ATP/M

Installation Manual

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PRINTING HISTORY

The Printing History below identifies the Edition of this Manual and any Updates that are included. Periodically, update packages are distributed which contain replacement pages to be merged into the manual, including an updated copy of this Printing History page. Also, the update may contain write-in instructions.

Each reprinting of this manual will incorporate all past updates; however, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with the user-inserted update information. New editions of this manual will contain new information, as well as 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 in the manual. To verify that your manual contains the most current information, check the dates printed at the bottom of each page with those listed below. The date on the bottom of each page reflects the edition or subsequent update in which that page was printed.

Effective Pages	Date
all	Sep 1985
1-6 to 1-8	Apr 1986
A-1 to A-5	Feb 1987
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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:

        $\begin{bmatrix} A \\ B \end{bmatrix}$ 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:

        $\begin{Bmatrix} A \\ B \\ C \end{Bmatrix}$ 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 delimeter preceding a parameter in a syntax statement indicates that the delimeter *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*

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*)]Δ(*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.

Section 1
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1.1 INTRODUCTION

This manual describes the ATP/M and details the procedure for its installation in the HP MICRO 3000 Series and the HP 3000 Series 37 computer systems. The ATP/M is an Advanced Terminal Processor for the HP MICRO 3000 Series and HP 3000 Series 37 computer systems.

Some diagnostic programs (e.g. TICDIAG) refer to the TIC. This is the acronym for Terminal Interface Controller (ATP37), the predecessor of the ATP/M. The TIC diagnostic program is used to troubleshoot the Advanced Terminal Processor (ATP/M). For further information on TIC types, refer to Section 1-7.

Note that for the HP 3000 Series 37 any installed ATP37(s) can remain in the system when installing additional ATP/M(s). For further information on configuring the card cages refer to Section 2.4.

Throughout this manual a reference to an ATP/M may also be treated as a reference to an ATP37/M, as they are equivalent.

NOTE: The HP MICRO 3000 Series and HP 3000 Series 37 computer systems all require one ATP/M PCA (Printed Circuit Assembly) installed in slot 1 (channel 1) of the SPU.

1.2 GENERAL DESCRIPTION

The ATP/M provides eight point-to-point, asynchronous ports for connection to local or remote workstations. The HP MICRO 3000XE computer can support up to seven ATP/Ms, thus up to 56 asynchronous devices can be connected to the computer. See 1.5, System Configuration, for a full list of supported configurations, and 2.4, Configurations, for card cage configuration information. The channel number assigned to each ATP/M is determined by the slot in which it is installed.

The ATP/M is available in three versions as follows:

- The 25-pin version provides eight, 25-pin ports to RS-232-C (CCITT V.24) standards. Four of these ports are for direct connection to local workstations (distance = 15m/50ft max.) and four offer modem control capability for connection via full duplex, asynchronous modems to remote workstations. Note that the modem ports can also be used for local direct connection to workstations and that the same connector is used for both types of port. Modem port 7 may also be used for remote Tele-Support provided that the ATP/M is in slot 1 of the SPU.

- The RS-422 version provides seven, 5-pin ports to the RS-422 standard for connection of local workstations up to a distance of 1220m/4000ft. One 25-pin port is provided to RS-232-C (CCITT V.24) standards for a remote connection via a full duplex, asynchronous modem. This port may also be used for remote Tele-Support provided that the ATP/M PCA is in slot 1 of the SPU. Note that this modem port may also be used for local direct connection to a workstation.

- The 3-pin version provides seven, 3-pin ports to RS-232-C (CCITT V.24) standards for direct connection to local workstations (distance = 15m/50ft max.). One 25-pin port is provided to RS-232-C (CCITT V.24) standards for a remote connection via a full duplex, asynchronous modem. This port may also be used for remote Tele-Support provided that the ATP/M PCA is in slot 1 of the SPU. Note that this modem port may also be used for local direct connection to a workstation.

Each version of the ATP/M comprises the three following assemblies:

1) **ATP/M PCA:** This interface board (Printed Circuit Assembly) plugs into the connector mounted on the I/O Backplane of the SPU (MICRO 3000 Series, 3000 Series 37) and the I/O Extender (MICRO 3000XE and 3000 Series 37XE only).

   There are two versions of the board; one has RS-232-C drivers/receivers for both modem and direct connect ports while the other has RS-232-C drivers/receivers for modem and RS-422 drivers/receivers for direct connect ports (see Figure 1-1). Both versions include DMA (Direct Memory Access) control circuitry for the transfer of data between workstations and system memory through the Synchronous Intermodule Bus (SIMB). Each interface board is fitted with a 50-pin connector, accessible from the rear of the unit, for connection to its associated connector panel.
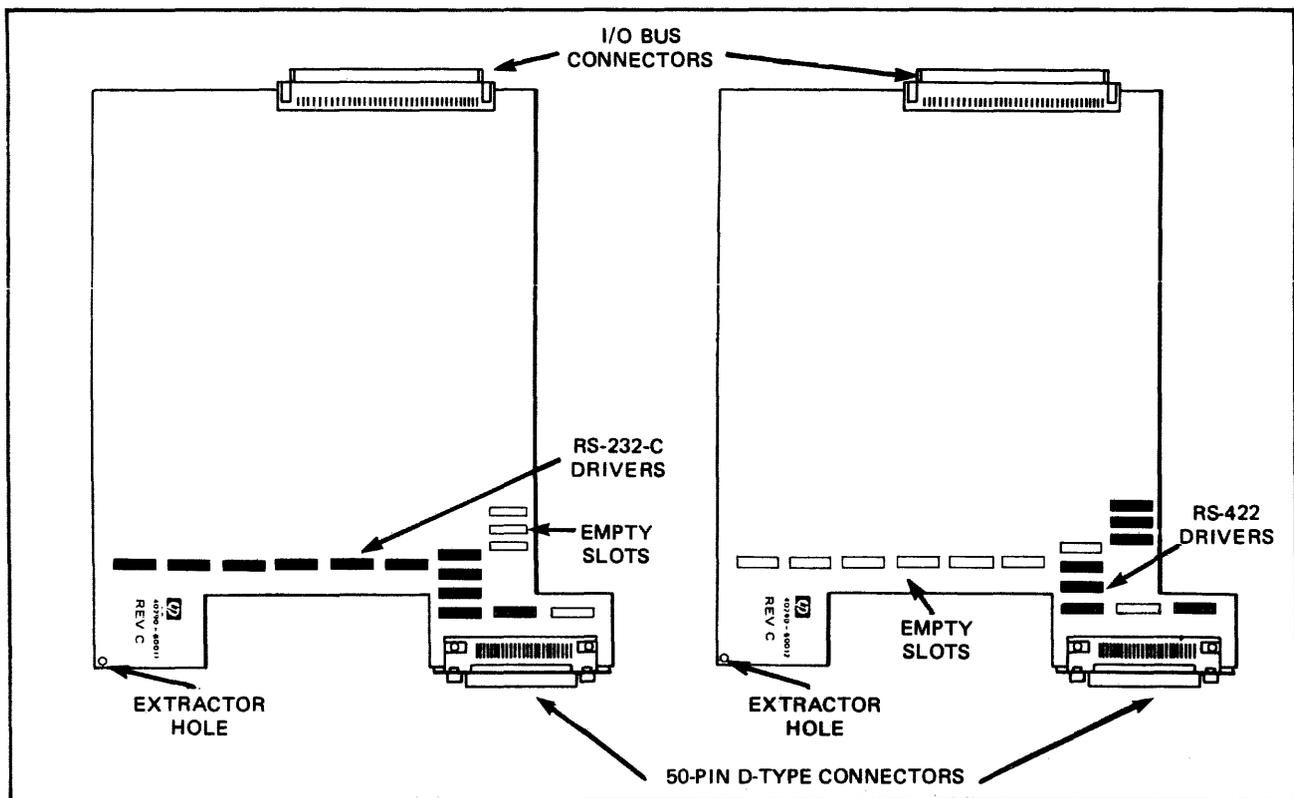
Figure 1-1 ATP/M PCA (RS-232-C, left) (RS-422, right)

2) **ATP/M Cable:** This is a shielded cable fitted with two 50-pin male D-type connectors to link the ATP/M PCA to the ATP/M Connector Panel. The same cable is used for each version of the ATP/M.

3) **ATP/M Connector Panels:** There are three versions (one RS-422 version and two RS-232-C versions) of connector panel. Normally, up to four connector panels can be mounted inside the MICRO 3000 Series or 3000 Series 37 cabinet. Note that only three connector panels may be installed in a cabinet that has a Tape Cartridge Autochanger unit installed (product number HP 35401A). The connector panels are fitted with one 50-pin, female connector for connection to the associated interface board (ATP/M PCA). All other connectors on the connector panels are labeled with their corresponding port number and letter(s) to indicate the type of port (M = Modem, DC= Direct Connect). Note that the modem ports can also be used for direct connections. The three versions of connector panel are shown in Figure 1-2.
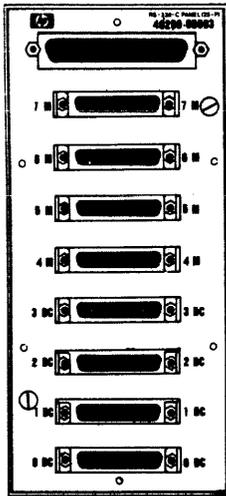
The 25-pin RS-232-C version is fitted with eight 25-pin female connectors (4 modem ports, 4 direct connect ports).
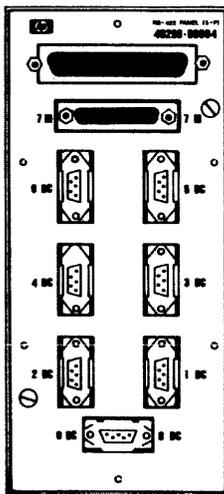
The RS-422 version is fitted with seven 5-pin female connectors (RS-422 direct connect ports) and one 25-pin female connector (an RS-232-C modem port).
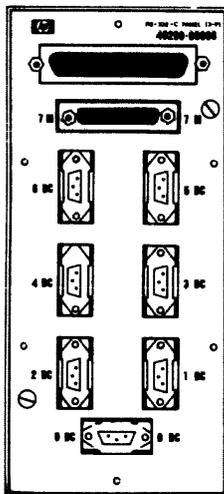
The 3-pin version is fitted with seven 3-pin female connectors (RS-232-C direct connect ports) and one 25-pin female connector (an RS-232-C modem port).

Figure 1-2 ATP/M Connector Panels

1.3 FUNCTIONAL DESCRIPTION

The ATP/M is a hardware input/output channel that interfaces the MICRO 3000 Series and 3000 Series 37 computers with up to eight asynchronous devices. Asynchronous devices are connected to a dedicated connector panel (mounted inside the rear of the system cabinet) which is connected to the ATP/M PCA by a 50 wire cable.

The MICRO 3000XE computer can support up to seven ATP/Ms, thus up to 56 asynchronous devices can be connected to the computer. See 1.5, System Configuration, for a list of supported configurations on the MICRO 3000 and 3000 Series 37 computers. The ATP/M has no configuration switches. The channel number assigned to it is determined by the slot number in which it is installed.

One ATP/M PCA must be installed in slot 1 (channel 1) of the SPU and the system console must be connected to port 0 of its associated connector panel. The PCA also contains Control B Detection and Remote Operator Interface circuitry. The circuitry is only enabled if the PCA is installed in slot 1 (channel 1) of the SPU and the keyswitch is in the Local or Remote position. The remote console is connected to the modem port 7.

Figure 1-3 is a block diagram of the ATP/M PCA. The PCA circuitry is in two sections which are linked by the Lynx Bus (L-Bus); the SIB (System Interface Board) circuitry and the AIB (Asynchronous Interface Board) circuitry. The AIB circuitry and the SIB circuitry are located on the same ATP/M PCA.
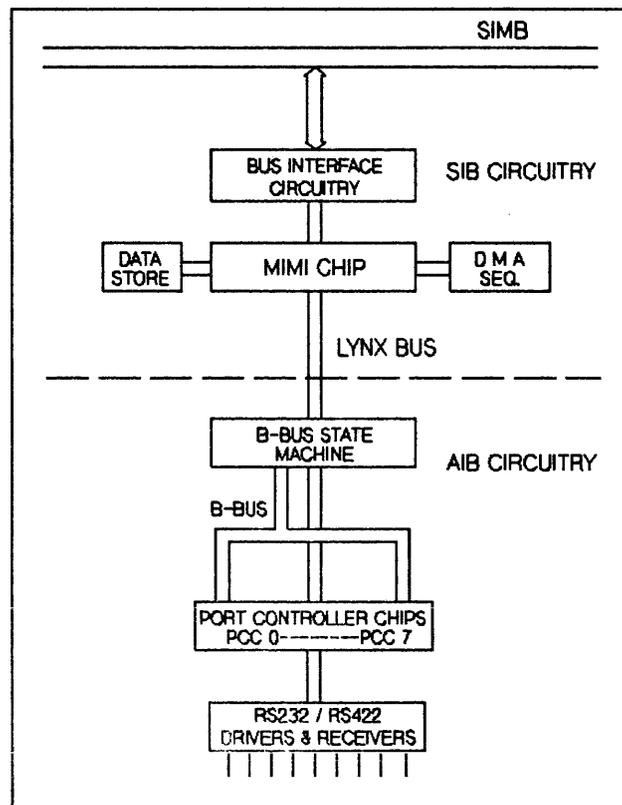
Figure 1-3 ATP/M PCA Block Diagram

The main SIB functions are performed by a single gate array chip known as the MIMI Chip. The MIMI Chip controls the store of DMA (Direct Memory Access) and Control Program bank and address values for each PCC (Port Controller Chip). It also executes the DMA to carry data between main memory and the Lynx Bus, and stores PCC interrupts in FIFO memory. The Data Store stores all this data while the DMA sequencer controls the operation of the DMA and runs most of the MIMI Chip operations. The Bus Interface Circuitry comprises various registers and state machines that handle interaction with the Synchronous Intermodule Bus (SIMB).

The AIB functions on the PCA are dedicated to supporting the eight PCCs (one per port) which control ports 0 through 7. Each PCC speed senses with the connected asynchronous device. The modem handshake lines for the modem ports (ports 4 to 7) are treated directly by each PCC. The B-Bus State Machine runs and arbitrates the B-Bus. The B-Bus is used for all communication between the PCCs and the Lynx Bus.

1.4 INSTALLATION POLICY

The Hewlett-Packard Customer Engineer (CE) is responsible for installing the ATP/M in the MICRO 3000 Series and 3000 Series 37 computer systems in accordance with the information given in this manual.

The MICRO 3000 Series and 3000 Series 37 SPU must have one ATP/M PCA fitted in slot 1. The SPU rear cover must be removed to install the PCA.

1.5 SYSTEM CONFIGURATION

The MICRO 3000 Series and 3000 Series 37 computer systems require one ATP/M installed in slot 1 (channel 1) of the SPU.

A maximum of two ATP/M are supported on the MICRO 3000 and 3000 Series 37.
A maximum of four ATP/M are supported on the 3000 Series 37XE.
A maximum of seven ATP/M are supported on the MICRO 3000XE.

The rules for configuring the SPU and I/O Extender card cages are detailed in Section 2-4.

1.6 REQUIRED SOFTWARE

Before proceeding with the hardware installation, the following operating system software must be installed:

> MPE V/UB-Delta-2 MIT (or later)
> Version (VUF): G.01.02
> Date Code: 2531   (or later)

1.7 TIC IDENTIFICATION

Some diagnostic programs refer to the TIC (Terminal Interface Controller). These are programs which originated at the same time as the ATP37 Terminal Interface Controller (also known as a TIC). The Advanced Terminal Processor (ATP/M) is considered as a TIC when running these programs. Some diagnostic programs (i.e. TICDIAG) require the TIC Type to be identified. To identify the TIC Type refer to Table 1-1.

TIC Type	Product Name	Product/Option Number	TIC Identification
0	ATP37	30460A	6 Direct Connect Ports (3 Pin) + 1 Modem Port (25 Pin) (No separate connector panel)
1	ATP/M	40290A Opt 125	4 Direct Connect Ports (25 Pin) + 4 Modem Ports (25 Pin)
2	ATP/M	40290A Opt 103	7 Direct Connect Ports (3 Pin) + 1 Modem Port (25 Pin)
3	ATP/M	40290A Opt 105	7 Direct Connect Ports (5 Pin) + 1 Modem Port (25 Pin) (RS-422 version)

Table 1-1 TIC Identification

1.8 OPTIONS AND ACCESSORIES

Table 1-2 lists the ATP/M product numbers and options that can be ordered by the customer. Note that the ATP/M PCA is installed in both the MICRO 3000 Series and the 3000 Series 37 SPUs.

The RS-422 5-pin Connector Panel is not available as a separate product as it is always used with the RS-422 version of the ATP/M PCA.

The RS-232-C PCA (40290-60011) supports both the 25-pin and the 3-pin connector panels.

Table 1-3 lists the part numbers of spares and accessories that may be required in the field.

Product/Option Number	Parts Description	Part Number

40290A Opt 103	includes:
	1 ATP/M PCA (interface board) RS-232-C
	  for 7 direct connect ports
	  and 1 modem port
	1 ATP/M Cable (PCA-to-Connector Panel)
	1 ATP/M Connector Panel RS-232-C
	  with 7 3-pin connectors
	  and 1 25-pin connector
	1 Loopback Hood (25-pin)
	1 Loopback Hood (3-pin)
	1 ATP/M Installation Manual (this manual)
	1 TIC Diagnostic Manual
		40290-60011
		
		40290-60005
		40290-60006
		
		40290-60009
		30148-60002
		40290-90001
		40290-90004

40290A Opt 125	includes:
	1 ATP/M PCA (interface board) RS-232-C
	  for 4 direct connect ports
	  and 4 modem ports
	1 ATP/M Cable (PCA-to-Connector Panel)
	1 ATP/M Connector Panel RS-232-C
	  with 8 25-pin connectors
	1 Loopback Hood (25-pin)
	1 ATP/M Installation Manual (this manual)
	1 TIC Diagnostic Manual
		40290-60001
		
		40290-60005
		40290-60003
		
		40290-60009
		40290-90001
		40290-90004

40290A Opt 105	includes:
	1 ATP/M PCA (interface board) RS-422
	  for 7 direct connect ports
	  and 1 modem port
	1 ATP/M Cable (PCA-to-Connector Panel)
	1 ATP/M Connector Panel RS-422
	  with 7 5-pin connectors
	  and 1 25-pin connector
	1 Loopback Hood (25-pin)
	1 Loopback Hood (5-pin)
	1 ATP/M Installation Manual (this manual)
	1 TIC Diagnostic Manual
		40290-60002
		
		40290-60005
		40290-60004
		
		40290-60009
		30147-60002
		40290-90001
		40290-90004

24450A	includes: 1 ATP/M Connector Panel RS-232-C with 8 25-pin connectors (4 x M, 4 x DC) 1 Loopback Hood (25-pin)	40290-60003 40290-60009

Table 1-2 ATP/M Product Numbers and Options

Description	Part Number

Loopback Hoods:
 	
      25-pin RS-232-C
      5-pin RS-422
      3-pin RS-232-C
      50-pin RS-232-C
      50-pin RS-422
	
	40290-60009
	30147-60002
	30148-60002
	40290-60007
	40290-60008

Interface Boards:
 	
    ATP/M PCA (RS-232-C)
    ATP/M PCA (RS-422)
	
	40290-60011
	40290-60012

Connector Panels:
 	
   3-pin RS-232-C Connector Panel (Opt. 103)
   25-pin RS-232-C Connector Panel (Opt. 125)
   5-pin RS-422   Connector Panel (Opt. 105)
	
	40290-60006
	40290-60003
	40290-60004

Cable: ATP/M Cable (with 2 50-pin male D-type connectors, length 254 cm / 100 in.)	 40290-60005

Table 1-3 Spares and Accessories

1.9 EXCHANGE ASSEMBLIES

Both of the ATP/M PCAs can be exchanged under the Board Exchange Scheme. These are the only exchange assemblies for the ATP/M. Refer to Table 1-4 for the exchange part numbers.

Description	New Part Number	Exchange Part Number

Interface Boards:
 	
    ATP/M PCA (RS-232-C)
    ATP/M PCA (RS-422)
	
	40290-60011
	40290-60012
		
		40290-69011
		40290-69012

Table 1-4 Exchange Assemblies

1.10 DOCUMENTATION

The following documentation can be consulted for additional information on the ATP/M:

COMMUNICATIONS HANDBOOK . . . . part number 30000-90105

SERIES 37 SITE PREPARATION GUIDE. part number 30457-90008

CE HANDBOOK . . . . part number 30070-90010

HP MICRO 3000 C.E. INSTALLATION MANUAL. . . . . part number 30534-90003

HP MICRO 3000XE INSTALLATION MANUAL . . . . part number 30474-90001

HP MICRO 3000/3000XE SOFTWARE INSTALLATION MANUAL. . . . . . . part number 32033-90039

SERIES 37 CUSTOMER INSTALLATION GUIDE. . . . . part number 30457-90001

SERIES 37XE INSTALLATION MANUAL. part number 30457-90009

SERIES 37 SOFTWARE INSTALLATION MANUAL. . . . . part number 32033-90037

SERIES 37 SOFTWARE INSTALLATION UPDATE NOTICE. . . . . part number 40290-90006

HP 3000 DIAGNOSTIC MANUAL SET . . . . part number 30457-60007
This manual set contains the two following manuals:

- *SELF TEST & MAINTENANCE MODE MANUAL*. . . . . part number 30457-90003
- *TERMINAL INTERFACE CONTROLLER DIAGNOSTIC MANUAL*. . . . . . . part number 40290-90004

SERIES 37 SYSTEM PROCESSING UNIT
SELF-PACED HARDWARE TRAINING GUIDE (PACKAGE). . . . . part no:32450+49A-90101

TERMINAL ON-LINE DIAGNOSTIC SUPPORT MONITOR . . . . part number 30144-90013

POINT-TO-POINT WORKSTATION I/O MANUAL. . . . . part number 30000-90250

SYSTEM OPERATION & RESOURCE MANAGEMENT MANUAL. . . . . part number 32033-90005

2.1 INTRODUCTION

This section details how to install the ATP/M in the MICRO 3000 Series and 3000 Series 37 computer systems.

Both the SPU and the I/O Extender may remain in the system cabinet when installing the ATP/M.

Once the contents of the shipping carton have been verified the ATP/M assemblies should be unpacked as you are ready to install them.

NOTE: Before starting the ATP/M installation procedure ensure that all users are logged off and all subsystems are shutdown (no sessions/jobs) before shutting down the system (by entering (CONTROL) [A] followed by SHUTDOWN in response to the = prompt) and removing mains power (disconnect mains plug).

WARNING

ENSURE THAT THE SYSTEM IS DISCONNECTED FROM THE A.C. POWER SUPPLY BEFORE STARTING THE INSTALLATION PROCEDURE. HAZARDOUS VOLTAGES ARE PRESENT INSIDE THE SPU AND THE I/O EXTENDER.

CAUTION

The semiconductor devices used in this equipment are susceptible to static discharge. Use anti-static handling procedures when installing or removing the PCAs.

CAUTION

The contents of memory will be lost when the a.c. (line) and battery voltages are both off. Therefore, before proceeding, ensure that any contents of memory to be saved are stored on another medium for retrieval later.

2.2 UNPACKING AND INSPECTION

The customer is initially responsible for unpacking and inspection. A packing list is attached to the shipping carton and the contents should be verified against this.

If the shipping carton or its contents are damaged upon receipt then the customer should immediately report this to the HP Customer Engineer and to the carrier or to the carrier's agent. The shipping carton and packing material should be retained for inspection by the carrier.

Missing or damaged items will be replaced without waiting for the settlement of claims. Items shipped to replace damaged parts will be billed to the customer until the damaged parts are returned to Hewlett Packard.

The Customer Engineer should report problems that are HP's responsibility to the Support Engineer at the appropriate HP division.

| CAUTION |

THE ATP/M PCA (PRINTED CIRCUIT ASSEMBLY) MUST BE PACKED IN ITS ANTI-STATIC BOX FOR SHIPPING AND DURING NORMAL HANDLING.

2.3 TOOLS AND EQUIPMENT

The following hardware tools and equipment are required for:

Installation and Removal

- The Field Service Portable Workstation (9300-1155) is strongly recommended to handle PC boards in an ESD safe environment.

- Standard hand tools including a Number 1 Posidriv and a flat-blade screwdriver.
  Note: A 2.5mm (3/32 in.) Allen wrench or straight hex. wrench is required for the MICRO 3000.

- Antistatic Wrist Strap.

- MICRO 3000 Series/3000 Series 37 Board Extractor Tool (30457-80004).

Troubleshooting and Diagnostics

- The required loopback hoods (refer to Table 1-3).

- 4951B Protocol Analyzer.

- Volt-ohmmeter (HP3465/3466 or equivalent)

2.4 CONFIGURATIONS

The MICRO 3000XE and 3000 Series 37 SPUs and I/O Extenders have a 5 slot card cage. Slot 1 always has the highest priority and slot 5 has the lowest. PCAs fitted in the SPU slots always have a lower priority than those in the I/O Extender. The SPU and the I/O Extender have slot numbers marked on their rear panels.

The MICRO 3000 SPU has a four slot card cage. Slot 1 always has the highest priority and slot 4 has the lowest. The SPU has slot numbers marked on its rear panel.

Figures 2-1 and 2-2 show the channel numbers associated to each slot.

The system configurations for the ATP/M are as follows:

- A maximum of **two** ATP/M can be installed in a MICRO 3000 computer system (i.e. there is not an I/O Extender).

- A maximum of **seven** ATP/M can be installed in a MICRO 3000XE computer system (i.e. with an I/O Extender).

- A maximum of **two** ATP/M (or ATP37) can be installed in a Series 37 computer system (i.e. there is not an I/O Extender).

- A maximum of **four** ATP/M (or ATP37) can be installed in a Series 37XE computer system (i.e. with an I/O Extender).

Note: Installation of seven ATP/Ms in the MICRO 3000XE requires that that there is only one memory PCA and one PIC PCA installed; LANs and INPs cannot be installed.

The following rules must be observed when configuring the SPU and I/O Extender card cages:

HP MICRO 3000

- The Processor Board **must** be installed in SPU slot 4.

- The first ATP/M **must** be installed in SPU slot 1. (An additional ATP/M may be installed in either slot 2 or 3).

- The LAN PCA **may only** be installed in slot 2.

- The INP PCA **may only** be installed in slot 3.

Maximum number of ATP/Ms = 2.
Maximum number of INPs = 1.
Maximum number of LANs = 1.

HP MICRO 3000XE

- The Central Processing Unit (CPU) **must** be installed in SPU slot 5.

- The first ATP/M PCA **must** be installed in SPU slot 1. Further ATP/Ms may be located as follows: One ATP/M in any available SPU slot and up to 5 ATP/Ms in any available slots in the I/O Extender. (Maximum of seven ATP/Ms in SPU + I/O Extender).

- The first Memory PCA* **must** be installed in SPU slot 2, and an additional Memory PCA (if required) **must** be installed in SPU slot 3.

- The LAN PCA **must** be installed in slot 1 of the I/O Extender card cage.

- The PIC PCA may be installed in any available slot.

- The INP PCA may be installed in any available slot.

Maximum number of ATP/Ms = 7.
Maximum number of high-speed PICs = 2
Maximum number of PICs = 3.
Maximum number of INPs = 3.
Maximum number of LANs = 1.

Note: All maxima CANNOT be configured concurrently.

* Memory PCA boards are not supported in the I/O Extender.

HP 3000 Series 37 and 37XE

- The Central Processing Unit (CPU) PCA must be installed in SPU slot 5.

- A Peripheral Interface Controller (PIC) PCA must be installed in SPU slot 4 if there is no I/O Extender (i.e. Series 37). If there is an I/O Extender then either a PIC PCA or an ATP/M PCA can be installed in SPU slot 4, or it can be left empty.

- If a second memory PCA is required, it must be installed in SPU slot 3. If a second memory is not required then either a PIC PCA or an ATP/M PCA may be installed in SPU slot 3, or it can be left empty.

- The first memory PCA must be installed in SPU slot 2.

- The first ATP/M (or ATP37) must be installed in SPU slot 1.

- Any PCA with a connector on the right side (e.g. the ATP/M PCA) cannot be installed in the slot immediately above an ATP37.

- No memory can be installed in the I/O Extender.

- If the I/O Extender is empty, the PIC PCA must be installed in the I/O Extender in slot 5.

- A maximum of three PIC PCAs (maximum of two high-speed PICs) can be installed in the Series 37XE. If a third PIC is installed, only INPs can be connected to it.

- A maximum of two 512k Memory PCAs, two 1024k Memory PCAs or one 2048k Memory PCA can be installed in the system.

- A maximum of three Intelligent Network Processor (INP) PCAs can be installed in the Series 37XE.

SUMMARY

In a MICRO 3000, there must be an ATP/M installed in slot 1 of the SPU. One further ATP/M can be installed in slot 2 or 3.

In a MICRO 3000XE, there must be an ATP/M installed in slot 1 of the SPU. One further ATP/M can be installed in any available SPU slot. Up to five further ATP/Ms can be installed in any available slots in the I/O Extender.

In a 3000 Series 37, there must be an ATP/M (or ATP37) installed in slot 1 of the SPU. One further ATP/M can be installed in slot 3.

In a 3000 Series 37XE, there must be an ATP/M (or ATP37) installed in slot 1 of the SPU. Further ATP/M(s) can be installed in either SPU slots 3 and 4 or in the I/O Extender according to the card configuration.
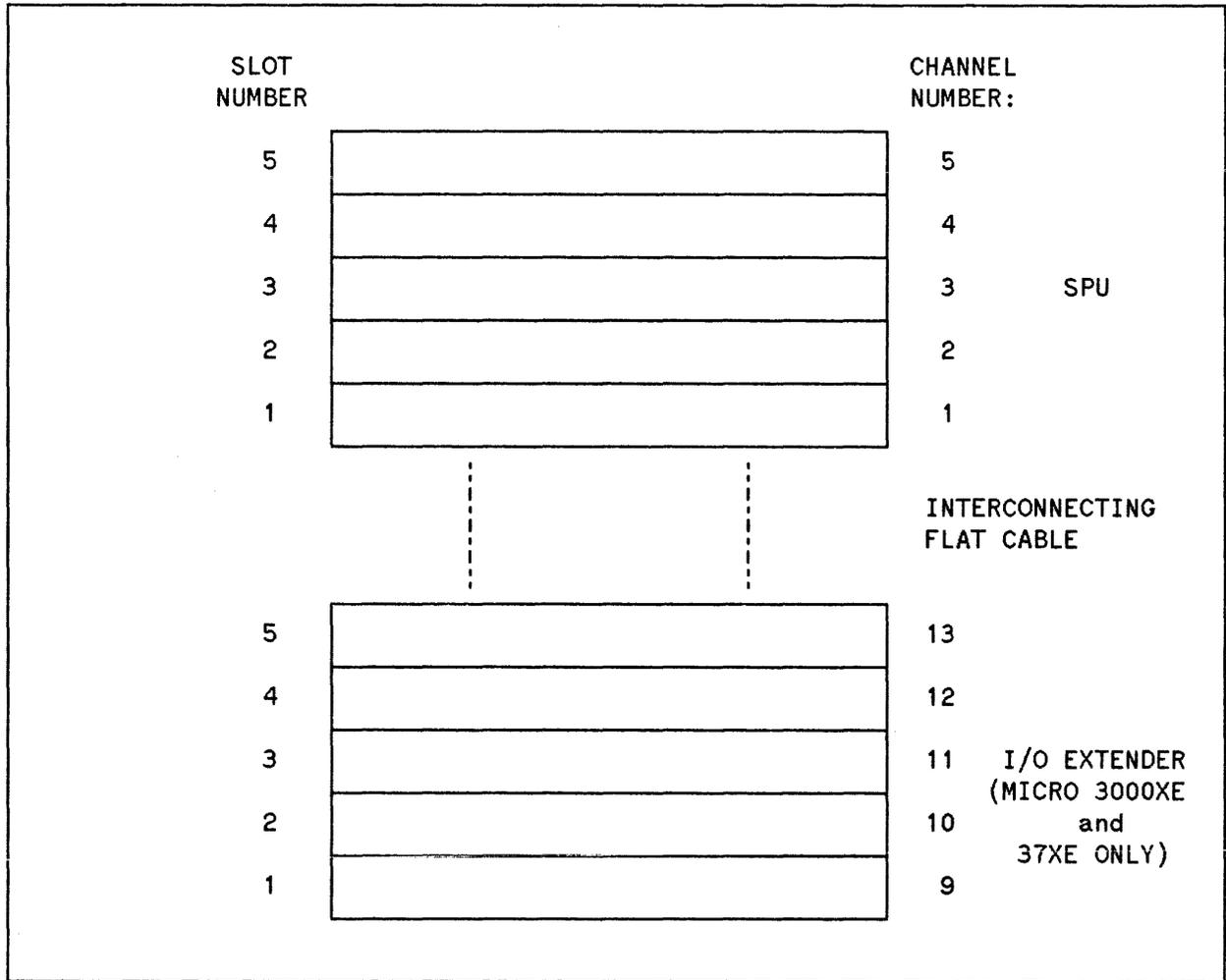
Figure 2-1 MICRO 3000XE and 3000 Series 37 SPU/Extender Slot and Channel Assignments
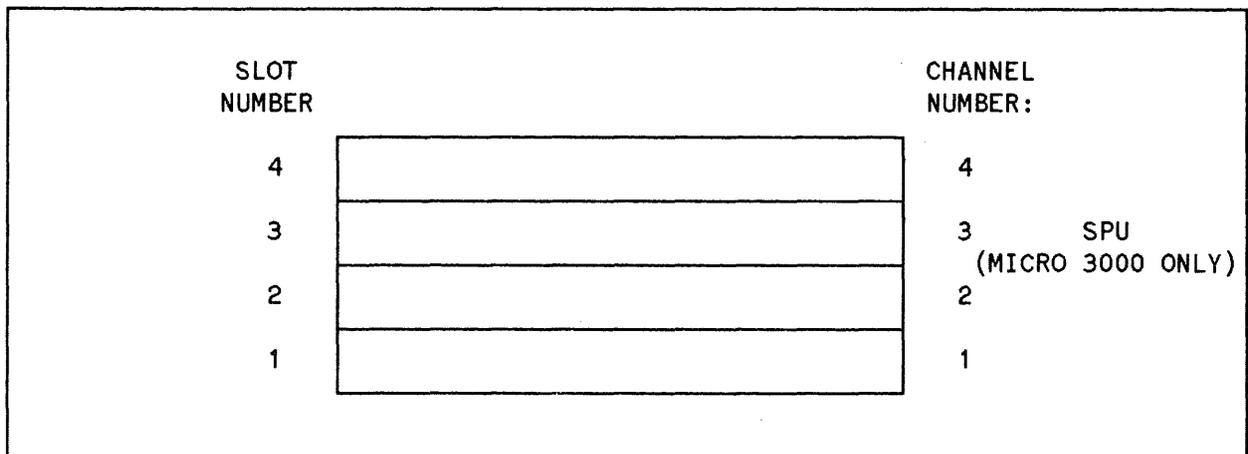
Figure 2-2 MICRO 3000 SPU Slot and Channel Assignments

2.5 PREPARATION

There are no special site preparation requirements prior to installation of the ATP/M. However, special care should be taken when installing the RS-422 version of the ATP/M as problems can occur due to the length of device cables (up to 1220m/4000ft) supported by RS-422.

If there is a potential difference of more than 7 volts between the signal ground at the ATP/M Connector Panel and the signal ground at the terminal then the terminal installation cannot be effected. For further information refer to the Computer Support Division policy on installing HP Data Terminals.

Further details can also be found in the HP 3000 Series 37 Site Planning & Preparation Guide (30457-90008).

2.6 REMOVING/REPLACING THE CABINET PANELS

1) Manually unsnap and remove the back and top panels of the cabinet as illustrated. The panels can be replaced later by reversing the procedure.
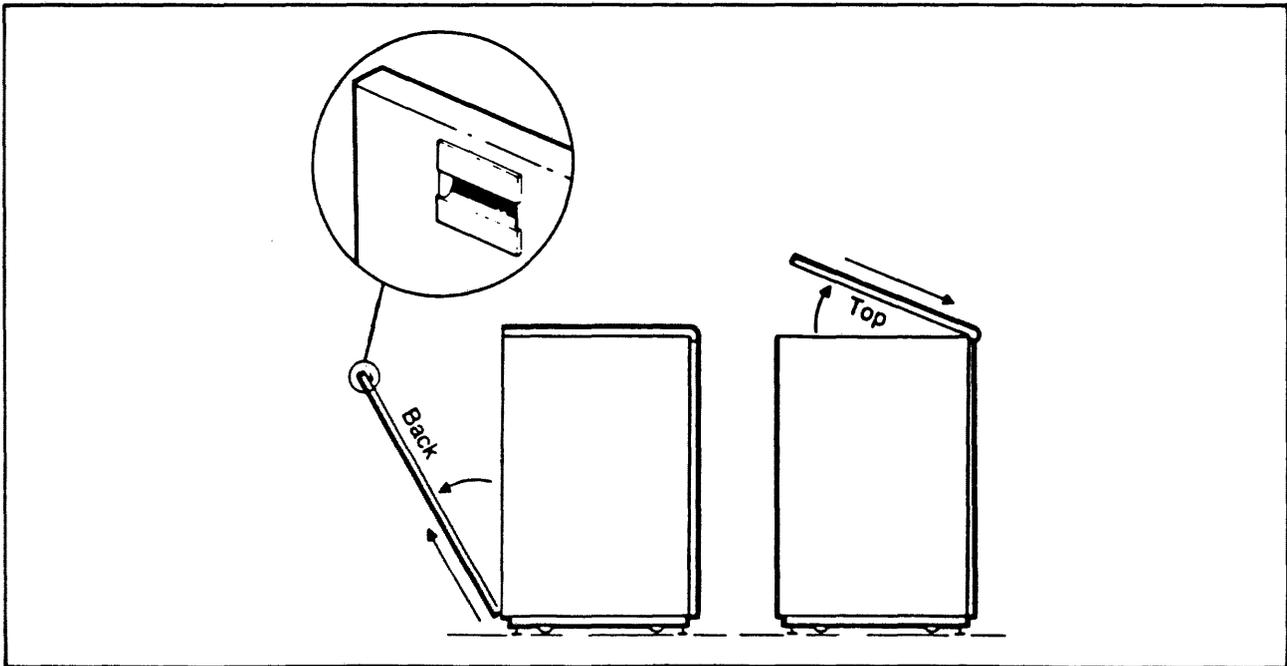
Figure 2-3 Removing/Replacing Cabinet Panels

2.7 REMOVING/REPLACING THE REAR PANELS

Use the same procedure to remove and replace the SPU rear panel and/or the I/O Extender rear panel as required.

2) **Removal.** Remove the rear panel as follows:

   a) Refer to Figures 2-4 and 2-5.

   b) **For the MICRO 3000XE and 3000 Series 37:**
      Using a Number 1 Posidriv screwdriver loosen the six captive screws and remove the rear panel.

      For the MICRO 3000:
      Using a 2.5mm (3/32 in.) Allen wrench or straight hex. wrench loosen the eight captive screws and remove the rear panel.

   c) The power cord to the fan on the rear panel can be unplugged at the fan if necessary.

Replacement The rear panel is replaced by reversing the removal procedure. Ensure that the dust covers fitted in the rear panel at each slot position are removed where required and that the 50-pin D-type connector of the ATP/M PCA is correctly aligned before tightening the screws.

NOTE

Ensure that the fan power cord is positioned under the ATP/M PCA in slot 1 before replacing the rear panel.
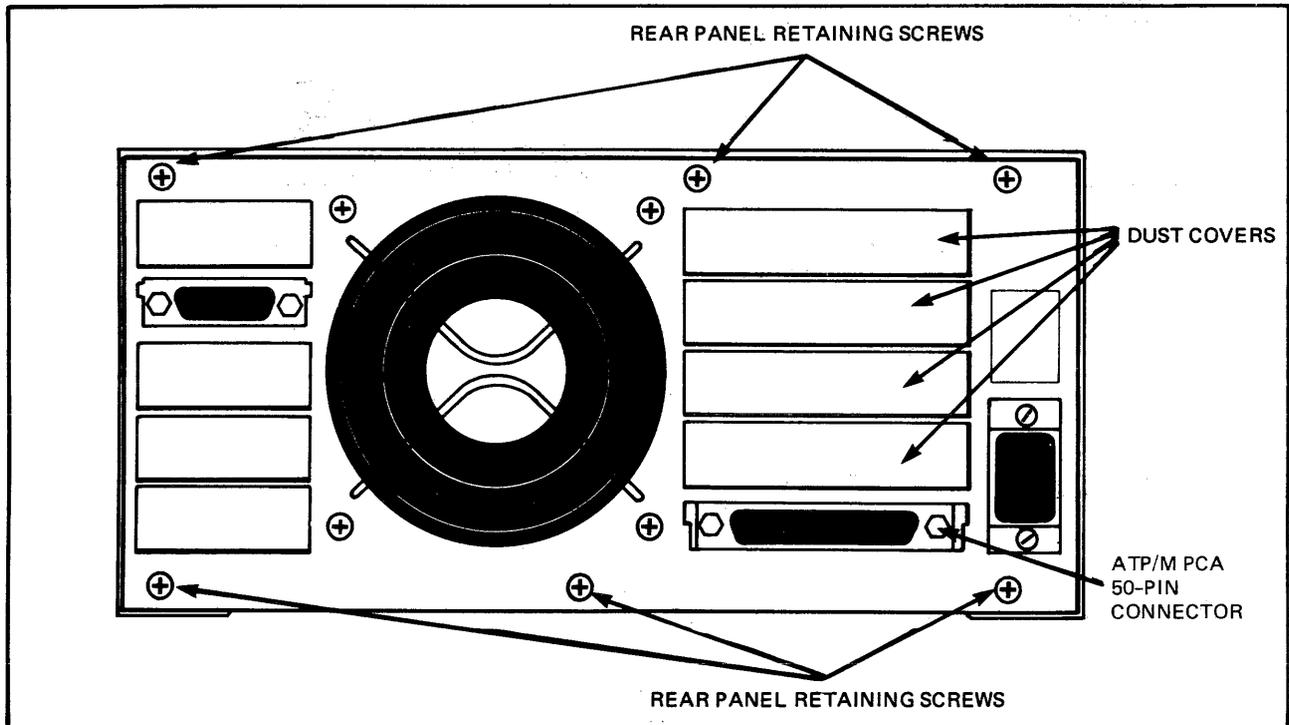
Figure 2-4 MICRO 3000XE and 3000 Series 37 SPU/Extender Rear View
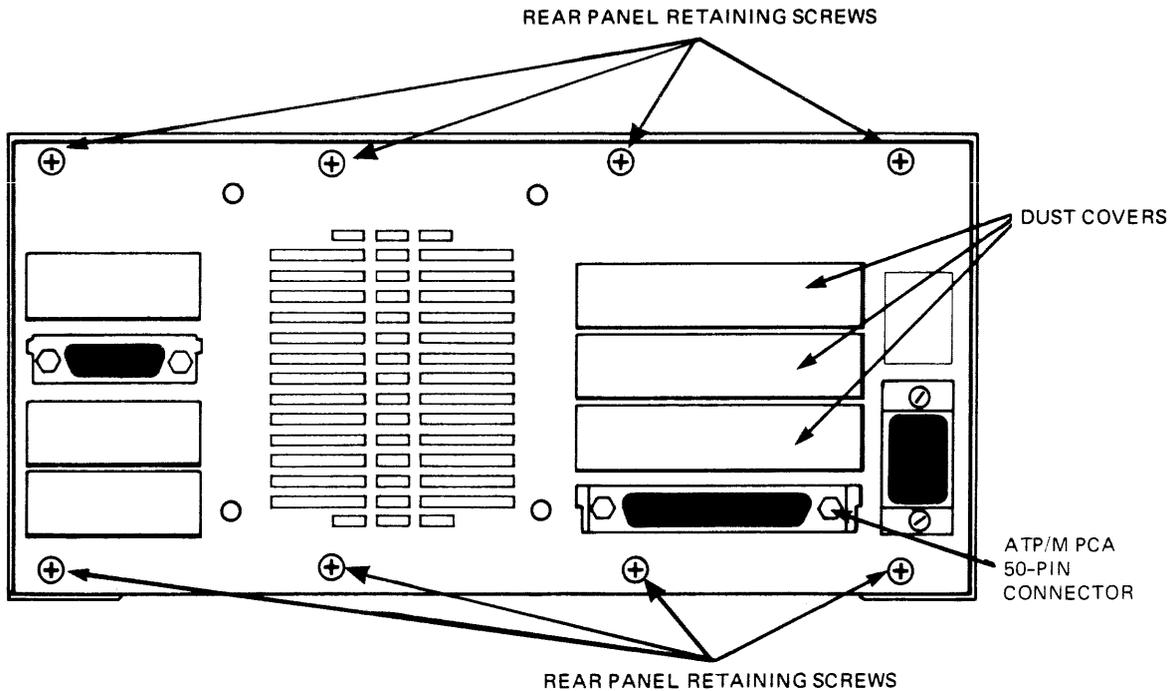
Figure 2-5 MICRO 3000 SPU Rear View

2.8 INSTALLING THE ATP/M PCA

Use the same procedure to install the ATP/M PCA in the SPU and/or the I/O Extender as required. Refer to Section 2.4 for the card cage configurations before proceeding.

CAUTION

Always use anti-static handling procedures when installing the ATP/M Printed Circuit Assembly (PCA).

3) **Installation.** The ATP/M PCA is installed as follows:

a) Refer to Figures 2-6 and 2-7.

b) Hold the PCA at its edges, component side up, with the 50-pin D-type connector towards you (see Figure 1-1).

c) Carefully slide the PCA into the unit in the slot runners at the required position.

d) Push the PCA fully into the unit so that the PCA connector engages with the connector on the I/O Bus.

e) The rear panel can then be replaced following the procedure in Section 2.7 (Replacement).

Removal. The removal procedure is detailed in Section 2.11.

ATP/M PCA   FAN POWER CORD
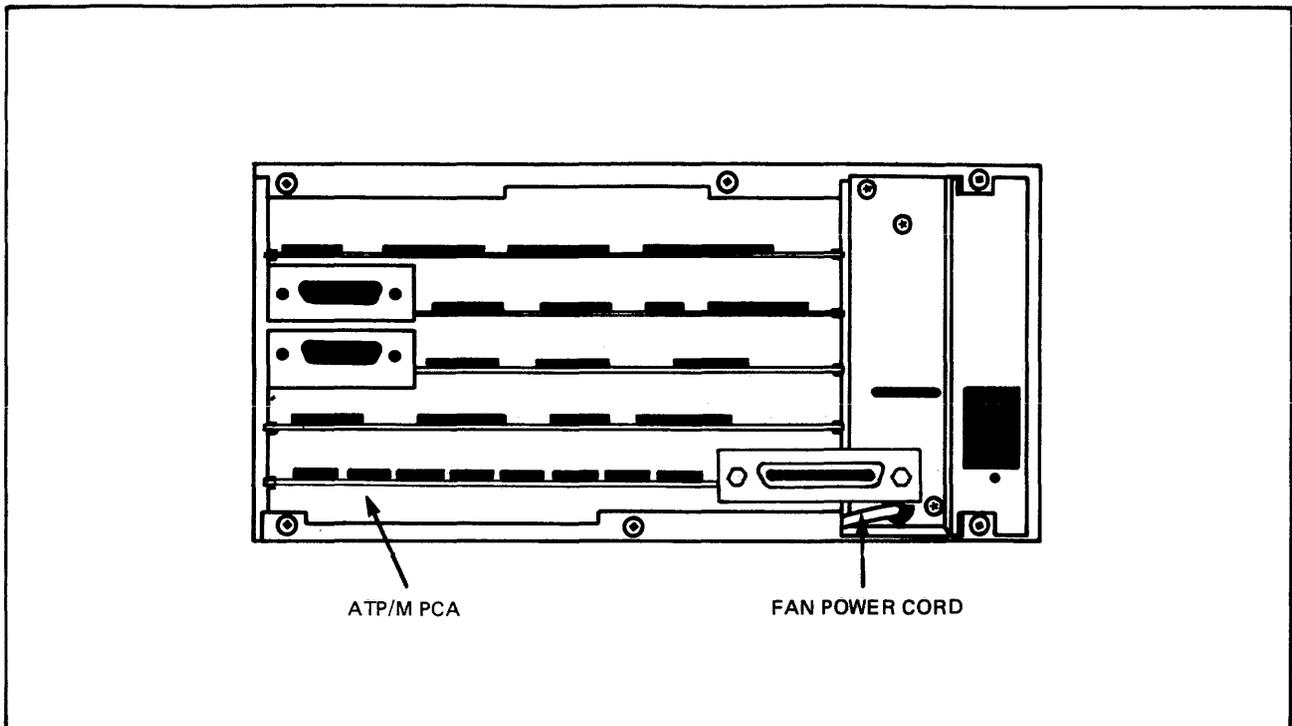
Figure 2-6 MICRO 3000XE and 3000 Series 37 SPU/Extender Rear Panel Removed

ATP/M PCA   FAN POWER CORD
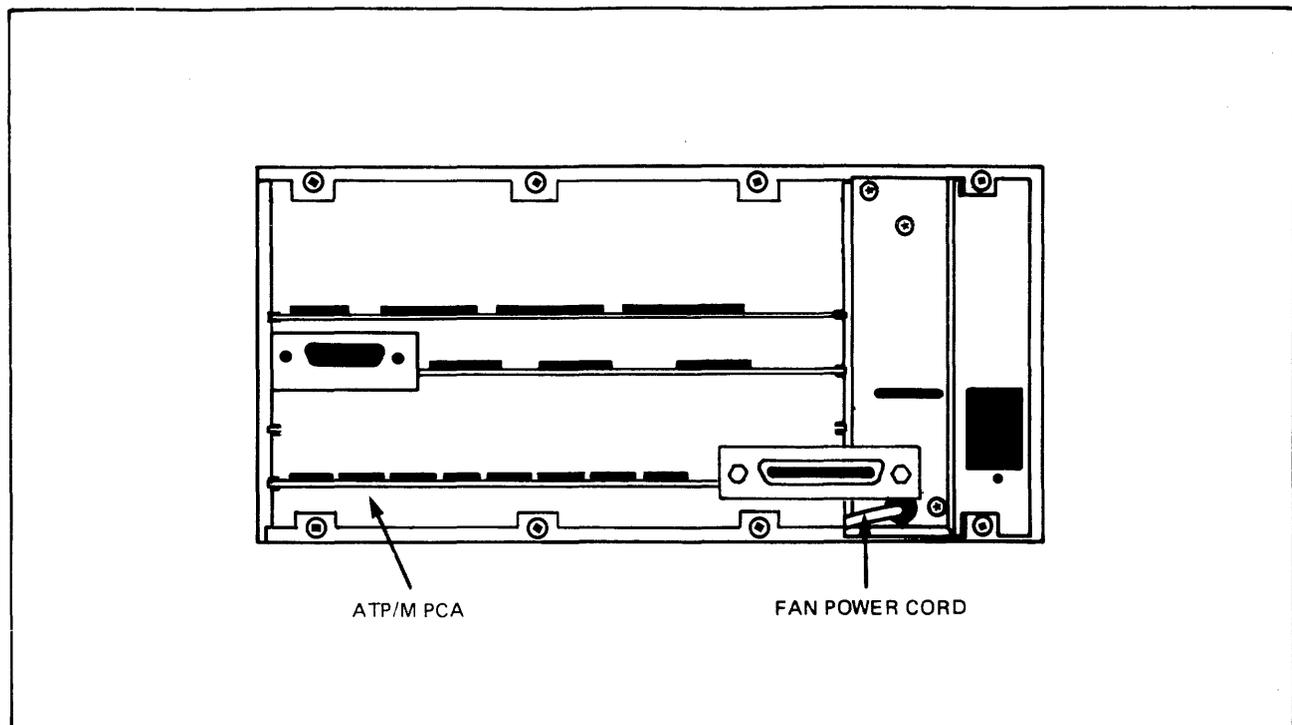
Figure 2-7 MICRO 3000 SPU Rear Panel Removed

CABLE TIE
(LEAVE IN POSITION)

SPU

ATP/M
CONNECTOR PANELS

I/O EXTENDER

ATP/M
CONNECTOR PANELS

AC POWER STRIP

CABLE GUARDS
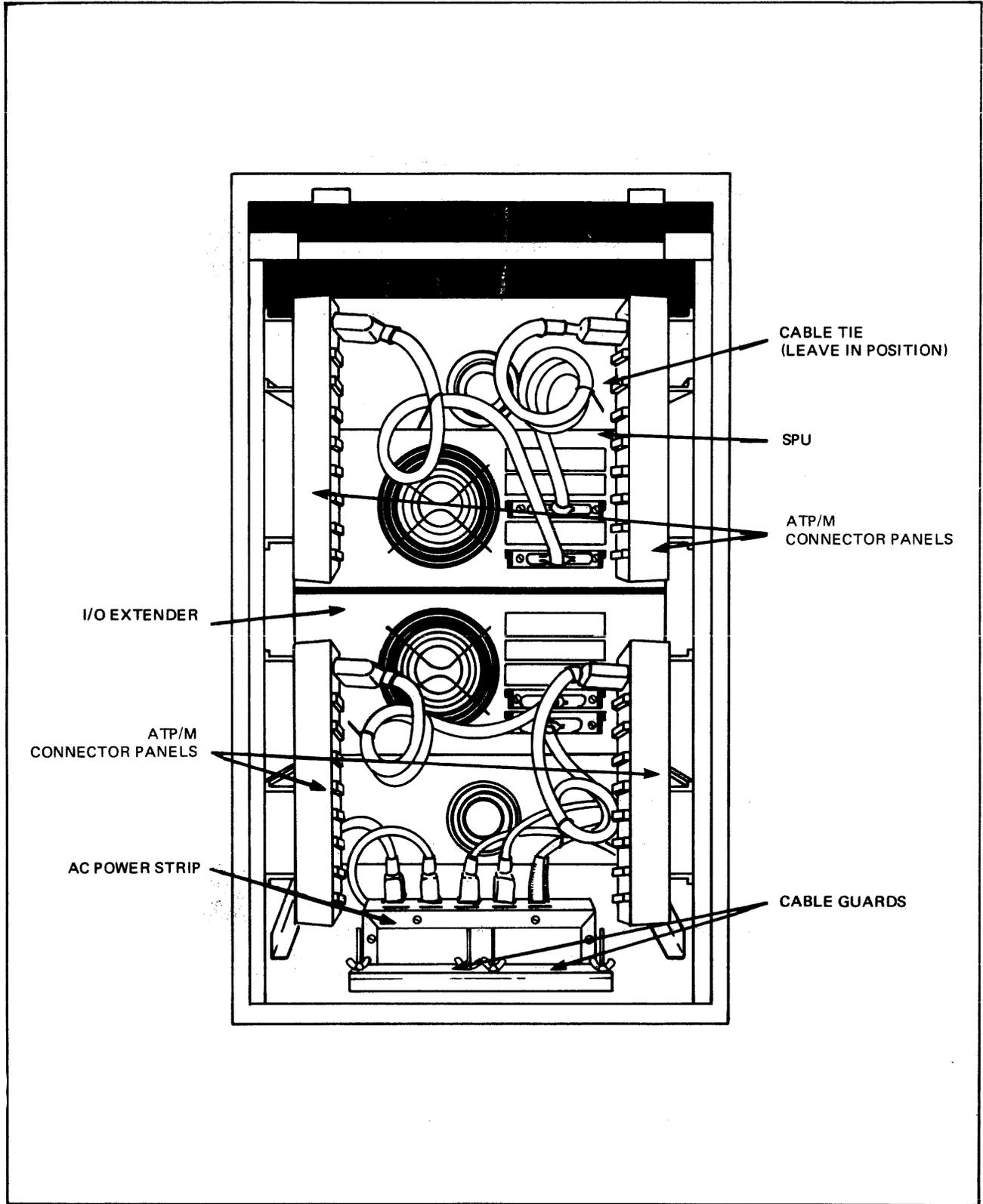
Figure 2-8 MICRO 3000XE Cabinet With Four ATP/M Connector Panels

2.9 MOUNTING THE ATP/M CONNECTOR PANEL

4) **Installation.** Mount the ATP/M Connector Panel(s) as follows:

a) Refer to Figures 2-8 and 2-9. Figure 2-9 shows the mounting positions of two ATP/M Connector Panels on the vertical strut inside the rear of the cabinet (right side). The vertical placement of the connector panels is identical on both sides of the cabinet. It is recommended that the connector panels associated with the SPU are mounted above those of the I/O Extender.
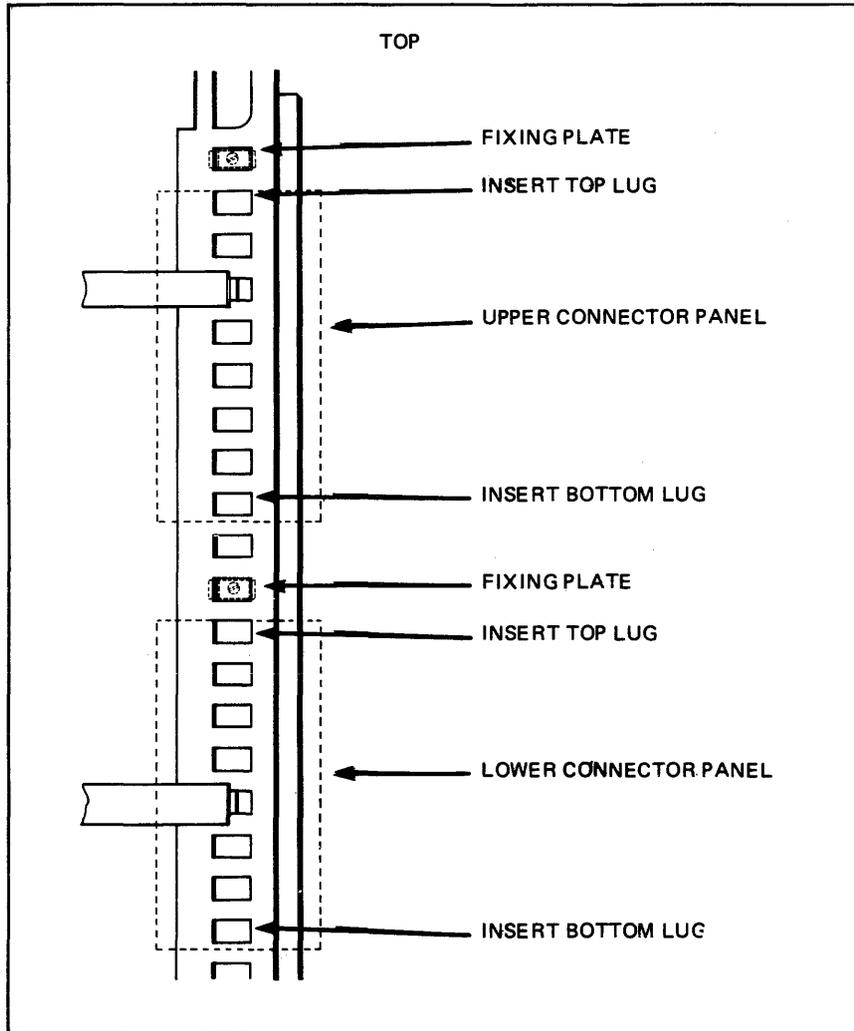
Figure 2-9 ATP/M Connector Panel Positioning

b) The mounting plate at the rear of the connector panel is shown in Figure 2-10. The fixing plate must be removed before mounting the connector panel in position.

TOP LUG

FIXING PLATE

MOUNTING PLATE
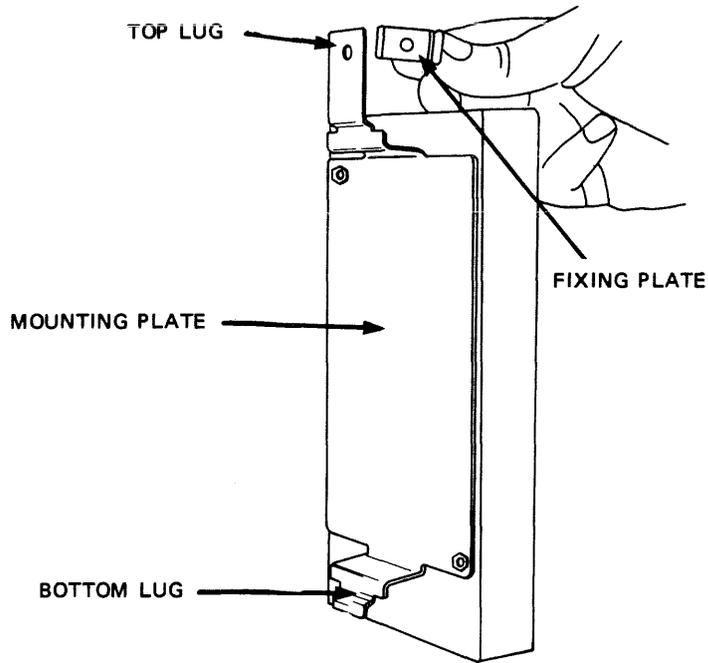
BOTTOM LUG

Figure 2-10 Connector Panel Mounting Plate

c) Insert the top lug of the connector panel mounting plate in the vertical strut at the correct position with reference to Figure 2-9. Then insert the bottom lug and push the connector panel down to locate it.

d) Secure the connector panel in position by tightening the fixing plate to the top lug as shown in Figure 2-11.

Removal. Remove the connector panel(s) by reversing the installation procedure.
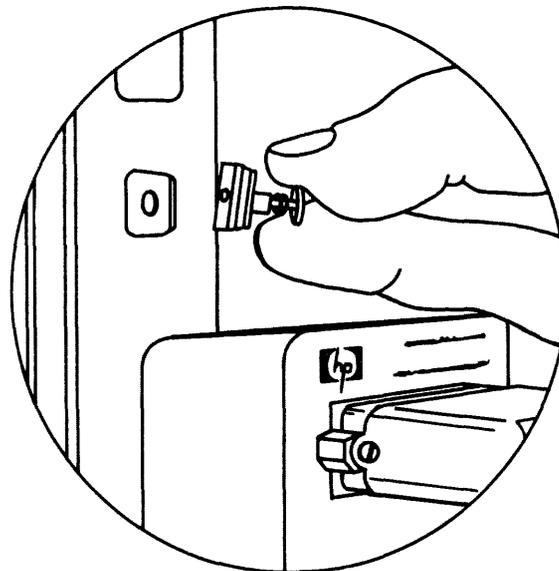
Figure 2-11 Securing the Connector Panel

2.10 INSTALLING THE ATP/M CABLE

5) **Installation.** Connect the ATP/M PCA and Connector Panel using the cable as follows:

a) Refer to Figures 2-8 and 2-12. The locking screws on the 50-pin connectors are held in place by retaining circlips which can be left in position. It is not necessary to remove the cable tie from the cable to install it in the cabinet.

b) Connect the cable to the ATP/M PCA and its associated connector panel by engaging the 50-pin connectors and securing them using the locking screws.

c) Take the label marked with the correct slot number (see Figures 2-1 and 2-2) from the adhesive labels provided and stick it on the connector panel for identification.

Removal. Remove the cable by simply loosening the locking screws and disconnecting the connectors.
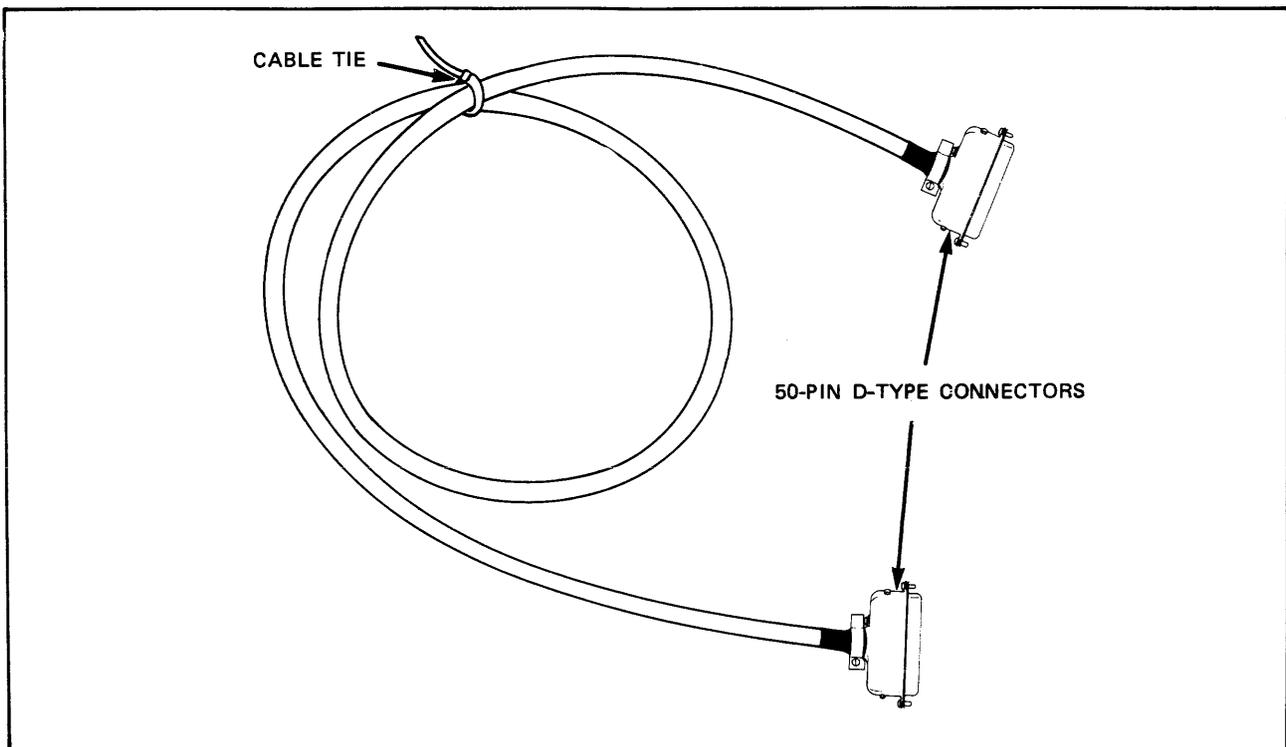
Figure 2-12 ATP/M Cable

2.11 REMOVING THE ATP/M PCA

The procedure for removing an ATP/M PCA is as follows:

a)   Connector panels may need to be removed as detailed in Section 2.9. Note that the installed device cables (if any) can normally remain connected to the connector panel.

b)   Remove the SPU or I/O Extender rear panel as detailed in Section 2.8.

c)   Refer to Figure 2-13. Insert the extractor tool in the hole on the left of the PC board and push the extractor tool to the left. This disconnects the PCA connector from the I/O Bus. The PCA can then be slid out of the unit by gently pulling the extractor tool on the left and the 50-pin connector on the right.
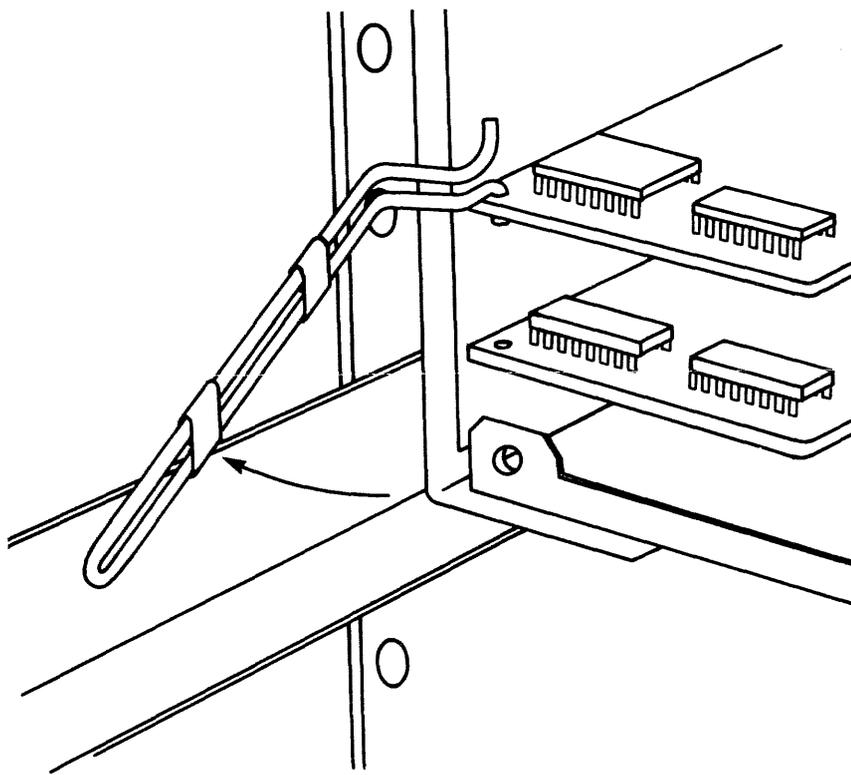
Figure 2-13 PCA Removal

3.1 INTRODUCTION

This section details how to install the device (workstation, printer, modem, etc.) cables and connect them to the ATP/M Connector Panel.

The connector panel device port signals are detailed together with information on the modem signal behavior for the 25-pin modem ports. The recommended cables for connecting workstations to the ATP/M are listed in Table 3-6. Table 3-7 lists the recommended cables for modem connections.

3.2 INSTALLING THE DEVICE CABLES

Installation. Install the device cables and connect them to the ATP/M Connector Panel device ports as follows:

a) Refer to Figure 2-8. Remove the two wing-nuts and the top plate from the cable guard on the same side as the connector panel.

b) Connect each device cable connector to its associated port on the connector panel. Ensure that the connectors are correctly engaged. Note that the 3-pin and the 5-pin male/female connectors clip together when fully engaged. The 25-pin connectors must be secured by tightening the locking screws.

c) Identify each device cable by attaching a marked identification tag close to the cable connector.

d) Bundle the device cables of each connector panel as far as the cable guard using cable ties.

e) Spread the cables across the width of the cable guard and then secure them by replacing the top plate and tightening the wing-nuts.

f) The system cabinet panels can then be replaced as shown in Section 2.6, ensuring that the device cables pass clearly through the aperture between the base of the cabinet and the rear panel.

Removal. Remove the device cables by reversing the installation procedure. The 3-pin and the 5-pin male connectors are released by pressing firmly on either side of the plastic connector housing (at the base of the clip) and pulling it free.

3.3 DEVICE PORT SIGNALS

The ATP/M Connector Panel device port signals are listed in Tables 3-1, 3-2, 3-3 and 3-4.

Connector Pin Number	CCITT V.24	Function		EIA	Connector Pin Function	Utility
1	101	Frame Ground	FG	AA	PROTECTIVE GROUND	Used
2	103	Transmit Data	TD	BA	INPUT	Used
3	104	Receive Data	RD	BB	OUTPUT	Used
4	105	Request to Send	RTS	CA	INPUT	Used
5	106	Clear to Send	CTS	CB	OUTPUT	Not Used
6	107	Data Set Ready	DSR	CC	OUTPUT	Used
7	102	Signal Ground	SG	AB	SIGNAL GROUND	Used
8	109	Data Carrier Detect	DCD	CF	OUTPUT	Used
9	-	-		-	INPUT	Not Used
10-19	-	-			NOT CONNECTED	Not Used
20	108.2	Data Terminal Ready	DTR	CD	INPUT	Used
21	-	-			NOT CONNECTED	Not Used
22	125	Ring Indicator	RI	CE	INPUT	Not Used
23	112	Data Rate Select		CH	OUTPUT	Not Used
24/25	-	-			NOT CONNECTED	Not Used

Table 3-1 25-Pin Modem Port (DCE) Signals

Connector Pin Number	CCITT V.24	Function		EIA	Connector Pin Function
1	101	Frame Ground	FG	AA	PROTECTIVE GROUND
2	103	Transmit Data	TD	BA	INPUT
3	104	Receive Data	RD	BB	OUTPUT
4-6	-	Not Connected			-
7	102	Signal Ground	SG	AB	SIGNAL GROUND
8/25	-	Not Connected			-

Table 3-2 25-Pin Direct Connect Port (DCE) Signals

Connector Pin Number	Function		Connector Pin Function
1	Frame Ground	FG	PROTECTIVE GROUND
2	Transmit Data (A)	TD	INPUT
3	Receive Data (A)	RD	OUTPUT
4	Transmit Data (B)	TD	INPUT
5	Receive Data (B)	RD	OUTPUT

Table 3-3 5-Pin Direct Connect Port (DCE) Signals

Connector Pin Number	Function		Connector Pin Function
1	Signal Ground	SG	SIGNAL GROUND
2	Transmit Data	TD	INPUT
3	Receive Data	RD	OUTPUT

Table 3-4 3-Pin Direct Connect Port (DCE) Signals

3.4 MODEM SIGNAL BEHAVIOR

Table 3-5 provides modem signal behavior information at the modem.

Port 7 is a modem port on each version of the ATP/M. Only this port of the connector panel associated to the ATP/M PCA installed in slot 1 can be used to support a remote console. It is used for ROI (Remote Operator Interface) and Tele-Support. For further information refer to the Self Test & Maintenance Mode Manual or the Series 37 Self-Paced Hardware Training Guide (see Section 1-10).

The ATP/M software sets all modem ports to a default line speed of 1200 baud. If the asynchronous device speed is not 1200 baud then the line speed is sensed and set by the ATP/M upon receipt of a Carriage Return character.

```
┌────────────────────────────────────────────────────────────────────────┐
│                      TYPICAL MODEM CONNECTION                            │
├────────────────────────────────────────────────────────────────────────┤
│ Condition: ON                                                            │
│                                                                          │
│    DTR up   ────────────────►     ◄───────────────   DSR up             │
│                                                                          │
│    RTS up   ────────────────►                                            │
│                                         "dial"                           │
│                                   ◄───────────────   DCD up             │
│                                                                          │
│                                        "log-on"                          │
├────────────────────────────────────────────────────────────────────────┤
│ Condition: OFF "log-off" (BYE)                                           │
│                                   Transmit Data line                     │
│                                   ◄───────────────   BYE from remote    │
│               Down 5 seconds                         terminal            │
│    DTR      ────────────────►                                            │
│                                                                          │
│               (no change)                                                │
│    RTS up   ────────────────►     (no change)                            │
│                                   ◄───────────────   DSR up             │
│                                                                          │
│                                   ◄───────────────   DCD down           │
├────────────────────────────────────────────────────────────────────────┤
│ Condition: OFF (Loss of DSR e.g. modem loses power)                      │
│                                                                          │
│                                   ◄───────────────   DSR down           │
│               Down 5 seconds                                             │
│    DTR      ────────────────►                                            │
│                                                                          │
│               (no change)                                                │
│    RTS up   ────────────────►                                            │
│                                                                          │
│                                   ◄───────────────   DCD don't care     │
├────────────────────────────────────────────────────────────────────────┤
│ Condition: OFF (Loss of DCD, e.g. noisy line or loss of remote modem)    │
│                                   ◄───────────────   DCD down           │
│               Down 5 seconds                         (see Note*)         │
│    DTR      ────────────────►                                            │
│                                                                          │
│               (no change)                                                │
│    RTS up   ────────────────►                                            │
│                                                                          │
│                                   ◄───────────────   DSR don't care     │
├────────────────────────────────────────────────────────────────────────┤
│ NOTE: CTS and RING INDICATOR are not used. The ATP subsystem monitors DSR│
│       and DCD continuously. Anytime DTR drops the session is logged off. │
│ Note* Down for 30 seconds or noisy modem line (50 contiguous ups and     │
│       downs).                                                            │
└────────────────────────────────────────────────────────────────────────┘
```
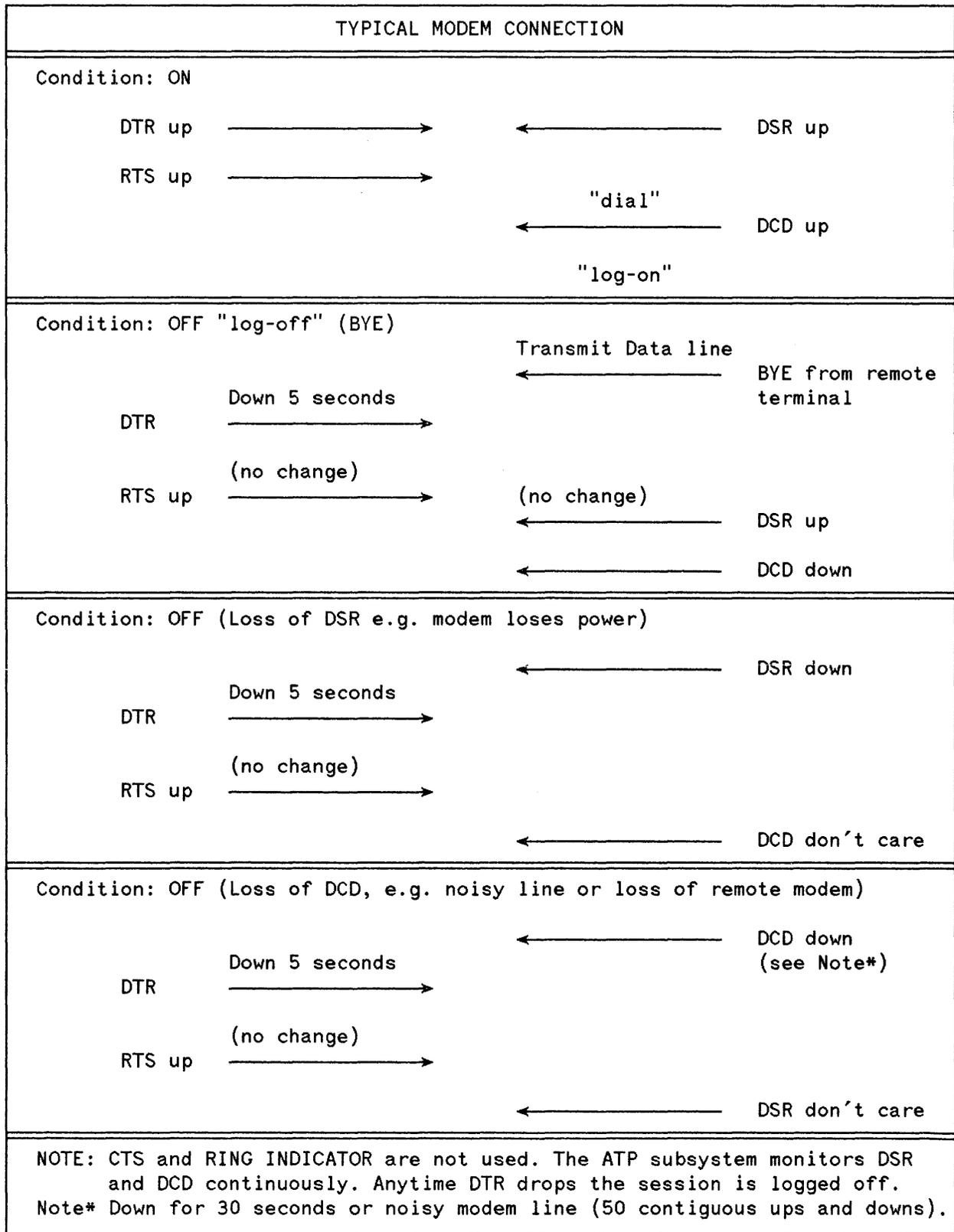
Table 3-5 Modem Signal Behavior at the Modem

3.5 CABLING INFORMATION

Cables for connecting local workstations directly to an ATP/M RS-232-C (25-pin) direct connect or modem port:		
Workstation	Product Number	Cable Description
150 2625A 2628A	13242N/M/Y	male (25-pin)/male (25-pin) length 5 meters (16 ft.)
2623A 2624B	13222N/M/Y	male (25-pin)/male (25-pin) length 5 meters (16 ft.)
2392A	40242M/Y	male (25-pin)/male (25-pin) length 5 meters; RFI filter
Cables for connecting local workstations directly to an ATP/M RS-232-C (3-pin) direct connect port:		
Workstation	Product Number	Cable Description
150 2625A 2628A	13242X	male (3-pin)/male (25-pin) length 5 meters (16 ft.)
2623A 2624B	13222X	male (3-pin)/male (50-pin) length 5 meters (16 ft.)
2392A	40242X	male (3-pin)/male (25-pin) length 5 meters; RFI filter
Cables for connecting local workstations directly to an ATP/M RS-422 (5-pin) direct connect port:		
Workstation	Product Number	Cable Description
150 2625A 2628A	13242P	male (5-pin)/male (25-pin) length 5 meters (16 ft.)
2623A 2624B	13222P	male (5-pin)/male (50-pin) length 5 meters (16 ft.)
2392A	40242P	male (5-pin)/male (25-pin) length 5 meters; RFI filter

Table 3-6 ATP/M Workstation Connection Cables

Product Number	Cable Description
30062B	male (25-pin)/male (25-pin) length 7.6 meters (25 ft.)
30062B Opt 001	male (25-pin)/male (25-pin) length 15.2 meters (50 ft.)

Table 3-7 ATP/M To Modem Connection Cables

ATP/M			MODEM		
Connector Pin Number	Function		Connector Pin Number	Function	
1	Frame Ground	AA	1	Frame Ground	AA
2	Transmit Data	BA	3	Receive Data	BB
3	Receive Data	BB	2	Transmit Data	BA
4	Request To Send	CA	8	Data Carrier Detect	CF
5	Clear To Send	CB	-	Not Connected	
6	Data Set Ready	CC	20	Data Terminal Ready	CD
7	Signal Ground	AB	7	Signal Ground	AB
8	Data Carrier Detect	CF	4	Request To Send	CA
9	-		9	-	
10-19	-		10-19	-	
20	Data Terminal Ready	CD	6	Data Set Ready	CC
21	-			-	
22	Ring Indicator	CE	5	Clear To Send	CB
23	Data Rate Select	CH	23	Data Rate Select	CH
24/25	-			-	

Table 3-8 Typical Modem Connection Cable Signals

4.1 INTRODUCTION

The following diagnostic tools are available to test and troubleshoot on the ATP/M.

4.2 SYSTEM SELF TESTS

1) **PON (Power-ON) Self-Test.** First, all the I/O boards installed in the system are tested. The slot numbers of any I/O boards which fail are indicated on the LED display of the SPU front panel. The tests which are performed on the ATP/M are the same as those listed for the Maintenance Mode Self-Test. If the ATP/M (in SPU slot 1) supporting the system console passes this test then pass/fail information is also displayed on the system console. If the ATP/M supporting the system console fails this test then the Self Test loops on the test that detected the failure.

2) **Maintenance Mode Self-Test.** The Maintenance Mode TEST command allows the operator to access test sections of the PON Self-Test. The selected test(s) may be looped up to 9999 times. The tests which are performed on the ATP/M are as follows:

- INIT Test. Performs an initialization and tests the registers.

- I/O Operations Test. Tests the basic I/O operations.

- Port Registers Test. Performs a write to the port registers and verifies the data.

- Diagnostic Loopback Test. This uses the DMA sequencer ROM.

- PCC Tests. This initiates PCC tests on all eight ports.

- DMA Data Loopback Test. Performs DMA data loopback on all eight ports.

For further information refer to the Self-Test & Maintenance Mode Manual (30457-90003).

4.3 OFF-LINE TESTS

3) **DUS Diagnostic (TICDIAG).** TICDIAG (Version V2.00 or later) is an off-line diagnostic program which is part of the Diagnostic Utility Operating System. It is used to test the ATP/M (and the ATP37). The tests are divided in two sections; the SIB circuitry tests and the AIB circuitry tests (see Section 1.3).

The AIB tests may require loopback hoods. There are 3-pin, 5-pin and 25-pin loopback hoods available to test individual ports. Two 50-pin loopback hoods are available (one for RS-232-C, one for RS-422) to test all ports simultaneously. A 50-pin loopback hood cannot be used on the ATP/M

which is supporting the system console but this can be switched to another ATP/M when running TICDIAG. The 50-pin loopback hood is useful for determining whether it is the PCA or the cable/connector panel subset which is defective.

For further information refer to the TICDIAG Manual (40290-90004).

4.4 ON-LINE TESTS

4) **Terminal On-Line Diagnostic Support Monitor (TERMDSM).** This on-line diagnostic program enables comprehensive testing of one or more ATP/M ports without affecting the system resources available for other ports and peripheral devices. A simple command is available to identify software broken ports. There are three diagnostic test sections as follows:

- The first section tests the data paths from the I/O hardware to the PCC. If all ports on the AIB section are to be tested then the PCC(s) to Modem Controller Chip (MCC) circuitry is also tested.

- The second section is run with loopback hoods installed on the specified ports.

- The third section performs a Write then a Read test on data sent to a specified terminal.

For further information refer to the Terminal On-Line Diagnostic Support Monitor Manual (30144-90013).