

Distributed Systems Network



Advanced Terminal Processor
(DSN/ATP)
Installation Manual



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Advanced Terminal Processor (DSN/ATP) Installation Manual



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New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition or a new update is published. No information is incorporated into a reprinting unless it appears as a prior update; the edition does not change when an update is incorporated.

The software code printed alongside the date indicates the version level of the software product at the time the manual or update was issued. Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one to one correspondence between product updates and manual updates.

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LIST OF EFFECTIVE PAGES

The List of Effective Pages gives the date of the most recent version of each page of the manual. Within the manual, changes since the most recent edition are indicated by printing the date of the update on the bottom of the page, and by marking the changes with a vertical bar in the margin. If an update is incorporated when an edition is reprinted, these bars are removed but the dates are retained. No information is incorporated into a reprinting unless it appears as a prior update. To verify that your manual contains the most current information, check that the date printed at the bottom of the page matches the date listed below for that page.

Effective Pages	Date
First Edition.....	March 1982
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This manual contains installation and servicing information for the Advanced Terminal Processor (ATP).

This manual was written for the HP Customer Engineer (CE) and System Engineer (SE) with the assumption that the reader has a good working knowledge of the HP 3000 System environment, and is specifically trained in installing HP 3000 products. This manual may be used in conjunction with related documentation for the HP 3000 Series 44 and 64 Computer Systems. Related documents include the following technical manuals:

- *HP 3000 Computer Systems, Console Operator's Guide, (for series 11/111/30/33/40/44/64), (32002-90004)*
- *HP 3000 Computer Systems, Communications Handbook, (30000-90105)*
- *HP 3000 Computer Systems, System Manager/System Supervisor Reference Manual, (30000-90014)*
- *MPE V System Operation & Resource Management Reference Manual, (32033-90005)*
- *HP 3000 Distributed Systems Network/Advanced Terminal Processor Off-line Diagnostic Procedures Manual, (30144-90004)*
- *HP 3000 Distributed Systems Network/Advanced Terminal Processor On-line Diagnostic Procedures Manual, (30144-90004)*
- *HP 3000 Distributed Systems Network/Asynchronous Serial I/O Reference Manual, (30000-90250)*
- *HP 3000 Series 64/68 Installation Manual, (30140-90007)*
- *Point-to-Point Workstation I/O Reference Manual, (30000-90250)*

This manual is organized as follows:

Section 1, **GENERAL INFORMATION**, briefly describes the main features of the ATP and how it operates. This section also contains a list of the equipment supplied as well as the interconnecting cable assemblies. Since this is a brief overview, intended only to give the reader a better understanding of how the ATP functions, certain operational details have been omitted.

Section 2, **INSTALLATION**, contains instructions for installing the hardware and software components of the ATP and its connecting cables. Specifically discussed are installation of the System Interface Board (SIB), the Asynchronous Interface Board (AIB) and the Port Connector Assembly. This section also describes the software installation procedures and the installation verification procedures.

Section 3, **TROUBLESHOOTING TOOLS and TIPS**, contains general servicing information, repair procedures and reshipment instructions. Also included is a description of applicable maintenance aids, and a troubleshooting flow chart.

PREFACE (continued)

Appendix A, **WIRING DIAGRAMS**, contains information and specifications for building **HP-DC A** and **HP-DC B** cables.

Appendix B, **ATP JUNCTION BOX INSTALLATION**, contains instructions for installing the **ATP Remote Junction Box**, and information for installing additional **direct-connect** and **modem ports**.

CONVENTIONS USED IN THIS MANUAL

NOTATION

DESCRIPTION

nonitalics

Words in syntax statements which are not in italics must be entered exactly as shown. Punctuation characters other than brackets, braces and ellipses must also be entered exactly as shown. For example:

EXIT;

italics

Words in syntax statements which are in italics denote a parameter which must be replaced by a user-supplied variable. For example:

CLOSE *filename*

[]

An element inside brackets in a syntax statement is optional. Several elements stacked inside brackets means the user may select any one or none of these elements. For example:

$\left[\begin{array}{l} A \\ B \end{array} \right]$ User *may* select A or B or neither.

{ }

When several elements are stacked within braces in a syntax statement, the user must select one of those elements. For example:

$\left\{ \begin{array}{l} A \\ B \\ C \end{array} \right\}$ User *must* select A or B or C.

...

A horizontal ellipsis in a syntax statement indicates that a previous element may be repeated. For example:

[,*itemname*]...;

In addition, vertical and horizontal ellipses may be used in examples to indicate that portions of the example have been omitted.

▣

A shaded delimiter preceding a parameter in a syntax statement indicates that the delimiter *must* be supplied whenever (a) that parameter is included or (b) that parameter is omitted and any *other* parameter which follows is included. For example:

itema [▣*itemb*] [▣*itemc*]

means that the following are allowed:

itema
itema, itemb
itema, itemb, itemc
itema, , itemc

CONVENTIONS (continued)

Δ When necessary for clarity, the symbol Δ may be used in a syntax statement to indicate a required blank or an exact number of blanks. For example:

```
SET[(modifier)] $\Delta$ (variable);
```

underlining When necessary for clarity in an example, user input may be underlined. For example:


```
NEW NAME? ALPHA
```

In addition, brackets, braces or ellipses appearing in syntax or format statements which must be entered as shown will be underlined. For example:

```
LET var[[subscript]] = value
```

shading Shading represents inverse video on the terminal's screen. In addition, it is used to emphasize key portions of an example.



The symbol  may be used to indicate a key on the terminal's keyboard. For example, **RETURN** indicates the carriage return key.

CONTROL *char*

Control characters are indicated by **CONTROL** followed by the character. For example, **CONTROL**Y means the user presses the control key and the character Y simultaneously.

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WIRING DIAGRAMS

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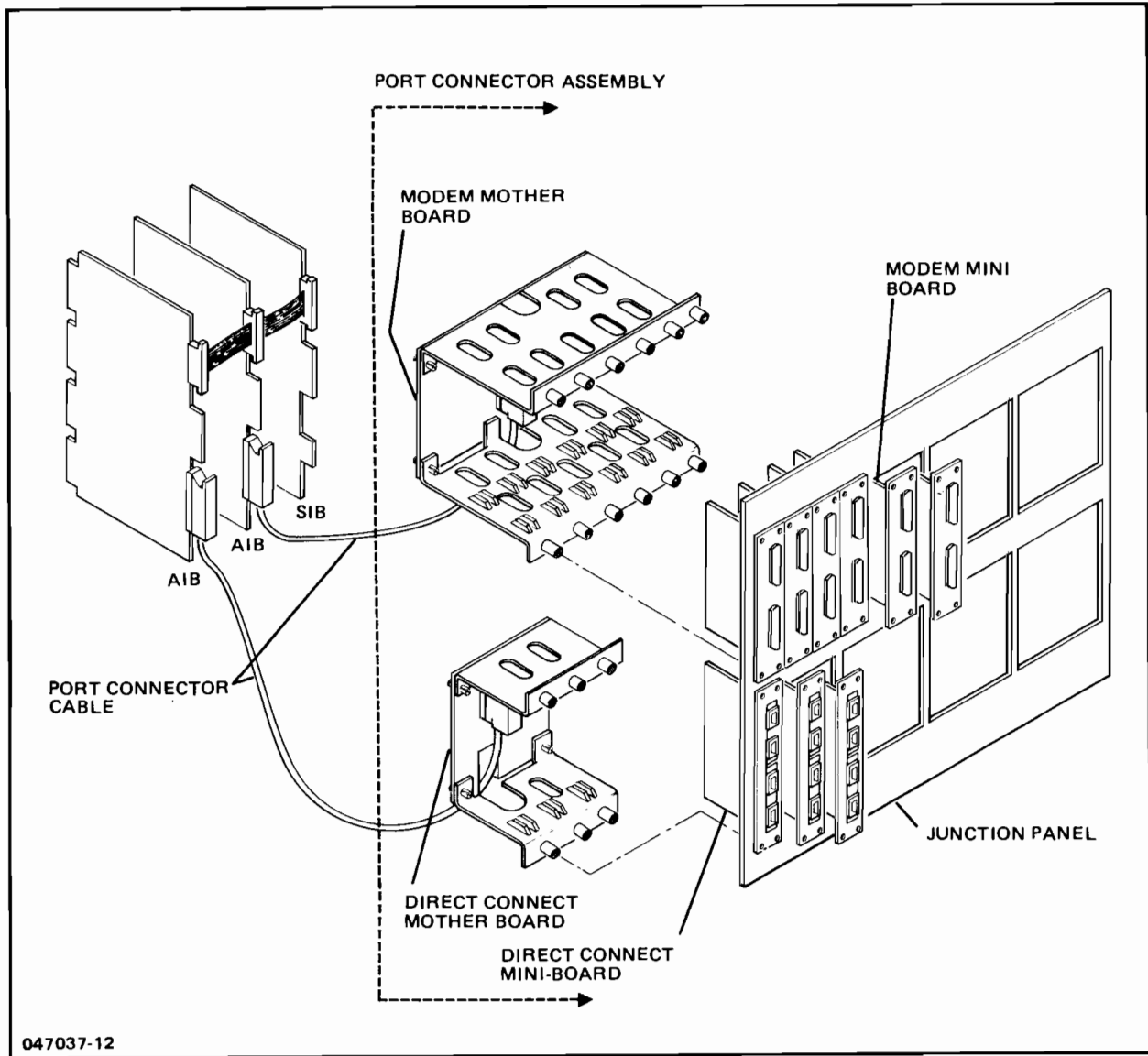


Figure 1-1. Advanced Terminal Processor and Related Cabling



THEORY OF OPERATION

The Advanced Terminal Processor (ATP) provides the HP 3000 Series 44/48 and 64/68 Computer Systems with an intelligent controller for asynchronous data communication. The ATP removes the "per character" interrupt to the CPU by providing direct memory access (DMA) for bit serial data transfers. An ATP subsystem can support up to 96 asynchronous ports directly connected or through a modem link, and supports the data bit rate range of 110 to 19.2K thus providing data communication capabilities in high-speed as well as low speed environments. On the Series 64/68, it allows asynchronous devices to be attached directly or through full duplex modems. On the Series 44/48, only direct connection is available.

A minimum ATP subsystem consists of one System Interface Board (SIB), one Asynchronous Interface Board (AIB), and one Hardwired Port Controller or one Modem Port Controller. It requires two I/O slots, uses one IMB channel address and can support twelve terminal ports. A maximum subsystem uses one System Interface Board (SIB) and eight Asynchronous Interface Boards (AIB's), requires nine slots, uses one IMB channel address, and can support 96 terminal ports. An HP 3000 Series 64 computer may have one maximum and one partial ATP subsystem installed, which support up to 144 terminals. A Series 68 computer may have 3 maximum and 1 partial ATP subsystems installed, which supports up to 336 point-to-point terminals or 400 multipoint terminals. Each ATP subsystem requires one unique IMB channel address.

FEATURES

Important features of the ATP are:

- Data Communication data transfer rates up to 19.2K bits per second.
- Full-duplex modem support which is compatible with EIA RS-232-C and CCITT V.28.
- Modem Support compatible with Bell 103 and 202T (full duplex) and 212 modems.
- Single Chip Microcomputer per port.

FUNCTIONAL DESCRIPTION

The Advanced Terminal Processor includes the following major functional components.

- ATP Driver
- Port Controllers (Modem or Direct Connect)
- System Interface Board
- Asynchronous Interface Board

Block diagrams of the major functional components of the SIB and AIB are shown in figure 1-2 and 1-3. The solid interconnecting lines in the block diagrams represent data paths while the broken lines indicate service request paths.

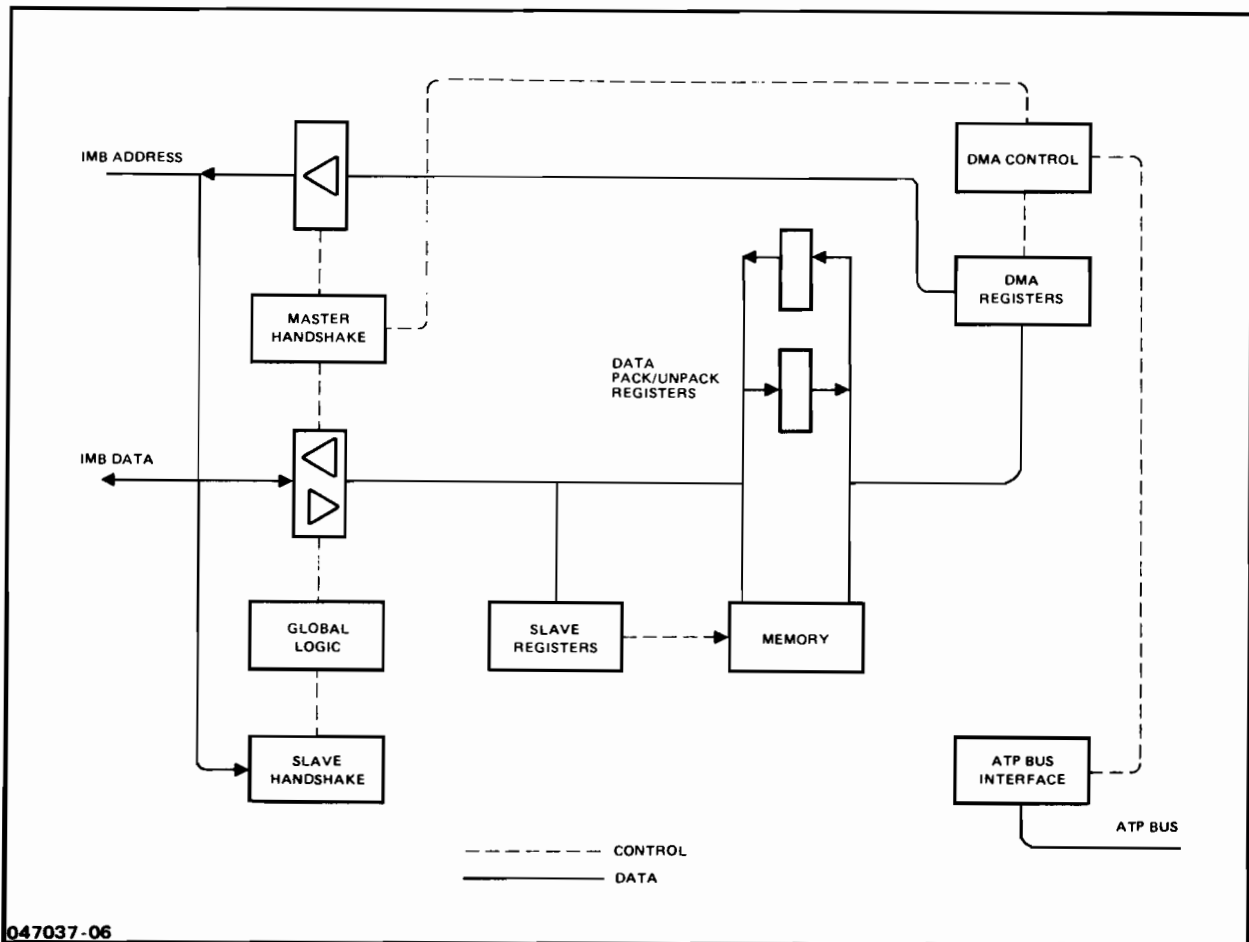


Figure 1-2. System Interface Board Block Diagram

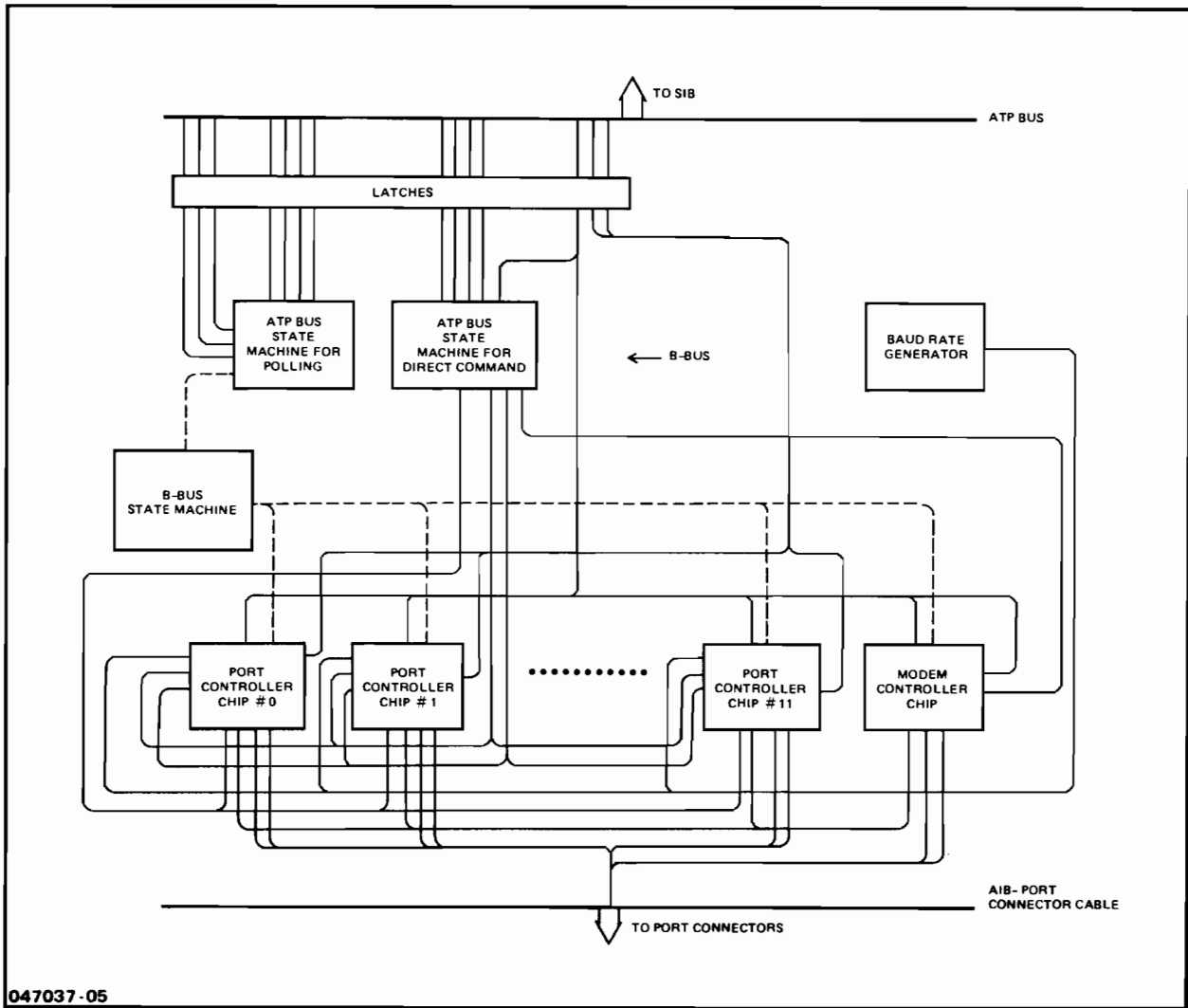


Figure 1-3. Asynchronous Interface Board Block Diagram

ATP DRIVER

The ATP Driver provides the software interface to the MultiProgramming Executive (MPE) file system. It receives requests from multiple sources to initiate terminal I/O functions. It handles the port controller interrupts, which report completion of the current function, the detection of a terminal action or error requiring software intervention. The software driver also manages the terminal buffer pool and system I/O tables.

PORT CONTROLLERS

The Port Controllers consist of an Asynchronous Interface Board, cable, and Port Connector Assembly, either Modem or Direct Connect.

Each Asynchronous Interface Board (AIB) provides an ATP subsystem with 12 terminal ports, an ATP bus interface, and an interface to the port connectors. The AIB is built around a single chip microcomputer, of which there is one for each terminal port. The chip performs most of the protocol functions of a terminal port and is referred to as the Port Controller Chip (PCC). The PCC contains a Serial Communications Interface which allows the chip to be efficiently interfaced with a variety of devices which require an asynchronous serial data format. The AIB also contains another microcomputer, a Modem Controller Chip (MCC), which is shared by all the PCC's and communicates with the modem Scanner Chip (MSC) on the Modem Mother Board, in order to perform multiplexing of the modem control lines. The MCC also performs diagnostics for the board.

The Advanced Terminal Processor offers a variety of Port Connections which allow terminals and modems to be connected to the HP 3000 Series 64/68. On the Series 44/48, only terminal direct connection is available.

Each Port Connector assembly consists of a Mother Board, which interfaces with the AIB, Mini-boards which interface with the terminal/modem connections, and associated internal cabling. The Port Connectors are available in two basic types: Modem and Direct Connect. The direct connect port connector offers the HP-DC A or HP-DC B hardware terminal interface. The the HP-DC A interface uses RS-422 type data signals only and the HP-DC B interface uses RS-232-C type data signals only. Both are intended to allow terminals to be connected to an HP 3000 without the use of a modem, line driver or other external "box". The ATP modem interface supports only full duplex modems and conforms to the HP-Modem B standard, which is a version of RS-232-C.

SYSTEM INTERFACE BOARD

The System Interface Board (SIB) provides the hardware interface to the Intermodule Bus (IMB) and controls the ATP bus. It controls the direct memory access (DMA) path into three areas of memory--an input buffer, an output buffer, and a control program area--for each port. It also causes software interrupts via the IMB interrupt line, and performs byte packing and unpacking.

HARDWARE MODULE INTERCONNECTION

The System Interface Board (SIB) of the ATP is backplane compatible with the HP 3000 Series 44/48 and Series 64/68 Computer Systems. It is installed in the Intermodule Bus channel section of the I/O card cage. The SIB communicates with the CPU and memory via the IMB through the use of IMB protocol. The SIB receives signals and power from the system via connectors P2, P3 and P4. P1 is not used. The AIB receives power from the system via connectors P2 and P4. Connector P4 is also used for power-on reset, P1 and P3 are not used. Frontplane connector J1 on both the SIB and AIB is used for the ATP bus connection. Connector J2 on the SIB is used for test signals. Connector J2 on the AIB connects to the Mother Board assembly and includes power for the Port Connectors.

EQUIPMENT SUPPLIED

In order to purchase an ATP subsystem, the customer orders (1) HP 30144A (which is the HP 3000 System Interface Board (SIB) , and any combination of the 30145A's and/or 30155A's (Direct Connect or Modem Connect Port Controllers, respectively).

Each of the Port Controller products (PCP) (30145A or 30155A) contain:

- One (1) Asynchronous Interface Board (AIB)
- One (1) Mother Board (either Direct Connect or Modem Connect)
- Three (3) or six (6) Mini Boards
- One (1) AIB to Junction Panel Cable

The SIB and the AIB's are installed in the I/O Card Cage of the Series 64/68. The Mother Boards and Mini Boards are installed in the Junction Panel which is sheet metal composed of several cutouts, and is removable from the I/O Card Cage. The AIB/JP cable connects the Junction panel hardware (Mother and Mini boards) to their respective AIB.

For ATP add-ons, all of these parts arrive individually boxed and must be assembled on site using the procedure found in this manual.

For HP 3000 64/68 installations, the SIB and the AIB will still arrive boxed separately. However, the Mother Board and Mini Boards and the AIB/JP cable will be pre-assembled into the Junction Panel, in the factory, then boxed as an assembled unit. Therefore, what is actually shipped to the customer's site will be the SIB, the AIB's and a pre-assembled Junction Panel containing the number of Mother and Mini boards ordered under products 30145A and 30155A.

Also included with the pre-assembled Junction Panel will be a cable which should be attached once the Junction Panels are installed.

NOTE

The mother board and mini boards assembled for AIB #0 on the main I/O Bay will not have an AIB/JP cable attached. The cable for this AIB is special and is shipped with the Series 64/68. Instructions for its attachment are included in this manual.

The minimum Advanced Terminal Processor subsystem consists of the following:

- One System Interface Board (SIB), Product Number 30144A which consists of:

One System Interface Board, Part Number 30144-60001,

Three SIB to AIB Cables, Part Numbers 30000-93053 Short (3)
 30000-93056 Medium (6)
 30094-60002 Long (9)

- One Direct Connect Port Controller, Product Number 30145A which consists of:

One Asynchronous Interface Board (AIB), Part Number 30145-60001,

One AIB to Port Connector Cable, Part Number 30145-60004,

One Direct Connect Mother Board, Part Number 30145-60003.

Three HP-DC A Mini-Boards and two Card Guides, Part Number 30147-60001 (provides 12 ports).*

Label Sheets, Part Numbers 7121-2439 (6 each)
 7121-2440 (1 each)
 7121-2442 (opt 1 & 3)

AND/OR

- One Modem Port Controller, Product Number 30155A which consists of:

One Asynchronous Interface Board (AIB), Part Number 30145-60001,

One AIB to Port Connector Cable, Part Number 30145-60004,

One Modem Mother Board, Part Number 30145-60002,

Six HP-Modem B Mini-Boards and two Card Guides, Part Number 30146-60001 (provides 12 ports).

Four Label Sheets, Part Number 7121-2438 (12 each)
 7121-2439 (1 each)
 7121-2442 (opt 1 & 3)

Option 001 Deletes AIB to Mother Board Cable, 30145-60004 Series 64 only. This cable is replaced by DCU/AIB cable, which is part of the Series 64. Adds Junction Panel sheet metal.

*Option 002 Customer can choose to replace HP-DC A ports with HP-DC B ports (p/n 30148-60001) in increments of 4 ports at a time.

Option 003 Adds Junction Panel sheet metal.

General Information

The following table lists the interconnecting cable assemblies available for installation of the ATP.

Table 1-1. Interconnecting Cable Assemblies

Product Number	Description	Part Number
	SIB to AIB Cable 3-connector 6-connector 9-connector	30000-93053 30000-93056 30094-60002
	AIB Port Connector Cable	30145-60004
30062B Option 001	Modem Cable (7.6 Meters) Modem Cable (15 Meters)	30062-60022 30062-60023
30062C Option 001 Option 002	Modem Extension Cable Modem Extension Cable (15 Meters) Modem Extension Cable (30 Meters)	30062-60006 30062-60009 30062-60012
30152A	HP-DC B Adapter Cable, 3 Pin Male to 25 Pin Female (5 Meters)	30152-60001
30153A	HP-DC B Extension Cable, 3 Pin Male to 3 Pin Female (15 Meters)	30153-60001
30154A	HP-DC A Extension Cable, 5 Pin Male to 5 Pin Female (30 Meters)	30154-60001
13222P	262x HP-DC A Adapter Cable on Data Port 1, 50 Pin Micro-Ribbon to 5 Pin Male (15 Meters)	
13222X	262x HP-DC B Adapter Cable on Data Port 1, 50 Pin Micro-Ribbon to 3 Pin Male, (5 Meters)	
13242X	262x HP-DC B Adapter Cable on Data Port 2, 25 Pin Male to 3 Pin Male (5 Meters)	
13232I	264x HP-DC A Adapter Cable, 30 Pin Edge Connector to 5 Pin Male, (5 Meters)	
13232X	264x HP-DC B Adapter Cable, 30 Pin Edge Connector to 3 Pin Male (5 Meters)	

Table 1-1. Interconnecting Cable Assemblies (cont.)

Product Number	Description	Part Number
	HP-DC A Loopback Connector (5 Pin Male)	30147-60002
	HP-DC B Loopback Connector (3 Pin Male)	30148-60002
	HP Modem B Loopback Connector (25 Pin Male)	30146-60002
	AIB Loopback Connector (72 Pin Edge Connector)	30145-60005

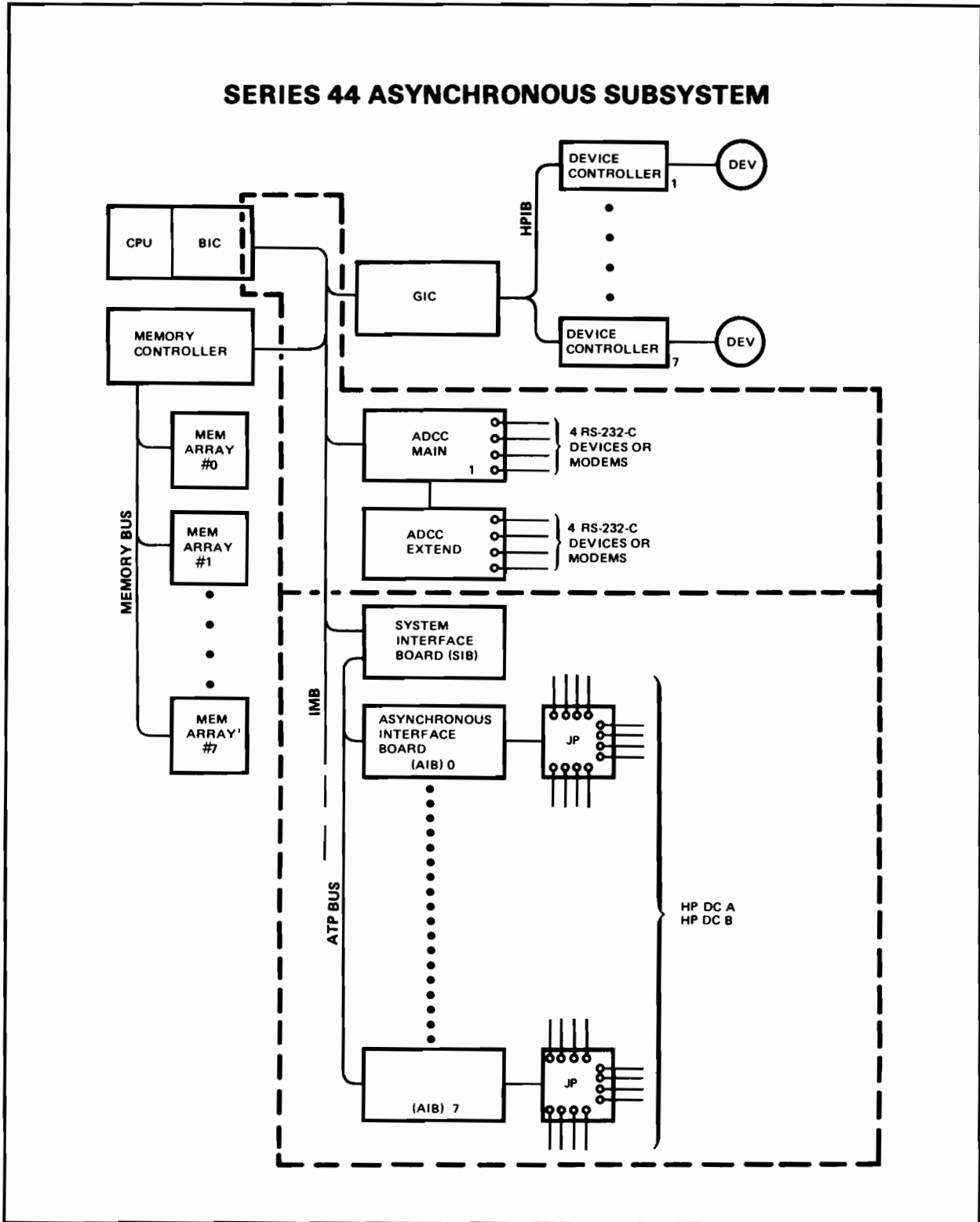


Figure 1-4. Typical Interface to System for Series 44

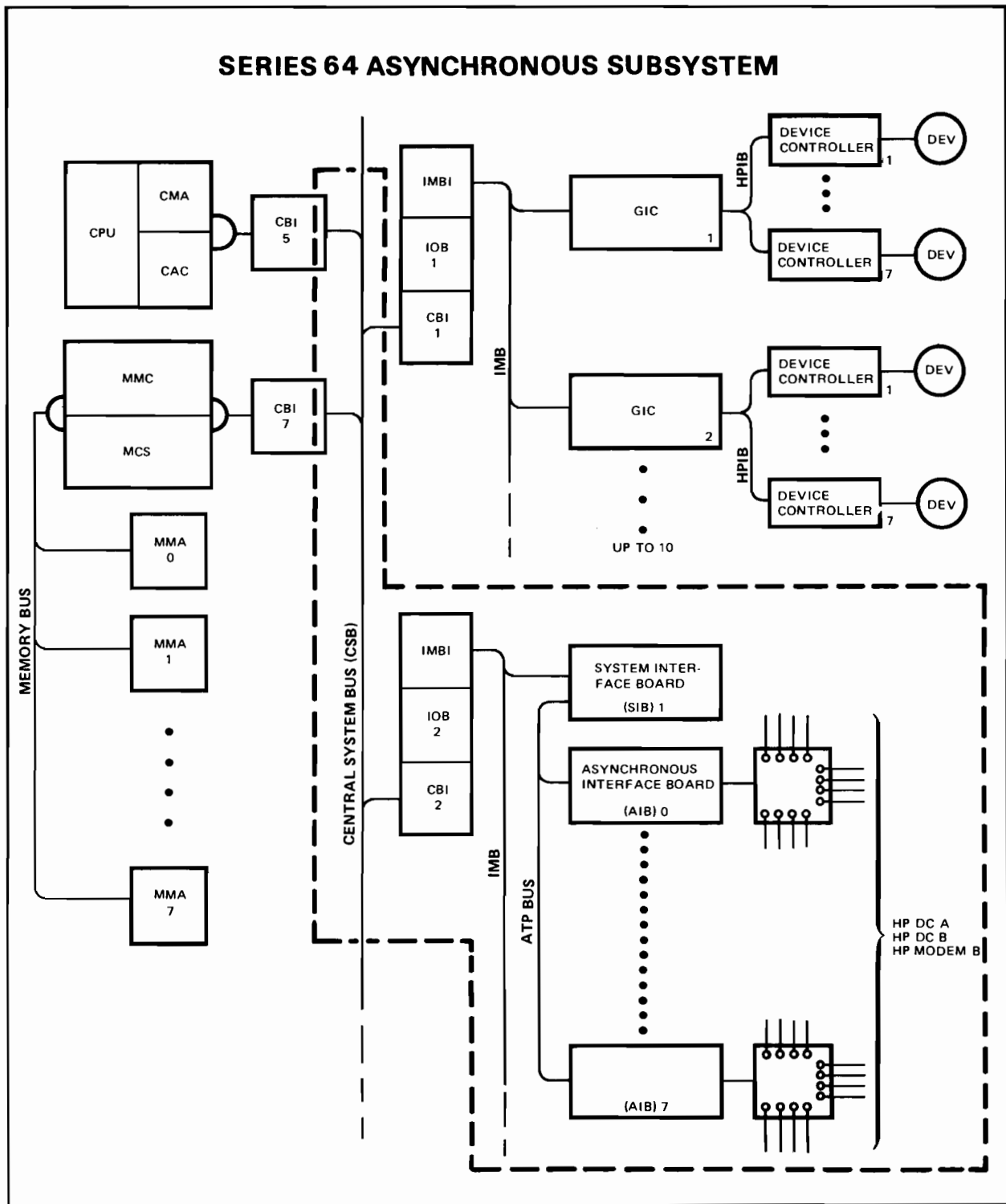


Figure 1-5. Typical Interface to System for Series 64

SPECIFICATIONS

The specifications for the Advanced Terminal Processor are presented in Table 1-2.

Table 1-2. Specifications

Model:	Advanced Terminal Processor
Interface:	Compatible with EIA RS-232-C and CCITT V.28 for modem connection. Direct connection is either 3 wire or 5 wire, RS-232-C type-signals or RS-422.
Data Rate:	Modem - Up to 1200 bits per second in full-duplex mode. Directly Connected - Up to 9600 bits per second for each port.
Modems supported:	Bell 103, 202T (Full Duplex) and 212
Multiplexer Supported:	HP Fiber Optic Multiplexer
Number of Terminals supported in one ATP Subsystem environment	Series 44: 60 Series 64: 96* Series 48: 96 Series 68: 96

*Series 64 can have two ATP subsystems and can support 144 terminals, 96 on the first subsystem, 48 on the second subsystem or a combination totalling no more than 144 terminals.

This section contains information for unpacking, inspecting, installing, and initially testing an ATP subsystem.

CAUTION

ATP PCA's are ESD sensitive. All the actual work on the system or junction panel hardware must be done with some form of ESD protection. You must be grounded to the system with a wrist strap or other form of grounding to prevent ESD damage.

UNPACKING AND INITIAL INSPECTION

If the ATP printed circuit assemblies (PCA's) and associated cable assemblies are received separately from the computer system, inspect the cartons containing the items before opening. If there is evidence of external damage to the carton, notify the nearest HP Sales and Service Office and request that the carrier's agent be present when the carton is opened. ATP's are now in boxes with a warning stating that only HP personnel should open and install the boards.

Inspect each item as the carton is unpacked. If the PCA's or cable assemblies are damaged or fail to match the packing list notify the carrier and the nearest HP Sales and Service Office immediately. Retain the shipping carton and packing material for the carrier's inspection. The HP Sales and Service Office will arrange for repair or replacement of the damaged item without waiting for any claims against the carrier to be settled.

PREPARATION FOR INSTALLATION

System Backup (Add-on Installation Only)

Before beginning ATP installation activities, ensure that the system operator has backed up the user's system environment, including his files. This precaution will prevent the possible inadvertent loss of the data residing on disc.

POWER REQUIREMENT VERIFICATION

The ATP PCA's obtain their operating power directly from the IMB backplane of all HP 3000 44/64 computing systems which have adequate power to accommodate an ATP subsystem or multiple ATP subsystems without the need for any power supply modification.

On the IMB backplane, verify that the power requirements for the ATP subsystem meet the specifications shown below in Table 2-1.

Table 2-1. ATP Power Requirements Series 44/48/64/68

	Voltage Requirements	Amps
System Interface Board (SIB)	+5 VDC	at 3.8A
Asynchronous Interface Board (AIB)	+5 VDC	at 4.1A
HP-DC B Junction Panel Assembly	+12 VDC -12 VDC	at 0.8A at 0.8A
HP-DC A Port Connector Assembly	None	
Modem B Junction Panel Assembly	+5 VDC +12 VDC -12 VDC	at 1.2A at 0.55A at 0.55A

ATP THUMBWHEEL SWITCH SETTINGS

The thumbwheel switches on the ATP PCA boards must be manually set to configure the ATP subsystem for your specific system and application. The following paragraphs provide guidelines for the different system environments.

Set the switches as follows before installing the PCA board in the computer card cage, (see Figure 2-1).

SIB Thumbwheel Switch Settings

- a. The thumbwheel switch for the SIB is an address switch with sixteen numbered positions (0 through 15). The setting of this switch identifies the IMB channel number assigned to the SIB and is used by the system to determine channel interrupt priority. Rotate the switch until the number desired is displayed. (Refer to Table 2-2 for appropriate settings).

WARNING



This switch must be set to a unique number not used by any other IMB channel such as another SIB, a GIC, or an ADCC. Damage to one or more of the PCA's could result.

Table 2-2. Thumbwheel Switch Settings

SIB Installed	Number to be set into Channel Address of the SIB		
	Series 44	Series 64	Series 68
First	2 or 3 or 4	1	1
Second	NA	*	*
First Aux	NA	NA	*
Second Aux	NA	NA	*

* means any unused IMB channel address.

NOTE

For the Series 64, the console is to be attached to Channel 1, Port 0.

AIB Thumbwheel Switch Settings

- b. The thumbwheel switch for the AIB is an address switch with eight numbered positions (0 through 7). The SIB polls the AIBs in the sequence designated by the thumbwheel settings, not by the AIB's physical location in the card cage, (see Figure 2-1).

NOTE

Each AIB associated with a particular SIB must have a unique thumbwheel setting of 0-7.

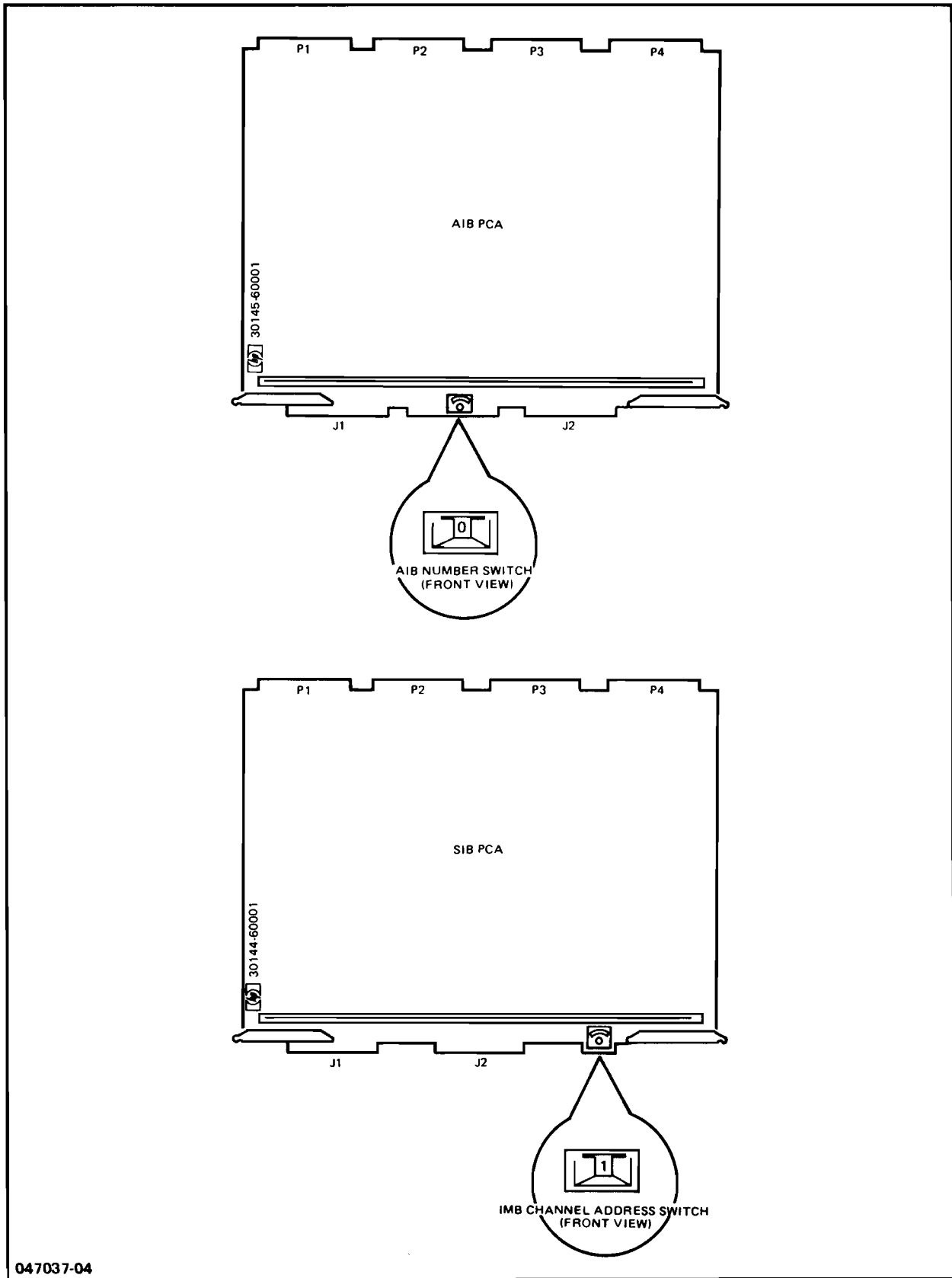


Figure 2-1. SIB/AIB Switch Location

HARDWARE INSTALLATION PROCEDURES FOR THE SERIES 44/48

The following procedures describe the installation of the ATP subsystem hardware in a Series 44/48 system environment.

Installing the SIB

NOTE

The user's files should have been backed up by the System Manager prior to beginning the installation.

- a. Ensure that all thumbwheel settings on the SIB and AIB's are properly configured. (Refer to the paragraph on ATP thumbwheel switch settings).
- b. Power down the card cage by placing the PROCESSOR switch in the off position. (See Figure 2-4 for location of the switch).

CAUTION

All power must be off when inserting or removing PCA boards from the Series 44 card cages.

- c. Open the door of the second card cage on the back of the HP 3000/44/48 mainframe.
- d. Insert the SIB into slot E6 within the "channel" range. The recommended slots for the SIB in a typical installation are E6 or E7. (See Figure 2-3)

On the HP 3000 Series 44/48, the SIB can be installed in any convenient slot in the range of E1 through E7 where the Flat Ribbon Cable will reach all needed connectors.

Installing the AIB

NOTE

Be sure that each AIB installed for a particular SIB has unique thumbwheel switch setting.

- a. Insert the AIB boards into vacant card cage slots adjacent to the SIB, slots E1 through E5. (See Figure 2-3).
- b. Attach the appropriate gray Flat Ribbon Cable, either 3 connector, 5 connector or 9 connector, from the SIB to all installed AIB'S.
- c. Make sure the power switch to the Port Connectors (a toggle switch on the front of the AIB board) is in the OFF position.

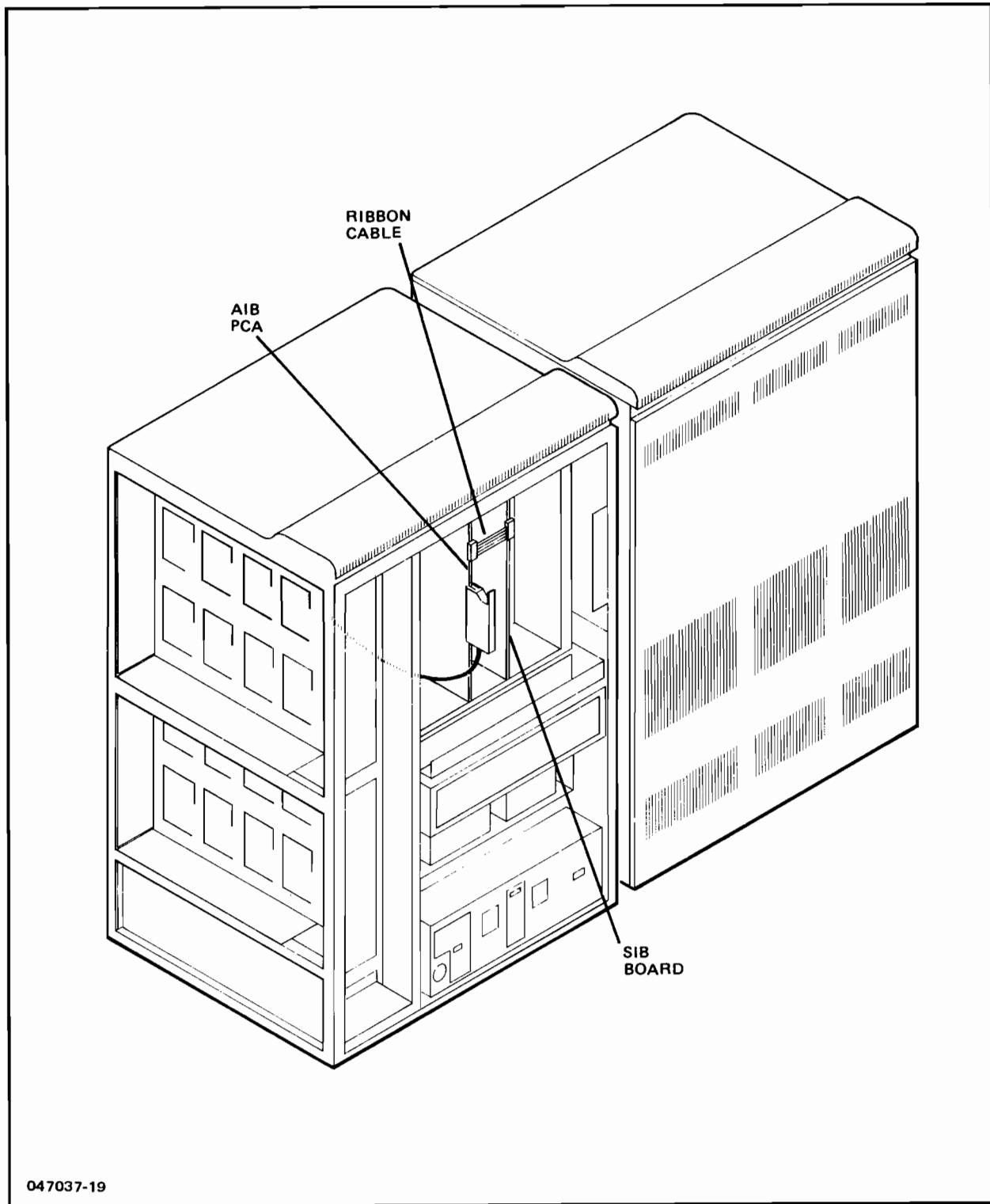


Figure 2-2. Ribbon Cable Location for Series 64/68

CARD CAGE 1

SLOT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	MEMORY ARRAY (0-256 KB)	MEMORY ARRAY 256-512 KB)	MEMORY ARRAY (512-768 KB)	MEMORY ARRAY (768-1024 KB)	MEMORY ARRAY (1024-1280 KB)	MEMORY ARRAY (1280-1536 KB)	MEMORY ARRAY (1536-1792 KB)	MEMORY ARRAY (1792-2048 KB)	MEMORY CONTROL & LOGGING	CMP	CTL	ALU	PCS	ADCC (M) (CH 1)	ADCC (E) (CH 11, DEV 5)	GIC (CH 11)	ADCC (M) / INP	ADCC (E) / INP	ADCC (M) / INP	ADCC (E)	ADCC (M)	ADCC (E) / GIC (CH 9)	ADCC (M) / GIC (CH 10)	GIC (CH 13)

CARD CAGE 2

SLOT NO.	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18	E 19	E 20	E 21	E 22	E 23	E 24
	ADCC (M) (CH2)	ADCC (E)	ADCC (M) (CH3)	ADCC (E)	ADCC (M) (CH4)	ADCC (E)	ADCC (M) / GIC (CH 12)	MEMORY CONTROL & LOGGING	MEMORY ARRAY (3840-4096 KB)	MEMORY ARRAY (3584-3840 KB)	MEMORY ARRAY (3328-3584 KB)	MEMORY ARRAY (3072-3328 KB)	MEMORY ARRAY (2816-3072 KB)	MEMORY ARRAY (2560-2816 KB)	MEMORY ARRAY (2304-2560 KB)	MEMORY ARRAY (2048-2304 KB)	INP (CH 12, DEV 4)	INP (CH 12, DEV 5)	INP (CH 12, DEV 6)	INP (CH 12, DEV 7)	PTR (CH 12, DEV 3)	PTR (CH 12, DEV 2)	PTR (CH 12, DEV 1)	PTR (CH 12, DEV 0)

Recommended
ATP Location

NOTE:

SLOTS IN CARD CAGE 2 ARE DESIGNATED E1, E2, etc., TO CORRESPOND WITH ASSOCIATED CABLE DESIGNATIONS

147022-16

Figure 2-3. Series 44 Slot Locations

Installing the Direct Connect Port Connector Assembly

One Direct Connect Port Connector Assembly consists of the following:

- One top card guide (p/n 30145-00001) with three flathead screws (2360-0182)
- One bottom card guide (p/n 30145-00003) with cable relief slot and three flathead screws
- One Mother Board (p/n 30145-60003) with four plastic fasteners
- Three Mini-Boards and 12 screws (p/n 2360-0115)
- One AIB to Port Connector Assembly cable and two screws.

Install the Port Connector assembly onto the Junction Panels as follows: (see Figure 2-9).

CAUTION

The ATP can only be installed in the side junction panel slots on the Series 44/48. ATP port connectors cannot be installed in the slots in the back of the system. (See Figures 2-5, 2-6).

CAUTION

The ATP can only be installed in the center and right port cut-outs on the Series 44/48. Only 6 of the 8 cut-outs can be used for the ATP. See Figures 2-5, and 2-6 for exact placement.

- a. Remove the plate covering the junction panel port cut-out where you plan to install the Port Connector. The recommended cut-out to begin with is in the upper right corner.
- b. Install the 78 pin connector end of the Port Connector cable (p/n 30145-60004) to the Mother Board connector J-1 and attach it with screws from the circuit side of the board.
- c. Attach the top card guide to the top of the Mother Board with two of the plastic fasteners. The top is marked on the Mother Board.
- d. Attach the bottom card guide to the Mother Board with two of the plastic fasteners. Make sure that the cable is inserted through the cable relief slot.
- e. Attach the Mother Board assembly, with the arrow pointing upward, to the port cut-out opening. The recommended procedure is to face the port cut-out and slide the Mother Board assembly through the cut-out making sure that the cable is hanging inside the junction panel. Hold the assembly in place by grasping the cable hood. Place the enclosed flathead screws into the counter sunk holes and tighten.

- f. Slide the Mini-Boards into the card guides and secure to the junction panel cut-out with the enclosed screws.
- g. Attach the Port Connector cable to connector J2 on the AIB. (see Figure 1-1).
- h. When you have completed installing the ATP subsystem, power on the mainframe, and ensure that the PROCESSOR switch is on.
- i. Power on the Port Connectors via the power switch on the appropriate AIB. (see Figure 2-13).

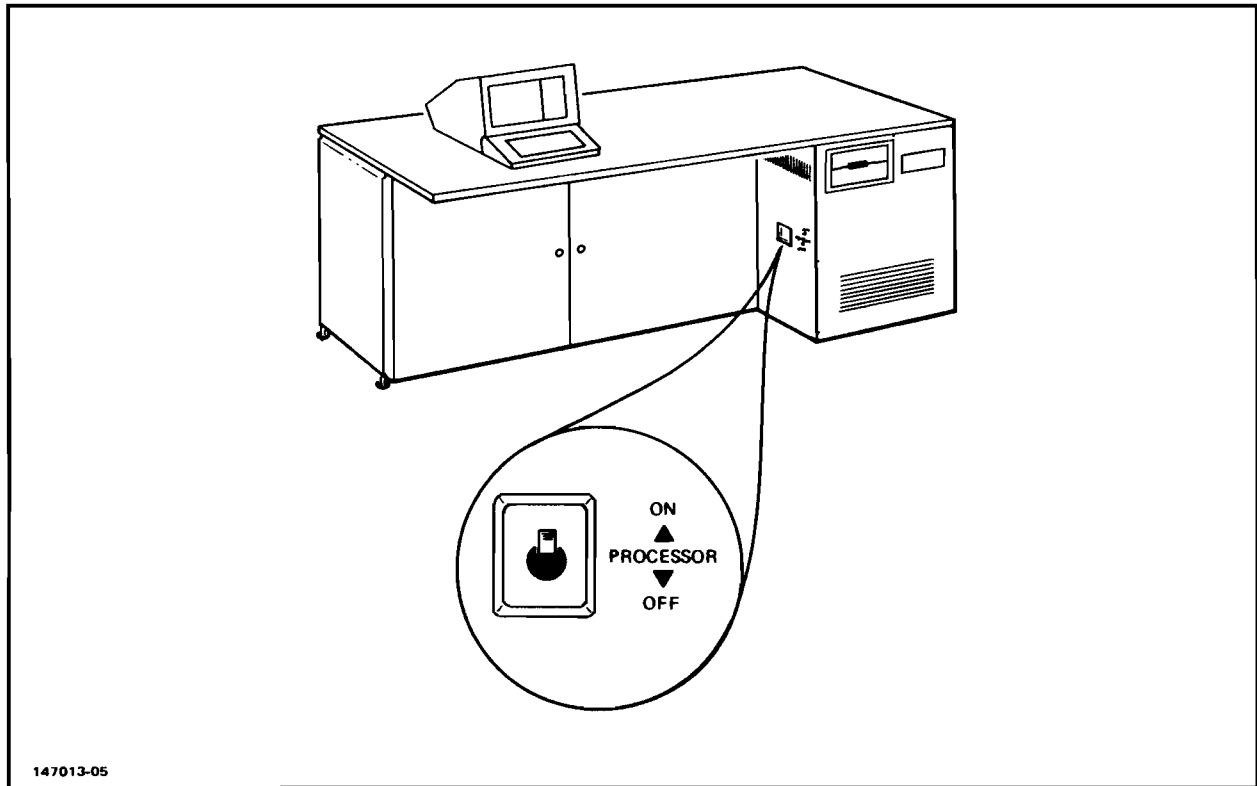


Figure 2-4. Location of PROCESSOR Switch on HP 3000/44/48

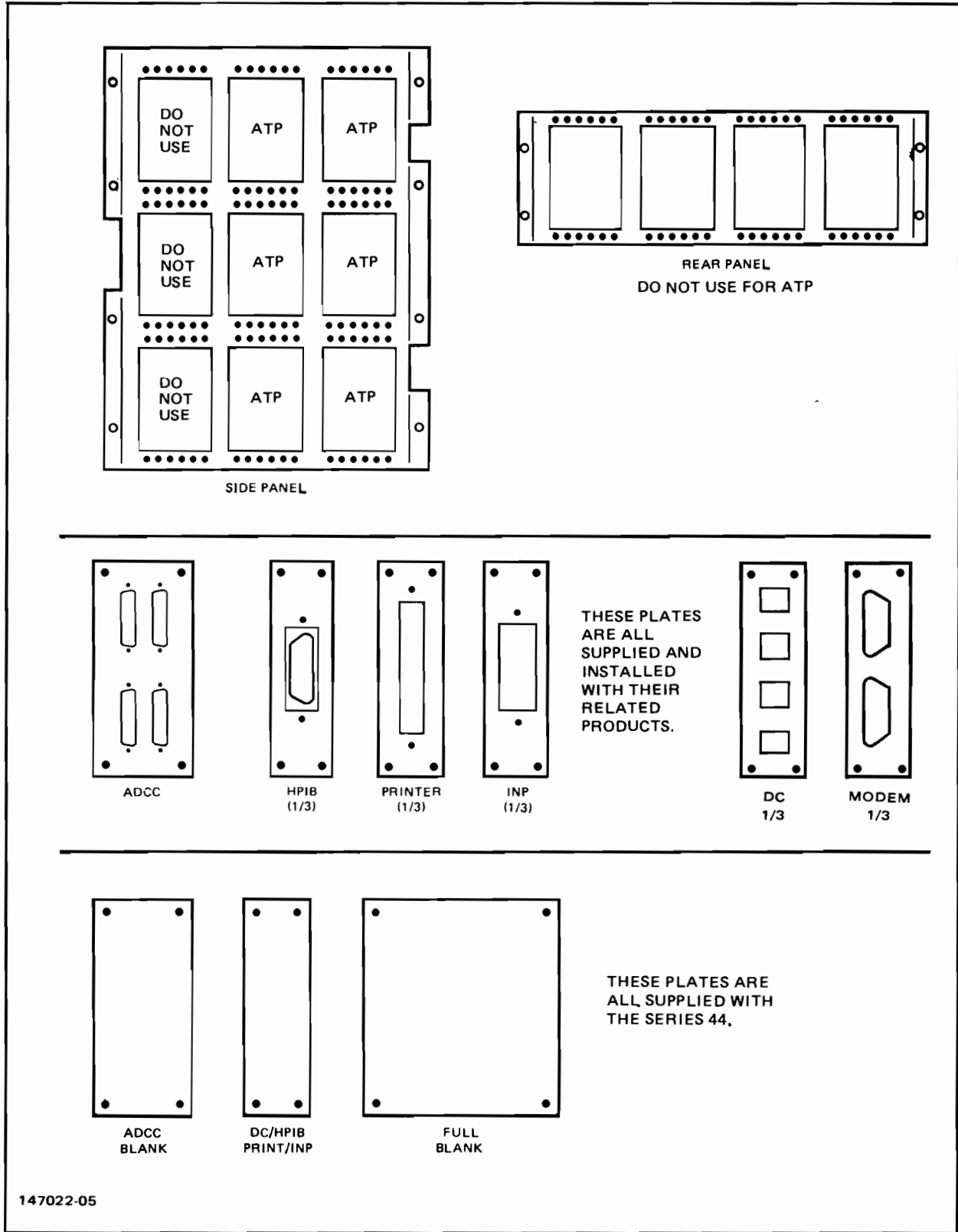


Figure 2-5. Series 44/48 Junction Panels

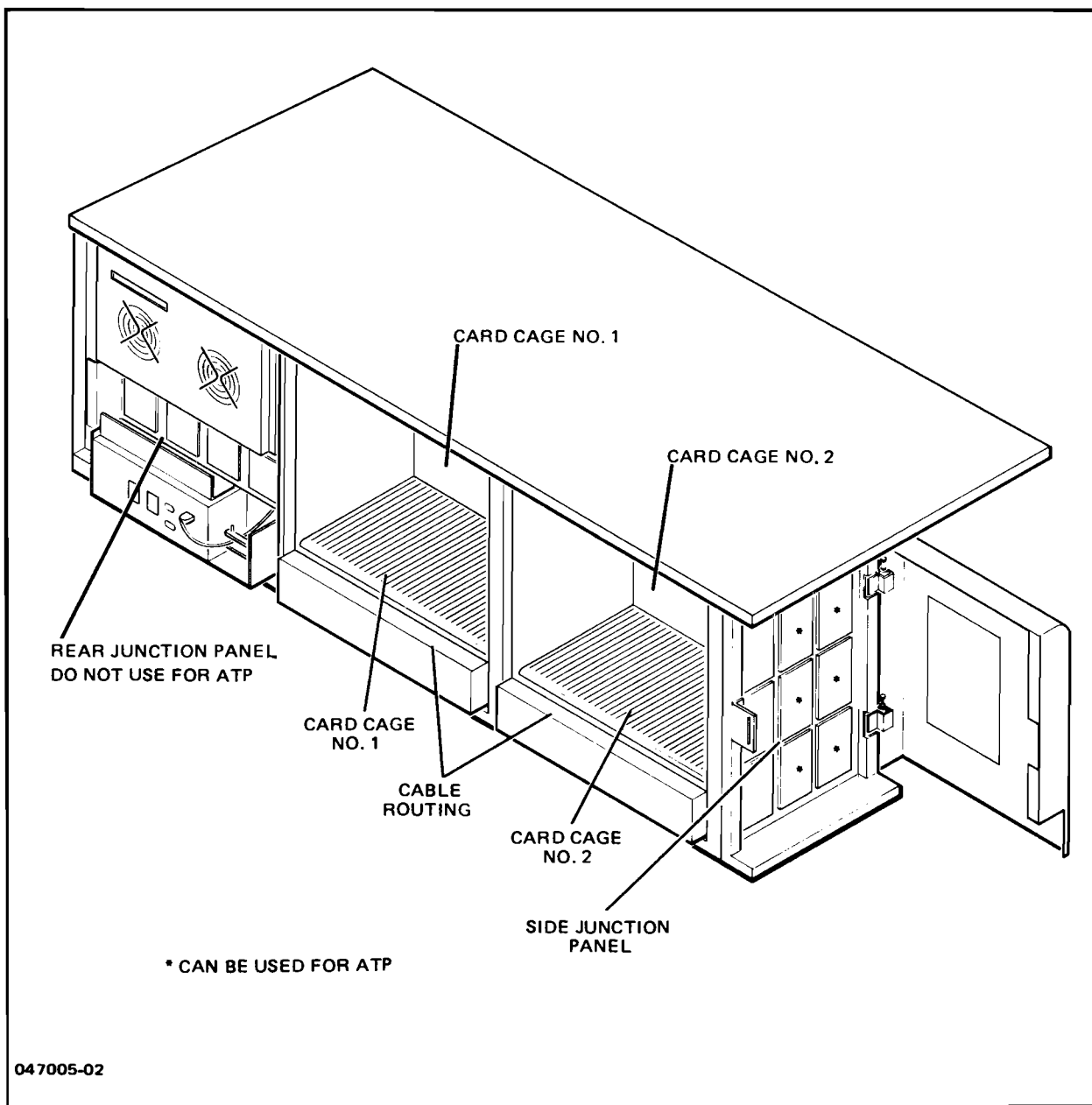


Figure 2-6. Series 44/48 Mainframe (Rear View)

HARDWARE INSTALLATION PROCEDURES FOR THE SERIES 64/68

The following procedures describe the installation of the ATP subsystem hardware in a Series 64/68 system environment.

The following major components are to be installed:

- System Interface Board (SIB) (either 1 or 2 per I/O Bay) - to be installed in the Series 64/68 I/O Card Cage.
- Asynchronous Interface Board (AIB) (1 or more up to 12 per I/O Bay) - to be installed in the Series 6X I/O Card Cage.
- Junction Panel - to be installed in the side opening of the I/O Card Cage.
- Cable Troughs - to be attached to the Junction Panels.

Installing the SIB

In the Series 64/68 environment there can be more than one ATP subsystem, thus, there can be more than one SIB. Since the SIB must be able to communicate with the CPU via the Inter-Module Bus (IMB) it must be physically inserted in a slot of an active IMB (the I/O card cage of a Series 64 has two IMB's). The AIB's, on the other hand, only require power from the I/O card cage backplane. Therefore, if more than one (1) SIB is to be shipped to the customer's site, the factory takes the liberty of assuming that both SIB's are to reside in IMB #1. In this instance, SIB #1 will only have four (4) AIB's associated with it and SIB #4 will have the remaining AIB's associated with it. Making this assumption allows for a variety of combinations of GIC's, INP's, Transactor PCA's, SIB's and AIB's, such that both SIB's can communicate using IMB #1.

This configuration of SIB's holds true for both the Main and Aux I/O Bay's.

NOTE

The user's files should have been backed up by the system manager prior to the beginning of installation.

- a. Ensure that all thumbwheel settings on the SIB(s) and AIB(s) are properly configured. (Refer to the paragraph on ATP thumbwheel switch settings).
- b. Remove the back panel covering the I/O section of the card cage and the far right front panel as shown in the Series 64 Installation Manual, p/n 30140-90007. (see Figure 2-7).
- c. Power down the card cage by setting the POWER SUPPLY BREAKER switch to the OFF position. (See Figure 2-7 for the location of the switch).

WARNING

Power must be OFF in the Card Cage area when inserting or removing PCA boards from the Series 64/68 card cages.

- d. Insert the System Interface Board into a vacant card cage slot within the "channel" range.

On the HP 3000/64/68, the SIB can be installed in any convenient I/O Channel slot where the Flat Ribbon Cable will reach all needed AIB's. The SIB should be placed to the left of all the GIC's installed in the backplane. It also needs to be within 10 slots of another SIB or GIC. The recommended slot for the SIB in a typical installation is slot 12. On a two IMB system, the recommended slot is 17.

- e. Select the channel number according to the configuration matrix in Table 2-2.

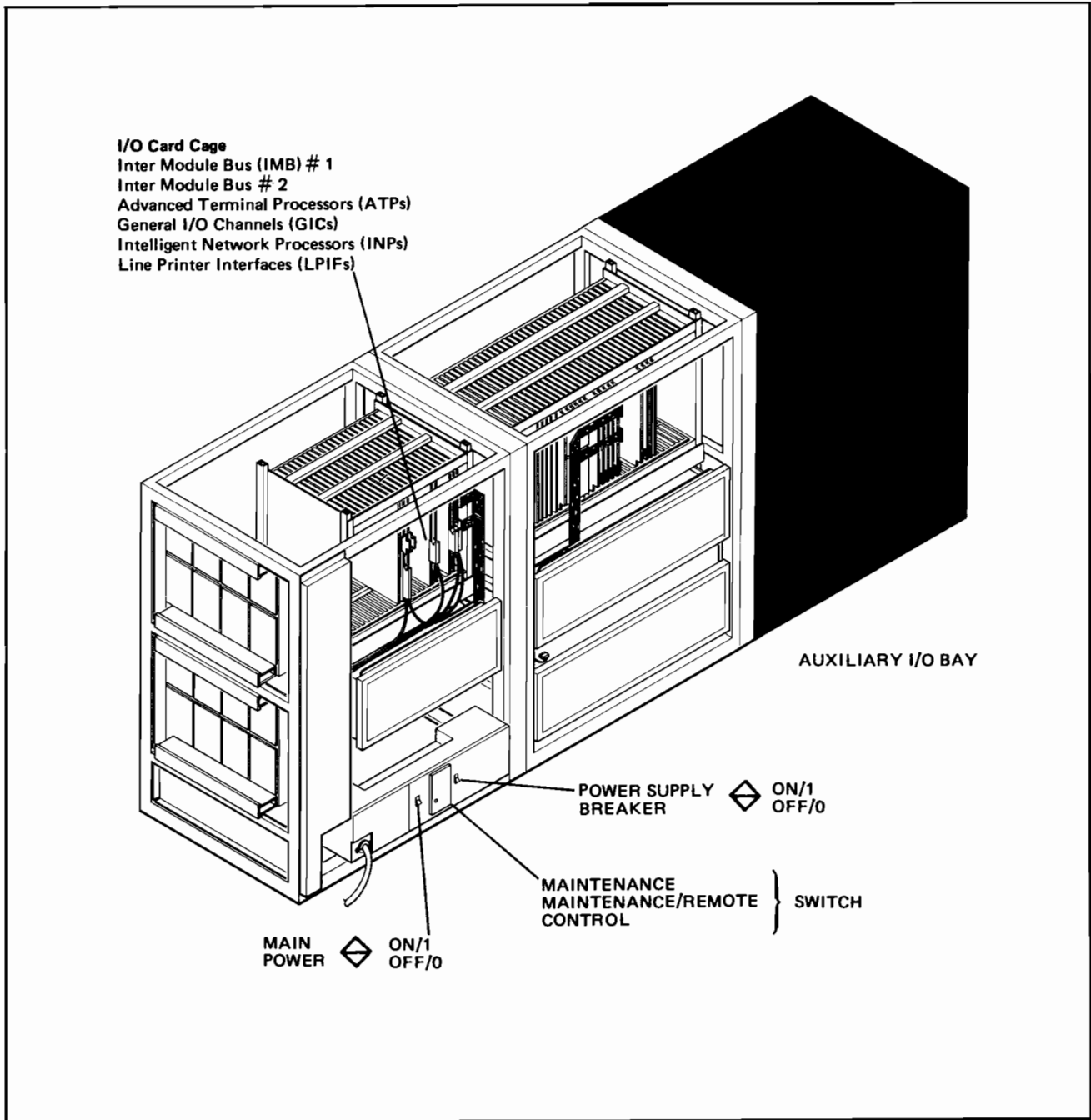


Figure 2-7. Location of Power Breaker Switch and I/O Cage

Installing the AIB

NOTE

Be sure each AIB installed for a particular SIB has a unique thumbwheel switch setting.

- a. Insert the AIB board(s) into a vacant card cage I/O channel slot(s) left of and immediately adjacent to the SIB.
- b. Attach the appropriate gray Flat Ribbon Cable, either 3 connector, 5 connector or 9 connector, from the SIB to all installed AIB's, (see Figure 2-2).
- c. Make sure that the power switch to the Port Connectors is in the OFF position.

NOTE

The first AIB will be cabled differently than subsequently installed AIB's. The cabling is provided by the Series 64/68 and is for the maintenance console and remote diagnostics. (See Series 64 Installation Manual for details). The cabling will originate from the DCU hood connector (see Figure 2-8) and should be installed as follows:

1. Ensure that the small three-pin connector is attached to J18 on the Inter Card Cage Panel. Be aware of this connection when installing the cable to the Port Connector assembly. Too much tension may dislodge and damage the connector.
2. Attach the DCU to AIB cable to the AIB and run the port connector cable out to the port connector assembly.
3. The Remote Diagnostic Interface connector to the remote Junction Panel slot, which is recessed and to the right of the main junction panel array, is factory installed.
4. Detach the AIB Hood Connector from the AIB and proceed to the section on "Installing the Port Connector Assembly".
5. After installing the first Port Connector Assembly, install Console 2642 option 964, to Port 0 of Junction Panel 1 (see Figure 2-11) and run Console self test.

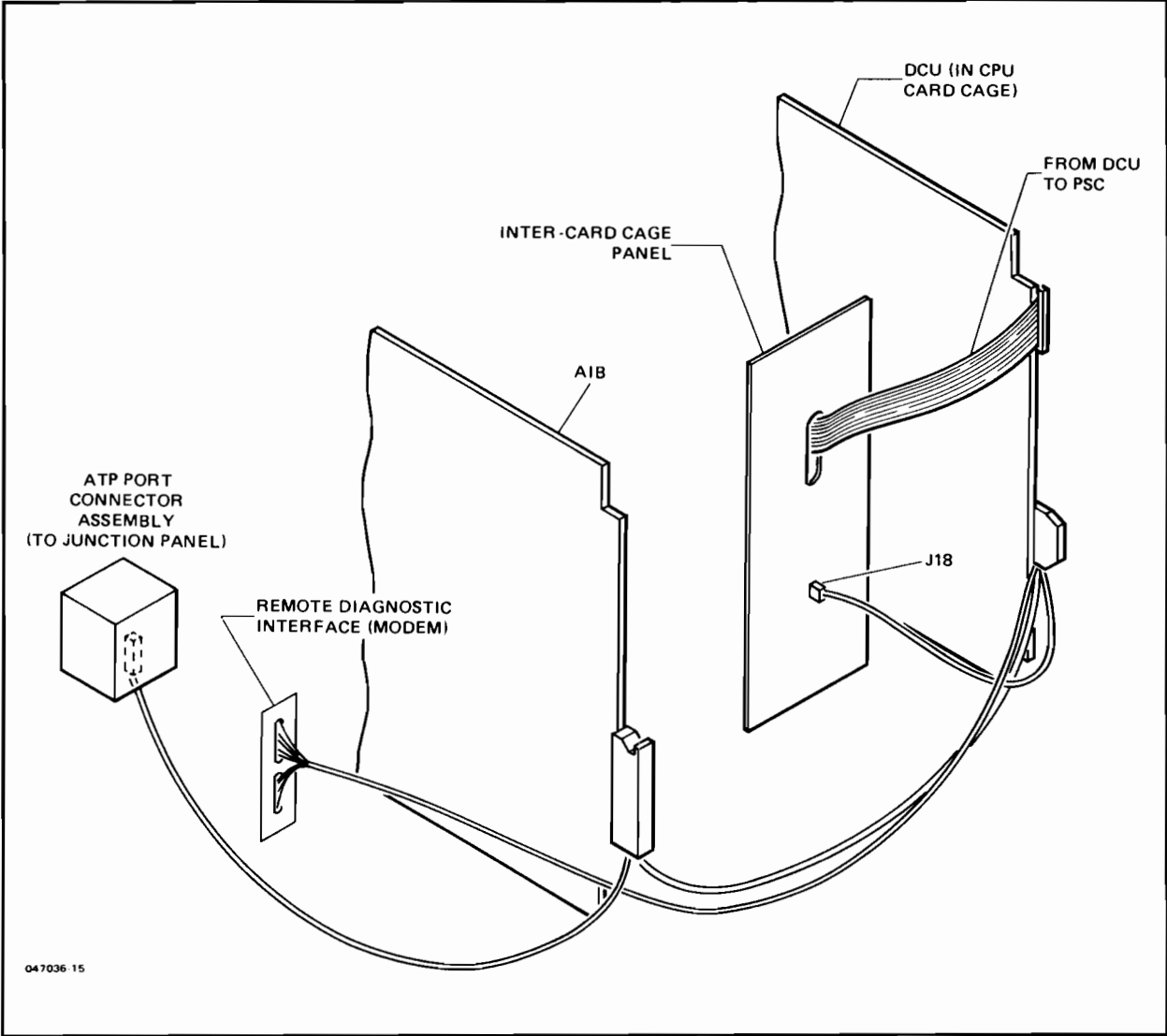


Figure 2-8. Location of DCU Cabling

Installing the Direct Connect Port Connector Assembly

One Direct Connect Port Connector assembly consists of the following:

One top card guide (p/n 30145-00001) with three flathead screws (2360-0182)

One bottom card guide (p/n 30145-00003) with cable relief slot and three flathead screws

One Mother Board (p/n 30145-60003) with four plastic fasteners

Three Mini-Boards and 12 washers and screws (p/n 2360-0115)

One AIB to Port Connector assembly cable and two screws

Install the Port Connector assembly onto the Junction Panels as follows: (see Figure 2-9),

- a. Remove the plate covering the junction panel port cut-out where you plan to install the Port Connector, (See Figure 2-10).
- b. Install the 78 pin connector end of the Port Connector cable (p/n 30145-60004) to Mother Board connector J-1 and attach it with screws from the circuit side of the board.
- c. Attach the top card guide to the top of the Mother Board with two of the plastic fasteners. The top is marked on the Mother Board.
- d. Attach the bottom card guide to the Mother Board with two of the plastic fasteners. Make sure that the cable is inserted through the cable relief slot.
- e. Attach the Mother Board assembly, with the arrow pointing upward, to the port cut-out opening. The recommended procedure is to face the port cut-out and slide the Mother Board assembly through the cut-out making sure that the cable is hanging inside the junction panel. Hold the assembly in place by grasping the cable hood. Place the enclosed flathead screws into the counter sunk holes and tighten.
- f. Slide the Mini-Boards into the card guides and secure to the junction panel cut-out with the enclosed screws and washers.
- g. Attach the Port Connector cable to connector J2 on the AIB, (see Figure 1-1).

Installation

- h. When you have completed installing the ATP subsystem, power on the mainframe, and ensure that the **POWER SUPPLY BREAKER** switch is on.
- i. Power on the Port Connectors via the power switch on the appropriate AIB (see Figure 2-13). On Port 0 on Junction Panel 1, attach Console 2642, option 964 (see Figure 2-11) and run Console self test.

NOTE

For the Auxiliary I/O Bay on the Series 68, Slot 13 is for the INP, Slot 14 is for the INP, Slot 15 is **FULL BLANK**, and Slot 16 is **Three 1/3 BLANKS**. The Auxiliary I/O Bay is rotated 180° from the first I/O Bay.

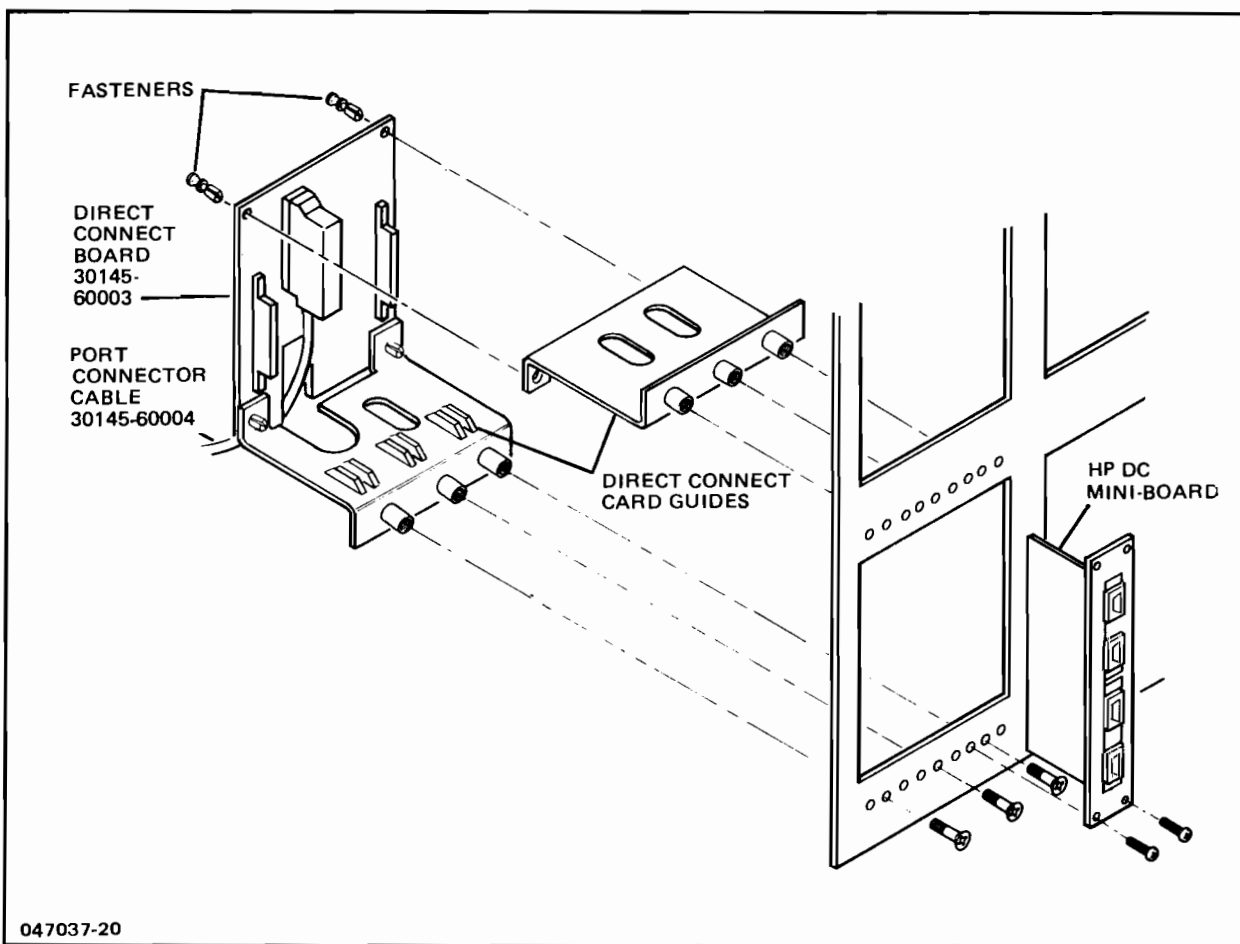


Figure 2-9. Direct Connect Port Connector Assembly and Junction Panel

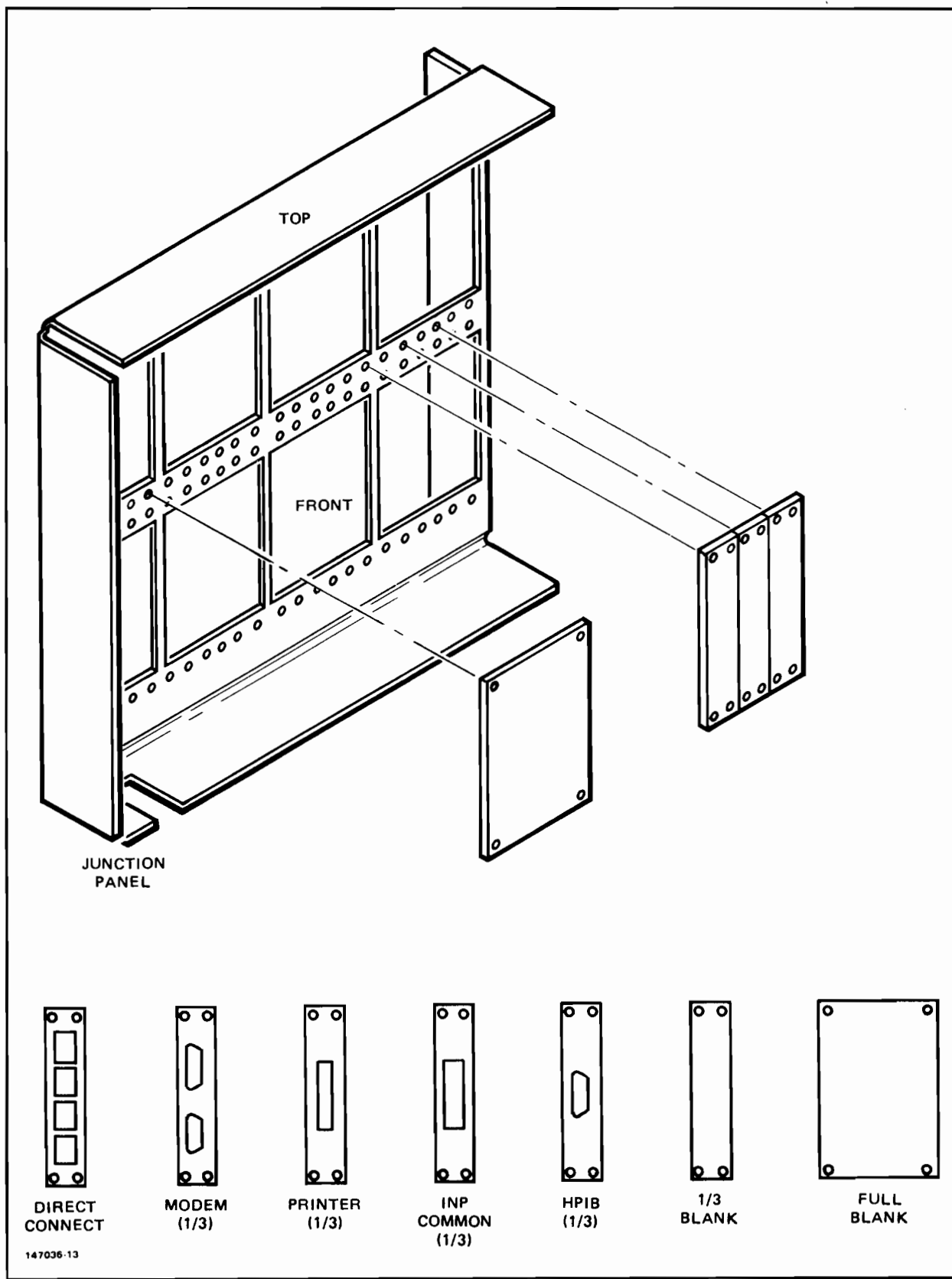


Figure 2-10. Junction Panel and Mounting Plates

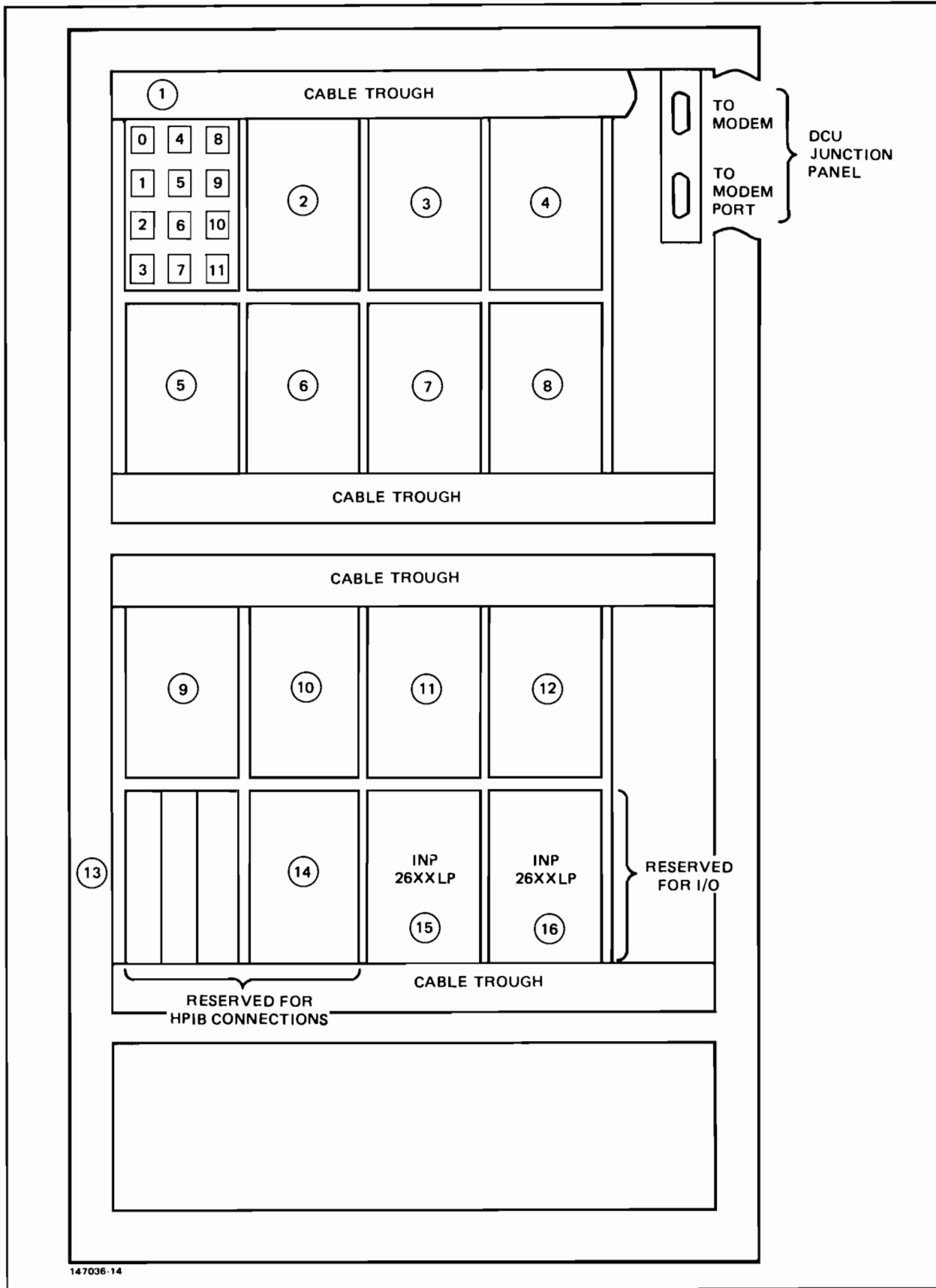


Figure 2-11. Junction Panel Layout

Installing the Modem Connect Port Connector Assembly

One Modem Connect Port Connector assembly consists of the following:

Two identical card guides (p/n 30145-00002) and twelve flathead screws (2360-0182)

One Mother Board (p/n 30145-60002) with eight plastic fasteners

Six Mini-Boards and 24 panhead screws (p/n 2360-0115)

One AIB to Modem Port Connector assembly cable (p/n 30145-60004) and two screws

Install the Port Connector Assembly onto the junction panels as follows: (see Figure 2-12)

- a. Remove two full side-by-side plates covering the port cut outs where you plan to install the Port Connector Assembly, (see Figure 2-10).
- b. Install the 78 pin connector end of the Port Connector cable (p/n 30145-60004) to Mother Board connector J-1 and attach it with screws from the circuit side of the board.
- c. Attach the first card guide to the Mother Board with four of the plastic fasteners.
- d. Attach the second card guide to the Mother Board with four of the plastic fasteners.

NOTE

The Modem Connect Assembly cannot be installed in the same manner as the Direct Conect Assemblies. The Modem Connect Assemblies cannot be placed through the junction panel cut-out and attached. They must be installed as described below:

- e. Remove the right front cover of the mainframe so you can place the Mother Board assembly inside of and flush against the junction panel. Attach the Mother Board assembly, with the cable facing downward through the cable relief slot, to the junction panel port opening. Hold the assembly in place by grasping the cable hood. Place the enclosed flathead screws into the counter sunk holes and tighten.
- f. Slide the Mini-Boards into the card guides and secure to the junction panel cut-out with the enclosed screws.
- g. Attach the Port Connector cable to connector J2 on the AIB, (see Figure 1-1).

Installation

- h. When you have completed installing the ATP subsystem, power on the mainframe and ensure that the **POWER SUPPLY BREAKER** is on.
- i. Power on the Port Connectors via the power switch on the appropriate AIB, (see Figure 2-13).

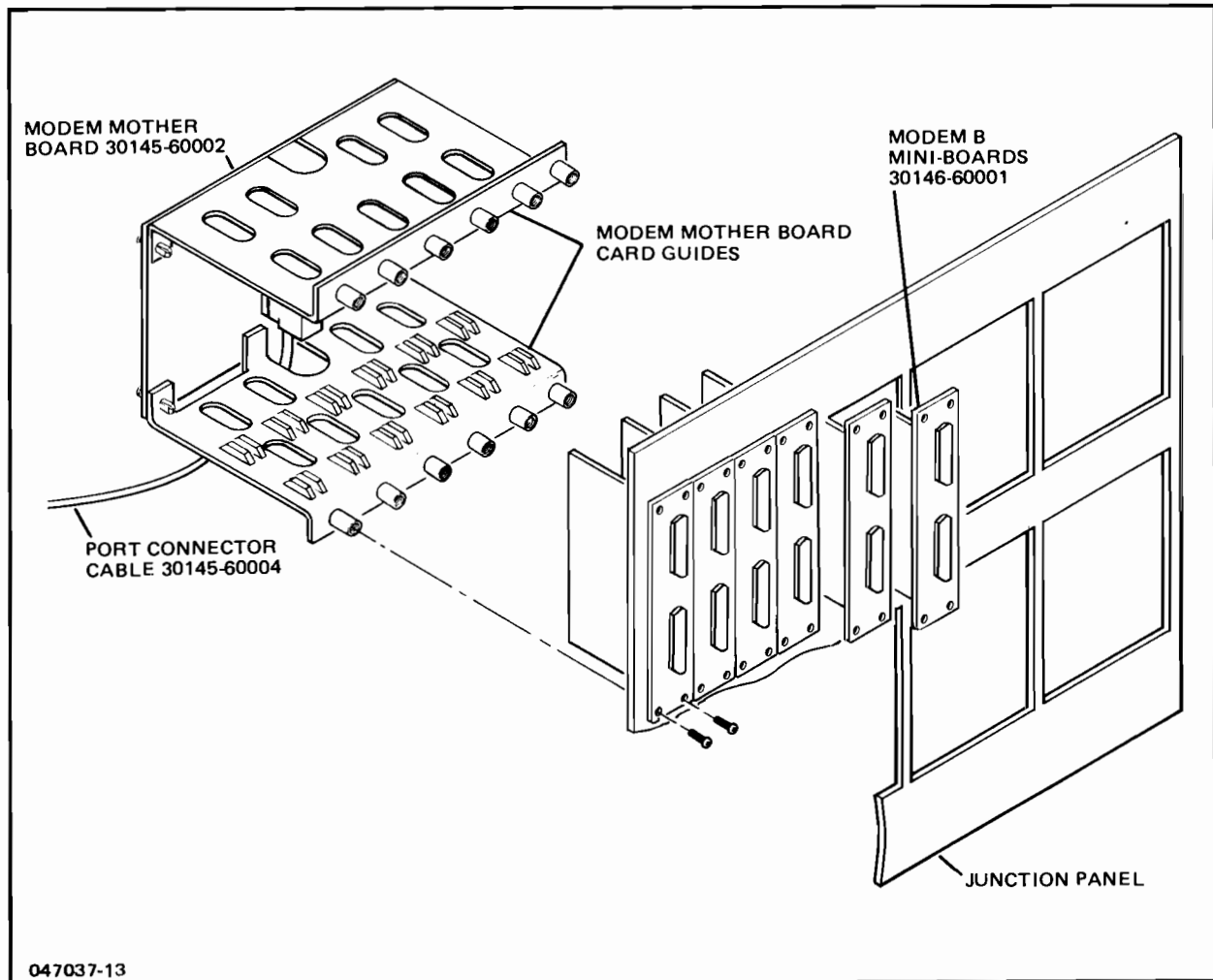


Figure 2-12. Modem Connect Port Connector Assembly and Junction Panel

Installation of Junction Panels

There are two Junction Panels to be installed per I/O Bay; where the first junction panel is to be placed in the lower opening of the side of the I/O card cage and the second side panel is to be placed in the upper opening of the side of the I/O card cage (refer to Figure 2-10 for orientation). Figure 2-11 provides a view of Junction Panel with the correct orientation previous to inserting into the I/O card cage openings. (Note that for the Auxiliary I/O Bay, the junction panels are rotated 180°). Keeping these two figures in mind, perform the following procedure:

1. Determine which of the two junction panels is the first side panel by:
 - Locating the system console ATP junction panel which will have the first mini board (located top left) marked as shown below, (Figure 2-13),
 - assuring that the AIB/JP cable is not attached for this junction panel assembly (this junction panel will be using the DCU AIB/JP cable shipped with the Series 64/68),
 - assuring that the bottom row of cutouts contain "1/3 BLANK" cover plates and "FULL BLANK" cover plates, which will be removed later in order to insert HP-IB junction panel connections.



NOTE

All junction panel assemblies must have an AIB/JP cable connected to them on the AUX I/O side panels, otherwise they are identical to the main I/O side panels.

2. Run AIB/JP cables through the I/O card cage lower opening and then to the right such that the AIB/JP cables now protrude out the rear of the Series 64 I/O card cage (refer to Figure 2-7).
3. Seat the Junction Panel appropriately and attach to the opening with the 12 screws provided (P/N 2680-0274) (3 for the top, 3 for the left side, 3 for the right side, and 3 for the bottom).
4. Remove the mini boards for the system console (junction panel). If the console junction panel is a Direct Connect then remove the left most and the middle mini boards. If it is a Modem Connect then remove the mini boards marked "PORTS" 4/5, and 6/7.
5. Locate the mother board end of the DCU AIB/JP cable (it should be already attached to the DCU and to the rear of the Remote Console Modem port (see Figure 2-8)).
6. Insert the mother board end (78-pin subminiature D) of the DCU AIB/JP cable through the cable opening made by the bottom of the Mother Board and the lower card guide and attach with the screws provided (2200-0514).
7. Re-insert the system console junction panel mini boards and attach with the earlier removed screws.

NOTE

It is possible that there will be no ATP junction panels pre-assembled into the top junction panel opening in the I/O Bay, or into the second set of junction panels if an Option 003 is ordered. If so, merely install the rest of the junction panels as per step 3.

- 8. Run the AIB/JP cables of the Second Junction Panel through the upper opening of the side of the I/O card cage and then to the right such that these cables also protrude out the rear of the I/O card cage.
- 9. Attach the second Junction Panel as in step 3.
- 10. Locate the AIB end of the DCU AIB/JP cable for the system console junction panel and attach it to the AIB #0 that is connected to SIB #1.
- 11. Attach the Cable Troughs (quantity 4, 2/panel) in the locations shown in Figure 2-1 with the screws (4/trough) P/N 2510-0301 and washers P/N 3050-0139 provided.

NOTE

The AIB/JP cables should not have been connected yet. This omission is necessary to facilitate the following verification procedures.

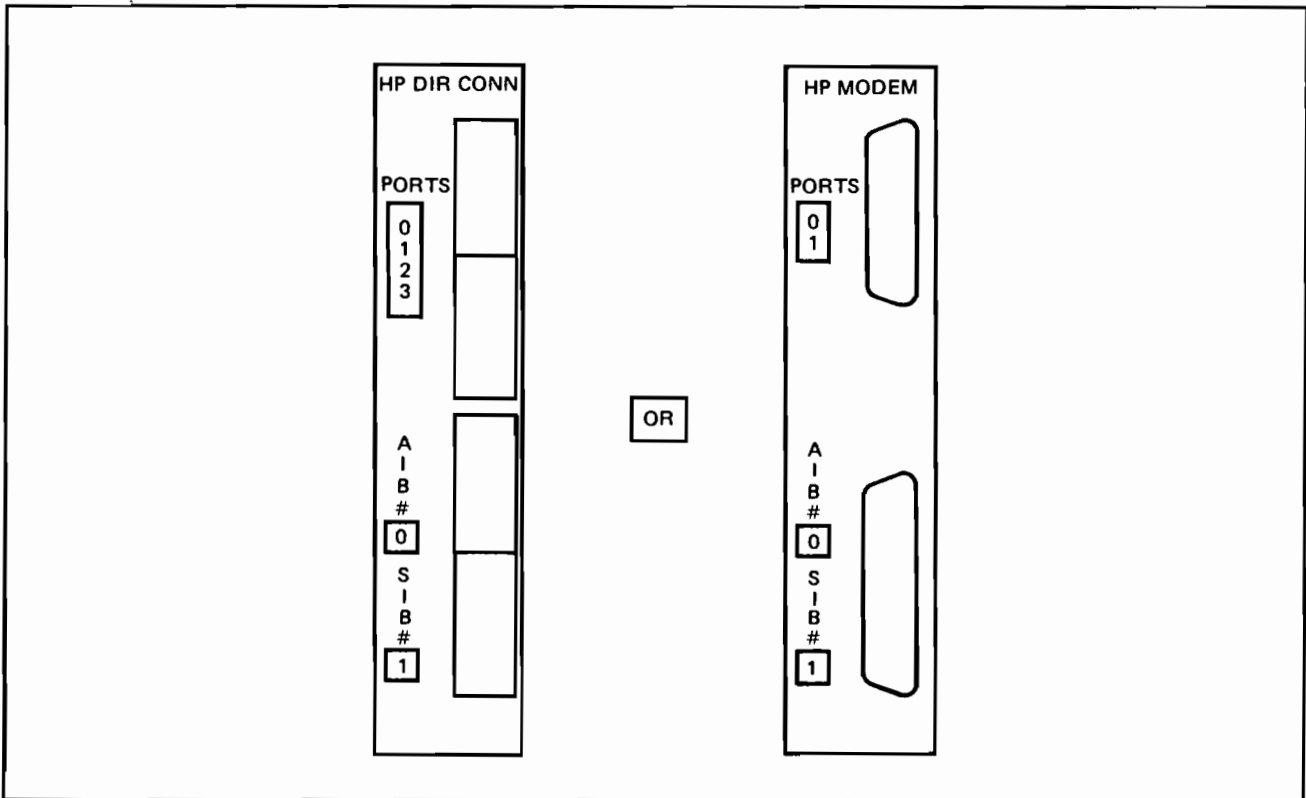


Figure 2-13. Direct Connect or Modem Connect Junction Panel

HARDWARE INSTALLATION VERIFICATION

To verify that the ATP has been correctly installed and that it now functions properly:

- a. Turn on the power.

On the HP 3000 Series 44/48, return the PROCESSOR switch to the ON position.

On the HP 3000 Series 64/68, return the POWER SUPPLY BREAKER switch to the ON position.

Power on the Port Connectors via the AIB power switch.

- b. Flip the reset test switch on the edge of the AIB to manually reset the AIB so that the self test can be initiated. All LEDs should be off and if any remain on, the board is malfunctioning. To initiate the self test, use a screwdriver or a similar tool to short together Test Point 5 and Test Point 7, (see Figure 2-14).
- c. All the light-emitting-diode (LED) indicators (Figure 2-13) on the front plane will blink on and off in sequence. If no LEDs remain lit, then no errors have been detected. If any LEDs remain lit, the AIB is malfunctioning.
- d. If the self-test is unsuccessful, replace the AIB.
- e. If the self-test is successful, screw the back panel onto the computer. The system is now ready for operation.
- f. Plug the console into port 0 of AIB 0 on Junction Panel 1, (see Figure 2-11).
- g. Load the Diagnostic Utility System (DUS) and run I/O MAP and ATP diagnostic ATPDIAG. On the Series 64/68, run the Fault Locating Diagnostic's I/O Map, (refer to Series 64 DUS manual, Part Number 32342-60001, Series 44 DUS manual, Part Number 30070-90043 and ATP Off-Line Diagnostic Manual, Part Number 30144-90003).

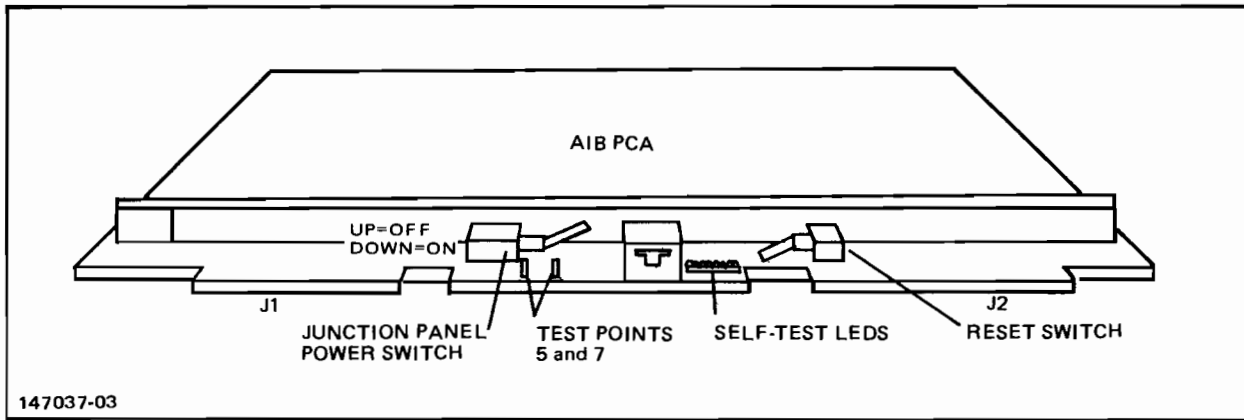


Figure 2-14. Self-test Switch and LED Indicators

SOFTWARE INSTALLATION PROCEDURES FOR SERIES 44/48

Load the operating system as per instructions in the Console Operator's Guide, part number 32002-90004. After the ATP hardware has been installed, all that needs to be done is to configure the appropriate number of ports for the user's requirements during a RELOAD or a cool start from the MIT. Once this has been completed, have the customer perform a 0 date SYSDUMP to permanently protect his I/O configuration and initial software installation.

Table 2-3. I/O Configuration For Series 44/48

LOG DEV #	DRT #	U N I T	C H A P T E R	SUB TYPE	TERMINAL TYP	SPE	PRO	REC WIDTH	OUTPUT DEV	MODE	DRIVER NAME	DEVICE CLASSES
1	89	0	0 0	9				128	0		HIOMDSC1	SYSDISC DISC SPOOL
3	89	1	0 0	9				128	0		HIOMDSC1	SYSDISC DISC SPOOL
6	82	0	0 32	2				66	0	S	HIOLPRT2	LP FASTLP SLOWLP SMALLPAP
7	73	0	0 24	0				128	0		HIOTAPE0	TAPE DDUMP
8	73	1	0 24	0				128	0		HIOTAPE0	TAPE
9	73	2	0 24	0				128	0		HIOTAPE0	TAPE
10	73	3	0 24	0				128	LP	JA	HIOTAPE0	JOBTAPE
20	32	0	0 16	0	10	960	0	40	20	JAID	HIOTERMO	TERM
21	33	0	0 16	0	10	240	0	40	21	JAID	HIOTERMO	TERM
22	34	0	0 16	0	10	240	0	40	22	JAID	HIOTERMO	TERM
23	35	0	0 16	0	10	240	0	40	23	JAID	HIOTERMO	TERM
24	36	0	0 16	0	10	240	0	40	24	JAID	HIOTERMO	TERM
25	37	0	0 16	0	10	240	0	40	25	JAID	HIOTERMO	TERM
26	38	0	0 16	0	10	240	0	40	26	JAID	HIOTERMO	TERM
27	39	0	0 16	0	10	240	0	40	27	JAID	HIOTERMO	TERM
28	16	0	0 16	4	10	960	0	40	28	JAID	HIOTERMO	TERM
29	17	0	0 16	0	10	240	0	40	29	JAID	HIOTERMO	TERM
30	18	0	0 16	4	10	960	0	40	30	JAID	HIOTERMO	TERM
31	19	0	0 16	1	10	120	0	40	31	JAID	HIOTERMO	TERM
32	20	0	0 16	4	10	960	0	40	32	JAID	HIOTERMO	TERM
33	21	0	0 16	4	10	960	0	40	33	JAID	HIOTERMO	TERM
34	22	0	0 16	0	13	120	0	40	34	JAID	HIOTERMO	HP2601 PRINTER
61	86	0	0 17	3				0	0		IOINPO	INP1
62	87	0	0 17	1				0	0		IOINPO	INP2
70	#61	0	0 41	0				128	0	I	IODSO	PIRANHA PIR
71	#61	0	0 16	0	??	240	0	40	71	J ID	IODSTRMO	DSHTERM
72	#61	0	0 16	0	??	240	0	40	72	J ID	IODSTRMO	DSHTERM
73	#61	0	0 16	0	??	240	0	40	73	J ID	IODSTRMO	DSHTERM
74	#61	0	0 16	0	??	240	0	40	74	J ID	IODSTRMO	DSHTERM
75	#61	0	0 16	0	??	240	0	40	75	J ID	IODSTRMO	DSHTERM
76	#61	0	0 16	0	??	240	0	40	76	J ID	IODSTRMO	DSHTERM
77	#61	0	0 16	0	??	240	0	40	77	J ID	IODSTRMO	DSHTERM
78	#61	0	0 16	0	??	240	0	40	78	J ID	IODSTRMO	DSHTERM
80	#62	0	0 41	0				128	0	I	IODSO	MORK
81	#62	0	0 16	0	??	240	0	40	81	J ID	IODSTRMO	DSHTERM
82	#62	0	0 16	0	??	240	0	40	82	J ID	IODSTRMO	DSHTERM
83	#62	0	0 16	0	??	240	0	40	83	J ID	IODSTRMO	DSHTERM
84	#62	0	0 16	0	??	240	0	40	84	J ID	IODSTRMO	DSHTERM
85	#62	0	0 16	0	??	240	0	40	85	J ID	IODSTRMO	DSHTERM
86	#62	0	0 16	0	??	240	0	40	86	J ID	IODSTRMO	DSHTERM
87	#62	0	0 16	0	??	240	0	40	87	J ID	IODSTRMO	DSHTERM
88	#62	0	0 16	0	??	240	0	40	88	J ID	IODSTRMO	DSHTERM
100	8	0	0 16	0	10	960	0	40	100	JAID	HIOTERMO	ATPTERM
101	8	1	0 16	0	10	960	0	40	101	JAID	HIOTERMO	ATPTERM
102	8	2	0 16	0	10	960	0	40	102	JAID	HIOTERMO	ATPTERM
103	8	3	0 16	0	10	960	0	40	103	JAID	HIOTERMO	ATPTERM
104	8	4	0 16	0	10	960	0	40	104	JAID	HIOTERMO	ATPTERM
105	8	5	0 16	0	10	960	0	40	105	JAID	HIOTERMO	ATPTERM
106	8	6	0 16	0	10	960	0	40	106	JAID	HIOTERMO	ATPTERM
107	8	7	0 16	0	10	960	0	40	107	JAID	HIOTERMO	ATPTERM
108	8	8	0 16	0	10	960	0	40	108	JAID	HIOTERMO	ATPTERM
109	8	9	0 16	0	10	960	0	40	109	JAID	HIOTERMO	ATPTERM
110	8	10	0 16	0	10	960	0	40	110	JAID	HIOTERMO	ATPTERM
111	8	11	0 16	0	10	960	0	40	111	JAID	HIOTERMO	ATPTERM
112	8	12	0 16	1	10	960	0	40	112	JAID	HIOTERMO	MODEM
113	8	13	0 16	0	10	960	0	40	113	JAID	HIOTERMO	ATPTERM
114	8	14	0 16	0	10	960	0	40	114	JAID	HIOTERMO	ATPTERM
115	8	15	0 16	0	10	960	0	40	115	JAID	HIOTERMO	ATPTERM
116	8	16	0 16	0	10	960	0	40	116	JAID	HIOTERMO	ATPTERM
117	8	17	0 16	0	10	960	0	40	117	JAID	HIOTERMO	ATPTERM
118	8	18	0 16	0	10	960	0	40	118	JAID	HIOTERMO	ATPTERM
119	8	19	0 16	0	10	960	0	40	119	JAID	HIOTERMO	ATPTERM
120	8	20	0 16	0	10	960	0	40	120	JAID	HIOTERMO	ATPTERM
121	8	21	0 16	0	10	960	0	40	121	JAID	HIOTERMO	ATPTERM
122	8	22	0 16	0	10	960	0	40	122	JAID	HIOTERMO	ATPTERM
123	8	23	0 16	0	10	960	0	40	123	JAID	HIOTERMO	ATPTERM

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SOFTWARE INSTALLATION PROCEDURES FOR SERIES 64/68

NOTE

The following procedures assume that the ATP software has been integrated into the Series 64/68 Master Installation Tape (MIT).

After the ATP hardware has been installed, all that needs to be done is to configure the appropriate number of ports for the user's requirements during a RELOAD or a COOLSTART from the MIT. Once this has been completed, have the customer perform a 0 date SYSDUMP to protect his I/O configuration and initial software installation.

Insert the appropriate key into the Key Switch and turn it to the CONTROL position on the PCM (see Figure 2-7). For detailed information, see Series 64 Installation Manual, p/n 30140-90007.

- a. Enter CONTROL B. The system will respond with a (C>) prompt.
- b. Verify the banner for the correct IMB number, CHANNEL number, and DEVICE number of the magnetic tape drive. It is the top line, inverse video (LOAD X,XX,X).
- c. Enter LOAD. The system will respond with the following messages:
LOADING INIT/IDENT MICROCODE
LOADING DEVICE MICROCODE
LOADING SYSTEM MICROCODE
(SYSTEM IDENTIFICATION)
WHICH OPTION-COLDSTART/RELOAD/UPDATE? (RELOAD)
WHICH OPTION SPREAD/COMPACT/RESTORE/ACCOUNTS/
NULL? (CR)
- d. Answer the following questions as indicated: (For more information, see System Supervisor/System Manager Reference Manual (p/n 30000-90014), or MPE V System Operation and Resource Management Reference Manual (p/n 32033-90005)).

NOTE

Answers are in parenthesis. Also, the DRT# is calculated as follows: $(IMBI \times 128) + (CHANNEL\# \times 8) + DEVICE\# = DRT$. Where: IMBI = 0 or 1 (first IMBI always 0) CHAN# = 1 or 4 (1 is the first ATP subsystem and 4 is the second ATP subsystem installed) DEVICE# = always 0.

Table 2-4. I/O Configuration for Series 64

LOG DEV #	DRT #	U . N I T	C H A P T E R	SUB TYPE	TERMINAL TYP	SPE	PRO	REC WIDTH	OUTPUT DEV	MODE	DRIVER NAME	DEVICE CLASSES
1	25	0	0	0	9			128	0		HIOMDSC1	DISC SPOOL SYSDISC
2	26	0	0	0	9			128	0		HIOMDSC1	DISC SPOOL SDISC
3	25	1	0	0	9			128	0		HIOMDSC1	DISC SPOOL
4	26	1	0	0	9			128	0		HIOMDSC1	DISC SPOOL
5	26	2	0	0	8			128	0		HIOMDSC1	SDISC PVDISC
6	24	0	0	32	2			66	0	S	HIOLPRT2	LP EPOC PP SMALLPAP SLOWLP
7	17	0	0	24	0			128	0		HIOTAPE0	TAPE DDUMP
8	17	1	0	24	0			128	0		HIOTAPE0	TAPE
9	17	2	0	24	15			128	0		HIOTAPE0	TAPE TAPE9
10	17	3	0	24	0			40	LP	J	HIOTAPE0	JOBTAPE
20	8	0	0	16	0	10	960	0	40	20	JAID	HIOTERM1 ATPTERM
21	8	1	0	16	0	10	960	0	40	21	JAID	HIOTERM1 ATPTERM
22	8	2	0	16	0	10	960	0	40	22	JAID	HIOTERM1 ATPTERM
23	8	3	0	16	0	10	960	0	40	23	JAID	HIOTERM1 ATPTERM
24	8	24	0	16	0	10	960	0	40	24	JAID	HIOTERM1 ATPTERM
25	8	4	0	16	0	10	960	0	40	25	JAID	HIOTERM1 ATPTERM
26	8	6	0	16	0	10	960	0	40	26	JAID	HIOTERM1 ATPTERM
27	8	7	0	16	0	10	960	0	40	27	JAID	HIOTERM1 ATPTERM
28	8	8	0	16	0	10	960	0	40	28	JAID	HIOTERM1 ATPTERM
29	8	9	0	16	0	10	960	0	40	29	JAID	HIOTERM1 ATPTERM
30	8	10	0	16	0	10	960	0	40	30	JAID	HIOTERM1 ATPTERM
31	8	11	0	16	0	10	960	0	40	31	JAID	HIOTERM1 ATPTERM
32	8	12	0	16	0	10	960	0	40	32	JAID	HIOTERM1 ATPTERM
33	8	13	0	16	0	10	960	0	40	33	JAID	HIOTERM1 ATPTERM
34	8	14	0	16	0	10	960	0	40	34	JAID	HIOTERM1 ATPTERM
35	8	15	0	16	0	10	960	0	40	35	JAID	HIOTERM1 ATPTERM
36	8	16	0	16	0	10	960	0	40	36	JAID	HIOTERM1 ATPTERM
37	8	17	0	16	0	10	960	0	40	37	JAID	HIOTERM1 ATPTERM
38	8	18	0	16	0	10	960	0	40	38	JAID	HIOTERM1 ATPTERM
39	8	19	0	16	0	10	960	0	40	39	JAID	HIOTERM1 ATPTERM
40	8	20	0	16	0	10	960	0	40	40	JAID	HIOTERM1 ATPTERM
41	8	21	0	16	0	10	960	0	40	41	JAID	HIOTERM1 ATPTERM
42	8	22	0	16	0	10	960	0	40	42	JAID	HIOTERM1 ATPTERM
43	8	23	0	16	0	10	960	0	40	43	JAID	HIOTERM1 ATPTERM
44	8	24	0	16	0	10	960	0	40	44	JAID	HIOTERM1 ATPTERM
45	8	25	0	16	0	10	960	0	40	45	JAID	HIOTERM1 ATPTERM
46	8	26	0	16	0	10	960	0	40	46	JAID	HIOTERM1 ATPTERM
47	8	27	0	16	0	10	960	0	40	47	JAID	HIOTERM1 ATPTERM
48	8	28	0	16	0	10	960	0	40	48	JAID	HIOTERM1 ATPTERM
49	8	29	0	16	0	10	960	0	40	49	JAID	HIOTERM1 ATPTERM
50	8	30	0	16	0	10	960	0	40	50	JAID	HIOTERM1 ATPTERM
51	8	31	0	16	0	10	960	0	40	51	JAID	HIOTERM1 ATPTERM
52	8	32	0	16	0	10	960	0	40	52	JAID	HIOTERM1 ATPTERM
100	27	0	0	17	3			0	0		IOINPO	INP1
101#100	0	0	0	41	0			128	0	I	IODSO	DAG DAGGWOOD
102#100	0	0	0	16	0	10	240	0	40	102	JAID	IODSTRMO DAGTERM
103#100	0	0	0	16	0	10	240	0	40	103	JAID	IODSTRMO DAGTERM
104#100	0	0	0	16	0	10	240	0	40	104	JAID	IODSTRMO DAGTERM
105#100	0	0	0	16	0	10	240	0	40	105	JAID	IODSTRMO DAGTERM
106#100	0	0	0	16	0	10	240	0	40	106	JAID	IODSTRMO DAGTERM
107#100	0	0	0	16	0	10	240	0	40	107	JAID	IODSTRMO DAGTERM
108#100	0	0	0	16	0	10	240	0	40	108	JAID	IODSTRMO DAGTERM
109#100	0	0	0	16	0	10	240	0	40	109	JAID	IODSTRMO DAGTERM
110#100	0	0	0	16	0	10	240	0	40	110	JAID	IODSTRMO DAGTERM
111#100	0	0	0	16	0	10	240	0	40	111	JAID	IODSTRMO DAGTERM
112#100	0	0	0	16	0	10	240	0	40	112	JAID	IODSTRMO DAGTERM
113#100	0	0	0	16	0	10	240	0	40	113	JAID	IODSTRMO DAGTERM
114#100	0	0	0	16	0	10	240	0	40	114	JAID	IODSTRMO DAGTERM
115#100	0	0	0	16	0	10	240	0	40	115	JAID	IODSTRMO DAGTERM
116#100	0	0	0	16	0	10	240	0	40	116	JAID	IODSTRMO DAGTERM

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Installation

ANY CHANGES? (YES)
LOAD MAP? (CR)
SYSTEM ID=ICF/55 C.XX.XX? (CR)
MEMORY SIZE=512.? (CR)
I/O CONFIGURATION CHANGES? (YES)
LIST I/O DEVICES? (YES)
LIST CS DEVICES? (CR)
HIGHEST DRT=127. (CR)
* LOGICAL DEVICE NUMBER? (ENTER UNIQUE LDEV#)
DRT NUMBER? (ENTER APPROPRIATE DRT#)
UNIT NUMBER? (ENTER A UNIQUE UNIT NUMBER FROM 0-95)
SOFTWARE CHANNEL NUMBER? (0)
TYPE? (16 (Terminal) OR 32 (Remote) (REMOTE SPOOLED
PRINTER))
SUB TYPE? (0)
TERM TYPE? (PICK APPROPRIATE TERM TYPE (For systems running
on MPE V (Version G.00.00 or later) the prompt
will be:
ENTER [TERMTYPE #], [DESCRIPTOR FILENAME] ?
SPEED IN CHARACTERS PER SECOND? (ENTER APPROPRIATE SPEED)
PROTOCOL? (CR) (NOT APPLICABLE FOR ASYNCHRONOUS DEVICES
AS INDICATED BY TYPE ENTRY)
RECORD WIDTH? (40 OR 66 (REMOTE SPOOLED PRINTER))
OUTPUT DEVICE? (ENTER SAME LDEV AS ABOVE OR "0" FOR
PRINTERS)
ACCEPT JOB/SESSIONS? (YES)
ACCEPT DATA? (YES)
INTERACTIVE? (YES)
DUPLICATIVE? (YES)
INITIALLY SPOOLED? (CR)
DRIVER NAME? HIO ?
DEVICE CLASSES? (ENTER ANY 8 CHARACTER NAME)

- * Once you have completed entering the I/O Configuration information for all devices, ensure that the maximum data segment size is large enough to accommodate the required number of TBUFS/LDEVs configured. Use the following algorithm to compute the maximum data segment size:

$$\text{MAXDATASEG} - (\text{TDSOVRHD} + (\#\text{LDEV} * 26) + (\#\text{PORTS} * 138)) =$$
$$\text{TBUFAREA} / 69 = \#\text{TBUF ENTRIES POSSIBLE}$$

MAXDATASEG - Initialization procedure automatically obtains an extra data segment size of 32760. If memory is fragmented, the ATP initialization procedure will obtain something smaller but not necessarily large enough to contain all requested TBUFS. In this instance, a message is outputted to the console informing the user of this situation.

TDSOVRHD - THE TERMINAL DATA SEGMENT (TDS) OVERHEAD IN WORDS
CURRENTLY = 1249 WORDS.

TBUFAREA - THE AREA REMAINING IN THE TDS THAT MAY BE ASSIGNED
TO THE TBUF ENTRIES OF 69 WORDS EACH.

ATP I/O CONFIGURATION CONSIDERATIONS

The following considerations support the maximum performance of an ATP subsystem in a Series 44/64 operating system environment:

- a. Configure in 1 timer per port. Not enough timers will cause hangs or halts after date and time.
- b. Configure 5 TBUFS per port for a minimum of 24 ports to support faster data transfer rates within the system. Four TBUFS per port are recommended for configured ports 24 through 50; 3 TBUFS per port are recommended for over 50 ports configured. The default automatically configured is 24 TBUFS.

INSTALLATION VERIFICATION PROCEDURES

The following procedures are applicable for the Series 44/48 and the Series 64/68. (TERMDSM.PUB.SYS should be used with systems that are currently running with MPE V (version G.00.00 or later) operating system. If you are on MPE V (version E.00.00 or F.00.00 or earlier) refer to ATPDSM.PUB.SYS).

- a. Run the ATPDSM/TERMDSM diagnostic program by entering the following:

```
RUN ATPDSM.PUB.SYS or RUN TERMDSM.PUB.SYS
```

The system responds with a (->) prompt.

- b. Enter BROKEN (cr). The system responds by outputting all LDEV numbers which have their BROKEN or UNFIXABLE bit set in their associated Logical Monitor DIT.

If an LDEV has its UNFIXABLE bit set, there is probably an I/O configuration problem (i.e, unit # is greater than 127, wrong driver name configured, more than one LDEV configured for a particular port (unit #), non responding modem port MSC).

If an LDEV has its BROKEN bit set, one of the following problems may have occurred:

- Port configured on a missing AIB, unfixable
- ATP initiator program can't build the ATP data segment, unfixable
- Self test on PCC failed, unfixable
- Can't get to the speed sense state for this port, not enough timers. Correct this problem by adding more timers.

- c. If UNFIXABLE bit set, re-verify and correct the I/O configuration for terminal I/O.

MULTIPLE ATP INSTALLATIONS

For additional data communication capability, two ATP subsystems can be installed in an HP 3000 Series 64 Computer System. Due to space limitations within the card cage, only a partial ATP subsystem (one SIB and five AIB's) can be installed in the HP 3000 Series 44.

After the first ATP subsystem has been installed, subsequent ATP subsystems are installed by following the same procedures as outlined in the previous paragraphs in this section. Any available card slot within the specified range can be used, since each ATP's address is determined by the setting of its thumbwheel switch, rather than by the card slot it occupies.

LIST OF SUPPORTED TERMINALS

- 2382
- 262x series
- 2631B
- 2635 series
- 264x series (except 2641 APL)
- 375x series

LABEL INSTALLATION

Packaged with the AIB are sheets of labels which are to be attached to the Port Connector cable hood and the Mini-Boards. Each label is to be placed on a specific piece of hardware as is explained below.

"ATP-AIB/Junction Panel Cable" is printed onto the port connector cable hood which is on the AIB.

AIB# 0, CH. UNIT# 0-11 label, (p/n 7121-2442) is to be placed below the above mentioned label on the port connector cable hood. This designates which AIB number the thumbwheel is set on and which channels it controls.

The three remaining sheets, (p/n's 7121-2438, 7121-2439, 7121-2440) are to be placed on the mini-boards to correspond to the SIB number, the AIB number and the port numbers being used.

This section contains general servicing information for the Advanced Terminal Processor. This information includes safety precautions, repair philosophy, maintenance aids, use of the self-test capability, troubleshooting, and field-level repair.

SAFETY PRECAUTIONS

Whenever the ATP printed circuit assemblies are installed or removed, ensure that the computer system's **PROCESSOR/POWER SUPPLY BREAKER** switch is set to OFF.

Whenever the ATP boards are being connected or disconnected to the Modem Port Connector Assembly (by attaching or removing the AIB to Modem Port Connector interconnecting cable), ensure that the Port Connector power-switch is set to OFF and that the modem power is also turned off.

Be particularly cautious when selecting the routing for the longer lengths of the interconnecting data cables. **DO NOT** run these cables outdoors! Indoor routing must be planned to avoid sources of electrical "noise", such as arc welders.

Failure to observe these precautions could result in damage to the components of the computer system, the ATP, and/or the modem.

REPAIR PHILOSOPHY

Field repair of the ATP is done by replacing the AIB, SIB, Port Connector Assembly boards, and associated cabling. When troubleshooting procedures have verified a board malfunction, remove the defective board from the system and replace the board as described in the field replacement section. The AIB and SIB are exchange assemblies, the remaining ATP components are throw away assemblies. To exchange an ATP component, remove it from the system and prepare it for reshipment to Hewlett-Packard in accordance with the reshipment instructions section of this manual.

MAINTENANCE AIDS

The ATP consists of more than just the apparent hardware. It is actually a sophisticated system of both hardware and software. To support such a system, a support package has been provided for verification and troubleshooting. This support package (p/n 30144-67801) consists of the following:

- 1 AIB Loopback Test Hood Part Number 31045-60005
- 12 HP-DC A Loopback Test Hoods Part Number 30147-60002
- 12 HP-DC B Loopback Hoods Part Number 30148-60002
- 12 HP Modem B Loopback Test Hoods Part Number 30146-60002

Table 3-1. Troubleshooting Flow Chart

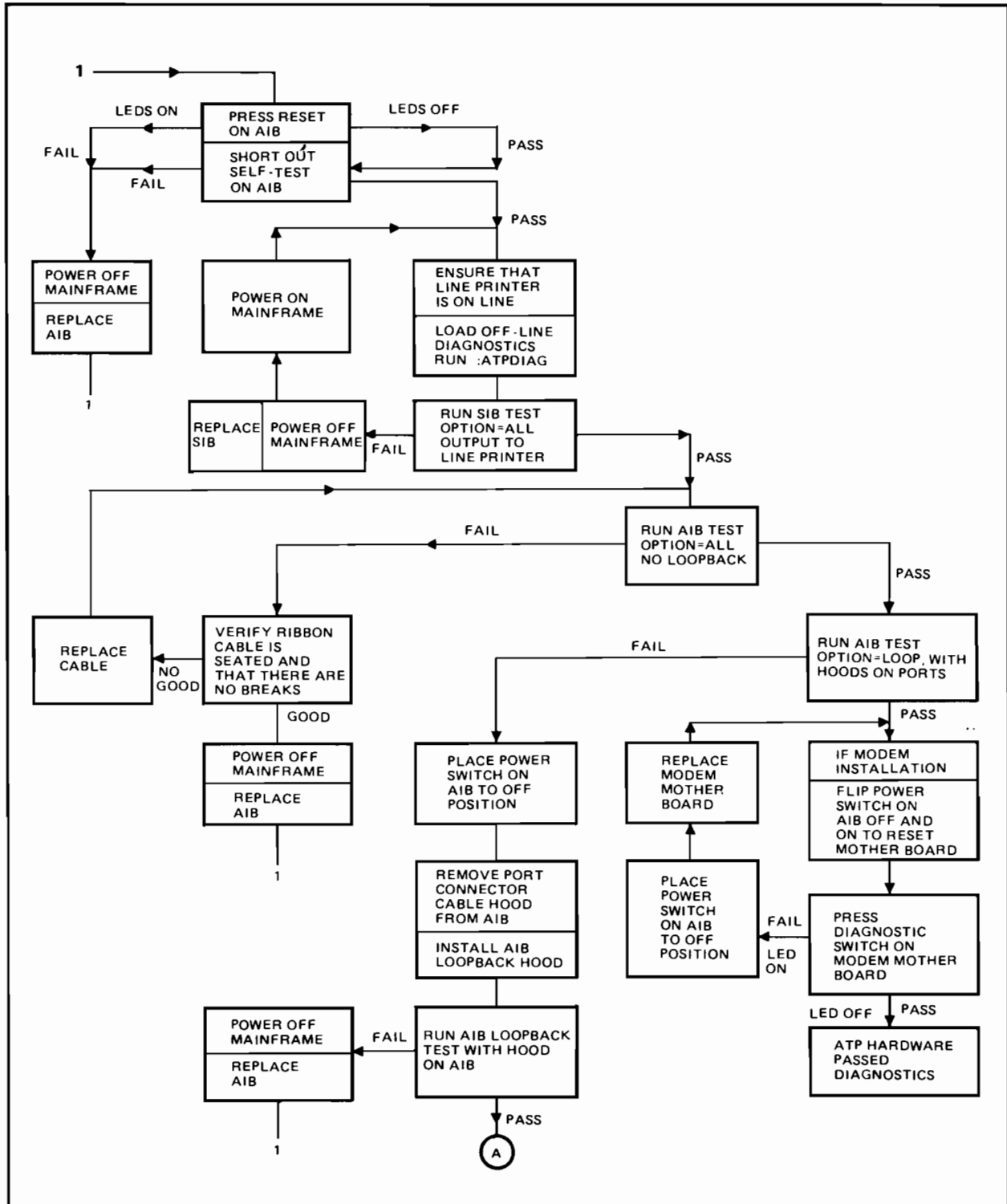


Table 3-1. Troubleshooting Flow Chart (cont.)

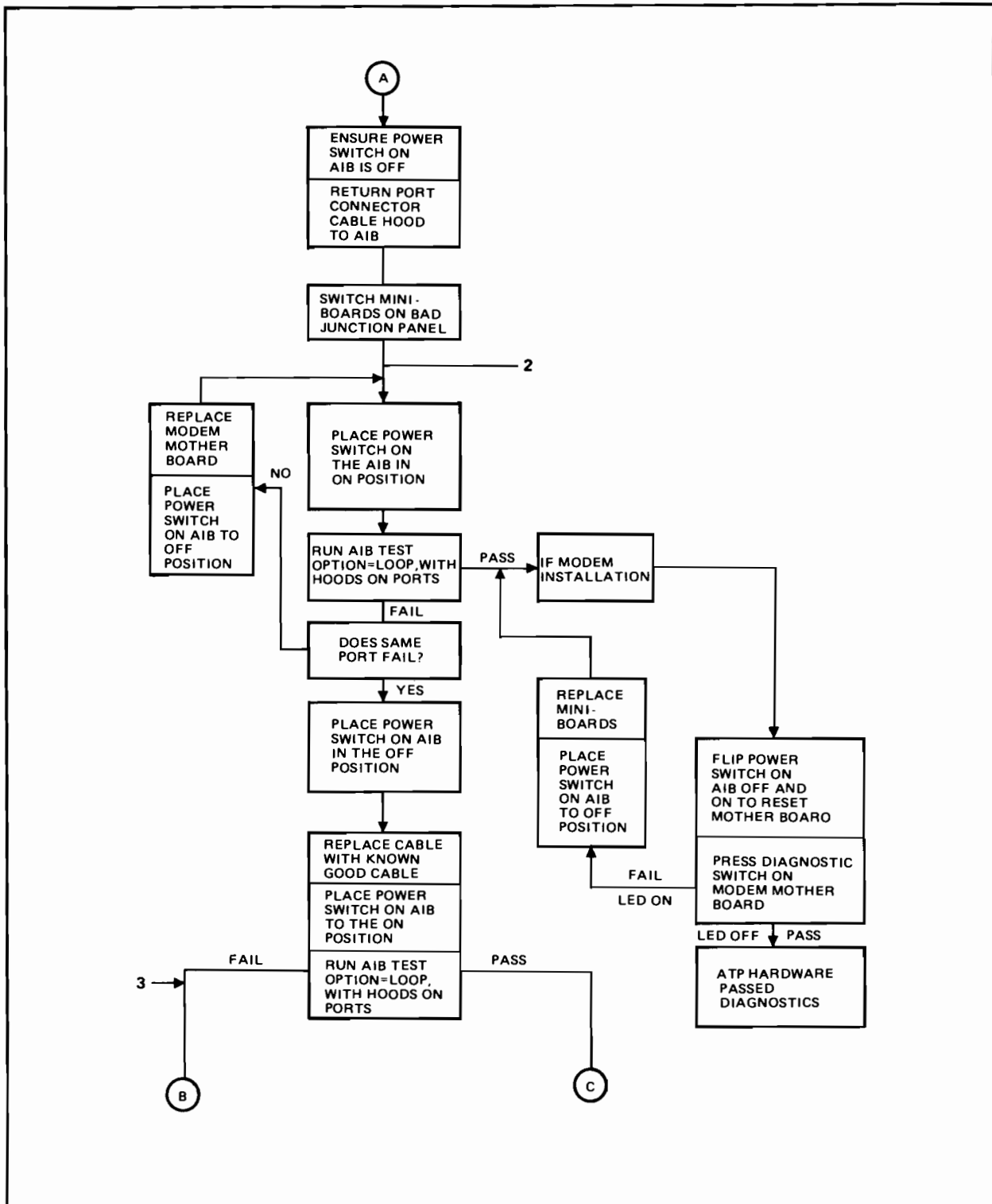
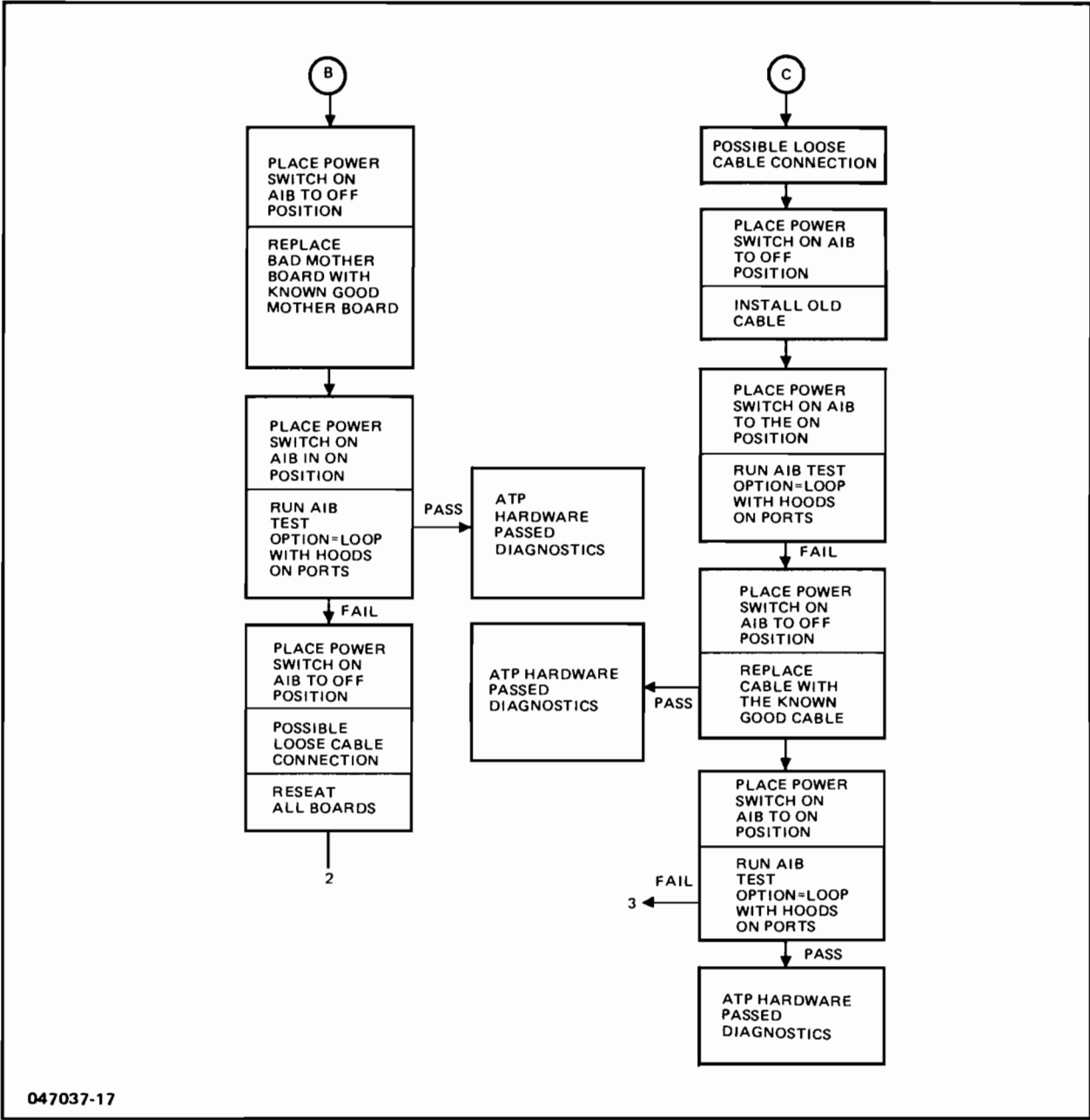


Table 3-1. Troubleshooting Flow Chart (cont.)



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FIELD LEVEL REPAIR

Replacement of the SIB and AIB Boards

When the troubleshooting procedures indicate the need for replacement of the ATP boards, proceed as follows:

- a. Ensure that the system operator has backed up the system files before beginning this procedure.
- b. Turn off the power.

On the HP 3000 Series 44/48, set the PROCESSOR switch (located on the side panel beneath the desk-top of the mainframe, as shown in Figure 2-4) to the OFF position.

On the HP 3000, Series 64/68, set the POWER SUPPLY BREAKER switch as shown in Figure 2-7) to the OFF position.

CAUTION

Power must be off when inserting or removing any device or card in the system.

- c. When replacing the Ribbon Cable, disconnect both ends from the edge of SIB and AIB board.
- d. When replacing the SIB or AIB, disconnect the cable hood connector and the Ribbon Cable connector from the edge of the SIB or AIB board.
- e. Remove the SIB (p/n 30144-60001) or the AIB (p/n 30145-60001), from the computer card cage.
- f. Install the factory replacement SIB or AIB board in the same slot in the computer card cage, using the procedure described under "Hardware Installation Procedures" in Section II. Make sure that the replacement board switch settings are identical to those being replaced. Install the new Ribbon Cable in the same manner.
- g. Verify that the ATP subsystem is now working properly as described under "Hardware Installation Verification" in Section II.

Replacement of Mother Boards, Mini Boards and Port Connector Cables

When the troubleshooting procedures indicate the need for replacement of the Mother Board, Mini-Board or Port Connector cable, proceed as follows:

- a. Ensure that the system operator has backed up the system files before beginning this procedure.
- b. Power OFF the Port Connector Assemblies via the power switch on the appropriate AIB(s), (see Figure 2-14).
- c. Remove the malfunctioning component from the junction panel.
- d. Install the factory replacement Mother Board, Mini-Board, or Port Connector cable into the same location from where it was removed, using the procedure described under "Hardware Installation Procedures" in Section II.
- e. Verify that the ATP subsystem is now working properly as described under "Hardware Installation Verification" in Section II.

RESHIPMENT INSTRUCTIONS

When shipping the ATP boards to Hewlett-Packard for service or repair, attach a tag to each item identifying the owner and indicating the type of service or repair to be accomplished. Include the part number and date code of each item.

Package the item(s) in the original factory packaging material, if available. If the original packaging material is not available, standard factory packaging material can be obtained from the nearest Hewlett-Packard Sales and Service Office. If standard packaging material is not available, wrap the item(s) in suitable cushioning material (ESD protected bags only-nickel plated or pink polyurethane) and place the item(s) in a corrugated carton (200 pound test material). Seal the carton securely and mark it **FRAGILE** to ensure careful handling.



The specification requirements for building a RS-232-C three conductor shielded and jacketed cable are listed below:

Third Party Compliance

- (1) U. L. Style 2464
- (2) U. L. Style 1061 VW-1, individual conductors
- (3) CSA AWM-SR PVC, individual conductors

Electrical

- (1) Voltage Rating: 300V at 80 degrees C (1000 V rms test between conductors and conductors to shield).

Mechanical

- (1) Singles: Three, 24 (7x32) AWG tinned copper.
Insulation: PVC, 0.009 in. minimum average wall thickness.
Colors: Blue, gray, white.
Cable Lay: Twist Singles in above sequence for flexibility.

Shield

- (1) Metallized polyester, metallization facing out.
- (2) Braid from 36 AWG tinned copper for 85% minimum coverage.

Jacket

- (1) PVC, 30 mil minimum wall thickness rated at 80 degrees C.

Wiring Diagrams

The specification requirements for building a RS-422 five conductor shielded cable:

Third Party Compliance

- (1) This cable shall meet the requirements of U. L. Style 2464 and EIA STD RS-422.

Electrical

- (1) Conductor resistance dc: <30 ohms/1000 ft.
- (2) Mutual Pair Capacitance: ≤ 20 pF/ft. between one wire, in a pair, to the other.
- (3) Stray Capacitance: ≤ 40 pF/ft. between one wire and all others in the cable with all others grounded.
- (4) Pair-to-Pair Balanced Crosstalk: ≥ 40 dB of attenuation at 150 kHz between one pair of wires and any other pair.
- (5) Voltage Rating: 300V rms @ 80 degrees C (1000V rms test between conductors and conductors to shield).

Mechanical

- (1) Singles: Two twisted pairs plus one single AWG 24 (7x32) tinned, stranded copper.
- (2) Insulation: Foamed polyethylene.
- (3) Colors: One conductor of each twisted pair shall be WHT, the other conductors to be BLK, BRN. The single conductor shall be RED.
- (4) Cable Lay: Twist the twisted pairs around the single for maximum flexibility.
- (5) Shield (Inner): Metallized polyester; metallization facing outward.
- (6) Shield (Outer): Braid from AWG 36 tinned copper for 85% minimum thickness.
- (7) Jacket: Polyvinyl chloride, 0.035 in. minimum wall thickness.

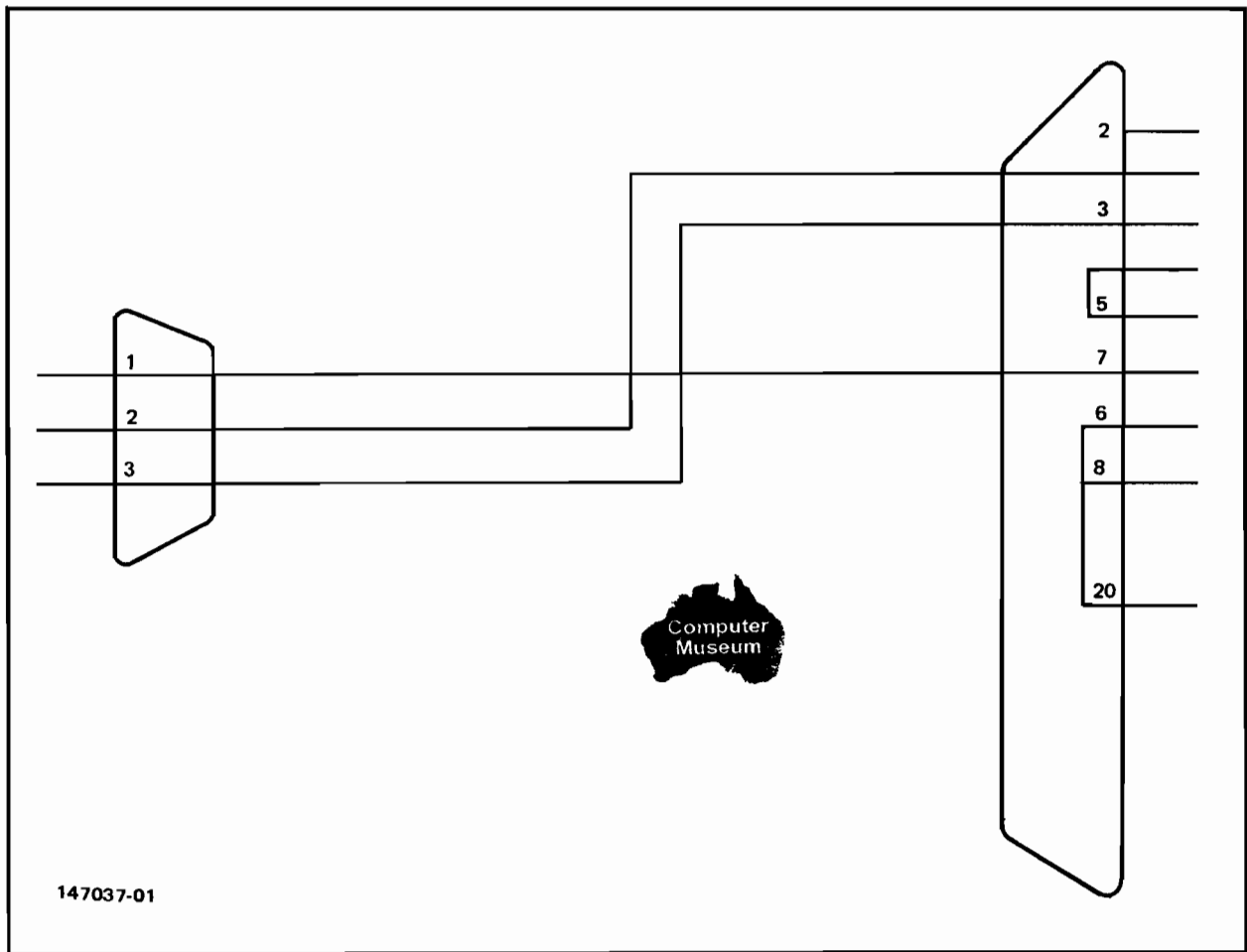


Figure A-1. Wiring Diagram for HP-DC B Adapter Cable

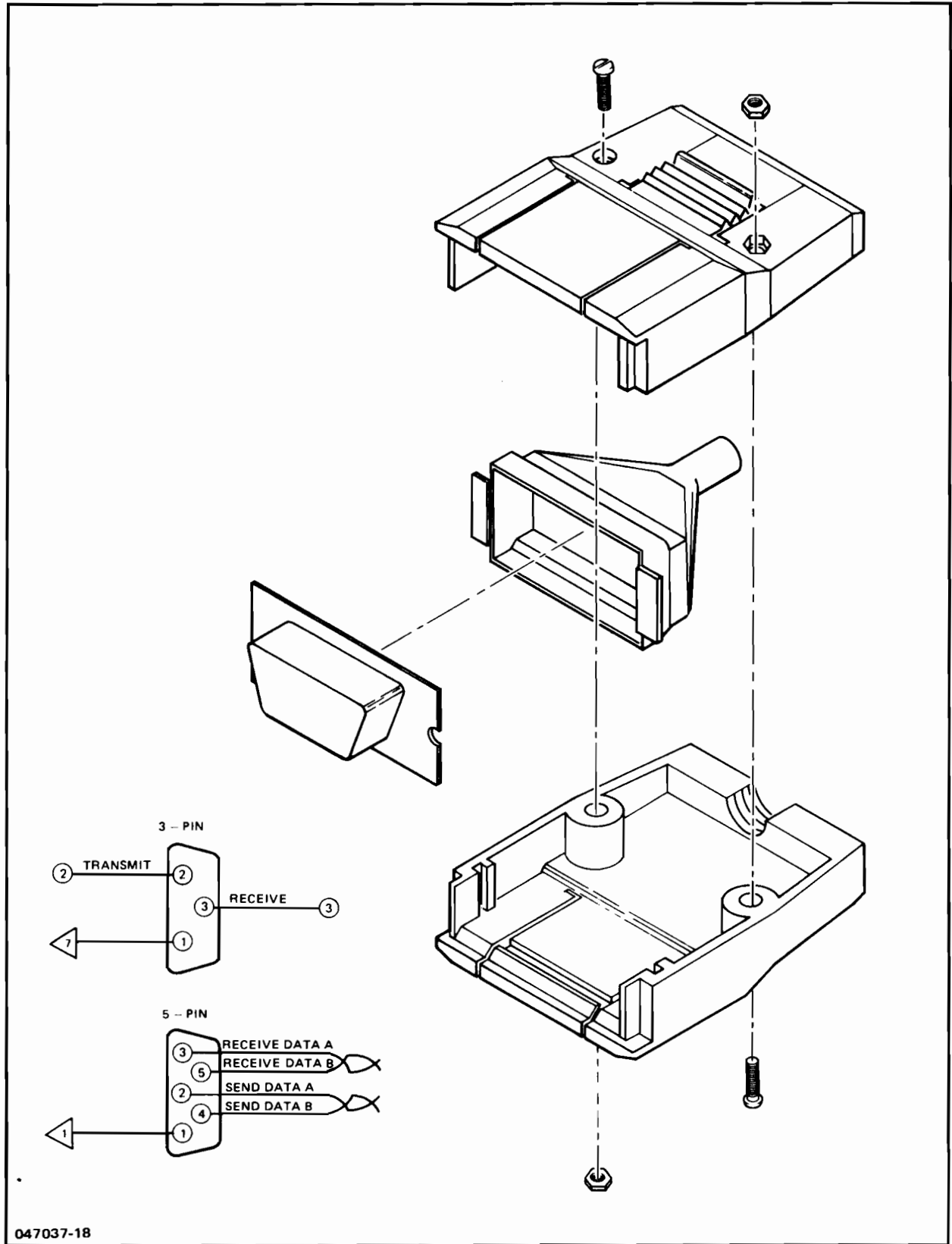


Figure A-2. Cable Wiring for HP-DC A and HP-DC B

INTRODUCTION

The ATP Remote Junction Box adds support of the ATP on the HP 3000 Series 39/40/42 and expands the ATP on HP 3000 Series 44/48 to include modems. This appendix provides installation information for installing the the junction box and for installing additional direct-connect and modem ports. In addition, by adding ADCCs and the junction box, up to 120 terminals may be configured on the Series 44/48.

The product structure is as follows:

30273A D.C. ATP Expansion Subsystem

- 001 Delete SIB (Series 44/48 only)
- 002 Replaces an RS-422 mini-board with an RS-232 mini-board
- 042 Series 39/40/42 Subsystem*
- 048 Series 44/48 Subsystem*

30274A Modem ATP Expansion Subsystem

- 001 Delete SIB (Series 44/48 only)
- 042 Series 39/40/42 Subsystem*
- 048 Series 44/48 Subsystem*

Options added to the existing AIB products

- 30145A and 30155A
- 042 Series 39/40/42 Subsystem*
- 048 Series 44/48 Subsystem*

*Defines the correct cable for the system that the unit is being installed on (must be specified).

CONFIGURATION INFORMATION

The ATP Remote Junction Box provides the capability of adding up to 48 ATP direct-connect ports or up to 24 modem ports per junction box. For the Series 48, two junction boxes may be installed, thereby doubling the direct-connect or modem capabilities.

Each junction box may be shipped with either all direct-connect ports, all modem ports, or a combination of the two. Direct-connect ports are packaged in modules of 12 and are mounted in a single cutout of the panel. Modem ports are packaged in modules of 12 but take up two cutout spaces on the panel.

CONFIGURATION LIMITATIONS

The following configurations are in addition to existing limitations imposed upon the HP 3000.

Series 39/40/42

- No more than four (4) AIB's may be installed.
- No more than two (2) AIB's may be installed for modem ports.

Series 44/48

- No more than eight (8) AIB's may be installed.
- No more than four (4) AIB's may be dedicated to modem ports.
- All of the ATP hardware must be in the first card cage.
- All of the system's memory must be installed in the second card cage.

+5V Power Supply Tolerance

The present tolerance for the +5V power supplies in the SPUs is +5(+/-0.10) volts. When a junction box is installed, the voltage must be adjusted to +5(+/-0.05)volts.

INSTALLING THE JUNCTION PANEL

To install the ATP Remote Junction Box (figure B-1), proceed as follows:

1. Inspect and unpack the junction box. (Refer to Section 2 of this manual for details.)
2. Remove the front panel of the junction box and verify that the correct number of direct-connect/modem ports are installed as ordered.

NOTE

You may receive ports that have been installed at the factory and also receive some ordered modules that are separately packaged and must be installed on site. If this occurs, refer to the add-on installation procedure before proceeding.

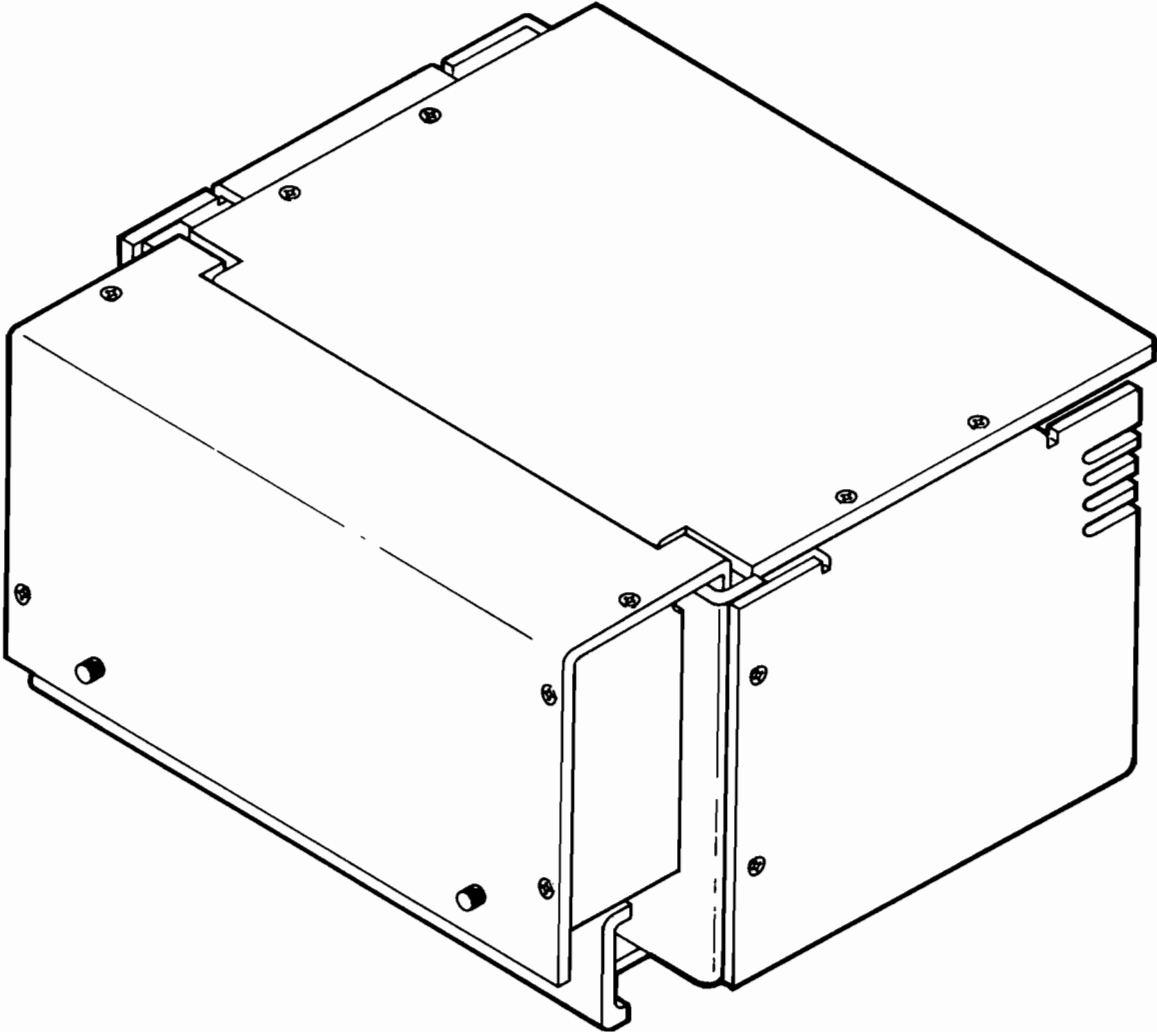


Figure B-1. Remote Junction Box

ATP Junction Box Installation

3. Shut power off on the SPU.
4. Route cable(s) from junction box to AIB(s) as appropriate.

For the Series 39/40/42, proceed as follows:

- a. On the SPU, set the POWER switch to off (0).
- b. Remove the rear cover of the SPU.
- c. Route the cable from the bottom up to the AIB(s). The card cage assignments may vary with each installation. Refer to the current configuration to determine the location of new board assignments or existing board relocation.
- d. Connect the cable to the AIB and then securely connect the grounding clamp to the ground bar on the bottom of the SPU. (See figure B-2.)
- e. Remove the front cover of the SPU.

For the Series 44/48, proceed as follows:

- a. On the SPU, set the power switch to off (0).
- b. Open the side junction panel door and rear card cage doors.
- c. Route the junction box cable(s) through a blank cutout, then under the card cage to the designated AIBs. (See figure B-3.)
- d. Connect the ground plate assembly securely to the screw holes at the cutout.

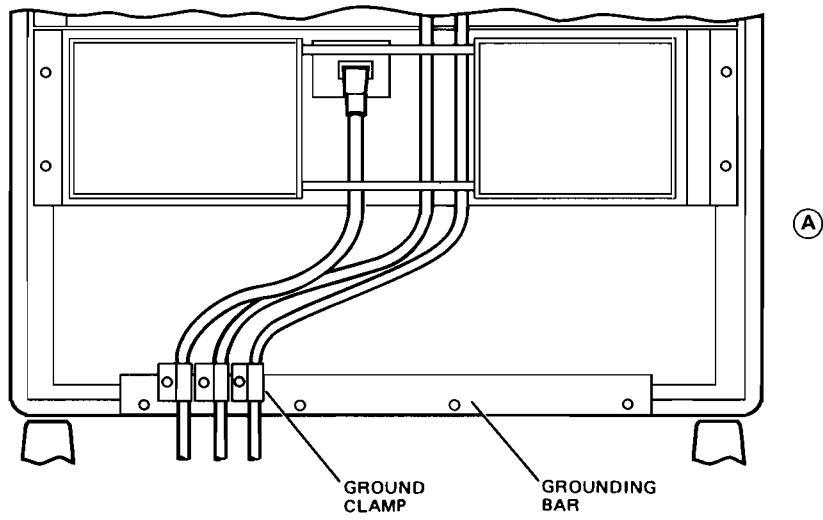
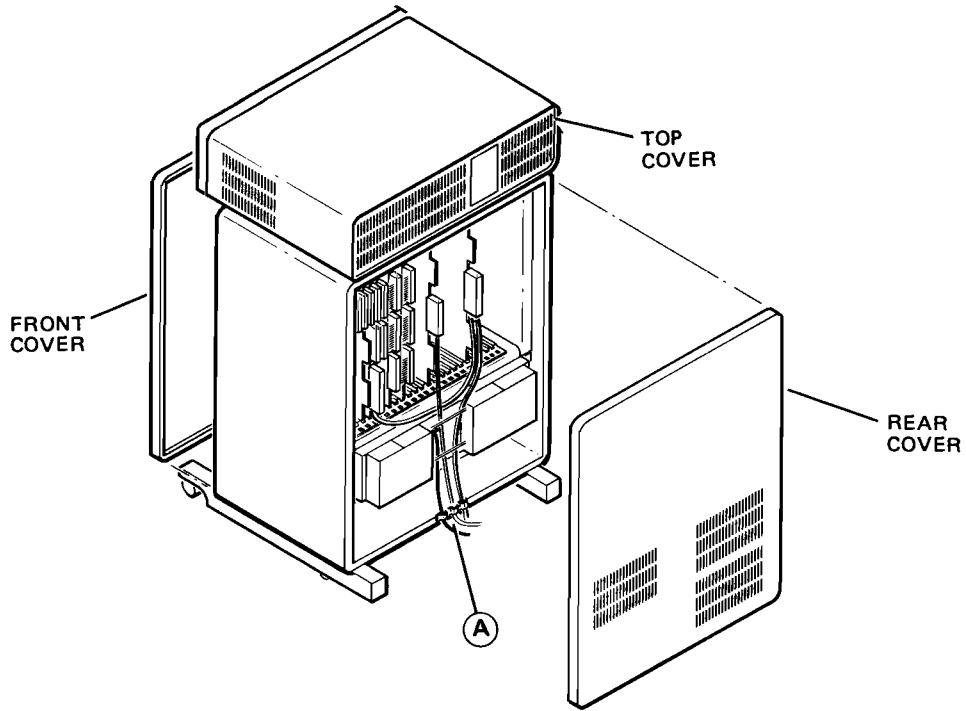


Figure B-2. Series 39/40/42 Cabling

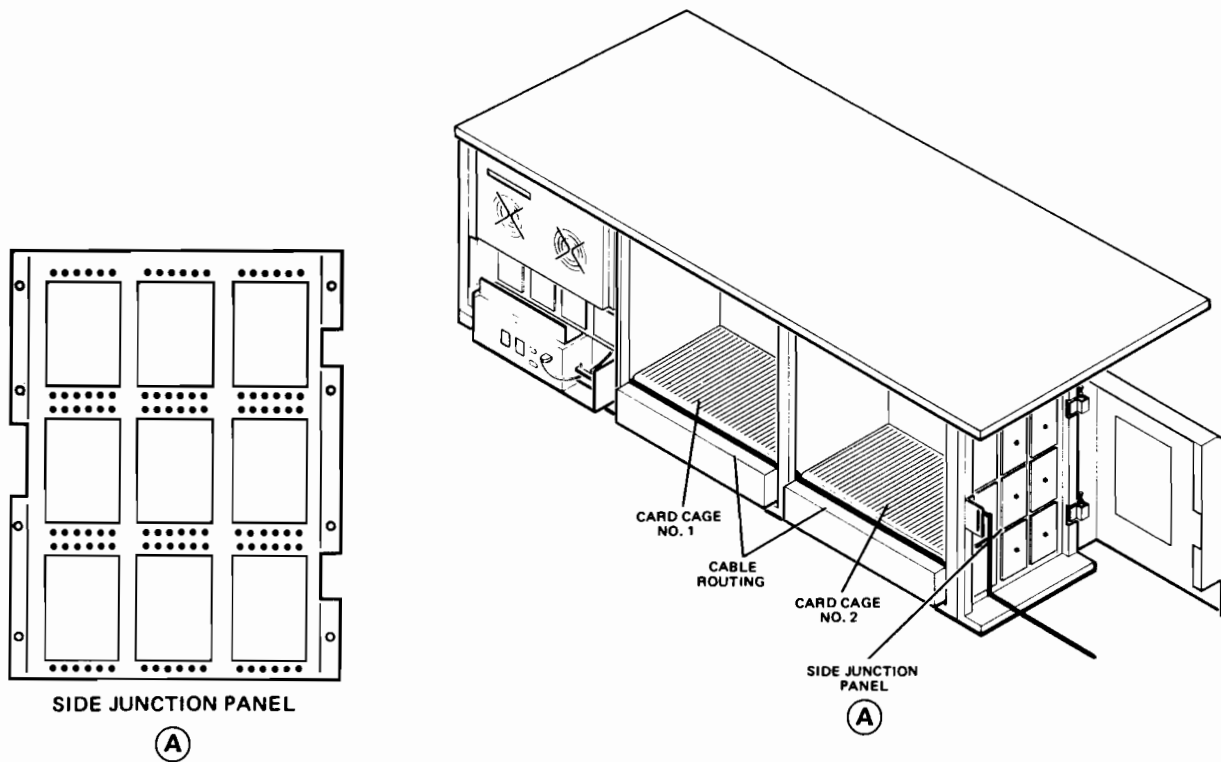


Figure B-3. Series 44/48 Cabling.

NOTE

When less than three cables are routed through a single cutout, the remaining blank space(s) must be closed with 1/3-size blank plates. Refer to Section 2.

- f. Set the POWER switch to on (1).

NOTE

To make the following measurement, an HP 3435 or HP 3436 multimeter, or an equivalent with an accuracy of 0.1% must be used.

- 5. On the backplane, measure the +5V. Adjust, as required, to +5 (+/-0.05) volts.
- 6. Configure all new devices so that newly installed terminals are operational.

ADDING DIRECT-CONNECT/MODEM PORTS TO THE JUNCTION BOX

Additional ports may be added to blank cutouts in the junction box. There are three possible arrangements in which ports are installed at the factory:

- All direct-connect ports
- All modem ports
- A combination of direct-connect and modem ports

For direct-connect ports, the first module is installed in the left-most cutout and additional modules are installed from the next blank left-side cutout. Four direct-connect modules can be installed per junction box. For modem ports, the first module is installed in the left-side two cutouts, and a second module in the right-side two cutouts. If there is a combination of the two, a direct-connect module would be installed in the left-side port and the modem module would be installed in the right two ports. This would leave the second cutout from the left blank and be available for one additional direct-connect module. As a general rule, all add-on direct-connect ports are mounted on the left side and the modem ports on the right side. This will avoid confusion that might arise from intermixing the port types. When the junction box is dedicated to one type of port or the other, the only rule that would apply is that all modules are installed beginning from the left.

NOTE

Before proceeding with an add-on installation of ports, review Section 2 of this manual. Installation procedures are given for mounting modules in the junction panels of the SPU's. This installation is the same as that for the junction box.

To install an additional module in the junction box, proceed as follows:

1. Shut power off to the SPU.
2. Inspect and unpack the module to be installed. (Refer to Section 2.)
3. Remove the front cover, top and rear panels of the junction box. (See figure B-4.)
4. Install the module in the appropriate slot as given in Section 2.
5. Route the cable out the rear of the junction box through the cable access slot, then securely connect the ground clamp to the bottom of the junction box.
6. Install the free end of the cable to the SPU as given in the the preceding installation procedure.
7. Replace the rear, top and front covers of the junction box.
8. Set the SPU POWER switch to on (1).

ATP Junction Box Installation

9. Measure and adjust the +5V supply, as necessary, to ensure that it reads is $+5(+/- 0.05)$ volts.
10. Configure the newly added terminals to ensure that they are operational.

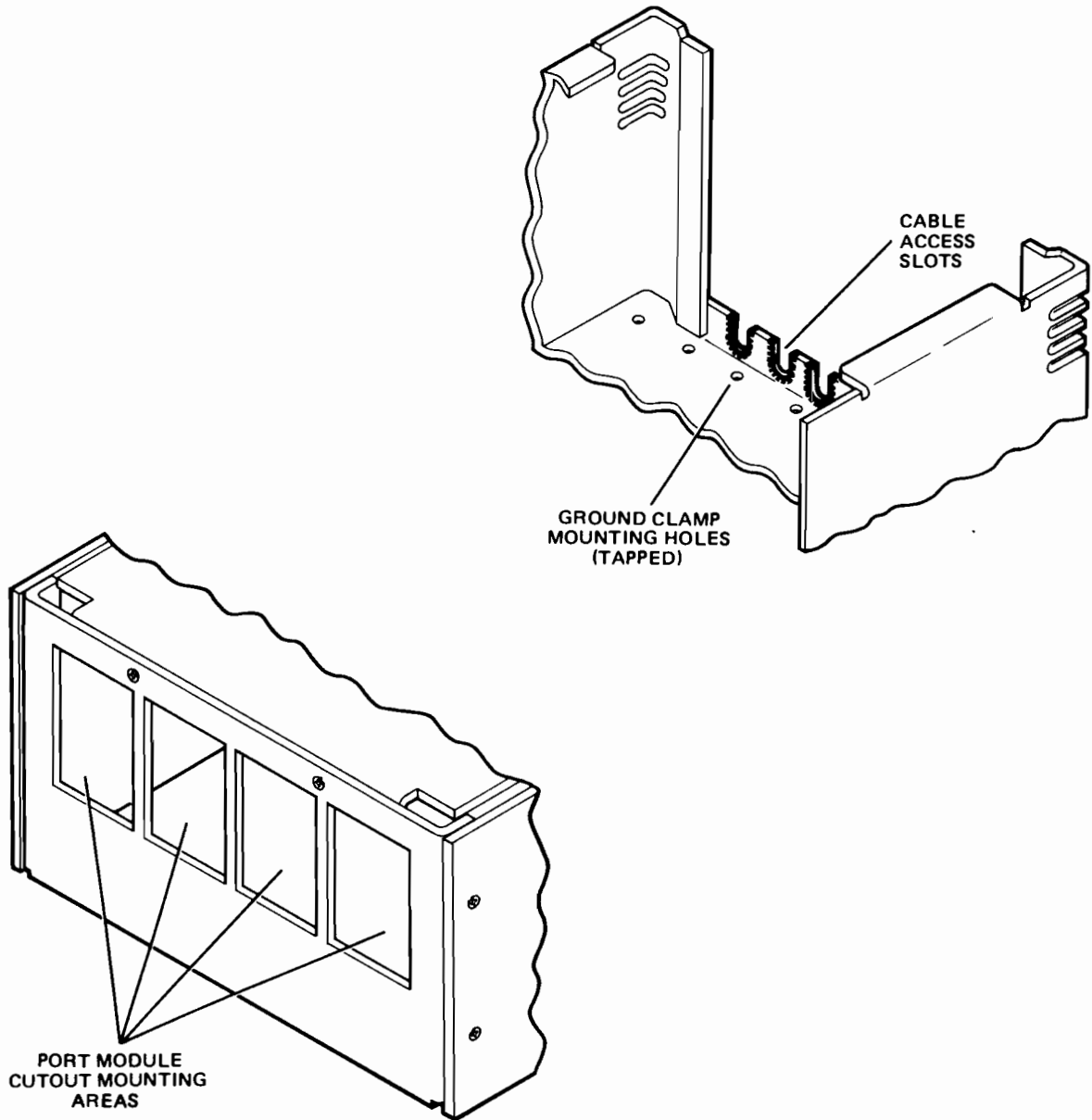


Figure B-4. Junction Box, Disassembled

CONFIGURING THE SERIES 44/48 FOR 120 TERMINALS

When configuring for 120 terminals, the PCAs must be properly configured in card cages 1 and 2. To relocate the PCAs, proceed as follows:

1. Whenever an AIB PCA with modem ports is installed, the memory controller and memory arrays must be moved from card cage 1 to card cage 2, as follows:

Memory Controller - memory slot 8, card cage 2

Memory Arrays - memory slot 9 through 16, card cage 2

2. For this configuration, there must be four ADCC MAINs and two ADCC EXTENDs (there cannot be three each). Install the ADCCs as follows:

ADCC MAIN - slot 14, card cage 1

ADCC MAIN - slot 2, card cage 2

ADCC EXTEND - slot 3, card cage 2

ADCC MAIN - slot 4, card cage 2

ADCC EXTEND - slot 5, card cage 2

ADCC MAIN - slot 6, card cage 2



NOTE

When GIC's are installed with the ADCC's in card cage 2, they must be installed in any order, except that the ADCC EXTEND's must be installed adjacent to the ADCC MAIN.

3. In card cage 1, install PCAs as follows:

ADCC MAIN - slot 14

GIC - - - - slot 15

SIB - - - - slot 16

AIB - - - slots 17-24



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Installation Manual

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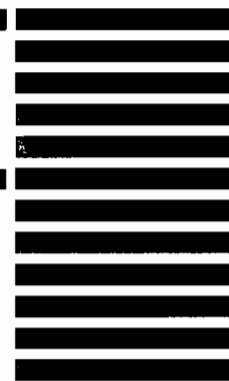
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