

3270 Emulation Cards  
Guide to Operations



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3270 Emulation Cards

GA27-3913-00

**Guide to Operations**

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**First Edition (November 1990)**

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The following statement applies to the IBM products covered in this manual, unless otherwise specified herein. The statement for other IBM products will appear in their accompanying materials.

When a 3270 Card is connected to an **FCC Class A** host as a peripheral using coaxial cable, the following warning applies:

#### **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 instruction 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 or by 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.

When the coaxial attachment to the host is not connected, this equipment complies with the **FCC Class B** limits and the following warning applies:

### **Federal Communications Commission (FCC) Statement**

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized IBM dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized IBM dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by 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 conformité 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 milieu résidentiel peut entraîner 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.

### **Canadian Department of Communications compliance statement**

This equipment does not exceed Class B 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 conformité aux normes du ministère des Communications du Canada**

Cet équipement ne dépasse pas les limites de Classe B 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 milieu résidentiel peut entraîner 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.



**DANGER**

**To avoid shock hazard:**

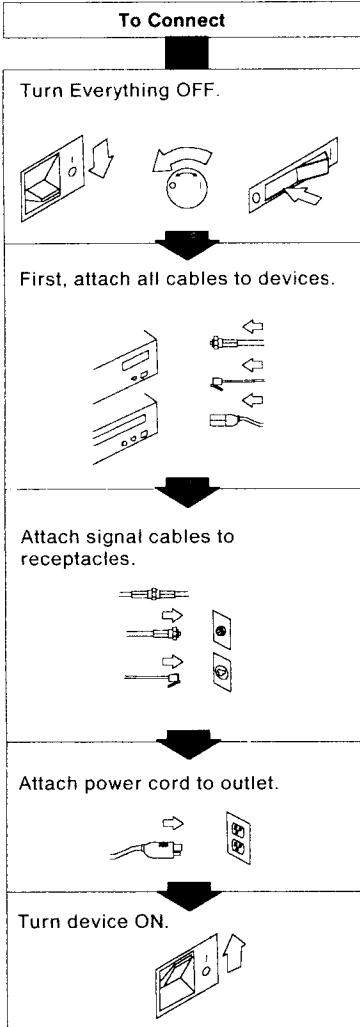
- **The power cord must be connected to a properly wired and grounded receptacle.**
- **Any equipment to which this product will be attached must also be connected to properly wired receptacles.**

See Section 5 for national language safety notices.

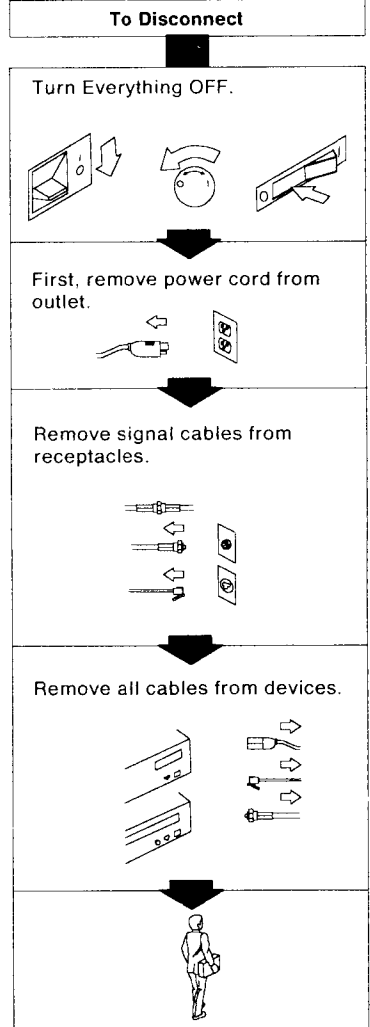


**DANGER:**

Electrical current from power, telephone, and communications cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving, or opening the covers of this product or attached devices.



Note: In the UK, by law, the telephone cable must be connected after the power cord.



Note: In the UK, by law, the power cord must be disconnected after the telephone line cable.

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# Preface

This manual is the guide to installation, problem determination, and maintenance of the 3270 Cards.

This manual contains five sections and one appendix:

**Section 1, Introduction:** This section introduces the 3270 Cards. The section also provides cabling and unpacking information.

**Section 2, The 3270 Card for Personal Computers with Intel 8088 Buses:** This section contains guidelines for installing the 3270 Card (Personal Computer 3278/79 Emulation Adapter) in a personal computer with an Intel 8088 (AT or PC XT) bus. This section also provides instructions for diagnosing problems that may occur during operation.

**Section 3, The 3270 Card for Personal Computers with Micro Channel Buses:** This section contains guidelines for installing the 3270 Card (3270 Connection) in a personal computer with a Micro Channel™ bus. This section also provides instructions for diagnosing problems that may occur during operation.

**Section 4, Maintenance and Service:** This section contains information to be used by service personnel.

**Section 5, National Language Safety Notices:** This section contains translated versions of the safety notices in this book.

**Appendix, Related Publications:** This appendix lists publications that provide more information on cabling and 3270-series devices.

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## Required Publications

- The operator's manual for your personal computer
- The hardware maintenance manual for your personal computer

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## Associated Publications

- The technical reference manual for your personal computer.
- *IBM Personal Computer 3278/79 Emulation Adapter, Technical Reference for the Advanced Adapter*, GA23-0302
- *IBM 3270 Connection Technical Reference*, GA23-0339

Additional related publications are listed the in the Appendix.

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## Section 1. Introduction

The 3270 Cards are hardware components that, with the appropriate software, provide 3278/79 emulation capabilities for personal computers.

3270 Cards can be installed in personal computers with either an Intel 8088<sup>1</sup> (AT or PC XT) or a Micro Channel™ bus. The 3270 Card for personal computers with an Intel 8088 bus is the Personal Computer 3278/79 Emulation Adapter. The following IBM personal computers have an Intel 8088 bus:

- IBM PC
- IBM PC XT™
- IBM Personal Computer XT Model 286
- IBM Personal Computer AT®
- IBM Personal System/2® Model 25
- IBM Personal System/2 Model 30.

The 3270 Card for personal computers with a Micro Channel bus is the 3270 Connection Card. The following IBM personal computers have a Micro Channel bus:

- IBM Personal System/2 Model 50
- IBM Personal System/2 Model 55
- IBM Personal System/2 Model 60
- IBM Personal System/2 Model 70
- IBM Personal System/2 Model 80.

You may already own any of several versions of these cards. The following illustrations show the current production models. These cards are direct replacements for older models.

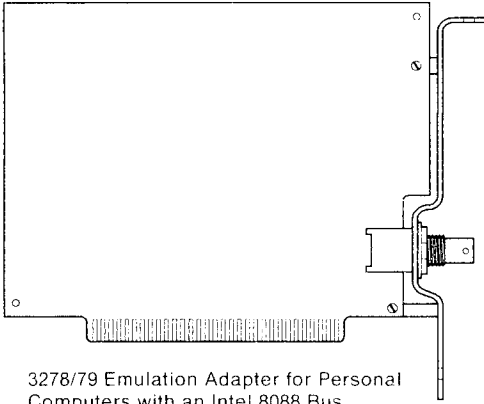
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<sup>1</sup> In this book, unless otherwise stated, Intel 8088 bus refers to the 8088, 8086, and 80286 buses.

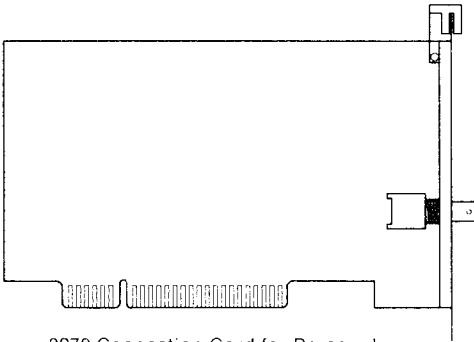
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Personal Computer AT and Personal System/2 are registered trademarks of International Business Machines Corporation.





3278/79 Emulation Adapter for Personal Computers with an Intel 8088 Bus



3270 Connection Card for Personal Computers with a Micro Channel Bus

Current level diagnostic programs are supplied with these cards. These programs will work with older versions of the cards, but **older level diagnostic programs may not work with these cards.**

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## Signal Cable Considerations

When a 3270 Card is attached to a host system, consider the following practices for installing signal cable:

- Installation
  - Cable runs (indoor and outdoor)
  - Types of signal cables and specifications (coaxial and twisted-pair)
  - Signal cable and power line separation
  - Cable labeling and testing
- Cable accessories.

Outdoor runs require additional installation guidelines, including lightning protection. For more information, refer to the signal cable publications listed in the Appendix.

## Cable Requirements and Card Options

Table 1 shows the card requirements for various signal cable types and IBM products.

Table 1. Cable Requirements

<b>IBM Model</b>	<b>Coaxial RG62A/U</b>	<b>150 ohm Shielded Twisted-Pair (22 AWG)<sup>1</sup></b>	<b>150 ohm Shielded Twisted-Pair (26 AWG)<sup>1</sup></b>	<b>Telephone Twisted-Pair Type 3</b>
3270 Cards	BNC	Yes (notes 1 and 3)	Yes (notes 1 and 3)	Yes (notes 2 and 5)
3299 Model 1 or 3274	BNC	Yes (note 1)	Yes (note 3)	Yes (note 2)
3299 Model 2 or 3174	BNC	Yes (note 1)	Yes (note 1)	Yes (note 5)
3299 Model 3	NA	NA	NA	Yes (note 4)

NA = Not applicable

<sup>1</sup> Dual Purpose Connector (DPC)

<sup>2</sup> IBM/ROLM Coax-to-Twisted-Pair Adapter (CTPA)

<sup>3</sup> IBM Cabling System red balun

<sup>4</sup> Modular jack connector

<sup>5</sup> Dual Purpose Connector - T3 (DPC-T3)

## Cable Length Limits

Table 2 shows the length limits of signal cable.

Table 2. Signal Cable Length Limits

	150 ohm Shielded Twisted-Pair (22 AWG)	150 ohm Shielded Twisted-Pair (26 AWG)	Coaxial (RG62A/U)	Telephone Twisted-Pair Type 3
Red Balun both ends (note 1)	2000 ft	1333 ft	N/A	N/A
Red Balun one end (note 1)	3280 ft	2186 ft	N/A	N/A
DPC both ends (note 2)	4920 ft	3333 ft	N/A	N/A
DPC-T3 both ends (note 3)	N/A	N/A	N/A	Yes (note 5)
IBM/ROLM Balun both ends (note 4)	N/A	N/A	N/A	Yes (note 5)
DPC-T3 IBM/ROLM opposite ends	N/A	N/A	N/A	Yes (note 5)
Minimum Length	None	None	None	100 ft
Maximum Length	See above	See above	4920 ft	900 ft

<sup>1</sup> Red Balun is the IBM Coaxial Balun Assembly, P/N 8642546

<sup>2</sup> DPC is the IBM Dual Purpose Connector Attachment Cable, P/N 6339073  
(See the IBM Cabling System Catalog, G570-2040)

<sup>3</sup> DPC-T3 is the IBM 3270 Dual Purpose Connector-to-Twisted-Pair  
(DPC-T3) Adapter (See the IBM 3174 Site Planning Guide, GA23-0213)

<sup>4</sup> See the IBM/ROLM Coax-to-Twisted-Pair Adapter Planning and Installation  
Guide, GA27-3722

<sup>5</sup> The telephone twisted-pair type 3 cable length must be between the minimum  
and maximum lengths.

**Note:** In this book, unless otherwise stated, the word "cable" refers to any of the above cable types.



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## Section 2. The 3270 Card for Personal Computers with Intel 8088 Buses



**DANGER**

To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.



**DANGER**

To avoid shock hazard:

- The power cord must be connected to a properly wired and grounded receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

See Section 5 for national language safety notices.

This section contains information for installing, operating, and testing the 3270 Card for personal computers with an Intel 8088 (AT or PC XT) bus.

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## Operating Requirements

The 3270 Card for personal computers with Intel 8088 buses operates under the same environmental limits as IBM personal computers or compatible system units. See your personal computer documentation for temperature and humidity requirements.

### Dimensions

**Length** 137 mm (5.40 in)

**Height** 116 mm (4.56 in)

### Power Requirements

**Voltage** +5 volts  $\pm 5\%$  (at card socket)

**Current** 600 mA maximum at 5.25 volts

### Heat Output

18 BTU/hour

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## Installing and Operating the Card

This card package consists of:

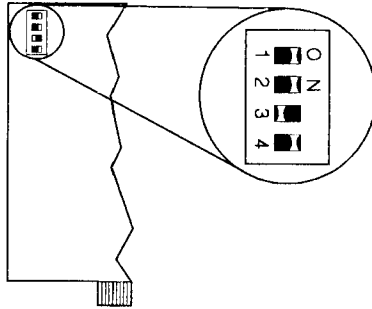
- 3270 Card
- 3270 Card diagnostic diskettes (two sizes)
- This book.

If any item is missing or damaged, notify the place of purchase.

## Installation Instructions

1. Set the power switches for all connected devices to off.
2. Unplug the system unit power cord from the power outlet.
3. Make sure that the switches on the card are set. The switch assembly contains four switches.

**Multiple Cards:** Switches 1 and 2 can be set to allow up to four cards to operate simultaneously within one system unit. The base I/O address range is automatically changed according to these switch settings.



Switch 1 Setting	Switch 2 Setting	Description	Base I/O Address
On	On	First Card	02Dx
Off	On	Second Card	06Dx
On	Off	Third Card	0ADx
Off	Off	Fourth Card	0EDx



**Slot 8 Operation:** Switch 3 allows this card to operate in slot 8 of IBM 5160, 5170 or 5531 PCs. The number is located on the back of the system unit.

Switch 3	Description
On	Operates in slot 8
Off	Operates in any slot other than slot 8

Switch 4 is not used.

**Note:** Steps 4 through 7 are summarized instructions for installing the card. Refer to your personal computer operator's manual for specific feature card installation instructions.

4. Remove the system unit cover.
5. Install the card in the personal computer. The card can be installed in any available expansion slot.
6. Replace the system unit cover.
7. Reconnect the cables.
8. Reconnect the power cords.
9. **Card installation is complete.**

## Operation

How the 3270 Card operates depends on the application software being used. Refer to the documentation that came with your application software for instructions on how to install and use it.

For information on available software for the card, see your personal computer dealer.

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## Diagnostics

The diagnostic programs you use for the 3270 Card are on the diagnostic diskettes. Select the diskette that fits your personal computer.

**Note:** Make a copy of the diagnostic diskette, and store the original.

To load the diagnostic programs:

1. Set the power switches for all external devices to on.
2. If your display has brightness or contrast controls, make sure they are turned fully clockwise. When the power-on self-test (POST) completes, adjust the controls for better viewing.
3. If your system unit has a key lock, make sure it is unlocked.
4. Insert the diagnostic diskette for the 3270 Card in drive A with the label side up and towards you.
5. Set the system unit power switch to on.

When POST completes successfully, the diagnostic programs load, and Menu 1 appears on the display screen (see "Menu 1 (Select an Option)" on page 14).

**Note:** If POST has errors, refer to the hardware maintenance manual for your personal computer.

The following sections show the main diagnostic menus and briefly describe the purpose of each menu option.

## Menu 1 (Select an Option)

THE IBM 3278/79 EMULATION ADAPTER  
DIAGNOSTIC  
Version X.XX  
Copyright IBM Corp XXXX

SELECT AN OPTION

0 - RUN DIAGNOSTIC ROUTINES  
9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED  
?

**0 - RUN DIAGNOSTIC ROUTINES** - Starts the system checkout procedure (goes to Menu 2).

**9 - EXIT TO SYSTEM DISKETTE** - Loads the application program from the diskette in drive A.

## Menu 2 (System Checkout)

This menu appears when option 0 (RUN DIAGNOSTIC ROUTINES) of Menu 1 is selected.

SYSTEM CHECKOUT

- 0 - RUN TESTS ONE TIME
- 1 - RUN TESTS MULTIPLE TIMES
- 2 - LOG UTILITIES
- 9 - EXIT DIAGNOSTIC ROUTINES

ENTER THE ACTION DESIRED  
?

**0 - RUN TESTS ONE TIME** - Runs the diagnostic tests once for problem isolation.

**1 - RUN TESTS MULTIPLE TIMES** - Runs the diagnostic tests the number of times specified in a following menu. This is a system test to detect intermittent problems.

**2 - LOG UTILITIES** - Allows use of the error log and time-of-day functions (goes to Menu 3).

**9 - EXIT DIAGNOSTIC ROUTINES** - Returns to Menu 1.

### Menu 3 (Log Utilities)

This menu appears when option 2 (LOG UTILITIES) on Menu 2 is selected.

#### LOG UTILITIES

- 0 - START ERROR LOG
- 1 - STOP ERROR LOG
- 2 - LIST LOG
- 3 - SET TIME OF DAY
- 4 - DISPLAY TIME OF DAY
- 9 - RETURN FROM UTILITIES

ENTER THE ACTION DESIRED  
?

**0 - START ERROR LOG** - Starts a record of failures detected by diagnostic tests. You can choose to log to diskette, cassette, or printer. If logging to diskette, use a copy of the diagnostics diskette that is not write-protected.

**1 - STOP ERROR LOG** - Stops recording failures detected by diagnostic tests.

**2 - LIST LOG** - Lists, on the screen, the failures contained in error log.

**3 - SET TIME OF DAY** - Allows you to set the current time of day, using a 24-hour clock.

**4 - DISPLAY TIME OF DAY** - If time was not set prior to selecting this option, the elapsed time since the diagnostic program was loaded is displayed.

**9 - RETURN FROM UTILITIES** - Returns to System Checkout (Menu 2).

---

## Problem Determination Procedures



**DANGER**

To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.



**DANGER**

To avoid shock hazard:

- The power cord must be connected to a properly wired and grounded receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

See Section 5 for national language safety notices.

The problem determination procedures (PDP) in this section test the 3270 Card in a personal computer with an Intel 8088 bus.

### Procedures

1. Make sure that the diagnostic diskette is in drive A before setting the system unit power to on.
2. Did the power-on self-test (POST) complete without errors?  
**No** Continue at step 4 on page 18.  
**Yes** Continue at step 3 on page 18.

3. Did the main diagnostic menu screen (Menu 1) appear?

**No** Continue at step 4.

**Yes** Continue at step 5 on page 19.

4. Check the following list to isolate the problem. Run POST after each check to see if the problem is resolved.

- a. Make sure all cables are correctly installed and securely connected.
- b. Refer to the installation instructions in the operator's manual for your personal computer and make sure the card was installed properly.
- c. Make sure that switch 3 is set to OFF and that all other switches are set according to the table on page 11. (If the card is installed in slot 8 of a system unit with a machine type number of 5160, 5170, or 5531, make sure that all switches are set to ON.)
- d. If the problem still persists, have the system unit serviced.

5. Does the display screen now look like the following screen example?

```
THE IBM 3278/79 EMULATION ADAPTER  
DIAGNOSTIC  
Version X.XX  
Copyright IBM Corp XXXX
```

```
SELECT AN OPTION
```

```
0 - RUN DIAGNOSTIC ROUTINES  
9 - EXIT TO SYSTEM DISKETTE
```

```
ENTER ACTION DESIRED  
?
```

- No** Repeat step 1 on page 17 and watch the screen for messages.
- Yes** Press 0 and Enter to run tests.  
Continue at step 6 on page 20.



6. Did the SYSTEM CHECKOUT diagnostic menu appear?

SYSTEM CHECKOUT

- 0 - RUN TESTS ONE TIME
- 1 - RUN TESTS MULTIPLE TIMES
- 2 - LOG UTILITIES
- 9 - EXIT DIAGNOSTIC ROUTINES

ENTER THE ACTION DESIRED  
?

**No** If the screen did not change, try other numeric keys on the keyboard. If the keyboard is not functioning properly, refer to the operator's manual for your personal computer and do the PDP described there.

**Yes** Continue at step 7.

7. Press 0 and Enter to select RUN TESTS ONE TIME.

A message appears stating that the tests are running; run time is approximately 5 to 10 seconds, depending on the type of personal computer being used.

8. Did a 28xx diagnostic error appear on the display screen?

**No** Continue at step 9 on page 21.

**Yes** Check the switches on the card. See step 4 on page 18 for the correct switch settings, and continue from there.

9. Did the SYSTEM CHECKOUT menu appear again?
- No** Continue at step 10.
- Yes** No card problem exists. Proceed to step 21 on page 24.
10. Did a NOT CONNECTED TO CONTROL UNIT message appear?
- No** Have the system unit serviced.
- Yes** Continue at step 11.
11. Is a cable (from a control unit) connected to the card?
- No** A cable must be connected to the card before it can be used.
- If you have a cable, attach the cable and return to step 1 on page 17.
- If a cable is not available, go to step 21 on page 24.
- Yes** Continue at step 12.
12. Disconnect then reconnect the cable to the card.
13. Press Y and Enter to rerun the test.
14. Did the CONNECTED TO CONTROL UNIT message appear?
- No** Continue at step 15 on page 22.
- Yes** Press N and Enter.
- Continue at step 20 on page 24.

15. Has the control unit been made ready (customized) for the card?

If you are unsure, ask your supervisor or the person in charge of host communications in your area.

**No** The control unit must be properly customized before the card can be used. See "Before You Install a Card" on page 6 for more information. Rerun the PDP when the card is connected to a customized control unit.

**Yes** Continue at step 16.

16. Are there other personal computers nearby equipped with the 3270 Card?

**No** Call your supervisor or the person in charge of host communications in your area to report a problem other than the personal computer.

When the problem is resolved, return to this section to rerun the PDP.

**Yes** Continue at step 17 on page 23.

17. Are the other personal computers nearby (equipped with the 3270 Card) functioning properly?

**No** Follow the procedure to report a problem other than the personal computer.

When the problem is resolved, return to this section to rerun the PDP.

**Yes** Disconnect the cable from a card in one of the properly functioning units.

Replace your cable with the one removed from a functioning system unit.

Press Y and Enter to rerun the test.

Continue at step 18.

18. Did the CONNECTED TO CONTROL UNIT message appear?

**No** Reconnect the cables to the original positions.  
Have the system unit serviced.

**Yes** Reconnect the cables to the original positions.

Press Y and Enter to rerun the test.

Continue at step 19 on page 24.

19. Did the CONNECTED TO CONTROL UNIT message appear?

**No** The problem is probably a faulty cable.

Follow your procedures to report a problem that is external to the personal computer.

**Yes** The trouble is probably an intermittent communication problem.

Press N and Enter and continue at step 20.

20. There does not appear to be any problem with the card. See "What to Do Next" for further assistance if the problem still exists.

21. Set the system unit power switch to off.

22. Remove the diagnostic diskette from drive A.

23. Put the diagnostic diskette and this book in the back of your personal computer operator's manual.

## **What to Do Next**

If the problem persists, do the following:

- Follow the PDP in the operator's guide for your personal computer.
- If you have already followed these procedures and you have other options installed, check the documentation that came with the options for PDP.
- Check the documentation that came with the software you are using for PDP.
- If all PDP available have been done and the problem persists, seek technical assistance.

---

## Section 3. The 3270 Card for Personal Computers with Micro Channel Buses



**DANGER**

To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.



**DANGER**

To avoid shock hazard:

- The power cord must be connected to a properly wired and grounded receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

See Section 5 for national language safety notices.

This section contains information for installing and operating the 3270 Card for a personal computer with a Micro Channel bus.

---

## Operating Requirements

The 3270 Card for personal computers with Micro Channel buses operates under the same environmental limits as the IBM Personal System/2 or compatible system units. Refer to your personal computer documentation for temperature and humidity requirements.

### Dimensions

**Length** 137 mm ( 5.40 in)

**Height** 106 mm ( 4.17 in)

### Power Requirements

**Voltage** + 5 volts  $\pm 5\%$  (at card socket)

**Current** 300 mA maximum at 5.25 volts

### Heat Output

18 BTU/hour

---

## Installing and Operating the Card

This card package consists of:

- 3270 Card
- 3270 Card diagnostic diskette
- This book.

If any item is missing or damaged, notify the place of purchase.

## Installation Instructions

The following instructions summarize the installation of a feature card. For specific details, refer to the operator's manual for your personal computer.

**Note:** Personal computers equipped with Micro Channel buses allow you to install more than one 3270 Card.

1. Find the instructions in your personal computer operator's manual for copying a feature. Copy the 3270 Card diskette onto the backup copy of your system's reference diskette.
2. Install the 3270 Card in the computer. The card can be installed in any available expansion slot.
3. Set configuration after installing the 3270 Card by following the instructions in your operator's manual.

## Operation

How the 3270 Card operates depends on the application software being used. Refer to the documentation that came with your application software for instructions on how to install and use the adapter. Keep this book with the documentation supplied with your computer for future reference.

For information on customizing your control unit, see "Before You Install a Card" on page 6. For information on available software for the 3270 Card, see your local personal computer dealer.



---

## Diagnostics

The 3270 Card diagnostics are used to isolate failures in the 3270 Card. These diagnostics are on the diskette that came with the 3270 Card.

Make sure you have completed the procedure in "Installation Instructions" on page 27 before you run the diagnostics.

You should begin the diagnostic procedures by inserting your system's reference diskette and selecting the option that allows you to test the computer. If you are having problems running the diagnostic procedures, refer to the section on solving computer problems in the operator's manual that came with your personal computer.

**Note:** If you encounter a message with the number 28xx (where xx may be any 2-digit number), replace your 3270 Card and rerun the diagnostics.

---

## Section 4. Maintenance and Service



**DANGER**

To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.



**DANGER**

To avoid shock hazard:

- The power cord must be connected to a properly wired and grounded receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

See Section 5 for national language safety notices.

This section contains information to be used by service personnel to isolate failures of the 3270 Card.

For system failures, go to the hardware maintenance manual for the personal computer.

---

## Safety Inspection Guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions related to card maintenance. Good judgment should be used to identify potential safety hazards not covered by this inspection guide.

If any unsafe conditions are present, a determination must be made about how serious the apparent hazard can be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power: Primary voltage on the frame can cause serious or fatal electrical shock.
- Explosive hazards: A damaged CRT face or capacitor can cause serious injury.
- Mechanical hazards: Loose or missing hardware can cause serious injury.

The guide consists of a series of checks.

1. Set the power switches for all personal computer components to off.
2. Disconnect all power cords from the power receptacles.
3. Check exterior covers for damage (loose, broken, or sharp edges).
4. Check power cords for the following:
  - Each power cord must have a third-wire ground connector in good condition. Use a meter to measure third-wire ground resistance for 0.1 ohm or less between the external ground pin and the frame ground as specified in the system hardware maintenance manual.
  - The cord set should be the appropriate molded type as specified in the system hardware maintenance manual.
  - The insulation must not be frayed or worn.

5. Refer to the operator's manual or hardware maintenance manual for the personal computer being serviced for the proper system unit cover removal procedures.
6. Check for any obvious unsafe alterations. Use good judgment as to the safety of any alterations.
7. Check inside the unit for any obvious unsafe conditions, such as: metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
8. Check for worn, frayed, or pinched cables. Ensure the voltage specified on the voltage tag (back panel of the unit) matches the voltage of the power receptacle. If in doubt, verify the voltage.
9. Examine the power supply and verify the following:
  - That the input voltage selection switch is set correctly on the universal power supplies.
  - That nonremovable fasteners in the power-supply cover have not been removed or tampered with.
  - That the grommet is installed where the internal power cables come through the frame of the power supply.
10. Check for the following labels:
  - On all system power supplies:

“Caution Hazardous Area. Do Not Remove This Cover. Trained Service People Only. No Serviceable Components Inside.”
  - If your system has a battery unit:

“Warning: Do not dispose of the battery unit in fire or water. See instructions for disposal in the battery installation instructions.”

“Check the condition of the battery.”



---

# Section 5. National Language Safety Notices



**VARNING**

För att undvika elolycksfall ska du aldrig koppla in eller ur kablar eller utföra installation, underhåll eller omkonfigurering av denna produkt vid åskväder.



**VARNING**

För att undvika elolycksfall:

- Nätkabeln måste anslutas till ett korrekt kopplat jordat eluttag.
- Även utrustning till vilken denna produkt ska anslutas måste vara ansluten till korrekt kopplade uttag.

**FARA:**

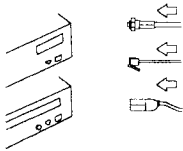
Elström från telefon-, kommunikations- och nätkablar kan vara farlig. För att undvika elolycksfall, koppla in eller ur kablar så som visas nedan när du installerar, flyttar eller öppnar kåporna på denna produkt eller anslutna enheter.

**Vid anslutning**

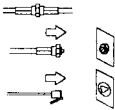
Stäng av all utrustning.



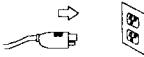
Anslut alla kablar till enheterna.



Anslut signalkablarna till uttagen.



Anslut nätkabeln till eluttaget.



Sätt på enheten.

**Vid urkoppling**

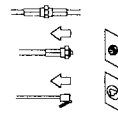
Stäng av all utrustning.



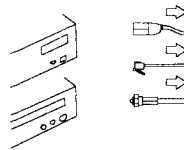
Lossa nätkabeln från eluttaget.



Lossa signalkablarna från uttagen.



Lossa alla kablar från enheterna.







**FARE**

For å unngå elektrisk støt må ikke kabler koples til eller fra. Du må heller ikke foreta installering, vedlikehold eller rekonfigurering av dette produktet under tordenvær.



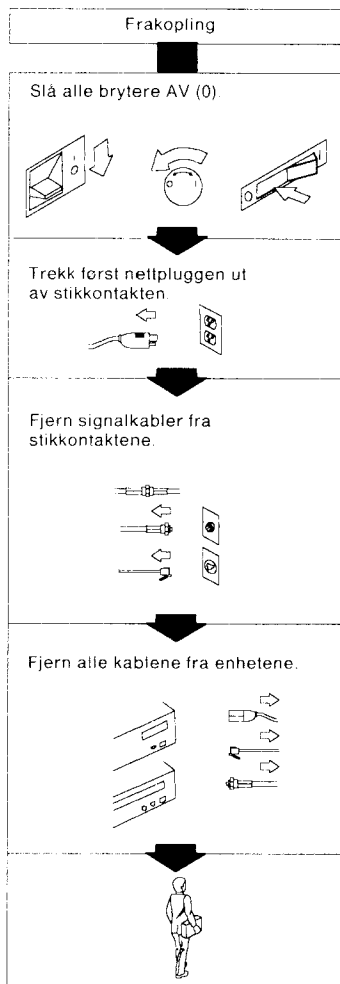
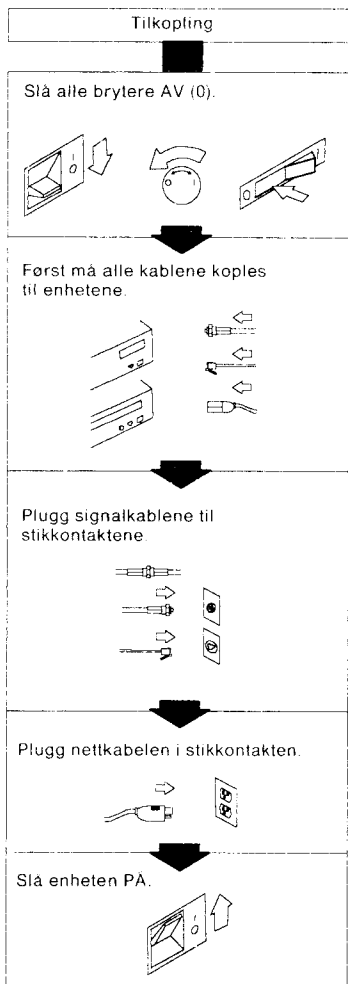
**FARE**

For å unngå elektrisk støt:

- Nettkabelen må være plugget i en korrekt koplet og jordet stikkontakt.
- Alt utstyr som er koplet til dette produktet må være plugget i en korrekt koplet stikkontakt.



**FARE:** Elektrisk strøm fra nett-, telefon- og kommunikasjonskabler medfører fare. For å unngå sjokkrisiko må kablene kobles til og fra slik det er vist på tegningen når du installerer, flytter eller åpner dekslene på dette produktet eller på enheter som er knyttet til det.





**PAS PÅ!**

For at undgå elektrisk stød, må kabler ikke tilsluttes eller afmonteres i tordenvejr. Desuden må produktet hverken installeres, vedligeholdes eller omkonfigureres i tordenvejr.



**PAS PÅ!**

Følgende regler skal overholdes:

- Netledningen skal tilsluttes en korrekt monteret stikkontakt med jordforbindelse.
- Eventuelt udstyr, som dette produkt tilsluttes, skal også tilsluttes korrekt monterede stikkontakter.



**PAS PÅ!**

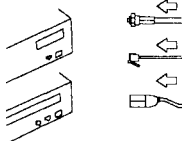
Elektrisk strøm fra el-, telefon- og kommunikationskabler er farlig. Monter og afmonter kabler som vist nedenfor, når dæksler på denne maskine skal installeres, flyttes eller åbnes.

### Ved montering

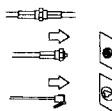
Sluk for alt udstyr.



Tilslut alle kabler til enheder.



Sæt signalkablerne i vægudtagene.



Sæt netledningen i stikkontakten.



Tænd.



### Ved afmontering

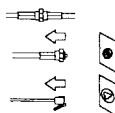
Sluk for alt udstyr.



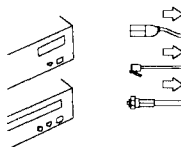
Tag netledningen ud af stikkontakten.



Tag signalkablerne ud af vægudtagene.



Tag alle kablerne ud af enhederne.





**GEVAAR**

Om het gevaar voor elektrische schokken te vermijden, geen kabels aansluiten of loskoppelen en dit product niet installeren, onderhouden of opnieuw instellen tijdens een onweer.



**GEVAAR**

Om elektrische schokken te vermijden:

- moet het netsnoer aangesloten zijn op een correct bedraad en geaard stopcontact.
- moeten alle machines waarmee dit product zal worden verbonden ook op correct bedrade stopcontacten zijn aangesloten.

**GEVAAR:**

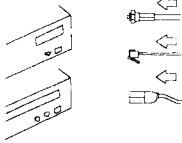
Elektrische stroom van netsnoeren, telefoondraden en communicatiekabels is gevaarlijk. Wanneer u deze machine of hierop aangesloten randapparatuur installeert of verplaatst en bij het openen van de kappen van deze machines moet u, om elektrische schokken te vermijden, de kabels aansluiten en loskoppelen zoals op de tekening wordt getoond.

**Hoe aansluiten**

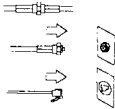
Schakel alles UIT.



Sluit eerst alle kabels aan op de machines.



Sluit de signaalkabels aan op de stopcontacten.



Sluit het netsnoer aan op het stopcontact.



Schakel de machine in.

**Hoe loskoppelen**

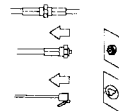
Schakel alles UIT.



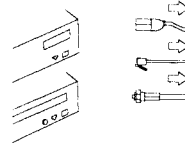
Koppel het netsnoer los van het stopcontact.



Koppel de signaalkabels los van de stopcontacten.



Koppels alle kabels van de machines los.





**PAS OP**

Om het risico van een elektrische schok te vermijden, dient u tijdens onweer geen kabels te ontkoppelen of aan te sluiten, noch installatie-, onderhouds- of reconfiguratie-werkzaamheden aan dit produkt te verrichten.



**PAS OP**

Om het risico van een elektrische schok te vermijden:

- dient het netsnoer gekoppeld te zijn aan een correct aangesloten stopcontact met randaarde;
- moet elk apparaat waarmee dit product verbonden wordt ook gekoppeld zijn aan een correct aangesloten stopcontact.



**PAS OP:**

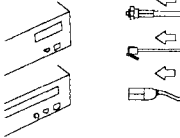
Elektriciteit kan gevaarlijk zijn.  
Volg onderstaande stappen voor aansluiten  
en loskoppelen van kabels en snoeren  
voordat u de computer of randapparatuur  
installeert, verplaatst of openmaakt.

### Aansluiten

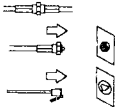
Zet alles UIT.



Sluit eerst alle kabels aan op de apparatuur.



Sluit alle signaalkabels aan op de aansluitpunten.



Sluit het netsnoer aan op het stopcontact.



Zet apparaat AAN.



### Loskoppelen

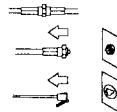
Zet alles UIT.



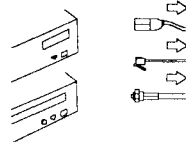
Verwijder eerst het netsnoer uit het stopcontact.



Verwijder alle signaalkabels uit de aansluitpunten.



Verwijder alle kabels uit de apparatuur.







**VORSICHT**

Um gefährliche Spannungen zu vermeiden, dürfen während eines Gewitters an diesem Gerät keine Kabel angeschlossen oder gelöst werden, ferner keine Installation, Wartung oder Rekonfiguration durchgeführt werden.



**VORSICHT**

**Aus Sicherheitsgründen**

- darf das Netzkabel nur an eine Schutzkontaktsteckdose angeschlossen werden.
- dürfen für den Anschluß anderer Geräte an den Drucker auch nur Schutzkontaktsteckdosen verwendet werden.



## Elektrische Sicherheit:

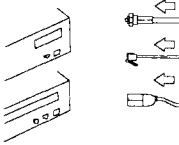
Gefährliche Spannungen an Netz-, Telefon- und Übertragungskabeln. Bei Installation, Transport oder Öffnen des Gerätegehäuses oder angeschlossenen Einheiten die Kabel wie abgebildet anschließen bzw. lösen. Bei Gewittern dürfen keine Kabel angeschlossen bzw. gelöst werden.

### Verbindungen anschließen

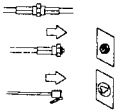
Alle Netzschalter ausschalten.



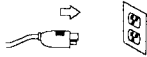
Zuerst alle Kabel an Einheiten,



dann Signalkabel



und Netzkabel an Steckdosen anschließen.



Gerät einschalten.



### Verbindungen lösen

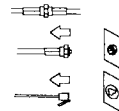
Alle Netzschalter ausschalten.



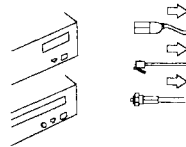
Zuerst Netzkabel



und Signalkabel von Steckdosen,



dann alle Kabel von Einheiten lösen.





**VAARA**

Älä kytke tai irrota kaapeleita äläkä asenna tai huolla tätä laitetta tai muuta sen kokoonpanoa ukonilman aikana.



**VAARA**

**Sähköiskun vaara:**

- Tämän laitteen virheetön ja turvallinen toiminta vaatii, että se kytketään vain maadoitettuun pistorasiaan.
- Myös kaikki lisälaitteet on kytkettävä maadoitettuun pistorasiaan.

**VAARA:**

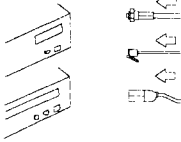
Sähkö-, puhelin- ja tietoliikennekaapeleissa voi esiintyä vaarallisia jännitteitä. Kytke ja irrota kaapelit ohjeiden mukaan, kun asennat tai siirrät tätä laitetta tai siihen liitettyjä oheislaitteita tai kun avaat niiden kansia.

**Kytentä**

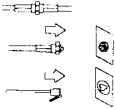
Käännä kaikki O-asentoon.



Kytke ensin kaapelit laitteisiin.



Kytke signaali-kaapelit vastakkeisiin.



Kytke verkkojohto pistorasiaan.



Kytke virta.

**Irrutus**

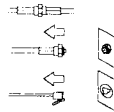
Käännä kaikki O-asentoon.



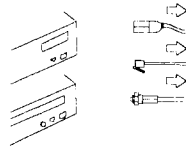
Irrota ensin verkkojohto pistorasiasta.



Irrota signaali-kaapelit vastakkeista.



Irrota kaapelit laitteista.





**DANGER**

**Pour écarter tout risque de choc électrique, évitez de brancher ou de débrancher des câbles, et de procéder à l'installation, la maintenance ou la reconfiguration du présent produit pendant un orage.**



**DANGER**

**Pour écarter tout risque de choc:**

- **Le cordon d'alimentation doit être connecté à une prise correctement câblée et mise à la terre.**
- **Tout équipement auquel sera rattaché ce produit doit également être connecté à des prises correctement câblées.**



**DANGER:**

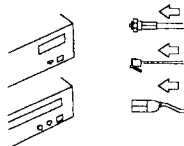
Le courant électrique transmis par les cordons d'alimentation et les câbles de téléphone et de transmission peut être dangereux. Pour éviter tout risque de choc électrique, suivez les indications ci-après pour connecter et déconnecter les câbles lors de l'installation ou du déplacement du présent produit ou de ses périphériques, ou lorsque vous ouvrez les couvercles de ces unités.

### Connecter

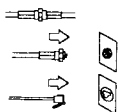
Mettre toutes les unités hors tension.



D'abord, connecter tous les câbles aux unités.



Connecter les câbles de transmission aux prises.



Connecter le cordon d'alimentation à la prise.



Mettre l'unité sous tension.

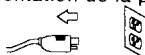


### Déconnecter

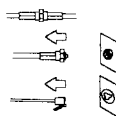
Mettre toutes les unités hors tension.



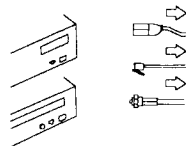
D'abord, déconnecter le cordon d'alimentation de la prise.



Déconnecter les câbles de transmission des prises.



Déconnecter tous les câbles des unités.





**DANGER**

Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.



**DANGER**

Pour éviter tout risque de choc électrique :

- Le cordon d'alimentation doit être branché sur une prise d'alimentation correctement câblée et mise à la terre.
- D'autre part, tout le matériel connecté à ce produit doit également être branché sur des prises d'alimentation correctement câblées et mises à la terre.



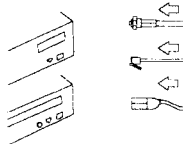
**DANGER :** Le courant électrique provenant des câbles d'alimentation, téléphoniques et de transmission peut présenter un danger. Pour éviter tout risque de choc électrique, connectez et déconnectez ces câbles comme indiqué ci-dessous lorsque vous installez ou déplacez ce matériel ou les unités connectées, ou que vous soulevez un carter.

### Pour connecter

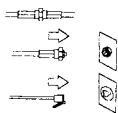
Mettez tout hors tension.



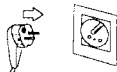
Connectez d'abord tous les câbles sur les unités.



Connectez les câbles de signaux sur les prises murales.



Branchez le cordon d'alimentation sur la prise murale.



Mettez l'unité sous tension.



### Pour déconnecter

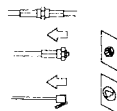
Mettez tout hors tension.



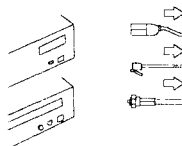
Débranchez d'abord le cordon d'alimentation de la prise murale.



Déconnectez les câbles de signaux des prises murales.



Déconnectez tous les câbles des unités.







**DANGER**

Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.



**DANGER**

Pour éviter tout risque de choc électrique :

- Le cordon d'alimentation doit être branché sur une prise d'alimentation correctement câblée et mise à la terre.
- D'autre part, tout le matériel connecté à ce produit doit également être branché sur des prises d'alimentation correctement câblées et mises à la terre.

**DANGER :**

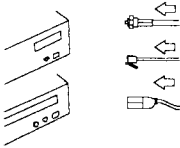
Le courant électrique provenant des câbles d'alimentation, téléphoniques et de transmission peut présenter un danger. Pour éviter tout risque de choc électrique, connectez et déconnectez ces câbles comme indiqué ci-dessous lorsque vous installez ou déplacez ce matériel ou les unités connectées, ou que vous soulevez un carter.

**Pour connecter**

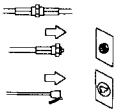
Mettez tout hors tension.



Connectez d'abord tous les câbles sur les unités.



Connectez les câbles de signaux sur les prises murales.



Branchez le cordon d'alimentation sur la prise murale.



Mettez l'unité sous tension.

**Pour déconnecter**

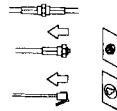
Mettez tout hors tension.



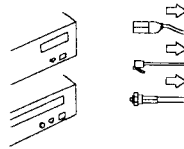
Débranchez d'abord le cordon d'alimentation de la prise murale.



Déconnectez les câbles de signaux des prises murales.



Déconnectez tous les câbles des unités.





**PERICOLO**

**Per evitare scosse elettriche, non collegare o scollegare cavi o effettuare installazioni, riconfigurazioni o manutenzione di questo prodotto durante un temporale.**



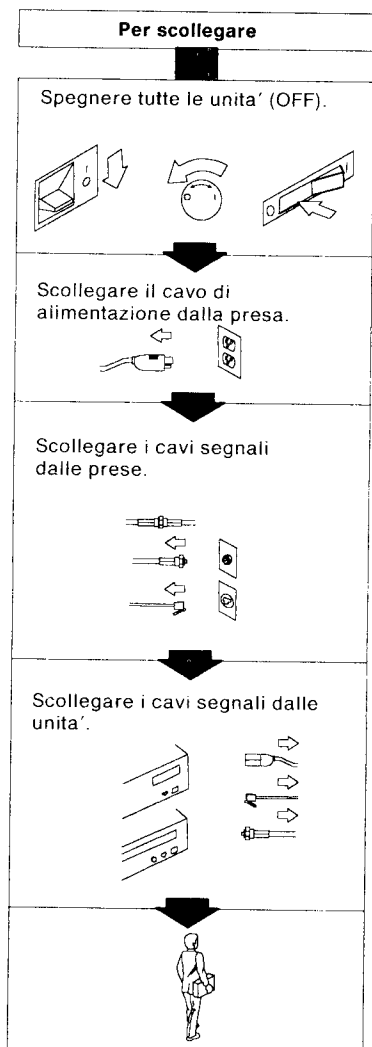
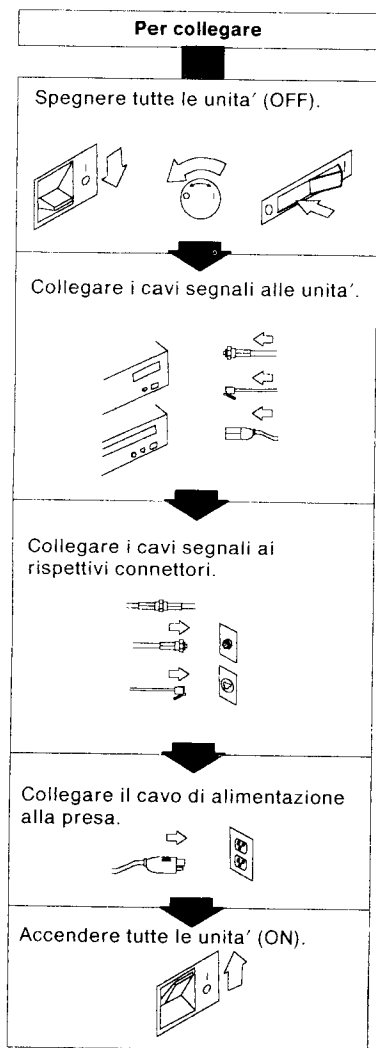
**PERICOLO**

**Per evitare scosse elettriche:**

- **Il cavo di alimentazione deve essere collegato a una presa munita di terra di sicurezza e propriamente cablata.**
- **Tutte le unita' esterne di questo prodotto, devono essere collegate a prese munite di terra di sicurezza e propriamente cablate.**



**PERICOLO:** La corrente elettrica di alimentazione del telefono e dei cavi di comunicazione e' pericolosa. Per evitare scosse elettriche collegare e scollegare i cavi, nella sequenza mostrata in figura, quando si installa, si trasporta o si tolgono i coperchi di questo prodotto o delle unita' ad esso collegate. Non maneggiare i cavi di interconnessione durante temporali.





**PERIGO**

**Para evitar choques eléctricos, não ligue nem desligue cabos ou efectue instalações, manutenção ou reconfiguração deste produto durante uma trovoada.**



**PERIGO**

**Para evitar perigos de choque electrico:**

- **O cabo de corrente eléctrica tem que ser ligado a uma tomada com os fios montados correctamente e com boa ligação de terra.**
- **Todo o equipamento a que este produto seja ligado terá também que estar ligado a tomadas com os fios montados correctamente.**



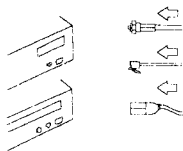
**PERIGO:** A corrente eléctrica proveniente de cabos de energia eléctrica, de telefone e de comunica[c]oe pode ser perigosa. Para evitar choques eléctricos, siga as instru[c]oes abaixo indicadas quando instalar, deslocar, ou abrir as tampas deste produto ou de dispositivos a ele ligados.

### Para ligar

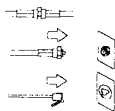
Desligue tudo.



Primeiro, ligue todos os cabos aos dispositivos.



Ligue os cabos de sinal às respectivas tomadas.



Ligue o cabo de corrente eléctrica à tomada.



Ligue o interruptor do dispositivo (on).



### Para desligar

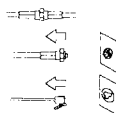
Desligue tudo.



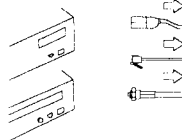
Primeiro, desligue o cabo de corrente eléctrica da tomada.



Desligue os cabos de sinal das respectivas tomadas.



Desligue todos os cabos dos dispositivos.





**PELIGRO**

**Para evitar peligro de descargas, no conecte o desconecte ningún cable, ni realice ninguna instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica.**



**PELIGRO**

**Para evitar peligro de descargas:**

- **El cable de alimentación debe estar conectado a una toma de alimentación adecuadamente cableada y con toma de tierra.**
- **Cualquier equipo al cual se conecte este producto debe estar también conectado a tomas de alimentación adecuadamente cableadas.**

**PELIGRO:**

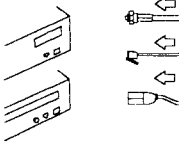
La corriente eléctrica de la alimentación, teléfono y cables de comunicación es peligrosa. Para evitar peligro de descargas cuando instale, mueva o abra las cubiertas de este producto o de un disp. conectado, conecte y desconecte los cables tal como se muestra a continuación.

**Para Conectar**

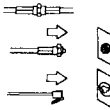
Apague Todo.



Primero, conecte todos los cables a los dispositivos.



Conecte los cables de señal a los receptáculos.



Conecte el cable de alimentación a la toma de alimentación.



Encienda el dispositivo.

**Para Desconectar**

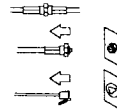
Apague Todo.



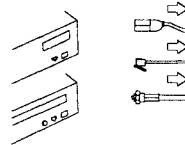
Primero, quite el cable de la toma de alimentación.



Quite los cables de señal de los receptáculos.



Quite todos los cables de los dispositivos.







**PERIGO**

Para evitar choque elétrico, não conecte ou desconecte qualquer cabo ou faça instalação, manutenção, ou reconfiguração deste produto quando houver relâmpagos.



**PERIGO**

Para evitar risco de choque:

- O cabo de força tem que estar conectado a uma tomada com fios adequados e corretamente aterrada.
- Qualquer equipamento, ao qual este produto será acoplado, também deverá estar conectado a tomadas com fios adequados.



**PERIGO:**

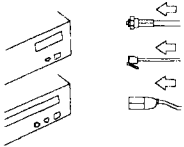
A corrente elétrica dos cabos de força, telefônicos, e de comunicação é perigosa. Para evitar risco de choque elétrico, ligue e desligue os cabos, como mostrado abaixo ao instalar, mover, ou abrir as tampas deste produto ou dos dispositivos acoplados.

Para ligar,

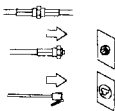
DESLIGUE tudo.



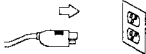
Primeiro, ligue todos os cabos aos dispositivos.



Ligue os cabos de sinal às tomadas.



Ligue o cabo de força à tomada.



LIGUE o dispositivo.



Para desligar,

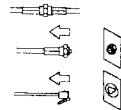
DESLIGUE tudo.



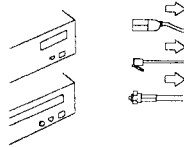
Primeiro, remova o cabo de força da tomada.



Remova os cabos de sinal das tomadas.



Remova todos os cabos dos dispositivos.





危険

雷が発生している間は、感電による危険を避けるために、ケーブルを接続したり、取り外したりしないでください。また、この製品の設置、保守、あるいは再構成を行なわないでください。



危険

感電による危険を避けるためには、

- 電源コードは正しく配線された接地（アース）極付きコンセントに接続する必要があります。
- この製品が接続される機器もすべて、正しく配線されたコンセントに接続する必要があります。



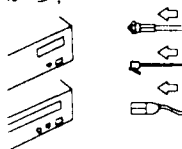
**危険：** 電源コード、電話回線、および通信ケーブルに流れている電流は危険です。感電による危険を避けるために、この製品またはそれに接続されている装置の設置、移動、またはカバーの取外しを行なう場合には、必ず以下に示す方法でケーブルの取外しおよび取付けを行なってください。

### 接 続

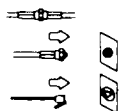
すべてのスイッチをオフにする。



まず装置にケーブルをすべて接続してから、



信号ケーブルをレセプタクルに接続する。



電源コードをコンセントに接続する。



装置をオンにする。



### 切 断

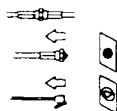
すべてのスイッチをオフにする。



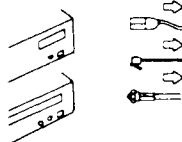
まずコンセントから電源コードを取り外してから、



信号ケーブルをレセプタクルから取り外す。



ケーブルをすべて装置から取り外す。





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## Appendix. Related Publications

- *IBM 3270 Character Set Reference*, GA27-2837
- *IBM 3270 Information Display System: 3274 Control Unit Description and Programming Guide*, GA23-0061
- *IBM 3270 Information Display System Data Stream Programmer's Reference*, GA23-0059
- *IBM 3270 Information Display System: 3174 Control Unit Functional Description*, GA23-0218
- *IBM Personal Computer Technical Reference* (for the user's system)
- *IBM Personal Computer Disk Operating System: Technical Reference*
- *IBM 3270 Information Display System: Introduction*, GA27-2739
- *IBM 3270 Information Display System: Installation Manual-Physical Planning*, GA27-2787
- *IBM 3270 Information Display System: IBM 3299 Terminal Multiplexer Product Information*, G520-4216
- *IBM 3270 Information Display System Library User's Guide*, GA23-0058
- *Electrical Safety for IBM Service Representatives*, S229-8124
- *Safety/Health Guidelines for IBM Service Representatives*, S241-5493
- *A Building Planning Guide for Communications Wiring*, G230-8059
- *IBM Cabling System Planning and Installation Guide*, GA27-3361
- *IBM Cabling System Catalog*, G570-2040
- *IBM/IOLM 3270 Coax-to-Twisted-Pair Adapter Planning and Installation Guide*, GA27-3722
- *Installation and Assembly of Coaxial Cable and Accessories*, GA27-2805
- *Using the IBM Cabling System with Communication Products*, GA27-3620.



---

## List of Abbreviations and Acronyms

<b>ASCII</b>	American National Standard Code for Information Interchange	<b>DOS</b>	Disk operating system
<b>AWG</b>	American Wire Gage	<b>HEX</b>	Hexadecimal
<b>CPU</b>	Central processing unit	<b>I/O</b>	Input/output
<b>CRT</b>	Cathode ray tube display	<b>PDP</b>	Problem determination procedures
<b>CUT</b>	Control unit terminal mode	<b>POR</b>	Power-on reset
<b>DFT</b>	Distributed function terminal mode	<b>POST</b>	Power-on self-test
		<b>RAM</b>	Random access memory





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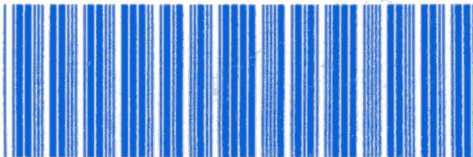
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GA27-3913-00

**IBM**  
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