Distributed Systems Network

Advanced Terminal Processor (DSN/ATP) On-line Diagnostic Manual

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Advanced Terminal Processor (DSN/ATP) On-line Diagnostic Manual

HEWLETT PACKARD

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This manual describes the On-Line Diagnostics for the Advanced Terminal Processor (ATP). The ATP is an asynchronous device controller for HP 3000 Series 44 and Series 64 computer systems. A minimum ATP subsystem consists of one System Interface Board (SIB), one Hardwired Port Controller or or one Modem Port Controller. It requires 2 I/O slots, uses one IMB channel address and can support 12 terminal ports. The maximum subsystem consists of one System Interface Board, and eight Port Controllers. It requires nine slots, used one IMB channel address and can support 96 terminal ports. A Series 64 computer may have a maximum of 2 ATP subsystems installed. Each ATP subsystem requires one unique IMB channel address.

This manual is written for the HP System Engineer and the HP customer user, with the assumption that the reader has a good working knowledge of the HP 3000 System environment, and is trained in working with on-line diagnostics. This manual may be used in conjunction with related documentation for the HP 3000 Series 44 and 64 Computer Systems. Related documents include the following technical manuals:

● HP 3000 Computer Systems, Console Operator's Guide, (for series II/III/30/33/40/44/64), part number 320002-90004

● HP 3000 Computer Systems, Communications Handbook, part number 3000-90105

● HP 3000 Computer Systems, System Manager/System Supervisor Reference Manual, part number 30000-90014

● HP 3000 Distributed Systems Network/Advanced Terminal Processor Off-line Diagnostic Procedures Manual, part number 30144-90003

● HP 3000 Distributed Systems Network/Asynchronous Serial I/O Reference Manual, part number 30000-90250

● HP 3000 Distributed Systems Network/Advanced Terminal Processor Installation Manual, part number 30144-90002

PREFACE (Continued)

This manual contains information for the use of the Hewlett-Packard Advanced Terminal Processor On-line Diagnostic/Support Monitor (ATPDSM). ATPDSM is a software tool that can be used for both verification testing and for more detailed troubleshooting. ATPDSM can be used as an aid to the computer user, as well as an installation tool and troubleshooting tool for the HP Customer Engineer (CE).

Since ATPDSM is much more flexible and versatile than most diagnostic programs, this manual is structured to reflect this versatility rather than merely outlining the typical step-by-step procedures.

This manual is organized as follows:

Section I, General Information, briefly describes the main features of ATPDSM, and the ATPDSM philosophy. Required hardware and software are also listed.

Section II, Operating Instructions, presents an overview of how ATPDSM is organized and how to use it.

Section III, ATPDSM Commands and Test Descriptions lists and describes the diagnostic tests and commands. It also contains error messages for the Diagnostic command.

Appendix A, contains Loopback connector pictures.

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ILLUSTRATIONS

INTRODUCTION

The primary intent of the HP Advanced Terminal Processor Online
Diagnostic/Support Monitor (ATPDSM) is to provide HP personnel
and customers with a means to install and test the ATP, and pro-
vides HP support engineers with mechanisms to gather failure in-
formation concerning ATP ports without the need for downing the
system. ATPDSM runs as an MPE session, invoked either locally or
through a dial-up port. The primary aim of the ATP diagnostics
program (ATPDSM) is to provide a friendly, interactive interface
for use by HP personnel and HP customers. ATPDSM will run diag-
nostics on one or more ports, abort jobs or I/O, reset one or
more ports and associated tables, display tables, dump (to a disk
file) tables for later analysis, format failure information dump-
ed by the ATP software, or identify ports considered broken by
the ATP software.

ATPDSM PHILOSOPHY

The philosophy behind the ATPDSM is to provide an on-line mech-
anism for gathering information concerning a failure of an ATP
port, testing the ATP hardware and terminal connections, and re-
initializing the ATP software and tables to a known good state.

Gathering information is provided by the BROKEN, DUMP and DISPLAY
commands. The Broken command identifies ports considered to be
broken and/or unfixable by the ATP software subsystem. The Dump
and Display commands provide a means of gathering and formatting
the ATP tables and data areas for analysis by trained support
personnel.

Troubleshooting the ATP subsystem is aided by the Diagnostic com-
mand. It allows testing of one or more port's ATP hardware and
terminal connection.

The Reset command is provided to allow the re-initializing of one
or more ATP ports to a known good state after aborting any ses-
sion associated with the port.

For convenience, the ATPDSM provides Abortio and Abortjob commands similar in function to those provided by MPE.

The ATPDSM provides very powerful commands that could cause the aborting of jobs and sessions, and the loss of data if used incorrectly. You should familiarize yourself with the commands being employed and the consequences of their use by the reading the command descriptions provided in Section III.

OPERATIONAL OVERVIEW

The ATP Online Diagnostic/Support Monitor runs in session mode, and the user must have certain capabilities in order to run ATPDSM. Operator (OP) capability is required to use the ATPDSM. Diagnostician (DI) capability is required to use the DIAGNOSTIC command.

The Diagnostic/Support Monitor is dependent upon the MPE operating system. Therefore, if MPE is not functioning on the system with the ATP to be tested, ATPDSM is not operational.

REQUIRED HARDWARE

The following hardware is required:

a. A minimal mainframe configuration (an HP 3000 Series 44 or an HP 3000 Series 64)
b. A minimal ATP system, ie: one SIB, one Port Controller, Modem or Direct Connect.
c. Loopback Connectors, which are included in the product support package (p/n 30144-67801).

    Twelve 25 pin Connectors for HP-Modem B   30146-60002
    Twelve 3 pin Connectors for HP-DC B   30148-60002
    Twelve 5 pin Connectors for HP-DC A   30147-60002

REQUIRED SOFTWARE

Required software for operation of the ATP Diagnostic/Support
Monitor is:

● The HP Multiprogramming Executive (MPE) operating system

● An ATP Driver

● The ATP Diagnostic/Support Monitor

ATPDSM ORGANIZATION

There are seven parts of ATPDSM which correspond to the eight options open to you when ATPDSM is run. These options are:

1) run diagnostics
2) abort job(s)
3) abort I/O
4) reset one or more ports and associated tables
5) display tables
6) dump one or more ports and associated tables
7) obtain a list of broken ports

Once you have created an MPE Session, you can invoke the ATPDSM job by entering:

    RUN ATPDSM.PUB.SYS <carriage return>

Use of the ATPDSM requires operator (OP) capability, therefore when ATPDSM has verified that you have MPE operator capability, it will output:

    TERMINAL DIAGNOSTICS--VERSION V.UU.FF
    Type HELP for aid

In order to make ATPDSM easy for infrequent users, there will be a help facility to output messages when requested. The message output when you enter HELP will change depending on where you are in what dialog.

Whenever // is entered, ATPDSM will terminate, EXCEPT when in the DIAGNOSTIC command dialog.

ONLINE TESTS AND COMMANDS

The Online tests and commands are described below and are followed by representative dialog. The format for each description is: the command, its syntax, and a verbal description. The Diagnostic command is the only true online test, therefore specific operating instructions as well as error messages are contained in this section. The rest of the commands are tools for which to trouble-shoot the ATP subsystem. For ease of reference, the commands are listed in alphabetical order.

COMMANDS

The lower case letters indicate the abbreviated form of each command.

ABORTIO   ->abortio <carriage return>

This command is given to initiate dialog for aborting I/O pending on an ATP port. Its function is identical to the MPE command interpreter ABORTIO command, except that it will only allow aborting I/O on ATP ports.

SAMPLE DIALOG

```
->ABORTIO
ABORTIO

Enter ATP LDEV#:   ldev#
Enter ATP LDEV#:   ldev#
Enter ATP LDEV#:   <carriage return>

->
```

The LEDV# is a logical device number of an ATP device. Respond with a carriage return to return to the main block of ATPDSM. When the LDEV# of an ATP device is entered, all I/O pending on that device will be aborted and the prompt will be repeated in order to abort I/O for other devices.

ABORTJOB   ->abortjob <carriage return>

This command is given to initiate the dialog for aborting one or
more jobs or sessions. Its function is identical to the MPE com-
mand interpreter ABORTJOB command.

SAMPLE DIALOG

        -> ABORTJOB
        ABORTJOB

        Enter Job ID: jobid
        Enter Job ID: jobid
        Enter Job ID: <carriage return>

        ->

The job ID can either be a job number (#Jnnn) or a session number
(#Snnn). The job ID prompt is repeated to allow you to abort
multiple jobs and sessions. Respond with a carriage return to
terminate the command and return to the main block of ATPDSM.

BROKEN ATP PORTS   ->broken <carriage return>

This command is given to obtain a list identifying ATP ports con-
sidered to be in a broken state and/or in an unfixable state by
the ATP software subsystem. A broken state is the result of an
error detected by the ATP software and can be cleared up by using
the RESET command.

Consult the RESET command description before attempting a reset.

An unfixable state is the result of an error that cannot be
cleared unless the cause of the error is corrected first. RESET
will not fix an unfixable port. Listed below are some of the
causes resulting in a port being unfixable:

- ● Port configured on a missing AIB,
- ● ATP initiator program can't build the ATP data segment,
- ● self-test on PCC failed.

```
┌──────────────┐
│     NOTE     │
└──────────────┘
```

This list is not conclusive.   Certain errors
may   go   undetected   by   the ATP software
subsystem.

SAMPLE DIALOG

->Broken
BROKEN ATP PORTS

LDEV #	BROKEN	UNFIXABLE
101	*	*
102	*	

->

No additional response is required. The BROKEN program will
examine each ATP port in the system and list those considered
broken and/or unfixable by the ATP software subsystem, by placing
an asterisk in the appropriate column.

DIAGNOSTICS   -> diag <carriage return>

This command is given to initiate the dialog for running
diagnostics on one or more ATP ports, and is used to diagnose
suspected problems with the ATP hardware and terminal connection.
The use of this command requires diagnostician (DI) capability.

Operating Instructions and Error Messages

The command provides three tests which progressively test more of
the hardware data paths from the mainframe to the ATP hardware to
the terminal.

The first diagnostic test is run without loopback connectors.
This test checks the operation of the Port Controller Chip (PCC)
and the data paths from the HP 3000 I/O hardware to the PCC.
If all the ports on a particular Asynchronous Interface Board
(AIB), are to be tested, the test will also check the paths from
the PCC to the Modem Controller Chip (MCC).

The second diagnostic test is run with the loopback connectors
installed on the Port Connectors/Junction Panels for the speci-
fied ports. The required connectors are listed in the "Required
Hardware" section.

This test performs the same checks as does the diagnostic test
without loopback connectors, but also performs a check on the
data paths out through the Port Connector/Junction Panel Assembly
interface and back to the mainframe for the specified port.

The third test is a Write then Read test to HP264x and HP262x
terminals strapped for the ENQ/ACK handshake. This test writes a
line of data to the terminal and then triggers a read back from
the terminal and compares the returned data. This test senses
the terminal speed and parity in so that the terminals need only
to be set up for one of the ATP supported speeds and powered on.

```
          ┌──────────────────┐
          │       NOTE       │
          └──────────────────┘
```

The diagnostic test with the loopback connectors
installed cannot be run at the same time as the
terminal Write then Read test. Nor can it be run
at the same time as the diagnostic test without
loopback connectors.

The tests may be run from 1 to 32767 passes per each test. Each
pass through a test will give a pass or fail indication for that
specific test.

A number of options are available to the user of the diagnostic command for listing pass/fail information and controlling the testing of devices. The first option is to list only passes for which a test fails. This will substantially reduce the output required to be examined for failures.

The next option is to stop the diagnostic tests when the first failure occurs. This is useful when both pass and fail messages are being output so that the failure information does not run off the screen.

The final option is to stop testing a device when it fails a test. This is useful when reporting only failing devices and a particular port has a hard failure, which otherwise would cause failure information for other ports to run off the screen.

Specification of the ports to be tested can be accomplished in two ways. First, by the logical device number of the port to be tested. Secondly, by a port specification in the form of:

P<SIB#>-<list of AIB's> [(<list of ports>)].

If the list of ports is omitted, all the ports on the AIB selected will be tested. The list of AIB's and ports can include individual numbers and ranges of numbers. For example:

1,2,4/7 would be a valid list of numbers.

Several groups of ports can be listed on one line separated by semicolons. For example:

P1-0,1;3(0,2/4) would specify SIB 1, all ports
on AIB's 0 and 1, and the ports 0,2,3,4 on AIB 3.

The two modes of specifying the ports to be tested cannot be mixed on the same line. However, the prompt is repeated until just a carriage return is entered thereby allowing the use of both modes.

The diagnostic command runs with the system break facility disabled. Should termination of the command be desired, the subsystem break facility (control Y), can be used to abort the diagnostic. The diagnostic will prompt the user with the current pass count and ask if the diagnostic tests are to be aborted. Due to the structure of the diagnostic command, entering more than one subsystem break may be required to suspend execution of the diagnostic.

SAMPLE DIALOG

```
    ->DIAGnostic
  DIAGNOSTIC

  Enter ports to be tested:
  > (ldev# or port specification)

  Enter ports to be tested:
  > <carriage return>

  Do you want to list failing devices only?
  Do you want to stop testing all devices after one failure?
  Do you want to stop testing a device after it fails?
  How many times do you want to run the test? (1-32767)
  Do you want to test the ports with the loopback connectors
      on the Junction Panel (Port Connectors)?
  Do you want to test the ports without the loopback connectors
      on the Junction Panel (Port Connectors)?
  Do you want a write/read test to the terminals?
```

The proper response to the above mentioned questions is "Y" for yes, "N" or carriage return for no.

If the diagnostic test with the loopback connector on the Port Connectors is requested, the command will prompt the user with a list of ports and logical device numbers to attach the appropriate loopback connectors to. An example is:

```
    Install the loopback connectors on the Junction Panel(s)
    for ports,
        P1-0(9)    (ldev# 109)
        P1-0(10)   (ldev# 110)
  Are all the connectors installed?
```

A negative response will terminate the command.

If the terminal write/read tests are selected, the command will prompt the user to be sure that the terminals are powered on. The example is:

```
    Are all the terminals powered on for the write/read test?
```

A negative response will terminate the command.

```
    ->
```

Recommended Testing Procedure

The ATPDSM Diagnostic command gives the user the ability to test the ATP hardware and the terminal connection through the three provided tests.

The recommended procedure for diagnosing a suspected ATP hardware or terminal connection problem is as follows:

1. Perform the diagnostic test without loopback connectors on the Port Connectors/Junction Panel. This will test the port's circuitry on the AIB. A failing test will indicate a problem with the AIB, and it should then be replaced. If the tests pass, then proceed to step 2.

2. Perform the diagnostic test with the appropriate loopback connectors on the Port Connectors/Junction panel. This will test the circuitry associated with the port connector interface in addition to the port's AIB circuitry which was verified as properly functioning in step 1. A failing test indicates a problem with the port's port connector circuitry, and it should be replaced. If the test passes, proceed to step 3.

3. Perform the Write/Read test with a HP264x or HP 262x terminal strapped for the ENQ/ACK handshake. This will test the connection from the Port Connectors/Junction Panel to the terminal and back. A failing test indicates a problem with the connection. Check the cable from the Port Connector to the terminal. If it passes, proceed to step 4.

4. At this point the ATP hardware and terminal connections appear to be functioning properly. If the problem is intermittent, the above tests may have to be run extensively in order to pin down the problem. If the failure is of a consistent nature, a hard failure, and all the above tests have passed, the problem probably lies in the configuration of the terminal. Check the I/O configuration of the terminal.

Diagnostic Command Limitations

The diagnostic tests do not completely test the modem Port Connector Assembly circuitry unless all the ports on the AIB are tested.

The diagnostic command does not provide detailed failure infor-
mation for performing component level diagnosis. This type of
diagnosis is performed by the ATP Offline Diagnostic.

The ATPDSM diagnostic command does not explicitly test the SIB
circuitry. It is assumed to be in working order. Should the SIB
be in question, the ATP Offline Diagnostic is to be used to do
extensive testing.

DISPLAY   ->dis <carriage return>

This command is given to initiate the dialog for displaying ATP tables and data areas for a particular port to the user's terminal. It provides for visual inspection of the ATP environment, and should only be employed by those users with an intimate knowledge of the ATP software and its associated tables.

```
┌─────────────┐
│    NOTE     │
└─────────────┘
```

Display should never be used to submit ATP failure information to the factory. Instead, the DUMP command facility can be used for this purpose.

The following tables can be inspected by the display command:

TDS	(terminal data segment primary and secondary areas)
MONDIT	(logical monitor dit)
PDDIT	(protocol and data manager dit)
HWDIT	(physical driver-hardware dit)
CNTLPROG	(control program)
TBUF	(terminal buffers)
IOQ	(ioq element)
ILT	(interrupt linkage table)
DLT	(driver linkage table)
DRT	(device reference table)
LPDT	(logical-physical device table)
LDT	(logical device table)
PCB	(process control block associated with the ioq)
LDTPCD	(process control block associated with the ldt)

SAMPLE DIALOG

```
-> DISplay
DISPLAY

Enter table name or LDEV number:  ldev#
Enter table name or LDEV number:  <table name>
   (Table information will be displayed here).
Enter table name or LDEV number:  <carriage return>

->
```

An ATP logical device number should be entered first, and the the tables to be displayed. At any point in the dialog, a new logical device number can be entered and subsequent table requests will display information for this new device. Respond with a carriage return to exit the display command.

DUMP   ->du <carriage return>

This command is given to initiate the dialog for dumping the cur-
rent state of ATP tables, terminal buffers, and ATP memory con-
tents to a disc file. In addition, if an ATP generated dump
exists for the port to be dumped, this too will be placed into
the disc file.

Use of this command requires save file (SF) capability.

The ATP software subsystem has an area set aside in the terminal
data segment to dump failure information at the time of a detect-
ed error. There is only enough storage for one dump, so infor-
mation on the first detected failure is placed in this area.

If an ATP generated dump exists in the subsystem, the message

        "An ATP generated dump exists for ldev# n."
                Use DUMP to format it.

will appear when the ATPDSM is first activated and when the dump
command is entered. By specifying this logical device to be
dumped, the command will place the ATP generated dump and a dump
of the current state of the device into the disc file. After
the ATP generated dump has been placed into the disc file, the
storage area in the terminal data segment is freed for logging
information on another failure.

Dumps are placed into a disc file with the name ATPnnn in the
logon group, where nnn is the logical device number of the device
being dumped. There are two methods for getting a hard copy of
the dump. First, a file equation may be entered prior to execut-
ing the ATPDSM and the Dump command.

        :FILE ATPnnn;DEV=LP

will direct the dump for logical device number nnn to the line
printer device. Secondly, FCOPY may be used to copy the dump
file to the line printer device after exiting the ATPDSM.

        :FILE LP;DEV=LP
        :FCOPY FROM=ATPnnn;TO=*LP;CCTL

You also have the option of dumping the PCC memory contents.
This option is destructive to the ports environment due to the
fact that an automatic RESET of the port is issued upon comple-
tion of the command. If you do not wish to alter the state of
the ATP tables, the Dump command should be employed without
specifying this option.

SAMPLE DIALOG

```
->DUmp
DUMP


    Enter ATP LDEV number:   nnn
    Do you want to dump the PCC memory? Y
```

If the logical device specified is owned by a process, the fol-
lowing message will appear:

    The device entered is owned. Dumping the PCC memory will
    result in an automatic RESET of this port that will probably
    abort the session associated with this device, therefore be
    sure that you have the correct logical device number. If you
    wish to dump the PCC memory, respond with "Y", if no, res-
    pond with "N" or carriage return.

Regardless of your reponse, the dialog continues with;

```
    Do you want to include a message? Y
       message-> A message explaining the reason
       message-> for generating this dump.
       message-> <carriage return>
    Data dumped into file ATPnnn.

    Enter ATP LDEV number:   <carriage return to exit dump>

    ->
```

In the above dialog, nnn is a valid logical device number of an
ATP port. The prompt is repeated allowing multiple devices to be
dumped until carriage return is entered. The message explaining
the condition resulting in the dump may be up to 20 lines in
length, and can be terminated at any time by entering carriage
return.

EXIT

->exit <carriage return>

Using the EXIT command when the ATPDSM prompt (->) is displayed causes termination of the ATPDSM and returns control to MPE.

HELP

help <carriage return>

HELP causes the ATPDSM to give you information pertaining to the particular section of the program which you are currently running. It may be entered in response to any prompt.

Reset Port and Tables ->reset <carriage return>

This command is given to initiate dialog for resetting one or more ATP ports and associated tables to their initial settings when MPE was brought up. The session logged on via this port will be aborted, the ATP tables and software reset to their initial state, and the port prepared for speed sensing.

CAUTION

Extreme care should be used when employing the RESET command to ensure that the correct port is being reset.

RESET should not be used on any port where an ABORTJOB of the session associated with it would not be considered.

Sample Dialog

    ->RESET
    RESET

    Enter ATP LDEV #: ldev#

If the device to be reset is owned, the following will appear:

    The device entered is currently owned. Resetting this device will probably abort the session associated with it, therefore be sure that you have the correct logical device number. If you wish to continue with the reset process, respond with "Y", if not, respond with "N" or carriage return.

If the reset continues and the port is not considered broken by the ATP software subsystem, the following will appear:

    The ATP subsystem does not consider this device broken. However, this does not exclude the possibility of a hung port. If you wish to continue with the reset process respond with "Y", if not, "N" or carriage return.

    Enter ATP ldev number: <carriage return or ldev#>
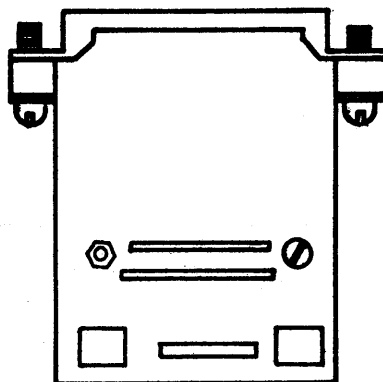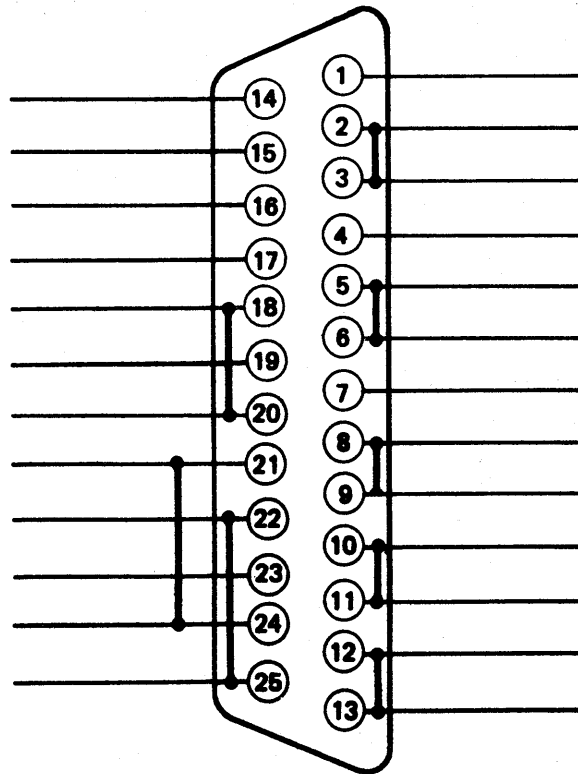
    ->

The reset prompt will continue until a carriage return is entered.
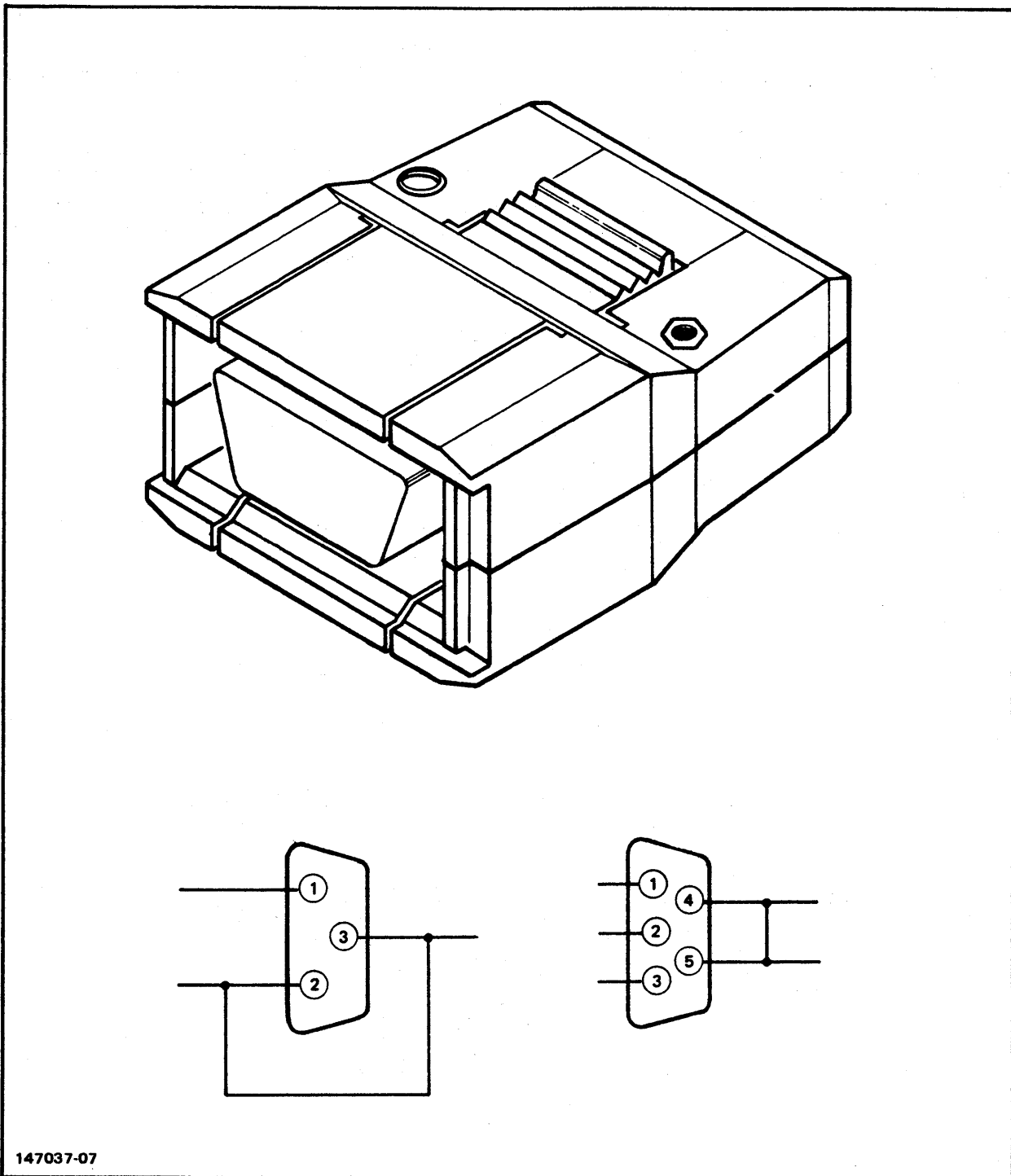
147037-02

Figure A-1.   HP-Modem B Loopback Connector

147037-07

Figure A-2. HP DC A and HP DC B Loopback Connectors

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