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2074 Console Support Controller Installation and Maintenance Information

G229-9028-03

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2074 Console Support Controller Installation and Maintenance Information

G229-9028-03

Notice!

Before using this information and the products it supports, be sure to read the general information under Appendix B, “Notices”, on page B-1.

Fourth Edition (June 2003)

This document refers to the IBM® 2074 Console Support Controller.

This major revision replaces the third edition and makes it obsolete.

There may be a newer version of this document in PDF format available on **Resource Link™**. Go to ***http://www.ibm.com/servers/resourcelink*** and click on **Library** in the navigation bar. A newer version is indicated by a lower case alphabetic letter following the form number suffix (for example: 00a, 00b, 01a, 01b).

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Safety and Environmental Notices

Safety

Safety notices may be printed throughout this guide. **DANGER** notices warn you of conditions or procedures that can result in death or severe personal injury. **CAUTION** notices warn you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous. **Attention** notices warn you of conditions or procedures that can cause damage to machines, equipment, or programs.

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About This Publication

This publication describes the installation and maintenance information for the 2074 Models 001, 002 and 003.

Who Should Use This Publication

This publication is intended for the technical staff who will install and maintain their particular 2074 model.

Terms Used

The following terms are used throughout this publication. It is important that you understand their meaning before proceeding.

- **ESCON®:** Enterprise Systems Connection.
- **ESCON1:** This term is used to define the specific ESCON card that has **two LEDs** exposed on the back edge of the card. This card can be installed in the 2074 Models 001 and 002 only.
- **ESCON2:** This term is used to define the specific ESCON card that has an **LED display** exposed on the back edge of the card. This card can be installed in ALL current 2074 models (Models 001, 002 and 003).
- **VPD**: Vital Product Data is defined for this publication as the machine type, model and serial number of the 2074.

What Is Included In This Publication

This publication contains the following chapters and appendices:

- Chapter 1, “Installation”, on page 1-1 describes the 2074 installation process.
- Chapter 2, “Maintenance Information”, on page 2-1 provides maintenance information about the 2074.
- Chapter 3, “Service Procedures”, on page 3-1 describes the 2074 service procedures.
- Chapter 4, “Discontinuance / Relocation”, on page 4-1 is a flow chart which lists the steps to be followed for a 2074 discontinuance or relocation.
- Appendix B, “Notices”, on page B-1lists the trademarks and service marks used in this publication, the environmental and electronic emission notices, and information about the use of IBM online books.

Related Publications

Important

Please ensure that you are using the most recent version of all related documentation.

Other IBM publications that you will find helpful and that you should use along with this publication include:

- *2074 Overview Document*.
- *2074 Console Support Configuration Guide*, SC28-6806.
- *xSeries™ 340 Type 8656 Hardware Management Manual*, part number 19K6113 (for the 2074 Model 001).

- *xSeries 342 Type 8669 Hardware Management Manual*, part number 24P2922 (for the 2074 Model 002).
- xSeries 235 Type 8671 Hardware Management Manual, part number 59P6524 (for the 2074 Model 003).

Note: The 2074 Overview Document (Overview.pdf) can be sourced from the following locations:

- C:\present
- 2074 Load CD in the PRESENT subdirectory
- ftp:\\P390.IBM.COM\doc\2074
- ftp:\\s390is.pok.ibm.com\doc\2074

Note: The Hardware Management Manuals (HMMs) can also be found on the CD-ROM in the HMM subdirectory.

How To Send Your Comments

Your feedback is important in helping to provide the most accurate and high-quality information. Send your comments by using Resource Link at *http://www.ibm.com/servers/resourcelink*. Select **Feedback** on the Navigation bar on the left. Be sure to include the name of the book, the form number of the book, the version of the book, if applicable, and the specific location of the text you are commenting on (for example, a page number or table number).

Summary of Changes

Summary of Changes for G229-9028

2074 Installation and Maintenance Information

Release Level	Date	Changes in Level
00	07/00	Initial Release - Model 001.
01	01/01	Miscellaneous corrections and clarifications along with updates for the 2074's Driver 1.0.7 level of code.
02	01/02	Miscellaneous corrections and clarifications along with the addition of Model 002 information.
03	06/03	Addition of Model 003 information.

Chapter 1. Installation

This chapter provides the basic information needed to install the 2074. This section is written with the experienced user in mind.

Physical Planning Information

Physical Specifications

Powercords:
Power Cords 9870 NC - Default US/CAN 10A/125V
Power Cords 9871 NC - 250V 2.8m -
Power Cords 9872 NC - 250V 2.8m -
Power Cords 9873 NC - 250V 2.8m -
Power Cords 9874 NC - 250V 2.8m - Israel
Power Cords 9875 NC - 250V 2.8m - China
Power Cords 9876 NC - 250V 2.8m - Australia,NZ
Power Cords 9877 NC - 250V 2.8m - UK,UAE,HK
Power Cords 9878 NC - 250V 2.8m - Fr.Ger.
Power Cords 9879 NC - 250V 2.8m - Den.
Power Cords 9880 NC - 250V 2.8m - So.Af.
Power Cords 9881 NC - 250V 2.8m - Japan

2074(M) IEC320-C13(FM) —— IEC320-C14(M) PDU(FM)

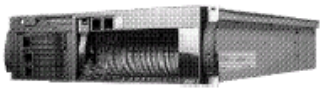
2074(M) IEC320-C13(FM) —— NEMA 5-15P(M) NEMA 5-15R(FM)

(4) Adapter Cables Included in Ship Group
US Default NEMA 5-15P(qty 2) Included in Ship Group
Default IEC320(qty 2) Included in Ship Group

Used as S/390 or operating system console
Connects to a host via an ESCON channel or with a FICON Bridge
Connects to client PCs with:
- Ethernet (10 Mb/s) - FC 7401
- Fast Ethernet (100 Mb/s) - FC 7402
- 4/16 MB Token Ring - Integrated
- 4/16 MB Token Ring - Integrated

1 ESCON Std - FC 7403 (16) 3270 Sessions
2nd ESCON - FC 7403 (16) 3270 Sessions
Cables supplied by Customer

cbr 01/22/03
2074Unit



2074-001 Console Support Controller

120 or 240V, 1-Phase, 3-Wire

Each Frame = Dual Univ. Power PS&Cords
Physical Specifications
Size: The 2074 package is a rack-model box measuring approximately:
· Width: 16.30 inches (standard 19-inch rack)
· Height: 5.25 inches (3U)
· Depth: 26.00 inches
The following additional space is required for the machine to function properly:
· A 100-mm clearance should be allowed in the rear for cables.
Weight: 2074 system weight can be approximately 60 pounds when fully configured.
Power Requirements and Heat Output: The 2074 without a display will use the following power:
· 100-127 V AC 50 Hz or 60 Hz 4.1A
· 200-240 V AC 50 Hz or 60 Hz 2.1A
The BTU output of a 2074 without a display is 1,280 BTU/hr (375 watts), .41KVA

Powercords:

Power Cords 9870 NC - Default US/CAN 10A/125V
Power Cords 9871 NC - 250V 2.8m -
Power Cords 9872 NC - 250V 2.8m -
Power Cords 9873 NC - 250V 2.8m -
Power Cords 9874 NC - 250V 2.8m - Israel
Power Cords 9875 NC - 250V 2.8m - China
Power Cords 9876 NC - 250V 2.8m - Australia,NZ
Power Cords 9877 NC - 250V 2.8m - UK,UAE,HK
Power Cords 9878 NC - 250V 2.8m - Fr.Ger.
Power Cords 9879 NC - 250V 2.8m - Den.
Power Cords 9880 NC - 250V 2.8m - So.Af.
Power Cords 9881 NC - 250V 2.8m - Japan

2074(M) IEC320-C13(FM) ——— IEC320-C14(M) PDU(FM)

2074(M) IEC320-C13(FM) ——— NEMA 5-15P(M) NEMA 5-15R(FM)

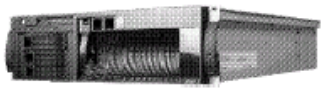
(4) Adapter Cables Included in Ship Group
US Default NEMA 5-15P(qty 2) Included in Ship Group
Default IEC320(qty 2) Included in Ship Group

Used as S/390 or operating system console

Connects to a host via an ESCON channel or with a FICON Bridge
Connects to client PCs with:
- (2) Auto-sensing Ethernet (10/100 Mb/s) - Integrated
- (2) Auto-sensing Token Ring (4/16 Mb/s) - Integrated

1 ESCON - Integrated Std (32) 3270 Sessions
2nd ESCON - FC 7408 (32) 3270 Sessions
Cables supplied by Customer

cbr 01/22/03
2074Unit



2074-002 Console Support Controller

120 or 240V, 1-Phase, 3-Wire

Each Frame = Dual Univ. Power PS&Cords

Physical Specifications
Size: The 2074 package is a rack-model box measuring approximately:
· Width: 17.3 inches (standard 19-inch rack)
· Height: 5 inches (3U)
· Depth: 27.3 inches
The following additional space is required for the machine to function properly:
· A 100-mm clearance should be allowed in the rear for cables.
Weight: 2074 system weight can be approximately 60 pounds when fully configured.
Power Requirements and Heat Output: The 2074 without a display will use the following power:
· 100-127 V AC 50 Hz or 60 Hz 4.1A
· 200-240 V AC 50 Hz or 60 Hz 2.1A
The BTU output of a 2074 without a display is 1,280 BTU/hr (375 watts), .41KVA

Powercords:

9870 US/CAN 125V 2800mm
9871 Italy 2800mm
9872 Switzerland 2800mm
9873 Argentina 2800mm
9874 Israel 2800mm
9875 China 2800mm
9876 Australia 2800mm
9877 UK 2800mm
9878 Europe 2800mm
9879 Denmark 2800mm
9880 South Africa 2800mm
9881 Japan 2800mm
9882 Brazil 2800mm
9883 Chicago 125V 1800mm
9886 Korea 2800mm
9887 India 2800mm
9888 US/CAN 250V 2800mm
9889 Chicago 250V 1800mm

2074(M) IEC320-C13(FM) —— IEC320-C14(M) PDU(FM)

2074(M) IEC320-C13(FM) —— NEMA 5-15P(M) NEMA 5-15R(FM)

(4) Adapter Cables Included in Ship Group
No Default, but IEC320(qty 2) Included in Ship Group

Used as zSeries Operating System console

Connects to a host via an ESCON channel or with a FICON Bridge
The ESCON card on this model has an MT-RJ connector
Connects to client PCs with: (each must be on seperate subnet)
- (2) Auto-sensing Ethernet (10/100/1000 Mb/s)
- (2) Auto-sensing Token Ring (4/16 Mb/s)

1 ESCON - Std (48) 3270 Sessions
2nd optional ESCON - FC 7409 additional (48) 3270 Sessions
Optional Rack mount conversion kit FC 7420. Not MESable
LAN and ESCON Cables supplied by Customer

MZ 06/23/03
2074Unit

2074-003 Console Support Controller

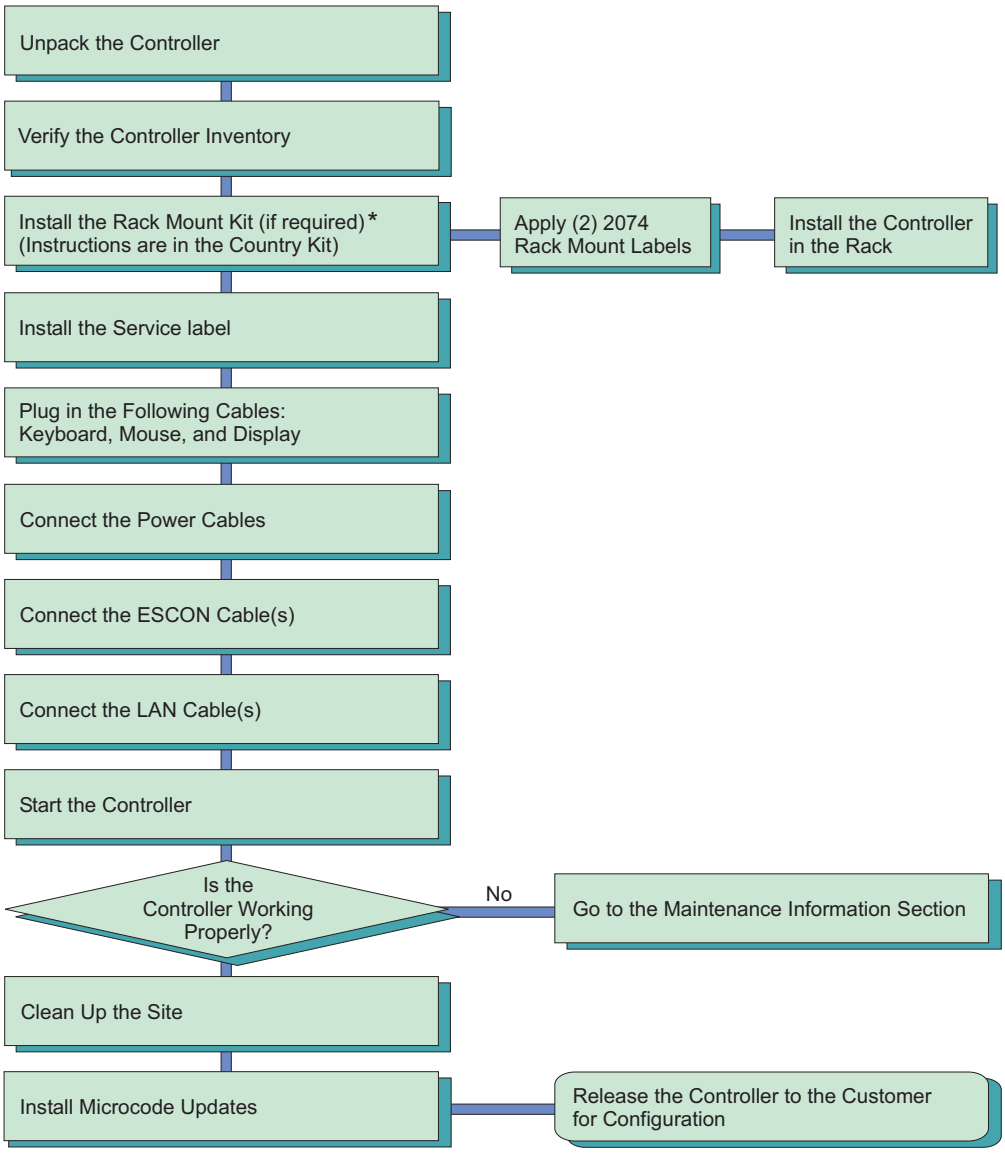
120 or 240V, 1-Phase, 3-Wire

Each Frame = Dual Univ. HS Power & Cords

Physical Specifications
Size: The 2074 package is a rackable/tower box measuring approximately:
Tower (as shipped):
· Width: 8.7 inches
· Height: 17.31 inches
· Depth: 27.5 inches
Rack (optional kit required):
· Width: 17.31 inches (standard 19-inch rack)
· Height: 8.6 inches (5U)
· Depth: 27.5 inches
The following additional space is required for the machine to function properly:
· A 100-mm clearance should be allowed in the rear for cables.
Weight: 2074 system weight can be approximately 75 pounds when fully configured. Power supplies must be removed before attempting a two person lift.
Power Requirements and Heat Output: The 2074 without a display will use the following power:
· 100-127 V AC 50 Hz or 60 Hz 8A
· 200-240 V AC 50 Hz or 60 Hz 4A
The BTU output of a 2074 without a display is between 341 and 2600 BTU/hr (100-760 watts)

Installation Flowchart

Use the following flowchart as a guide for installing the 2074:



* Remove hot-pluggable power supplies prior to two-person lift

Figure 1-1. Flowchart describing the installation process

2074 Setup Instructions

Unbox the 2074.

Unbox the monitor and keyboard that came with it.

Place the 2074 either next to a suitable table, or install it into an approved rack using the optional rack mounting kit. Place the service label as shown in the following diagram.

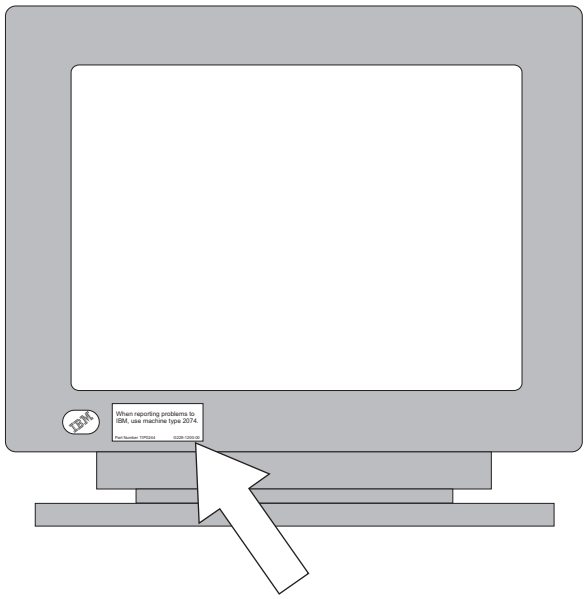


Figure 1-2. Proper label placement.

Attach the monitor, keyboard, and mouse cables to the rear of the 2074 following the color coded symbols and legends.

Note: At no time should you attach any printers directly to the 2074. Printers get attached to clients, if 1) There is a driver for the printer, appropriate for the operating system the client is running, 2) The clients TN3270E emulator supports ″printers″. These printers can be used in two different ways. 1) They can appear to the Host operating system as a ″coax″ 3287 printer. They will have a ″real″ address. 2) These printers can also be used for emulator ″print screen″ functions. In this case the printer isn't assigned an address. Only the emulator has an association with it for screen printing.

Attach the power cords to the 2074, using the provided extension cables if needed. Plug each power cord into a different feed, for maximum protection. A different feed would mean a circuit coming from a panel box protected by a different “main”. The green power LED on the front of the 2074 should be blinking slowly.

Attach the power cord to the monitor, and plug it into the more reliable of the two circuits.

Attach the customer's ESCON cables with MTRJ connectors to the appropriate ESCON2 card in the back of the 2074. For Models 001 and 002 with ESCON1 or ESCON2 cards installed, the first ESCON card is located in slot 1 for Channel Adapter 0 and the second ESCON card is located in slot 2 for Channel Adapter 1. For Model 003 with ESCON2 cards installed, the first ESCON2 card is located in slot 2 for Channel Adapter 0 and the second ESCON2 card is located in slot 3 for Channel Adapter 1. Inform the customer about each ESCON cable's origin and destination.

Note: ESCON1 cards require an ESCON Duplex connector and ESCON2 cards require an MTRJ connector.

The following illustration show the connectors on the rear of the 2074 Model 003.

Note: The illustrations in this document might differ slightly from your hardware. Only one LAN adapter should be used, unless the customer really understands ROUTE statements. OS/2® can't have more than one LAN adapter (NIC) on the same subnet.

Starting in 2074 Driver 1.0.8, on the Load CD and the 2074's C: drive is a copy of the class foils used for 2074 training. This file is called CLASS.PDF and is located in the PRESENT subdirectory. It can be very useful for understanding the 2074 and how to configure it. Please tell the customer about it. This file is also on both FTP sites. ACROBAT reader is available from ADOBE's web site.

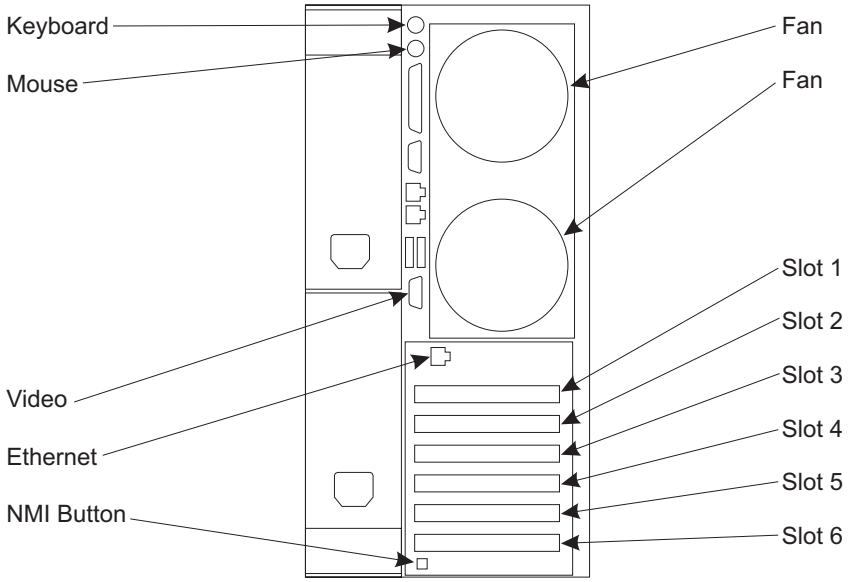


Figure 1-3. Model 3 connector and slot locations - tower view

Notes:

1. The video connector is **ALWAYS** blue and is appropriately labeled on the panel itself.
2. The ″non-Maskable Interrupt″ request button is labeled ″NMI″ on the panel. Do NOT activate the NMI button unless you have been instructed to by IBM 2074 Support, as it will crash the 2074 and cause a system dump to be taken.

Models 001 and 002		Model 003	
Slot	**Adapter**	**Slot**	**Adapter**
1	1st ESCON1 or ESCON2 card (channel adapter 0)	1	Empty
2	2nd ESCON1 or ESCON2 card (channel adapter 1)	2	1st ESCON2 card (channel adapter 0)
3	2nd Ethernet adapter (LAN1)	3	2nd ESCON2 card (channel adapter 1)
4	1st Token Ring adapter (LAN2)	4	2nd Ethernet adapter (LAN1)
5	2nd Token Ring Adapter (LAN3)	5	1st Token-Ring adapter (LAN2)
6	Does not exist	6	2nd Token-Ring adapter (LAN3)
Note: 1st Ethernet is on the planar. (LAN0)			

Attach the customer's certified, and we mean certified, LAN cables to the appropriate LAN cards. The integrated Ethernet is LAN0. This LAN0 runs at a PCI bus speed of 33 Mhz. This LAN1 adapter runs at a PCI bus speed of 100 Mhz.

Note: Do not attach any other cables to any other ports on the 2074. The only cables allowed are: 1-4 LAN's, 1-2 ESCON's, Keyboard, Mouse, Display and 2 power cords.

Note: Unused LAN cards still maintain a position in MPTS & TCP/IP. Therefore, if the customer is a Token Ring only shop, they will always be using LAN2 and LAN3 optionally.

Customer Information

Before you initialize the 2074, it is **important** that you complete the ″Customer Information Worksheet″ located in Appendix A of this publication. You will be prompted for this information in the following step.

Power on the 2074

Power on the monitor. The amber LED should be on.

Power on the 2074. The green power LED should be on. You might have to hold the button in for a few seconds.

Normal bring up is:

- The PC counts memory up to 128 Megabytes on the Model 001, 256 Megabytes on the Model 002 and 512 Megabytes on the Model 003.
- The LSI SCSI Select banner is displayed.
- Various LAN adapter BIOS banners are displayed.
- OS/2 should start to boot from the hard disk drive.
- The blue "rescue" screen should be displayed for 10 seconds.
- The 2074's black and white "Lighthouse" logo will be displayed during the loading of the device drivers.
- OS/2 device driver messages are displayed. After the BTIDD device driver loads, which has a 10 second delay, the LAN adapters will delay the process for a few minutes.

  Note: Some LAN adapter device drivers display misleading information during their initialization, none of which require a response from the user.
- Finally, the OS/2 desktop stops at the ″STARTUP.CMD″ window awaiting customer data input by creating the CUSTOMER.DAT file. Choose Option 1. **It is critical that the file be created before proceeding and equally critical that the correct information is inputted because this information is added to the traces.**

After the information is entered, the G: drive will be allocated. This will take about 1 minute.

Verify the 2074 Start Up

- Were any errors reported on the screen? If yes, follow the MAPS.

- Is the “system error” LED on? If it is, then refer to the appropriate xSeries® Hardware Maintenance Manual.

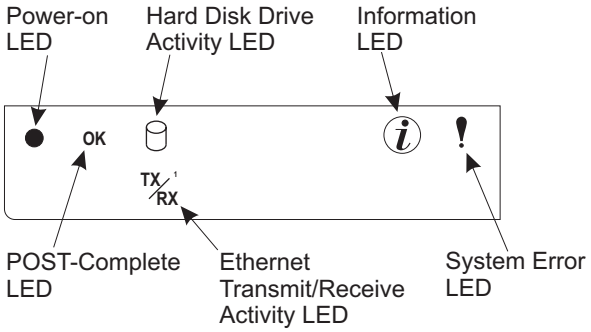


Figure 1-4. 2074 Operation Information Panel - Model 003

- If the customer attached Ethernet cables, verify that the green LINK LED is on for each Ethernet. LAN0 has it’s LED in the RJ-45 socket. There is also a green ″link″ LED in the RJ-45 socket for LAN0. LAN1 LED is on the rear of the PCI adapter in slot 4. If it isn’t, verify that the cable is attached to a HUB and refer to the MAPS in this book.
- If the Ethernets are 100 Mbit, verify that the 100 TX LED is on for each Ethernet that is attached to the 100 Mbit HUB. If it isn’t and the LINK LED is on, verify that the HUB is 100 Mbit and refer to the MAPS in this book.
- If the customer attached Token-Ring cables, verify that the green LED is on solid. If it isn’t, verify that the cable is attached to a MAU and refer to the MAPS in this book.
- For systems with ESCON1 cards installed, verify that the ESCON1 card’s Top LED is green. Then verify that the ESCON1 card’s Bottom LED is green or orange. If either of these cases exists, refer to the section in Chapter 2 of this publication entitled ″ESCON Troubleshooting″, as your card(s) may be defective.
- For systems with ESCON2 cards installed, verify that the ESCON2 adapter LED display, located on the top half of the back edge of the adapter, is illuminated. If not, refer to the section in Chapter 2 of this publication entitled ″ESCON Troubleshooting″.
- From an OS/2 window, run CHECKPCI. Did everything pass? If not, correct the problems.
- Check for the availability of code updates for the 2074. See “Change Management Tools” on page 3-8, and “Downloading Patches” on page 3-9.

If everything passed, then turn the system over to the customer for system configuration.

Chapter 2. Maintenance Information

This section should be the starting point for all repair actions for the 2074. The following Problem/Service Activity Table will direct you to the appropriate task.

Note: Be sure to run the **End of Call** procedure at the end of any service action.

Problem/Activity	Go to...
Customer has reported a Failing Symptom such as...	
The 2074 is not operational (e.g. No Power, POST error, failing Hardware, or code trap) or the System Error Light is illuminated	See “Service Start Map” on page 2-1
There is a client terminal session problem or no-session	See “Client Terminal Session Troubleshooting” on page 2-6
There is an ESCON connectivity problem	See “ESCON Troubleshooting” on page 2-11
Any Customer reported situation not listed above	See “Service Start Map” on page 2-1
How to proceed in the event of a 2074 hang.	See “Troubleshooting 2074 Hang Conditions” on page 2-5
For information on FRU removal and replacement procedures	See the appropriate series Hardware Maintenance Manual
For information on performing 2074 LAN Diagnostics	See “2074 LAN Adapter Diagnostics” on page 2-16
For information on performing series Diagnostics	See the appropriate series Hardware Maintenance Manual
If you are here to perform EC/Code-Reload/FRU Replace/Log/Trace related activities	See “Service Procedures Problem/Action List” on page 3-1

Service Start Map

1. Determine the problem area. Ask the customer why they called this 2074 in for service.
2. Is the 2074 powered on or does it power on? If yes continue. If not, follow the “Symptom FRU index” in the appropriate series Hardware Maintenance Manual.
3. Do you have a POST error or a Beep Code? If yes then refer to the “Symptom FRU index” in the appropriate series Hardware Maintenance Manual. After following the appropriate series procedure, return to “End of Call” on page 2-25. If no, then continue at the next step.
4. Is there the system error LED illuminated on the Operator Information Panel? If yes, go to the appropriate hardware maintenance manual for your particular 2074 model.

   Note: If the system isn’t booting from any media, diskette, CD or hard disk and tries to boot from the LAN adapters, then:

   a. Reset the 2074.
   b. Press F1 to enter system BIOS setup.
   c. Disable Wake on LAN® from the “Start Options” menu.

d. Save and Exit BIOS setup.

5. Does the 2074 operating system appear “hung”? The 2074 ships with an OS/2 screen saver that displays a color picture of a lighthouse after 20 minutes. The 2074 ships without a password. To clear this screen, just press “**ENTER**″. If the customer has added a password, you will need it. Ask the customer for the password. If the customer doesn’t remember the password or wants the password removed, you will have to reload the 2074 code from the load CD. Please refer to Chapter 3, ″Service Procedures″ to reload the 2074 code. If you can’t clear the logo because the 2074 appears ″hung″, please refer to the section titled ″Troubleshooting 2074 Hang Conditions″.
6. Check the LAN adapters LEDs and the ESCON LED display. For the Token Ring LEDs description see Table 2-2 on page 2-14. For the Ethernet PCI adapter in slot 3, see Step 9 under “Token-Ring or Ethernet LAN adapter diagnostics” on page 2-18.

   Note: If more than one LAN adapter (NIC) is in use (cable attached to it), question why they are doing this. Unless the customer ″really″ understands networking and route statements, only one NIC should be enabled. Unlike Windows®, OS/2 has no concept of load balancing, and two NICs cannot be on the same subnet. Maybe this is the source of the problem.

   A quick guide is (only check LAN adapters that have cables attached):

   - Token Ring adapters should have the green LED on solid. If lights are not correct, go to network checkout “2074 LAN Adapter Diagnostics” on page 2-16.
   - The on-planar Ethernet card should have the ’LINK ON’ indicator on in the rear RJ-45 connection. There is also a Transmit/Receive LED for this card located on the Operator Information Panel. There is no LED indicating link speed for the on-planar Ethernet. If you suspect there may be a problem with this card, go to network checkout “2074 LAN Adapter Diagnostics” on page 2-16.
   - The Ethernet PCI adapter in slot 4 has both a Link status and a Link Speed LED. If you suspect that there may be a problem with the Ethernet PCI adapter to network, checkout “2074 LAN Adapter Diagnostics” on page 2-16.
   - For ESCON1 cards, if the channel is online, the top and bottom LEDs should be green. If not, refer to “ESCON Troubleshooting” on page 2-11
   - For ESCON2 cards, the LED display should read ″On-line″. If not, refer to“ESCON Troubleshooting” on page 2-11.
7. Using the steps outlined under “Determining Whether the 2074 Channel Adapters Are Active” on page 3-3, verify that the states of the channel adapters are correct.
8. From an OS/2 Window execute the command CHECKPCI. Did it pass? There should be nothing in red. If no, verify why the PCI adapters aren’t where they belong. This will verify that unknown adapters aren’t installed and that none are missing. If adapters are missing, the LAN card numbering will be incorrect. This is not acceptable.

   Note: For the 2074 Model 003, Slot 1 should always be empty.
9. Now would be a good time to check for dumps:

   Note: From an OS/2 window, type the command ″**DATE**″ and if this is different from the actual, report this to the next level of service, prior to correcting. Repeat for the ″**TIME**″ command. It is important to report

any delta from actual to the next level of service. Also, note that the CHECKPCI program reports the DATE and TIME.

- Is there an OS/2 TRAPDUMP on the G: drive in the SADUMP subdirectory? If yes, contact the next level of service.
- Is there a SNAPDUMP on the C: drive in the 2074 subdirectory? See "Snap Shot Dump" on page 3-4. If yes, contact the next level of service.
- Are there any traces on the C: drive in the BTI subdirectory with filenames such as CA*.DD and CA*.FW? If yes, contact the next level of service.

10. At this point, or if you are experiencing intermittent problems, it is appropriate to contact the next level of support with the data you now have determined.
    - Why the next level of support was called.
    - Whether or not this is a new install; whether or not it ever worked before it failed.
    - What the system environment is. How many NIC's have cables. A list of the IP addresses of all the NIC's (with cables attached) to prove they aren't on the same subnet.
    - Verification that the correct code load level installed. See "Determining Code and Patch Level" on page 3-8.
    - The state of LEDs on the Token Ring Ethernet and ESCON adapters.
    - The presence of any dump data.
    - The results of CHECKPCI.
    - The status of the system error light on the Operator Information Panel.
    - Any host reported errors associated with the 2074.

Diagnostics

This section provides basic troubleshooting information to help you resolve some common problems that might occur with your 2074.

Diagnostic Tools Overview

The following tools are available to help you identify and resolve hardware-related problems:

- **POST beep codes, error messages, and error logs**
  The power-on self-test (POST) generated beep codes and messages to indicate successful test completion or the detection of a problem. See "POST" on page 2-5 for more information.
- **Diagnostic programs and error messages**
  The 2074 diagnostic programs are stored in upgradeable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of your 2074.
- **Light path diagnostics**
  Your 2074 has light-emitting diodes (LEDs) to help you identify problems with 2074 components. These LEDs are part of the light-path diagnostics that are built into your 2074. By following the *path of lights*, you can quickly identify the type of system error that occurred. See "Identifying Problems Using LEDs" on page 2-4 for more information.
- **Troubleshooting charts**
  These charts list problem symptoms, along with suggested steps to correct the problems.

Identifying Problems Using LEDs

Your 2074 has LEDs to help you identify problems with some 2074 components. These LEDs are part of the light path diagnostics built into the 2074. By following the path of lights, you can identify the type of system error that occurred. See the following sections for more information.

Power Supply LEDs

The AC and DC Power LEDs on the power supply provide status information about the power supply.

Light Path Diagnostics and Table

You can use the light path diagnostics built into your 2074 to quickly identify the type of system error that occurred. Your 2074 is designed so that any LEDs that are illuminated remain illuminated when the 2074 shut down, as long as the AC power source is good and the power supplies can provide +5V DC current to the 2074. This feature helps you isolate the problem if an error causes the 2074 to shut down.

The following illustrations show the LEDs on the diagnostics panel on the system board of the 2074 Model 001, Model 002, and Model 003.

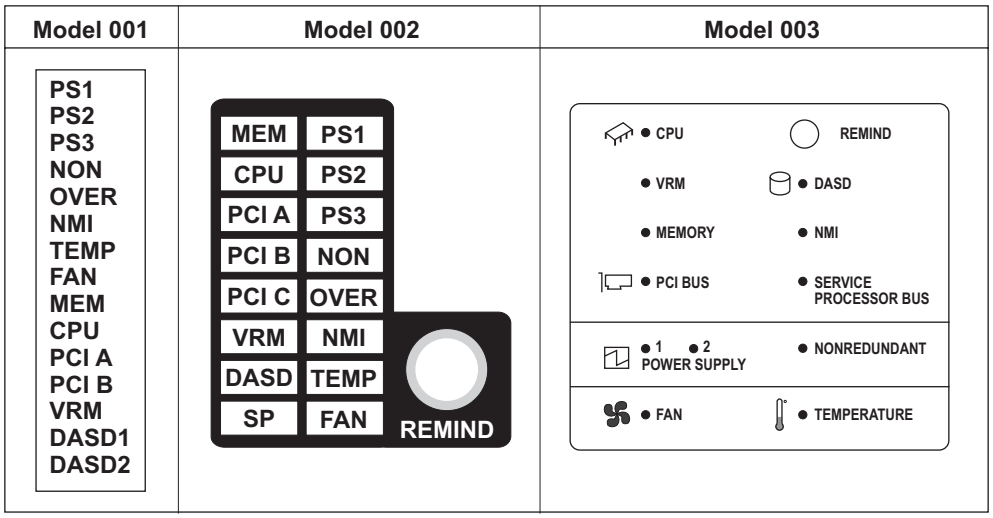


Figure 2-1. 2074 Diagnostics Panel

The System Error LED on the operator information panel is lit when certain system errors occur. If the System Error LED on your 2074 is lit, use the ″Lit LED on diagnostics panel″ section in the appropriate xSeries Hardware Maintenance Manual to help determine the cause of the error, and the action you should take. If you need to run PC diagnostics, refer to the “Diagnostic programs and error messages” of the appropriate xSeries Hardware Maintenance Manual.

Notes:

1. If a diagnostic panel LED is on, and the information LED panel system error LED is off, there is probably an LED problem. Run LED diagnostics.
2. Check the System Error Log for additional information before replacing a FRU.
3. The DIMM error LEDs, processor error LEDs, and VRM error LEDs turn off when the system is powered down.

POST

When you turn on the 2074, it performs a series of tests to check the operation of 2074 components and some of the options installed in the 2074. This series of tests is called the power-on self-test or POST.

If POST finishes without detecting any problems, a single beep sounds, the first screen of your operating system or application appears.

If POST detects a problem, more than one beep sounds and an error message will appear on your screen.

Notes:

1. If you have a power-on password or administrator password set, you must type the password and press ENTER when prompted, before POST will continue.
2. A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.

Event/error logs: The POST error log contains the three most recent error messages that the system generated during POST. The System Event/Error Log contains all error messages issued during POST and all system status messages from the Advanced System Management Processor.

To view the contents of the error logs, you must reboot the system and start the Configuration/Setup Utility by pressing the **F1** key as soon as the IBM logo appears on the screen. When the Setup Utility screen appears, select **Event/Error Logs** from the menu.

Troubleshooting 2074 Hang Conditions

This section covers how to proceed in the event of a 2074 hang.

First make note of the LED display on each ESCON card.

Note: If the LED display is not scrolling, note what is displayed and report to the next level of service.

If you were called due to a problem and can't clear the screen, then the 2074 may be hung. You may need to force an OS/2 dump. If the 2074 is hung with the lighthouse screen saver displayed, then **CTRL-ALT-DEL** or **CTRL-ALT-F10+F10 will be ignored**. You may need to force an NMI dump. Please refer to the appropriate instructions by 2074 model type to force an NMI dump.

- **2074-001 NMI Dump:** To force a dump in the 2074 Model 001, use a small screwdriver to short out the pins at location J24 on the system board. For location of the NMI pins, refer to the section entitled ″Adapter Slot Locations″ in the ″2074 Console Support Controller Installation and Maintenance Information publication, form number G229-9028-01 (version 01).
- **2074-002 NMI Dump:**To force an NMI dump in the 2074 Model 002, press the NMI button on the back panel next to the video connector. See page 1-7, note 2 in the ″2074 Console Support Controller Installation and Maintenance Information publication, form number G229-9028-02 (version 2).
- **2074-003 NMI Dump:**To force an NMI dump in the 2074 Model 003, please refer to the ″**Rear View**″on page 6 of the xSeries 235 Type 8671 ″Hardware

Maintenance Manual and Troubleshooting Guide″. The NMI button is located at the bottom of the back of the server (near Slot 6).

If you are not able to force an NMI dump, then press the ″reset″ switch. You should then disable the screen saver until the problem is corrected. To disable the screen saver, do the following:

1. Right mouse click on a blank area of the desktop.
2. Left click on ″**properties**″.
3. Select ″**no automatic lockup**″.
4. Exit the window.

Note: When the screen saver is displayed all keystrokes other than the password and **ENTER** are ignored. Again, that means **CTRL-ALT-DEL** or **CTRL-ALT-F10+F10** are ignored.

Client Terminal Session Troubleshooting

Let us begin by explaining the terms **client** and **session**.

Client This refers to the customer's workstation or PC on which the 3270 Emulation program is being run.

Session
This refers to the 3270 Emulator session.

The three basic problems are:

- No session?
- Session drops?
- Things not working correctly?

For No Session:

To determine a connection problem, use the ″/Q″ option for LAN3274.EXE. Refer to LAN3274.DOC for guidance. To view this document, use the ″E″ editor by doing:

E C:\2074\LAN3274.DOC

from an OS/2 Window command prompt.

The /Q option will show currently active connections both to the Host and to the Client by address, from the 2074's perspective. Issue from an OS/2 window the command:

LAN3274 CAx ALL /Q | MORE (with x = 0 or 1)

Here is a sample command output (for a complete description of all fields, see the LAN3274.DOC document as instructed above):

```
CI DI CA:L:P:CU:UA Client IP Address T C H R     LUNane     RTO    Idle
-- -- ------------ ----------------- - - - - -------------- ---- -------
01 00  0:0:0C:1:60 192.101.35.122    T Y N Y     TC9CN0     0060   24hr
02 01  0:0:0C:1:61    (none)         T N N Y     TC9CN1     0060   N/A
05 04  0:3:0C:1:60 192.101.35.122    T Y Y Y    TC9CZ10     0060 00:06:29
```

Figure 2-2. Sample Output for LAN3274 Query Command

If fields in the Client Connect (″C″) and Host Connect (″H″) columns are not both Y, then you have isolated the problem and should continue. For example, **D**evice **I**ndex 04 has active client and host connections; **DI** 00 has lost the host connection.

We need to differentiate between whether the 3270 emulator session can communicate with the 2074 or whether the 2074 is not communicating with the Host system. If the 3270 emulator session can communicate with the 2074, then the 3270 emulator session will either display your operating system or VTAM® logo or will display a header that looks something like the one shown here:

```
**   2074 Index 01 connected to TERM2074 via IP Address 10.21.30.90:7491  **
**    CA=1  Index=01  LPAR=2 Port=EE  CU=2  UA=62  LUName=tc9adz2b      **
** Type=009032 Model=005 Mfg=IBM SN=000000041256 Tag=0C8 Status=InActive  **
```

Figure 2-3. Sample 3270 Emulator Session Header

This header will only appear if the LAN connection between the client and the 2074 is operational and the 3270 emulator session parameters match those defined on the 2074. However, if the **Status** indication is **Inactive**, there is some kind of ESCON connectivity or configuration problem and you should continue at ESCON Troubleshooting.

If the header does not appear on the 3270 session, there is either a problem with the LAN between the client and the 2074 or with the 3270 session parameters and those defined on the 2074.

- Verify that this client can Ping the IP address of the 2074. Use the IP address that is being defined to the 3270 emulator session. If you can Ping, then continue. If you cannot Ping, then go to the 2074 LAN Adapter Diagnostics section. You should also try pinging the client from an OS/2 session on the 2074. This will verify that the client's TCP/IP is configured.
- For the 3270 emulator session parameters, does the "port number" match the one shown for that device on the 2074 Device Manager Parameter Menu? (See procedure below)
  - From the 2074 Desktop, double-click on the "Configure CA x" (where x=0 or 1) Icon.
  - Press Enter
  - Press F2
  - You should now be at the 2074 System Devices Menu, Press F12.
  - You should now be at the 2074 Device Manager Parameter Menu and the "port number" should be visible.
- For the 3270 emulator session parameters, does the LU Name (LUN) match what is shown in the "parameter" column for the appropriate "index" row on the 2074 System Devices Menu? (See procedure below)
  - From the 2074 Desktop, double-click on the "Configure CA x" (where x=0 or 1) Icon.
  - Press Enter
  - Press F2
  - You should now be at the 2074 System Devices Menu. Find the LU Name in the "parameter" column for the appropriate "index".

A brief explanation of how the client finds the host session is this: From the client's 3270 session in question they have to provide three values. These three values are:

IP Address

This is the IP address of a LAN adapter in the 2074 you want to talk to. This identifies which 2074 you want.

Port Number

This port number is from the F2, F12 screen of the Channel Adapter in the 2074. This identifies which Channel Adapter (ESCON card) you want. Use a port number unique to your network. To assist in determining your port number, it is suggested you refer to the port ″Internet Assigned Numbers Authority″ (IANA) website to view port numbers already in use. This website is located at **http://www.iana.org/assignments/port-numbers**.

LU Name

This must match the value (“password”) from the line on the 2074 System Devices Menu screen for the Channel Adapter. This identifies which line on the 2074 System Devices Menu screen you can get. There are limits on this. If the line on the 2074 System Devices Menu screen has an IP address with the “password”, then only a client with this IP address can get this session. This “password” is the only way to identify which line you will get. Each line on the 2074 System Devices Menu screen, has values which state which LPAR, port on the ESCON director you want to talk out, and what CU and UA that host’s IOCDS has defined to an address. To be safe, limit the ″password″ to eight characters.

If all three of these parameters are correct, then the next step is to determine if it is the customer’s 3270 emulator, or a LAN problem.

For session drops and things not working correctly:

Eliminate the LAN and the clients emulator:

- Try to reproduce the problem on one of the 2074’s PCOM 3270 emulator sessions using 127.0.0.1 as the target IP address. You need to start one of the local 2074 PCOM 3270 sessions by double-clicking on one of the ‘User 3270’ or ‘User 3271’ Icons on the 2074 desktop.
  - Under the Communication pull down, select Configure.
  - Highlight PC/LAN, TCP/IP - Telnet3270 and select Configure.
  - Select Configure Link
  - Make sure the IP address is 127.0.0.1.
  - Select Advanced and enter the “port number” and “LU Name” that the customer was trying to use on the client.
  - Continue to select ‘OK’ until you are back to the PCOM 3270 session screen.

  If you can reproduce the problem with the client’s emulator session by using the local PCOM 3270 session, there may be a 2074 code problem so call the next level of support. If you cannot reproduce the client’s emulator session problem then the problem is either with the client’s emulator software or the LAN. This service manual is not intended to diagnose problems with client emulator software or the customer’s network, but to verify the integrity of the 2074. However, here is a test that may be possible in some situations if you wish to go further:
- If there is a second 2074 unit on the same LAN, perform the previous steps of defining the IP address, “port number”, and “LU Name” to that 2074’s PCOM 3270 emulator session. If you can reproduce the problem, then call the next level of support. If you cannot reproduce the problem, then the problem appears to be on the client. This last test has confirmed the LAN.

If the clients emulator is having problems, suggest they:

- Verify it is TN3270E capable
- Contact the emulator vendor for service
- Try a different 3270 emulator

Note: If the client PC is locking up or hanging, then contact the operating system vendor to determine the application which is failing. If it is determined that the emulator they are using is at fault, contact the emulator vendor for support. If the emulator is IBM's PCOM, then have the customer contact IBM Software Support, or whoever is the proper contact for PCOM service. Running a NIP Console or a Printer over TN3270E isn't something vendors were ever able to test until this offering. The 2074 only sends 3270 data streams to the emulator. Nothing we send, be it incorrect or LAN corrupted, should ever cause an emulator to fail or lockup a PC.

If the client emulator locks up with a PROG751 error, the application software may be sending illegal characters to the client session. The IBM PCOM emulator has a setting that will eliminate this lockup. We recommend adding the following to the *.WS configuration file of the clients:

```
[LT]
UndefinedCode=y
IgnoreWCCStartPrint=y
```

The second setting will eliminate another problem where the client's local PC printer may print a single page when the client connects to a VTAM session. If your client 3270 emulator is not IBM PCOMM, you will have to determine what the equivalent settings are for your emulator and configure them thusly.

There are options to help with remote or problem clients. The options are ″/RSP″ and ″/RTO=60″. These options can appear as global options for all of LAN3274's addresses (F2, F12), or for a specific address (F2). /RSP means only send one CCW per TCP/IP packet, and wait for a response. /RTO is a time out timer in seconds to wait for a response. Also, the zSeries (S/390®®) Operating System must have its MIH adjusted to a proper value, so it doesn't time out before /RTO does. For more information review LAN3274.DOC. The basic principal is as follows:The 2074 has no way of knowing if the client is a) hung, b) unplugged from the LAN, c) not responding due to a slow LAN. So we implemented the /RTO time out. It tells the host operating system that the client is gone. The client should notify the 2074 that the emulator is ending by sending the 2074 a ″disconnect″ message.

Also, the client's PC has to have its TCP/IP enabled in addition to the emulator sessions configured. For help configuring the emulator, review the class foils used for training IBM, located in the PRESENT subdirectory on both the 2074 Load CD and the 2074's C: drive. The file name is CLASS.PDF. The 2074 has Adobe's ACROBAT reader in the OS/2 SYSTEM folder. Use it to view the file.

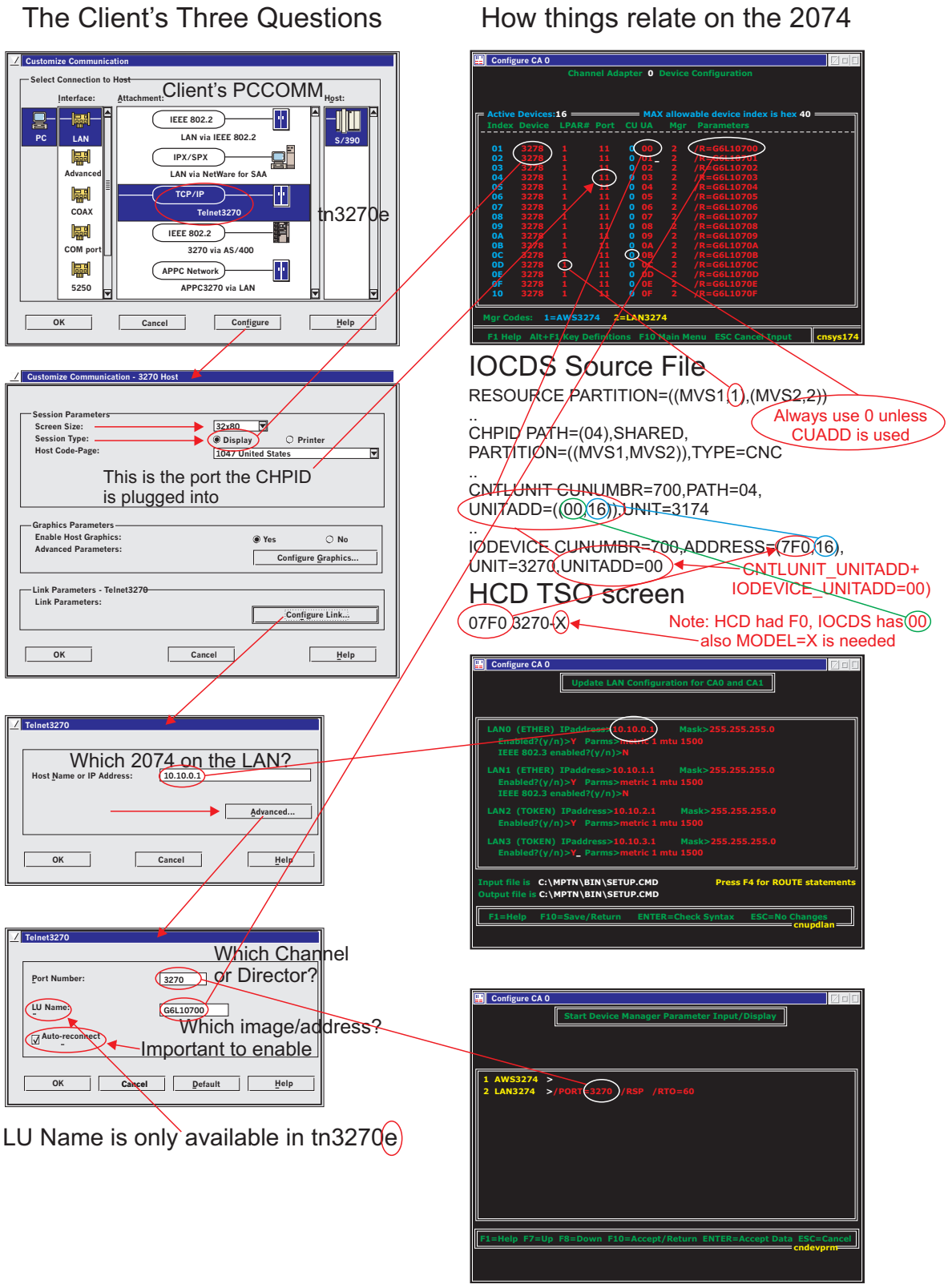


Figure 2-4. How things relate on the 2074.

ESCON Troubleshooting

If your ESCON Adapter fails to initiate successfully this section will provide you with some general trouble shooting guidelines to help you identify and fix your problem.

Note: If your ESCON Adapter has **two Light Emitting Diodes (LEDs)** located on the back edge of the adapter, use the following ″**ESCON 1**″ - Troubleshooting Guidelines. If your ESCON Adapter has a **Light Emitting Diode (LED) Display** located on the back edge of the adapter, use the following ″**ESCON 2**″ - Troubleshooting Guidelines.

IMPORTANT: The ″**ESCON 1**″ Adapter can be installed in 2074 Models 001 and 002 **only.** The ″**ESCON 2**″Adapter can be installed in all current 2074 Models (Models 001, 002. and 003).

If, after you have been through this troubleshooting section, you are still unable to make your adapter work properly, you should contact your next level of support for assistance.

″ESCON 1″ - Troubleshooting Guidelines

The ESCON Adapter includes two Light Emitting Diodes (LEDs) on the back edge of the adapter. These LEDs are located just below the ESCON connector and can be used to help isolate whether a problem is hardware or software related.

Each LED will illuminate in one of three colors. The top LED illuminates Red, Yellow, or Green. The bottom LED illuminates Red, Orange or Green. When the 2074's power is turned on, both LEDs should always be illuminated. The following table illustrates the use of each LED.

Table 2-1. Status of LED Summary

Color\LED	Top LED	Bottom LED
OFF	Power Off	Power Off
Yellow	POST in Progress	Not Applicable
Orange	Not Applicable	Emulation Loaded, Channel Offline
Red	POST Failed	Emulation Not Loaded
Green	POST Ran Successfully	Channel Online

As soon as the system is powered on, under normal operation the ESCON adapter executes its own Power On Self Test (POST) and then loads the emulation firmware. Follow the steps below to determine if the adapter has powered on successfully and is operational.

Steps

1. If either LED is off, power down your 2074, remove the adapter, and re-install it. Make sure the adapter is properly seated in the slot. Power the 2074 back on. If the LEDs remain unlit, replace the ESCON adapter. If you have already replaced the ESCON adapter, contact the next level of service.
2. When your 2074 is first powered on, both LEDs will briefly turn Red. When the adapter starts running Power on Self Test (POST), the top LED will illuminate Yellow. Once the POST completes, the top LED will illuminate Green if POST was successful or Red if POST failed.

Watch the top LED as your system powers up. Verify the top LED goes from Red to Yellow to Green. If the top LED is Yellow and the bottom LED is Red wait for 5 minutes to see if the status changes. If the top LED remains Red or turns Yellow and then Red again, the adapter is not working properly. Power down your 2074 and reinstall the adapter. Power the 2074 back on. If the condition repeats itself, replace the ESCON adapter. If you have already replaced the ESCON adapter, contact the next level of service.

3. When the top LED turns Green, POST has been completed. The adapter's Intel 960 processor will then load the 3274 device emulation. The bottom LED indicates the status of the emulation.
   When the adapter is first powered on the bottom LED should be Red. This is a normal indication that emulation has not yet been loaded. The LED will remain Red while POST runs. Once the top LED turns Green, indicating POST has been successful, the bottom LED should quickly turn Orange.
   If the top LED is Green and the bottom LED is Red, wait for one minute. If the bottom LED remains Red, the emulation has not successfully loaded. Perform a hardware reset (or Power Off/Power On) of your 2074. If the problem persists, replace the ESCON adapter. If you have already replaced the ESCON adapter, contact the next level of service.
4.
   With your 2074 powered on, check to make sure both LEDs are lit. If the top LED is Green and the bottom LED is Orange, then the adapter has successfully completed POST and loaded firmware. The adapter is operational. Depending on the configuration, the bottom LED will remain Orange until the first Establish Logical Path (ELP) is received from the host channel connected to the 2074.
   If ESCON connectivity between the host and the 2074 still has not been established the following should be considered:
   - If both lights on the card are Green then you have a configuration problem and not a media (cable, trunk etc.), **NOR** a 2074 ESCON adapter hardware problem. If you suspect that there may be a configuration problem see the '2074 Console Support Controller Configuration Guide' and the appropriate Host I/O configuration documentation.
   - If the top light is Green and the bottom light is Orange then you may have either a configuration, media (cable, trunk, etc.), or 2074 ESCON adapter problem. First you should make sure both ends of the ESCON cable are properly seated. Unplug each end one at a time and plug it back in. Make sure there is a 'click' when the cable connector is inserted into the receptacle. You also should clean the ends of the ESCON cable and receptacle with a Fiber Optic Cleaning kit. At this point, if the bottom light on the ESCON card is still Orange, then you need to conduct ESCON Link Fault Isolation. Further ESCON Link Fault Isolation is beyond the scope of this service manual. You should proceed with ESCON Link Fault Isolation procedures that you are familiar with and that are appropriate to the Host system to which the 2074 is connected. This may include taking light measurements with a light meter. Note also that there are no ESCON wrap tests that can be run at the 2074 ESCON adapter.
   - From an OS/2 window, you can use the BTITOOL to display neighbor node information and to display code violation and bit error counters. Each command will need to be run once for each of the adapters, or better yet, for the ESCON adapter whose link state you are trying to debug. The command is run from an OS/2 Window.
     – Use **BTITOOL SHOW NEIGHBOR INFO CARD=x** (where x=0 or 1) for neighborhood node information.
       Sample output:

Note: Values in ()'s are EBCDIC values in HEX.

```
Channel is currently: Connected
Flags field:     0x00
Node Parameters: 0x00 0x0A 0xE5
Type Number:     009032 ( F0 F0 F9 F0 F3 F2 )
Model Number:    005 ( F0 F0 F5 )
Manufacturer:    IBM ( C9 C2 D4 )
Plant:           02 ( F0 F2 )
Serial Number:   000000041256
  ( F0 F0 F0 F0 F0 F0 F0 F4 F1 F2 F5 F6 )
Tag:             0x00 0xE1
```

– Use **BTITOOL SHOW LINK INCIDENTS CARD=x** (where x=0 or 1) for code violations, bit error, and link incident information.
Sample output:

```
Link Incident Counts for card 1:
     Implicit Errors: 0
     Bit Error Threshold: 179
     Loss Of Signal: 0
     Not Operational: 0
     Sequence Timeout: 0
     Unconditional Disconnect: 0
     Unconditional Disconnect Response: 0

 Cumulative Link Incident Counts for card 1:
     Implicit Errors: 0
     Bit Error Threshold: 179
     Loss Of Signal: 0
     Not Operational: 0
     Sequence Timeout: 0
     Unconditional Disconnect: 0
     Unconditional Disconnect Response: 0
```

– Use **BTITOOL HELP TEST** for a help menu of possible commands.

- If you remove the cover of the 2074, you can see that each of the ESCON cards has a moving LED display with some status and firmware level information. ADAPTER OPEN means the ESCON card is loaded. If it doesn't, then IML the Channel Adapter. ADAPTER OPEN ... CHANNEL OFFLINE, NO LIGHT means the ESCON card is loaded, but it doesn't see the light. Verify that the cable is seeing the light. ADAPTER OPEN ... CHANNEL ONLINE means it is happy, then the problem must be with the definitions.

Summary

The sequence for the ESCON card is:

- During *power on* it runs a POST (top LED green)
- Loads its own emulation code (bottom LED orange)
- OS/2 device driver BTIDD.SYS loads without error messages (Adapter OPEN)
- IML CA0 or CA1 ICON start the Channel Adapter's ESCON card (bottom LED green)

There are no wrap tests. You can use a light meter to measure the light input to the card and the light output. To measure the light output, IML the Channel Adapter.

From the host or the ESCON director, the serial number displayed for the Tag Results of the 2074 is now the 2074's serial number, starting with Driver 1.0.7. Before driver 1.0.7, the serial number of the channel adapter was returned.

″ESCON 2″ - Troubleshooting Guidelines

The ESCON Adapter includes a Light Emitting Diode (LED) Display on the back edge of the adapter. This LED Display is located on the top half of the ESCON card and can be used to help isolate whether a problem is hardware or software related.

Depending on the state of the card, the scrolling message on the LED Display will vary. When the 2074's power is turned on, the LED Display should always be illuminated. The following table illustrates the meaning of the scrolling LED Display messages.

Table 2-2. LED Display Status Summary

LED Display Message(s)	ESCON Adapter Status
Static: Firm, Copy, MEMx, ZERO, UART, SLC2, SREG, SCAN, DIAG, IWRP, DONE, ToFW	POST in progress
Static: Eslc, BgXX, EINT, Eacc, Ecpu, Epci, EcpP, EpcA, EpcR, Emem, Ewdt, EXCP, Eseq	Various card errors occurring during POST or functional operation
Scrolling: BTIFW AP10rx..xxx **Adapter Closed**	POST complete, device driver not yet loaded
Scrolling: BTIFW AP10rx..xxx xxx% CPU Util xx Conn open **Channel offline** **No light**	• Device driver loaded, Channel Adapter not IML'ed • **OR** Channel Adapter IML'ed ok, but there exists an ESCON connectivity problem (Loss of Signal, Loss of Sync, etc...)
Scrolling: BTIFW AP10rx..xxx xxx% CPU Util xx Conn open **Channel online**	Channel Adapter IML'ed OK, Host connectivity established OK

As soon as the system is powered on, under normal operation, the ESCON adapter executes its own Power On Self Test (POST) and then loads the emulation firmware. Follow the steps below to determine if the adapter has powered on successfully and is operational:

Steps

1. If the LED Display is off, power down your 2074, remove the adapter, and re-install it. Make sure the adapter is properly seated in the slot. Power the 2074 back on. If the LED Display remains unlit, replace the ESCON adapter. If you have already replaced the ESCON adapter, contact the next level of service.
2. When your 2074 is first powered on, the LED Display will scroll through the Power on Self Test (POST) messages. Once this completes, the LED Display will scroll through the firmware level message and the ″Adapter closed″ message. This sequence will persist until the ESCON adapter device driver is loaded during OS/2 boot-up. If the POST sequence on the LED Display gets stuck at one point for at least 5 minutes, then power down the 2074 and reinstall the adapter. If the condition repeats itself, replace the ESCON adapter. If you have already replaced the ESCON adapter, contact the next level of service.

3. When the ESCON adapter device driver is loaded successfully and the Channel Adapter has been IML'ed, the scrolling LED Display messages will contain ″Channel offline″. This indicates that the ESCON adapter is operational but the first Establish Logical Path (ELP) has not yet been received from the host channel connected to the 2074. Once a logical path has been established between the 2074 and the host, the LED Display scrolling message will contain ″Channel online″.
   If ESCON connectivity between the host and the 2074 still has not been established, the following should be considered:
   - If the LED Display scrolling message contains ″Channel online″, then you have a configuration problem and not a media (cable, trunk, etc) NOR a 2074 ESCON adapter hardware problem. If you suspect that there may be a configuration problem, see the ″2074 Console Support Controller Configuration Guide″ and the appropriate host I/O configuration documentation.
   - If the LED Display scrolling message contains ″Channel offline″ and ″No light″, then you may have either a configuration, media (cable, trunk, etc), or 2074 ESCON adapter problem. First you should make sure both ends of the ESCON cable are properly seated. Unplug each end one at a time and plug plug it back in. Make sure there is a ″click″ heard when the cable connector is inserted into the receptacle. When you unplug the cable connector at the 2074 ESCON adapter, the LED Display should say ″DARK″. When you plug the cable connector back into the 2074 ESCON adapter, the LED Display should say ″LITE″. If this does not occur, you should also clean the ends of the ESCON cable and receptacle with a Fiber Optic Cleaning Kit. At this point, if the LED Display scrolling message on the ESCON card still contains ″Channel offline″ and ″No light″, then you need to conduct ESCON Link Fault Isolation. Further ESCON Link Fault Isolation is beyond the scope of this manual. You should proceed with ESCON Link Fault Isolation procedures that you are familiar with and that are appropriate to the Host system to which the 2074 is connected. This may include taking light measurements with a light meter.

     Note: There are no ESCON wrap tests that can be run at the 2074 ESCON adapter.
   - From an OS/2 window, you can use the BTITOOL to display neighbor node information and to display code violation and bit error counters. Each command will need to be run once for each of the adapters, or better yet, for the ESCON adapter whose link state you are trying to debug. The command is run from an OS/2 Window.
   - Use **BTITOOL SHOW NEIGHBOR INFO CARD=x** (where x=0 or 1) for neighborhood node information.
     Sample output:

     Note: Values in ()'s are EBCDIC values in HEX.

```
Channel is currently: Connected
Flags field:     0x00
Node Parameters: 0x00 0x0A 0xE5
Type Number:     009032 ( F0 F0 F9 F0 F3 F2 )
Model Number:    005 ( F0 F0 F5 )
Manufacturer:    IBM ( C9 C2 D4 )
Plant:           02 ( F0 F2 )
Serial Number:   000000041256
  ( F0 F0 F0 F0 F0 F0 F0 F4 F1 F2 F5 F6 )
Tag:             0x00 0xE1
```

- Use **BTITOOL SHOW LINK INCIDENTS CARD=x** (where x=0 or 1) for code violations, bit error, and link incident information.
  Sample output:

```
Link Incident Counts for card 1:
     Implicit Errors: 0
     Bit Error Threshold: 179
     Loss Of Signal: 0
     Not Operational: 0
     Sequence Timeout: 0
     Unconditional Disconnect: 0
     Unconditional Disconnect Response: 0

 Cumulative Link Incident Counts for card 1:
     Implicit Errors: 0
     Bit Error Threshold: 179
     Loss Of Signal: 0
     Not Operational: 0
     Sequence Timeout: 0
     Unconditional Disconnect: 0
     Unconditional Disconnect Response: 0
```

- Use **BTITOOL HELP TEST** for a help menu of possible commands.

Summary

The sequence for the ESCON card is:

- During *power on*, it runs a POST (LED Display indicates POST steps as they run)
- Loads its own emulation code (LED Display scrolls firmware level and ″Adapter closed″)
- OS/2 device driver BTIDD.SYS loads without error messages (LED Display scrolling message contains ″channel offline″ and possibly ″No light″)
- IML CA0 or CA1 ICON start the Channel Adapter's ESCON card (LED Display scrolling message contains ″Channel online″)

There are no wrap tests. You can use a light meter to measure the light input to the card and the light output. To measure the light output, IML the Channel Adapter. From the host or the ESCON director, the serial number displayed for the Tag Results of the 2074 is now the 2074's serial number.

2074 LAN Adapter Diagnostics

In general to diagnose a LAN problem you need to determine if it is caused by 1) Configuration, 2) Media, or 3) Failing adapter.

You shouldn't be analyzing LAN problems caused by media. What this means is, if the adapter doesn't have the proper LEDs on, then the customer needs to ensure that the media (cables) are certified and attached to working Hubs or MAUs. The following table defines what is proper:

Note: Return to this point if the Adapter LEDs are OK.

Table 2-3. Sample Command Output

Adapter Type	**Determining Proper LAN Adapter LED Illumination**
On-Planar Ethernet	See ″Start Planar Ethernet Diagnostic″ at step 3 on page 2-19.

Table 2-3. Sample Command Output (continued)

Adapter Type	Determining Proper LAN Adapter LED Illumination
Ethernet PCI Adapter	See ″Start Ethernet PCI Adapter Diagnostic″ at step 9 on page 2-23.
Token Ring Adapter	See ″Start Token Ring Adapter Diagnostic″ at step 6 on page 2-21.

If the LAN cables aren't certified, then they might not function at the rated speed. This isn't your problem. You have two of each LAN adapter in this system. If you have a situation that one adapter's LED isn't on, then temporarily move the cable to the other adapter as a test. If this adapter fails too, then the customer should be asked to verify their LAN. Ethernet adapters will immediately recognize the Hub (if their drivers are loaded). Token Ring adapters *only* find the MAU during initialization (a reboot of the 2074).

Note: The on planar Ethernet runs at a PCI bus speed of 33 Mhz. The second Ethernet in slot 4 runs at a PCI bus speed of 100 Mhz.

Let's start with the LEDs on the adapters. We will only consider the adapters that the customer has attached to their LAN. Verify which of the four LAN adapters have cables attached to it. Disregard those that have no cable attached. Are the LEDs correct? For Token Ring adapters the green LED should be on solid. If it isn't refer to the LAN diagnostics section in this manual for Token Ring. Be aware that Token Ring adapters won't connect to the MAU unless they were attached during initialization. To be sure, reboot the 2074 and wait until the OS/2 desktop appears.

Caution

Reboot will be disruptive to all connections through the 2074

Then check the lights. For Ethernet: are the LINK LEDs correct? If it isn't refer to the LAN diagnostics section in the manual for Ethernet. Also, check the 100MB or 100 TX LED. Verify if its state is correct.

If these Token Ring adapters are the only ones on the LAN, then modify their configuration to force their speed to 16 Mb/s if it isn't already there. You can modify **C:/IBMCOM/PROTOCOL.INI** and change ″**AUTO**″ to ″**M16**″ for these Token Ring adapters.

During 2074 reboot or boot, are any error messages displayed? Did you have to press "**ENTER**" due to an error? If so then these errors need to be attended to. You shouldn't receive any of these error messages if the LAN adapters are missing their cables, so they aren't a good diagnostics aid. They are an indication that the adapter is missing or broken.

The PING command can have a block size parameter after the IP address. Try testing with different values.

If you received no error messages, and the lights are correct, try "pinging" yourself. From an OS/2 window execute the command **PING 127.0.0.1 1024 1**. This is the loop back interface. It should always pass. Next try pinging the addresses of the LAN adapters the customer has attached to LANs. You can get the addresses of

these from **C:\MPTN\BIN\SETUP.CMD**. Ping the addresses of any of the four IFCONFIG lines which don't start with REM. This won't actually go out on the LAN, but it will test if TCP/IP is happy with it. If this passes, then go to a customer PC on the same LAN, and ping these same addresses from the client. If this fails, then there is a LAN or configuration problem. Have the customer correct it. If it passes, then there isn't a problem with the LAN or the TCP/IP address definitions.

Other things to look at are 1) **C:\IBMCOM\LANTRAN.LOG**, 2) **NETSTAT -a**, or 3) **NETSTAT -r**

The LAN adapter names are positional, and shouldn't be changed. In MPTS this is the order:

Table 2-4. Slot Locations of Network Adapters

	2074-001	**2074-002**	**2074-003**
LAN1	2nd Ethernet - PCI Slot 3	2nd Ethernet - PCI Slot 3	2nd Ethernet - PCI Slot 4
LAN2	1st Token-Ring - PCI Slot 4	1st Token-Ring - PCI Slot 4	1st Token-Ring - PCI Slot 5
LAN3	2nd Token-Ring - PCI Slot 5	2nd Token-Ring - PCI Slot 5	2nd Token-Ring - PCI Slot 6

Note: LAN0 is the on-planar Ethernet.

The order these appear in MPTS, is reflected in **C:\IBMCOM\PROTOCOL.INI**. The above LANx's must appear is this exact order in MPTS, and never should be changed.

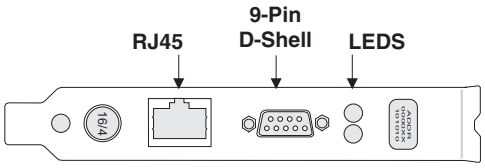
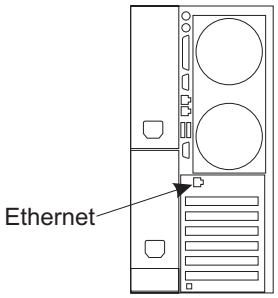
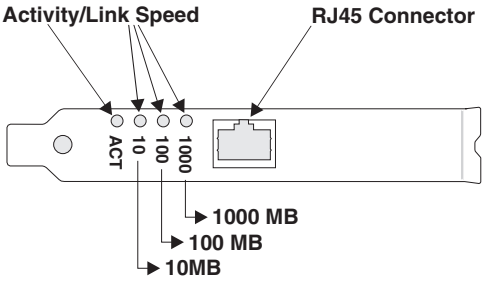
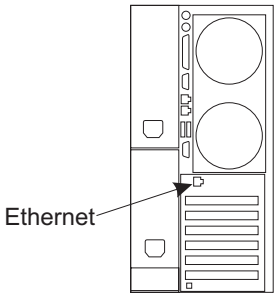
Token-Ring or Ethernet LAN adapter diagnostics

For on planar Ethernet troubleshooting and diagnostics, refer to the Troubleshooting Charts in the appropriate xSeries Hardware Maintenance Guide.

These procedures isolate problems with LAN adapters (Token-Ring or Ethernet adapters) plugged into the PCI bus or the Ethernet LAN adapter built into the planar.

If you do no already have the LAN adapter diagnostic diskettes, you will need to create those using the procedures on "Creating Diagnostic Diskettes" on page 3-10.

To isolate the problem, start by checking the LEDs.

1 Determine the type of LAN adapter that is failing. • Locate adapter card slots 4, 5 and 6 • Compare the cable end brackets of the cards to the graphics on the right. Is a Token-Ring adapter installed with a cable attached? **No** **Yes** **Next** Go to Step 6.	Token Ring  Planar Ethernet 
2 Is an Ethernet PCI adapter installed with a cable attached? **No** **Yes** **Next** Go to Step 9.	Ethernet PCI 
Start Planar Ethernet Diagnostic	
3 Is a cable plugged into the Ethernet port on the planar? **Yes** **No** **Next** No LANs are in use Is the link ok LED in the RJ-45 socket on solid? **Yes** **No** **Next** Refer to Table 2.5	

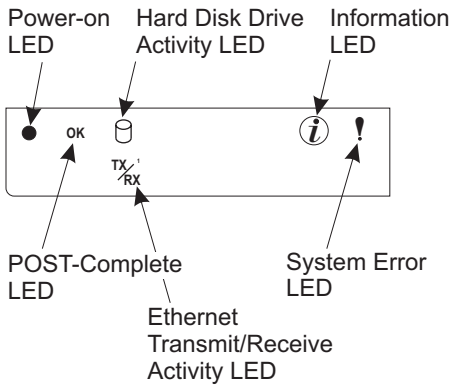
4 Examine the LEDs located on the front panel. For the Ethernet Transmit/Receive LED, flashing indicates network transmit or receive activity. Continue at step 5.	

Table 2-5. Ethernet Link State Definitions

Ethernet Link State	Green LED which indicates link status
Off	The Ethernet interface did not find a valid link on the network connection. Transmit and receive are not possible. Have customer verify the LAN connection.
On (solid)	The Ethernet interface has a valid link on the network connection and is ready for normal operation.

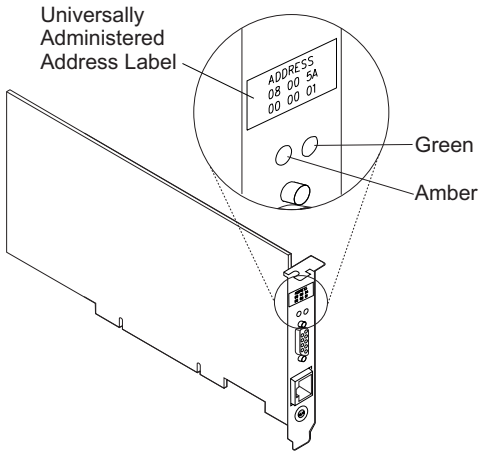
5 Run the planar Ethernet diagnostic from the F2 selection during system power on. Follow the appropriate *xSeries Maintenance Manual* from there. If you have replaced the planar, the customer may need to know the MAC address of the new ethernet adapter on the planar. To display the MAC addresses of all adapters in the 2074, type in the following from an OS/2 window: **NETSTAT -N | MORE**. You can also use the diagnostic diskette called 31P6301 on the CD-ROM in the DIAG subdirectory to test the on-planar Ethernet on the 2074-003.	Before rebooting the system, make sure the 2074 system is shutdown.
End Planar Ethernet Diagnostic	
Start Token-Ring Adapter Diagnostic	
6 Using the graphic on the right, examine the LEDs located on the cable end bracket. Match the state of the LEDs to the following tables. The first shows the normal start-up sequence which you can observer when powering the system up. The second lists possible problem states and the actions to take.	

Table 2-6. Startup Sequence of LED States

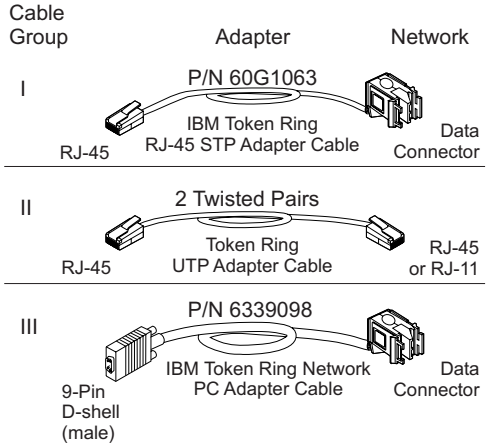
Amber	Green	Explanation
Blinking	Blinking	The adapter is waiting for initialization
Off	Off	The adapter initialization is in progress, or the computer is powered off.
Off	Blinking	The adapter did not detect any problems during its self-diagnostic tests and is waiting to open. If this LED state occurs after the adapter has been opened, this state indicates that the adapter has been closed under software control.
Off	On	The adapter is open and operating correctly.

Table 2-7. Problems Shown by Adapter LED states

Amber	Green	Explanation and Action
On	Off	The adapter self diagnostic tests failed or there is a problem with the adapter. **Action:** Go to step 8 to test the adapter.

Table 2-7. Problems Shown by Adapter LED states (continued)

Amber	Green	Explanation and Action
Blinking	Off	The adapter is closed due to an undetected error. One of the following conditions exists: • The adapter open failed. • The adapter detected a wire fault. • The adapter failed the auto-removal test. **Action:** Perform the following procedures, as appropriate: 1. Go to step 7. 2. Verify that the adapter is configured correctly. 3. If other stations on the network are having problems communicating, contact your network administrator.
Blinking	On	The adapter has detected a beaconing or a hard error. **Action:** Go to step 7.
On	On	The adapter has failed before running the self-diagnostic tests. **Action:** Go to step 8 to test the adapter.

7 Check the following list of possible causes if the adapter is unable to communicate on the network but other stations on the network are able to communicate: • Verify that the appropriate adapter cable is connected to the adapter and to the network. • Verify that the adapter is firmly seated in the expansion slot. • Verify that the setting for the adapter's Data Rate option matches the data rate of the network, or that the data rate has been set to AutoSense if yours is not the first station on the ring. • Replace the adapter cable with one that is known to be good. • Go to the next step to run the Token Ring diagnostics. If the tests are completed successfully, and the adapter is still not communicating, contact the network administrator. • Check **C:IBMCOM\LANTRAN.LOG** for errors.	

8

Shutdown the 2074. Shutdown OS/2 by right clicking on the OS/2 desktop and selecting 'Shut down...' Select 'Yes' on any confirmation windows. **DO NOT** reboot until you see the message indicating that is OK to do so.

Insert the Token-Ring Diagnostic diskette. See "Creating Diagnostic Diskettes" on page 3-10 if you need to create the diagnostic diskette.

Reboot the 2074 by pressing the reset button on the front panel. If the 2074 will not boot with the adapter installed, remove the adapter and retry. If it will boot with the adapter removed, replace the adapter.

At the DOS 7.0 Boot Menu, select option 2, **IBM PCI Token-Ring Extended Diagnostics**. Option 2 must be selected as soon as the screen appears. If not, the diagnostics default to running option 1. Select the specific Token-Ring adapter to be tested. A selection menu is listed identifying each adapter by its universally administered address. Use the cursor keys or the mouse to select the adapter for test.

Connect the adapter to the network and press the **Test** (ENTER) key. There are two test options: wrap test and on-ring test. The wrap test tests the adapter and cable through the hub or concentrator, or through a wrap plug attached to the cable. The on-ring test requires that the adapter is connected to a network with other adapters, so the ring speed of the network can automatically be sensed. If the adapter is the only one on the network, the on-ring test will fail.

Run the default option first. If an error is detected, then run the wrap test to isolate the TR adapter.

If the test indicates there is no adapter in the system, or that diagnostics cannot be run:

- Check that the adapter is correctly seated in the slot.
- Make sure that the LEDs blink alternately amber and green after you power up your computer.
- See "Identifying problems using LEDs" in step 6.
- If the tests are completed successfully, and your computer is still not communicating, contact your network administrator.

If the wrap test and on-ring test run without errors, the adapter is ready for use. Exit the diagnostic program, and follow the directions for reactivating the computer.

If a network error occurs, record any messages that appear, record the LED sequences, and contact your network administrator.

This procedure does not verify that the data rate of the device driver setting matches the data rate of the LAN segment.

If more than one Token-Ring is in your machine, and you have not run this diagnostic disk already, the diagnostic will reboot your computer, after updating the disk for the correct number of Token-Rings.

When testing is complete, remove the diagnostic diskette, and reboot the system by pressing the reset switch on the front panel.

If you have replaced the Token Ring card, the customer may need to know the MAC address of the new card. To display the MAC addresses of all adapters in the 2074, type in the following from an OS/2 window: **NETSTAT -N | MORE**

End Token-Ring Adapter Diagnostic

Start Ethernet PCI Adapter Diagnostic

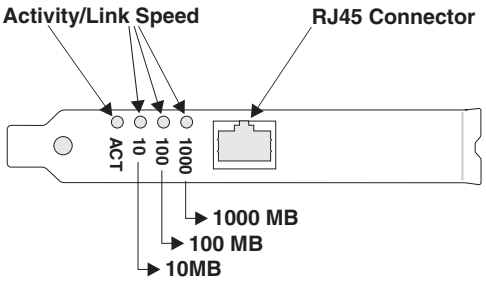
9 Examine the LEDs located on the cable end bracket. There are four LEDs on the Ethernet PCI adapter: **ACT (for activity) LED:** • Off – The adapter is not sending or receiving network data *or* – The adapter and switch are not receiving power *or* – The cable connection between the switch and the adapter is faulty *or* – You have a driver configuration problem • Flashing – The adapter is sending or receiving network data. The frequency of the flashes varies with the amount of network data. **Link Speed LEDs:** • On - indicates link speed. • Off - Refer to Table 2-8.	
10 Using the procedure on the right, shutdown the 2074 Console Support Controller. Insert the Ethernet PCI adapter diagnostic diskette. If you do not have an Ethernet PCI adapter diagnostic diskette, refer to “Creating Diagnostic Diskettes” on page 3-10. Reboot the 2074 by pressing the reset button on the front panel. Follow the instructions on the screen to test the Ethernet PCI adapter. When testing is complete, remove the diagnostic diskette and reboot the system by pressing the reset switch on the front panel. If you have replaced the Ethernet PCI adapter, the customer may need to know the MAC address of the new card. To display the MAC addresses of all adapters in the 2074, type in the following from an OS/2 window: **NETSTAT -N | MORE**.	Before rebooting the system, make sure the 2074 system is shutdown.
End Ethernet PCI Adapter Diagnostic	

Table 2-8. Common Problems and Solutions

Problem	Action
The diagnostics are completed successfully, but the connection fails.	• Ensure that the network cable is securely attached. • Ensure that you are using category 5 cabling when operating at 100 Mbps, and it is certified for 100Mbps.
LNK LED does not light	• Ensure that you have loaded the network drivers. • Check all connections at the adapter and the hub. • Try another port on the hub. • If you forced duplex mode, ensure that you also force the speed to either 10 or 100 Mbps. • Ensure that the hub port is configured for the correct speed, 10 or 100 Mbps.
ACT LED does not light.	• Ensure that you have loaded the network drivers. • If you suspect that the network may be idle, try sending data from the workstation. • Try another adapter if the adapter is not transmitting or receiving data.
Data is corrupted or sporadic.	Ensure that you are using category 5 cabling when operating at 100 Mbps, and it is certified for 100Mbps.
The adapter stopped working without apparent cause.	• If the network driver files are missing or might be corrupted, reload the hard drive from the CD-ROM. • Try a different Ethernet PCI adapter.

End of Call

From an OS/2 Window execute the command CHECKPCI. Did it pass? There should be nothing in red. If no, verify why the PCI adapters aren't where they belong. This will verify that unknown adapters aren't installed and that none are missing. If adapters are missing, the LAN card numbering will be incorrect. This is not acceptable.

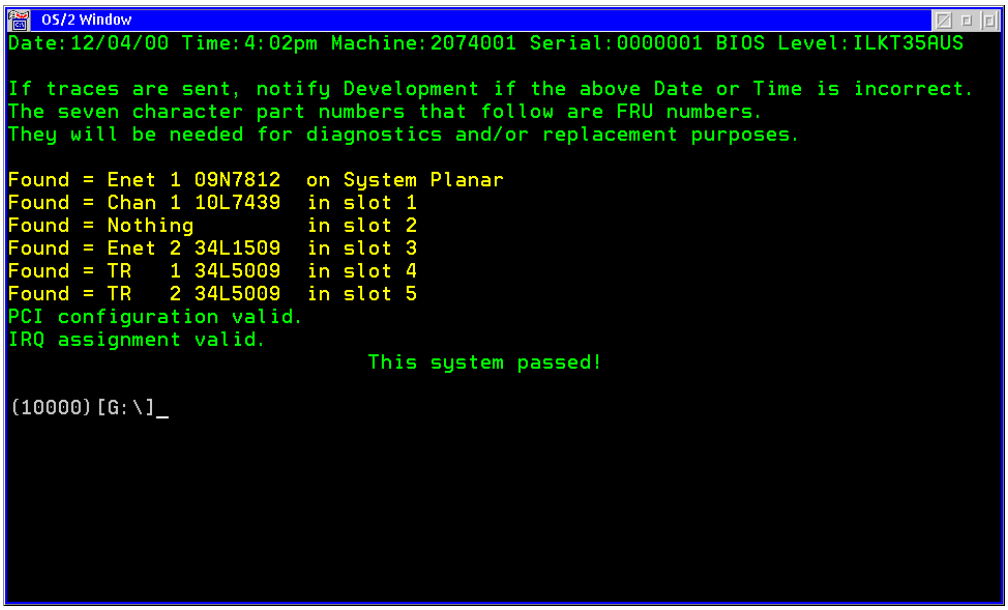


Figure 2-5. Example of OS/2 window showing valid PCI configuration.

Chapter 3. Service Procedures

Service Procedures Problem/Action List

Problem Area Reported	Go to
Determining whether the 2074 Channel Adapters are active	Go to “Determining Whether the 2074 Channel Adapters Are Active” on page 3-3
2074 Snap Shot Dump	Go to “Snap Shot Dump” on page 3-4
2074 Error Logs	Go to “2074 Error Logs” on page 3-5
2074 I/O Traces	Go to “2074 I/O Trace (AWSTRACE.LST)” on page 3-7
Sending Traces and Logs	Go to “Sending Traces and Logs to IBM Service (SENDLOG.CMD)” on page 3-8
Determining Code and Patch Level	Go to “Determining Code and Patch Level” on page 3-8
Patch Apply	Go to “Installing Patches” on page 3-9
Creating Diagnostic Diskettes	Go to “Creating Diagnostic Diskettes” on page 3-10
Configuration Backup Procedures	Go to “Configuration Save/Restore Procedures” on page 3-11
Loading the 2074 Hard Drive	Go to “Loading the 2074 Hard Drive” on page 3-12
Replacing an ESCON Card	Go to “Replacing an ESCON Card” on page 3-13
Replacing an Ethernet or Token Ring Card	See the appropriate xSeries Hardware Maintenance Manual
Updating VPD Data	Go to “Updating VPD Data” on page 3-14

Access the IBM 2074 from the OS/2 desktop by selecting icons from one of the three 2074 folders.

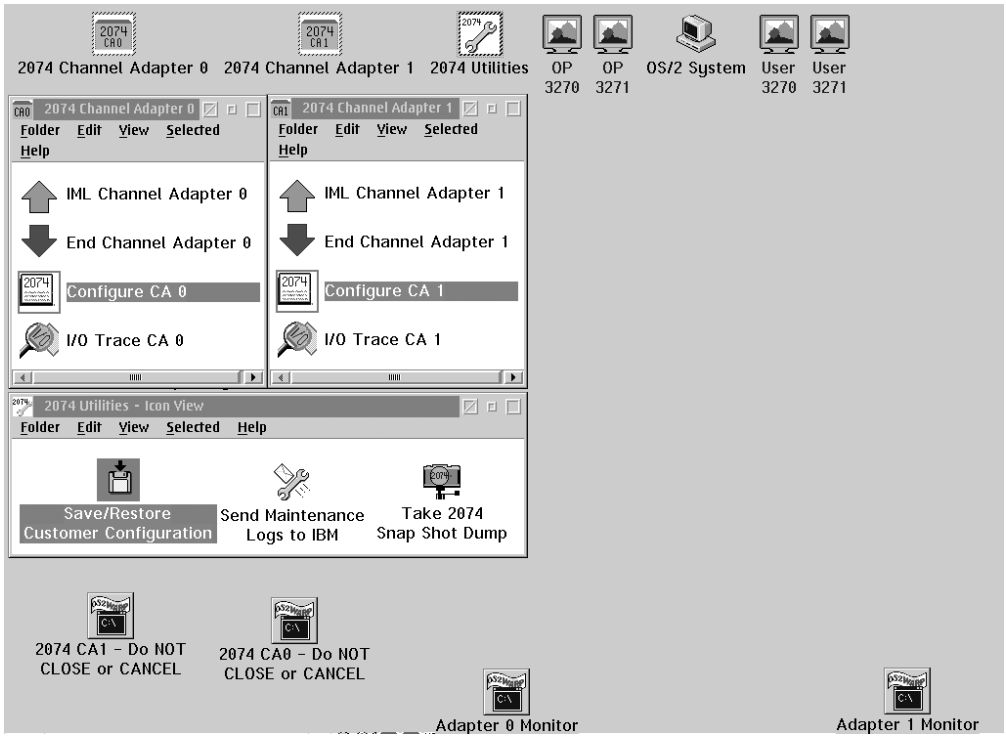


Figure 3-1. OS/2 Desktop Displaying 2074 Icons

The 2074 icons relevant to system service are:

I/O Trace CA 0 or 1

Use this selection to view the contents of the I/O trace buffer and create an I/O trace file.

The information contained in the I/O trace file is created for use by personnel in the IBM 2074 Support Center. Because the trace table wraps and irrelevant data could overlay the beginning of the true problem, irrelevant data could overlay the beginning of the true problem, it is important to limit the scope of the I/0 trace. See “2074 I/O Trace (AWSTRACE.LST)” on page 3-7 for information about how to set up an I/O trace.

Save/Restore Customer Configuration

Use this selection to save to diskette the customer’s 2074 configuration data. This includes files from the C: drive such as CONFIG.SYS, PC 3270 workstation profiles, TCP/IP LAN adapter configuration, and copies of the 2074 device configuration files (DEVMAPs) from the E: drive. See “Configuration Save/Restore Procedures” on page 3-11 for more information.

Take 2074 Snap Shot Dump

Use this selection to create a dump file.

The 2074 Snap Shot Dump facility creates a dump of the 2074 I/0 subsystem, including control blocks and device manager data. This information is created for use by personnel in the IBM 2074 Support Center during problem determination. Use this selection only when directed to do so by IBM 2074 Support Center personnel.

Send Maintenance Logs to IBM

Use this selection when instructed by IBM Support Center to copy logs and traces to diskette for transmittal to IBM for analysis.

Determining Whether the 2074 Channel Adapters Are Active

It may be useful to check whether the 2074 Channel Adapters are currently started. When the 2074 Channel Adapters are started, there is a minimized ICON created for each adapter on the OS/2 Desktop. Each ICON will be labeled: '2074 CAx Do NOT CLOSE or CANCEL' where x is 0 or 1. If you double-click to maximize one of the ICON's then the panel will look similar to Figure below. The line on the panel that indicates the status will read '2074 CAx started'. Once you are done viewing this panel, be sure to carefully minimize the panel (**DO NOT CLOSE THIS PANEL**). To minimize, click the ICON in the upper left corner of the panel and select 'Minimize' from the pull-down menu.

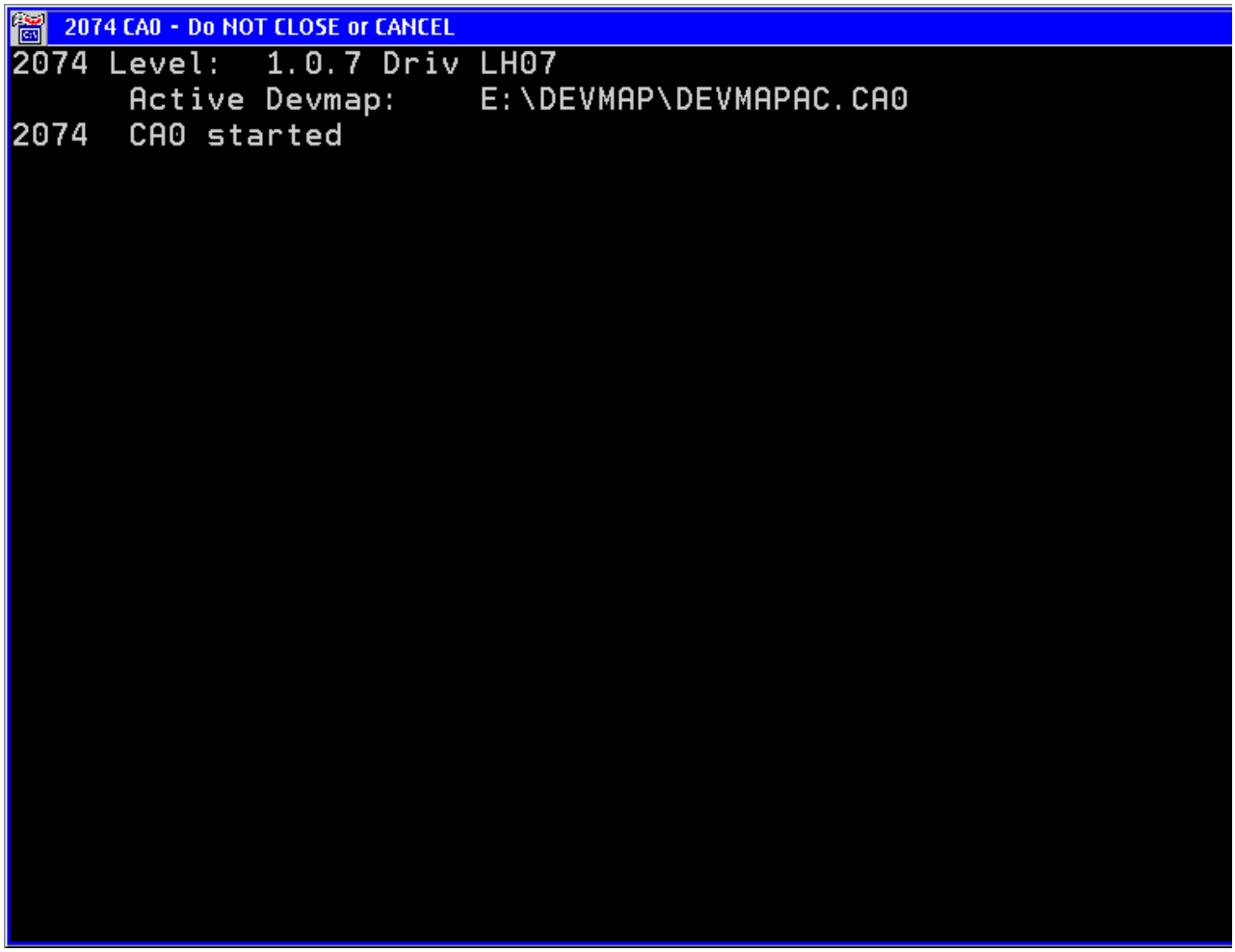


Figure 3-2. Example of the Display of 2074 CA0 started window.

Collecting I/O Traces and Logs

Traces and logs will be collected automatically when a 2074 component abnormally terminates (SYS3173 or SYS3175) or they can be manually collected via the Snap Shot Dump icon in the 2074 Utilities folder. You might want to manually collect a trace in order to debug a I/O subsystem problem that does not result in an abend.

The AWSABEND component is called to collect data when a 2074 component abends. Not all errors are intercepted by AWSABEND, but it is called on many SYS3175 or SYS3173 abends. It cannot handle "black screen" traps -- for example,

a trap D in a device driver. AWSABEND is called automatically; it should not be invoked directly from the command line or from an icon.

AWSABEND automates some of this data collection so that when something goes wrong, IBM will be more likely to have the data required to determine the problem. It reduces the chance that the customer will have to reproduce the problem because some of the data was lost and not available to IBM service. AWSABEND cannot trap all the errors, so manual data collection still may be required in some cases.

The file AWSABEND.LST is created at IML time. Components that have specific trace or debug files that should be collected during an abend can add the name and paths of the files to be collected to this file. At a minimum, the file contains CUSTOMER.DAT which identifies the customer name and contact. AWSSNAP and AWSTRCSP also add their names to the file when they are invoked and/or stopped.

Summary of Operation (AWSABEND.CMD)

During IML, the AWSERROR routine sets up a thread to watch for an abend. During component initialization, DMINIT sets up an exit list which OS/2 runs when a component terminates. During termination, the exit list checks to see if it was abnormally terminated, and if so, it clears the semaphore on which AWSERROR abend-watch thread was waiting.

Abend-watch invokes the AWSABEND.CMD program to perform the data collection. Currently, it takes these actions:

1. Stops trace spooling.
2. Takes a snap dump.
3. Collects BTI (ESCON card) traces.
4. Uses AWSSRAM2 to collect all the data pointed to by AWSABEND.LST into a AWSSNAPn.RAM file
5. Renames/erases Process dumps. (PDUMPs).
6. Exit and allows the abend-watch thread to resume execution.

Snap Shot Dump

Selecting the **Take 2074 Snap Shot Dump** icon from the 2074 Utilities icon folder not only performs a snap dump of the I/O subsystem, it also collects the same traces and logs as AWSABEND (based on the items specified in AWSABEND.LST). A pop-up message box will tell you the name of the file that was created. It is of the form AWSSNAPn.RAM. This file can be copied to diskette by the SENDLOG command. See “Sending Traces and Logs to IBM Service (SENDLOG.CMD)” on page 3-8.

This function should be used under the direction of support personnel for problem determination. Not all problems result in abends, for instance poor I/O performance. You may be asked by the next level of support to turn on tracing for certain I/O devices. When the I/O event of interest occurs, click on the Snap Shot Dump icon to capture the I/O trace information.

I/O Trace

Selecting **I/O Trace CA 0** allows you to capture, view and search the contents of the I/O trace buffer for Channel Adapter 0 and save the current buffer contents to the file: **C:\2074\AWSTRACE.LST**.

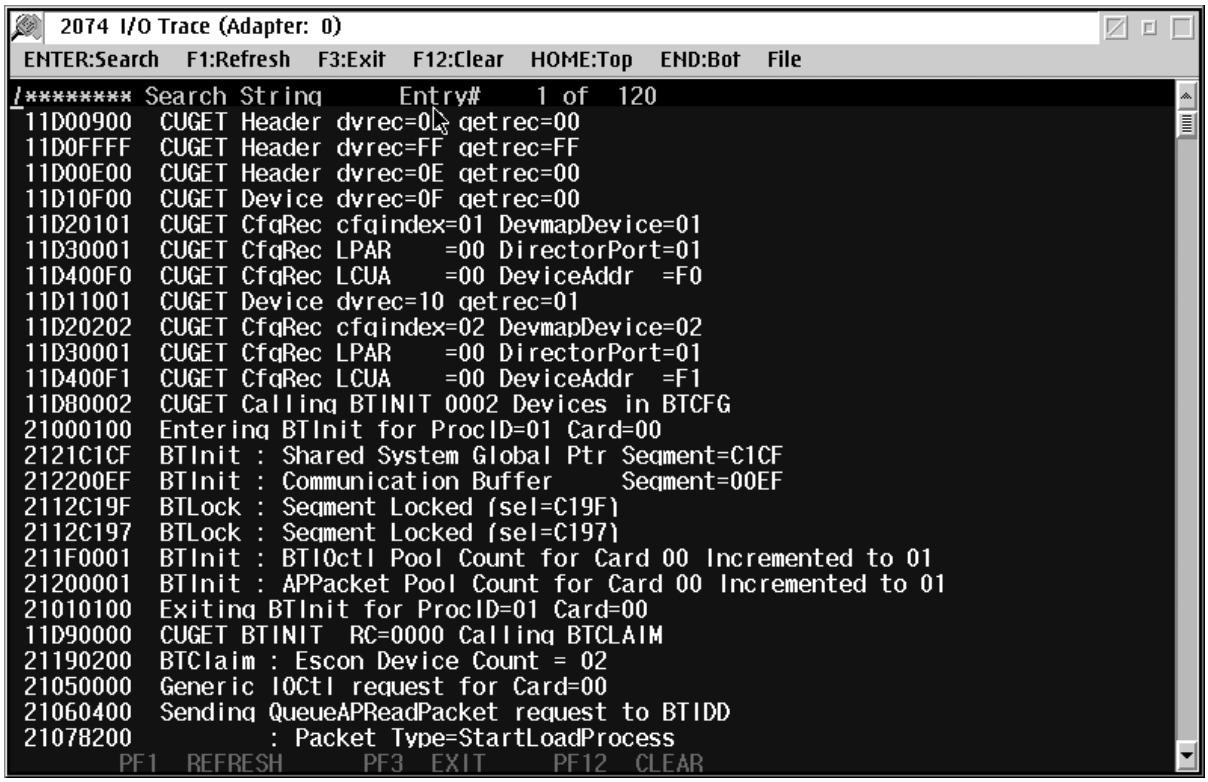


Figure 3-3. The 2074 I/O Trace screen

The trace buffer is 2000 entries long and wraps automatically. This makes it useless, except for verifying that you have tracing enabled for the device. The trace buffer display includes text descriptions of each entry, added by the display program. The actual trace data is shown as eight hexadecimal characters at the beginning of each line.

The trace information is provided for use by IBM 2074 support personnel only. You may be asked by the Support Center to bring up this screen to verify that I/O data is being traced and to save the buffer contents, now or after a manual refresh (F1 key) to the AWSTRACE.LST file (click **FILE** on grey menu bar at top of screen).

Note: There is only one AWSTRACE.LST file for both Channel Adapters 0 and 1 and each time you click on **FILE**, this file is replaced, not appended to. You must open an OS/2 window and manually rename the file if you wish to save it.

2074 Error Logs

The 2074 provides several logs that can be useful if you experience problems during installation and configuration.

- **C:\2074\AWSERROR.LOG**
- **C:\2074\INSTALL.LOG**
- **C:\OS2POPUP.LOG**
- **C:\IBMCOM\LANTRAN.LOG**

AWSERROR.LOG

This is where all error messages with prefix “AWS” are logged. There is one message per line. The format is:

```
<mm/dd/yy hh:mm:ss> AWSzzznnnx Error message
```

This message format is thoroughly described in the on-line message help file. AWSERROR.LOG is cumulative over time but is purged and backup copies are written to the E:\ drive.

2074 messages are logged in AWSERROR.LOG in the **C:\2074** subdirectory. The messages have a time and date stamp so you can see a history of messages. See online message help file **C:\2074\2074MSG.INF** for message descriptions and actions. Use the OS/2 VIEW command to view this help file.

INSTALL.LOG

This is where all patch installation/removal activity is logged.

POPUPLOG.OS2

This is where OS/2 abend error messages are logged. Each message takes up multiple lines in the file and are separated Each message takes up multiple lines in the file and are separated from subsequent messages by a row of dashes. The format is:

```
hh:mm:ss mm-dd-yy, Type of Abend, Process ID, Taskid
Name of Abending Module (if known)
Register Information (multiple lines)
```

POPUPLOG.OS2 is cumulative over time and is never erased.

LANTRAN.LOG

This is where MPTS (LAN adapter support program) puts initialization messages and error messages. There is one message per line. This file gets created anew every time OS/2 is booted, and so only contains the history from the most recent OS/2 boot.

This file is a record of the initialization process as executed by CONFIG.SYS. It is located in the **C:\IBMCOM** subdirectory. The information in this file relates to:

- Starting each adapter device driver including all messages generated during initialization
  - Loading the driver, version loaded, and related information
  - Opening an adapter, and whether it was successful or unsuccessful
  - Data rate used
  - Addresses
- Loading the communication protocols
  - Success or failure
  - Version loaded
- Binding the protocols to the adapters
  - Which protocols are bound to which adapter
  - When and if connectivity is established

2074 I/O Trace (AWSTRACE.LST)

The 2074 I/O trace is a powerful tool for finding problems in the device manager and I/O code. This facility provides two ways to set up and limit the scope of the trace:

- Editing the CHAN.TRC file.
  There is only one CHAN.TRC file for both 2074 Channel Adapters. To change the default settings in CHAN.TRC, use the 2074 Console Support Controller **F12 Edit Trace Entries** menu. You must select the End Channel Adapter 0 or 1 icon if the Channel Adapter is IMLed and then IML Channel Adapter 0 or 1 for changes to the trace settings to take effect. The defaults for tracing are XXX and KRN.XXX stands for trace all addresses, and KRN is kernel tracing. You may have to reduce these values.
- Using the 2074 Console Support Controller **F2 Update System Devices** menu
  When a 2074 Channel Adapter (0 or 1) is IMLed, then the tracing of individual I/O device addresses can be turned on or off from the 2074 Configurator F2 Update System Device menu. You *must* be viewing the **Currently Active Device Map** to perform this function. The **ALT+T** key can be used on individual device lines to toggle on or off I/O device tracing. When tracing is turned on for a device, its **Index** number will be yellow. When tracing is turned off, it will be light blue (cyan). But, if no I/O has ever been done to the device since IML, then the index number will remain blue, even if tracing is active.

The trace entries are stored in a wrap-around buffer large enough to hold 2044 entries. This makes it useless, except for verifying that you have tracing enabled. Use the trace spooling facility. You are limited only by your available disk space. It is important to limit the scope of the trace, because the trace table wraps and irrelevant data could overlay data relevant to the true problem.

LAN3274 Data Stream Trace

- Saves the 3270 data stream in disk files by address to E:\Trace
- Collected by SNAPDUMP
- AWSABEND.LST dynamically updated
- Tracing must be enabled for these index numbers (devices) in the configurator
- See C:\2074\LAN3274.DOC for help
- Activated two ways:
  - As a parameter to LAN3274 (F2, F12 screen)
  - From command line
    LAN3274 CAx (index number or ALL) (parameter)
- The parameters are:

  /S (grows without limits, will fill disk drive!)
  files called LANx00yy.TRC (up to 128 files)
  x=ESCON card number
  yy=index number of this device from DEVMAP

  /S=n (where n is the number of 4K blocks)
  files called LANx00yy.TR0 and LANx00yy.TR1
  each yy will have 2 files (n*4096) bytes big.
  Up to 256 alternating files are created.

  /SOFF (only valid from command line)
  Turns off this tracing by index or for all indexes
  History file called LANx3274.TRC, TR0, TR1
  contains login attempts by clients. (1, 2, or 4 files)

Sending Traces and Logs to IBM Service (SENDLOG.CMD)

SENDLOG is a utility to copy logs and traces to diskette so they can be sent to IBM.

You will be prompted for a problem number. Enter the problem number or PMH number that was assigned by the support group requesting the log data.

The SENDLOG command, issued either from an OS/2 window or from the icon "Send Maintenance Logs to IBM" in the 2074 Utilities folder is used to copy this data. It will list the files currently waiting to be transmitted, and prompt you for a problem number, problem description, etc. It will also list previously transmitted files and allow you to resend or delete them.

Some logs may be larger in size than a 1.44MB diskette. SENDLOG will split the file up and copy it onto multiple diskettes.

Trace file logs are shipped/uploaded as attachments via Lotus® notes or e-mailed to shift@us.ibm.com.

Summary of Operation (SENDLOG.CMD)

The SENDLOG command prepares a captured trace/log file for transmission to IBM. It prompts the user for description of the problem (which is then saved in DESCRIBE.LOG) and the IBM problem number. This description is appended to the AWSSNAPn.RAM file by AWSSRAM2.EXE. The trace/log file is then renamed to prob_num.RAM.

SENDLOG either copies the file (if it will fit) to a single diskette, or splits up the file into multiple 144000 byte files and copies them to multiple diskettes.

If the copy completes successfully, then the trace/log file is renamed to prob_num.SNT, denoting that it has been sent.

2074 FTP Site

IBM has an FTP site for the 2074 on the IBM Intranet (accessible to IBM CEs and IBM internals).

The IBM Intranet FTP site is:

ftp://S390IS.POK.IBM.COM

Read the **README.HTM** file or **README.TXT** file for instructions and a description of what is currently available on this site. As of this printing, the subdirectories include:

- **/2074/LPATCH** - download 2074 patches from here

Change Management Tools

This is the procedure to follow to download and apply 2074 patches.

Determining Code and Patch Level

The SYSLEVEL.AWS file in C:\2074 reflects the code level currently on the 2074. To display the current code level:

1. Open an OS/2 window
2. Enter: **QLEVEL**
3. Keep pressing Enter until the 2074 level scrolls onto the screen.
4. Continue pressing Enter to return to the C prompt.

Downloading Patches

Patches are available as ZIP files from the IBM Intranet FTP site listed above.

From your IBM Thinkpad or customer's PC:

1. Use your usual method to connect to the IBM Intranet.
2. Establish a FTP connection to the 2074 FTP site by connecting to the IBM Intranet enter **FTP S390IS.POK.IBM.COM**.
3. Enter **anonymous** when prompted for a name.
4. Enter your last name followed by @IBMCE for the password. For example enter **my_name@ibmce**.
5. At the FTP> prompt enter **bin** to transfer files in binary mode.
6. At the FTP> prompt enter **CD 2074** to switch to the 2074 subdirectory.
7. At the FTP> prompt enter **CD LPATCH** to switch to the patch subdirectory.
8. At the FTP> prompt enter **dir** to list the available patches. Note the filename of the patch you want to download.
9. At the FTP> prompt enter **get filename** to download the required patch.
10. Repeat the previous step to download any additional patches.
11. At the FTP> prompt enter **quit** to end the FTP session.
12. Copy the patch files to diskette(s) and bring them to the IBM 2074.

On the 2074 system:

1. Open an OS/2 window.
2. Create a temp directory to copy the patches to by entering **MD \PATCH**.

   Note: This may fail if the directory already exists; this not an error.
3. Switch to the directory where the patches are to be downloaded to by entering **CD \PATCH**.
4. Copy the patch files from the diskette onto the 2074's hard disk: **COPY A:*.* C:\PATCH:**

Unpacking Patches

Patches are shipped (downloaded) as ZIP files, and need to be unpacked (unzipped) before they can be installed.

1. Open an OS/2 window.
2. Enter **CD \PATCH** to switch to the subdirectory where the patches were downloaded.
3. Enter **dir *.zip** to list the downloaded patches.
4. Enter **PKUNZIP2 filename.zip -d -o** to unpack each patch.

Installing Patches

Application of service cannot be concurrent with normal operations. The customer must tell all his users that their terminal sessions are going down, and you must shutdown the 2074 I/O subsystem by clicking on End Channel Adapter 0 and 1 icons.

You can use the command ″LAN3274 CAx ALL /Q″ to check who is attached and when their last attention happened (check for idle users).

Follow the instructions in the **readme** file to run the **2074PAT** command that handles both the installation and removal (regression) of patches. Instructions on the screen or in the readme file will inform you about any other actions which may be required to make the patch take effect, e.g. rebooting OS/2.

When a patch is applied, an entry is made into INSTALL.LOG. An entry is also made if a patch is regressed. INSTALL.LOG can be viewed with the OS/2 command **TEDIT C:\2074\INSTALL.LOG**

Creating Diagnostic Diskettes

All diagnostic programs for the IBM 2074 are contained on the 2074 Load CD that is shipped with each system. A directory on the CD called **\DIAG** is the top level directory for all diagnostics programs and instructions. Each adapter or system component that has a diagnostic will have a subdirectory under **\DIAG** named by the adapter, e.g. **\DIAG\IBMTR** contains Token Ring adapter diagnostics.

DIAG.PAC contains the names of all the diagnostics that are shipped on the CD. To view this file enter **TEDIT H:\DIAG\DIAG.PAC**.

Note: H: is the drive letter of the CD-ROM drive.

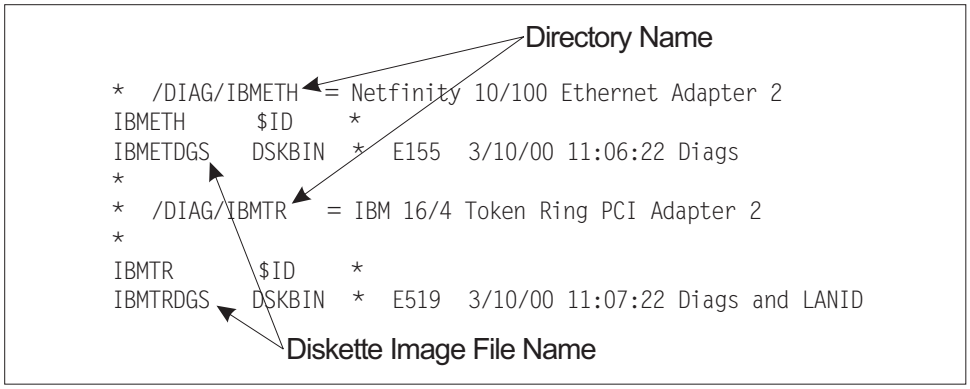


Figure 3-4. DIAG.PAC

Procedures

Diagnostics are shipped as diskette image files and must be restored to blank 1.44MB diskettes using the LOADDSKF utility.

1. Determine the filename and directory of the diskette to be created.
   This information is contained in the DIAG.PAC file which can be viewed by typing (where **F:** is the drive letter of the CD-ROM drive): **TEDIT F:\DIAG\DIAG.PAC**
2. Create the diskette using the LOADDSKF command as follows:
   F:\DIAG\LOADDSKF F:\DIAG\dirname\filename.DSK A: /F where:
   - **F:** is the driver letter of the CD-ROM
   - **dirname** is the directory name containing the diskette image (follows: the \DIAG\ in the DIAG.PAC file).
   - **filename** is the name of the diskette image file (name just before the DSKBIN in the DIAG.PAC file). Each DSKBIN represents one diskette.

- **A:** is the drive letter of the diskette drive.
- **/F** forces the diskette to be reformatted.

To create the IBM Token Ring Diagnostic diskette the command would be:
F:\DIAG\LOADDSKF F:\DIAG\IBMTR\IBMTRDGS.DSK A: /F

3. Label the diskette with the diagnostic name that is on it.

Configuration Save/Restore Procedures

CFGSR saves or restores parts of the OS/2 configuration to diskette. The purpose is to restore the configuration when OS/2 needs to be re-installed because of a disk failure that affects the hard drive, or when a new software level is installed that requires OS/2 to be reinstalled from CD.

When to use CFGSR:

1. After a new install to save the 2074 initial customer configuration.
2. After changing the 2074 device configuration (e.g. Configure CA 0 or 1 icons), PC 3270 session defaults, or TCP/IP addresses.
3. Before the IBM CE reloads the hard disk from the 2074 Load CD to solve a program problem or exchange the hard disk for analysis.
4. After reloading the hard disk to restore the previous configuration.

CFGSR saves specific data from the C: and E: drives, such as CONFIG.SYS, PC 3270 customization, DEVMAPs, TCP/IP customization such as IP addresses, etc. It does not save the desktop configuration (folders, etc.) if modified from the 2074 defaults. The customer will have to recreate any folders or icons that he has added to the OS/2 desktop.

Configuration Save/Restore Steps

Save Configuration data

1. Insert a blank, formatted 1.44MB diskette into the diskette drive.
2. From the OS/2 desktop, Double-click on the ’2074 Utilities’ Icon.
3. Double-click on the ’SAVE/RESTORE Customer Configuration’ Icon within the ’2074 Utilities’ folder.
4. Type **SAVE** at the prompt that appears and press **ENTER**.
5. When you see the message **Configuration backup complete** remove the diskette and set the write protect tab to the open position. Be sure to label and date the diskette.

Restore Configuration data

1. Insert the configuration backup diskette in the diskette drive.
2. From the OS/2 desktop, Double-click on the ’2074 Utilities’ Icon.
3. Double-click on the ’SAVE/RESTORE Customer Configuration’ Icon within the ’2074 Utilities’ folder.
4. Type **RESTORE** at the prompt that appears and press **ENTER**.
5. After restoring a configuration, be sure to **reboot the system** so the restored files become active.

Notes:

1. A confirmation message will be displayed before any existing files will be overlaid.

2. Error messages may displayed if some optional files cannot be found. This can happen on a save or on a restore.
3. The “Save/Restore Customer Configuration” icon in the 2074 Utilities folder may be used instead of typing CFGSR into an OS/2 window.
4. If the 2074 Load CD is reloaded onto a system, an initial menu (called from STARTUP.CMD) will ask you to choose between:

   ```
   1. New Installation
   2. Restore Saved Customer Configuration
   ```

   Choosing selection 2 is the same as typing CFGSR RESTORE.

Method

The data was put on the diskette by using the COPY command or the AWSSRAM2 command and was restored with COPY or with AWSLRAM2. If a saved diskette was damaged, you might be able to retrieve and restore parts of the configuration by using these commands.

Loading the 2074 Hard Drive

Although the 2074 hard drive is normally loaded by IBM manufacturing, you may need to reload the hard drive for several reasons:

1. The hard disk has permanent or intermittent hardware problems.
2. The OS/2 system is malfunctioning, perhaps due to data corruption.
3. IBM Product Engineering requests the return of the hard disk for dump analysis.
4. A mandatory EC requires a new level of 2074 Load CD to be installed.
5. To Reset a lost OS/2 password.

The procedure for loading the 2074 hard disk is as follows:

1. Locate the “IBM 2074 Load CD”.
2. If you are replacing a faulty hard drive, and cannot get an OS/2 Window, skip to step 4. Otherwise, run “Save/Restore Customer Configuration”. This can be done by opening the 2074 Utilities folder and double-clicking on the Save/Restore icon. It can also be run by typing **CFGSR SAVE** at an OS/2 prompt.

   Note: You will need a blank, formatted 1.44MB diskette.
   This will save all the customer specific files to the floppy diskette, so they can be reloaded after the hard disk is restored.
3. Remove the Customer Configuration Save diskette from drive A:, label it, and slide the write-protect tab to the open (protected) position.
4. Place the 2074 Load CD into the CD-ROM drive.

   Note: For IBM CEs, a new Load CD is available from an ECA whenever levels change.
5. Shutdown OS/2 (Ctrl-Alt-Del). Power off the system if you are replacing the hard drive; else leave it powered on to reboot.
6. If you are replacing a faulty hard drive, do it now.
7. Power-on the system (or it is rebooting)
8. The system will boot DOS from the 2074 Load CD.
9. A selection screen will be displayed. Read the choices ***carefully***:

Note: If during a Reload or Restore of the Hard Drive, you experience ″**Virus Warning**″ during BIOS initialization, highlight ″Change is Expected,″ and press ENTER to continue.

- If you are reloading the hard drive because of reasons 4 or 5, then select **F5** to reload only the C: and D: partitions of the hard disk.
- If you have replaced the hard drive because of reasons 1 - 3, then select **F8** to delete all hard disk partitions and restore the disk drive to the original manufacturing data (or a newer version, if the CD is at a higher EC level).

The hard disk restore will take approximately five minutes.

10. Remove the CD from the CD-ROM drive, and press Ctrl-Alt-Del to reboot from the newly restored hard drive.
11. When the OS/2 desktop comes up, a menu will be displayed:

```
                    2074 - Start up Menu

        1. New Installation

        2. Restore saved customer configuration
```

Figure 3-5. 2074 Start up Menu

Most of the time, you will choose selection **2**. You will be prompted to insert the “Customer Configuration Save” diskette into drive A: that you created earlier in this procedure.

12. Insert the diskette and follow the instructions on the screen to restore the customer’s configuration data.
13. Shutdown and reboot OS/2 to make this configuration take effect.

Replacing an ESCON Card

To replace an ESCON adapter:

1. Ensure that the 2074 is Offline to all operating systems and is available for service. Shutdown OS/2 (Ctrl-Alt-Del) on the 2074. Label and disconnect all external cables and power cords.
2. If the 2074 is mounted in a rack, then release the left and right side latches and pull the 2074 out of the rack enclosure until both slide rails lock.

   Note: When the 2074 is in the locked position, you can reach the cables on the back of the 2074.
3. Slide the cover-release latch, located on the front panel, to the open position. Then slide the top cover (rack mounted) or left side cover (tower configuration) toward the rear of the 2074 about 25 mm (1 inch). Lift the cover off the 2074 and set the cover aside.

   Attention: For proper cooling and airflow, replace the cover before turning on the 2074. Operating the 2074 for extended periods of time (over 30 minutes) with the cover removed might damage 2074 components.

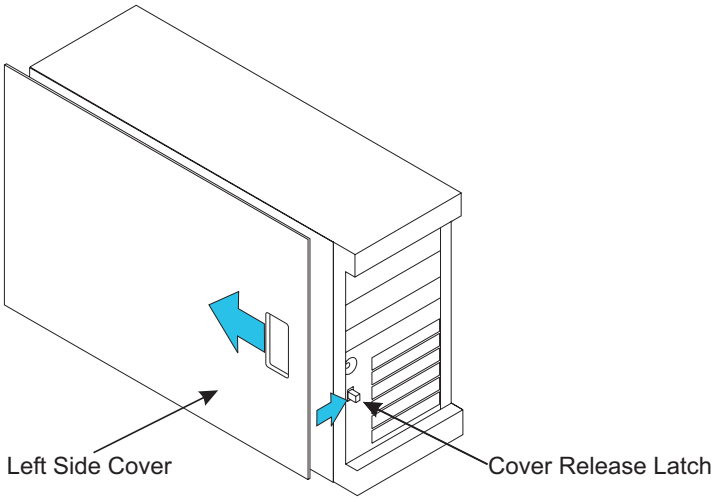


Figure 3-6. Removal of the 2074 Cover (Tower Configuration)

4. Determine which ESCON adapter will be replaced.

   Attention: Expansion-slot covers must be installed on the openings for all vacant slots. This maintains the electromagnetic emissions characteristics of the system and ensures proper cooling of system components.
5. Disconnect the external fiber cable connected to the failing ESCON adapter.
6. Remove the failing ESCON adapter.
7. Remove the new ESCON adapter from the static-protective package.

   Attention: Avoid touching the components and gold edge connectors on the adapter.
8. Install the new ESCON adapter:
   a. Carefully grasp the adapter by its top edge or upper corners, and align it with the expansion slot on the system board.
   b. Press the new ESCON adapter *firmly* into the expansion slot.

      Attention: When you install an ESCON adapter in the 2074, be sure that it is completely and correctly seated in the system-board connector before you apply power. Incomplete insertion might cause damage to the system board or the adapter.
9. Reconnect the internal cables to the ESCON adapter. Refer to the documentation that came with your ESCON adapter for cabling instructions.
10. Replace the cover.
11. Reconnect the external cables, power cords, and peripheral devices.

Updating VPD Data

If you replaced the 2074 planar, then the system VPD data needs to be updated.

There are three model dependent VPD update procedures for the 2074. The CE needs to perform one of the following procedures:

- **Updating the VPD data in the 2074 Model 001:**
  1. Attach monitor, keyboard and mouse cables, and power cords.
  2. Power Up Unit
     During Boot, Press **F1**. This will Enter “Setup”
  3. Select “System Information” from “Configuration/Setup Utility”

4. Select “Product Data”. Verify BIOS build level “ILKT21AUS” or newer. The ″21A″ in the preceding string is the level of the BIOS. If your level is higher than level 21A, that is acceptable
5. Press “**ENTER**″ to select “Machine Type/System Serial Number”
6. Enter “**2074001**″ for the “Machine Type/Model”
7. Enter the serial number in the “System Serial Number” field.
   Get this serial number from the barcode label on the left side of the 2074
8. Select “Update VPD” from the “Machine Type/System Serial Number”
9. Press “**ENTER**″ to change the “VPD Machine/Model Type”
10. Press “**ESC**″ three times to get back to “Main Menu”
11. Select “Load Default Settings” and press ″**ENTER**″ to confirm
12. Select “Date & Time”. Verify or set.
13. Press ″**ESC**″ to get back to “Main Menu”
14. Select ″Save Settings” and ″**ENTER**″ to confirm.
15. Select “Exit Setup” and ″**ENTER**″ to confirm.
16. When OS/2 is done rebooting, run CHECKPCI from an OS/2 window to verify the system’s VPD.

Note: Version 21A of the BIOS is available on the 2074’s Load CD in the Diag subdirectory. It is also on both FTP sites. Only use this if a replacement motherboard BIOS is below 21A.

- **Updating the VPD data in the 2074 Model 002:**

  This procedure requires the xSeries 342 BIOS Flash diskette. An image of this diskette is located on the 2074 Load CD in the file

  ```
  F:\DIAG\8669\QAJTxxA.DSK
  ```

  Use another PC to run the

  ```
  F:\DIAG\LOADDSKF.EXE
  ```

  command to build a 1.44 High-Density diskette from this image. Then follow these steps:

  1. Attach monitor, keyboard and mouse cables, and power cords.
  2. Insert the xSeries 342 BIOS Flash diskette into drive A.
  3. Power up the 2074. PC DOS will boot from the diskette.
  4. On the ″IBM Flash Update Utility″ main menu, select option 1, ″Update **POST/BIOS**.
  5. If asked, ″Do you want to move the current code to backup ROM?″, answer ″**N**″.
  6. When asked, ″Would you like to update the Serial Number?″, answer ″**Y**″.
  7. Type the serial number in the pop-up menu. Get this serial number from the 2074’s barcode label. Press **ENTER**.
  8. When asked, ″Would you like to update the Machine Type/Model?″, answer ″**Y**″.
  9. Type **2074002** in the pop-up menu. Press **ENTER**.
  10. If asked, ″Would you like to save the current flash code to disk?″, answer ″**N**″.
  11. On the ″Select language″ menu, select option 1, ″**1 - English**″ and proceed with the upload of the BIOS..
  12. Remove the diskette from drive A: and press **ENTER** to restart the system.

13. When OS/2 has finished booting, run CHECKPCI from an OS/2 window to verify the system's VPD.

- **Updating the VPD data in the 2074 Model 003:**

  This procedure requires the xSeries 235 BIOS Flash diskette. An image of this diskette is located on the 2074 Load CD in the file

  `F:\DIAG\8671\GRJTxxA.DSK`

  Use another PC to run the

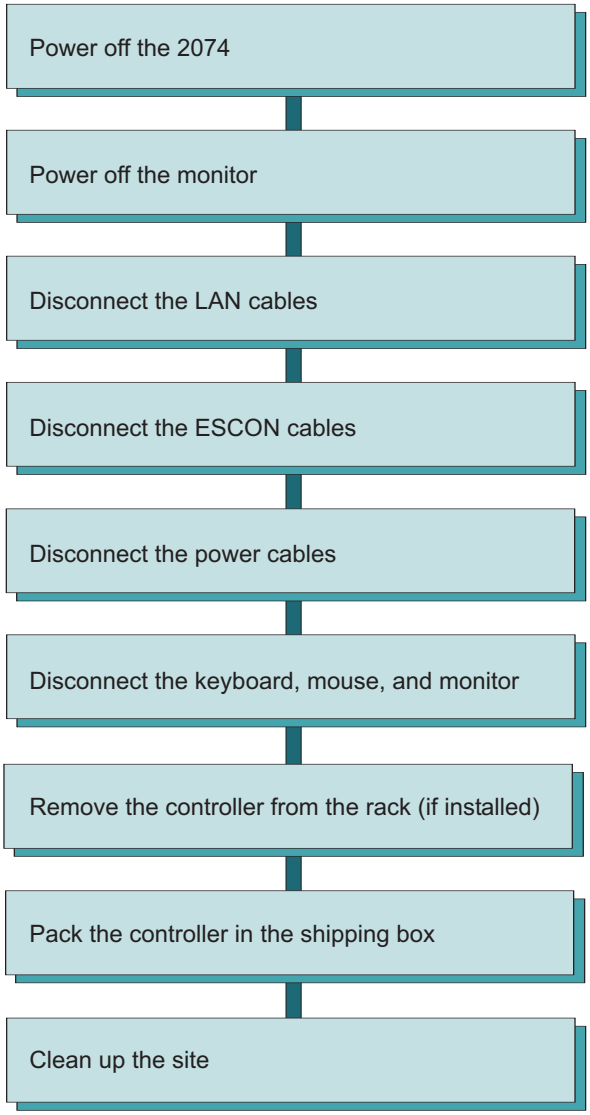
  `F:\DIAG\LOADDSKF.EXE`

  command to build a 1.44 High-Density diskette from this image. Then follow these steps:

  1. Attach monitor, keyboard and mouse cables, and power cords.
  2. Insert the xSeries 235 BIOS Flash diskette into drive A.
  3. Power up the 2074. PC DOS will boot from the diskette.
  4. On the ″IBM Flash Update Utility″ main menu, select option 1, ″Update **POST/BIOS**.
  5. If asked, ″Do you want to move the current code to backup ROM?″, answer ″**N**″.
  6. When asked, ″Would you like to update the Serial Number?″, answer ″**Y**″.
  7. Type the serial number in the pop-up menu. Get this serial number from the 2074's barcode label. Press **ENTER**.
  8. When asked, ″Would you like to update the Machine Type/Model?″, answer ″**Y**″.
  9. Type **2074003** in the pop-up menu. Press **ENTER**.
  10. If asked, ″Would you like to save the current flash code to disk?″, answer ″**N**″.
  11. On the ″Select language″ menu, select option 1, ″**1 - English**″ and proceed with the upload of the BIOS.
  12. Remove the diskette from drive A: and press **ENTER** to restart the system.
  13. When OS/2 has finished booting, run CHECKPCI from an OS/2 window to verify the system's VPD.

Chapter 4. Discontinuance / Relocation

Use the following flowchart as a guide for discontinuing the 2074



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Appendix A. Customer Information Worksheet

Prior to 2074 initialization, it is **important** that you complete the following information. You will be prompted for this information as part of the initialization process.

1. **Contact Name**_____
2. **E-Mail Address**_____
3. **Telephone Number**_____
4. **Street Address**_____
5. **City or Town**_____
6. **State or Province**_____
7. **Postal Code (ZIP)**_____
8. **Country**_____

Note: The street address **cannot** be a Post Office Box.

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

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The following statement applies to this IBM product. The statement for other IBM products intended for use with this product will appear in their accompanying manuals.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions contained in the installation manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors, by installation or use of this equipment other than as specified in the installation manual, or by any other unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1)this device may not cause harmful interference, and (2)this device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class A limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department

of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

Avis de conformlté aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe A d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en millieu résidentiel peut entrainer le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

United Kingdom Telecommunications Act of 1984

The United Kingdom Telecommunications Act 1984

This apparatus is approved under General Approval number NS/G/1234/J/100003 for indirect connections to public telecommunications systems in the United Kingdom.

Taiwan Class A Compliance Statement

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