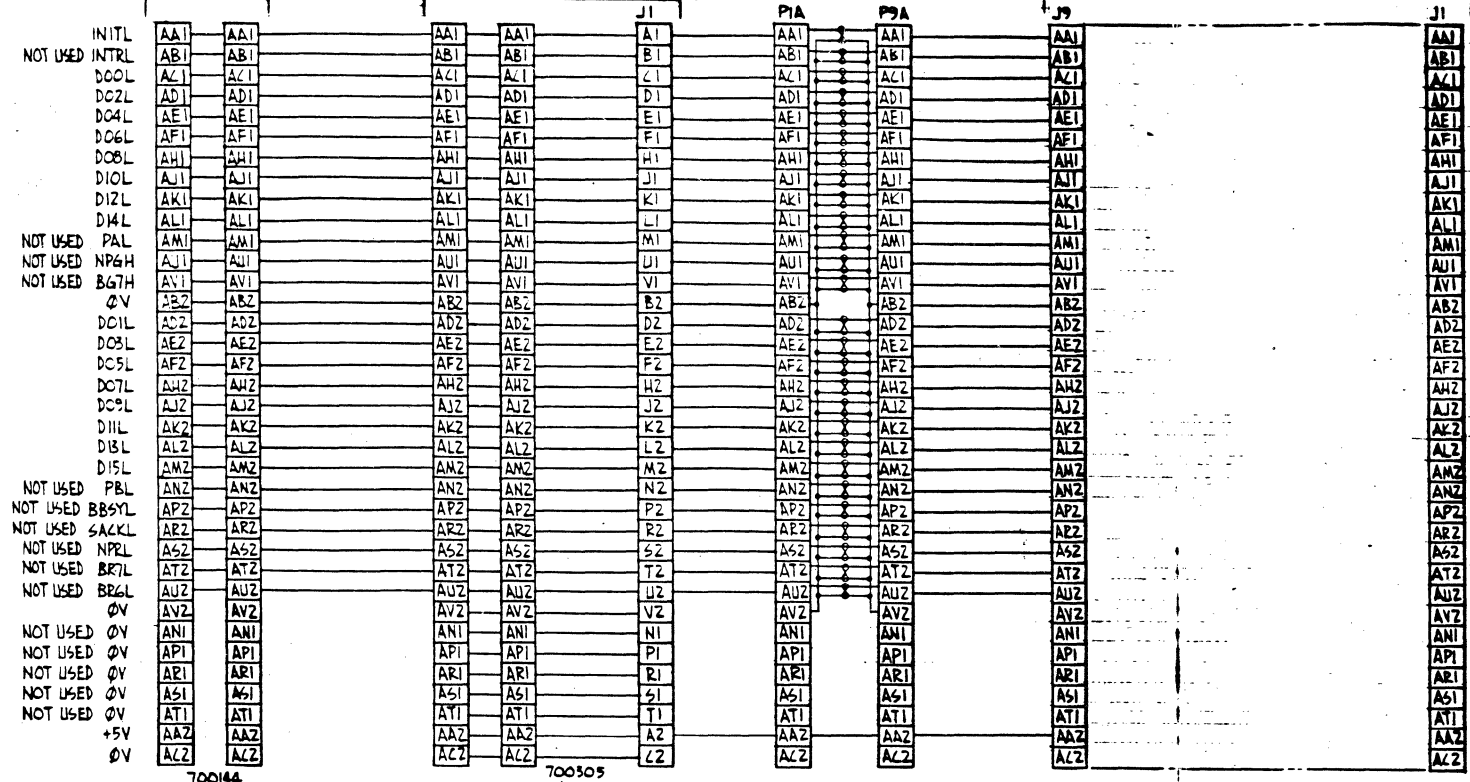


FIGURE 6.1 PM 1150/2 SIGNAL FLOW DIAGRAM

PRODUCTION RELEASE			
PART ASSY NO. & QTY PER ASSY		PARTS LIST	
PART ASSY REV LTR		CONTRACT NO.	
DO NOT SCALE DRAWING		Plessey Memories Incorporated	
CHECKED BY: [Signature]		DRAWN BY: [Signature]	
ENGR: [Signature]		DWG TITLE	
PROJ ENGR: [Signature]		SIGNAL FLOW DIAGRAM	
PROJ DESIGN: [Signature]		BULL II	
OTHER APPROVALS:		SIZE CODE IDENT NO. DWG NO.	
NEXT ASSY USED ON:		F 700329	
APPLICATION:		SCALE: 1 OF 1	

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SIZE	CODE IDENT NO	DWG NO.
A	52648	MA 700350
SCALE	REV	SHEET 6-2

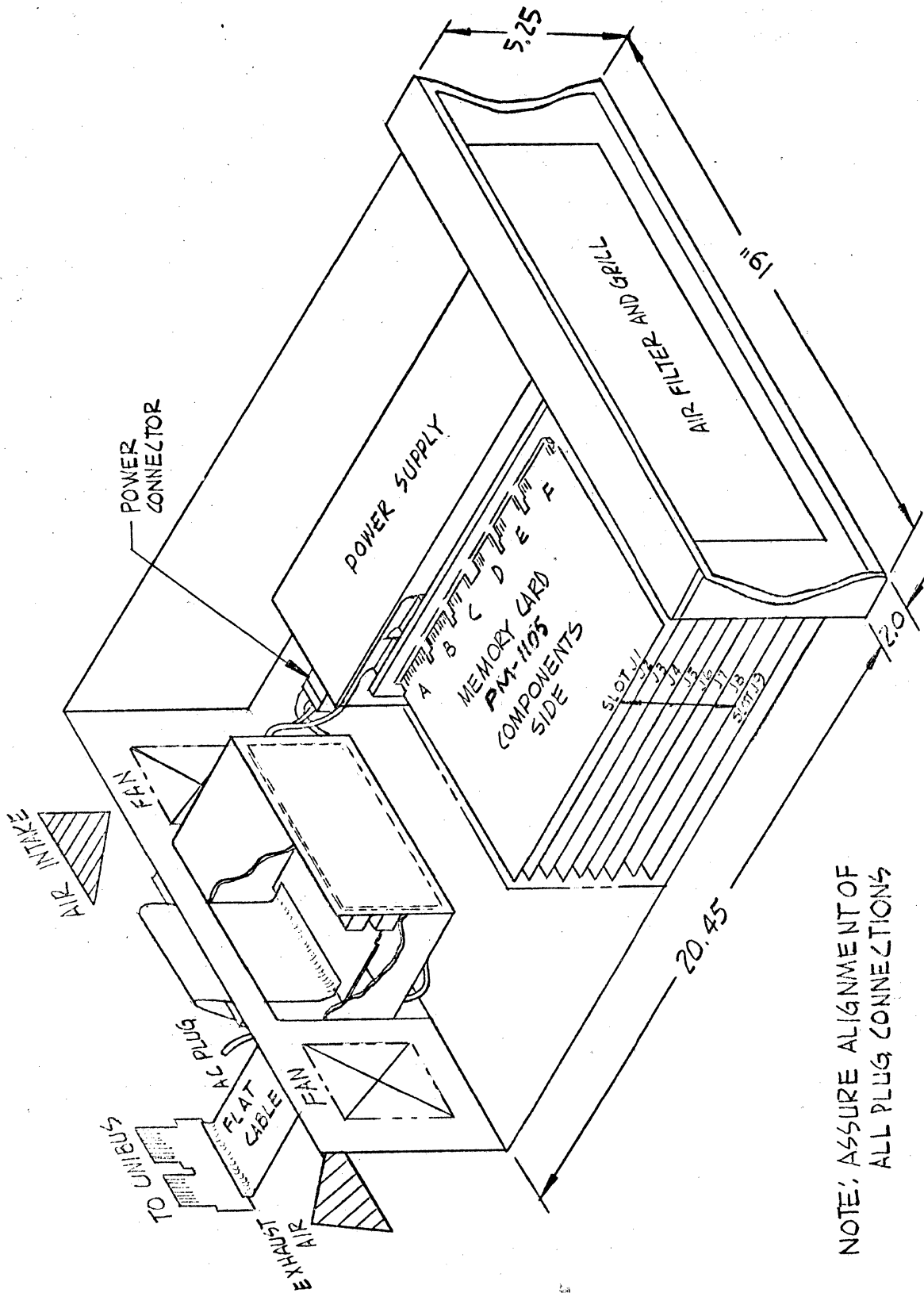


FIG. 6.2 PM-1150/2 MECHANICAL OUTLINE

NOTE: ASSURE ALIGNMENT OF ALL PLUG CONNECTIONS

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SIZE

**A**

CODE IDENT NO.

52648

DWG NO.

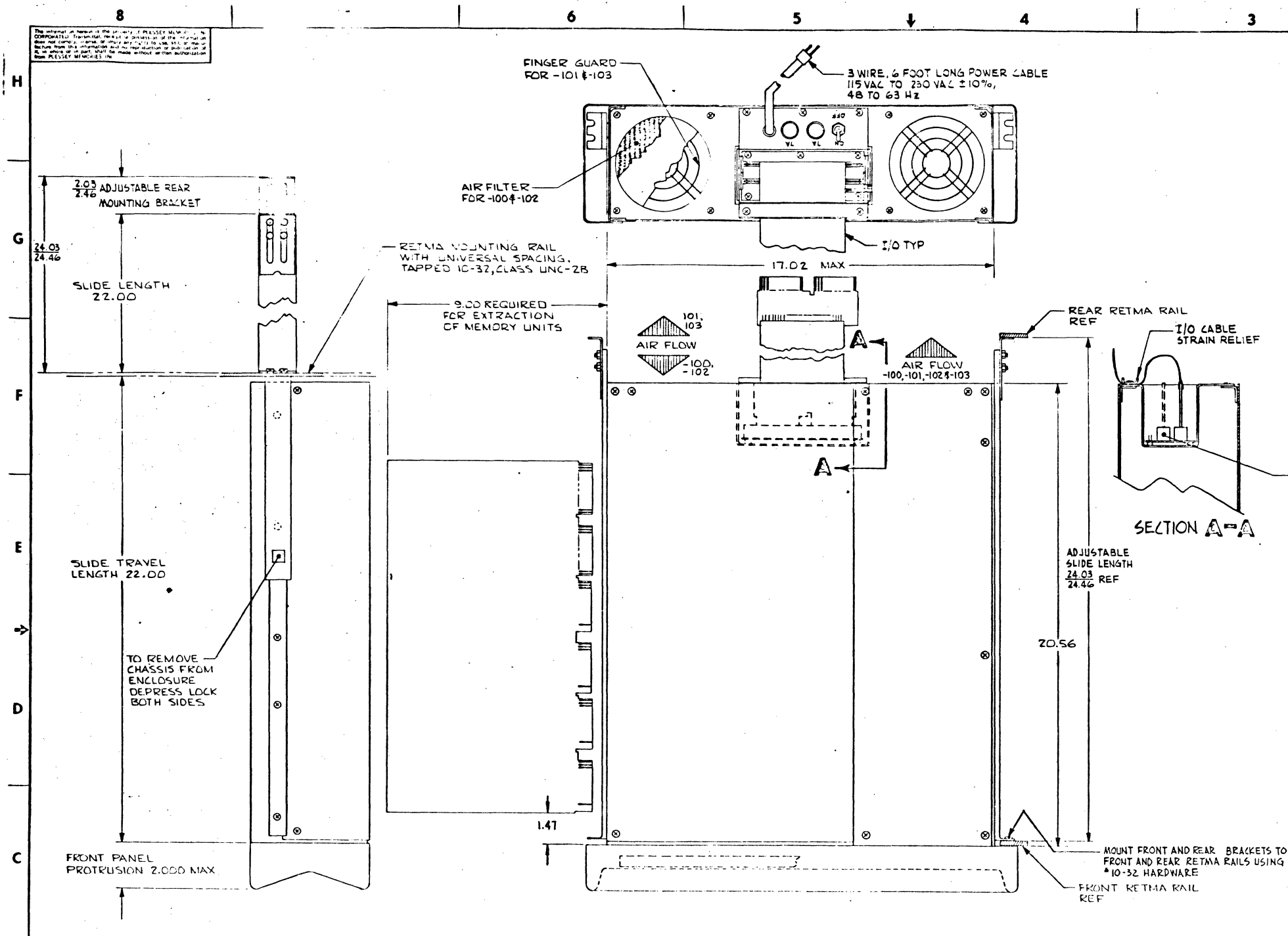
MA 700350

SCALE

REV **A**

SHEET 6-3

ZONE LTR		REVISIONS	
DESCRIPTION	DATE	APPROVED	
-	RELEASED TO PROD PER ERO 500391	27 MAR 74	JTB



5 SLOT UTILIZATION: PM1105, 40K MAX, OR PM1116, 80K MAX.

SLOT	A	B	C	D	E	F
J1		PLESSEY	MEMORIES BK OR 16K			
J2		PLESSEY	MEMORIES BK OR 16K			
J3		PLESSEY	MEMORIES BK OR 16K			
J4		PLESSEY	MEMORIES BK OR 16K			
J5		PLESSEY	MEMORIES BK OR 16K			
J6		PLESSEY	MEMORIES BK OR 16K			
J7		PLESSEY	MEMORIES BK OR 16K			
J8		PLESSEY	MEMORIES BK OR 16K			
J9		PLESSEY	MEMORIES BK OR 16K			

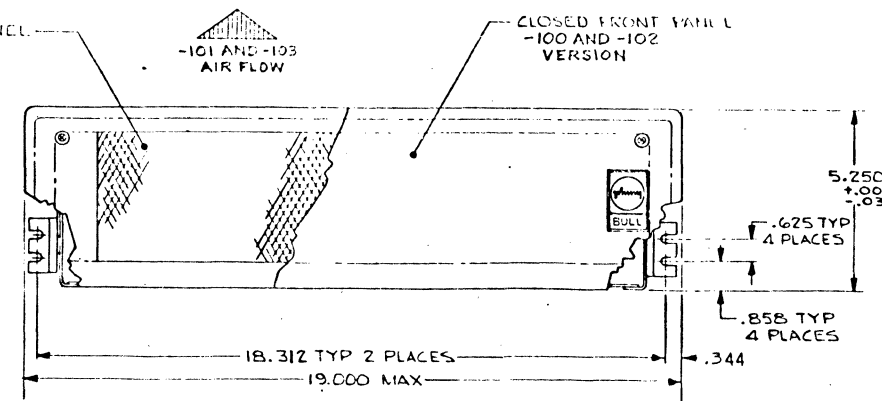
6 SLOT UTILIZATION: 3 UNITS PM1105, 1 UNIT DECMM11-L 32K MAX, OR 3 UNITS PM1116, 1 UNIT DECMM11-L 56K MAX.

SLOT	A	B	C	D	E	F
J1		PLESSEY	MEMORIES BK OR 16K			
J2		PLESSEY	MEMORIES BK OR 16K			
J3		PLESSEY	MEMORIES BK OR 16K			
J4		PLESSEY	MEMORIES BK OR 16K			
J5		PLESSEY	MEMORIES BK OR 16K			
J6						
J7			DECMM11-L	STACK		
J8			DECMM11-L	DRIVE		
J9			DECMM11-L	DRIVE		

7 SLOT UTILIZATION DECMM11-L 24K MAX

SLOT	A	B	C	D	E	F
J1		I/O				
J2			DECMM11-L	STACK		
J3			DECMM11-L	DRIVE		
J4			DECMM11-L	DRIVE		
J5			DECMM11-L	DRIVE		
J6			DECMM11-L	DRIVE		
J7			DECMM11-L	DRIVE		
J8			DECMM11-L	DRIVE		
J9			DECMM11-L	DRIVE		

- 8 PLESSEY MEMORY CAN BE LOCATED IN ANY SLOT POSITION BUT ONE SLOT SPACING MUST EXIST BETWEEN MEMORIES.
9. ALL MAXIMUM DIMENSIONS INCLUDE HEIGHT OF SCREEN HEADS.
10. UNIT DESCRIPTION:
- A. WEIGHT: FILE (EMPTY) - 60 POUNDS  
FILE AND 5 PM1105 (40K) - 61 POUNDS.
  - B. CHASSIS MATERIAL: STEEL, CADMIUM PLATED, GOLDEN BRIDESCENT.
  - C. AIR FILTER: -100 PERMANENT TYPE, WASHABLE, ACCESSIBLE FROM REAR OF UNIT.  
-101 PERMANENT TYPE, WASHABLE, ACCESSIBLE FROM FRONT OF UNIT.
  - D. COOLING AIR: DUAL 120 CFM FANS.
  - E. DESIGNED FOR MOUNTING INTO A 19.00 WIDE X 22.5 MIN DEEP CABINET CONFORMING TO REQUIREMENTS OF E.I.A. STANDARDS RS-310.
11. FOR PRODUCT SPECIFICATION SEE P5700350.
- NOTES: UNLESS OTHERWISE SPECIFIED.



PRODUCTION RELEASE

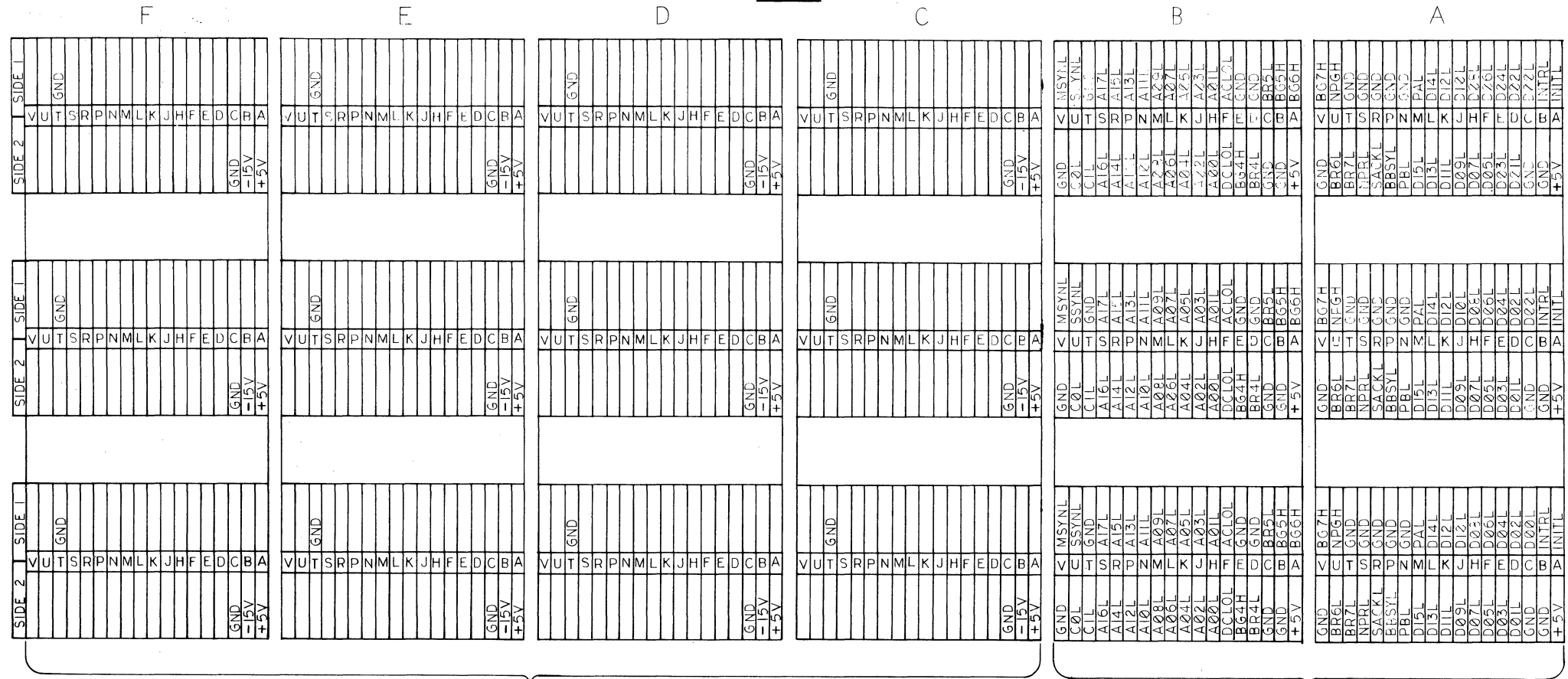
PART/ASSY NO. & QTY PER ASSY		NOTE/PART OR IDENTIFYING NO.		NOMENCLATURE OR DESCRIPTION / MATERIAL		SPEC/SOURCE		CODE NO. FIND NO.	
PART/ASSY REV LTR		DO NOT SCALE DRAWING		CONTRACT NO.		PARTS LIST		Plessey Memories Incorporated	
-103 FINAL		REWORK TOLERANCE PER PARAGRAPH 11.02		DRAWN: JTB/MSR/74		DWG TITLE		Santa Ana, California	
-102 FINAL		COUNTERBORE AND SHOULDER FILLET MADE TO BE 3R MAXIMUM		CHECK: JTB/MSR/74		FILE MEMORY			
-101 FINAL		REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO 10R		ENGR: JTB/MSR/74		40K x 16 BITS MAX			
-100 FINAL		ROUGHNESS OF MACHINED SURFACES TO PER MIL-S-131		PROD. DATE		INSTALLATION CONTROL DRAWING			
NEXT ASSY USED ON		STANDARD HOLE TOLERANCE PER AND HSB		OTHER APPROVALS		SIZE CODE IDENT NO. DWG NO.			
APPLICATION		TOLERANCES UNLESS OTHERWISE SPECIFIED ARE ANGLES ± 1° ± 30'		SCALE: 1/2		F 52648 OM 700350		SHEET 1 OF 1	
		DIMENSIONS ARE IN INCHES AND APPLY AFTER NEXT TREAT AND FINISH UNLESS OTHERWISE SPECIFIED		DISTR. NO.					



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REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		RELEASED TO PROJ PER ENG 500409	22 MAY 74	JAB

COMPONENT SIDE  
OF MEMORY SYSTEM BOARD



WIRED J1 THRU J3  
J4 THRU J6  
J7 THRU J9

UNIBUS  
WIRED J1 THRU J9

VIEW OF WIRE WRAP  
PIN SIDE OF BACKPLANE

**PRODUCTION RELEASE**

PART ASSY NO. & QTY PER ASSY		NOTE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION / MATERIAL	SPEC SOURCE	CODE IDENT NO.	FIND NO.
PART ASSY REV LTR <td colspan="6">PARTS LIST</td>		PARTS LIST					
PART NO. <td colspan="6">CONTRACT NO.</td>		CONTRACT NO.					
NEXT ASSY <td colspan="6">DRAWN <i>KRAVANS</i> 22 MAY 74</td>		DRAWN <i>KRAVANS</i> 22 MAY 74					
USED ON <td colspan="6">CHECK <i>[Signature]</i> 22 MAY 74</td>		CHECK <i>[Signature]</i> 22 MAY 74					
APPLICATION <td colspan="6">ENGR <i>[Signature]</i> 22 MAY 74</td>		ENGR <i>[Signature]</i> 22 MAY 74					
<td colspan="6">PROJ. ENGR</td>		PROJ. ENGR					
<td colspan="6">PROD. DESIGN</td>		PROD. DESIGN					
<td colspan="6">OTHER APPROVALS</td>		OTHER APPROVALS					
<td colspan="6">DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH UNLESS OTHERWISE SPECIFIED</td>		DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH UNLESS OTHERWISE SPECIFIED					
<td colspan="6">DO NOT SCALE DRAWING</td>		DO NOT SCALE DRAWING					
<td colspan="6">SCREW THREADS PER HANDBOOK H-28</td>		SCREW THREADS PER HANDBOOK H-28					
<td colspan="6">COUNTERBORE AND SPOTFACE FILLET RADI TO BE .013 MAXIMUM</td>		COUNTERBORE AND SPOTFACE FILLET RADI TO BE .013 MAXIMUM					
<td colspan="6">REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .010</td>		REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .010					
<td colspan="6">ROUGHNESS OF MACHINED SURFACES 125/PER USAS B46.1</td>		ROUGHNESS OF MACHINED SURFACES 125/PER USAS B46.1					
<td colspan="6">STANDARD HOLE TOLERANCE PER AND 1987</td>		STANDARD HOLE TOLERANCE PER AND 1987					
<td colspan="6">TOLERANCES ON .XX ±.03 XXX ±.010 ANGLES ±.020</td>		TOLERANCES ON .XX ±.03 XXX ±.010 ANGLES ±.020					
<td colspan="6">INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5</td>		INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5					
<td colspan="6">DWG TITLE</td>		DWG TITLE					
<td colspan="6">SIZE CODE IDENT NO. DWG NO.</td>		SIZE CODE IDENT NO. DWG NO.					
<td colspan="6">D 52648 700396</td>		D 52648 700396					
<td colspan="6">SHEET 1 OF 1</td>		SHEET 1 OF 1					

NOTES: UNLESS OTHERWISE SPECIFIED

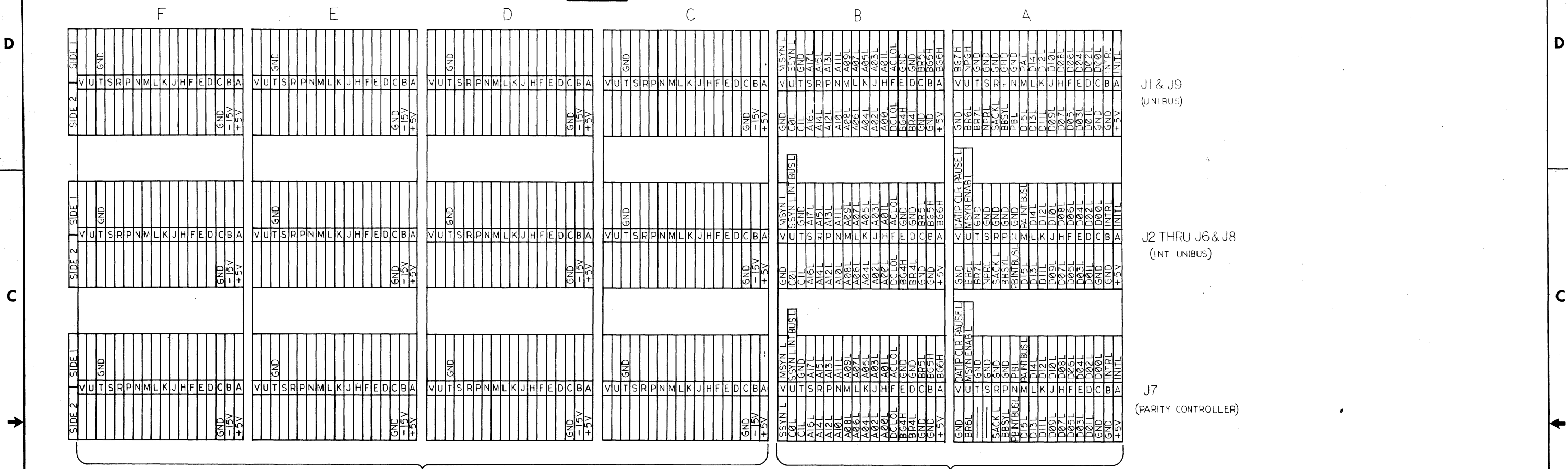
REV 1  
DWG NO 700396

A

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COMPONENT SIDE  
CF MEMORY SYSTEM BOARD

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
-		RELEASED TO PROD PER EKO 500409	4 June 74	JH



WIRED J1 THRU J3  
J4 THRU J6  
J7 THRU J9

UNIBUS  
WIRED AS NOTED

VIEW OF WIRE WRAP  
PIN SIDE OF BACKPLANE

PRODUCTION RELEASE

PART/ASSY NO. & QTY PER ASSY		NOTE PART OR IDENTIFYING NO.		NOMENCLATURE OR DESCRIPTION / MATERIAL		SPEC/SOURCE	CODE IDENT NO.	FIND NO.
PART/ASSY REV LTR		DO NOT SCALE DRAWING		CONTRACT NO.		Plessey Memories Incorporated Santa Ana, California		
PART NO.		SCREW THREADS PER HANDBOOK H-28		DRAWN KRAVANIS		DWG TITLE		
NEXT ASSY		COUNTERBORE AND SPOTFACE FILLET RADI TO BE .015 MAXIMUM		CHECK <i>Boyle</i>		PMF II/P BACKPLANE PIN ASSIGNMENT		
USED ON		REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .010R		ENGR <i>Wade</i>		PROJ. ENGR		
APPLICATION		ROUGHNESS OF MACHINED SURFACES 125 PER USAS B46.1		PROJ. DESIGN		SIZE CODE-IDENT NO. DWG NO.		
		STANDARD HOLE TOLERANCE PER AND 1587		OTHER APPROVALS		D 52648 700397		
		TOLERANCES ON: XX = ±.03 XXX = ±.010 ANGLES = ±9° 30'				SCALE: — SHEET / OF /		
		INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5				DISTR NO.		
		DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH UNLESS OTHERWISE SPECIFIED						

NOTES: UNLESS OTHERWISE SPECIFIED

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REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
-	REL TO PROD PER ERO 501003	2/14/77	<i>ja</i>

APPLICATION	
NEXT ASSY	USED ON

**PRODUCTION RELEASE**

REV STATUS OF SHEETS	REV LTR																			
	SHEET																			
	REV LTR	-	-	-	-	-														
	SHEET	1	2	3	4	5														

DO NOT SCALE DRAWING		CONTRACT NO.		 <b>Plessey Memories Incorporated</b> Santa Ana, California	
SCREW THREADS PER HANDBOOK H-28	DRAWN	M. Bodmann	<i>MB</i>	DWG TITLE	
COUNTERBORE AND SPOTFACE FILLET RADII TO BE .010 MAXIMUM	CHECK	J. Agotsch	<i>ja</i>	PM-1150/2A SUPPLEMENT TO PM-1150/2 MANUAL	
REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .010R	DESIGN	<i>R.T. Jones</i>	<i>3-8-77</i>		
ROUGHNESS OF MACHINED SURFACES 125 PER USAS B46.1	PROJ. ENGR.	D. Fox	<i>2/14/77</i>		
STANDARD HOLE TOLERANCE PER AND 10387	OTHER			SIZE	CODE IDENT NO.
TOLERANCES ON: .XX = ± .03 .XXX = ± .010 ANGLES = ± 0° 30'	APPROVALS			<b>A</b>	52648
INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5				DWG NO.	SM 701220
DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH UNLESS OTHERWISE SPECIFIED				SCALE:	
				SHEET 1 OF 5	

## PM-1150/2A SUPPLEMENT TO PM-1150/2 MANUAL

The PM-1150/2 Expansion Chassis has been modified to improve its performance. The modified expansion chassis is defined as the PM-1150/2A. It has a new power supply with a different power cable from the power supply to the backplane assembly and a new backplane assembly.

The PM-1150/2A uses the same backplane assembly for parity or non-parity configurations. It can support either configuration as desired.

The PM-1150/2A can support the following memories:

PM-1132/100	32K non-parity core memory
PM-1132/102	32K parity core memory
PM-S1132	32K non-parity MOS memory
PM-S1132P	32K parity MOS memory
PM-1116B	16K non-parity core memory
PM-1105B	8K non-parity core memory
PM-1105BP	8K parity core memory
MM11-C	DEC 8K parity or non-parity core memory
MM11-D	DEC 16K parity or non-parity core memory
MS11-JP	DEC 16K parity or non-parity MOS memory

All of the above listed memories are modified Unibus memories. They can be installed in slots 1 through 8. They cannot be installed in slot 9 as it is wired for standard Unibus

### CAUTION

Do not attempt to install any standard Unibus memory in slots 1 through 8 as it might cause damage to the backplane assembly.

NOTE: PM-S1132 MOS memory cannot be installed in slot 1.

When using parity memories, the Plessey PM-7850 or DEC M7850 parity controller must be used. The controller is installed in the A and B connectors of any available slot 1 through 8 on the backplane assembly.

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SIZE	CODE IDENT NO.	DWG NO.
<b>A</b>	52648	SM 701220
SCALE	REV	SHEET
	—	2

PM-1150/2A POWER SUPPLY

Power to the backplane is carried from the power supply unit via a 9-pin mate-n-lock connector as shown below:

PIN	FUNCTION	WIRE COLOR
P2-1	DCLO	VIOLET
P2-2	ACLO	YELLOW
P2-3	-15V	BLUE
P2-4	0V	BLACK
P2-5	0V	BLACK
P2-8	+15V	GREY
P2-9	+5V	RED

AC power to the power supply unit is routed via a 3-pin mate-n-lock connector. Green wire is ground and the black and the white wires are AC input.

The PM-1150/2A power supply provides continuous voltages and currents as shown below:

VOLTAGE	CURRENT
+5V	16A
-15V	13A
+15V	2.2A

DC output voltages, DCLO and ACLO adjustments are set in the factory and need not be changed. However, if the need arises, they are identified as shown:

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SIZE

**A**

CODE IDENT NO.

52648

DWG NO.

SM 701220

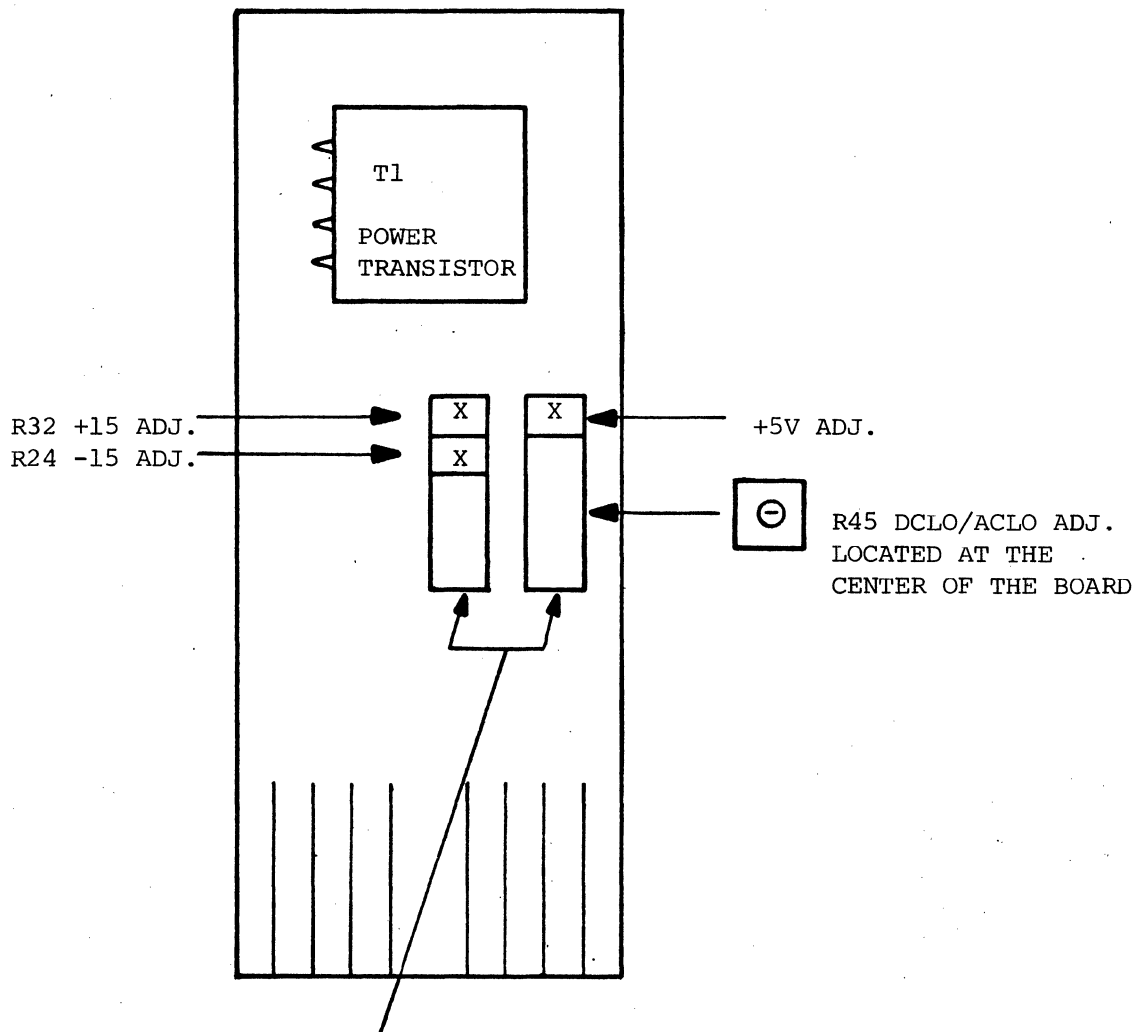
SCALE

REV

—

SHEET

3



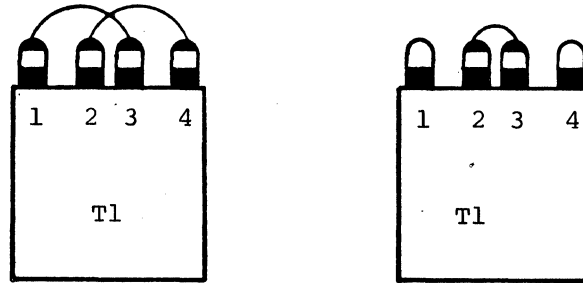
TWO COMPONENTS BOARDS PLUGGED INTO A CONNECTOR AT THE BOTTOM OF THE UNIT.

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SIZE	CODE IDENT NO.	DWG NO.
<b>A</b>	52648	SM 701220
SCALE	REV -	SHEET 4

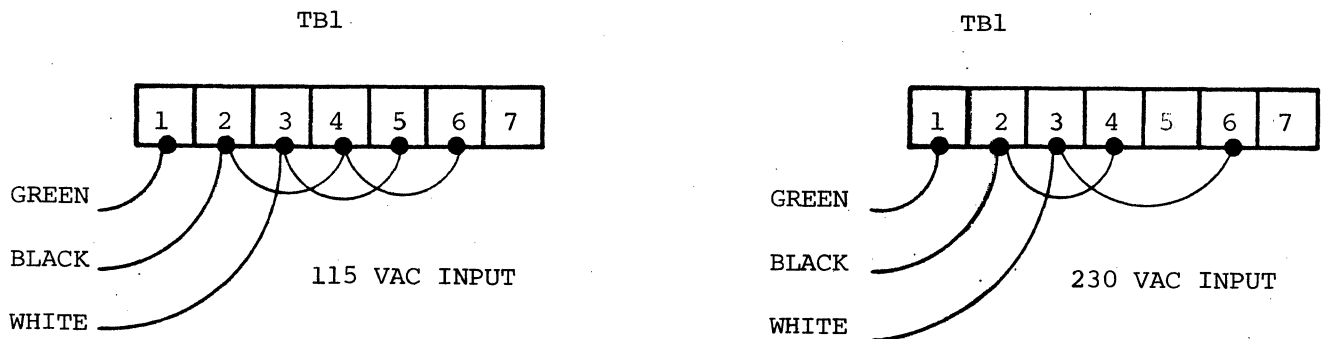
To convert the PM-1150/2A expansion chassis from 115VAC input operation to 230 VAC input operation, the following instructions should be followed:

1. Change jumper wires on the power supply power transformer as shown:



	JUMPERS	
115VAC	1-3	2-4
230	2-3	—

2. Jumper the TB-1 terminal as shown:



115VAC input version uses 10A-250V fuses for F1, F2, and F3.  
 230VAC input version uses 5A-250V fuses for F1, F2, and F3.  
 F1 and F2 are located at the rear of the chassis. F3 is located on the front of the power supply

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SIZE CODE IDENT NO. DWG NO.

**A**

52648

SM 701220

SCALE

REV

—

SHEET

5

