



*Hardware Reference
Library*

Quick Reference

**IBM System 36/38
Work Station
Emulation Adapter**

72X6169
SA21-9861-1



*Personal Computer
Hardware Reference
Library*

Quick Reference

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Second Edition (January 1989)

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Preface

This manual tells how to install, test, troubleshoot, and service the IBM System 36/38 Work Station Emulation Adapter.

The IBM System 36/38 Work Station Emulation Adapter can be installed in an IBM PERSONAL SYSTEM/2™. (This manual uses the convention that *IBM Personal System/2* refers to those members of the IBM Personal System/2 which are supported by the IBM System 36/38 Work Station Emulation Adapter. This includes models 50, 60, 70, and 80.)

The adapter allows the IBM Personal System/2 to emulate work stations for host systems, such as the IBM System/36 or IBM System/38, that support an IBM Arctic protocol twinaxial cable interface. Up to four display station emulation or printer emulation sessions, in any combination, may be maintained by each IBM Personal System/2 with an adapter installed.

The IBM System 36/38 Work Station Emulation Adapter hardware consists of the adapter card and an integrated cable assembly. The adapter card plugs into a system expansion slot inside the IBM Personal System/2. The integrated cable assembly connects the adapter to the host system twinaxial cable.

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How this Manual is Arranged

This manual is organized into three major sections:

Chapter 1: Hardware Installation

This chapter provides instructions for initial installation and testing of the adapter. Once these instructions are completed, the adapter should be installed and functioning properly.

Chapter 2: Troubleshooting

This chapter provides step-by-step instructions to help you isolate and correct problems which may occur with the adapter after it is in use.

Chapter 3: Service Information and Parts Catalog

This chapter provides information on preparing a failing adapter for service. It also gives part numbers for the IBM System 36/38 Work Station Emulation Adapter and the integrated cable assembly.

Related IBM Personal System/2 Publications

- *IBM System 36/38 Work Station Emulation Adapter Hardware Maintenance and Service, SY31-9053*
- *IBM System 36/38 Work Station Emulation Adapter Technical Reference, SA21-9862*
- *IBM System 36/38 Work Station Emulation Program User's Guide, SC21-8072-0*
- *IBM System 36/38 Work Station Emulation Program Technical Reference, SC21-8068*
- The following manuals are available for all IBM Personal System/2 computers:
 - *Quick Reference*
 - *Technical Reference*
 - *Hardware Maintenance Service*
 - *Hardware Maintenance Reference*

Federal Communications Commission (FCC)

The IBM System 36/38 Work Station Emulation Adapter (hereafter called adapter) is an FCC Class A device designed for installation in an IBM Personal System/2 computer that has the Micro Channel™ Architecture. The adapter supports the attachment of the IBM Personal System/2 to the host computer as a work station in the IBM 5250 family of information display systems.

Warning: The IBM Personal System/2 with the adapter installed in it (hereafter called equipment) generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. The equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

If this equipment does cause interference to radio or television, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commissions helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.0.

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Chapter 1. Adapter Installation

This chapter provides instructions for installing the IBM System 36/38 Work Station Emulation Adapter into an IBM Personal System/2 computer.

After you complete this chapter, the adapter should be installed and working properly.

Before You Begin

This section describes materials you should have and procedures you should perform before installing the adapter.

Inventory Checklist

The following items are included in the adapter package. (See Figure 1-1 on page 1-3.) To ensure that these parts are present, place a check mark beside the name of each item.

- IBM System 36/38 Work Station Emulation Adapter (long or short card)
- Integrated cable assembly (type 1 or 2)
- IBM System 36/38 Work Station Emulation Adapter Diagnostics Diskette
- Two connector shields

If any items are missing or damaged, contact your place of purchase for information on replacement.

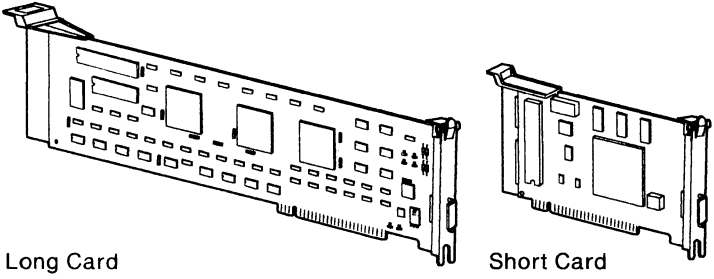
Other Materials Needed

You also need to have the following:

- An *IBM Personal System/2 Quick Reference* manual
- A backup copy of the *IBM Personal System/2 Reference Diskette*

Tools Required

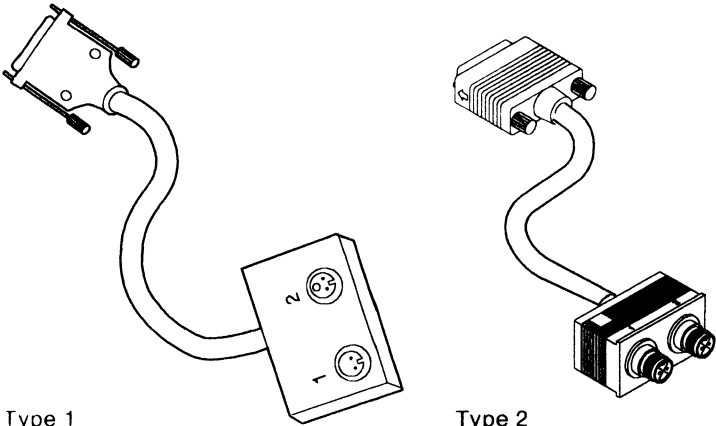
No tools are needed for installing the adapter.



Long Card

Short Card

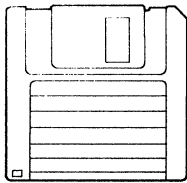
Work Station Emulation Adapter



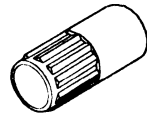
Type 1

Type 2

Integrated Cable Assembly



Adapter Diagnostics Diskette



Connector Shield

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Figure 1-1. Items Included in the Adapter Package

Station Address

The adapter makes it possible for your IBM Personal System/2 to maintain up to four emulation sessions at the same time. The host system must have a station address for each session you plan to use.

Obtain the station address(es) from the technical person responsible for the host system. Record the address(es) below. Make a check mark to indicate whether the session is for a display or printer.

Station Address	Display	Printer
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Note: Only one address (a display station address) is needed for performing the diagnostics in Chapter 2, "Troubleshooting."

Internal Self-Test

Before installing the adapter, be certain that your IBM Personal System/2 is performing correctly. If necessary, consult the *IBM Personal System/2 Quick Reference* for instructions on running the computer's internal self-test.

Installation Procedures

Perform the following procedures to install the adapter and the integrated cable assembly.

Updating the IBM Personal System/2 Reference Diskette

Note: You will need a backup copy of the IBM Personal System/2 Reference Diskette before you can continue. If you have not already made one, refer to the *IBM Personal System/2 Quick Reference* for instructions on backing up the reference diskette.

The Adapter Diagnostics Diskette contains information which must be copied to your backup copy of the IBM Personal System/2 Reference Diskette before installing the adapter.

Do not use version 1.00 of the Adapter Diagnostic Diskette. You should use version 1.01.

The IBM Personal System/2 Reference Diskette provides a program for copying an option diskette, such as the Adapter Diagnostics Diskette. Refer to your *IBM Personal System/2 Quick Reference* to perform the procedures for copying an option diskette.

Installing the Adapter Card

Your *IBM Personal System/2 Quick Reference* gives instructions for installing options such as the IBM System 36/38 Work Station Emulation Adapter. Follow the installation instructions in that manual to do the following:

- Remove the system unit cover
- Install the adapter
- Install the system unit cover

Do not turn on the IBM Personal System/2.

After you have installed the adapter, continue with "Installing the Integrated Cable Assembly" on page 1-6.

Installing the Integrated Cable Assembly

Connect the D-connector end of the of the integrated cable assembly to the external connection on the adapter. Firmly tighten the thumbscrews.

Note: Do not connect the integrated cable assembly to the host system twinaxial cable.

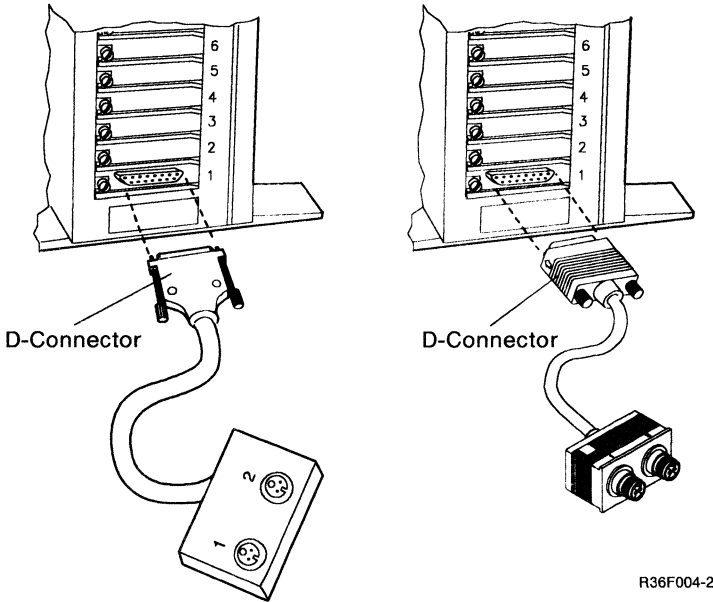
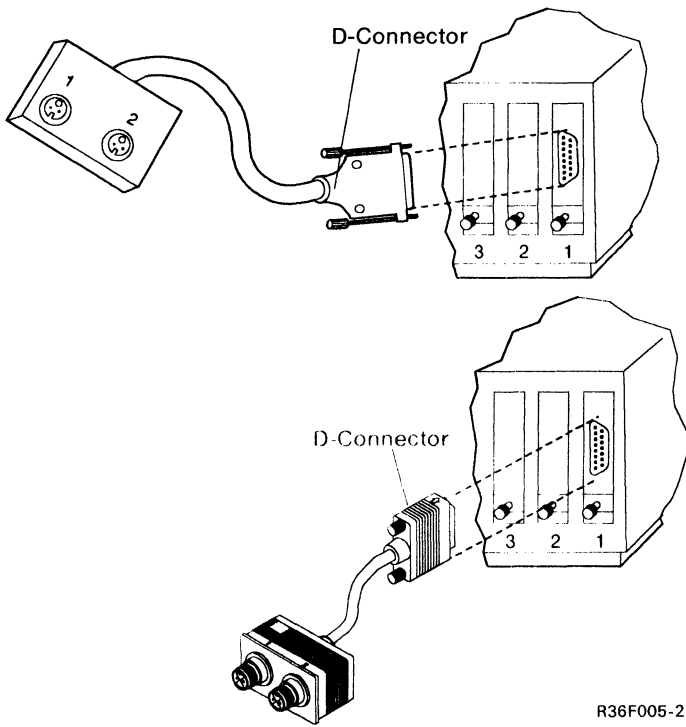


Figure 1-2. Connection to Floor-Standing Models



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Figure 1-3. Connection to Desktop Models

Setting the Configuration

You must configure your IBM Personal System/2 so that it can recognize the adapter. If you want more information on configuring the system, refer to the *IBM Personal System/2 Quick Reference*. Proceed as follows to run the configuration program:

1. Insert the updated IBM Personal System/2 Reference Diskette, with the label up and metal-shutter end first, into drive A. Make sure the diskette "clicks" into place. Then turn on the computer.

Note: If the IBM Personal System/2 will not complete its internal self-test after the adapter is installed, turn the computer off, wait five seconds, and turn it on again. If the test still shows failure, remove the adapter and repeat the test. If the test then completes successfully, have the adapter serviced (see "Service Information" on page 3-1).

2. A screen with the title Adapter Configuration Error - 00165 appears. Page down to the end of the message; then press Y to start automatic configuration of the system.
3. When automatic configuration is complete, press Enter to retest the computer.

This completes the installation of the adapter. Proceed to "Testing the Adapter Offline" on page 1-9 to check the adapter function.

Testing the Adapter Offline

You can now use the information copied to the IBM Personal System/2 Reference Diskette to determine whether the adapter is installed correctly and working properly in the *offline* mode; that is, with the adapter not connected to the host system.

Proceed as follows to test the adapter:

1. The Main Menu is now on the display. Select the *Test the Computer* option and follow the directions on the display. (You will be required to test all options installed in your IBM Personal System/2.)
2. When a list of devices appears, look for *System 36/38 Work Station Emulation*. If this item is not listed, do the following:
 - a. Verify that the adapter is installed and seated properly. (Installation instructions are in the *IBM Personal System/2 Quick Reference*.)
 - b. If the adapter is installed and seated properly, the adapter is faulty; refer to Chapter 3, "Service and Parts Information."
3. When the 36/38 Emulation Test Setup Menu appears, select *Offline Testing*.
4. If the testing procedures detect adapter failure, use the "Troubleshooting Chart" on page 2-4 in this manual and the troubleshooting chart in your *IBM Personal System/2 Quick Reference* to locate and correct the problem. Write down any error codes that appear. Then repeat the offline testing procedures.
5. If no error codes appear during a test cycle and the Main Menu reappears, the installation is successful.

Continue at *Connecting the IBM Personal System/2 to the Host System* on page 1-10.

Connecting the IBM Personal System/2 to the Host System

You have completed the installation of the adapter, connected the integrated cable assembly to the adapter, and performed the required testing. The following steps tell you how to connect the IBM Personal System/2, with the adapter installed, to the host system twinaxial cables.

Twinaxial Cables

DANGER

- 1. An improperly wired outlet or plug can place hazardous voltages on accessible metal parts. The power cord and plug (when supplied) have been approved for use with this equipment and meet the necessary testing laboratory/test house standards. For your safety, the power cord and plug must be connected to a properly wired and grounded outlet. The customer is responsible for the outlet and plug wiring.***

If it becomes necessary to change the power cord or plug or if the outlet is improperly wired, have the change made by a qualified electrician according to local or national code. A new power cord may be ordered from your IBM sales representative.

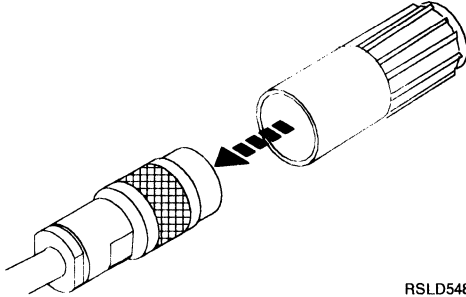
- 2. For each communications cable, turn off the power switches and disconnect the power plugs of all peripherals before installing the connector shields.***
- 3. Do not touch the exposed metal surfaces of the two separate communications cables at the same time.***
- 4. Do not touch the communications cables during an electrical storm.***

FAILURE TO FOLLOW THESE PROCEDURES COULD RESULT IN SEVERE ELECTRICAL SHOCK.

For information on connecting twinaxial cables to the host system and on splicing cables, refer to the appropriate host system documentation.

Note: The IBM Personal System/2 should be turned off and unplugged from the wall outlet before twinaxial cables are connected or disconnected.

Before you connect the cable to the integrated cable assembly, place the twinaxial connector shield on the cable connector.



RSLD548-1

Figure 1-4. Installing Connector Shield

To connect your IBM Personal System/2 ahead of other display stations on the twinaxial cable, refer to "Connecting Ahead of Other Display Stations" on page 1-12. To connect it as the final display on the twinaxial cable, refer to "Connecting as Final Display Station" on page 1-13.

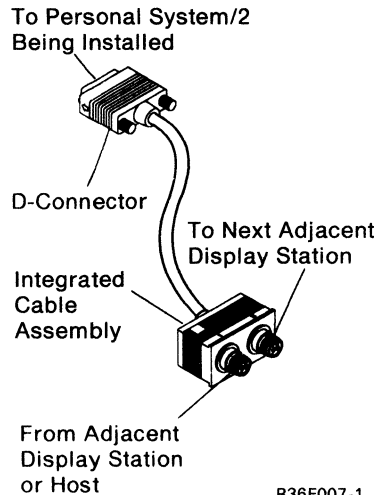
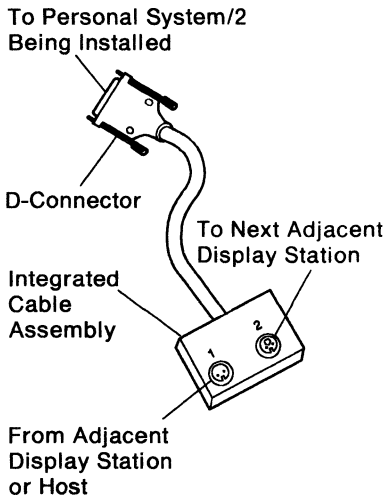
Connecting Ahead of Other Display Stations

Important

Do not connect or disconnect the twinaxial cables to or from the integrated cable assembly except under direction from the technical person responsible for the host system. Disconnecting or connecting the cables can affect other display stations connected to the same line.

To connect your IBM Personal System/2 between two display stations on the same twinaxial cable or between the host system and another display station, do the following:

1. Find the twinaxial cable from the host system or adjacent display station and connect it to socket 1 on the integrated cable assembly.
2. Connect the remaining twinaxial cable to socket 2 to complete the connection.



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3. Proceed to "After Installation" on page 1-14.

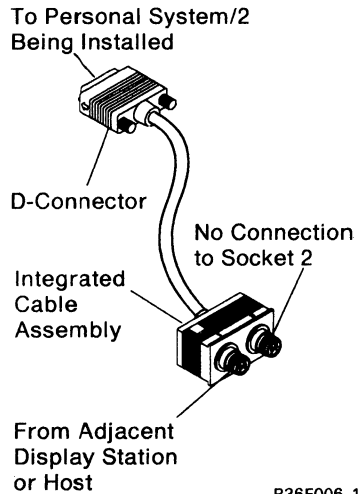
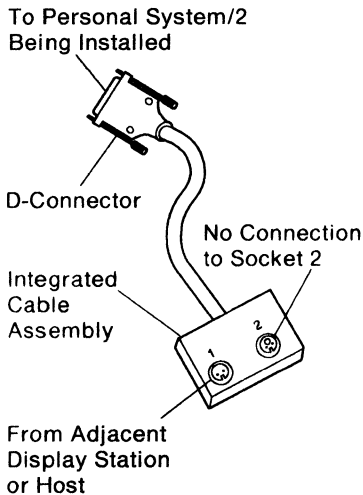
Connecting as Final Display Station

Important

Do not connect or disconnect the twinaxial cables to or from the integrated cable assembly except under direction from the technical person responsible for the host system. Disconnecting or connecting the cables can affect other display stations connected to the same line.

If your IBM Personal System/2 is the last display station on the host system twinaxial cable, do the following:

1. Connect the twinaxial cable to socket 1 of the integrated cable assembly.
2. Leave socket 2 empty to end the line.



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3. Continue at "After Installation" on page 1-14.

After Installation

For assistance if you experience any problems after your IBM Personal System/2 is *online* to the host system, refer to Chapter 2, "Troubleshooting."

If you did not experience problems with the installation and testing of the adapter, proceed to the *IBM System 36/38 Work Station Emulation Program User's Guide*.

PC Support 36/38 Information

In order to install PC Support 36/38, you must use the work station emulation program *WSE.COM* supplied with the IBM System 36/38 Work Station Emulation Program User's Guide. *WSE.COM* replaces the *DE5250.COM* and *DP5250.COM* enhanced emulation programs specified in the instructions for installing PC Support 36/38.

- PC Support/36:

Follow the instructions for installing PC Support/36 and select the *Other* option when you are selecting the emulation program. Enter *WSE.COM* for the name of the emulation program and *M=MASTER.DAT* for the optional parameter to tell *WSE.COM* the name of the master profile to use. To start work station emulation, use the command *WSE.COM M=MASTER.DAT*, where *MASTER.DAT* is the name of the master profile for *WSE.COM* to use.

- PC Support/38:

1. Configure session 1 of work station emulation (*WSE.COM* program) with the advanced options for the display session. Select the option for virtual diskette drive names and enter the virtual source drive you want to use. This is similar to the */s* option used with the Enhanced 5250 Emulation programs during the PC Support/38 install process, where *s* is the virtual drive to be used. For example, if you are using a PS/2 Model 50 with one diskette drive and one fixed disk, specify *A* as the virtual diskette drive and specify *YES* to the Allow real diskette drive access parameter.

2. When installing PC Support/38 (*PC Support/38 Technical Reference manual*, SC21-9090-1), follow the instructions for Enhanced 5250 Emulation until you get to Step 4.2. Instead of Step 4.2, enter the command *WSE.COM M=MASTER.DAT*, where *MASTER.DAT* is the name of the master profile. After loading *WSE.COM*, go to Step 5.0 and follow the remaining steps to finish installing PC Support/38 on your PS/2.

Chapter 2. Troubleshooting

This chapter contains procedures for isolating and resolving adapter problems after the adapter has been installed and has passed the offline tests given in "Testing the Adapter Offline," in Chapter 1.

The procedures in this chapter tell how to handle problems associated with the adapter hardware. Software problems are not considered in this manual.

Important

Do not connect or disconnect the twinaxial cables to or from the integrated cable assembly except under direction from the technical person responsible for the host system. Disconnecting or connecting the cables can affect other display stations connected to the same line.

The Online Test

The online test determines whether the adapter functions correctly in a host-supported environment. It provides a test of the twinaxial cable system by responding to a poll and testing for a correct response.

Requirements for Online Test

Do not run the online test until the following requirements have been met:

- The IBM Personal System/2 is connected to the twinaxial cable of the host system.
- The power is On, and the host system is operating properly.

If you have any doubts about the above requirements, check with the technical person responsible for the host system.

If you cannot meet the requirements, make the necessary corrections before continuing.

Running the Online Test

Proceed as follows:

1. Turn off the IBM Personal System/2 system unit and display.
2. Insert your backup copy of the IBM Personal System/2 Reference Diskette into drive A. (The adapter diagnostics should have been copied to this diskette in "Updating the IBM Personal System/2 Reference Diskette" on page 1-5.)
3. Turn on the power.
4. Wait for the internal self-test to complete.
5. When the Main Menu appears, select the *Test the Computer* option, and follow the directions on the display.
6. When the 36/38 Emulation Test Setup Menu appears, select *Online Testing*.
7. When the Display Station Address Selection Menu appears, select a display station address that is valid for the adapter (one that is recorded under "Station Address" on page 1-4).
8. Follow the directions on the display.
 - If error messages and/or error codes appear, write them down. Refer to the "Troubleshooting Chart" on page 2-4 and to the *IBM Personal System/2 Quick Reference* troubleshooting chart to resolve the problem.
 - If the Main Menu reappears without any errors being displayed, the Adapter has passed the online test. The adapter function has been fully tested in a host-supported environment.

Troubleshooting Chart

The following chart lists the problems you may have encountered, a brief comment on the probable cause of the problem, and an action to take to resolve the problem.

Note: When directed to *remove* or *install the adapter*, use the instructions in your *IBM Personal System/2 Quick Reference*. When directed to *service the adapter*, refer to Chapter 3, "Service and Parts Information."

Symptom or Error Code	Probable Cause	Suggested Action
Internal self-test does not complete.	Faulty adapter.	Remove adapter. Repeat test. If the test completes, have adapter serviced.
Personal system hangs after successfully powering up or during diagnostics.	Faulty adapter.	Rerun the diagnostic. If failure occurs again, service the adapter.
Adapter not in the list of installed devices.	Adapter not seated properly.	Check for proper seating of the adapter.
	Adapter not installed.	Install the adapter.
	Faulty adapter.	Service the adapter.
1604	Adapter connected on the twinaxial cable during offline test.	Perform the online test.
	Faulty adapter.	Service the adapter.

Figure 2-1 (Part 1 of 4). Troubleshooting Chart

Symptom or Error Code	Probable Cause	Suggested Action
1605, 1606	Integrated cable assembly not attached.	Attach the integrated cable assembly and rerun the diagnostics.
	Faulty adapter or cable.	Service the adapter or cable.
1609	Work station address in use by another work station.	Select the correct address and rerun the diagnostics.
	Faulty adapter.	Service the adapter.
1614	Incorrect version of diagnostics.	Use version 1.01.
	Faulty adapter.	Service the adapter.
1640	Work station address not valid, not configured at the controller.	Get a valid station address from the technical person responsible for the host system. Rerun the diagnostics.
	Twinaxial cable not connected.	Check with the technical person responsible for the host system for repair or reconnection of the cable.
	Faulty adapter or cable.	Service the adapter or cable.
All other 16XX numbers except 1600	Faulty adapter.	Service the adapter.

Figure 2-1 (Part 2 of 4). Troubleshooting Chart

Symptom or Error Code	Probable Cause	Suggested Action
Message displays: No valid addresses were detected on this line	Connections from adapter to host are not secure.	Check for secure connections to the integrated cable assembly and to the host.
	Other work stations on twinaxial cable are not securely connected.	Check and secure connections for all work stations on twinaxial cable.
	Cable termination (of last display on twinaxial cable) incorrectly performed.	Refer to "Connecting the IBM Personal System/2 to the Host System" on page 1-10 and make the correct connection.
	Faulty adapter.	Service the adapter.
	Faulty integrated cable assembly.	Service the integrated cable assembly (see Chapter 3, "Service and Parts Information").
Message displays: Station address you have just selected is already in use by another station	Station address has been assigned to more than one station.	Get the correct station address from the technical person responsible for the host system and repeat the online test.

Figure 2-1 (Part 3 of 4). Troubleshooting Chart

Symptom or Error Code	Probable Cause	Suggested Action
Message displays: The address you have selected is not active	Incorrect display station address has been entered.	Get a correct station address from the technical person responsible for host system and repeat online testing.
Message displays: S36/38 Work Station Emulation Adapter is not enabled.	Conflict with another adapter.	Remove adapters one at a time to find the conflicting adapter. Contact your place of purchase to resolve the conflict.
	Faulty adapter.	Replace the adapter.

Figure 2-1 (Part 4 of 4). Troubleshooting Chart

Chapter 3. Service and Parts Information

This chapter tells how to have your adapter serviced and gives parts information for the adapter and integrated cable assembly.

Service Information

After you have determined that you have a faulty adapter, you can obtain service in the following ways:

- Call a service technician to repair the hardware at your location.
- Deliver the hardware to a service center for repair.
- Call your place of purchase.

Consult your warranty and/or maintenance agreement information to determine which method of obtaining service is appropriate. Use of a service method other than that to which you are entitled may result in an additional charge.

Service Provided at Service Center

If you are having the adapter serviced at a service center, you must determine which items to package and deliver to the service center.

Items You Should Deliver to Service Center

Provide the service center with the following:

- The adapter
- The IBM Personal System/2 in which the failing adapter was installed

You may also need to provide the integrated cable assembly. (See below.)

When to Provide the Integrated Cable Assembly

It is necessary to provide the service center with the integrated cable *only if* one of the following error codes or messages was indicated by the diagnostics:

- 1609
- 1610
- 1634
- 1635
- 1640
- 1644
- 1655
- No valid addresses were detected on this line

Do not disconnect the integrated cable assembly from the twinaxial cable unless it is necessary to deliver the integrated cable assembly to the service center.

Disconnecting the Integrated Cable Assembly from the Twinaxial Cable

If it is necessary to remove the integrated cable assembly from the twinaxial cable, proceed as follows:

1. Turn off the IBM Personal System/2.
2. Remove the power cord from the wall outlet.
3. Disconnect the D-connector of the integrated cable assembly from the adapter.

Important

Do not connect or disconnect the twinaxial cables to or from the integrated cable assembly without the assistance of the technical person responsible for the host system. Disconnecting or connecting the cables can affect other display stations connected to the same line.

4. Disconnect the twinaxial cable connectors from the the integrated cable assembly.

Note: A connector (Part Number 7362230) may be purchased to permit devices down-line from (farther away from) the host system to resume operation after removal of the integrated cable assembly. If there are no down-line devices, the connector is not required. You must, however, ensure proper termination of the twinaxial cable as instructed by the host system twinaxial device set-up instructions.

Packaging Items for Delivery to the Service Center

Perform the following steps before delivering any adapter hardware to the service center:

1. If the adapter is not already installed in the IBM Personal System/2, install it.
2. Refer to the "Moving the Computer" section of your *IBM Personal System/2 Quick Reference* and follow the instructions for shipping the computer.
3. If you are delivering the integrated cable assembly, wrap it in a cushioning material and package it with the computer.

Note: While using the testing procedures, you were asked to record error messages (including error codes if provided). When you return the hardware for service, include a note with this error information.

On-Site Service

If you are having the adapter serviced at your location, ask the service person to bring an adapter card replacement (part number 69X6292 or 69X6283).

If one of following error codes or messages appeared during testing, ask the service person to bring a replacement integrated cable assembly also (part number 72X6263 or 93X2614):

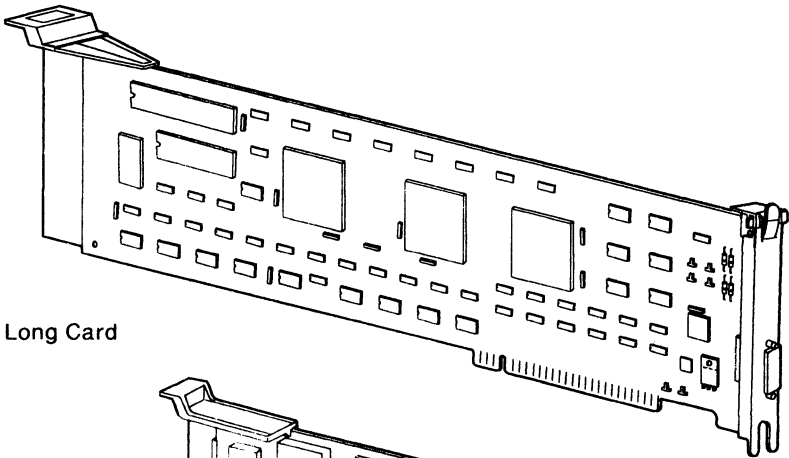
- 1609
- 1610
- 1634
- 1635
- 1640
- 1644
- 1655
- No valid addresses were detected on this line

Parts Information

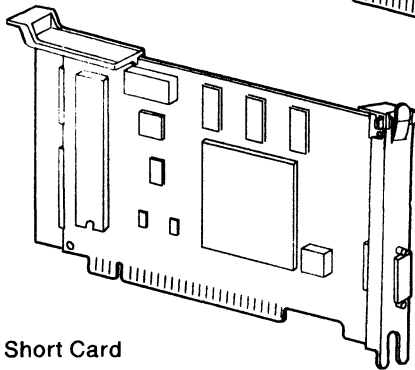
This section lists the part numbers for the adapter hardware.

TAC Code	Part Number	Description
300	69X6292 or 69X6283	IBM System 36/38 Work Station Emulation Adapter Card

Figure 3-1. IBM System 36/38 Work Station Emulation Adapter Card Parts Information



Long Card

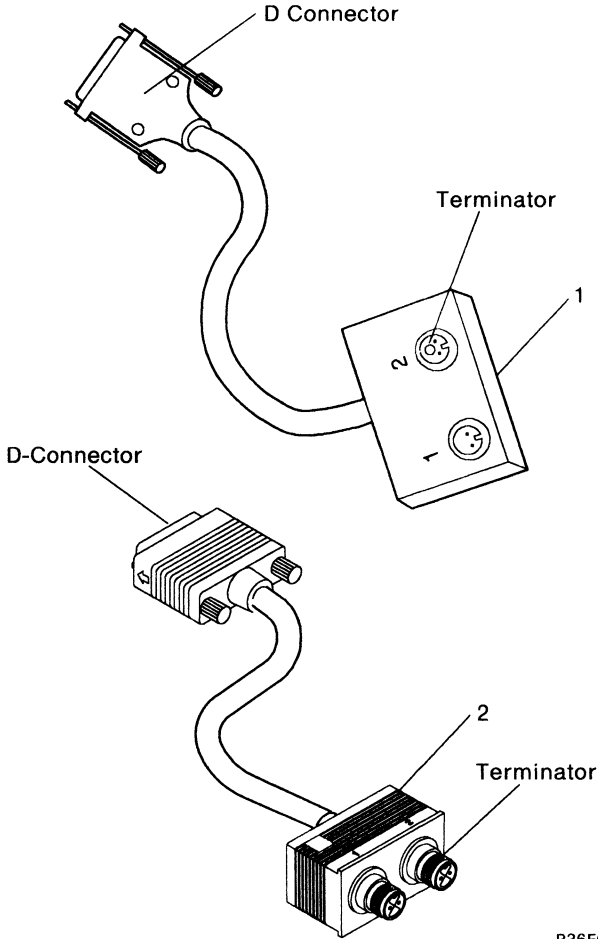


Short Card

R36F003-2

Index Number	Part Number	Description
1	72X6263	Integrated Cable Assembly
2	93X2614	Integrated Cable Assembly

Figure 3-2. Integrated Cable Assembly Parts Information



R36F002-1

Glossary

Terms not found in this Glossary may be found in the *IBM Data Processing Glossary (GC20-1699)*.

adjacent. Nearby or next to in position.

configuration. A set of information that identifies system components to each other.

connector shield. A sleeve that covers the metal surfaces at the end of a twinaxial cable to protect against electrical shock.

diagnostics. Procedures that help identify the source of an error or problem.

diskette. A thin, flexible magnetic disk enclosed in a rigid protective jacket.

diskette drive. The device that reads information from or writes information to the diskette.

DOS. Disk Operating System. The software that controls the flow of data to and from the diskette drives and fixed disk.

emulate. To imitate one system with another so that the imitating system accepts the same data and achieves the same results as the imitated system.

host. The primary controlling computer in a multiple computer installation.

internal self-test. A program that runs automatically when the IBM Personal System/2 is powered on, and that tells the user whether the IBM Personal System/2 is in working order.

offline. Not controlled directly by or not communicating with a host computer system.

online. Controlled directly by or directly communicating with a host computer system.

poll. The process of requesting data stations to transmit, one at a time.

session. A period of interaction between a user and a computer system.

station address. A unique numeric code used by the host to identify a display station, emulated display station, printer, or emulated printer.

system expansion slots. Slots located in the system unit, which allow adapter cards to be installed.

twinaxial. A type of cable in which two wires run side-by-side with an outer shielding (usually braided wire). Used for connecting the System/36 or System/38 to its work stations.

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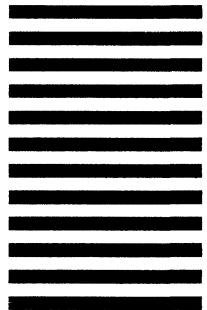
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