



CONTROL DATA®
KS-22640, L4
MEMORY POWER SUPPLY

GENERAL DESCRIPTION
OPERATION
INSTALLATION AND CHECKOUT

 **MAGNETIC PERIPHERALS, INC.**
a Control Data Company

Volume 1

HARDWARE INSTALLATION/OPERATION MANUAL



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PREFACE

This Manual provides the information needed to install and operate the Power Supply when used with the LARK™ Micro Unit (LMU) (BJ7D3-A or BJ7B7-A) and is intended to serve customer engineers and operators who require detailed information about installation and operations.

The total content of the Manual is comprised of three sections, each having a unique publication number, and is contained in one volume. The manual's publication number (77715992) should be used when making reference to the PIO Hardware Installation/Operation Manual.

The following table identifies the content of this manual:

<u>SECTION NUMBER</u>	<u>TITLE</u>	
1	General Description	77715993
2	Operation	77715994
3	Installation and Checkout	77715995

NOTE

The Lark Micro Unit (LMU) and the power supply with I/O adapter (PIO) are separate and distinct devices with their own unique documentation. The LMU is identified as Model 9457 and requires Installation/Operation Manual (Volume 1) - Publication No. 77738001. The Installation/Operation Manual (Volume 1) for the PIO is Publication No. 77715992. When the equipment configuration includes both the LMU and PIO, it is identified as the Lark Module Drive (LMU) and requires both Installation/Operation Manuals.

EMI NOTICE

WARNING

This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

OPERATOR SAFETY INSTRUCTIONS

1. This unit is designed for use with the Lark Micro Unit.
2. The unit is to be installed according to the installation instructions.
3. The power plug must be connected to a power source that has the protection of not greater than 16 amps. The power plug is to be used as a disconnect device.
4. The unit is to be operated in an ambient temperature between 0° C and 50° C.
5. The unit is to be serviced by qualified technical personnel only after pulling the power plug.

BENUTZER SICHERHEITSANWEISUNG

1. Dieses Netzgerät ist nur in Verbindung mit dem Magnetplattenlaufwerk Lark Micro Unit zu verwenden.
2. Die Zusammenschaltung wird wie im Manual unter "Installations Information" beschrieben, vorgenommen.
3. Die Netz - Stromversorgung wird über eine Steckdose mit nicht mehr als 16A Absicherung vorgenommen.
4. Das Netzgerät ist konstruiert für eine Umgebungstemperatur von 0° C bis 50° C.
5. Reparaturen am Netzgerät sind nur von qualifizierten Service Technikern, nach Abschalten bzw. durch Ziehen des Netzsteckers, vorzunehmen.

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1.1 INTRODUCTION

The Lark Power Supply and Adapter Assembly (PIO) provides the LARK Micro Unit with DC and AC power and provides it with interface to the host controller.

1.2 GENERAL DESCRIPTION

The PIO consists of a power supply section (shown in Figure 1-1) and a section for the I/O Adapter PWA. The power supply furnishes power to the LARK Micro Unit and also to the I/O Adapter PWA. Voltages generated for the drive are +5 V, -5.2 V, +16.5 V, and -16.5 V. The I/O PWA requires +5 V and -5.2 V. The power supply also provides AC voltage for the LMU.

The I/O PWA converts the external SMD interface to an internal microcomputer based interface. The PWA also provides proper line termination and noise isolation for both interfaces.

NOTE

The PIO is a component and therefore does not require a FCC label.

1.3 FUNCTIONAL BLOCK DIAGRAM

A functional block diagram is shown in Figure 1-2. The power supply regulator circuitry is mounted on a single PWA within the power supply section. The I/O Adapter circuitry is mounted on one PWA in a section below the power supply. The Terminator PWA plugs into the I/O PWA.

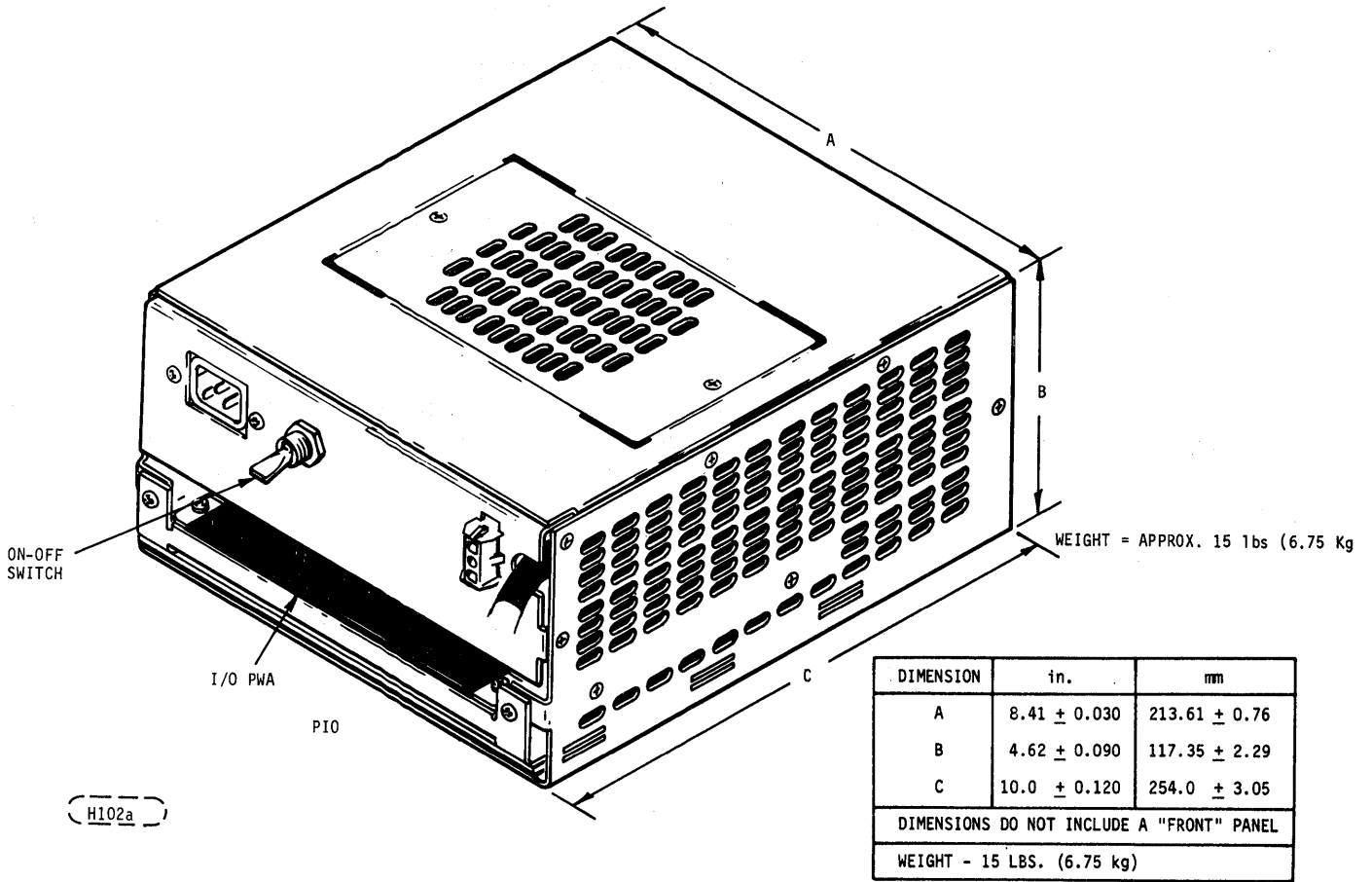
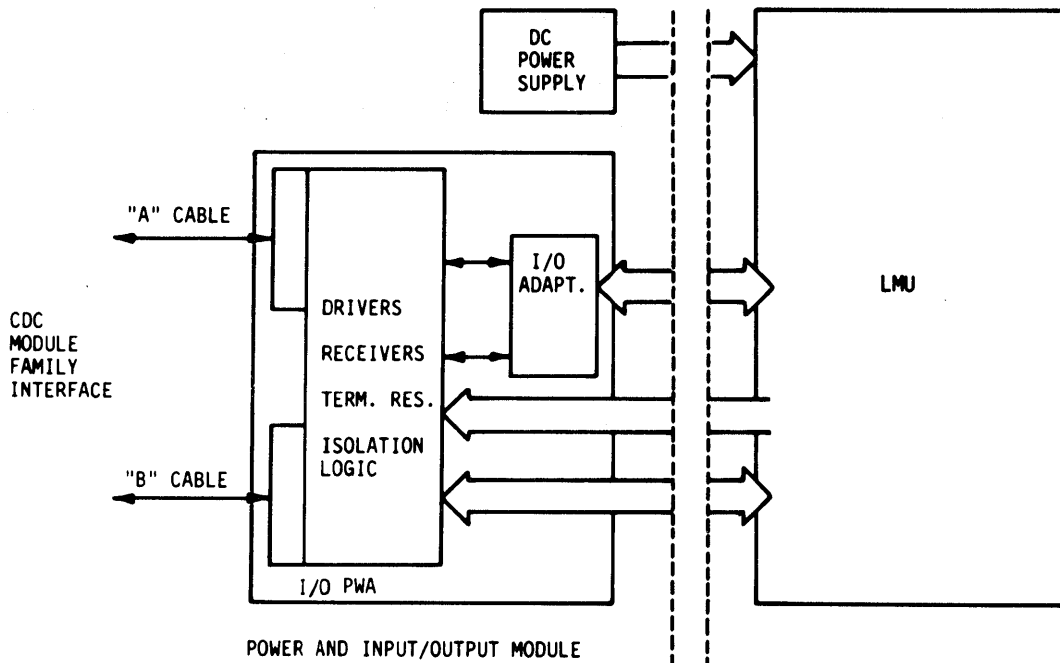


FIGURE 1-1. PIO PHYSICAL CHARACTERISTICS



F024b FIGURE 1-2. FUNCTIONAL BLOCK DIAGRAM

2.1 INTRODUCTION

This section provides the instructions and information required to operate the Lark Module Drive PIO.

2.2 CONTROLS

The only control on the PIO is the AC power ON/OFF switch shown in Figure 2-1. This switch operates the AC power circuit breaker CB-1. This switch is not available to the equipment operator. It is expected that only maintenance personnel will operate the ON/OFF switch.

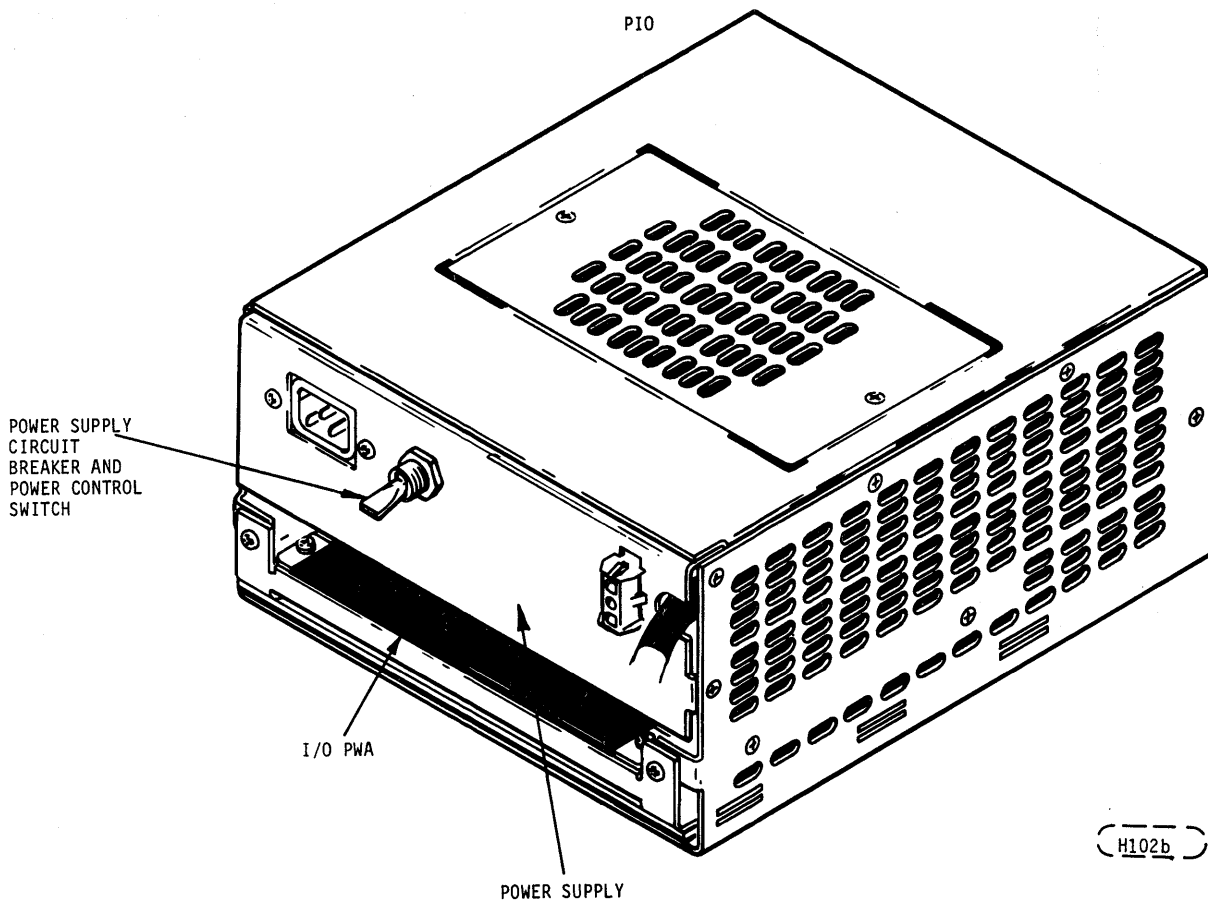


FIGURE 2-1. OPERATOR CONTROLS

3.1 INTRODUCTION

This section provides the information and procedures necessary to install the PIO.

3.2 UNPACKING

During unpacking, exercise care so that tools being used do not cause damage to the unit. As the unit is unpacked, inspect it for possible shipping damage. All claims for this type of damage should be filed promptly with the transporter involved.

Retain the shipping container and packing material if a claim is to be filed for damage, unit is to be reshipped, or shipped to service center.

Unpack the unit as follows:

- a. Remove the tape from the shipping container.
- b. Open the container and remove the PIO and cables.
- c. Do not connect the input power cable between the PIO and LMU until all other installation steps have been completed and the LMU is ready for initial checkout.

3.3 SPACE ALLOCATION

Figure 1-1 shows the PIO overall dimensions for determining space allocation. Detailed mounting hole data is provided in Figure 3-1. Example configurations are shown in Figure 3-2. Interconnecting cables are supplied to interface the PIO to the LMU.

The PIO is designed so that, in its final installed configuration, only a blank front panel (to be furnished by the user) is to be accessible to the equipment operator.

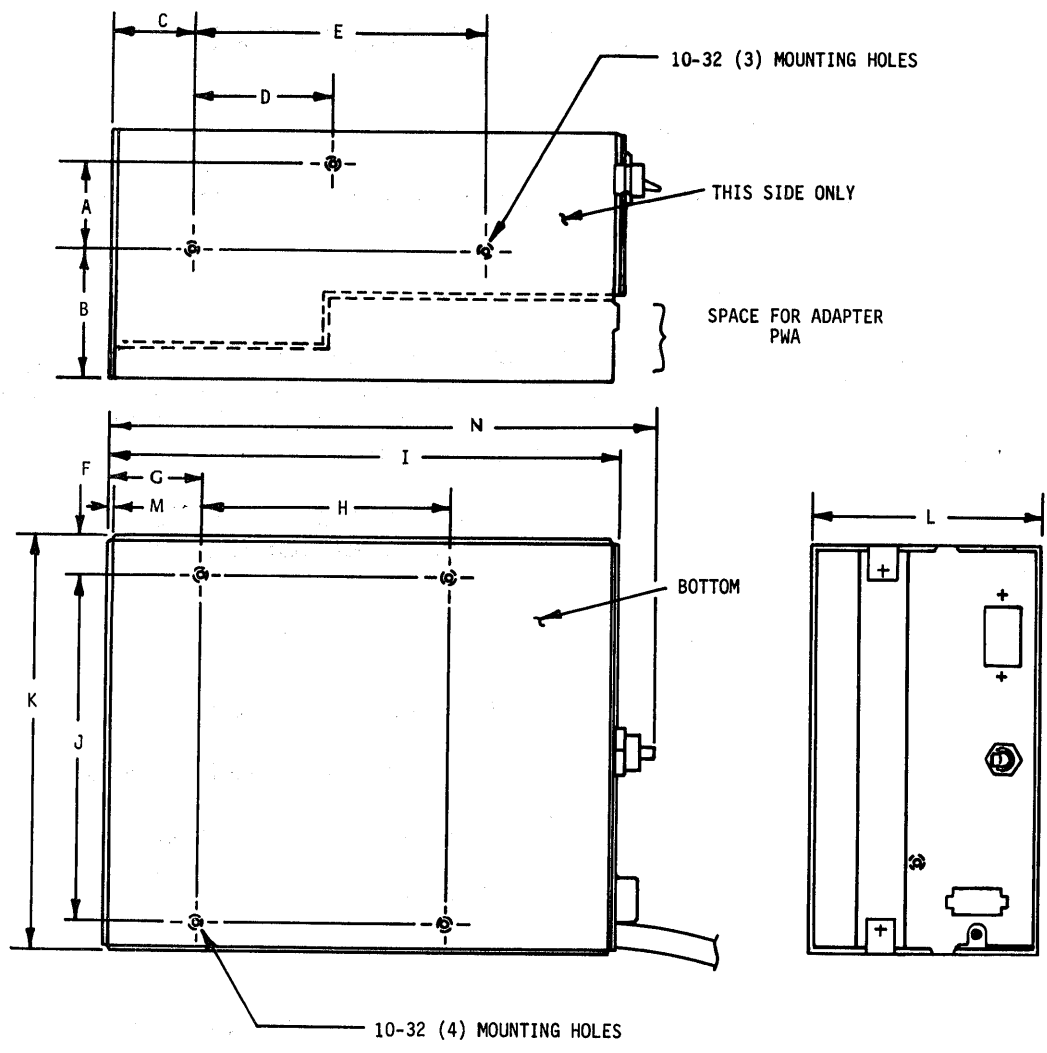
3.4 PIO COOLING

The PIO is cooled by means of a blower. The ambient temperature of incoming air at the blower must not exceed 122° F (50° C) when measured within 1/2 inch of the PIO enclosure.

3.5 POWER REQUIREMENTS

3.5.1 PRIMARY POWER REQUIREMENTS

The primary voltage and current requirements are shown in Tables 3-1 and 3-2 for one PIO and one LMU. The operational line currents are described in Figure 3-3.

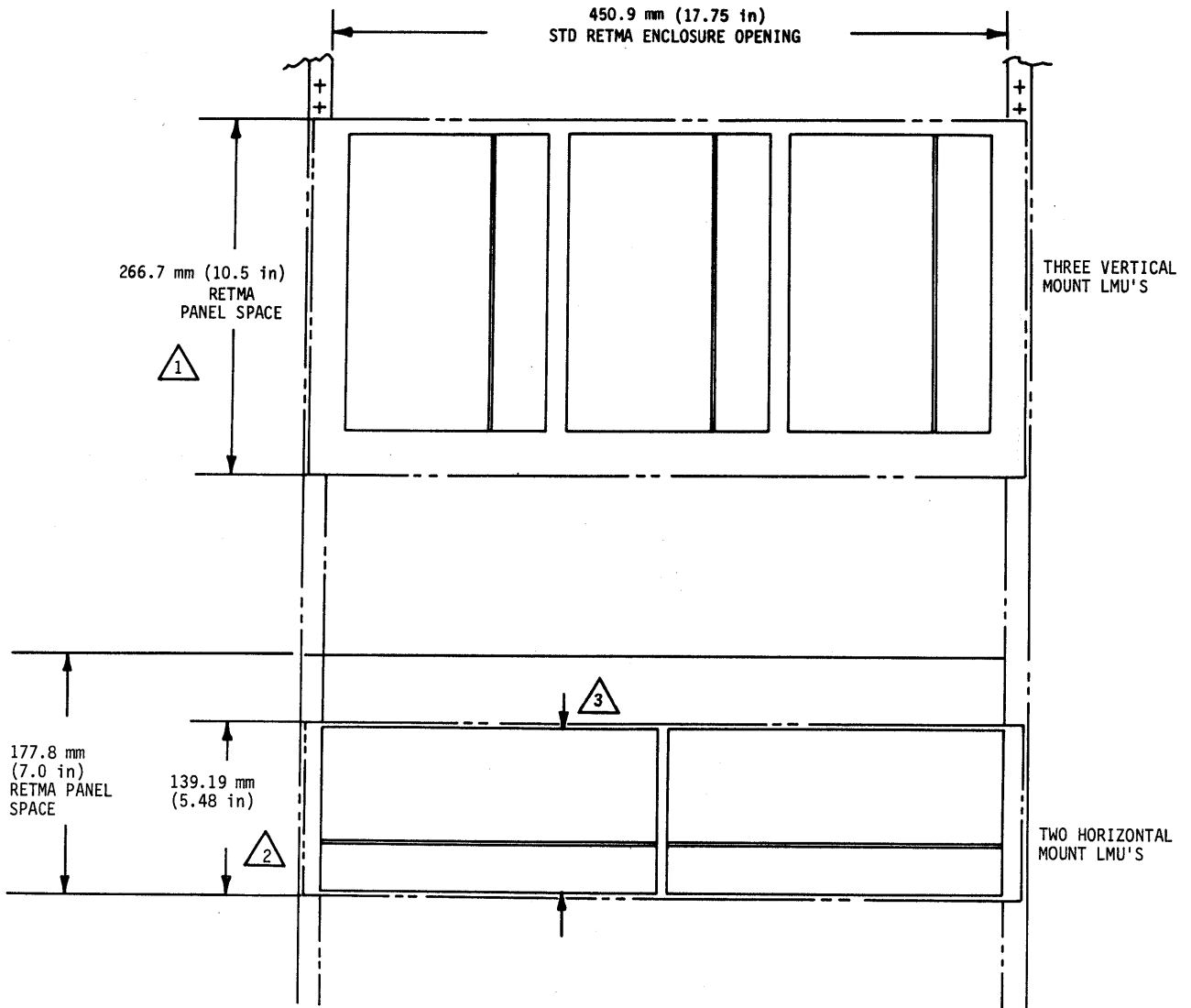


NOTE
 PENETRATION OF MOUNTING HARD-
 WARE NOT TO EXCEED 0.25 in
 (6.35 mm). DIMENSIONS DO
 NOT INCLUDE USER FURNISHED
 FRONT PANEL

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DIMENSION	INCHES	mm
A	1.50 ± 0.030	38.1 ± 0.76
B	2.435 ± 0.075	61.85 ± 1.91
C	1.748 ± 0.045	44.5 ± 1.14
D	2.50 ± 0.030	63.5 ± 0.76
E	5.750 ± 0.030	146.1 ± 0.76
F	.450 ± 0.030	11.43 ± 0.76
G	1.81 ± 0.035	46.0 ± 0.89
H	4.875 ± 0.015	123.8 ± 0.38
I	10.0 ± 0.120	254.0 ± 3.05
J	7.50 ± 0.015	190.5 ± 0.38
K	8.41 ± 0.030	213.61 ± 0.76
L	4.62 ± 0.090	117.35 ± 2.29
M	0.059	1.5
N (ref)	10.83	

FIGURE 3-1. PIO MOUNTING HOLE DATA



△ 1 DIMENSION INCLUDES SPACE FOR SUPPORT STRUCTURE AND SLIDES.

△ 2 DIMENSION INCLUDES SPACE FOR SUPPORT STRUCTURE.
STANDARD RACK REQUIRES MODIFICATION TO UTILIZE SLIDES.

△ 3 LMU VERTICAL ENVELOPE 5.48" INCLUDING SHOCK ABSORBERS.

GG180a

FIGURE 3-2. EXAMPLE LMD CONFIGURATIONS

3.5.2 POWER CABLE AND MATING CONNECTOR

The AC power cable supplied with the PIO is 7.5 feet (2.29 meters) long. The cable connector plug requiring a mating receptacle is described as follows:

<u>DESCRIPTION</u>	<u>CDC P/N</u>	<u>NEMA CONFIGURATION</u>
120 V, 15 A, 60 Hz, 2-pole, 3-wire receptacle connector at PIO end, 2- pole, 3-wire plug connector at power source end (see Figure 3-4).	75778702	5-15P

The mating receptacle connector required at the AC power source is NEMA Configuration: 5-15R

Do not connect the AC power cable between power source and PIO until all other installation steps have been completed and the drive is ready for initial checkout.

The PIO 60 Hz power supply contains two fuses. Refer to the Maintenance Manual Section 6 for removal and replacement procedures.

3.6 CABLING AND FEATURE SELECTION

The connectors for interfacing the PIO to the controller and LMU to the PIO as well as the drive address selection switch are located on the I/O board. Remove the I/O board as follows:

1. Remove the two screws holding the I/O board in the PIO base pan (see Figure 3-5).
2. Slide out the I/O board until the I/O connectors and drive address selection switch are accessible.

The I/O board is now ready to accomplish drive address selection, terminator board installation and cabling.

TABLE 3-1. PRIMARY VOLTAGE REQUIREMENTS*

VOLTAGE (VAC)	TOLERANCE (VAC)	FREQUENCY (Hz)	TOLERANCE (Hz)
120	-16, +8	60	+0.5, -1.0

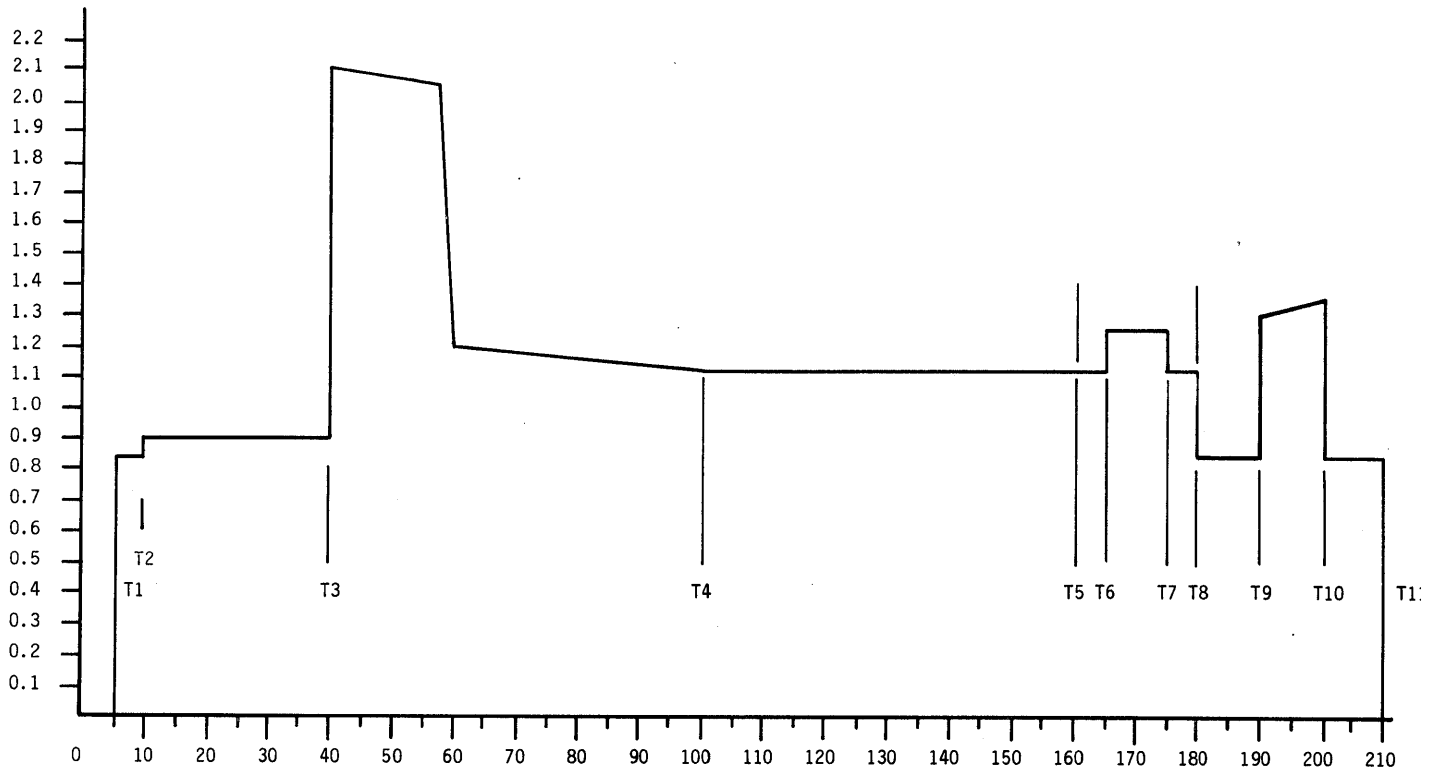
*Combined LMU and PIO requirements.

TABLE 3-2. CURRENT/POWER REQUIREMENTS*

DRIVE INPUTS	CURRENTS AND (WATTAGE)					
	ON TRACK		SEEKING		STARTING	
	NOMINAL	MAXIMUM	NOMINAL	MAXIMUM	NOMINAL	MAXIMUM
120 VAC	0.7 A (60 W)		0.7 A (60 W)			
+16.5 V	0.4 A (6.6 W)		0.72 A (11.9 W)			
-16.5 V	0.35 A (5.8 W)		0.67 A (11.1 W)			
+5 V	1.4 A (7.0 W)		1.4 A (7.0 W)			
-5 V	2.88 A (14.4 W)		2.88 A (14.4 W)			
TOTAL WATTAGE	(93.8 W)		(104.4 W)			
I/O INPUTS						
+5.0 V	0.9 A (4.5 W)		0.9 A (4.5 W)			
-5.0 V	0.3 A (1.5 W)		0.3 A (1.5 W)			
TOTAL WATTAGE	(6.0 W)		(6.0 W)			
POWER SUPPLY INPUTS	RUN CURRENT		START CURRENT		START TIME (SEC)	
	NOMINAL	MAXIMUM	NOMINAL	MAXIMUM	NOMINAL	MAXIMUM
120 VAC	1.18 A (142 W)		1.6 A (192 W)		60	

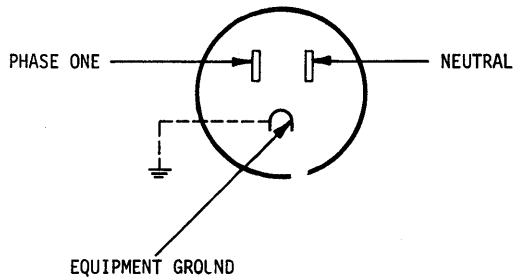
*Combined LMU and PIO requirements.

T1 = BREAKER ON
 T2 = DOOR SOLENOID
 T3 = SPINDLE START
 T4 = UP TO SPEED
 T5 = HEAD LOAD
 T6 = AVERAGE SEEK
 T7 = STOP SEEK
 T8 = PUSH/STOP (RETRACT)
 T9 = SPINDLE BRAKE
 T10 = SPINDLE BRAKE OFF
 T11 = BREAKER OFF



FF052

FIGURE 3-3. OPERATIONAL NOMINAL LINE CURRENTS TO POWER SUPPLY VS TIME (120 V INPUT)



ZZ183b

FIGURE 3-4. INPUT POWER CABLE CONNECTOR PLUG (120 V 60 HZ POWER SOURCE END)

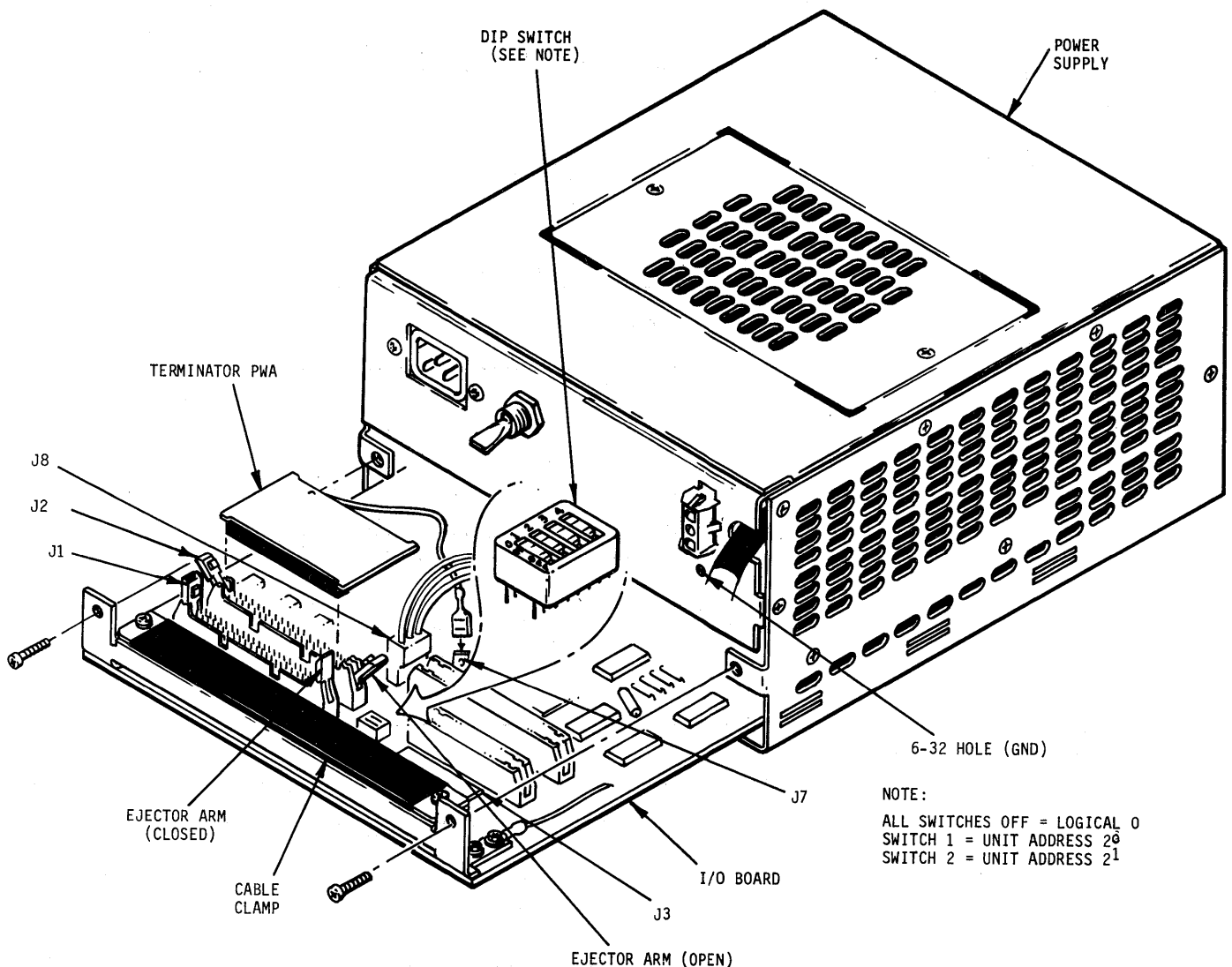
3.6.1 FEATURE SELECTION

The PIO is provided with a dip switch module which allows a binary address to be selected to operate in a multiple drive system. The drive can only be selected as unit 0 through 3. The dip switch module is located in the I/O board in the PIO (see Figure 3-5).

3.6.2 RADIAL OR DAISYCHAIN SELECTION

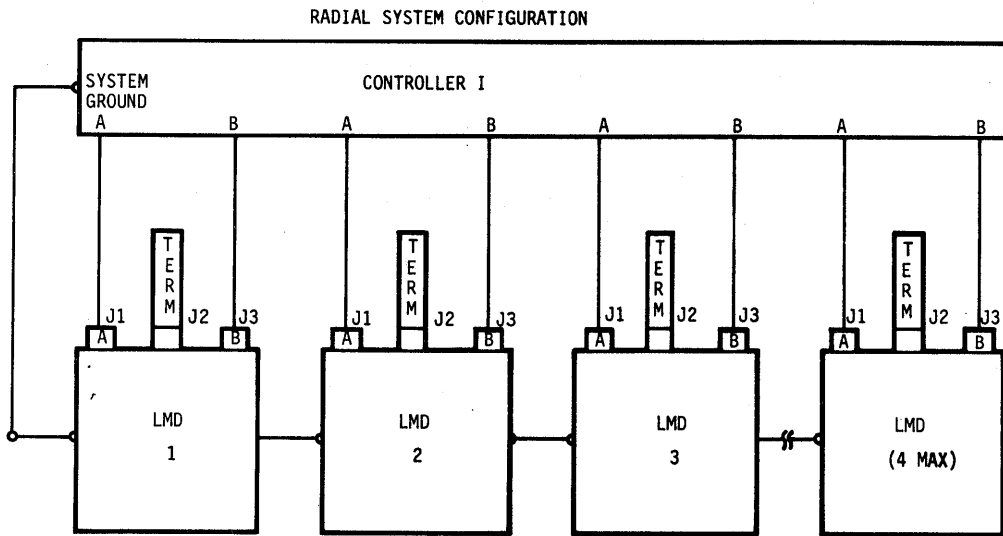
Figure 3-6 shows the intercabling and terminator placement for various drive arrangements. Shown are the radial daisychain systems configurations. A single drive is connected as shown for the radial configuration.

Insure the terminator PWA is plugged into the PIO I/O Board (J2) and the connector ejector arms are closed (see Figure 3-5).



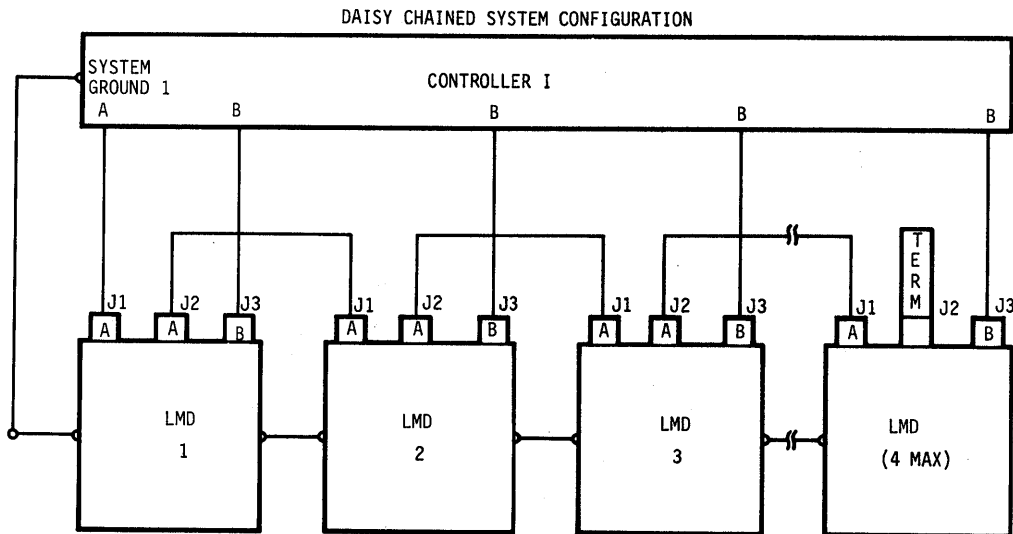
(H103a)

FIGURE 3-5. POWER SUPPLY AND I/O BOARD



NOTES

1. MAXIMUM TOTAL A CABLE LENGTHS = 100 FEET (30.48 METERS)
2. MAXIMUM INDIVIDUAL B CABLE LENGTHS = 50 FEET (15.24 METERS)



NOTES

1. TERMINATION OF "A" CABLE LINES ARE REQUIRED AT CONTROLLER AND THE LAST UNIT OF THE DAISY CHAIN OR EACH UNIT IN A RADIAL CONFIGURATION.
2. TERMINATION OF "B" CABLE RECEIVER LINES ARE REQUIRED AT THE CONTROLLER AND ARE ON THE UNIT'S RECEIVER CARDS.
3. MAXIMUM CUMULATIVE A CABLE LENGTH PER CONTROLLER = 100 FEET (30.48 METERS) MAXIMUM INDIVIDUAL B CABLE LENGTH = 50 FEET (15.24 METERS).

Z184a

FIGURE 3-6. LMD SYSTEM CABLING

3.6.3 LMU TO PIO INTERCABLING

Four cables are used to connect the LMU to the PIO; unshielded cables can be used for lengths of 4 feet or less. Shielded cables must be used for lengths between 4 feet and 10 feet (maximum length).

1. One 40 Conductor Flat Ribbon Cable ("C" Cable).
2. One 26 Conductor Flat Ribbon Cable ("D" Cable).
3. One AC Power Cable (3-Wire).
4. One DC Power Cable (6-Wire, Part of PIO).

Connect these cables as follows: (See Figure 3-7)

1. Remove two screws holding AC Distr PWA Cover in place and remove the cover.
2. Connect 40 conductor flat ribbon ("C") cable between LMU Base PWA (J1 on Base PWA) and PIO I/O PWA (J4).
3. Connect 26 conductor flat ribbon ("D") cable between LMU Base PWA (J2) and PIO I/O PWA (J5).
4. Connect DC power cable for PIO to LMU Base PWA (J3).
5. Connect AC power cable between LMU AC Distr PWA (J1) and PIO Power Supply.
6. Reinstall AC Distr PWA Cover.

3.6.4 PIO TO CONTROLLER CABLING

Standard SMD/CMD flat "A" and "B" cables can be used to interface the PIO to the controller. Refer to Section 3-10 "ACCESSORIES" for applicable cable/connector part numbers and cable length restrictions. The connector pin and signal name assignments are shown in Figure 3-8 and 3-9. Figure 3-10 is a table that shows the decoding of the TAG bus lines.

Install the cables as follows: (See Figures 3-5 and 3-7)

1. Connect "A" cable to PIO I/O PWA (J1) and close connector ejector arms.
2. Connect "B" cable to PIO I/O PWA (J3). Ensure connectors are oriented correctly on I/O PWA, i.e. Pin 1 to Pin 1.
3. Connect other end of cables (Steps 1 and 2) to controller.
4. Route all cables through cable clamp on I/O PWA.

CAUTION

Insure J1 and J2 connector ejector arms are fully closed before reinstalling I/O PWA.

5. Reinstall I/O PWA in base pan of power supply.

3.6.5 I/O AND POWER CABLE ROUTING

For sliding rack mounted drives, it is recommended that a cable retract mechanism be incorporated in the rack design. Retract mechanisms can be purchased from a number of available manufacturers.

3.6.6 CONDITIONS FOR COMPLIANCE WITH FCC REGULATIONS

The LARK Disk Drive and PIO Module do comply with the Class A FCC requirements when installed in any standard metal cabinet. However, if the Drive/PIO are to be run in a non-metal (non shielded) cabinet or as a true, standalone unit, installation per SPO 68861-1, MPI P/N 77700610 is required. The option kit is available upon request and basically consists of all shielded I/O and AC/DC power cabling, plus a few brackets to accommodate proper termination for the shielding. The order for such a kit must reflect the customer required A and B cable length in feet.

3.7 GROUNDING

Connect a low impedance ground strap, 19 mm (0.75 inch) braid, from controller system ground-to-PIO (GND on front plate)-to-LMU casting.

3.8 ENVIRONMENT

Temperature

a. Operating

32° F (0° C) to 122° F (50° C) with a maximum gradient of 27° F (15° C) per hour. Maximum operating temperature should be reduced as a function of altitude by 1.95° F/1000 ft. (1.08° C/304.8 m).

b. Transit Temperatures

-40° F (-40.4° C) to 158° F (70.0° C) with a maximum gradient of 36° F (20° C) per hour. This specification assumes that the PIO is packaged in the shipping container designed by manufacturing for use with the PIO.

c. Storage Temperatures

14° F (-10° C) to 122° F (50.0° C) with a maximum gradient of 27° F (15.0° C) per hour.

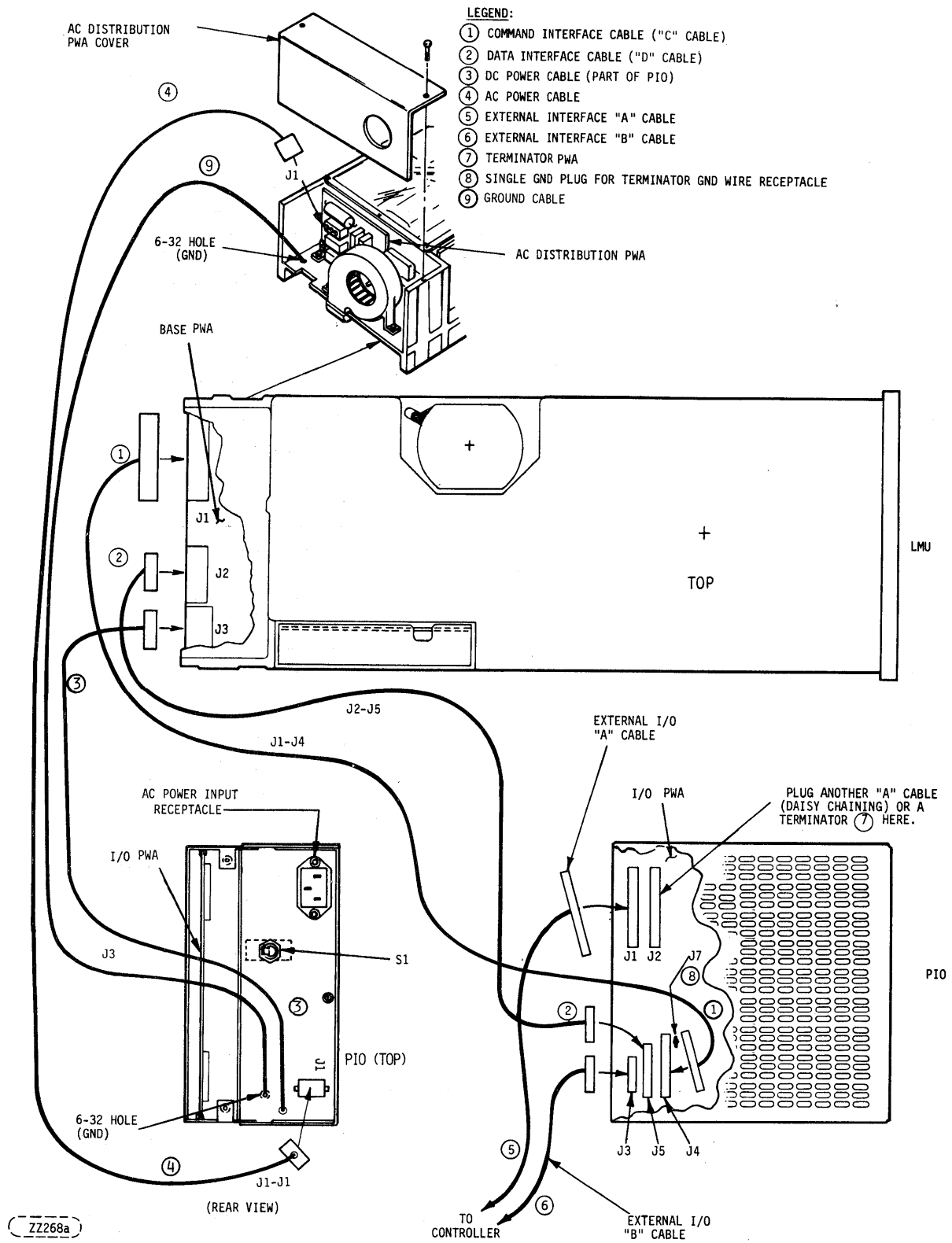
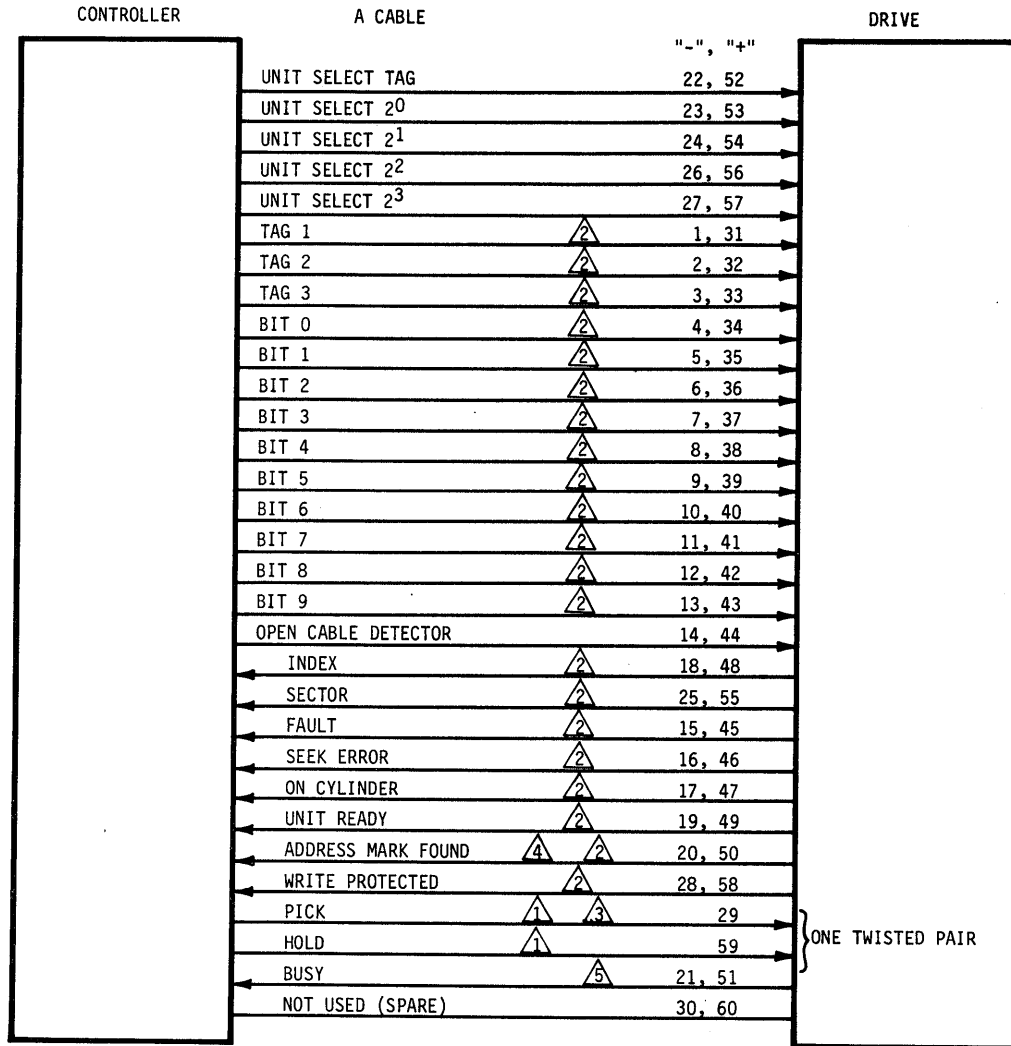


FIGURE 3-7. LMD CABLE CONNECTIONS

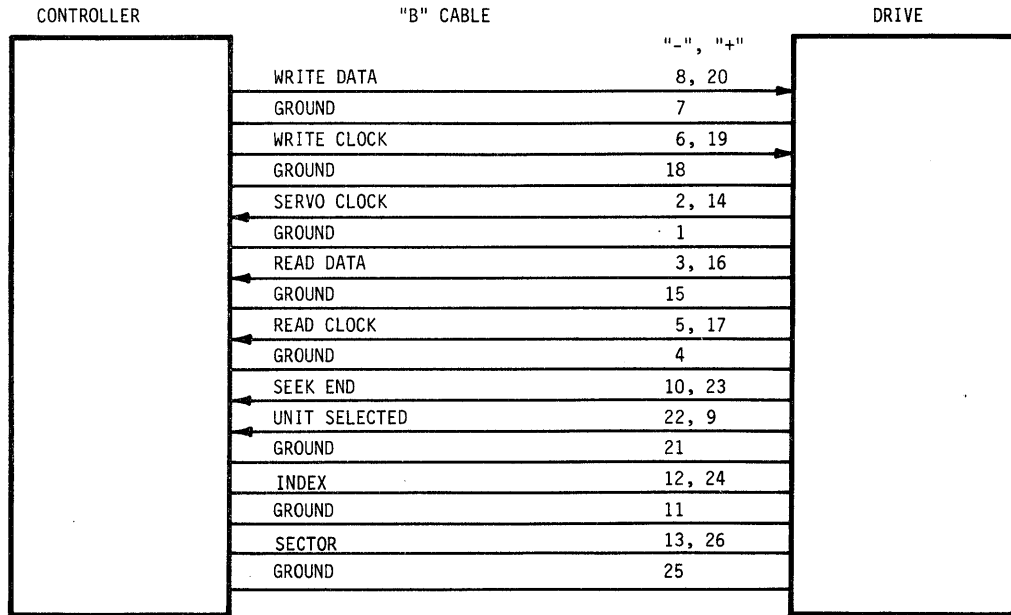


NOTE: 60 POSITION
 30 TWISTED PAIR - STRAIGHT FLAT CABLE
 MAXIMUM LENGTH - 100 FT (30.48 METERS) (CUMULATIVE)

2178a

- △1 SPECIAL SIGNAL, NOT A BALANCED TRANSMISSION SIGNAL
- △2 GATED BY UNIT SELECTED
- △3 NOT INTERPRETED, IS DAISY CHAINED, NO DRIVER CONNECTION WITHIN THE LMD.
- △4 NOT ACTIVATED, IS DAISY CHAINED, ALWAYS A LOGIC ZERO OUTPUT IF UNIT IS SELECTED
- △5 NOT GENERATED, IS DAISY CHAINED, NO DRIVER CONNECTION WITHIN THE LMD

FIGURE 3-8. TAG BUS I/O INTERFACE ("A" CABLE)



- NOTES: 1. 26 CONDUCTOR FLAT CABLE.
 MAXIMUM LENGTH - 50 FT. (15.24 METERS)
 2. NOSIGNALS GATED BY "A" CABLE UNIT SELECT.

Z178b

FIGURE 3-9. "B" CABLE INTERFACE

	TAG 1	TAG 2	TAG 3
BUS	CYLINDER ADDRESS	HEAD/VOLUME SELECT	CONTROL SELECT
BIT 0	2 ⁰	2 ⁰ \triangle 1	WRITE GATE
BIT 1	2 ¹	2 ¹ \triangle 1	READ GATE
BIT 2	2 ²	\triangle 2	SERVO OFFSET PLUS
BIT 3	2 ³	\triangle 2	SERVO OFFSET MINUS
BIT 4	2 ⁴	\triangle 2	FAULT CLEAR
BIT 5	2 ⁵	\triangle 2	\triangle 2
BIT 6	2 ⁶	\triangle 2	RTZ
BIT 7	2 ⁷	\triangle 2	DATA STROBE EARLY
BIT 8	2 ⁸	\triangle 2	DATA STROBE LATE
BIT 9	2 ⁹	\triangle 2	\triangle 2

- \triangle 1 HEAD CHANGES ARE NOT INITIATED UNTIL A VALID SEEK IS RECEIVED FOLLOWING A HEAD CHANGE COMMAND IF THE SEEK-ON-HEAD-CHANGE OPTION IS NOT SELECTED. IF THE SEEK-ON-HEAD-CHANGE OPTION IS SELECTED, THE HEAD CHANGES AND A ZERO DISTANCE SEEK WILL BE INITIATED AS A RESULT OF THE HEAD CHANGE.
- \triangle 2 NOT INTERPRETED BY THE LMD.

Z179b

FIGURE 3-10. TAG BUS DECODE

Relative Humidity

a. Operating

20% to 80% RH (providing there is no condensation) with a maximum gradient of 10% per hour.

Transit (as packed for shipment)

5% to 95% (providing there is no condensation).

b. Storage 10% to 90% (providing there is no condensation).

c. Altitude (actual or effective)

1. Operating

983 feet (300 m) below sea level to 6560 feet (2000 m) above sea level.

2. Transit (as packed for shipment)

983 feet (300 m) below sea level to 8200 feet (2500 m) above sea level.

3.9 INITIAL CHECKOUT AND STARTUP PROCEDURE

This procedure should be used to make the first power application to the LMD. The procedure assumes that the preceding procedures and requirements of this section have been performed. (LMU to PIO Cabling - 3.6.3) (PIO to Controller Cabling - 3.6.4).

1. Insure system AC power circuit breaker is OFF.
2. Insure PIO power switch is positioned to OFF.
3. Verify LMU START/STOP switch is in STOP (out) position.
4. Unscrew LMU carriage locking pin (CCW direction) until head of screw is flush with top of cover (see Figure LMU Installation/Operation Manual). Resistance to turning will be felt as locking pin nears the correct position.
5. Install the AC power cable between power source and PIO AC power input receptacle.
6. Turn on Subsystem AC power circuit breaker.
7. Position PIO AC power switch to ON. The LMU cooling fan should operate and front panel door should unlock when START/STOP switch is in STOP position (out).
8. Verify proper disk cartridge is available and insert into LMU.




9. Operate LMU START/STOP switch to START (in). Spindle motor should rotate. Head loading sequences is initiated, START/STOP indicator blinks until heads are loaded then, remains illuminated. Also, front panel door locks when spindle rotation begins.
10. Perform on-line diagnostics, as applicable.

3.10 ACCESSORIES

3.10.1 I/O INTERFACE ACCESSORIES-PIO TO/FROM CONTROLLER

I/O Interface PIO to Controller Accessory items required, but not furnished with the device unless specifically ordered are shown in Table 3-3 and 3-4.

TABLE 3-3. EXTERNAL I/O CABLES AND TERMINATOR PART NUMBERS

CABLE	QUANTITY	PART NO.
"A" Cable (Controller to PIO) (Same connector on each end. See Paragraph 3.10.2.)	One per PIO in radial,  one per multispindle installation in Daisy-chain.	775642XX
"A" Cable (PIO to PIO) (Same connector on each end. See Paragraph 3.10.2.)	One less than total  devices in the Daisychain.	775642XX
"B" Cable (Controller to PIO)	One per PIO 	775643XX
Terminator	One per PIO in radial, one per multispindle installation in Daisychain (One is provided with each I/O PWA).	75886100


 Last two digits denote length. (For cable length, see Table 3-4.)

TABLE 3-4. I/O CABLE LENGTH AND TABS

PART NO.	CABLE LENGTH IN <u>METERS</u>									
	1.52 5	1.83 6	2.44 8	3.05 10	4.58 15	6.96 20	7.63 25	9.15 30	12.2 40	15.24 50
"A" Cable 775642XX TAB (XX)	00	01	02	03	04	05	06	07	08	09
"B" Cable 775643XX	00	01	02	03	04	05	06	07	08	09

3.10.2 I/O CABLE CHARACTERISTICS AND CONNECTOR PART NUMBERS

3.10.2.1 "A" CABLE

<u>ITEM*</u>	<u>DESCRIPTION</u>	<u>CDC P/N</u>	<u>BERG P/N</u>	<u>SPECTRA-STRIP P/N</u>
1	Connector (60 Pos)	94361115	65043-007	-----
2	Flat Cable (twisted-pair), 30 pair, 28 AWG	95043902		138-2899-992
3	Contact, Insert	94245603	48048	-----
<u>ITEM</u>	<u>DESCRIPTION</u>	<u>CDC P/N</u>	<u>3M P/N</u>	
4	60 pin, vertical header	91904653		3372-2302

"A" Cable Mating Receptacle on Unit or Controller.

3.10.2.2 "B" CABLE

<u>ITEM*</u>	<u>DESCRIPTION</u>	<u>CDC P/N</u>	<u>3M P/N</u>
5	Connector (26 pos.)	65853402	3399-3000
6	Connector Pull Tab	92004801	3490-2
7	Flat Cable (26 pos.) with ground plane and drain wire.	95028509	3476-26

"B" Cable Mating Receptacle on Unit or Controller.

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>CDC P/N</u>	<u>BERG P/N</u>
8	26 pin.	96752044	65610-126

*These cables are for in-cabinet use only.

3.10.2.3 I/O CABLE CHARACTERISTICS

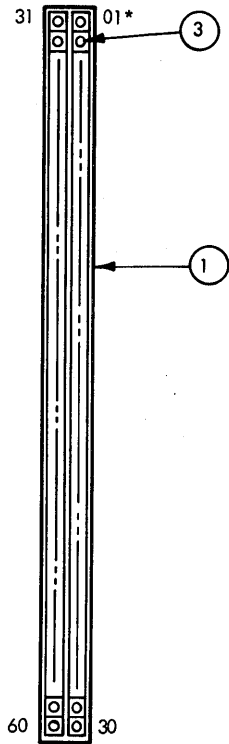
"A" Cable

Type: 30 twisted pair, flat-cable
Twists per inch: 2
Impedance: 110 ± 10 Ohms
Wire Size: 28 AWG, 7 strands
Propagation time: 1.6 to 1.8 ns/ft (0.49 to 0.55 ns/m)
Maximum cable length: 100 feet (30.48 meters) cumulative
Voltage Rating: 300 V rms

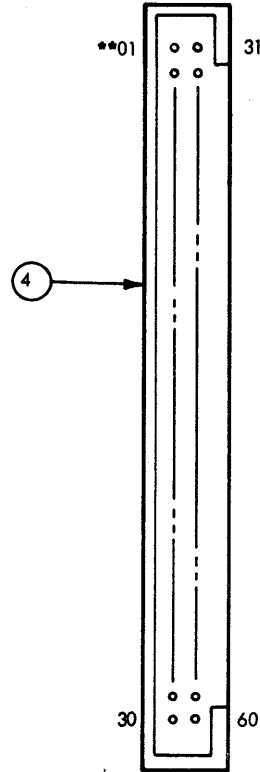
"B" Cable (with ground plane)

Type: 26 conductor, flat cable with ground plane and drain wire
Impedance: 65 Ohms (3M P/N 3476-26)
Wire Size: No. 28 AWG, 7 strands
Propagation time: 1.5 to 1.8 ns/ft (0.46 to 0.55 ns/m)
Maximum cable length: 50 feet (15.24 meters)
Voltage Rating: 300 V rms

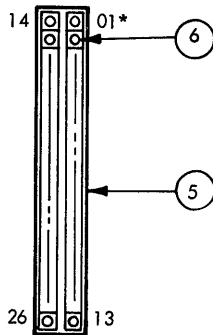
60 PIN RECEPTACLE
CABLE "A" CONNECTOR



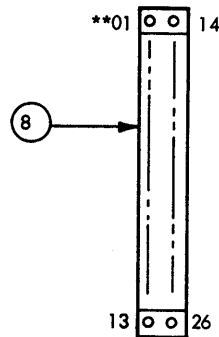
60 PIN MATING
PWB "A" CONNECTOR
ON UNIT OR CONTROLLER



26 PIN RECEPTACLE
CABLE "B" CONNECTOR



26 PIN MATING
PWB "B" CONNECTOR
ON UNIT OR CONTROLLER



* CONNECTORS AS PURCHASED
MAY NOT HAVE RECEPTACLE
NUMBERS MARKED ON THEM

** PIN NUMBERS ETCHED ON PWB

XX214a

FIGURE 3-11. I/O CONNECTORS

USER COMMENTS

FILE REFERENCE

FROM:
 Date _____
 Name _____
 Address _____
 City _____
 State _____ Zip Code _____
 Area Code _____ Phone _____

NOTE:
 This form is not intended to be used as an order blank. Control Data Corporation welcomes your evaluation of this publication. Please indicate any errors, suggested additions or deletions, or general comments below.
 Business-related questions are to be directed to your Local Sales Office.

Equipment Identification _____ Part Number _____ Serial No. _____

Document: (Title / Number / Revision) _____

COMMENTS:

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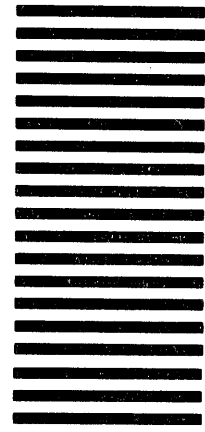
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Area Code _____ Phone _____

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Customer Training
Mail Station: OKM 154
Phone: (405) 324-3001

Magnetic Peripherals, Inc.
P.O. BOX 12313
Oklahoma City, Oklahoma
73157

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DOCUMENT / MANUAL IDENTIFICATION _____

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- CLASS SCHEDULE
- COURSE DESCRIPTION
- OTHER _____

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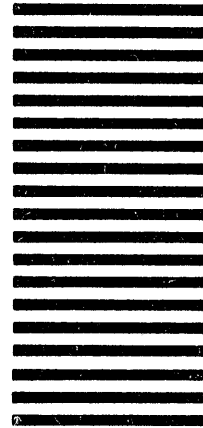
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