

HP 3000 Series 37



1/16/86

Sales Order #  
2417-27885-001

**ATP37/M**

**Installation Manual**

2nd Set of  
Ports Installed

When completed  
Please file this  
in black notebook



**HEWLETT  
PACKARD**

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Part No. 40290-90001  
E0985

Printed in France 09/85

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INSTALLATION MANUAL**

**40290-90001 September 1985**

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# PRINTING HISTORY

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. Note that 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.

First Edition . . . . . SEP 1985 . . . . .



# SAFETY CONSIDERATIONS

**GENERAL** - This product and relation documentation must be reviewed for familiarization with safety markings and instructions before operation.

## SAFETY SYMBOLS



Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect the product against damage.



Indicates hazardous voltages.



Indicates earth (ground) terminal (sometimes used in manual to indicate circuit common connected to grounded chassis).

## WARNING

The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.

## CAUTION

The **CAUTION** sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a **CAUTION** sign until the indicated conditions are fully understood and met.

## CAUTION

### STATIC SENSITIVE DEVICES

Some of the semiconductor devices used in this equipment are susceptible to damage by static discharge. Depending on the magnitude of the charge, device substrates can be punctured or destroyed by contact or mere proximity to a static charge. These charges are generated in numerous ways such as simple contact, separation of materials, and normal motions of persons working with static sensitive devices.

When handling or servicing equipment containing static sensitive devices, adequate precautions must be taken to prevent device damage or destruction. Only those who are thoroughly familiar with industry accepted techniques for handling static sensitive devices should attempt to service the cards with these devices. In all instances, measures must be taken to prevent static charge buildup on work surfaces and persons handling the devices. Cautions are included through this manual where handling and maintenance involve static sensitive devices.

**SAFETY EARTH GROUND** - This is a safety class I product and is provided with a protective earthing terminal. An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and be secured against any unintended operation.

**BEFORE APPLYING POWER** - Verify that the product is configured to match the available main power source per the input power configuration instructions provided in this manual.

If this product is to be energized via an auto-transformer (for voltage reduction) make sure the common terminal is connected to the earth terminal of the main power source.

## SERVICING

## WARNING

Any servicing, adjustment, maintenance, or repair of this product must be performed only by qualified personnel.

Adjustments described in this manual may be performed with power supplied to the product while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.

Capacitors inside this product may still be charged even when disconnected from its power source.

To avoid a fire hazard, only fuses with the required current rating and of the specified type (normal blow, time delay, etc.) are to be used for replacement.

## WARNING

### EYE HAZARD

Eye protection must be worn when removing or inserting integrated circuits held in place with retaining clips.

# 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     |
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| all . . . . .   | SEP 1985 |



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## 1.0 INTRODUCTION

This manual describes the ATP37/M and details the procedure for its installation in an HP 3000 Series 37 computer system. The ATP37/M is an Advanced Terminal Processor for Series 37 computer systems.

Some diagnostic programs (e.g. TICDIAG) refer to the TIC. This is the acronym for Terminal Interface Controller. The TIC is the Advanced Terminal Processor (ATP37 or ATP37/M) for the HP 3000 Series 37 computer system. For further information on the TIC refer to Section 1-5.

Note that any installed ATP37(s) can remain in the system when installing additional ATP37/M(s). For further information on configuring the card cages refer to Section 2.3.

**NOTE:** The HP 3000 Series 37 computer system requires one ATP37/M (or ATP37) PCA (Printed Circuit Assembly) installed in slot 1 (channel 1) of the SPU.

## 1.1 GENERAL DESCRIPTION

The ATP37/M provides eight point-to-point, asynchronous ports for connection to local or remote workstations. The Series 37 computer can support up to four ATP37/M, thus up to 32 asynchronous devices can be connected to the computer. An I/O Extender (Series 37XE) is required if more than two ATP37/M are to be installed in the system or if there are no more slots available in the SPU (see 2.3 Configurations). The channel number assigned to each ATP37/M is determined by the slot in which it is installed.

The ATP37/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 ATP37/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 ATP37/M PCA is in slot 1 of the SPU.
- 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 ATP37/M PCA is in slot 1 of the SPU.

Each version of the ATP37/M comprises the three following assemblies:

- 1) **ATP37/M PCA:** This interface board (Printed Circuit Assembly) plugs into the connector mounted on the I/O Backplane of the SPU (Series 37 and 37XE) and the I/O Extender (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.

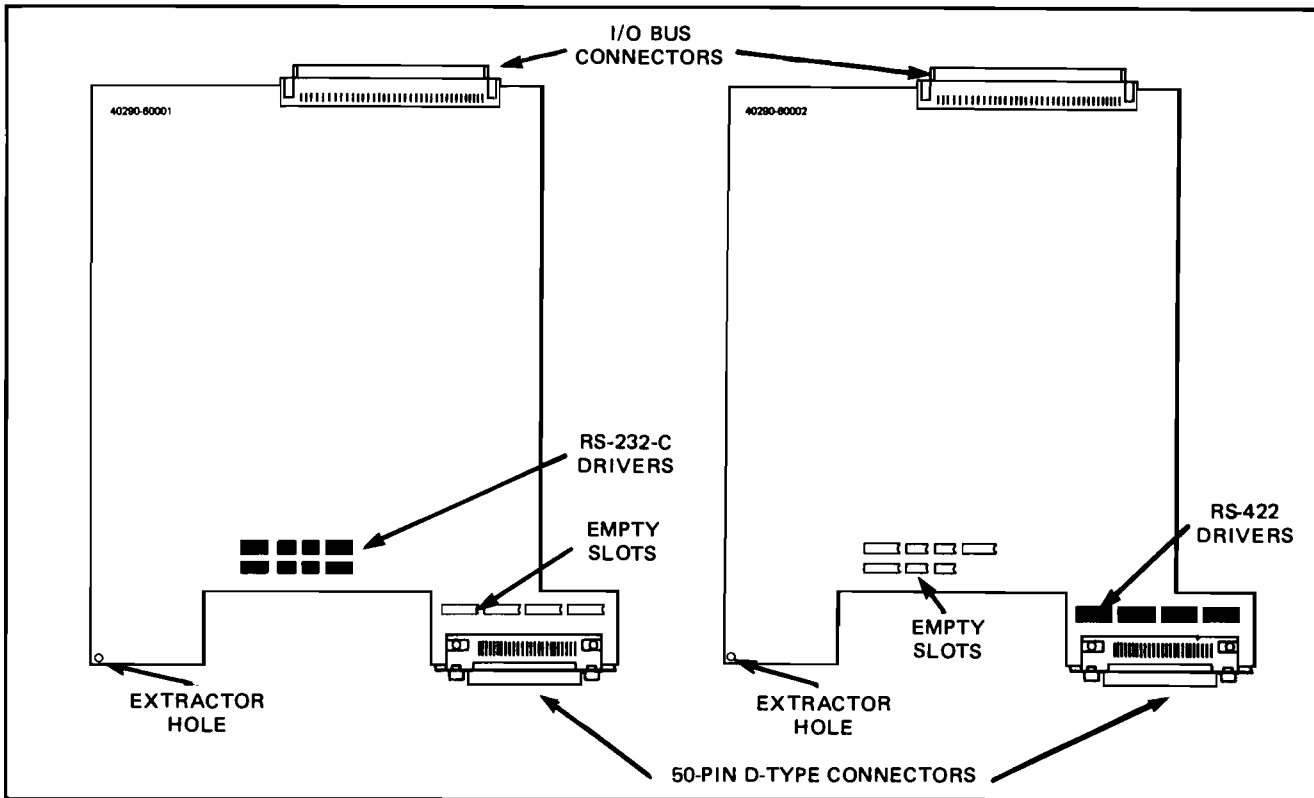
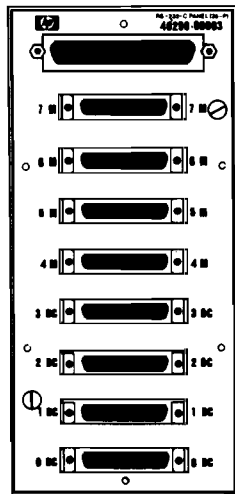
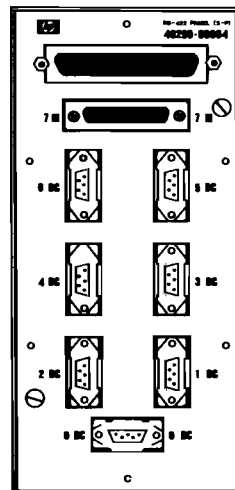


Figure 1-1 ATP37/M PCA (RS-232-C, left) (RS-422, right)

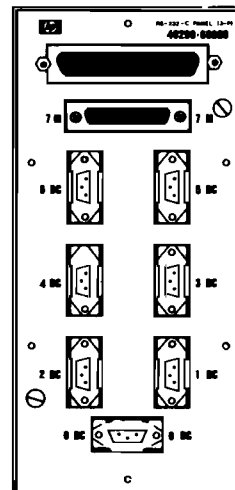
- 2) **ATP37/M Cable:** This is a shielded cable fitted with two 50-pin male D-type connectors to link the ATP37/M PCA to the ATP37/M Connector Panel. The same cable is used for each version of the ATP37/M.
- 3) **ATP37/M Connector Panels:** There are three versions (one RS-422 version and two RS-232-C versions) of connector panel. Up to four connector panels can be mounted inside the Series 37 cabinet. The connector panels are fitted with one 50-pin, female connector for connection to the associated interface board (ATP37/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 ATP37/M Connector Panels

## 1.2 FUNCTIONAL DESCRIPTION

The ATP37/M is a hardware input/output channel that interfaces the Series 37 computer with up to eight asynchronous devices. Asynchronous devices are connected to a dedicated connector panel (mounted inside the rear of the Series 37 cabinet) which is connected to the ATP37/M PCA by a 50 wire cable.

The Series 37 computer can support up to four ATP37/M, thus up to 32 asynchronous devices can be connected to the computer. An I/O Extender (Series 37XE) is required if more than two ATP37/M are to be installed in the system. The ATP37/M has no configuration switches. The channel number assigned to it is determined by the slot number in which it is installed.

One ATP37/M (or ATP37) 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 ATP37/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 ATP37/M PCA.

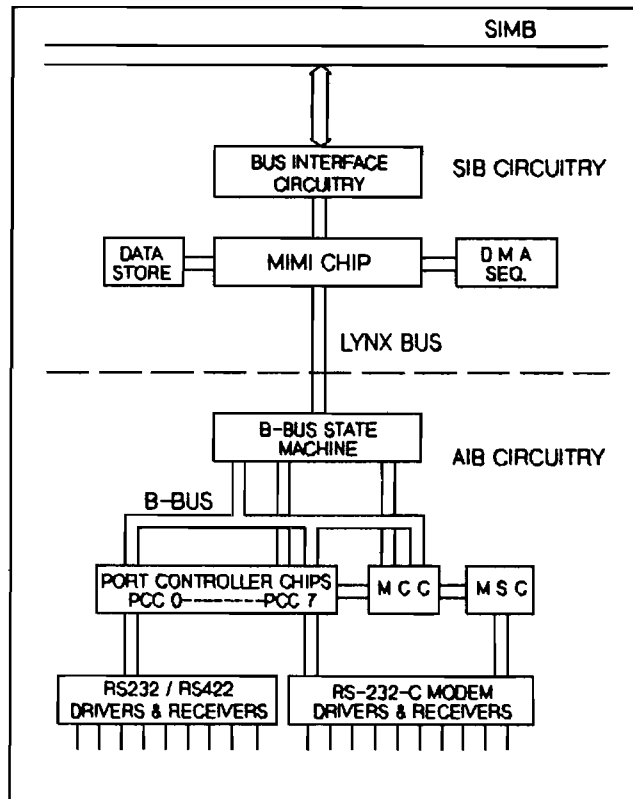


Figure 1-3 ATP37/M PCA Block Diagram

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 Controller Chip (MCC) and the Modem Scanner Chip (MSC) control the modem handshake lines for the modem port(s). Modem ports are set to 1200 baud and if the asynchronous device speed is not 1200 baud then speed sensing is accomplished by receiving a Carriage Return character. The B-Bus State Machine runs and arbitrates the B-Bus. The B-Bus is used for all communication between the PCCs, the MCC and the Lynx Bus.

### 1.3 INSTALLATION POLICY

The Hewlett-Packard Customer Engineer (CE) is responsible for installing the ATP37/M in HP 3000 Series 37 and 37XE computer systems in accordance with the information in this manual.

The Series 37 (and 37XE) SPU must have one ATP37/M (or ATP37) PCA fitted in slot 1. The SPU rear cover must be removed to install the PCA.

### 1.4 SYSTEM CONFIGURATION

The HP 3000 Series 37 computer system requires one ATP37/M (or ATP37) installed in slot 1 (channel 1) of the SPU.

A maximum of two ATP37/M (or ATP37) are supported on the HP 3000 Series 37.

A maximum of four ATP37/M (or ATP37) are supported on the HP3000 Series 37XE.

The rules for configuring the SPU and I/O Extender card cages are detailed in Section 2-3.

### 1.5 REQUIRED SOFTWARE

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

**MPEV/T-Delta-2 MIT** (or later)  
**Version (VUF): G. 01. 02**  
**Date Code: 2531** (or later)



## 1.6 TIC IDENTIFICATION

Some diagnostic programs refer to the TIC (Terminal Interface Controller). The TIC is the Advanced Terminal Processor (ATP37 or ATP37/M) for the HP 3000 Series 37 computer system. Some diagnostic programs (e.g. 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) +<br>1 Modem Port (25 Pin)<br>(No separate connector panel) |
| 1        | ATP37/M      | 40290A Opt 125        | 4 Direct Connect Ports (25 Pin) +<br>4 Modem Ports (25 Pin)                                |
| 2        | ATP37/M      | 40290A                | 7 Direct Connect Ports (3 Pin) +<br>1 Modem Port (25 Pin)                                  |
| 3        | ATP37/M      | 40290A Opt 105        | 7 Direct Connect Ports (5 Pin) +<br>1 Modem Port (25 Pin)<br>(RS-422 version)              |

Table 1-1 TIC Identification

## 1.7 OPTIONS & ACCESSORIES

Table 1-2 lists the ATP37/M product numbers and options that can be ordered by the customer.

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 ATP37/M PCA.

The RS-232-C PCA (40290-60001) 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                | includes:<br>1 ATP37/M PCA (interface board) RS-232-C<br>for 7 direct connect ports<br>and 1 modem port<br>1 ATP37/M Cable (PCA-to-Connector Panel)<br>1 ATP37/M Connector Panel RS-232-C<br>with 7 3-pin connectors<br>and 1 25-pin connector<br>1 Loopback Hood (25-pin)<br>1 Loopback Hood (3-pin) | 40290-60001<br><br>40290-60005<br>40290-60006<br><br>40290-60009<br>30148-60002 |
| 40290A Opt 125        | includes:<br>1 ATP37/M PCA (interface board) RS-232-C<br>for 4 direct connect ports<br>and 4 modem ports<br>1 ATP37/M Cable (PCA-to-Connector Panel)<br>1 ATP37/M Connector Panel RS-232-C<br>with 8 25-pin connectors<br>1 Loopback Hood (25-pin)  | 40290-60001<br><br>40290-60005<br>40290-60003<br><br>40290-60009                |
| 40290A Opt 105        | includes:<br>1 ATP37/M PCA (interface board) RS-422<br>for 7 direct connect ports<br>and 1 modem port<br>1 ATP37/M Cable (PCA-to-Connector Panel)<br>1 ATP37/M Connector Panel RS-422<br>with 7 5-pin connectors<br>and 1 25-pin connector<br>1 Loopback Hood (25-pin)<br>1 Loopback Hood (5-pin)     | 40290-60002<br><br>40290-60005<br>40290-60004<br><br>40290-60009<br>30147-60002 |
| 24450A                | includes:<br>1 ATP37/M Connector Panel RS-232-C<br>with 8 25-pin connectors (4 x M, 4 x DC)<br>1 Loopback Hood (25-pin)   | 40290-60003<br><br>40290-60009  |

Table 1-2 ATP37/M Product Numbers &amp; Options

| Description   | Part Number   |
|---|---|
| <b>Loopback Hoods:</b><br><br>25-pin RS-232-C<br>5-pin RS-422<br>3-pin RS-232-C<br>50-pin RS-232-C<br>50-pin RS-422                                     | 40290-60009<br>30147-60002<br>30148-60002<br>40290-60007<br>40290-60008 |
| <b>Interface Boards:</b><br><br>ATP37/M PCA (RS-232-C)<br>ATP37/M PCA (RS-422)  | 40290-60001<br>40290-60002  |
| <b>Connector Panels:</b><br><br>3-pin RS-232-C Connector Panel<br>25-pin RS-232-C Connector Panel (Opt. 125)<br>5-pin RS-422 Connector Panel (Opt. 105) | 40290-60006<br>40290-60003<br>40290-60004                               |
| <b>Cable:</b><br><br>ATP37/M Cable (with 2 50-pin male D-type connectors, length 254 cm / 100 in.)  | 40290-60005   |

Table 1-3 Spares & Accessories

## 1.8 EXCHANGE ASSEMBLIES

Both of the ATP37/M PCAs can be exchanged under the Board Exchange Scheme. These are the only exchange assemblies for the ATP37/M. Refer to Table 1-4 for the exchange part numbers.

| Description  | New Part Number            | Exchange Part Number       |
|--|----------------------------|----------------------------|
| <b>Interface Boards:</b><br><br>ATP37/M PCA (RS-232-C)<br>ATP37/M PCA (RS-422) | 40290-60001<br>40290-60002 | 40290-69001<br>40290-69002 |

Table 1-4 Exchange Assemblies

## 1.9 DOCUMENTATION

The following documentation can be consulted for additional information on the ATP37/M:

*COMMUNICATIONS HANDBOOK* . . . . . part number 30000-90105  
*SERIES 37 SITE PREPARATION GUIDE* . . . . . part number 30457-90008  
*CE HANDBOOK* . . . . . part number 30070-90010  
*SERIES 37 CUSTOMER INSTALLATION GUIDE* . . . . . part number 30457-90001  
*SERIES 37XE INSTALLATION MANUAL* . . . . . part number 30457-90009  
*SOFTWARE INSTALLATION MANUAL* . . . . . part number 32033-90037  
*HP 3000 DIAGNOSTIC MANUAL SET* . . . . . part number 30457-60007  
 THIS MANUAL SET CONTAINS THE FOLLOWING TWO 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



## 2.0 INTRODUCTION

This section details how to install the ATP37/M in a Series 37 or 37XE computer system.

Both the SPU and the I/O Extender may remain in the system cabinet when installing the ATP37/M.

Once the contents of the shipping carton have been verified the ATP37/M assemblies should be unpacked as you are ready to install them.

**NOTE:** Before starting the ATP37/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]) 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.

## 2.1 UNPACKING & 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 ATP37/M PCA (PRINTED CIRCUIT ASSEMBLY) MUST BE PACKED IN ITS ANTI-STATIC BOX FOR SHIPPING AND DURING NORMAL HANDLING.

## 2.2 TOOLS & 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.
- Antistatic Wrist Strap.
- Series 37 Board Extractor Tool (30457-80004).

### Troubleshooting and Diagnostics

- The required loopback hoods (refer to Table 1-3).
- 1640A/B Protocol Analyzer.
- Volt-ohmmeter (HP3465/3466 or equivalent)

## 2.3 CONFIGURATIONS

Both the SPU and the I/O Extender 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. Figure 2-1 shows the channel numbers associated to each slot.

The system configurations for the ATP37/M are as follows:

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

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

- 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 ATP37/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 ATP37/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 ATP37/M (or ATP37) must be installed in SPU slot 1. *Leave ATP37 IN*
- Any PCA with a connector on the right side (e.g. the ATP37/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.

Thus in a Series 37, there must be an ATP37/M (or ATP37) installed in slot 1 of the SPU and an add-on ATP37/M can only be installed in slot 3.

In a Series 37XE, there must be an ATP37/M (or ATP37) installed in slot 1 of the SPU, and add-on ATP37/M(s) can be installed in either SPU slots 3 and 4 or in the I/O Extender according to the card configuration.



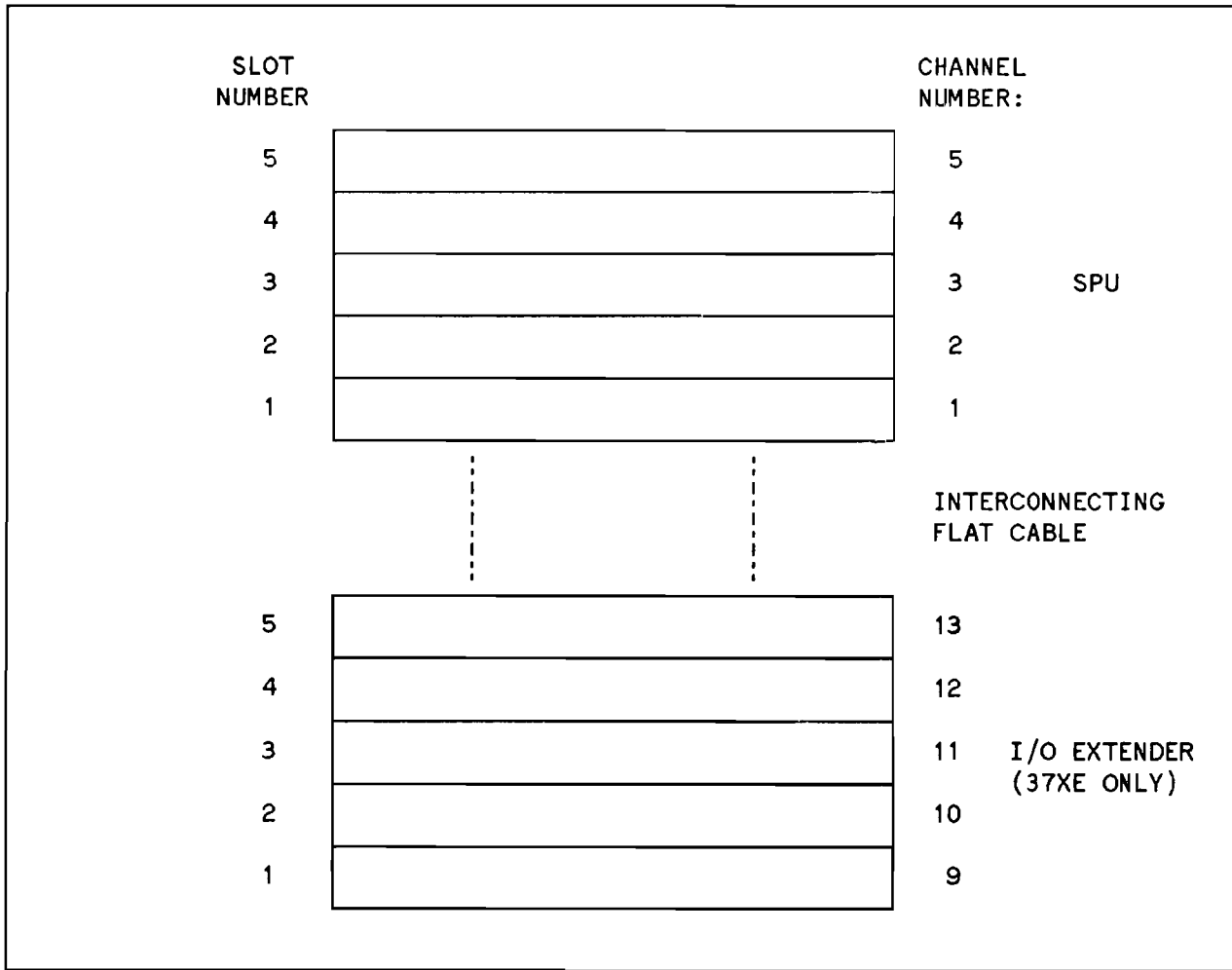


Figure 2-1 SPU/Extender Slot & Channel Assignments

## 2.4 PREPARATION

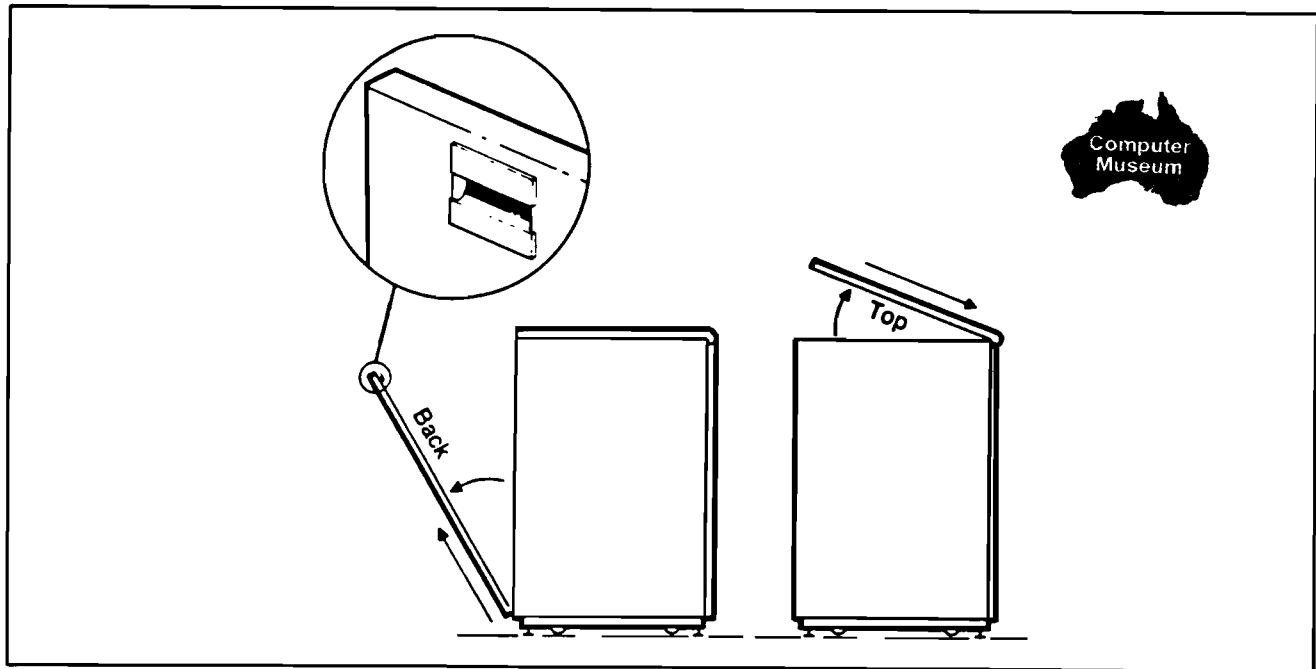
There are no special site preparation requirements prior to installation of the ATP37/M. However, special care should be taken when installing the RS-422 version of the ATP37/M as problems can occur due to the length of device cables (up to 1220m/4000ft) supported by RS-422.

If there is a potential difference of more than 7 volts between the signal ground at the ATP37/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).

## 2.5 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.



## 2.6 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 Figure 2-2.
  - b) Using a Number 1 Posidriv screwdriver loosen the six 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 ATP37/M PCA is correctly aligned before tightening the screws.

### NOTE

Ensure that the fan power cord is positioned under the ATP37/M PCA in slot 1 before replacing the rear panel.

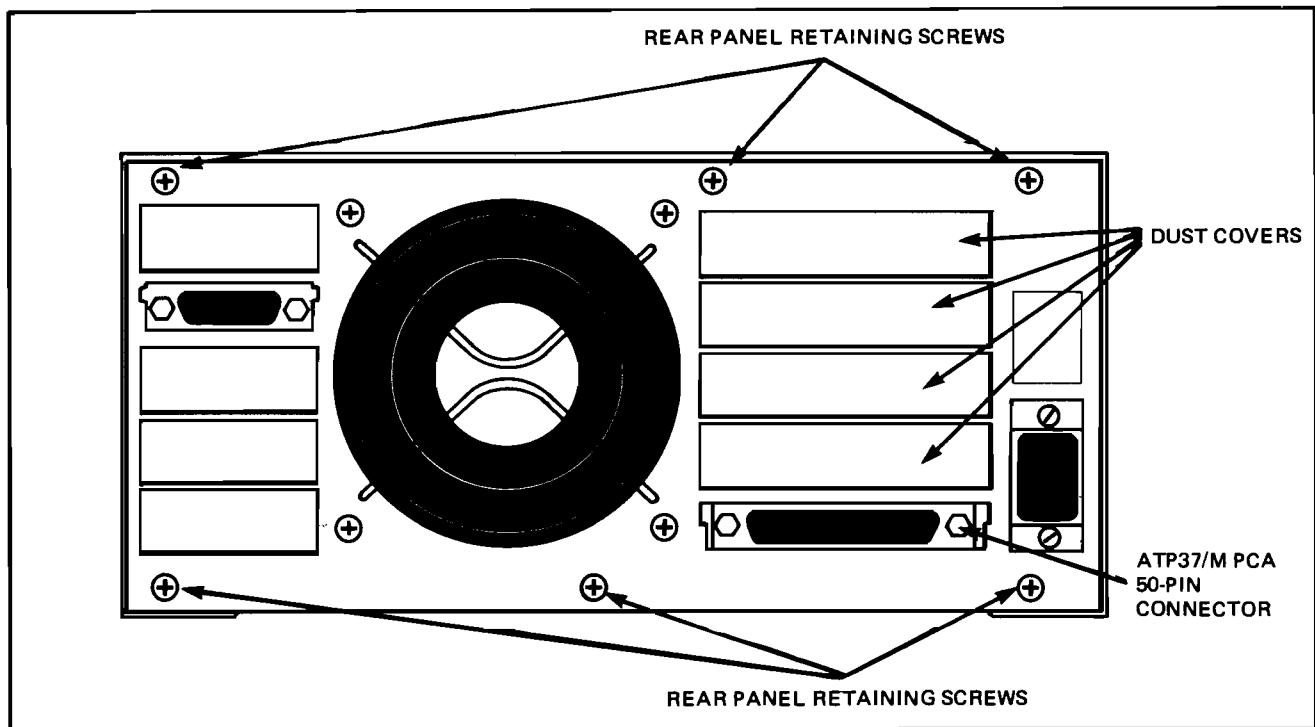


Figure 2-2 SPU/Extender Rear View

## 2.7 INSTALLING THE ATP37/M PCA

Use the same procedure to install the ATP37/M PCA in the SPU and/or the I/O Extender as required. Refer to Section 2.3 for the card cage configurations before proceeding

### CAUTION

Always use anti-static handling procedures when installing the ATP37/M Printed Circuit Assembly (PCA).

3) **Installation.** The ATP37/M PCA is installed as follows:

- a) Refer to Figure 2-3.
- 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 2.6 (Step 2).

**Removal.** The removal procedure is detailed in Section 2.10.

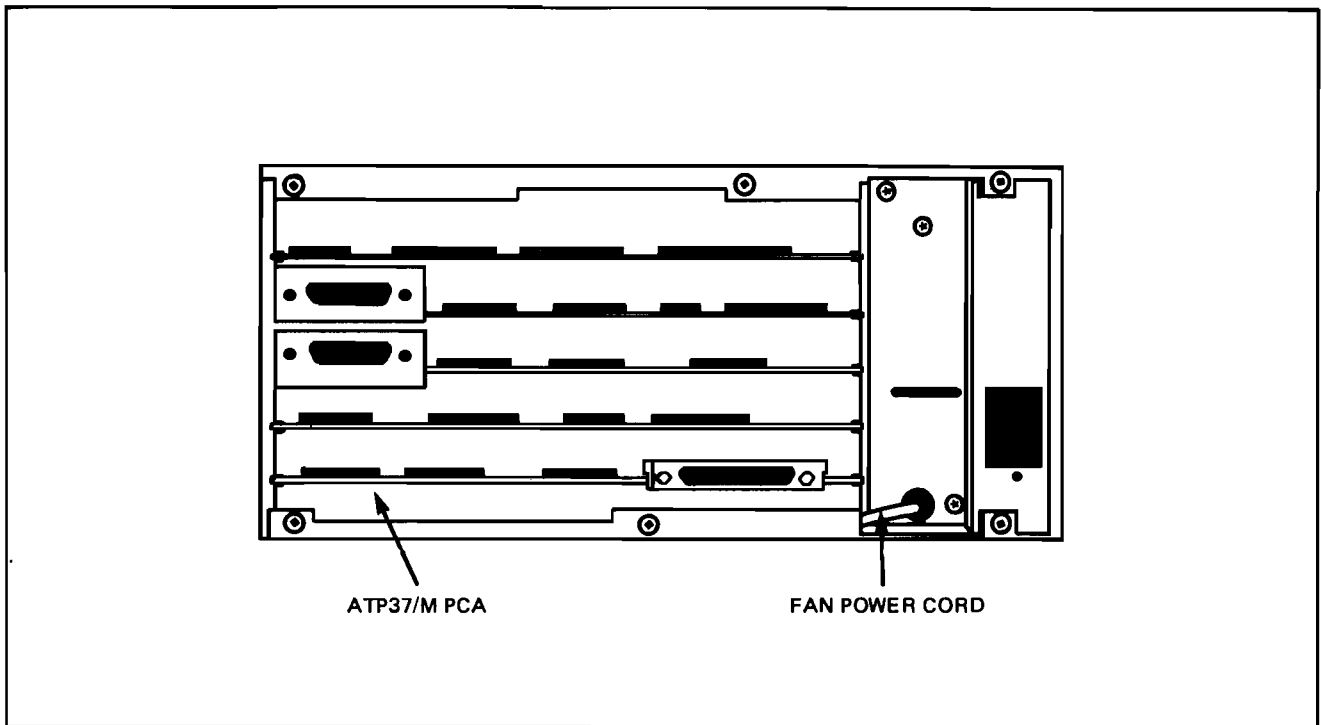


Figure 2-3 SPU/Extender Rear Panel Removed

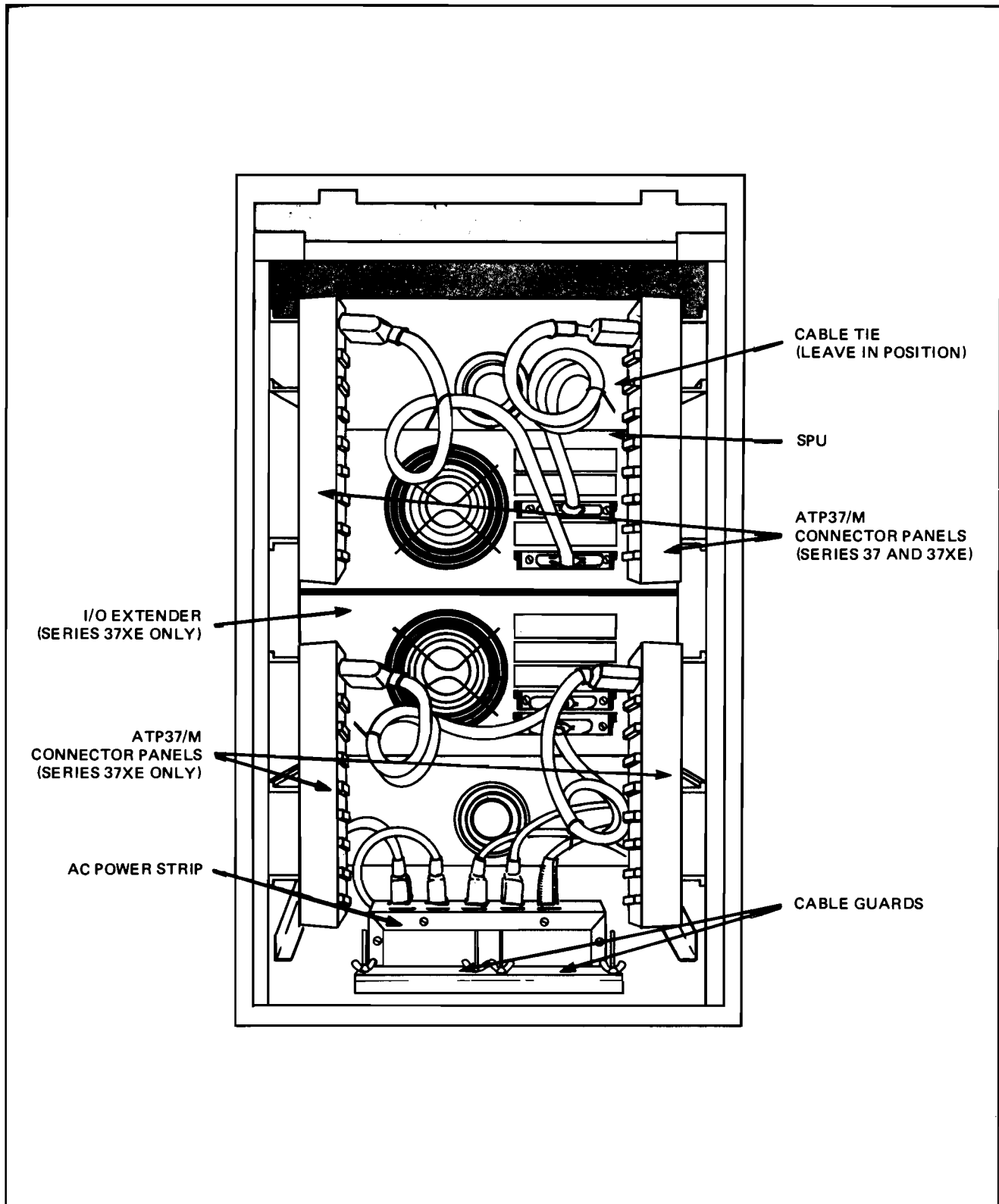


Figure 2-4 Series 37XE Cabinet With Four ATP37/M Connector Panels

## 2.8 MOUNTING THE ATP37/M CONNECTOR PANEL

- 4) Installation. Mount the ATP37/M Connector Panel(s) as follows:
- a) Refer to Figures 2-4 and 2-5. Figure 2-5 shows the mounting positions of two ATP37/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.

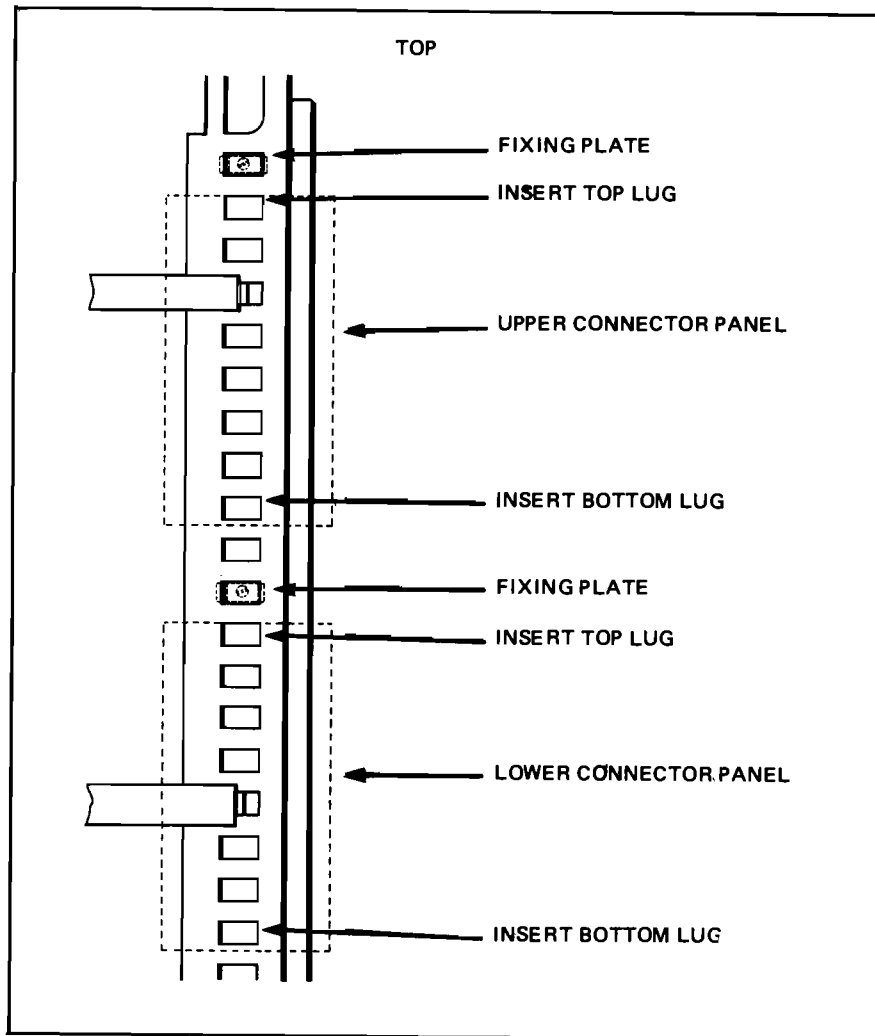


Figure 2-5 ATP37/M Connector Panel Positioning

- b) The mounting plate at the rear of the connector panel is shown in Figure 2-6. The fixing plate must be removed before mounting the connector panel in position.

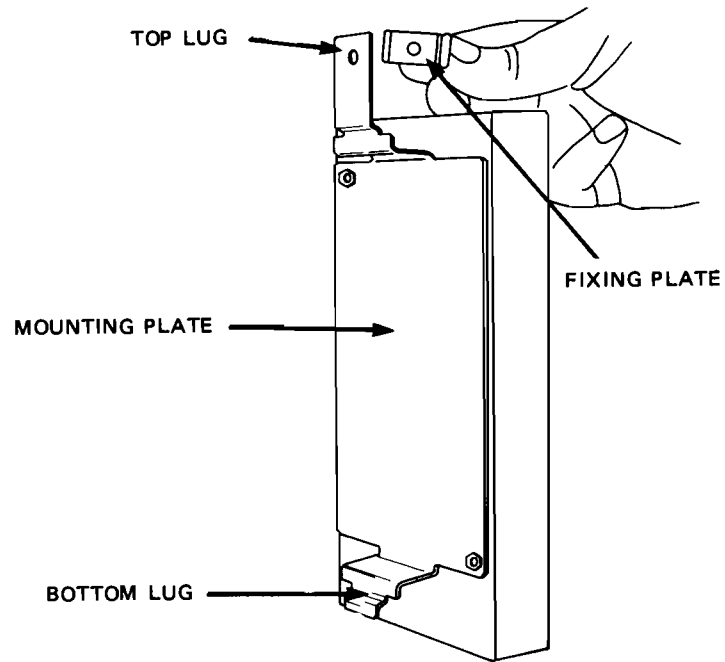


Figure 2-6 Connector Panel Mounting Plate

- c) Insert the top lug of the connector panel mounting plate in the vertical strut at the correct position with reference to Figure 2-5. 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 2-7.

**Removal.** Remove the connector panel(s) by reversing the installation procedure.

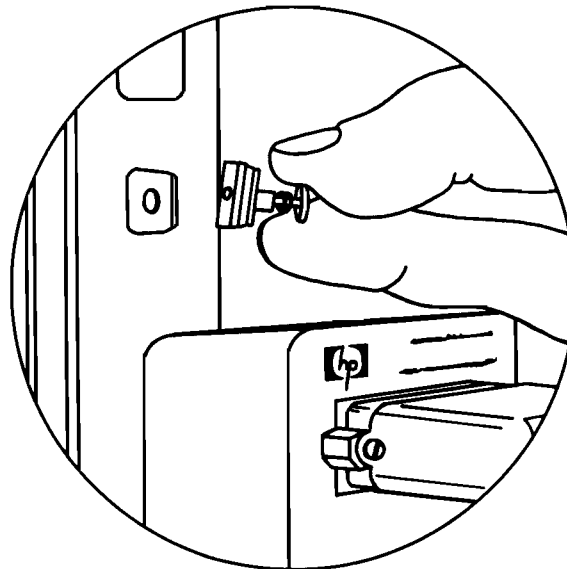


Figure 2-7 Securing The Connector Panel

## 2.9 INSTALLING THE ATP37/M CABLE

- 5) **Installation.** Connect the ATP37/M PCA and Connector Panel using the cable as follows:
- Refer to Figures 2-4 and 2-8. 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.
  - Connect the cable to the ATP37/M PCA and its associated connector panel by engaging the 50-pin connectors and securing them using the locking screws.
  - Take the label marked with the correct slot number (see Figure 2-1) 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.

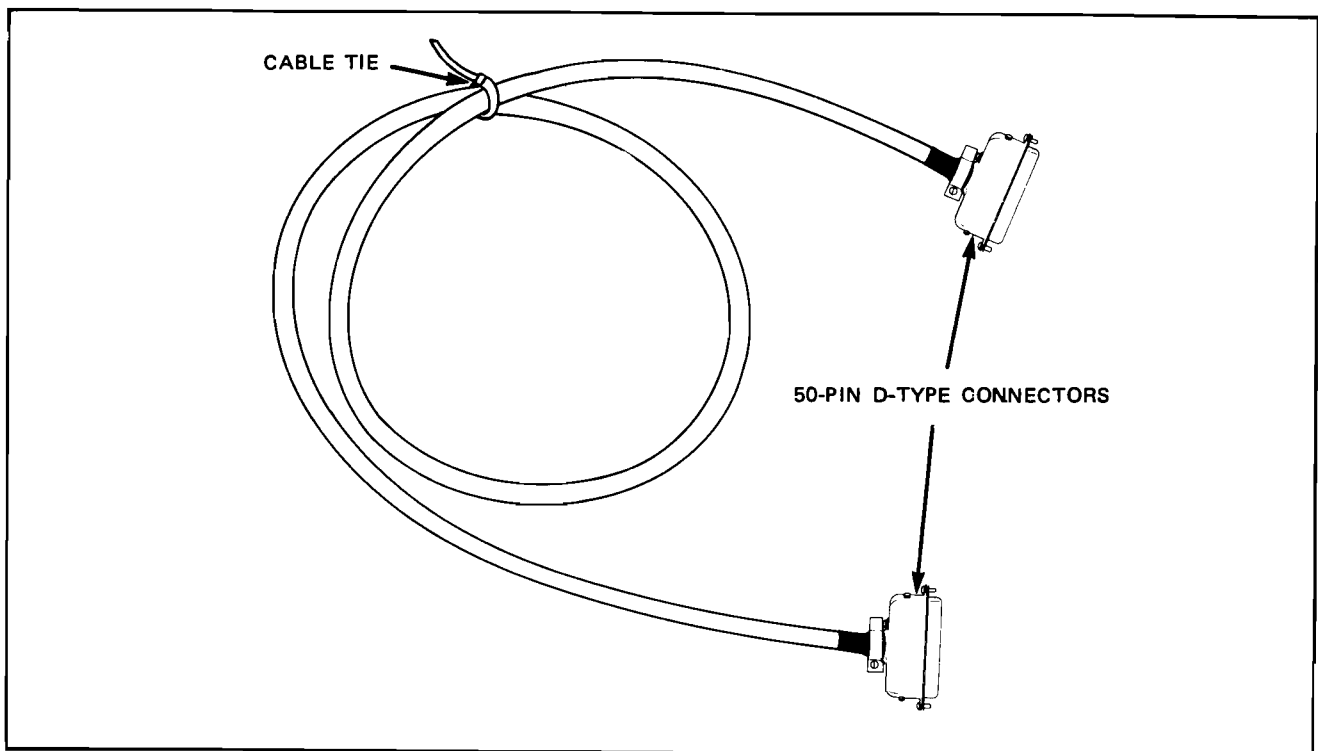


Figure 2-8 ATP37/M Cable



## 2.10 REMOVING THE ATP37/M PCA

The procedure for removing an ATP37/M PCA is as follows:

- a) Connector panels may need to be removed as detailed in Section 2.8. 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 2.6.
- c) Refer to Figure 2-9. 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.

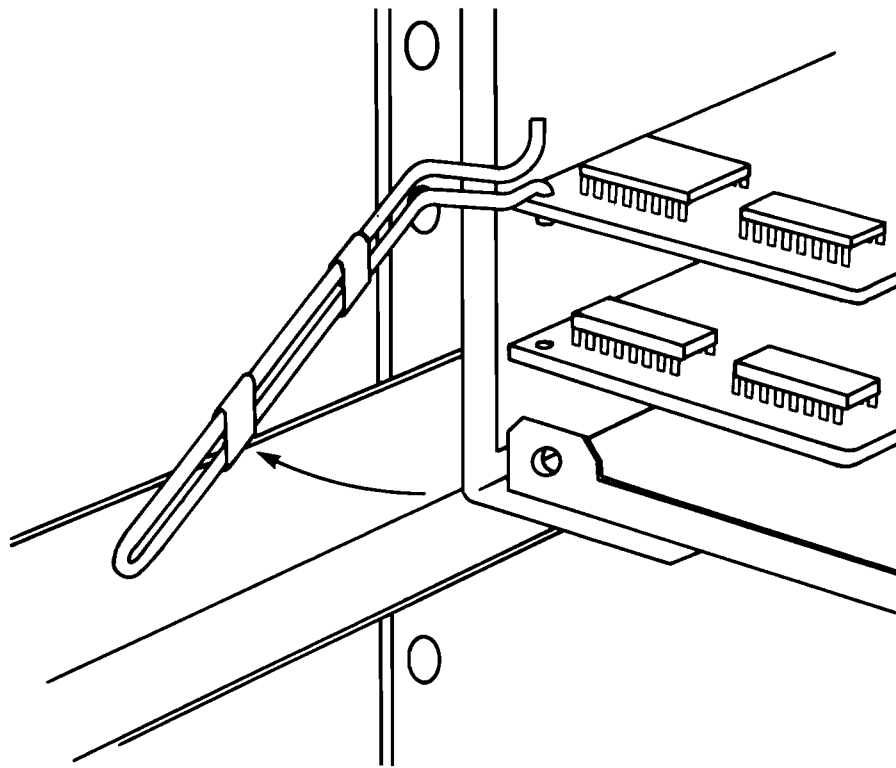


Figure 2-9 PCA Removal



## 3.0 INTRODUCTION

This section details how to install the device (workstation, printer, modem, etc.) cables and connect them to the ATP37/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 ATP37/M are listed in Table 3-6. Table 3-7 lists the recommended cables for modem connections.

## 3.1 INSTALLING THE DEVICE CABLES

**Installation.** Install the device cables and connect them to the ATP37/M Connector Panel device ports as follows:

- a) Refer to Figure 2-4. 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 Series 37 cabinet panels can then be replaced as shown in Section 2.5, 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.

### 3.2 DEVICE PORT SIGNALS

The ATP37/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 |                   |
|----------------------|------------|---------------------|-----|------------------------|-------------------|
| 1                    | 101        | Frame Ground        | FG  | AA                     | PROTECTIVE GROUND |
| 2                    | 103        | Transmit Data       | TD  | BA                     | INPUT             |
| 3                    | 104        | Receive Data        | RD  | BB                     | OUTPUT            |
| 4                    | 105        | Request to Send     | RTS | CA                     | INPUT             |
| 5                    | 106        | Clear to Send       | CTS | CB                     | NOT USED          |
| 6                    | 107        | Data Set Ready      | DSR | CC                     | OUTPUT            |
| 7                    | 102        | Signal Ground       | SG  | AB                     | SIGNAL GROUND     |
| 8                    | 109        | Data Carrier Detect | DCD | CF                     | OUTPUT            |
| 9-19                 | -          | Not Connected       |     |                        | -                 |
| 20                   | 108.2      | Data Terminal Ready | DTR | CD                     | INPUT             |
| 21                   | -          | Not Connected       |     |                        | -                 |
| 22                   | 125        | Ring Indicator      | RI  | CE                     | NOT USED          |
| 23                   | 111        | Data Rate Select    |     | CH                     | NOT USED          |
| 24/25                | -          | Not Connected       |     |                        | -                 |

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

| Connector Pin Number | CCITT V.24 | Function      | EIA | Connector Pin Function |               |
|----------------------|------------|---------------|-----|------------------------|---------------|
| 1                    | -          | Not Connected |     |                        | -             |
| 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      | PROTECTIVE GROUND      |
| 2                    | Transmit Data (A) | INPUT                  |
| 3                    | Receive Data (A)  | OUTPUT                 |
| 4                    | Transmit Data (B) | INPUT                  |
| 5                    | Receive Data (B)  | OUTPUT                 |

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

| Connector Pin Number | Function      | Connector Pin Function |
|----------------------|---------------|------------------------|
| 1                    | Signal Ground | SIGNAL GROUND          |
| 2                    | Transmit Data | INPUT                  |
| 3                    | Receive Data  | OUTPUT                 |

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

### 3.3 MODEM SIGNAL BEHAVIOR

Table 3-5 details the modem signal behavior for all modem ports.

Port 7 is a modem port on each version of the ATP37/M. Only this port of the connector panel associated to the ATP37/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 1-8).

The ATP37/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 ATP37/M upon receipt of a Carriage Return character.

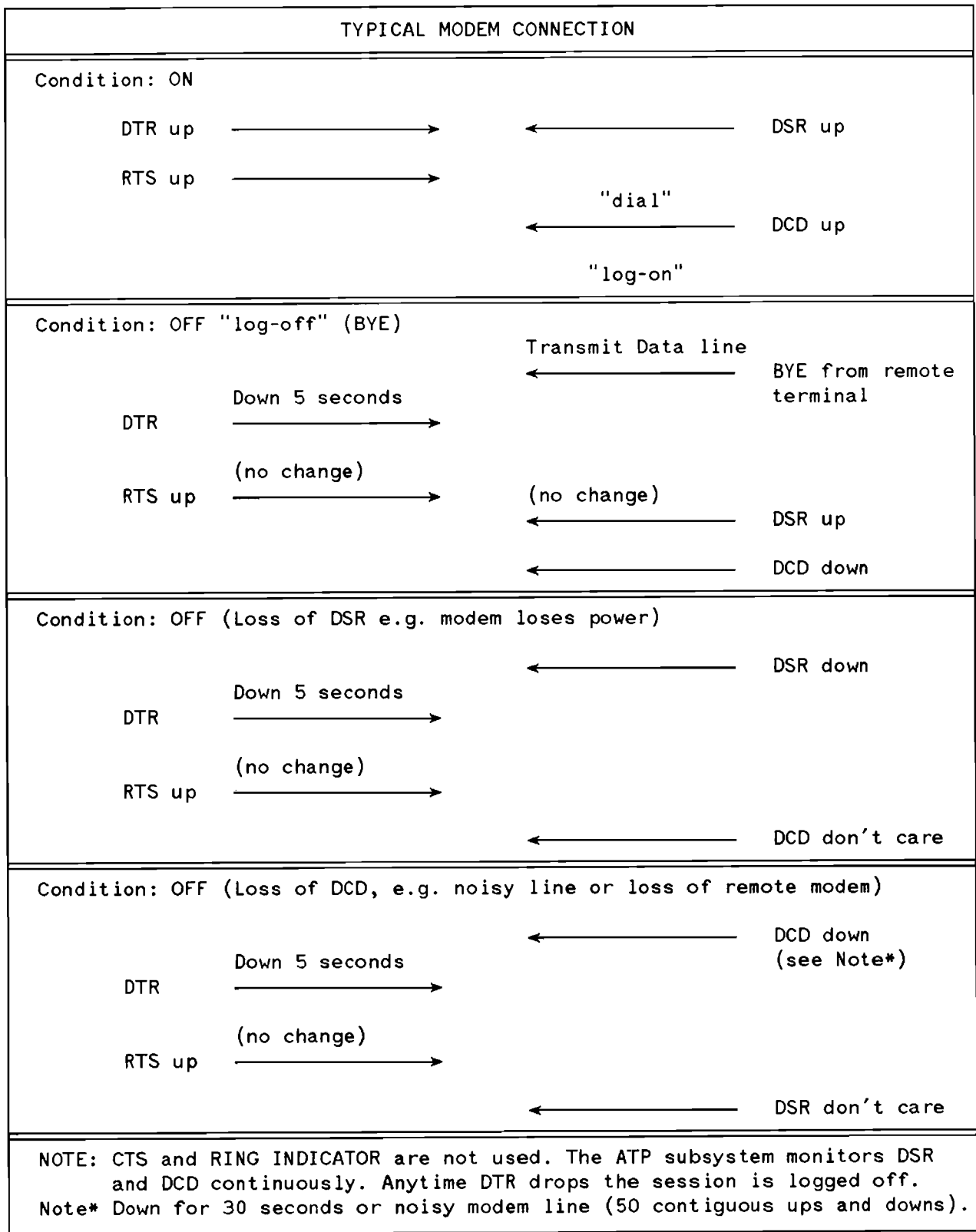


Table 3-5 Modem Signal Behavior at the Modem

### 3.4 CABLING INFORMATION

| Cables for connecting local workstations directly to an ATP37/M RS-232-C (25-pin) direct connect or modem port: |                |  |
|---|----------------|--|
| Workstation   | Product Number | Cable Description  |
| 150<br>2625A<br>2628A   | 13242N/M/Y     | male (25-pin)/male (25-pin)<br>length 5 meters (16 ft.)    |
| 2623A<br>2624B  | 13222N/M/Y     | male (25-pin)/male (25-pin)<br>length 5 meters (16 ft.)    |
| 2392A   | 40242M/Y       | male (25-pin)/male (25-pin)<br>length 5 meters; RFI filter |
| Cables for connecting local workstations directly to an ATP37/M RS-232-C (3-pin) direct connect port:           |                |  |
| Workstation   | Product Number | Cable Description  |
| 150<br>2625A<br>2628A   | 13242X         | male (3-pin)/male (25-pin)<br>length 5 meters (16 ft.)     |
| 2623A<br>2624B  | 13222X         | male (3-pin)/male (50-pin)<br>length 5 meters (16 ft.)     |
| 2392A   | 40242X         | male (3-pin)/male (25-pin)<br>length 5 meters; RFI filter  |
| Cables for connecting local workstations directly to an ATP37/M RS-422 (5-pin) direct connect port:             |                |  |
| Workstation   | Product Number | Cable Description  |
| 150<br>2625A<br>2628A   | 13242P         | male (5-pin)/male (25-pin)<br>length 5 meters (16 ft.)     |
| 2623A<br>2624B  | 13222P         | male (5-pin)/male (50-pin)<br>length 5 meters (16 ft.)     |
| 2392A   | 40242P         | male (5-pin)/male (25-pin)<br>length 5 meters; RFI filter  |

Table 3-6 ATP37/M Workstation Connection Cables

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

Table 3-7 ATP37/M To Modem Connection Cables

| HP 3000 SERIES 37    |                     |    | 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

## 4.0 INTRODUCTION

The following diagnostic tools are available to test and troubleshoot on the ATP37/M.

## 4.1 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 ATP37/M are the same as those listed for the Maintenance Mode Self-Test. If the ATP37/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 ATP37/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 ATP37/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).

## 4.2 OFF-LINE TESTS

- 3) **DUS Diagnostic (TICDIAG).** TICDIAG (Version V2.00) is an off-line diagnostic program which is part of the Diagnostic Utility Operating System. It is used to test the ATP37 and the ATP37/M. The tests are divided in two sections; the SIB circuitry tests and the AIB circuitry tests (see Section 1.2).

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 ATP37/M which is supporting the system console but this can be switched to another ATP37/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).



### 4.3 ON-LINE TESTS

4) **Terminal On-Line Diagnostic Support Monitor (TERMDSM).** This on-line diagnostic program enables comprehensive testing of one or more ATP37/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).



Part No. 40290-90001  
Printed in France 09/85  
E0985

