Advanced 3270 Adapter/2

for the Personal System/2™

Attachmate

Advanced 3270 Adapter/2

Installation Manual

Attachmate Technical Support 1-800-888-1187

Manual # 821-01189   Second Edition: March, 1990

IRMA is a registered trademark of Digital Communications
Associates, Inc.

IBM is a registered trademark of International Business Machines
Corporation.

MS-DOS is a registered trademark of Microsoft Corporation.

AT&T is a registered trademark of American Telephone and
Telegraph Company.

PS/2, Personal System/2, and MicroChannel are trademarks of
International Business Machines Corporation.

For help with this product, call Attachmate's Technical Support at
1-800-888-1187

*************WARNING*****************

The equipment described herein has been certified to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class A limits may be attached to the computer. Operation with noncertified peripherals is likely to result in interference to radio and TV reception. You may also experience problems if the adapter is not installed and used in strict accordance with the instructions in this manual.

Contact your Attachmate representative if you experience problems.

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

P7400 Advanced 3270 Adapter/2

(Gerät, Typ, Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

VFG 1046/1984

(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Attachmate Corporation, Bellevue, Washington USA

Table of Contents

Introduction

Chapter 1
Installation

Chapter 2
Testing and Troubleshooting

Chapter 3
3270 Control Unit Tests

Appendix A
I/O and Memory Addresses

Appendix B
Specifications

Appendix C - Supplemental Reading

Index

Introduction

The Attachmate *Advanced 3270 Adapter/2* is the most flexible 3278/3279 emulation adapter on the market. It offers a *dual purpose connector* (DPC) and an RJ-11 jack which gives you the option of directly connecting with standard 3270 coaxial cable, or low cost twisted-pair wiring.

The *Advanced 3270 Adapter/2* emulates both IBM and DCA-IRMA adapters. This capability allows you to operate your PS/2 or compatible with any micro-mainframe software written for these adapters.

It fully supports and controls the IBM 3270 Type-2 coax communications protocol and 3270 data stream interface commands between an IBM PS/2, or compatible, and an IBM 3X74 control unit. The *Advanced 3270 Adapter/2* offers the following features.

- On-board system memory for multi-session *distributed function terminal* (DFT) mode

- Programmable memory address register

- Coax and twisted-pair wiring

- Universal support of *extended attribute bytes* (EABs)

When used with Attachmate's *EXTRA!* connectivity software, the *Advanced 3270 Adapter/2* supports the following:

■ 3278/79 display terminals: models 2, 3, 4, and 5

■ 3287 printers: models 1 and 2

■ 3287 printer status register

■ Single session *control unit terminal* (CUT) mode

■ Large screens - (80 X 32), (80 X 43) and (132 X 27)

■ Extended attributes: highlighting, reverse image, seven colors

■ Extended data streams: IBM file transfer and program symbols

■ National language support

■ DFT mode

Supporting Software

The *Advanced 3270 Adapter/2* works with a wide variety of software. However, it is best complemented by Attachmate's *EXTRA!* connectivity software. *EXTRA!* provides a full range of capabilities including basic 3270 terminal and printer emulation, IBM compatible file transfer, and full 3270 emulation functions.

EXTRA! can be customized for your specific computer environment and needs. It can turn your personal computer into a simple 3270 terminal or full function 3270-PC with multiple host sessions and windows.

The following table lists some of the additional software programs that are compatible with the *Advanced 3270 Adapter/2*.

> *EXTRA! Extended for DOS* from Attachmate Corporation
> *EXTRA! for Windows* from Attachmate Corporation
> PC 3270 from IBM
> 3270 Workstation Program from IBM
> Entry-Level from IBM
> PC 3270 Emulation from IBM
> Attachment-370 from IBM
> PROFS/PC from IBM
> VM Bond from IBM
> TSO PC-Server from IBM
> E78 Plus Emulation Software from DCA/IRMA
> PC-Focus from Information Builders
> Goldengate from Cullinet
> Tempus Link from Micro Tempus
> Interactive PC Link from McCormack & Dodge

About This Manual

To make the best use of this manual, you should be familiar with the operation of your IBM Personal System/2, or compatible and the associated disk operating system (OS/2). You should also be familiar with the operation of IBM 3270 terminals and printers. Refer to Appendix C in this manual for a list of reference materials.

Chapter 1
Setup and Installation

Introduction

Chapter 1 provides details on how to choose a connection, how to set the *Advanced 3270 Adapter/2* for your connection type, and how to install your adapter. To assist you with the configuration for the Adapter/2, we have included a chart which lists the adapter's default settings.

You will also find diagrams with call outs to help you locate the different components on your adapter and assist you with the installation.

Materials You will Need

Before you begin installing the *Advanced 3270 Adapter/2* you will need the following items.

■ The *Advanced 3270 Adapter/2 Installation* manual.

■ User's guide or equivalent documentation for your personal computer system.

■ The Advanced Option Diskette found in the *Advanced 3270 Adapter/2* package.

If you haven't already created one, make a backup or working copy of the Reference diskette which came with your PS/2 or compatible computer. If you're not sure how to make a backup, refer to the PS/2 manual. You will need this diskette during the configuration procedure.

Choosing a Connection Type

The *Advanced 3270 Adapter/2* has two connection types. This means it can be connected to the control unit using shielded RG-62AU coaxial cable, or shielded twisted-pair wiring.

The *Advanced 3270 Adapter/2* has been set at the factory to run in the most common situations. If you plan to use the coax connection (also called a *dual purpose connector*-DPC for short), the board is ready for installation without modification. If you need to modify the settings, this section will instruct you on how to do this.

The Dual Purpose Connector

Use the *dual purpose connector* (DPC) if you have standard 3270 coax or twisted-pair wiring.

Because of the on-board balun circuitry, external balun devices are not required if you are using twisted-pair wiring.

What is a Balun? A balun is an electronic device which converts a balanced transmission line, such as twisted-pair, into an unbalanced transmission line suitable for data communications.

NOTE: The twisted-pair wire must be fitted with the proper termination plug to interface with the on-board balun circuitry through the DPC. Attachmate recommends the TPC-2 (Twisted-Pair/Coax Plug) connector available from ADC Telecommunications, Minneapolis, Mn. A preassembled 15 foot, nonshielded cable (IBM DPC-T3 Adapter Cable that plugs into an RJ-11 wall plug), is also available from IBM.

The RJ-11 Jack

Use this connector if you have twisted-pair wiring fitted with an RJ-11 or telephone-style jack. On-board balun circuitry eliminates the need for an external balun device.

WARNING: FCC Part 15 test results indicate that shielded twisted-pair wiring or shielded coax cable should be used to prevent potential adapter interference with radio and television reception.

The Adapter's Layout

Remove your Attachmate *Advanced 3270 Adapter/2* from its box and protective bag. To prevent electrostatic damage to the circuits, avoid touching components or the back of the board.

Locating the Coax and Telephone-Style Jacks

Place the adapter in front of you, as shown in the diagram below. You will notice the adapter has a telephone-style jack and a coax jack. If you plan to use the coax jack the board is ready to install without modification. You may skip to the "Installation" section. If you plan to plug an RJ-11 connector into the telephone-style jack, you will need to change a switch setting on the adapter. Read the following section titled, "Setting the Adapter for the Telephone-Style Jack Connection" for instructions.

RJ-11 Telephone-Style Jack
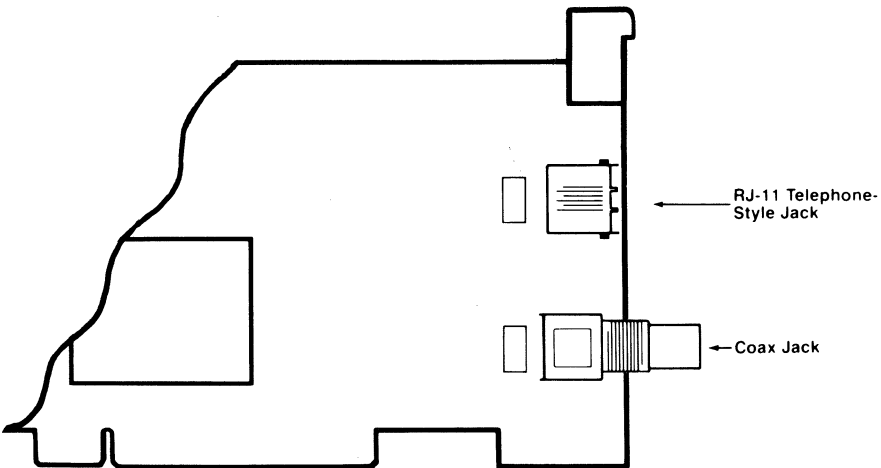
Coax Jack

Setting the Adapter for the Telephone-Style Connection

To use the adapter's telephone-style jack you must change the switch setting. Turn your board so that it matches the diagram below.

Directly behind the coax jack is the coax-RJ-11 switch. One end of the switch is labeled *coax* and the other is labeled *RJ-11*. The coax position connects the DPC into the adapter circuit. The RJ-11 setting is for the RJ-11 connector. To switch from the default *coax* position to the *RJ-11* position, simply move the switch.

You will also notice that directly behind the RJ-11 jack is the polarity switch. This switch provides polarity reversal of the twisted-pair interface. To connect your adapter properly, first choose the type of cable you will be using, then move the polarity switch to the "straight through" position (=). If the proper cable is not available move the switch to the reversed position (✕). This setting will reverse the polarity of pins 3 and 4.
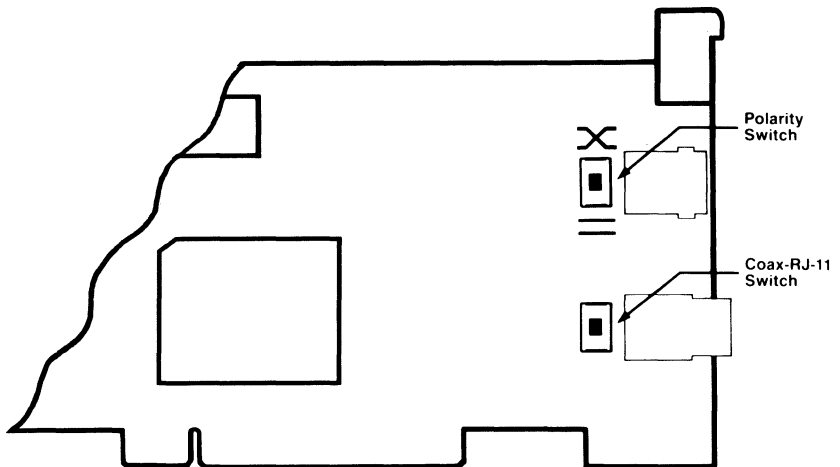
Installation and Default Settings

This section contains instructions on how to install your adapter. It also includes an overview of the *Advanced 3270 Adapter/2*'s default configuration settings.

IMPORTANT: Attachmate recommends selecting a higher-numbered slot to install the *Advanced 3270 Adapter/2*. The PS/2 will turn off a newly installed adapter in a higher-numbered expansion slot if it conflicts with any previously installed adapter. It will also turn off a newly installed adapter in a lower-numbered expansion slot. Selecting a higher-numbered slot will ensure that if there is a conflict with already resident adapters, only the *Advanced 3270 Adapter/2* will be turned off. If your emulation software will support an alternate configuration, you can reconfigure the *Advanced 3270 Adapter/2* to resolve the conflict; your resident adapters may or may not be as flexible.

NOTE: In this section PS/2 refers to the IBM PS/2 and PS/2 compatibles.

Installation

CAUTION: Hazardous voltages may be near the power supply. Turn OFF the power to your PC then disconnect the power cord.

1   Remove the cover from your PS/2 system unit. Consult your PC's manual for instructions and safety considerations before installing the adapter board into an I/O expansion slot.

2   In your PS/2 I/O expansion area, locate a vacant adapter slot. Unscrew the adapter slot screw and remove the cover plate.

3   Carefully slide the adapter into position by first routing the DPC connector through the slot in the option panel (normally at the rear of the computer system). Firmly seat the adapter in the expansion bus connector located at the bottom of the slot. If you encounter difficulties, check the bottom edge of the bracket. It must be aligned with the mounting screw. Tighten the mounting screw to provide a solid ground connection and to anchor the board.

4   Follow the instructions in your PC's manual to secure the unit cover. For maximum safety, completely reassemble the PC before turning on the power.

Configuration

The *Advanced 3270 Adapter/2* is configured after installation using internal programmable registers called Programmable Option Select (POS). Program these registers using your system's configurator utility.

When you add an adapter to a PS/2, you must alter the PS/2's configuration to accommodate the added adapter. There are two configuration modes you can use: automatic and manual.

Automatic - When you use the automatic configuration mode, the computer uses the default settings to configure the system and the adapter(s). This quick method works best if there are no other adapters or adapter conflicts. (Adapters conflict when they have the same I/O and memory addresses, or interrupt level generation settings.)

Manual - In manual configuration mode, you choose the configuration settings for the system and adapters. This is the recommended mode when there are other adapters in the system and there is a possibility that the *Advanced 3270 Adapter/2* will conflict with one of them.

The default configuration settings for the *Advanced 3270 Adapter/2* are listed on the following page. Refer to the documentation provided with each adapter installed in your PC for its configuration settings.

The configuration settings for the *Advanced 3270 Adapter/2* may be altered to eliminate possible conflicts. If there are any problems, refer to Appendix A in this manual for alternate adapter settings. Be certain to read your software documentation to make sure your software will support the alternate settings.

Advanced 3270 Adapter/2 Default Configuration

Setting	Value
IBM I/O Address	02D0-02DF
IBM I/O Address Access	Enabled
IRMA I/O Address	Enabled
IRMA I/O Address	0220-0227
Memory Access	Enabled
Memory Range	0CE000-0CFFFF
Power-Up Communications	Disabled
Terminal Type	Model 2

You can also check for conflicts during manual configuration. The PS/2 will display the current configuration status and indicate the adapters which are in conflict.

Follow the steps below to copy the configuration and diagnostics files from the Advanced 3270 Adapter/2 Option diskette, to the Reference diskette for your PS/2.

1 Insert your back-up copy of the Reference diskette for your system into drive A.

2 Turn on your computer and all attached devices.

3 Error number 165 will appear on the screen and your computer will emit two beeps as it loads the configurator utility.

4   The opening menu of your system's configurator utility
     will appear on the screen. Select "No" to the prompt,
     "Automatic Configuration?."

5   From the Main Menu, select "Copy an Option Diskette."

6   Follow your system's instructions to copy the
     Advanced 3270 Adapter/2 Option diskette to the
     Reference diskette. This will transfer the configuration
     and diagnostics files for the *Advanced 3270 Adapter/2.*

7   You can now configure your system either
     automatically or manually. Refer to your PC's user
     manual for specific instructions on manual and
     automatic configuration.

8   Complete diagnostics have been included on the
     Advanced 3270 Adapter/2 Option diskette. This
     software should be backed up onto a working copy and
     stored along with your application media.

This completes the installation procedures for the *Advanced 3270
Adapter/2.* To assure that your adapter is completely functional,
follow the diagnostic test procedures outlined in Chapter 2, "Testing
and Troubleshooting."

Chapter 2
Testing and Troubleshooting

Introduction

This chapter describes the tests you will find in the Diagnostic Test Program along with instructions on how to use them. This program can be used to make sure your adapter has been correctly installed and configured. It's also a good way to pin point any problems that may arise while using the board.

The program is made up of six tests which are described in this section. These tests range from a complete check of the adapter's internal system to a test that checks the connection between the computer and the controller.

The Tests

This section briefly describes each of the six tests that make up the Diagnostic Test Program.

Adapter Self Test - This test checks all internal systems including the adapter's processing functions, on-board memory, internal registers, and its arithmetic logic unit. It also makes sure that all the on-board processing capabilities are functioning and ready to support emulation.

System Interface Test - Completely and thoroughly tests all eight fully supported POS registers. After the test is completed, the card is returned to its original operational mode.

Memory Test - This test picks up where the Adapter Self Test left off when checking on-board memory. The Memory Test determines how much memory is available on the adapter, as well as the memory that is accessible through the computer. Before you can run this test, make sure that your board is set to memory access "enabled" (the default setting). See Appendix A for more details.

IBM Interface Test - Conducts a complete test of the IBM I/O Address Registers and Interrupt Lines. Registers are used as a single communication path between the adapters in your computer and the computer itself. This test makes certain that the board will function correctly during IBM emulation. Before running this test, make sure that your board has been set to IBM interface "enabled" (the default setting). See Appendix A for more details.

IRMA Interface Test - This test conducts a complete check of the DCA-IRMA I/O Address Registers and Interrupt Lines to make certain that the adapter will function correctly during IRMA emulation. Make sure that your board has been set to IRMA interface "enabled" (the default setting) before running this test. See Appendix A for more details.

Active Connection Test - This test checks the coax lines to make sure that there is an active connection. To verify the connection, the test sends a keystroke to the controller, which returns the keystroke. Because it uses the actual communications media, your board must be connected to a fully operational and configured control unit.

Loading the Diagnostic Test Program

Follow the instructions in this section for loading the test program on your PC, and how to use it.

IMPORTANT: The Diagnostic Test Program will only work with the factory default settings. Also, *EXTRA!* **should not be loaded** when running the test program.

Instructions

1   Make a back-up copy of the Diagnostic Test Program.

2   Place the backup copy into a floppy disk drive. At the drive's DOS prompt, type the following:

diag [Enter]

3   The first screen of the Diagnostic Test Program will appear.

The Diagnostic Test Program Screen

The screen, which appears after loading the Diagnostic Test Program, is divided into the five windows, as shown below.

```
Attachmate Advanced 3270 Adapter/2 Test Program - Version 1.30
┌──────────────────────────────────┬──────────────────────────────────────┐
│    Adapter found in slot│1        │              INSTRUCTIONS              │
│                         │         │1. Use F1-F3 to run any tests:          │
│    Adapter Identification│677F    │   a. Push F1 to run one pass through   │
│    Adapter Configuration│Enabled  │      all 6 tests.                      │
│        Memory Address│CD000-CFFFF  │   b. Push F2 to continuously run       │
│  IBM I/O Interface Address│Disabled│      through all 6 tests.              │
│  IRMA I/O Interface Address│Disabled│   c. Push F3 to select and run any    │
│            Terminal ID│Model 2     │      one of the 6 individual tests.    │
│    Power Up Communications│Disabled│2. Push F4 to search for an Advanced   │
│          PROM Version│1.50         │   3270 Adapter/2 above this slot.      │
├──────┬──────────────┬─────────────┤3. If an error occurs, check the list  │
│ LAST │ TEST ROUTINES│  PASS:FAIL  │   of possible problems.  If the        │
│      │              │             │   problem cannot be resolved, refer    │
│Passed│1. Adapter Self Test│00014:00│   to the Installation Manual for      │
│Passed│2. System Interface│00014:00 │   further assistance.                  │
│Passed│3. Memory     │00014:00     │      PgDn for TEST DESCRIPTIONS        │
│Passed│4. IBM Interface│00014:00    ├────────────────────────────────────────┤
│Passed│5. IRMA Interface│00014:00   │  Select Function or Press "X" to exit: │
│Passed│6. Active Connection│00014:00│                                        │
│      │              │             │ ┌─┐Run  ┌─┐Run   ┌─┐Run   ┌─┐Find     │
│      │   Elapsed time│00:00:09    │ │F1│All │F2│Tests│F3│One  │F4│Next     │
│      │              │             │ └─┘Tests└─┘Cont.└─┘Test  └─┘Card       │
└──────┴──────────────┴─────────────┴────────────────────────────────────────┘
```

Configuration Window - This window is located in the upper left portion of your screen. It lists the current adapter's slot number, identification number, microcode (PROM) version number and currently configured I/O and memory interface addresses, terminal ID and power up communications status.

Information Window - This window is located on the right hand side of your screen. It provides brief instructions on how to run the tests that make up the diagnostics program. If you press [PgDn], the window also will describe the tests, and what they will accomplish. Press [PgUp] to return you to the instructions.

If the adapter that you are testing fails any of the six tests, the information window will provide you with a list of possible causes for the problem. Press [PgDn] to view a list of suggested corrective actions.

Test Results Window - This window is located in the lower left hand portion of your screen. It lists the six tests that make up the diagnostics program, and tells you if the adapter passed or failed each test. The right hand column displays a cumulative log that lets you know, as testing progresses, how many tests your adapter passed and failed, and how long the tests took.

Command Line Window - This narrow window which is located directly under the Information Window, tells you what commands can be selected next.

Command Window - This window, which is located near the bottom right hand portion of your screen, displays the four function keys and their corresponding test. When you press the function key the test is run. The following section explains each of these function keys in detail.

Using the Diagnostic Test Program

Once you know how to read the Diagnostic Test Program screen, you can begin to use the program. This section explains how to run all six of the diagnostics tests, and how to obtain the results of the tests.

[F1] By selecting this key, the diagnostics program will run each of the six tests once. Select this function key if you would like to test a new adapter after installing it.

[F2] This key performs the same function as the [F1] key, but continues to test the adapter until one of the six tests fails, or until you press the [Esc] key to stop the testing.

After selecting [F2], you will be asked: **"Stop on error [Y/N], ESC to continue?"**

Select **N** (no) if you want the program to bypass the failed test and continue to test your adapter. Select **Y** (yes) if you want the testing to stop when the adapter fails a test. Press [Esc] to stop the testing in order to select a different function key.

[F3] With this option, you can select a single test to run once. Pressing [F3] brings up the following prompt "Enter test number, [Esc] to continue." After entering the number, the test is performed and the results are immediately displayed in the "Last" column of the Test Results window.

The same test can be run as often as you like by re-entering the test number after each pass, or you can run a new test by entering the new number after the first test has completed. To select another function key.

Normally, one pass through a single test or a group of tests will expose any problems with your adapter. However, if the problem occurs after the first pass, it will not be detected unless you have selected [F2], which continues to test the adapter until the problem is found or until you press [Esc].

[F4] Select this option if you have another *Advanced 3270 Adapter/2* in your system and want to run through the diagnostics tests. After selecting [F4], the program searches for the next *Advanced 3270 Adapter/2* in your PC. The program then clears the first board's configuration information from the "configuration window," and replaces it with the second board's configuration.

Press [PgUp] and [PgDn] to toggle between lists in the Information Window.

Test Messages

If your *Advanced 3270 Adapter/2* fails a test, a list of Possible Causes is displayed in the Information Window. This section lists and describes all of the messages that may appear under "Possible Causes." The message is presented in bold, italic type followed by the explanation. To view a list of Suggested Corrective Action, press [PgDn]. To return to the list of Possible Causes, press [PgUp].

```
          Attachmate Advanced 3270 Adapter/2 Test Program - Version 1.30
┌─────────────────────────────────────────┬───────────────────────────────────┐
│     Adapter found in slot 1              │          POSSIBLE CAUSES          │
│                                          │                                   │
│   Adapter Identification 677F            │ a. Another resident adapter has failed│
│   Adapter Configuration Enabled          │    or inappropriate configuration has │
│           Memory Address CE000-CFFFF     │    caused a system conflict.      │
│  IBM I/O Interface Address Disabled      │ b. Another resident adapter is    │
│ IRMA I/O Interface Address Disabled      │    improperly responding with the │
│              Terminal ID Model 2         │    Advanced 3270 Adapter/2 ID.    │
│    Power Up Communications Disabled      │ c. The Advanced 3270 Adapter/2 has│
│             PROM Version 1.50            │    failed, or needs to be reseated in │
│                                          │    the microchannel.              │
├──────┬──────────────────┬───────────────┤                                   │
│ LAST │  TEST ROUTINES   │  PASS:FAIL     │                                   │
├──────┼──────────────────┼───────────────┤                                   │
│      │ 1. Adapter Self Test              │                                   │
│Failed│ 2. System Interface  00000:01     │                                   │
│      │ 3. Memory                         │                                   │
│      │ 4. IBM Interface                  ├───────────────────────────────────┤
│      │ 5. IRMA Interface                 │  PgDn for Actions, ESC to continue│
│      │ 6. Active Connection              │                                   │
│      │                                   │ ┌──┐Run ┌──┐Run ┌──┐Run ┌──┐Find │
│      │          Elapsed time             │ │F1│All │F2│Tests│F3│One │F4│Next│
│      │                                   │ └──┘Tests└──┘Cont.└──┘Test└──┘Card│
└──────┴──────────────────┴───────────────┴───────────────────────────────────┘
```

Possible Causes

Another resident adapter has failed or inappropriate configuration has caused a system conflict.

This message means that another adapter in your PC may not be working or is configured improperly. Check to see if the *Advanced 3270 Adapter/2* configuration is not conflicting with the configuration of the other adapters in your system. Make certain that no configuration changes have been made to any resident adapter outside of the System Configurator such as dynamic configuration, which is caused by software.

Another resident adapter is improperly responding with the Advanced 3270 Adapter/2 ID

Another adapter in your system may be responding with the *Advanced 3270 Adapter/2* identification number without supporting these diagnostic routines.

The system microchannel slot is faulty.

The board's microchannel slot may be defective.

An Advanced 3270 Adapter/2 is not installed in this system.

The *Advanced 3270 Adapter/2* was not installed in the system or was not configured correctly.

Both the IBM and IRMA interfaces have been disabled.

When the adapter was configured, both the IBM and IRMA interfaces were disabled.

Either the IBM interface or the Memory Addresses have been disabled.

When the adapter was configured, either the IBM registers or the on-board memory addresses were disabled.

The Control Unit is not attached to the adapter.

This message means that the connection cable may not be connected to the adapter or the control unit port.

The Attached Control Unit port is inactive or has failed.

This message means that your system may be connected to a control unit port that has not been properly configured or is faulty.

The Advanced 3270 Adapter/2 has failed or needs to be reseated in the channel.

Make certain that the *Advanced 3270 Adapter/2* has been properly installed. Refer to Chapter 1 for installation instructions.

Suggested Corrective Actions

```
Attachmate Advanced 3270 Adapter/Z Test Program - Version 1.30
```

Adapter found in slot	1	SUGGESTED CORRECTIVE ACTION
Adapter Identification	677F	a. Reboot and use your reference disk
Adapter Configuration	Enabled	to view and verify the system
Memory Address	CE000-CFFFF	configuration.
IBM I/O Interface Address	Disabled	b. Reboot and use your reference disk
IRMA I/O Interface Address	Disabled	to Test the Computer.
Terminal ID	Model 2	c. Remove the offending adapter from
Power Up Communications	Disabled	this slot and rerun DIAGZ.
PROM Version	1.50	d. Reseat and/or replace the Advanced
		3270 Adapter/Z and rerun DIAGZ.

LAST	TEST ROUTINES	PASS:FAIL
Failed	1. Adapter Self Test	
	2. System Interface	00000:01
	3. Memory	
	4. IBM Interface	
	5. IRMA Interface	
	6. Active Connection	
	Elapsed time	

- Refer to "Troubleshooting" in the Installation manual for assistance.

PgDn for Actions, ESC to continue

| F1 Run All Tests | F2 Run Tests Cont. | F3 Run One Test | F4 Find Next Card |

The Information Window also displays a list of Corrective Actions that you can take after finding out the cause of the test failure. By pressing [PgDn] from the "Possible Causes" screen, a list of "Suggested Corrective Actions" will appear, as shown above.

This section lists all of the messages that may appear under "Suggested Corrective Actions," and explains what each message means.

Reboot and use your reference disk to view and verify the system configuration

Review the configuration for your computer to make sure none of the adapters in your system share the same configuration. If necessary, review your system's user documentation for configuration instructions.

Reboot and use your reference disk to test the computer

Check for any problems with the computer which may be causing a system conflict. If necessary, review your system's documentation for configuration instructions.

Assure that all the other test routines do not fail

Run the other test routines using function key [F2]. If one of the other tests fails, then the problem is not with the connection.

Assure end-to-end communication cable contract

Check any connections between the adapter and the control unit. This includes the connection at the adapter, control unit, and all points in between.

Verify that the control unit is fully functional and configured properly

Contact your network administrator to check that the control unit is completely functional and is properly configured.

Verify the Advanced 3270 Adapter/2 is installed

Check that the adapter is actually installed in your system.

To use the IRMA adapter interface, reboot and use the reference disk to configure an appropriate software compatible address

Using your system reference disk, reconfigure your *Advanced 3270 Adapter/2* for an appropriate IRMA I/O Address range that is supported by your emulation software. Consult Appendix A of this manual for a list of available ranges.

To use the IBM adapter interface, reboot and use the reference disk to configure an appropriate software compatible address

Using your system reference disk, reconfigure your *Advanced 3270 Adapter/2* for an appropriate IBM I/0 Address range supported by your emulation software. Refer to Appendix A of this manual for a list of available ranges.

Reseat and/or replace the Advanced 3270 Adapter/2 and rerun DIAG

If possible, reinstall the *Advanced 3270 Adapter/2* in another unused slot; the system board microchannel slot may be defective. Run this program again. If the problem persists, replace with a new *Advanced 3270 Adapter/2*. Return the problem adapter to Attachmate Corporation for repair.

Exiting the Diagnostic Test program

To exit the Diagnostic Test program and return to the DOS prompt, press [Esc] after the command line prompt:

"Select Function, or press "X" to exit."

Call for Help

If, after trying all of the solutions described in this chapter, you are unable to solve your problem, please call Attachmate's Technical Support department at 1-800-888-1187.

Chapter 3
3270 Control Unit Tests

Introduction

Attachmate's *Advanced 3270 Adapter/2* is designed to be connected to an IBM 3270 Control Unit. Most of these control units provide device testing and status capability that can be initiated by a terminal operator. This section briefly covers how you can initiate these tests from your PS/2, or compatible. If you encounter any problems with the guidelines in this section, refer to your control unit's operator guide for more information.

Types of 3270 Coax Ports

The coax-ports on an IBM 3270 Control Unit are typically one of three types. Once a port is configured, it is dedicated to a specific device type. This means you cannot connect a printer to a terminal port and vice versa. The following device types are defined on a 3274 controller.

Display Terminal (Single session CUT)

> Model 2 - 24 x 80 (e.g. IBM 3178, 3278, 3279)
> Model 3 - 32 x 80
> Model 4 - 43 x 80
> Model 5 - 27 x 132

Distributed Function Terminal (Multi-Session DFT)

> 3290 Large screen Display
> 3270 Personal Computer

3287 Printer

Control Unit Tests

To run the control unit tests, your PC must be running the factory default CUT configuration of *EXTRA!* or the 3270-PC Emulation Program. The tests can be run on either a CUT or DFT port. The examples given here are for an IBM 3274-61C with microcode release 63.0 installed.

NOTE: Different IBM controllers (e.g. 3276 and 3174) and subsequent microcode revisions may support and display slightly different versions of this test. Also, non-IBM controllers may not support these tests. Contact your system support personnel for additional assistance if required.

The Field and Data Test (/0)

To run the **/0** test, place the 3270 terminal in TEST mode by pressing [Alt/Test]. Note that the 25th line on your display indicates "Test". If "Test" is not displayed, you are not in TEST mode with the control unit. Once in TEST mode, enter /0 to start the test.

The test will result in the display of the following pattern where "pp" indicates the port number that you are using.

```
TEST:   3274.pp
?SEL PEN     SEL PEN
      &SEL PEN     >SEL PEN
      DISPLAY INSERT CK
```

The Device Status Table Test (/3)

To run the **/3** test, press [Alt/Test] to return to 3270 TEST mode . Once in TEST mode, enter /3 to activate the test. This test displays a summary of the control unit's Device Status Table with the format as shown on the following page.

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	
s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	Status
t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	Type
c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	# Coax Errors
d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	# Device Errors

where "s" represents terminal status:

1 = terminal on
0 = terminal off
X = port not configured
_ = terminal shut down (error)

where "t" represents terminal type:

d = CUT type display terminal
i = DFT type display terminal
p = Printer
_ = Terminal not connected or off

where "c" represents coax errors:

. = No errors
: = 1 - 9 errors
| = 10 - 19 errors
* = greater than 20 errors

where "d" represents device errors as above under coax errors.

This test will vary between different models of IBM Control Units. The number of ports may change and additional lines other than the ones shown above may be included. The top line is the least significant digit of the port number.

This test, which can be performed from any terminal connected to the control unit, is useful to determine the status of your port. The test also indicates the number of coax and device errors that have occurred on a given port. This may be useful for troubleshooting coax problems.

The Reset Device Status Table Test (/4)

To run this test, press [Alt/Test] to return to 3270 TEST mode. Once in TEST mode, enter /4 to activate the test. This test is capable of reseting the Device Status Table displayed in test /3 for your port only. Other information displayed will be dependent on your control unit's type and microcode level.

The Control Unit Logical Configuration Test (/b)

To run the /b test, press [Alt/Test] to return to 3270 TEST mode. Once in TEST mode, enter /b to activate the test. This test displays the logical configuration of the control unit.

A00	A01	....	Ann
s	s	....	s
a1	a1	....	a1
a2 - a2	a2 - a2	....	a2 - a2

where "nn" represents the number of 3274 ports,

where "s" represents the number of logical screens,

where "a1" represents the primary LU address,

where "a2" represents the range of secondary LU addresses (if any).

The primary use for this test is to determine if a given port is set up for CUT (only one logical screen) or DFT (more than one logical screen).

Other useful tests may be supported on your control unit. Please consult your System Administrator or the appropriate control unit technical manual for more information.

Appendix A
I/O and Memory Addresses

Introduction

This appendix gives instructions for modifying or altering your adapter's configuration if a conflict should arise. Note that a conflict is an unusual condition.

IBM Advanced 3278/79 Emulation Adapter

To emulate the functional characteristics of the IBM Advanced 3278/79 Emulation Adapter, the *Advanced 3270 Adapter/2* acknowledges I/O addresses 02D0-02DF (or alternates) and on-board memory addresses 0CE000-0CFFFF (or alternates). These addresses are enabled with the factory default settings.

DCA-IRMA 3278/9 Emulation Adapter

To emulate the functional characteristics of the DCA-IRMA 3278/9 Emulation Adapter, your adapter responds to I/O addresses 0220-0227 (or alternates). These addresses are enabled with the factory default settings.

Altering the Adapter's Configuration

The configuration of the *Advanced 3270 Adapter/2* is determined by your system's configuration utility supplied on the Reference diskette which came with your system. For specific instructions on accessing your system's configuration utility, consult the documentation for your system.

The configuration utility will allow you to either configure automatically or manually. If you configure automatically, the utility will configure your adapter using the default configuration settings for your adapter. When you configure manually, you select the configuration settings from a range of optional settings.

Choose automatic configuration if there are no other adapters or adapter conflicts. Adapters conflict when they share the same memory address, I/O register address, and interrupt configuration settings.

Choose manual configuration if the *Advanced 3270 Adapter/2* conflicts with other adapters. If your emulation software requires special settings for your communication adapter, you may want to choose manual configuration as well.

When you choose manual configuration, the utility screen will display the settings and their default values. Any conflicts with adapters in lower-numbered slots will generally be noted by an asterisk next to the conflicting setting.

To change a configuration setting, select it using the key(s) designated by your utility for this purpose. You can then use the appropriate function key to choose one of the available optional settings.

After you have made your choices, save the new configuration according to the instructions for your system configurator utility.

I/O Address Ranges

The *Advanced 3270 Adapter/2* may be configured to access two I/O address interfaces concurrently; an IBM compatible interface and an IRMA compatible interface. Each interface can be assigned one of several different address ranges. The IBM interface has four optional address ranges and the IRMA interface has two. The table on the following page shows the alternate address range available for each interface.

You can also configure the *Advanced 3270 Adapter/2* to enable or disable either I/O address interface.

Available I/O Address Ranges (The square brackets [ ] denote the default values.)

Setting	Value
IBM I/O Address Range	[02D0-02DF] 06D0-06DF 0AD0-0ADF 0ED0-0EDF
IBM I/O Address Access	[Enabled] Disabled
IRMA I/O Address Access	[Enabled] Disabled
IRMA I/O Address Range	[0220-0227] 0280-0287

On-board Memory

The *Advanced 3270 Adapter/2* is equipped with its own 4K by 16-bit memory for control of screen and Extended Attribute Bytes (EABs) buffers. The computer accesses this memory through address range 0CE000-0CFFFF. The adapter may be reconfigured to allow access through other address ranges. You may also enable or disable on-board memory according to the requirements of the software. IBM Workstation software requires memory enabled while DCA-IRMA Workstation software does not. Attachmate's software may be configured either way. The table below shows the different options available for on-board memory.

On-board Memory Options (The square brackets [ ] denote the default values.)

Setting	Value
Memory Access	[Enabled] Disabled
Address Range	0C0000 - 0C1FFF 0C2000 - 0C3FFF 0C4000 - 0C5FFF 0C6000 - 0C7FFF 0C8000 - 0C9FFF 0CA000 - 0CBFFF 0CC000 - 0CDFFF [0CE000 - 0CFFFF] 0D0000 - 0D1FFF 0D2000 - 0D3FFF 0D4000 - 0D5FFF 0D6000 - 0D7FFF 0D8000 - 0D9FFF 0DA000 - 0DBFFF 0DC000 - 0DDFFF 0DE000 - 0DFFFF

Power-Up Communications

You may configure the *Advanced 3270 Adapter/2* to communicate immediately at power-up or after network configuration is complete. If you want to configure the adapter to communicate immediately, toggle to display power-up communications enabled. Attachmate has chosen to disable adapter communications at start-up to provide the most universally compatible configuration. However, some IRMA software may require immediate adapter communications. If your system is configured to run in the IBM DFT mode, adapter communications must be disabled at start-up. Consult the user guide or technical reference documentation for your software for specifications.

Terminal Display

You may configure the adapter for the type of terminal you are using. The table below shows the available terminal display types.

Available Terminal Display Options (The square brackets [ ] denote the default terminal.)

Setting	Terminal Type
Terminal	[Model 2] Model 3 Model 4 Model 5

Adapter Identification

Each adapter has a unique identification number which identifies it to the computer. The identification number for the *Advanced 3270 Adapter/2* is 677F. To provide solutions to possible conflicts, the *Advanced 3270 Adapter/2* has been provided with an alternate identification number, E7FF. Please note, however, a true conflict with other adapter identification numbers is a unique and unlikely condition.

Full emulation is available only through the default adapter identification number. The alternate identification number allows only IBM adapter emulation; IRMA adapter emulation will be disabled.

The identification number is altered by means of a physical switch. To alter the identification number you must either alter the setting before you install the adapter or, if already resident, you must remove the adapter and reinstall it after you have altered the ID number. The switch is labeled SW2. It is located in the lower left-hand corner of the adapter. SW2 consists of four subswitches, SW2-1, SW2-2, SW2-3, and SW2-4. There are five ON/OFF combinations possible, of which only two are currently available for adapter identification numbers, the rest are reserved for future applications. The default and alternate identification numbers are listed in the table on the next page.

If you alter the identification number, reconfiguration of your PS/2 will be required.

Adapter Default and Alternate Identification Numbers (The square brackets [ ] denote the default settings.)

SubSwitch	Setting	Description
SW2-1, SW2-2	[OFF] [OFF]	Reserved for Future Application
SW2-3, SW2-4	[OFF] [OFF] ON ON OFF ON ON OFF	Default ID number 677F Alternate ID number E7FF Reserved for Future Application Reserved for Future Applications

DIP Switches

1 2 3 4

OFF
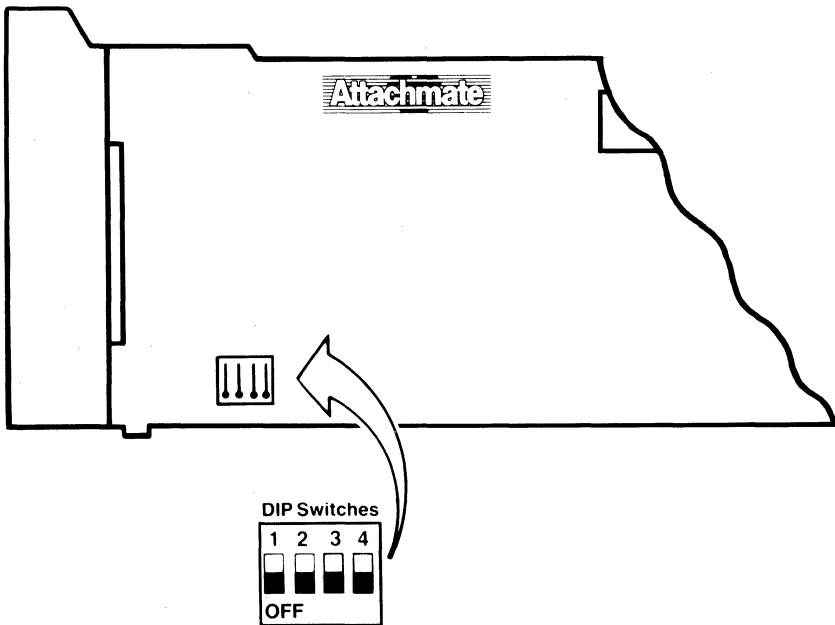
Appendix B
Adapter Specifications

This appendix contains the *Advanced 3270 Adapter/2*'s specifications.

Size

The overall dimensions of the *Advanced 3270 Adapter/2* are as follows:

13" x 4.3" x 0.6" (32.5 cm x 11 cm x 15mm), including card guide and DPC

Channel Specifications

The Advanced 3270 Adapter/2 is designed to meet all of IBM's MicroChannel Expansion bus specifications for the PS/2 system (models 50, 60, and 80). The adapter uses a two-section edge connector which provides supporting contacts for 8-bit as well as 16-bit communication.

It can access 0 or 8k of on-board memory and up to two concurrently selected I/O address ranges.

Electrical Specifications

Voltage: +5 volts: Less than 0.75 A typical
-12 volts: Less than 50 mA typical

Power: Typical 3.75 W maximum
Worst Case: 7.65 maximum

Environmental Specifications

Printed Circuit Materials

The Advanced 3270 Adapter/2 has been constructed of UL 94V-0 flame and fungus resistant material purchased from a UL listed vendor.

Operating Temperature and Humidity

Room temperature: 10 to 35 degrees Celsius
Humidity: 5 to 80 percent (noncondensing)

The actual temperature of the board should not exceed 55 degrees Celsius when operating inside the PC.

Cable Specifications

The Advanced 3270 Adapter/2 complies with 3270 standard specifications allowing up to 5000 feet (1500 meters) of type RG-62AU coaxial cable. Shielded twisted-pair is an acceptable connection media as well; actual useful cable length will be determined by cable gauge and type. Most shielded twisted-pair cable types will perform adequately in excess of 700 feet (200 meters). Using nonshielded coaxial or twisted-pair cable may limit the practical size of the cabling network. Extensive interconnection or using mixed cabling may also affect practical limits of cabling network.

WARNING: FCC Part 15 test results indicate that using nonshielded twisted-pair wiring or nonshielded coax cable may cause potential adapter interference with radio and television reception.

Appendix C
Supplemental Reading

The following is a list of reference sources which may help you to learn more about the operation of your personal computer and host communication peripherals.

- *IBM 3270 Information Display System 3274 Control Unit Description and Programmer's Guide*, IBM Publication GA 23-0061.

- *IBM 3270-Information Display System Data Stream Programmer's Reference*, IBM Publication GA23-0059.

- *3278 Display Station Operator's Guide*, IBM Publication GA 27-2890.

- *IBM 3287 Printer Operator's Guide*, IBM Publication GA 27-3230-1.

- *IBM PC Guide to Operations*, IBM Publication 6025000.

- *DOS 2.1 Disk Operating System Manual*, IBM Publication 6024120.

- *DOS 3.1 Disk Operating System Manual*, IBM Publication 6138519.

- *IBM PC Technical Reference Manual*, IBM Publication 6025005.

Index

[P]

Polarity switch, location, 1-7
Power-up communications
settings, A-6
Printer models supported, vi
Programmable memory
address register, v
Protocol support, v

[R]

Reset device status table test,
3-6
Resident adapter failure, 2-10
RG-62AU coaxial cable, 1-6
RJ-11 jack, 1-5

[S]

Screen size support, vi
Selecting a slot position, 1-8
Software program
compatibility, vii
System configurator utility,
A-2
System configurator, 1-12
System interface test
description, 2-2
Supplemental reading, C-1

[T]

Terminal type
alternate models, A-6
default model, 1-8
Termination plug, 1-4
Test messages, 2-9

Test results window, 2-6
Test routines
possible causes of failures,
2-13
Testing another adapter, 2-8
Testing for an active
connection, 2-3
TPC twisted-pair/coax plug,
1-4
Troubleshooting, 2-2
Twisted-pair wiring, 1-6

[W]

View the system
configuration, 2-13

Attachmate Corporation
13231 S.E. 36th St.
Bellevue, WA 98006
206-644-4010