5308 ASCII to 5250 Connection

Planning, Installation, and Maintenance Guide

G571-0023-03

5308 ASCII to 5250 Connection

Planning, Installation, and Maintenance Guide

G571-0023-03

Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page xi.

Fourth Edition (October 1998)

This is a revision of, and obsoletes, G571-0023-02.

This edition applies to the IBM 5308 ASCII to 5250 Connection Version 1.0 and to all subsequent releases and modifications until otherwise indicated in new editions.

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Machine: IBM 5308 ASCII to 5250 Connection

Warranty Period*: 1 Year

**Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

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To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-IBM-SERV (426-7378)**. In Canada, call IBM at **1-800-465-6666**. You may be required to present proof of purchase.

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You agree to:

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2. where applicable, before service is provided —
   a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
   b. secure all programs, data, and funds contained in a Machine, and
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Contents

USA/CANADA Hardware Warranty Statement iii

Notices xi
Canadian “Industry Canada” Notice xiii
Warranty and Repair Service in Canada xiii
Étiquette d'homologation du ministè des Communications du Canada . . . xiv
Technical Support xv
Trademarks xvi

Preface xvii
About This Book xvii
Changes Since This Book Was Published xvii
How This Book Is Organized xviii
Related Publications xix

Planning, Installing, and Configuring Your Installation

Chapter 1. Introducing the 5308 1-1
Product Highlights 1-2
Key Requirements 1-3
Shared Addressing 1-4
5308 PC Terminal Program 1-4
Supported Workstations 1-4
Supported Modems 1-5
Product Specifications 1-5
Physical Specifications 1-5
Operating Environment 1-5
Power Supply 1-6
Electrical Wiring Requirements 1-6

Chapter 2. Planning Your Installation 2-1
Laying Out Your Installation 2-1
Determining Cable Lengths 2-1
Maximum Number of Workstations 2-2
Making the Connection Between the 5308 and the Host 2-2
Direct Connection to the Host 2-2
Twinaxial Cabling 2-3
IBM Cabling System 2-3
Unshielded Twisted Pair Cabling 2-4
Connection through a Remote Control Unit 2-4
Connection through a Twinax Hub 2-5
Making the Connection Between the Workstation and the 5308 2-6
Direct Connection 2-7
Connection through an Internal Modem (5308-0M2) 2-7
Connection through an External Modem 2-8
Flow Control 2-8
Security, Auditability and Control 2-9
Your Installation Plan 2-9
Ordering Information 2-9

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Chapter 3. Installing the 5308 3-1
Tools 3-1
Hardware Checklist 3-1
Labeling Cables 3-2
Arranging the Parts of Your Installation 3-2
Back View of the 5308 3-2
Making the Connection Between the 5308 and the Host 3-4
Direct Connection to the Host 3-4
Connection to the Host through a Remote Control Unit 3-5
Connection to the Host through a Twinax Hub 3-6
Making the Connection Between the Workstation and the 5308 3-6
Direct Connection to the 5308 3-7
Connection to the 5308 through an Internal Modem (5308-0M2) 3-7
Connection to the 5308 through an External Modem 3-8
Front View of the 5308 3-8
Verifying the Voltage Switch Setting 3-9
Installing the System Diskette 3-10
Powering On the 5308 3-10

Chapter 4. Performing the Initial Configuration of the 5308 4-1
Configuring the Host and the Workstations 4-1
Configuring the Host for ASCII Devices 4-1
Configuring the Workstations 4-1
The Operator's Console 4-1
Accessing the Operator's Console 4-2
Using the Menus and Screens 4-2
Menu and Screen Commands 4-2
Using the Keylock on the 5308 4-3
System Administrator Mode Password 4-3
The Factory Shipped Password 4-3
Changing the Password 4-3
Using the Factory Default Configuration 4-4
Factory Default Configuration Settings 4-5
Auto Baud 4-6
The Initial Configuration of the 5308 4-6
Workstation Settings Required for Initial Configuration 4-6
Procedure for Performing the Initial Configuration 4-7

Chapter 5. Using the 5308 Configuration Program 5-1
Asynchronous Communication Configuration 5-2
ASCII Terminal Type 5-2
Communications 5-2
Modem Type/Commands 5-4
5250 Device Configuration 5-5
Enable/Disable Station Addresses 5-5
Station Address x Configuration 5-6
Working with Translation Tables 5-7
About Translation Tables 5-8
Host Character to ASCII Character Translations 5-9
ASCII Keyboard Character to Host Characters 5-12
Workstation Keyboard to Host Function Keys 5-15
Customization Problems 5-17
Saving 5308 Configuration Changes 5-17
Rebooting the 5308 5-18

Emergency Configuration Procedure 5-19
Keyboard Support 5-19

Service and Maintenance

Chapter 6. 5308 Service Manual 6-1
Start Here 6-1
Running Basic Assurance Tests 6-1
Isolating and Replacing Faulty FRUs 6-4
Power Supply 6-4
Symptoms 6-4
Solutions 6-4
Replacement Procedure 6-5
Twinax Communications Card 6-5
Symptoms 6-5
Solutions 6-5
Replacement Procedure 6-5
Downlevel Twinax Communication Card 6-7
Symptom 6-7
Solutions 6-7
Too Many Twinax Communication Cards 6-7
Symptoms 6-7
Solutions 6-7
Memory Module 6-8
Symptom 6-8
Solutions 6-8
Replacement Procedure 6-8
Cover 6-8
Removal/Replacement Procedure 6-8
Video Adapter 6-9
Symptom 6-9
Solution 6-9
Replacement Procedure 6-9
Planar 6-9
Symptoms 6-9
Solutions 6-10
Replacement Procedure 6-10
Configuration Card 6-20
Symptoms 6-20
Solutions 6-20
Replacement Procedure 6-20
Multiport RS-232 Card (5308-007 Only) 6-21
Symptoms 6-21
Solutions 6-21
Replacement Procedure 6-21
Internal Modem 6-22
Symptoms 6-22
Solutions 6-22
Replacement Procedure 6-22
Diskette Drive 6-23
Symptoms 6-23
Solutions 6-23
Replacement Procedure 6-23

Downlevel System Diskette 6-24
Symptom 6-24
Solution 6-24
Service Parts 6-25

Reference Information

Chapter 7. Installing the 2- to 7-Port Upgrade 7-1
Hardware Checklist 7-1
Tools 7-2
Before Starting 7-2
Installation Procedure 7-2

Chapter 8. Wiring Diagrams 8-1
Straight-Through Cables (Direct Connection to DCE Modems) 8-2
Null Modem Cables (Directly Connecting DTE Terminals) 8-3
Using Software Flow Control 8-4
Using Hardware Flow Control 8-5
Wrap Plug 8-6

Chapter 9. Choosing a Modem Initialization String 9-1
Selecting Your Modem Type 9-1
Asynchronous Operation 9-2
Hayes Command Set (AT Commands) 9-2
Data Set Ready Settings 9-2
Guidelines for Modem Initialization Settings 9-2
Switched Line Operation 9-5
Leased Line Operation 9-5
Suggested Modem Hang-Up Strings 9-6

Chapter 10. Code Page Tables 10-1
ASCII 819 Code Page 10-2
EBCDIC Code Pages 10-3
Code Page 037 10-3
Code Page 273 10-4
Code Page 277 10-5
Code Page 278 10-6
Code Page 280 10-7
Code Page 284 10-8
Code Page 285 10-9
Code Page 297 10-10
Code Page 500 10-11
Code Page 871 10-12

Chapter 11. Planning Forms 11-1
Host Information Form 11-1
5250 Device Configuration Forms 11-2
Cabling Forms 11-5
5308 Configuration Forms 11-7

Chapter 12. Troubleshooting 12-1
Boot Sequence 12-1
Boot Sequence Detected a Problem 12-2

Checking Connections 12-2
Between the 5308 and the Host 12-2
Between the 5308 and the Workstation 12-3
Checking Configurations 12-3
Host Configuration 12-4
5308 Configuration 12-4
Data Set Ready Settings for Modems 12-6
Workstation Configuration 12-6
Keyboard Problems 12-7
Hex Function 12-7
VT100/VT220 Function Mapping 12-7
Display Problems with non-US Character Sets 12-7
Running the Diagnostics 12-8
RS-232-C Wrap Diagnostics 12-8
What the Wrap Diagnostics Do 12-8
When to Run the Wrap Diagnostics 12-8
How to Run the Wrap Diagnostics 12-8
Twinax Communications Card Diagnostics 12-10
What the Twinax Communications Card Diagnostics Do 12-10
When to View the Results of the Twinax Communications Card Diagnostics 12-10
How to View the Results of the Twinax Communications Card Diagnostics 12-10
Error Messages 12-10
Accessing the System Administrator Mode 12-11
Configuration 12-12
Testing 12-14
Contacting IBM for 5308 Service 12-15

Bibliography X-1

Glossary X-3

Index X-7

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You can make a copy of the 5308 PC Terminal Program for each workstation that is attached to the 5308.

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The following FCC statement applies to the **IBM 5308 ASCII to 5250 Connection**:

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.

CISPR 22/European Standard EN 55022 (CE MARK)

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Industry Canada Compliance Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled: *Digital Apparatus*, ICES-003 of Industry Canada.

Avis de conformité aux normes d'Industrie Canada

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouiller : *Appareils numériques*, NMB-003 édictée par Industrie Canada.

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The Canadian “Industry Canada” Department of Communications (The I.C. label identifies certified equipment). This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. Industry Canada does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, make sure you are permitted to connect it to the facilities of the local telecommunications company. You must install the equipment using an acceptable method of connection. In some cases, you may also extend the company's inside wiring for single line individual service by means of certified connector assembly (telephone extension cord). You should be aware however, that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian Maintenance Facility designated by the supplier. Any repairs or alterations made by a user to this equipment, or equipment malfunctions, may give the telephone communications company cause to request the user to disconnect the equipment. For your own protection, make sure that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION:
Do not attempt to make electrical ground connections yourself. Contact the appropriate electrical inspection authority or electrician.

The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices, subject to the requirement that the total load numbers of all the devices does not exceed 100.

Warranty and Repair Service in Canada

Attention: IBM Support Center
IBM Corporation
1-800-565-3344

Étiquette d'homologation du ministè des Communications du Canada

AVIS: L'étiquette du ministère des Communications du Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause d'un mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisation d'eau métalliques, s'ily y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: l'utilisateur ne doit pas tenter de faire ces raccordements lui-même, il doit avoir recours à un service d'inspection des installations électriques ou à un électricien, selon le cas.

L'INDICE DE CHARGE (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordé à un circuit téléphonique bouclé utilisé par ce dispositif. L'extrémité du circuit bouclé peut consister en n'importe quelle combinaison de dispositifs pourvu que la somme des INDICES DE CHARGE de l'ensemble des dispositifs ne dépasse pas 100.

Technical Support

Installation and technical support, including problem diagnosis and resolution, is provided by the IBM 5250 Emulation Support Center in Charlotte, North Carolina. This support is accessed in call-back mode through the IBM Support Center. In the United States, you may call the **IBM Support Center at 1-800-237-5511** anytime; ask that your call be routed to the 36WSEM, location 153 area of RETAIN. You will receive a return call within eight business hours (Monday-Friday, 8:30 a.m.-5:00 p.m., eastern time).

If you get an automated response when you call the IBM Support Center, select the **AS/400** option. *The 5308 ASCII to 5250 Connection does not require a support contract.*

The IBM 5250 Technical Support Center also maintains a bulletin board system (BBS) that contains tips, user information, and program updates. The BBS is available 24 hours a day. You can call the IBM 5250 Technical Support Center BBS at 704-594-3799 anytime using an asynchronous modem. The BBS supports communications up to 14.4KB with 8 bits, no parity, and 1 stop bit.

You might also be able to obtain corrective service and information from the PC Company BBS at 1-919-517-0001. The BBS supports communications up to 14.4KB with 8 bits, no parity, and 1 stop bit. This BBS is mirrored on the Internet as follows:

`FTP.PCCO.IBM.COM`

Program updates might also be available through the World Wide Web. For program updates, refer to the Networking Hardware Product Offerings Home Page on the Internet at URL:

`http://www.raleigh.ibm.com/netprod.html`

To obtain support in Canada, you may call 1-800-565-3344; ask that your call be routed to the 36WSEM, location 153 area of RETAIN.

Outside the United States, Puerto Rico, or Canada, contact your local IBM representative or your Authorized IBM Supplier for information on program services.

When you call for your IBM support center, you should have the following information available:

- The model number and features of your 5308 ASCII to 5250 Connection
- The type of host attachment (AS/400, System/3X, 5394, 5494, and so on)
- Attached devices (modem, ASCII workstation, and so on)
- The specific steps and other relevant details to reproduce your problem.
- **Customer number**

  If you have an IBM Application System/400 (AS/400), System/36, or System/38 computer, your customer number is associated with the host serial number. If you do not know your customer number, ask to be routed to the control desk.

  When you are connected to the control desk, inform the customer support representative that you have an IBM mid-range host and that you need to access your customer number. The customer support representative can help

you route a call to the 36WSEM—Location 153 area of the IBM RETAIN Customer Support System.

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Preface

The 5308 lets you access your 5394 or 5494 Remote Control Unit or host computer from a remote PC or ASCII terminal through a direct connection or a modem connection. For an illustration of sample installations, see Chapter 1, “Introducing the 5308.”

About This Book

This book documents the following 5308 ASCII to 5250 Connection products:

- Two-Port 5308 ASCII to 5250 Connection (5308-002)
- Two-Port 5308 ASCII to 5250 Connection with Internal Modems (5308-0M2)
- Seven-Port 5308 ASCII to 5250 Connection (5308-007)
- 2- to 7-Port Upgrade

This book provides information for people who:

- Plan for the implementation of a 5308
- Install a 5308
- Install a 2- to 7-Port Upgrade
- Configure the host and a 5308

To use the planning, installation, configuration, and troubleshooting sections of this book, a working knowledge of the following related topics is necessary:

- Host device descriptions
- Host cabling
- Workstations that you are connecting
- Modems (for remote connections only)
- Your terminal emulation program (for PC workstations only)
- Troubleshooting methodology

This book also contains service and maintenance information for IBM service representatives.

Changes Since This Book Was Published

For information about changes to the product that were made after this book was published, see the README.TXT file on the IBM 5308 PC Terminal Program Diskette.

You can view this file using a PC editor, or you can display this file by doing the following:

1. Insert the program diskette into the A: drive of a personal computer.
2. Change to the A: drive.
3. Enter the following command:

   ```
   TYPE README.TXT ¦ MORE
   ```

4. To see the next screen of information, press Enter.

There is a separate README file for the 5308 PC Terminal Program. The file contains information that has changed since the *5308 User's Guide* was published. The file is copied to your terminal program directory when you install the program.

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How This Book Is Organized

The book is divided into the following parts:

"Planning, Installing, and Configuring Your Installation"
This section contains information about planning for the implementation of the 5308 and about installing and configuring the 5308. This section contains the following chapters:

- Chapter 1, "Introducing the 5308," provides an overview of the 5308, including a description of its controls and connectors and of the operator's console.
- Chapter 2, "Planning Your Installation," provides the information that you need to plan your installation, including ordering information.
- Chapter 3, "Installing the 5308," provides information about how to install the hardware.
- Chapter 4, "Performing the Initial Configuration of the 5308," provides information about how to configure your installation, including how to use the Operator's Console.
- Chapter 5, "Using the 5308 Configuration Program," provides information on using the IBM 5308 ASCII to 5250 Connection System Diskette.

"Service and Maintenance"
This section contains information for IBM service representatives.

"Reference Information"
This section contains reference information. This section contains the following chapters:

- Chapter 7, "Installing the 2- to 7-Port Upgrade," provides directions for upgrading a 5308-002 to a 5308-007.
- Chapter 8, "Wiring Diagrams," provides the wiring diagrams that you need to make cables or a wrap plug to be used with the 5308.
- Chapter 9, "Choosing a Modem Initialization String," provides the information that you need to edit the default modem initialization strings for supported modems or to choose modem initialization strings for other modems.
- Chapter 10, "Code Page Tables," contains the code pages that the 5308 supports.
- Chapter 11, "Planning Forms," contains the forms that you use to document your installation.
- Chapter 12, "Troubleshooting," provides information about resolving problems that might occur with your 5308.

A bibliography, a glossary, and an index are also included.

Note: Index entries followed by the notation (service) are for IBM service representatives.

Related Publications

The *IBM 5308 ASCII to 5250 Connection User's Guide* (referred to as the *5308 User's Guide* in this book), is also provided with the 5308. The *5308 User's Guide* contains information about configuring your workstations for use with the 5308 and about using the 5308 PC Terminal Program. You should consider ordering a copy of this book for each person who uses a workstation that is attached to the 5308.

Although this book and the *5308 User's Guide* provide all the information that you need to install, configure, and troubleshoot the 5308, other books might be helpful when you are setting up your installation. For example, you might want to refer to the documentation provided with your workstation or modem.

You should consider obtaining a copy of the documentation for each device that is attached to your 5308 and a copy of the documentation for your terminal emulation program, if an emulation program is being used.

For detailed information about related publications, see "Bibliography" on page X-1.

Planning, Installing, and Configuring Your Installation

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Chapter 1. Introducing the 5308

The 5308 ASCII to 5250 Connection lets you connect ASCII workstations (terminals or PCs) to an AS/400, a System/38, or a System/36 host. The 5308 can be connected to the host:

- Directly using twinaxial cabling
- Through a 5494 or 5394 Remote Control Unit using twinaxial cabling
- Through a 6299 or 5299 hub using UTP or fiber optic cabling

With the 5308, workstations can act as non-programmable workstations in the configuration of 5394 and 5494 Remote Control Units.

The 5308 ASCII to 5250 Connection is available in the following models:

5308-002 This model supports up to two workstations. An external modem is required for each workstation that is not directly connected to the 5308.

5308-0M2
This model supports up to two workstations. Two internal 28.8 Kbps modems are built into this model; external modems are only required for workstations that are not directly connected to the 5308 when leased lines are used. The internal modems do not support leased line attachment.

5308-007 This model supports up to seven workstations. An external modem is required for each workstation that is not directly connected to the 5308.

2- to 7-Port Upgrade
This product upgrades the 5308-002 to support seven workstations. An external modem is required for each workstation that is not directly connected to the 5308.

Note: If your 5308-002 has a 2- to 7-Port Upgrade installed, use the 5308-007 information.

All these models of the 5308 support workstations using any combination of direct or modem connections.

As shown in Figure 1-1 on page 1-2, the workstations can be connected directly to the RS-232 ports on the 5308 or can be connected through modems.

Workstations attached to the host through a 5308 can emulate the following 5250 devices:

- 3196
- 3197
- 3488 or 3489 (shared addressing feature)

Each workstation that emulates a 3488 or 3489 can access up to four sessions using only one host station address.

The 5308 PC Terminal Program is an ASCII terminal emulation program that is included with the 5308. The 5308 PC Terminal Program provides familiar 5250 keyboard mapping to PCs that are attached to the 5308. You can make a copy of the 5308 PC Terminal Program for each workstation that is attached to the 5308.

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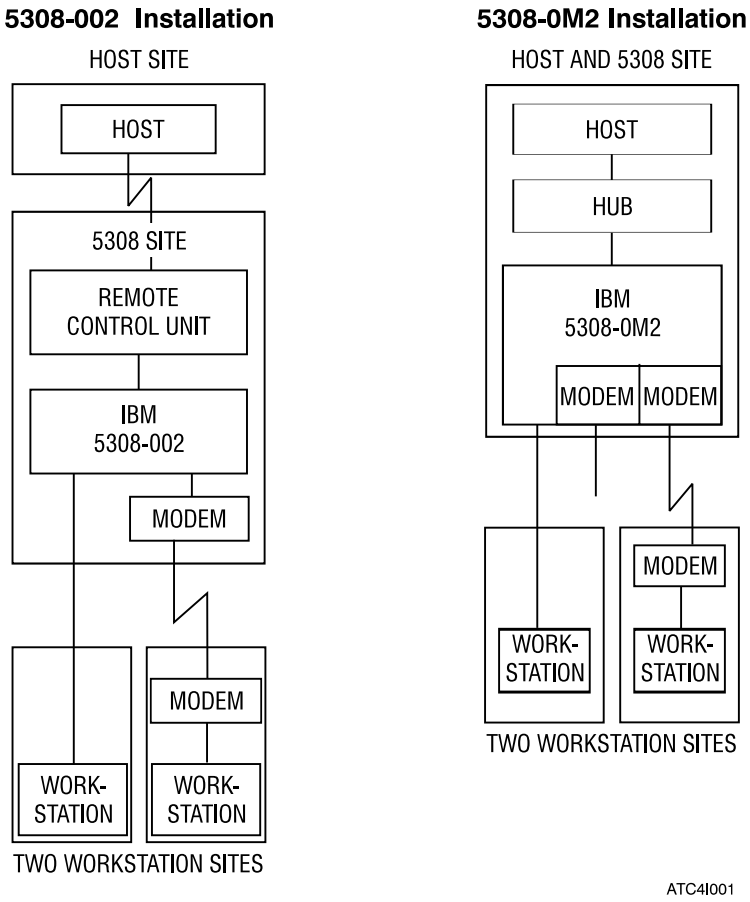


Figure 1-1. Sample Installations

For information about installing, configuring, and using the terminal program, see the *5308 User's Guide*.

Product Highlights

The 5308 provides a cost-effective solution for connecting remote PCs or ASCII terminals to the following using a dial-in or a leased phone line:

- 5494 Remote Control Unit
- 5394 Remote Control Unit
- AS/400 host
- System/38 host
- System/36 host

Features of the 5308 include:

- Reduces costs by letting you use a variety of inexpensive ASCII devices with your host
- Long distance phone call savings when multiple ASCII devices in one city dial-in locally to a 5394 or 5494 Remote Control Unit that can then make one long distance call to the remote host
- One twinaxial cable connection to your host supports:
  - Up to two devices through a 5308-002 or a 5308-0M2
  - Up to seven devices through a 5308-007

- Provides flexibility for ASCII devices:
  - Shared addressing to display up to four sessions on each workstation (Only one host station address is required for each workstation.)
  - A look and feel consistent with displays attached to the IBM AS/400 ASCII Workstation Controller
  - ASCII terminals that emulate supported terminals can be attached
- Lets you perform 5308 administrative tasks through a software interface (the Operator's Console) instead of requiring a dedicated workstation (For more information, see "The Operator's Console" on page 4-1.)
- Lets you select the EBCDIC code page that is used when communicating with the host. You can customize how character codes are translated to accommodate your workstation.
- Lets you select the EBCDIC keyboard that is used to transmit data to the host.
- Lets anyone whose workstation is attached to the 5308:
  - View the keyboard maps for the supported terminals (For directions, see the *5308 User's Guide*.)
  - View the active host character to ASCII character translation table
- The 5308 PC Terminal Program is included (for information about this program, see the *5308 User's Guide*)

  Note: The 5308 PC Terminal Program program can be installed (without charge) on workstations that are attached to the 5308.

Key Requirements

The 5308 requires an available twinaxial workstation controller port on one of the following:

- IBM 5394 or 5494 Remote Control Unit
- AS/400 (any model with a twinaxial workstation controller)

  Note: Remote connection to the AS/400 requires a 5494 Remote Control Unit Release 3.0, or later.
- System/38 (any model)
- System/36 (any model)

The 5308 requires that at least one of the following is directly connected to the 5308 for initial and emergency 5308 configuration:

- Supported ASCII terminal
- Terminal or PC that emulates a supported ASCII display (for example, a PC running the 5308 PC Terminal Program)

The terminal or PC that you use to perform initial or emergency configuration can be used as one of the workstations that is connected to the host through the 5308. For a list of terminals and PCs that are supported, see "Supported Workstations" on page 1-4.

For information about supported modems, see "Supported Modems" on page 1-5.

The following additional host software products might be required:

- If your host system is an IBM System/36 (5360 System Unit or 5362 System Unit), you must use Release 5 Modification Level 1 or later of the System Support Program (5727-SS1).
- If your host system is an IBM System/36 (5364 System Unit), you must use Release 5 Modification Level 1 or later of the System Support Program (5727-SS6).
- If your host system is an IBM System/38, you must use Release 8 or later of the Control Program Facility (5714-SS1) with Program Change 'C' (PC'C').
- If your host system is an IBM AS/400, you must use Release 1 or later of the OS/400 Program (5728-SS1).

If you decide to change the factory default configuration, a null modem cable is required the first time that you configure the 5308. For information about the null modem cable and about the cabling that is required for your installation, see:

- "Making the Connection Between the 5308 and the Host" on page 2-2
- "Making the Connection Between the Workstation and the 5308" on page 2-6

Shared Addressing

The shared addressing feature requires local attachment to an AS/400 that:

- Has a 2661, 6050, 9146, or 9148 Twinaxial Workstation Control Unit
- Runs under OS/400 Version 3 Release 1 or later with the latest PTF level installed

5308 PC Terminal Program

The 5308 PC Terminal Program requires one of the following operating systems:

- IBM DOS or MSDOS Version 5.0 or later.
- IBM OS/2 Version 2.11 or later (DOS full-screen)
- Microsoft** Windows** 3.1 or later (DOS box)
- Microsoft Win95** (DOS full-screen)
- Microsoft Windows NT** (DOS compatibility box)

Supported Workstations

The following workstations are supported:

- IBM 3153 ASCII Display emulating an IBM 3151, a DEC VT-100, or a Wyse WY50/WY60
- IBM 3151 ASCII Display
- DEC VT-220 ASCII Display
- Wyse WY50/WY60 ASCII Display
- Any terminals emulating the following:
  - IBM 3151 ASCII Display
  - DEC VT-100/102/220 ASCII Display
  - Wyse WY50/WY60 ASCII Display

- A PC that meets the following requirements:
  - 5308 PC Terminal Program or an ASCII emulation program that emulates one of the terminals listed above
  - 101- or 102-key keyboard
  - VGA display
  - 386 or later processor

These workstations can be attached directly to the RS-232 ports on the 5308 or attached through a modem.

Notes:

1. The 5308 does not support printing host files on printers that are attached to workstations. Some workstations might not support the local print screen function.
2. Some older terminals that require null character padding are not supported.

Supported Modems

The following modems are supported:

- IBM 7852
- IBM 7855
- IBM 7857
- U.S. Robotics-compatible modems

Other modems might work with the 5308.

Product Specifications

These specifications apply to the 5308-002, the 5308-0M2, and the 5308-007.

Physical Specifications

Width	395 mm (15.5 in)
Depth	415 mm (16.3 in)
Height	150 mm (5.9 in)
Weight	10.4 kg (23 lb)

Operating Environment

Temperature	10 to 40.6 degrees C (50 to 105 degrees F)
Relative humidity	8% to 80%
Calorific value	1283 Btu
Electrical power	0.375 KVA
Capacity of exhaust	1.13 cubic meter/min. (40 cubic feet/min.)
Noise level	40 dBA
Leakage and starting current	.7 mA / 40 A

Power Supply

The 5308 includes a power supply with switch-between settings at 90 to 132 VRMS and 180 to 264 VRMS. The power supply operates from 48 through 63 Hertz.

Electrical Wiring Requirements

A branch circuit of 15 amperes is recommended for the 5308. For safety and proper operation of the 5308, this circuit must be grounded to a dedicated equipment ground, not to a neutral ground. Do not use conduit as the only grounding means.

The customer is responsible for power outlet wiring.

Chapter 2. Planning Your Installation

This chapter provides information for planning for the installation or upgrade of a 5308, including:

- Laying out your installation
- Connecting the 5308 to the host
- Connecting the workstations to the 5308
- Ordering parts

Use the tables in “Your Installation Plan” on page 2-9 to record information about your installation.

Laying Out Your Installation

To determine the layout of your installation and the cable lengths that are required, use your building floor plan and wiring schedule. On the floor plan, mark the location of the host, the 5308, and the workstations. If your installation includes more than one site, mark up the floor plans for each site.

You must determine:

- The number and location of the workstations
- The number and location of the 5308s, including which workstations should attach to each 5308
- The location of power outlets for each workstation and for the 5308
- The location of the hosts, including which 5308s should attach to each host (if more than one host is used)
- The method of attachment to the host (direct, through a remote control unit, or through a twinax hub)
- The cabling scheme between the components of the cabling system, including the type of connection, pins, and phase

Determining Cable Lengths

Referring to your wiring schedule, mark the actual wire paths on your floor plan. Use this marked-up floor plan to help determine the cable lengths required. When determining cable lengths, include the following measurements:

- The distance from the 5308 to the floor
- If you have a raised floor, the length from the raised floor to the subfloor underneath
- The distance across the floor to the device
- The distance from the floor to the device

When determining cable lengths, make sure you do not exceed the maximum cable lengths for your configuration.

For detailed information about arranging devices, see the installation or device configuration documentation for the host.

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Maximum Number of Workstations

The maximum number of workstations that a 5308 supports is equal to the number of communications lines that it supports:

- A 5308-002 supports up to two workstations/communications lines.
- A 5308-0M2 supports up to two workstations/communications lines.
- A 5308-007 supports up to seven workstations/communications lines.
- A 2- to 7-Port Upgrade installed in a 5308-002 supports up to seven workstations/communications lines.

Each communications line requires a host address. The number of sessions available on a communications line depends on how the communications line is configured:

- If the communications line is defined for 3488 display emulation, up to 4 sessions are available on that workstation.
- Otherwise, one session is available on a communications line.

You can have other devices on the same twinaxial workstation controller port as the 5308. Each device on the port uses one of the addresses available for attaching workstations to the 5308.

If other devices are on the port, you cannot assign the addresses that these devices use to workstations. When you configure the 5308, disable any addresses that are used by other devices connected to the port.

A twinaxial workstation controller port supports a maximum of seven station addresses. The maximum number of workstations that you can connect to the 5308 depends on how many station addresses are available on the twinaxial workstation controller port that the 5308 is using.

Making the Connection Between the 5308 and the Host

You can connect the 5308 to the host:

- Directly
- Through a remote control unit
- Through a twinax hub

The information that is sent between the 5308 and the host is sent as a 5250 data stream.

Direct Connection to the Host

Figure 2-1 on page 2-3 shows a direct connection between the 5308 and the host.

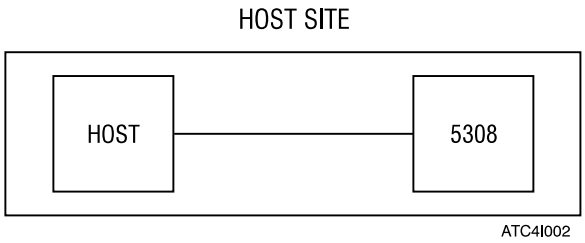


Figure 2-1. Direct Connection to the Host

Because the 5308 connects to the host using the twinaxial interface, it supports up to 1.5 km (5,000 ft.) of direct twinax cable attachment.

You can use the following types of cables to connect the 5308 and the host:

- Twinaxial cables
- IBM Data Connector cables
- UTP cables

Table 2-1 summarizes the maximum cable lengths for attaching the 5308 to the host and where to find more information about the type of cables that you are using.

Table 2-1. Maximum Cable Lengths for Connecting the 5308 to the Host

Type of cables	**Maximum length**	**See this page**
Twinaxial cables	1524 m (5000 ft.)	2-3
IBM Cabling System Type 1 cables	1524 m (5000 ft.)	2-3
UTP cables	304 m (1000 ft.)	2-4

Twinaxial Cabling

Each model of the 5308 ships with a twinax cable (part number 8117469) for attachment to the host. When using twinaxial cabling, the following rules apply:

- Any twinax workstation controller port can have a maximum of 11 junctions. Each 5308, workstation, cable splice, or station protector is a junction.
- When attaching a device to the twinax workstation controller port, the minimum distance between two junctions is 1 m (3.3 ft.).
- If a device has only one twinax connector, it must be the last or only device on the twinaxial workstation controller port.
- The maximum cabling distance between the host and the last device on a twinaxial cable is 1524 m (5000 ft.).

For more information about twinaxial cabling, see *IBM 5250 Information Display System Planning and Site Preparation*, GA21-9337.

IBM Cabling System

If you are using the IBM Cabling System (ICS), you can use IBM 5250 Emulation Data Connector Cable (part number 60G1043, feature code 1043) to connect the 5308 to the host.

Using ICS type 1 or type 2 cable, the maximum distance between the host and the last device on the twinaxial workstation controller port is 1524 m (5000 ft.). Cable

length limitations for ICS are based on the attenuation rate (how quickly the signal weakens) for type 1 or type 2 cable.

To account for the differences in attenuation rate in a section of cable that includes two or more cable types, calculate the length of type 1 or 2 cable that is equivalent to a segment of type 6, 8, or 9 cable. The maximum “equivalent” distance between the host and the last device on the ICS cable is 1524 m (5000 ft.).

To calculate the “equivalent” distance, use the formula: ***a*+2*b*+1.5*c***
where:

a Is the actual length of type 1 or type 2 cable
b Is the actual length of type 8 cable
c Is the actual length of type 6 or type 9 cable

The IBM Cabling System and an impedance matching device can also be used. For more information, see:

- *IBM Cabling System Catalog*, G570-2040
- *IBM Cabling System Planning and Installation Guide*, GA27-3361
- *Using the IBM Cabling System with Communications Products*, GA27-3620
- *Building Planning Guide for Communications Wiring*, G320-8059

Unshielded Twisted Pair Cabling

You can run twinax signals through unshielded twisted pair (UTP) cabling by using twinax cable and a UTP balun (order number 31H5087, feature code 5087) or by using a 6299 or 5299 hub. For more information about using twinax hubs, see “Connection through a Twinax Hub” on page 2-5.

Connection through a Remote Control Unit

Figure 2-2 shows how the 5308 can be connected to the host through a remote control unit.

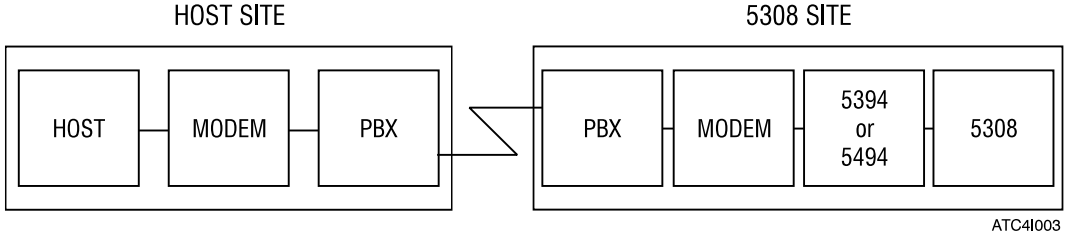


Figure 2-2. Connection through a Remote Control Unit

Remote control units let you locate workstations further from the host than local attachment allows. You can use a remote control unit to control the operation of workstations that are located more than 1524 m (5000 ft.) from the host. This remote attachment lets people in different buildings, cities, or countries share the resources of one host. The remote control unit manages the exchange of information between the workstation and the host.

The 5494 Remote Control Unit supports:

- Attachment to an AS/400 host
- A maximum of 28 workstations (base model) or 56 workstations (Twinaxial Expansion Kit installed)

- A maximum of 120 sessions, if you are using the address sharing feature of 3488 display emulation (Release 3.0 or later of the base model)

The 5394 Remote Control Unit supports attachment to a S/36, S/38, AS/400, or AS/Entry host. You can connect a maximum of 16 workstations to a 5394 Remote Control Unit.

Connection through a Twinax Hub

Figure 2-3 shows how the 5308 can be connected to the host through a twinax hub.

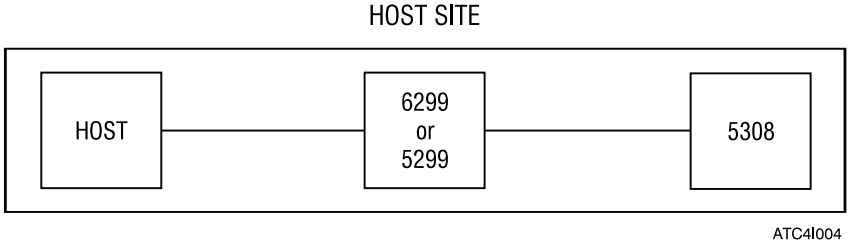


Figure 2-3. Connection through a Twinax Hub

Networking hubs enable twinaxial devices, such ASCII workstations, to be attached to hosts and remote control units using low-cost unshielded twisted-pair (UTP) wiring. These hubs can convert the cabling scheme for a midrange network from a daisy-chain topology to a highly flexible star topology.

The IBM 6299 Hub for Midrange Systems is an active (that is, powered) hub that supports EIA/TIA Category 3, 4, or 5 UTP cabling and that is available with RJ-11 and RJ-45 connectors in five standard pin assignments. Because the 6299 is an active hub, it supports greater host-to-device distances than the 5299. The 6299 includes integrated diagnostics that continuously monitor host and device channels.

The IBM Terminal Multiconnector and Twinax-to-Telephone Twisted Pair Adapter (5299 twinax hub) is a passive hub that is available with RJ-11 modular jacks that have pins 2 and 5 active.

If the 5308 is connected to the host through a 6299 hub using UTP and fiber optic cabling, the 5308 can be located over 3.3 km (11,000 ft.) from the host.

When using **UTP** cabling between the host and the hub, the following rules apply:

For a 6299:

- The maximum distance between the host and the 6299 is 670.5 m (2200 ft.) using category 5 (CAT 5) wiring.
- The maximum distance between the 6299 and the 5308 is 670.5 m (2200 ft.) using CAT 5 wiring.

For a 5299:

- The maximum distance between the host and the 5299 is 304.8 m (1000 ft.).
- The maximum distance between the 5299 and the 5308 is 274.3 m (900 ft.).

When using **twinaxial** cabling between the host and the hub, the following rules apply:

For a 6299:

- The maximum distance between the host and the 6299 is 1219.2 m (4000 ft.).
- The maximum distance between the 6299 and the 5308 is 670.5 m (2200 ft.) using CAT 5 wiring.

For a 5299:

- The maximum distance between the host and the 5299 is 609.6 m (2000 ft.).
- The maximum distance between the 5299 and the 5308 is 274.3 m (900 ft.).

When using **UTP** cable between the host and the **5308**, the maximum distance is 304.8 m (1000 ft.).

For more information about using a twinax hub with the 5308, see:

- *IBM 6299 Midrange Hub Planning, Installation, and Maintenance Guide*, G571-0362
- *IBM 5299 Terminal Multiconnector Model 3 Planning, Setup, and Maintenance Guide*, GA27-3749

Making the Connection Between the Workstation and the 5308

The ASCII ports on the 5308 are configured as RS-232 Data Terminal Equipment (DTE) and have a DB25 female interface. You can attach workstations to the 5308 directly through the RS-232 port or through a modem:

- Most workstations are DTE and are attached directly to the 5308 with null modem cables, such as order number 69X7017.
- Modems are configured as Data Communications Equipment (DCE) and are attached to the 5308 with straight-through cables, such as order number 21F4505.

The cabling for connecting your workstations to the 5308 is not included with the 5308 ASCII to 5250 Connection. For information about ordering cables, see “Ordering Information” on page 2-9.

To ensure good electromagnetic performance, use only shielded RS-232 cables. Shielded cables are constructed with electrical continuity between the metal D-shell connectors on both ends of the cable.

When you determine which cables to order, consider the following information about the workstation connector:

- The number of positions (9 or 25)
- The type of connector (pin or socket)

There are various commercially available adapters that convert one type of connector to another and that convert between 9-pin and 25-pin connectors.

To make the connection between a workstation and the 5308, you must consider how flow control is to be handled. For more information, see page “Flow Control” on page 2-8.

Direct Connection

Figure 2-4 shows how a workstation can be directly connected to the 5308. This is the type of connection specified in the factory default configuration of the 5308. If you directly connect your workstation to the RS-232 port on the 5308, you might not need to configure the 5308. For more information, see “Using the Factory Default Configuration” on page 4-4.

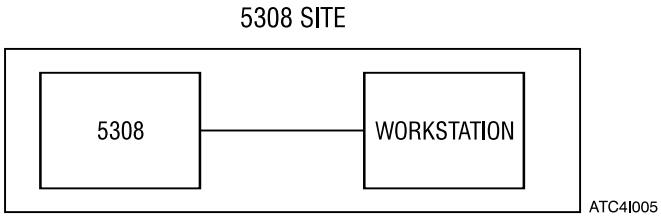


Figure 2-4. Direct Connection

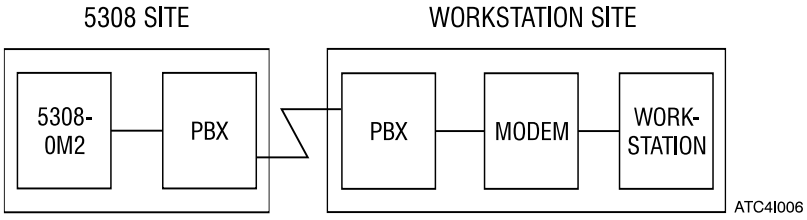
A null modem cable is required to directly connect a workstation to the 5308. An example of a cable that can attach terminals with female DB25 connectors to the 5308 is the RS-232 Null Modem Cable 20-Ft. (Interposed), which is order number 69X7017. For information about ordering a null modem cable, see “Ordering Information” on page 2-9.

The correct wiring for a null modem cable, is shown in Chapter 8, “Wiring Diagrams.”

The 5308 uses the RTS signal from your workstation to determine whether your workstation is on. This signal from your workstation should always be on. When RTS is OFF, the 5308 drops the connection to your AS/400 or S/36 host. If your workstation does not keep RTS on, see Chapter 8, “Wiring Diagrams” for alternate null modem cable wiring.

The 5308 uses the DTR signal from your workstation to determine whether your workstation can accept data when hardware flow control is selected. If you are using hardware flow control, make sure that your workstation uses the DTR signal to indicate readiness to accept data. For more information about flow control, see page 2-8.

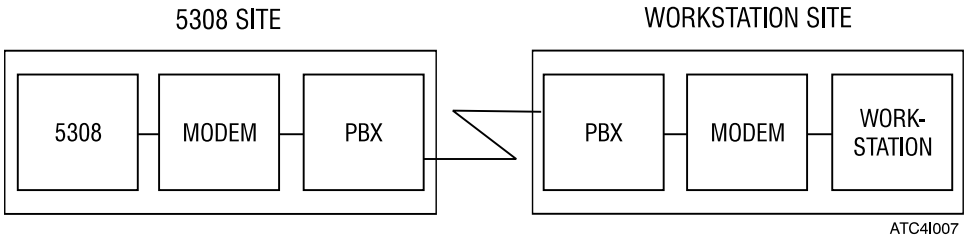
Connection through an Internal Modem (5308-0M2)



The 5308-0M2 has two 28.8 Kbps internal modems and ships with two telephone cables. Installing the 5308-0M2 requires connecting up to two RJ-11 telephone cables and making one twinaxial connection to the host.

Note: External modems and additional cabling are not required if you are using the internal modems only and switched lines.

Connection through an External Modem



To connect an external modem to the 5308, a straight-through function cable is required. The correct wiring for a straight-through function cable is shown in Figure 8-1 on page 8-2. For information about ordering a straight-through function cable, see "Ordering Information" on page 2-9.

The following are examples of cables that provide attachment from modems with female DB25 connectors to the 5308:

- 20-Ft. EIA 232 Straight-Through Cable (order number 21F4505)
- 40-Ft. EIA 232 Straight-Through Cable (order number 21F4342)

Note: This is not the same cable that is used to connect workstations to the 5308.

Flow Control

To make the connection between a workstation and the 5308, you must consider how flow control is to be handled:

- If your workstation is **connected through a modem** to the 5308, hardware flow control is recommended for the 5308. Hardware flow control uses CTS/RTS as signals for the modem. Use a straight-through cable, such as one of the following, to attach the modem to the 5308:
  - Order number 21F4505 (20 ft.)
  - Order number 21F4342 (40 ft.)

  Be careful when determining the flow control settings for the workstation-attached modem:
  - Most modems will not work with a workstation that tries to use DTR for flow control. Disable the DTR setting for the workstation.
  - If the workstation does not use CTS/RTS for flow control, use Xon/Xoff. For information about setting up your modem for Transmit Data Flow Control, see the *5308 User's Guide*.
- If your workstation is **directly connected** to the 5308, software (Xon/Xoff) flow control is recommended. Use one of the following to attach the workstation to the 5308:
  - A null modem cable (such as order number 69X7017)
  - A null modem adapter (such as part number 58F2861) and straight-through cable

  If you are making your own cable or null modem adapter, see Chapter 8, "Wiring Diagrams."

Security, Auditability and Control

This product uses the security and auditability features of the host hardware, software, and application software.

You are responsible for evaluation, selection and implementation of security features, administrative procedures and appropriate controls in application systems and communications facilities.

Your Installation Plan

Use a copy of the tables in Chapter 11, "Planning Forms," to plan the installation or upgrade of a 5308 and to create a record of your installation:

- If you are **installing a 5308**, complete the following tables before you begin the installation:
  - "Host Information Form" on page 11-1
  - "Cabling Forms" on page 11-5

  As you configure the 5308, complete the following tables:
  - "5250 Device Configuration Forms" on page 11-2
  - "5308 Configuration Forms" on page 11-7
- If you are **upgrading a 5308-002** to seven ports and you want to use the same configuration for communications lines 0 and 1 after the upgrade, record the configuration settings in the following tables before you power off the 5308-002 to begin the upgrade:
  - "Host Information Form" on page 11-1
  - "5250 Device Configuration Forms" on page 11-2
  - "5308 Configuration Forms" on page 11-7

  You should also complete the tables in "Cabling Forms" on page 11-5 so that you have a record of how the 5308 is cabled.

  As you configure the upgraded 5308, complete the following tables:
  - "5250 Device Configuration Forms" on page 11-2
  - "5308 Configuration Forms" on page 11-7

The more thorough your plan is, the easier installing, upgrading, configuring, and maintaining your 5308 will be.

Ordering Information

Table 2-2 on page 2-10 lists the part numbers that are associated with the 5308. The reversed video numbers (for example, **1**) correspond to the parts shown in Figure 2-5 on page 2-11.

To order the items in Table 2-2 on page 2-10, contact one of the following:

- Your IBM Representative
- Your IBM Authorized Business Partner
- IBM Direct at 1-800-IBM-CALL (1-800-426-2255, ask for department AE001)

To identify your local IBM Authorized Business Partner or IBM representative, call 1-800-IBM-4YOU (1-800-426-4968).

To obtain IBM Warranty Service, Maintenance Service, IBM Hourly Service, call 1-800-IBM-SERV (1-800-426-7378). IBM Hourly Service is available at the applicable rate and terms, including the element exchange price, if applicable.

Table 2-2. Ordering Information

Description	Machine	Models	Feature	Order Number	Part Number
Two-Port 5308 ASCII to 5250 Connection (United States, Canada)	5308	002		05J2220	
Two-Port 5308 ASCII to 5250 Connection with Internal Modems (United States, Canada)	5308	0M2		05J2230	
Seven-Port 5308 ASCII to 5250 Connection (United States, Canada)	5308	007		05J2240	
2- to 7-Port Upgrade	5308		2228	05J2228	
Two-Port 5308 ASCII to 5250 Connection (World Trade)	5308	002		05J2250	
Seven-Port 5308 ASCII to 5250 Connection (World Trade)	5308	007		05J2260	
1 Twinax cable (provided with the 5308)				8117469	
2 UTP Balun (RJ-45, pins 4 and 5)	5308		5087	31H5087	
3 IBM 5250 Emulation Data Connector Cable	5308		1043	60G1043	
4 20-Ft. EIA 232 Straight-Through Cable, DB25-Male to DB25-Male Cable				21F4505	21F4339
4 40-Ft. EIA 232 Straight-Through Cable, DB25-Male to DB25-Male Cable				21F4342	21F4344
5 20-ft. RS-232 Null Modem Cable (Interposed), DB25-Male to DB25-Male Cable[1]				69X7017	59X3833[1]
6 10-ft. RS-232 Null Modem Cable (Interposed), DB25-Male to DB25-Female Cable (for connection from the 5308 to terminals with DB25 male connectors)					12H1204
7 Null Modem Adapter, DB25-Female to DB25-Male Cable					58F2861
8 115 VAC power cord (provided with the 5308)				6952300	

Note: To ensure good electromagnetic performance, use only shielded RS-232 cables. Shielded cables are constructed with electrical continuity between the metal D-shell connectors on both ends of the cable.

[1] This part number is not a shielded cable with electrical continuity between the metal D-shell connectors on both ends of the cable. For better electromagnetic performance, make a cable using the wiring diagram in “Null Modem Cables (Directly Connecting DTE Terminals)” on page 8-3.

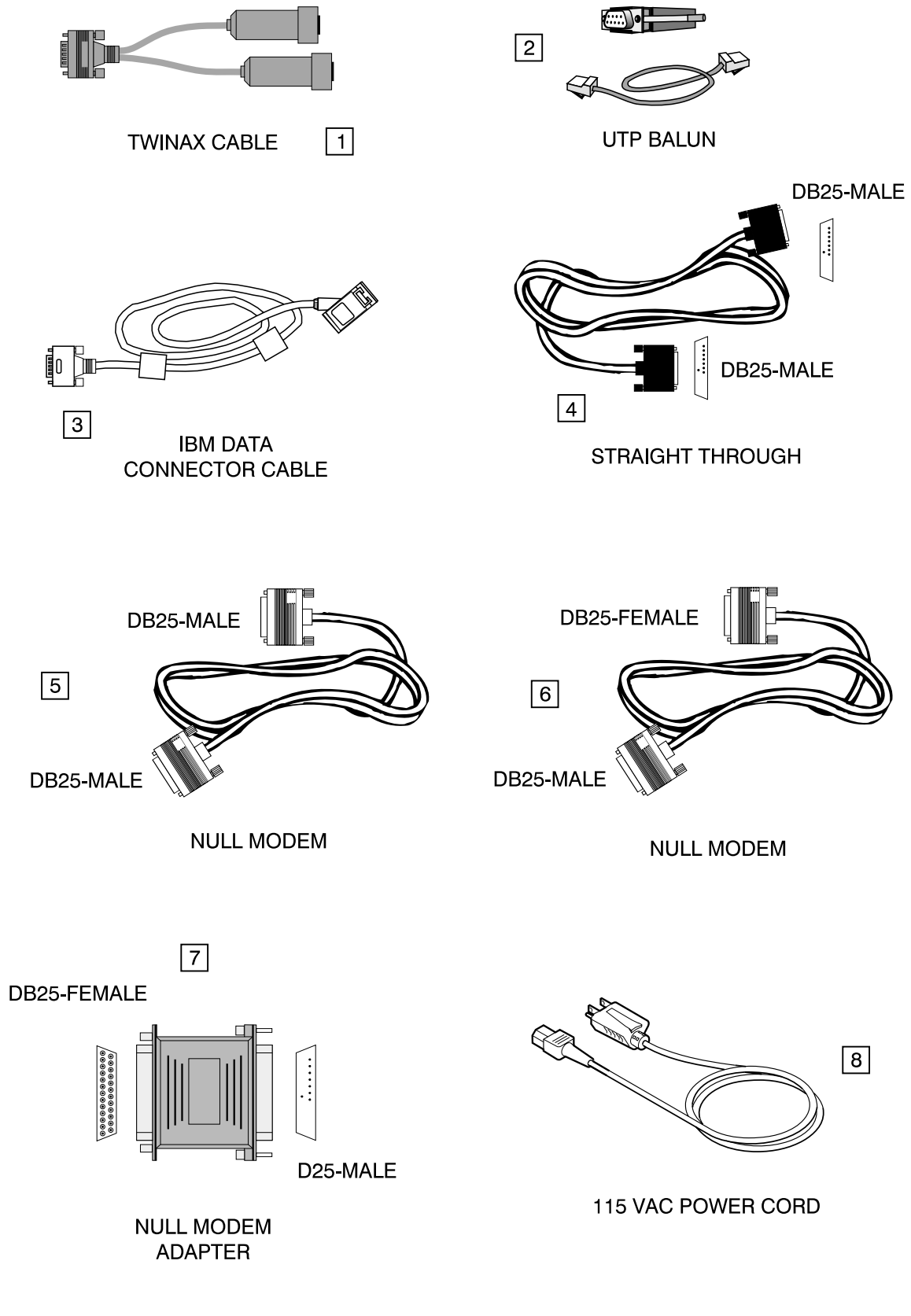


Figure 2-5. Parts Associated with the 5308

Chapter 3. Installing the 5308

Before you install the 5308, read Chapter 2, “Planning Your Installation,” and do the following:

1. Mark up your floor plan as described in “Laying Out Your Installation” on page 2-1.
2. Complete the tables in “Your Installation Plan” on page 2-9.
3. Order any additional cables, baluns, and cable adapters that you need using the information in “Ordering Information” on page 2-9.

Although all models of the 5308 can be used with different hosts, workstations, modems, remote control units, and twinax hubs, the installation processes are similar:

1. Unpack the 5308 and verify that you have everything you need for your installation.
2. Label the cables required for your installation.
3. Put the workstations and the 5308 in their locations.
4. Attach your workstations to the 5308.
5. Attach the 5308 to the host.
6. Verify the voltage switch setting.
7. Install the IBM 5308 ASCII to 5250 Connection System Diskette.
8. Power on the host, 5308, and workstations.

Tools

No special tools are required to install the 5308. To perform the initial configuration of the 5308, you need to directly connect a workstation to the RS-232 port that is labeled Communications Line 0.

Hardware Checklist

Using the information recorded in “Your Installation Plan” on page 2-9, verify that you have everything you need for your installation. The 5308 models 002, 0M2, and 007 are each shipped in one box that contains:

- 5308-002, 5308-0M2, or 5308-007
- IBM 5308 ASCII to 5250 Connection System Diskette
- IBM 5308 PC Terminal Program Diskette
- *Planning, Installation, and Maintenance Guide* (this book)
- *User’s Guide*
- Twinax cable
- Power cord
- Two telephone cables (5308-0M2 only)
- Twinax Y cable with DB15 connectors (5308-007 only)- not required on newer models with one double twinax card
- Six modular-to-RS232 conversion cables (5308-007 only)
- Safety information booklet

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- Customer comment card

For a list of the hardware that is provided with the 2- to 7-Port Upgrade, see “Hardware Checklist” on page 7-1.

Any features that you order, such as cables or baluns, are packaged separately.

If anything is missing or damaged, contact your point of sale for information about replacement.

Labeling Cables

Label both ends of each cable that is indicated in “Cabling Forms” on page 11-5 with the following information:

- Name of the 5308
- Device number (name or number of the workstation connected to the 5308)
- Communications line number (0 through 6)
- Type of connection to the 5308 (direct or remote)
- Patch panel number, if connected through a patch panel
- Type of cable (null modem or straight through)

Arranging the Parts of Your Installation

Using the floor plan that was marked with the location of the hosts, 5308s, and workstations, put the workstations and 5308 in their locations. When you put the 5308 in its location, allow the following clearance for air flow:

On each side	50 mm (2 in.)
In front and in back of the base	150 mm (6 in.)
Above the top	13 mm (.5 in.)

The 5308 can be put in a rack or on a table:

- If the 5308 is in a rack, center the 5308.
- If the 5308 is on a table, allow 50 mm (2.0 in.) on each side.

You can stack 5308s or place modems on top of the 5308 to save space.

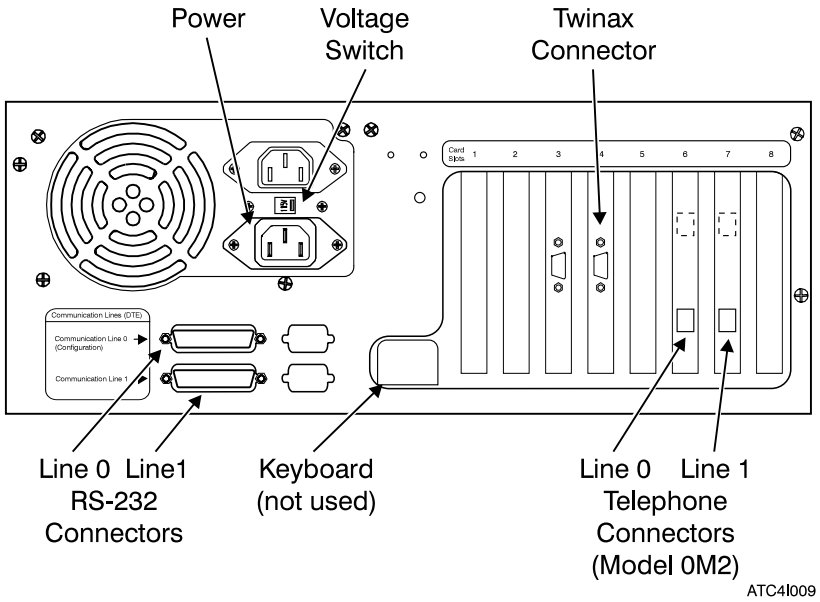
Using the wire paths marked on the floor plan of your installation, layout the cables that you need to complete your installation.

Back View of the 5308

Figure 3-1 on page 3-3 shows the back of the different models of the 5308. The 5308-002 and the 5308-0M2 are shown in one drawing. The difference between the back views of these models is that the 5308-0M2 has telephone connectors for the internal modems that are located in slots 6 and 7. A description of the voltage switch and the connectors that are shown in Figure 3-1 on page 3-3 follows.

Note: If your 5308-002 has a 2- to 7-Port Upgrade installed, use the 5308-007 information.

Models 5308-002 and 5308-0M2



Model 5308-007

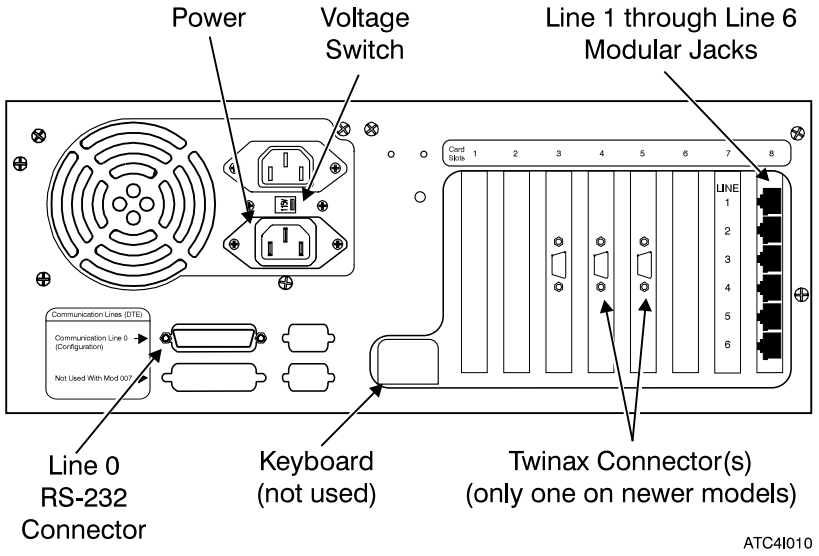


Figure 3-1. Back View of the 5308

The voltage switch on the back of the 5308 sets the voltage that the 5308 uses. Before you switch on the 5308, **make sure** that this switch is in the correct position for your power source. For the United States and Canada, the switch must be set to 115. For some countries, the switch must be set to 230.

The following connectors are on the back panel of the 5308:

Power connector

This connector is for the 5308 power cord.

Twinax connectors

On the 5308-002 and the 5308-0M2, there is only one twinax connector to connect the 5308 to the host, remote control unit, or twinax hub.

On the 5308-007, there are two twinax connectors that are joined by a twinax Y cable to connect the 5308 to the host, remote control unit, or twinax hub.

Note: On newer 5308-007's, there is only one twinax connector.

RS-232 connectors

These connectors are for directly connecting workstations or for attaching external modems:

- There are two RS-232 connectors available on the 5308-002 and the 5308-0M2.
- There is one RS-232 connector available on the 5308-007 (line 0) and six additional RS-232 connectors available through the modular-to-RS232 conversion cables that are provided for lines 1 through 6.

Note: To perform an initial or an emergency configuration of the 5308, the workstation that you use must be directly attached to the connector that is labeled Communications Line 0.

Modular Jacks

The 5308-007, has six modular jacks. A modular-to-RS232 conversion cable is provided for each of the six jacks.

Telephone connectors

These connectors are for connecting the telephone wiring that is provided with the 5308-0M2 to the internal modems. These connectors are only on the 5308-0M2.

For information about the LEDs, buttons, and keylock that are on the front of the 5308, see "Front View of the 5308" on page 3-8.

Making the Connection Between the 5308 and the Host

You can use the twinax cable that is provided with the 5308 (order number 8117469) to connect to your host:

- Directly
- Through a remote control unit

You can order other cables to connect the 5308 to your host.

For information about how the 5308 is to be attached to the host for your installation, see "Host Information Form" on page 11-1.

Important: Contact the host system administrator before connecting the 5308 to your host. Connecting the 5308 to your host can disrupt other devices on the twinax line.

Direct Connection to the Host

Figure 3-2 on page 3-5 shows a direct connection between the 5308 and the host.

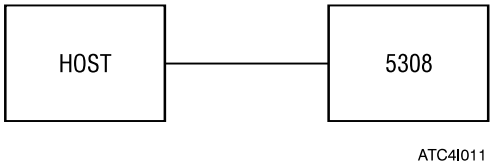


Figure 3-2. Direct Connection to the Host

To connect the 5308 directly to your host cabling system:

- Do one of the following:
  - For a **5308-002** or a **5308-0M2**, attach the DB15 connector of the twinaxial cable that is provided with the 5308 to the twinax connector shown in Figure 3-1 on page 3-3.
  - For a **5308-007**, connect the Twinax Y Cable to the Twinax Communications cards in slots 4 and 5 (using the twinax connectors shown in Figure 3-1 on page 3-3). Then connect the DB15 connector of the twinax cable that was provided with the 5308-002 to the Twinax Y Cable.

    Note: On newer 5308-007's, there is only one Twinax Communications card in slot 4.
- Attach one of the connectors to your host cabling system.
- If there is another device after the 5308 on the twinax line, attach the other connector to the next device. Otherwise, no action is required because the cable is self terminating.

Connection to the Host through a Remote Control Unit

Figure 3-3 shows how the 5308 can be connected to the host through a remote control unit.

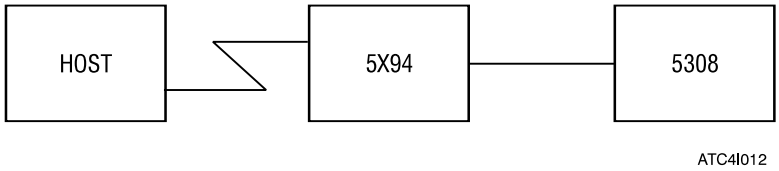


Figure 3-3. Connection through a Remote Control Unit

To connect the 5308 to your host through a remote control unit:

- Do one of the following:
  - For a **5308-002** or a **5308-0M2**, attach the DB15 connector of the twinaxial cable that is provided with the 5308 to the twinax connector shown in Figure 3-1 on page 3-3.
  - For a **5308-007**, connect the Twinax Y Cable to the Twinax Communications cards in slots 4 and 5 (using the twinax connectors shown in Figure 3-1 on page 3-3). Then connect the DB15 connector of the twinax cable that was provided with the 5308-002 to the Twinax Y Cable.

Note: On newer 5308-007's, there is only one Twinax Communications card in slot 4.

- Attach one of the connectors on the twinax cable to your remote control unit. For information about the location of the connector of the remote control unit, see the documentation provided with the remote control unit.
- If there is another device after the 5308 on the twinax line, attach the other connector on the twinax cable to the next device. Otherwise, no action is required because the cable is self terminating.

Connection to the Host through a Twinax Hub

Figure 3-4 shows how the 5308 can be connected to the host through a twinax hub.

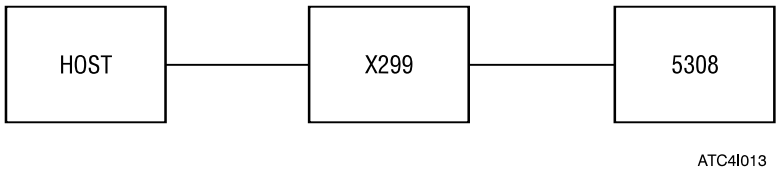


Figure 3-4. Connection through a Twinax Hub

To connect the 5308 to your host through a twinax hub, use a UTP balun (order number 31H5087):

- Do one of the following:
  - For a **5308-002** or a **5308-0M2**, attach the DB15 connector of the UTP balun to the twinax connector shown in Figure 3-1 on page 3-3.
  - For a **5308-007**, connect the Twinax Y Cable to the Twinax Communications cards in slots 4 and 5 (using the twinax connectors shown in Figure 3-1 on page 3-3). Then connect the DB15 connector of the UTP balun to the Twinax Y Cable.

    Note: On newer 5308-007's, there is only one Twinax Communications card in slot 4.
- Attach the RJ45 connector on the cable to the twinax hub. For information about the location of this connector, see the documentation provided with the twinax hub.

Making the Connection Between the Workstation and the 5308

You can attach workstations to the 5308 directly through the RS-232 ports or through modems:

- Most workstations are DTE and are attached directly to the 5308 with null modem cables, such as order number 69X7017.
- Modems are configured as Data Communications Equipment (DCE) and are attached to the 5308 with straight-through cables, such as order number 21F4505.

The cables for connecting workstations to the 5308 are purchased separately. For information about how the workstations are to be attached to the 5308 for your installation, see "Cabling Forms" on page 11-5.

Direct Connection to the 5308

Figure 3-5 shows how a workstation can be directly connected to the 5308. If your installation uses the factory default configuration for the communications lines, follow the directions in this section to connect the workstations to your 5308.

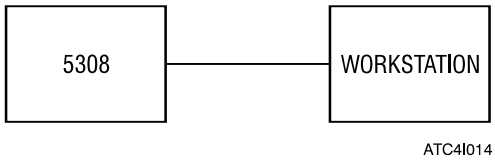


Figure 3-5. Direct Connection

To directly attach a workstation to the 5308:

- Attach the DB25 male end of the null modem cable to the 5308.
- Attach the other end of the null modem cable to the workstation. For information about the location of this connector, see the documentation provided with the workstation.

Connection to the 5308 through an Internal Modem (5308-0M2)

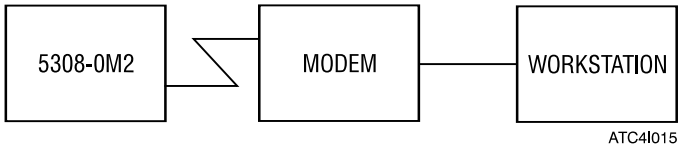


Figure 3-6. Internal Modem Connection

The 5308-0M2 contains two 28.8Kbps internal modems. Two telephone cables are provided with the 5308 for attaching the 5308 to the private branch exchange (PBX).

To connect a workstation to the 5308-0M2 using one of the internal modems:

- Attach one of the provided telephone cables to one of the telephone connectors on the back of the 5308.
- Attach the other end of the telephone cable to a telephone jack. For the location of the telephone jack, see the marked up floor plan for your installation.

Notes:

1. For information about installing the workstation-attached modem, see the documentation provided with the modem and the workstation. The *User's Guide* contains information about modem settings for the workstation-attached modem.
2. If you are using a switched line, an external modem is not required for this configuration.

Connection to the 5308 through an External Modem

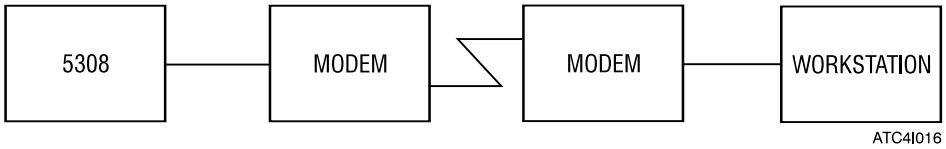


Figure 3-7. External Modem Connection

A straight-through function cable is required to attach a modem to the 5308.

Note: This is not the same cable that is used to attach a workstation to the 5308.

To connect a workstation to the 5308:

- Attach the DB25 male end of the straight-through function cable to one of the RS-232 connectors on the back of the 5308.
- Attach the other end of the cable to the modem.
- Attach the modem to the private branch exchange (PBX) using the documentation provided with the modem.

Note: For information about installing the workstation-attached modem, see the documentation provided with the modem and the workstation. The *User's Guide* contains information about modem settings for the workstation-attached modem.

Front View of the 5308

Figure 3-8 shows the front of the 5308. All models of the 5308 have the same front panel.

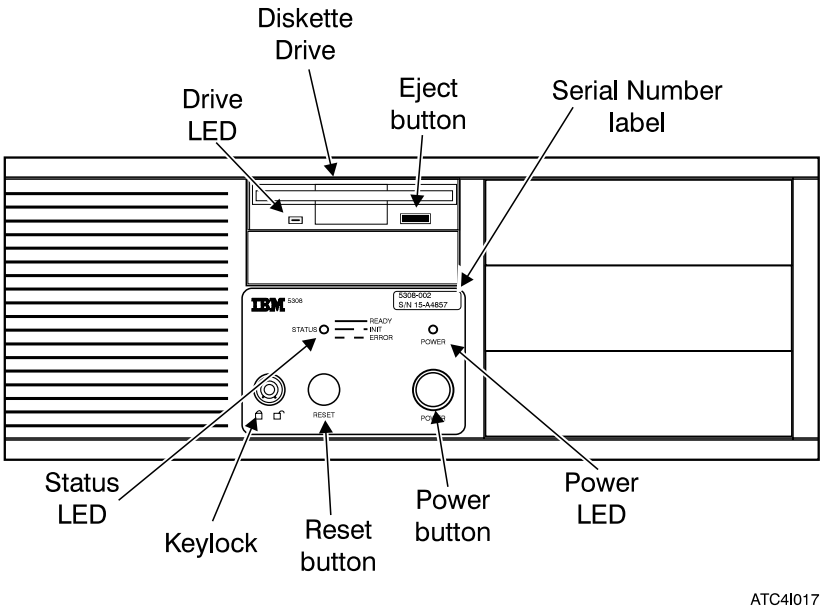


Figure 3-8. Front View of the 5308

The following operating controls are on the front panel of the 5308:

Buttons

Eject This button, which is located next to the diskette drive, lets you remove the product diskette from the drive.

Power This button powers the 5308 on and off.

Reset This button reboots the 5308 without having to power it off and on. For more information, see “Rebooting the 5308” on page 5-18.

Keylock

The keylock controls:

- Whether a password is required to access the system administrator options. For more information, see “System Administrator Mode Password” on page 4-3.
- Which configuration is used for the RS-232 port that is labeled communications line 0 when the 5308 is rebooted. For more information, see “Rebooting the 5308” on page 5-18.

Lights

The following LEDs are on the front panel of the 5308:

Drive LED This light is on when the drive is operating.

Status LED This light indicates the status of the 5308:

- The light is on when the 5308 is operational.
- The light blinks slowly and steadily when the diagnostics are running or when the 5308 is booting.
- The light blinks rapidly and then pauses when there is an error. Count the number of blinks between pauses. Then see “Boot Sequence Detected a Problem” on page 12-2 for information about the error.

Power LED This light is on when the 5308 is switched on.

For information about the voltage switch and the connectors that are on the back of the 5308, see “Back View of the 5308” on page 3-2.

Verifying the Voltage Switch Setting

Important: Powering on the 5308 when the voltage switch is not in the correct position for your country can damage the 5308.

Make sure that the voltage switch is set in the correct position for your country:

- For the United States and Canada, the voltage switch must be set to 115.
- For some countries, the voltage switch must be set to 230.

The voltage switch is located on the back of the 5308, as shown in Figure 3-1 on page 3-3.

Installing the System Diskette

Make a backup copy of the IBM 5308 ASCII to 5250 Connection System Diskette. For directions, see the documentation provided with the operating system for the PC that you use to make the backup copy.

Note: Do not write protect the diskette that contains the backup copy, because your configuration changes are saved to this diskette.

Put your backup copy (that is *not* write protected) of the system diskette in the 5308 diskette drive, and store the original diskette in a separate location. Leave the backup copy in the 5308 at all times.

Important: *Do not* move this diskette from one 5308 to another. The configuration information that is saved on the system diskette is specific to this 5308. If you move the diskette to another 5308, you might need to perform an emergency configuration of the 5308s.

Powering On the 5308

After you have verified that the voltage switch is in the correct position for your country, press the power button. The power LED glows. (For the location of the power button or the power LED, see Figure 3-8 on page 3-8.)

When you power on the 5308, the boot sequence begins:

1. The power LED lights.
2. The drive LED lights for 2 seconds.
3. The speaker beeps once, and the drive LED lights again.
4. After a pause, the status LED flashes slowly while the diagnostics run.

   If the Status LED repeatedly flashes rapidly and then pauses, there is an error. Count the number of blinks between pauses. Then see "Boot Sequence Detected a Problem" on page 12-2 for information about the error.

   Note regarding the 5308-0M2: When the diagnostics run on the 5308-0M2, it is normal for the internal modems to make noise.
5. After a few minutes, the status LED stops flashing and stays on.
6. Any directly connected terminals should display the initialization message.

   If the communications line is configured for auto baud detection, slowly press the spacebar multiple times (up to 10) so that the 5308 can determine the baud rate to use. Then the initialization message appears. For more information, see the *User's Guide*.

The boot sequence is now complete.

Chapter 4. Performing the Initial Configuration of the 5308

This chapter provides background information about configuring the 5308 and directions for procedures that are specific to configuring the 5308 for the first time.

A backup copy (that is *not* write protected) of the IBM 5308 ASCII to 5250 Connection System Diskette should remain in the 5308 at all times. When you save 5308 configuration settings, they are written to this diskette. This information is specific to that 5308:

- Do *not* copy configuration files from one 5308 to another. Configure each 5308 separately.
- Do *not* move this diskette from one 5308 to another. If you move the diskette to another 5308, you might need to perform an emergency configuration of the 5308s.

Configuring the Host and the Workstations

In addition to configuring the 5308, you need to configure the host and the workstations.

Configuring the Host for ASCII Devices

When you configure the host for the 5308, specify the following device codes for each workstation:

Type of Emulation	Display
Device type	3196, 3197, or 3488
Keyboard type	Enhanced

Configuring the Workstations

To configure the workstations, follow the directions in the *5308 User's Guide* and the documentation provided with your terminal or terminal emulation program.

The Operator's Console

The Operator's Console lets you perform 5308 administrative tasks from any workstation that is attached to the 5308. From the Operator's Console, you can:

- Configure the 5308, which includes establishing settings for the communications lines and defining the 5250 devices that are attached to each communications line. For directions, see Chapter 5, "Using the 5308 Configuration Program."
- Change the password that is required to access the system administrator options of the operator's console. For directions, see "System Administrator Mode Password" on page 4-3.
- Run the 5308 diagnostics, which let you check communication with the host and the function of the 5308 ports used to connect workstations. For directions, see "Running the Diagnostics" on page 12-8.
- Reboot the 5308. For more information, see "Rebooting the 5308" on page 5-18.

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You can also use the Operator's Console to view the keyboard maps for supported displays. This feature is available to any workstation that is attached to the 5308. For more information about viewing keyboard maps online, see the *5308 User's Guide*.

Accessing the Operator's Console

The Operator's Console can be accessed from any of the workstations attached to your 5308. We recommend that you use the RS-232 port that is labeled communications line 0 for configuring the 5308 because the emergency configuration procedure (described on page 5-19) uses this port only.

When the 5308 is operating normally, you access the Operator's Console by pressing the Operator's Console Mode key sequence:

- If you are using the 5308 PC Terminal Program, this key sequence is Alt/Home.
- Otherwise, this key sequence is Ctrl/O.

Only one workstation at a time can access the System Administrator mode of the Operator's Console. If another workstation attempts to enter the System Administrator mode at the same time, an error message indicating access denied is displayed. Other workstations attached to the 5308 can communicate with the host while System Administrator mode is being used.

Note: When a new 5308 configuration is saved, other workstations might experience a brief pause in host communication.

Using the Menus and Screens

The Operator's Console lets you use a series of screens and menus to access 5308 functions.

From menus, a list of available options is displayed. Using the up and down arrow keys, position the arrow next to the option you want to select.

For the most part, the remainder of the Operator's Console screens are screens for selecting configuration options. When one of these screens is first displayed, the position of the asterisk (*) indicates the current selection. When within a vertical list of choices, use the up and down arrow keys to change the current selection. The tab key is used to move between fields. There are some exceptions to this description of menus and screens.

Help screens are available from each menu and screen.

Menu and Screen Commands

At the bottom of each screen are commands that you can use by pressing the indicated key. These commands include:

Help	Displays help information for the current menu.
Cancel	Returns you to the previous menu or screen. If you are on a screen with selections, any input since the last time you pressed Enter is discarded also.
Roll down	Pages up one screen.
Roll up	Pages down one screen.

Any unique commands are also displayed at the bottom of the screen.

Using the Keylock on the 5308

During normal operation of the 5308, leave the keylock in the **Locked** position. The keylock controls:

- Whether a password is required to access the system administrator options of the Operator's Console. For information about using a password for the 5308, see "System Administrator Mode Password."
- Whether the 5308 reboots in normal or emergency mode. For information about rebooting the 5308, see "Rebooting the 5308" on page 5-18.

System Administrator Mode Password

The position of the keylock determines whether a password is required to access the System Administrator options of the Operator's Console and to change the current password:

- When the 5308 keylock is in the Unlocked position, no password is required.
- When the 5308 keylock is in the Locked position, the current password is required.

The Factory Shipped Password

The 5308 is shipped with the default password: **ibm5308**

This password is case sensitive. You must enter **ibm5308** not **IBM5308**. We recommend that you change this password as soon as possible after installing the 5308. For directions, see "Changing the Password."

Changing the Password

To change the 5308 System Administrator password:

1. From the Operator's Console Main Menu, select System Administrator Mode Options.
   - If the keylock is in the Unlocked position, the System Administrator Mode Options Main Menu screen appears immediately.
   - If the keylock is in the Locked position, the System Administrator Main Menu screen appears after you enter the current password.
2. Select the Change Password option from the menu. The Change Password screen appears.
3. Complete the Change Password screen:
   a. If the keylock is in the Locked position, type the current password in the Current Password field. Asterisks (*) are displayed instead of the password that you type.
   b. Press the Tab key to move between fields.

c. Type the new password in the New Password field and in the Verify New Password field. The new password:

   - Cannot begin with a blank
   - Cannot contain a blank
   - Must be 4 to 8 alphanumeric characters from the English alphabet
   - Must not match the current password

   Remember: The password is case sensitive.

d. When you have completed all the fields, press Enter to accept the new password or Cancel to cancel your changes. If all the fields contain valid input, the following message appears:

   ```
   Password will be changed if the next key pressed is the Enter key.
   ```

e. Do one of the following:

   - To activate your new password, press Enter.
   - To discard the new password, press any other key.

   If the 5308 hangs when you try to save configuration settings or to change the system administrator mode password, verify that a backup copy (that is *not* write protected) of the IBM 5308 ASCII to 5250 Connection System Diskette is in the diskette drive of the 5308. When the diskette is in the drive, reboot the 5308. Then change and save the configuration or the password again.

Using the Factory Default Configuration

The 5308 is shipped with a factory default configuration for the maximum number of communications lines supported by your 5308. This factory default configuration, described in “Factory Default Configuration Settings” on page 4-5, is for direct attachment to all the RS-232 ports that your 5308 supports.

If the default settings fit your needs for the communications lines, you can use the 5308 without changing the factory default settings. To use the factory default configuration, put the keylock in the Locked position and boot the 5308.

Note: If you are using the 5308-0M2 and want to use one or both internal modems, you must configure the 5308 using the directions in “Asynchronous Communication Configuration” on page 5-2.

Factory Default Configuration Settings

The factory default configuration settings for each communications line is as follows:

Asynchronous Communications

The default settings for asynchronous communications include:

ASCII Terminal Type

Prompt User

Communications

The default communications settings are:

Attachment	Direct
Baud Rate	Auto (See “Auto Baud” on page 4-6.)
Stop Bits	1
Data Bits	8
Parity	None
Flow Control	Xon/Xoff

5250 Device Configuration

The default settings for 5250 device configuration include:

Enable/Disable Station Addresses

The maximum number of station addresses is Enabled starting at 0. The maximum number is equal to the maximum number of communications lines supported by your 5308 system.

Station Address x Configuration

The default configuration settings for station address x are:

Device type	3196
Number of sessions	1
Host ⇔ ASCII translations	037-819
Host keyboard	United States
Communications line	Assigned to the same value as the station address. For example, communications line 0 is assigned to station address 0.

If you need a more detailed explanation of these settings, see Chapter 5, “Using the 5308 Configuration Program.”

To perform the initial configuration or an emergency configuration of the 5308, your workstation must be configured to be compatible with these factory default settings. For more information, see “Workstation Settings Required for Initial Configuration” on page 4-6.

Auto Baud

Auto is the factory setting for the baud rate. This setting is also used when the 5308 is booted with the keylock in the Unlocked position. This setting primarily exists for initial configuration and emergency reconfiguration of the 5308.

When the Auto Baud Rate setting is used for a communications line, the 5308 determines the baud rate to use when communicating with the workstation. For the 5308 to determine the baud rate, the user must press the spacebar of the workstation up to ten times. (For information about establishing communication with the host using auto baud see the *5308 User's Guide*.)

The Auto setting can only be used when *all* the following requirements are met:

- The workstation is directly attached to the 5308.
- The workstation is running at one of the baud rates that the 5308 supports.
- The workstation is configured for 8 data bits, 1 stop bit, and no parity.

Workstations with different settings *cannot* be used for the initial configuration or for an emergency configuration of the 5308.

When Auto is specified for a communications line, you cannot change the stop bits, data bits, or parity settings for the workstation on that line.

In most cases, a fixed baud rate is recommended because it prevents the person using the workstation from having to press the spacebar multiple times (the Auto baud sequence) to establish communications with the 5308.

The Initial Configuration of the 5308

Each communications line that you use must have a configuration that is associated with it. If you cannot use the factory default configuration, you must complete this procedure to configure your communications lines.

To perform the initial configuration of the 5308, you must directly attach a workstation that is configured as described in "Workstation Settings Required for Initial Configuration" to the RS-232 port that is labeled communications line 0.

Workstation Settings Required for Initial Configuration

When the 5308 communications line being used as the Operator's Console is in the factory default configuration, as it is when it is first shipped, the display being used as the Operator's Console must be configured as follows:

- Attached to the 5308 with an RS-232 interface using a null modem cable
- One of the supported baud rates between 2400 and 115200 bps (the 5308 determines the speed to be used when the auto baud key sequence is detected as described below)
- 1 stop bit, 8 data bits, parity NONE, and Xon/Xoff flow control

Procedure for Performing the Initial Configuration

Before you begin this procedure:

- The 5308 must be powered on.
- A workstation configured as described in “Workstation Settings Required for Initial Configuration” on page 4-6 must be directly attached to the RS-232 port that is labeled communications line 0.

To perform the initial configuration:

1. Power on the workstation.
2. Slowly press the spacebar multiple times (up to 10 times) until you are prompted for your display type. (This is the auto baud key sequence.)
3. Enter your display type following the instructions on the screen.
4. Enter the Operator’s Console Mode key sequence for your display type:
   - If you are using the IBM 5308 PC Terminal Program press and hold down the Alt key while you press the Home key.
   - For all other workstations, press and hold down the Ctrl key while you press the O key.

   The Operator’s Console Main Menu appears.
5. Configure your 5308 using the directions in Chapter 5, “Using the 5308 Configuration Program.”
6. If you are connecting to a S/36 or S/38 host, do one of the following:
   - If you are connecting to a S/36 host, ask the system personnel to initial program load (IPL) the system. This causes the host to recognize your display and to configure communications with your display.
   - If you are connected to a S/38 host, ask the system personnel to add the workstations that are attached to the 5308 to the system configuration table and then IPL the system.
   - If you are connected to an AS/400 host, you do not need to IPL the host. The AS/400 auto-configuration feature lets you start using the 5308 anytime the AS/400 host is running. The sessions on each workstations are automatically configured at the host.

To establish communications with the host through the 5308, follow the directions in the *5308 User’s Guide*.

Chapter 5. Using the 5308 Configuration Program

To configure the 5308:

1. If you are not already accessing the Operator's Console, press the Operator's Console Mode key sequence:
   - If you are using the 5308 PC Terminal Program, this key sequence is Alt/Home.
   - Otherwise, this key sequence is Ctrl/O.
2. From the Operator's Console Main Menu, press the up and down arrow keys until you have selected System Administrator Mode Options.
3. If you are prompted for the System Administrator mode password, enter it on the Password Verification screen. The System Administrator Mode Options Main Menu appears.
4. Select the Configure 5308 option. The Configure 5308 menu appears.
5. From this menu, select one of the following configuration options:

   Asynchronous Communication Configuration
   This option lets you configure the ASCII terminal type, communications, and modem type and modem commands. For directions, see "Asynchronous Communication Configuration" on page 5-2.

   5250 Device Configuration
   This option lets you:
   - Enable/disable station addresses
   - Configure station addresses
     - Select the Host⇔ASCII code page translation
     - Select the host keyboard
     - Select the type of 5250 emulation used for each communications line
   - Assign a communications line to a station address

   For directions, see "5250 Device Configuration" on page 5-5.

   Work with Translation Tables
   This option lets you customize the code page translations for different workstations. For directions, see "Working with Translation Tables" on page 5-7.

   Save Configuration Changes
   This option lets you save the changes you have made. For more information, see "Saving 5308 Configuration Changes" on page 5-17.

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Asynchronous Communication Configuration

The Asynchronous Communication Configuration menus of the Operator's Console let you configure the ASCII terminal type, communications, and modem type/commands for each of your 5308 communications lines. To configure asynchronous communications:

1. From the Configure 5308 Operator's Console Menu, select Asynchronous Communication Configuration option. This displays the Asynchronous Communication Menu.
2. Select the communications line you want to configure. The Configure Communications Line x menu appears. This menu provides the following configuration options:
   - ASCII Terminal Type (see page 5-2)
   - Communications (see 5-2)
   - Modem Type/Commands (see 5-4)

ASCII Terminal Type

To configure the ASCII terminal type:

1. Select **ASCII Terminal Type** from the Configure Communications Line menu. This displays the ASCII Terminal Type screen.
2. From the ASCII Terminal Type screen, move the asterisk (*) to your ASCII terminal type by pressing the up and down arrow keys. If you select **Prompt User**, the user is prompted to enter the ASCII Terminal Type before the 5308 can establish communications with the host.
3. When you are done, press Enter to accept your ASCII terminal type input or Cancel to cancel your input. The Configure Communications Line x menu appears again.

Communications

To configure your communications settings:

1. Select **Communications** from the Configure Communications Line x menu. This displays the Communications screen.

   In each group of fields, move the asterisk (*) to your selection by pressing the up and down arrow keys. To move between groups, press Tab.

   For example, in the Attachment field, press the up and down arrow keys to move between the Direct and Modem selections. To move from the Attachment field to the Flow Control field, press the Tab key.

2. The current settings are indicated by an asterisk. In most cases, the default settings for stop bits, data bits, parity, and flow control do not need to be changed. If you receive the following message, use a fixed baud rate instead of Auto:

   ```
   CANNOT CHANGE SELECTION WHEN BAUD RATE OF 'AUTO' IS SELECTED.
   ```

Select the following:

Attachment

If your workstation is directly attached to the 5308, select **Direct**.

If your workstation is attached to the 5308 through a modem, select **Modem**. Then, select **Modem Type/Commands** from the Configure Communications Line x menu to configure your modem.

Baud Rate

The 5308 supports baud rates in the range of 2400-115,200 bps (bits per second). Specifying a fixed baud rate for each workstation prevents the person using the workstation from having to press the spacebar up to ten times when establishing communications with the 5308.

When you select a baud rate for a modem that is capable of data compression, select a rate higher than the maximum connect rate of the modem.

- If the maximum speed for your modem is 14,400 bps, set your 5308 to 38,400 bps.
- If the maximum speed for your modem is 28,800 bps, set your 5308 to 57,600 bps.

The 5308 supports line speeds of up to 115.2 Kbps. The 5308 transmits data serially to the attached devices using an RS-232 interface. The slower the baud rate for a communications line is, the slower the response time to the workstation. When you configure the 5308, select the highest baud rate that the workstation (and modem, if remote) supports.

Avoid baud rates below 9600, as your performance might not be optimized at these rates.

The default setting for the baud rate is Auto. For information about the Auto setting, see “Auto Baud” on page 4-6.

Stop Bits

Specifies the delay time between transmitted characters. The default is **1**.

Data Bits

Specifies the number of data bits for each character. The default is **8**.

Flow control

At the 5308, we recommend you select **Xon/Xoff** (software flow control) for lines that have terminals directly attached and **Hardware** for lines with a modem attached:

- Modem attachments should raise and lower the Clear to Send (CTS) line when configured for hardware flow control.

Conditions at the workstation might be different:

- ASCII terminals configured for hardware flow control sometimes toggle the Data Terminal Ready (DTR) line. This type of hardware flow control is not compatible with most modems, but is acceptable when a workstation is directly connected to the 5308.
- Terminals or modems configured for software flow control should stop and restore data flow by transmitting Xoff/Xon characters.

Parity

Specifies whether error checking is performed. The default is **None**.

3. When you are done, press Enter to accept your Communications input or Cancel to cancel your input. The Configure Communications Line x menu appears again.

Modem Type/Commands

To configure your modem type and modem commands:

1. Select the Modem Type/Commands option from the Configure Communications Line x menu.
2. Move the asterisk (*) to your Modem Type by pressing the up and down arrow keys. The default is **U.S. Robotics-compatible, 28800 bps**.

   If you do not have one of the modems listed, select the (*)Other option.
3. Press the Tab key to move to the Commands. Selections on this screen are ignored, unless the (*)Modem option is selected on the Configure Communications Line x Communications screen.

   We provide you with default strings for the Init and Hangup commands, unless you have an **Other** modem. The default Commands strings defaults are for switched lines:

   - If you are using leased lines or a modem for which no default strings are supplied, you need to edit these fields. For information about editing the strings, see “Guidelines for Modem Initialization Settings” on page 9-2.
   - Otherwise, accept the default strings if possible.

   Notes regarding 5308-0M2 internal modems:

   a. The internal modems on the 5308-0M2 do not support leased lines.

   b. To reduce noise from the internal modems, turn the speakers off by putting an M0 command in the modem initialization string for each internal modem that you are using. To change the modem initialization string for the internal modem, use the Operator’s Console.
4. When you are done, press Enter to accept your Modem Type/Commands input or Cancel to cancel your input. The Configure Communications Line x menu appears again.

5250 Device Configuration

The 5250 Device Configuration menus let you configure your 5250 devices. To configure your 5250 devices, select the 5250 Device Configuration option from the Configure 5308 Operator's Console menu. The 5250 Device Configuration Menu appears. This menu provides the following options:

Enable/Disable Station Addresses

This option lets you enable and disable host station addresses. If other devices are on the same twinaxial workstation controller port as the 5308, use this option to disable the 5308 from using the addresses that those devices are using. Two devices cannot use the same station address on a twinaxial workstation controller port.

Station Address x Configuration

This option lets you:

- Select the Host⇔ASCII code page translation
- Select the host keyboard
- Select the type of 5250 emulation
- Assign a communications line to a station address

This menu shows the configuration status of each station address. For example, 3196-0 indicates the station address is configured for a 3196 device on communications line 0. Disabled indicates the station address is disabled. If these are settings that you just selected, you must save them and reboot the 5308 for them to become active.

Note: To save configuration changes for a station address, the station address *must* be enabled. When you save configuration changes, any changes to disabled addresses are not kept. The 5308 saves only configuration changes that are made to enabled station addresses.

Enable/Disable Station Addresses

To Enable/Disable Station Addresses:

1. Use the up and down arrow keys to select the Enable/Disable Station Addresses option from the 5250 Device Configuration menu to enable and disable station addresses, then press Enter. This displays the Enable/Disable Station Addresses screen.
2. Move the asterisk (*) to your Enable/Disable selections by pressing the up and down arrow keys. To move between Station Addresses, press the Tab key.

   The maximum number of station addresses that you can Enable is equal to the maximum number of communications lines that your 5308 supports. The 5308 will default to enabling the maximum number of addresses starting at station address 0.
3. When you are done, press Enter to accept your Enable/Disable Station Addresses input or Cancel to cancel your input. The 5250 Device Configuration Menu appears.

Station Address x Configuration

To configure a station address:

1. From the 5250 Device Configuration Menu, select the address that you want to configure by pressing the up and down arrow keys until the arrow is next to the correct Station Address x Configuration option. Then press Enter. The Station Address x Configuration screen appears.
2. In the **Device Type** field, press the up and down arrow keys to move the asterisk to your device type. The default is 3196.
3. To move to the Number of Sessions field, press Tab.
4. In the **Number of Sessions** field, press the up and down arrow keys to move the asterisk to the number of sessions that will use the address:
   - If you specified a 3196 or a 3197 in the Device Type field, only one session can be used on the address.
   - If you specified a 3488 in the Device Type field, up to 4 sessions can be used on the address. To select the number of sessions that are used, press the up and down arrow keys.

   Note: Shared addressing is only available when 3488 is specified in the Device Type field.
5. To move to the **Host⇔ASCII Translations** field, press the Tab key. To change the default Host⇔ASCII translation table for a session, do the following:
   a. Use the up and down arrow keys to place the cursor at the session whose translation table you want to change.

      You can specify a different translation table for each session that you configure. This permits people from different countries to use the same station address (one at a time). For example, if you had three workstations in Spain and one workstation in Italy, you could specify that the first three sessions used the 284↔819 translation table and the fourth session used the 280↔819 translation table. Any one who used the workstation in Italy would toggle to the fourth session when communications with the host were established.

   b. Display a pop-up list of the code page translations that are available by pressing the SelList key.

   c. Press the up and down arrow keys until the cursor is on the translation table that you want to use.

      Note: If you have selected a custom table, but have not yet customized it, see “Working with Translation Tables” on page 5-7 for more directions.

   d. Press Enter to select the translation table and close the pop-up list.

      Note: You can change the Host⇔ASCII Translation selection for any session, but your changes are only saved for the number of sessions that you specified in the Number of Sessions field. For example, if you specified four different translation tables, but you specified three sessions in the Number of Sessions field, only the first three translation tables would be saved.

6. To move to the **Host Keyboard** field, press Tab. To change the default host keyboard for a session, do the following:

   a. Use the up and down arrow keys to place the cursor at the session for which you want to change the host keyboard.

      You can specify a different host keyboard for each session that you configure. This permits people from different countries to use the same station address (one at a time). For example, if you had three workstations in Spain and one workstation in Italy, you could specify that the first three sessions used the Spanish keyboard and the fourth session used the Italian keyboard. Any one who used the workstation in Italy would toggle to the fourth session when communications with the host were established.

      Note: A more detailed discussion of the keyboards can be found in "Keyboard Support" on page 5-19.

   b. Display a pop-up list of the host keyboards that are available by pressing the SelList key.

   c. Press the up and down arrow keys until the cursor is on the keyboard that you want to use. Usually the host keyboard is set to match the workstation keyboard.

   d. Press Enter to select the host keyboard and close the pop-up list.

      Note: You can change the Host keyboard selection for any session, but your changes are only saved for the number of sessions that you specified in the Number of Sessions field. For example, if you specified four different host keyboards, but you specified three sessions in the Number of Sessions field, only the first three host keyboards would be saved.

7. Move to the **Communications Line** field by pressing Tab. If you want to change the Communications Line assignment, use the up and down arrow keys to move the asterisk to the line you want.

   Another way to set up **multiple sessions** is to assign the same communications line to different station addresses. You can have a maximum of eight sessions on a communications line. Setting up multiple sessions this way (instead of using shared addressing), reduces the number of workstations that you can attach to the 5308.

8. When you have specified all the settings for this station address:

   - To accept your input, press Enter.
   - To cancel your changes, press the Cancel key.

Working with Translation Tables

The Work with Translation Tables menus let you define up to seven custom translation tables that any session can be set up to use. If you are not familiar with translation tables, read "About Translation Tables" on page 5-8 before continuing.

If possible, when doing this configuration, use the type of workstation for which you are defining the translation table. Although you can define custom translation tables from any workstation, using the same type of workstation helps ensure that the customized translation tables are correct.

To define a custom translation table:

1. Select the Work with Translation Tables option from the Configure 5308 Operator's Console menu. The Work with Translation Tables Menu appears.
2. Select a Custom Translation Table. The Custom Translation Table *x* Menu appears. This menu provides the following options:
   - Host Character to ASCII Character (see page 5-9)

     Always change this translation table *before* selecting either of the other options.
   - ASCII Keyboard Character to Host Characters (see page 5-12)
   - Workstation Keyboard to Host Function Keys (see page 5-15)

     This translation table is used *only* for terminals, such as the DEC VT-100 and VT-220, that do not have function keys (that is, F1 through F12 keys).

About Translation Tables

The 5308 uses *translation tables* to define how the workstation code page and the host code page correspond. A *code page* is the set of characters that a device uses. The following types of code pages are used:

ASCII This stands for American National Standard Code for Information Interchange. Some workstations use ASCII code pages, which have 256 characters.

ANSI This stands for American National Standards Institute. Some workstations use ANSI code pages, which often have 128 characters.

EBCDIC This stands for Extended Binary Coded Decimal Interchange Code. Hosts use EBCDIC code pages, which have 192 characters.

Each character in a code page is assigned a *character code*. Translation tables control how the host and ASCII character codes correspond:

- When the host sends data for the workstation to display, the 5308 uses a translation table to switch from the host's EBCDIC character codes to the workstation's ASCII or ANSI character codes.
- When the workstation sends ASCII characters to the host (for example, when keys are pressed), the 5308 uses a different translation table to switch from the workstation's ASCII or ANSI character codes to the host's EBCDIC character codes.

Because some workstations have more characters than the host, some workstation characters do not have a corresponding host character. Similarly, because some workstations have fewer characters than the host, some host characters do not have a corresponding workstation character.

When you configure a station address (see page 5-6), you specify a translation table for each session that uses the station address. As shipped, the 5308 translates the supported host code pages to ASCII code page 819. There is a one-to-one correspondence between the character codes in these code pages:

- If a workstation supports ASCII code page 819 and the correct translation tables are specified for the communications line, sessions probably do not need a custom translation table.
- If a workstation does not support code page 819 and if experimenting with the workstation settings does not resolve the differences between the code pages, sessions probably need a custom translation table.

Note: The 5308 PC Terminal Program **only** supports Code Page 819. Custom translation tables should not be used for sessions that run the PC Terminal Program.

To determine whether host characters are displayed correctly on a workstation, follow the directions in the *5308 User's Guide*.

Host Character to ASCII Character Translations

Use this option to control how host characters are displayed on the workstation. Always change this translation table **before** selecting either of the other options. Changing a keyboard translation table before correcting the display translation table could lead to errors.

To define a custom translation table for how host characters are displayed on a workstation:

1. Select the custom translation table that you want to work with from the Work with Translation Tables Menu.
2. Select **Host Character to ASCII Character** from the Custom Translation Table x Menu. A screen similar to the one shown in Figure 5-1 on page 5-10, appears:
   - On the left side of the screen, a table shows how each character of the host code page is displayed on the workstation. The top and left sides of the table are the hexadecimal value of the host character codes. The body of the table shows the ASCII character that the workstation uses for each host character.

For example, to determine which ASCII character is substituted for the host character code x'81', you would find the intersection of 8- and -1. The ASCII character “a” is at this intersection, so it is the character that is substituted for the host x'81'.

- On the right side of the screen, the host code page that you are translating from is shown. For example, host code page 037 is used in Figure 5-1.

Custom Translation Table x

Host Character to ASCII Character

	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		&	-	ø	Ø	°	µ	^	{	}	\	0
-1		é	/	É	a	j	~	£	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	§	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	`	i	r	z	¾	I	R	Z	9
-A	Ç	!	¦	:	«	ª	¡	[	-	1	2	3
-B	.	$	,	#	»	º	¿	]	ô	û	Ô	Û
-C	<	*	%	@	ð	æ	Ð	¯	ö	ü	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	|	¬	?	"	±	¤	®	×	õ	ÿ	Õ	

Host Code Page: [037]

ASCII Code:
- Hex/Decimal [81/129]

F1=Help F3=Cancel F4=Hex/Char F5=CodePage F6=Change

ATC4I018

Figure 5-1. Sample Host Character to ASCII Character Screen

3. If the code page shown on the right side of the screen is not the one that your host uses:

   a. Press the CodePage key. A pop-up list of code pages appears.

      When you press the CodePage key and the pop-up list of code pages appears, if you decide you do not want to make a selection, you can press the Cancel key sequence that will redisplay the “Host Character to ASCII Character” screen unchanged.

   b. Use the up and down arrow keys to select the code page that your host uses.

   c. Press Enter. The Host Character to ASCII Character screen changes to reflect the translation from the host code page that you selected to ASCII code page 819.

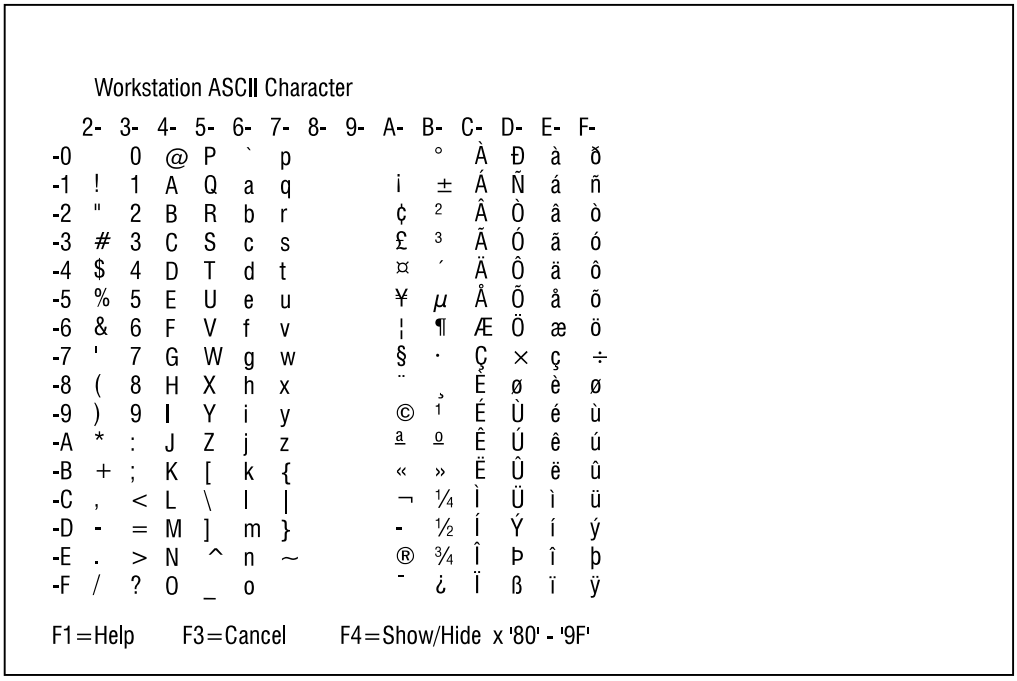
   Note: You can change the host code page that you are using at any time; but when you select a host code page (even the same one), any translations that you changed return to the default values.

4. Edit the translation table shown in the Host Character to ASCII Character screen to make it resemble as closely as possible the code page printed in Chapter 10. You can edit the translation table in character or hexadecimal format. To toggle between character and hexadecimal formats, press the Hex/Char key:

   Character Format
   To edit the translation table in character format:

   a. Use the arrow keys to move the cursor to the character that you want to change.

   b. Press the Change key. A screen similar to the one shown in Figure 5-2 appears. This screen shows the characters that are available on your workstation.



ATC4I019

Figure 5-2. Sample Workstation ASCII Characters Screen

   c. Use the arrow keys to select a character.

   d. Press Enter to put the character in the translation table.

   Notes:

   a. Workstation control characters (x'00' to x'1F' and x'7F') are not displayed.

   b. ASCII characters from x'80' to x'9F' are not displayed because host code page 819 does not use them. Some workstations use these characters as control characters. If you think that these characters are not control characters on your workstation, you can display them by pressing the Show/Hide x'80'-x'9F' key.

      If your workstation uses these characters as control characters, displaying them can cause unpredictable results. If you encounter problems, display the Workstation ASCII Characters screen (if it is not already displayed).

Then, hide the characters from x'80' through x'9F' by pressing the Show/Hide key again.

Hexadecimal format
To edit the translation table in hexadecimal format:

a. To move to the host character code that you want to change, press the arrow keys.

b. Type the new hexadecimal value for the workstation character that you want to use. The cursor moves to the next character code.

Notes:

1) The Change key does not appear in Hex mode.
2) Workstation values x'00' to x'1F', and x'7F' cannot be used.

5. When the Host Character to ASCII Character screen is as close as possible to the host code page that is printed in Chapter 10, press Enter.

ASCII Keyboard Character to Host Characters

Important: *Before customizing the keyboard translation table*, make sure the Host Character to ASCII Character translation table is defined correctly. For directions, see “Host Character to ASCII Character Translations” on page 5-9.

Use this option to control how the keyboard characters that the workstation sends are translated for the host.

Note: A more detailed discussion of keyboards can be found in “Keyboard Support” on page 5-19.

To define a custom translation table for how ASCII keyboard characters are translated for the host:

1. Select the custom translation table that you want to work with from the Work with Translation Tables Menu.
2. Select **ASCII Keyboard Character to Host Characters** from the Custom Translation Table x Menu. A screen similar to the one shown in Figure 5-3 on page 5-13, appears:
   - On the left side of the screen, a table shows how each character of the workstation (ASCII) code page is sent to the host when a key is pressed. The top and left side of the table are the hexadecimal value of the ASCII character codes. The body of the table shows the hexadecimal value of the host character that is used for each ASCII character.

- On the right side of the screen, the host code page that you are translating to is shown. For example, host code page 037 is used in Figure 5-3.

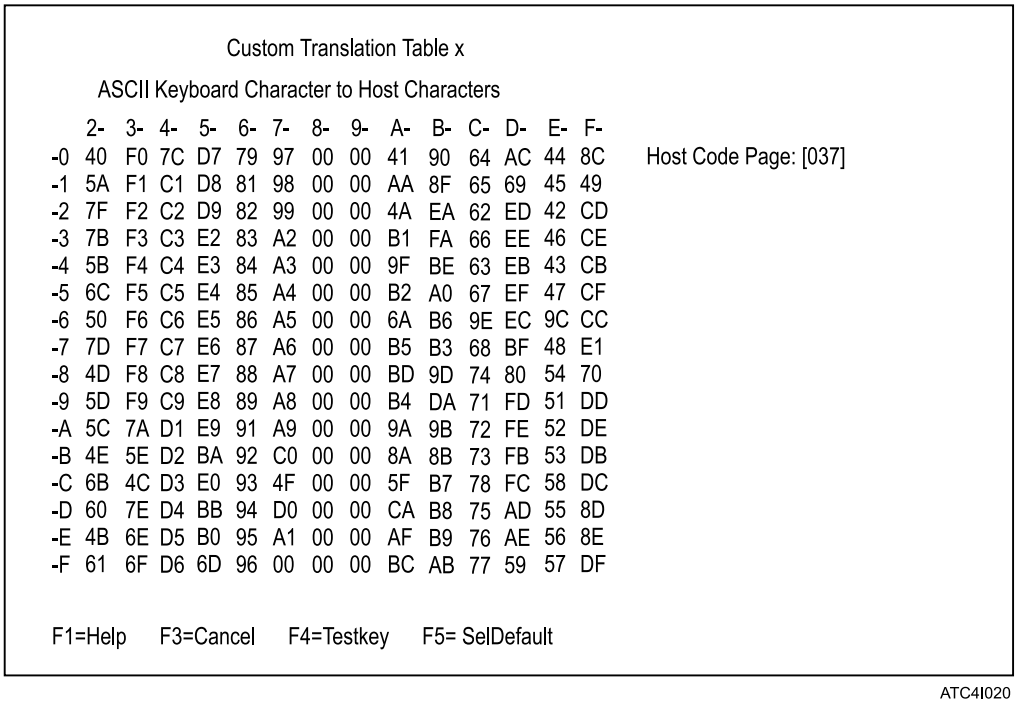


Figure 5-3. Sample ASCII Keyboard Character to Host Characters Screen

3. If the code page shown on the right side of the screen is not the one that your host uses, press the Cancel key and use the Host Character to ASCII character screen to select the correct code page.
4. Edit the translation table shown in the ASCII Keyboard Character to Host Characters screen as needed. You will probably need to make changes that are similar to the ones that you made to the Host Character to ASCII Character screen.

   Resetting the table to default values
   This table can be reset to default values to match the current Host Code Page. To accomplish this, press the SelDefault Key.

   Note: Any changes made prior to pressing this key will be lost.

Determining which ASCII value is sent to the host
To determine which ASCII value is sent to the host when you press a key:

a. Press the TestKey key. A screen similar to the one shown in Figure 5-4 appears.

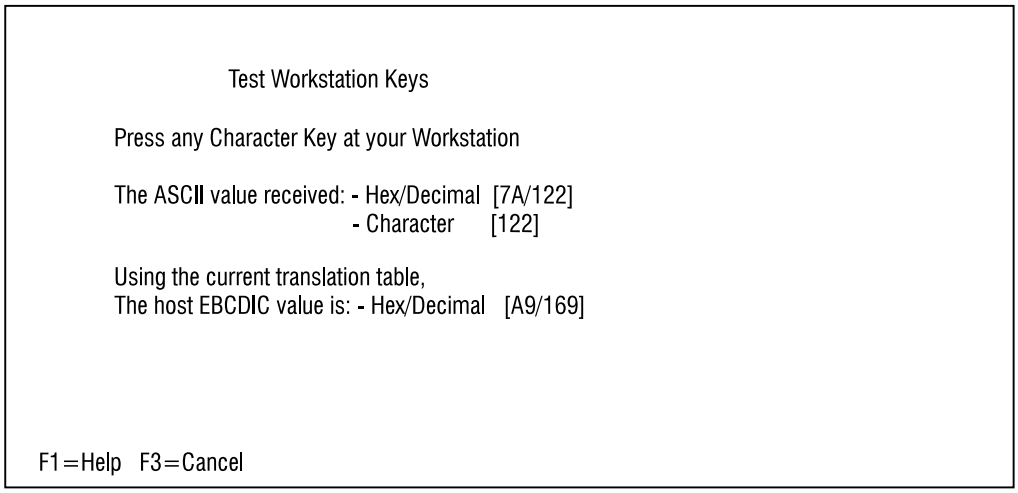


Figure 5-4. Sample Test Workstation Keys Screen

b. Press any key that sends one character (not a key that starts a compose sequence) to the 5308. The Test Workstation Keys screen changes to show the hexadecimal and decimal values for:
   - The ASCII character that was sent
   - The EBCDIC character that was substituted for the ASCII character

c. To return to the ASCII Keyboard Character to Host Characters screen, press Enter. The cursor is placed under the last character that you entered.

In the example above, the character representing X'7A' was pressed. Pressing Enter or the Cancel key sequence will redisplay the ASCII Keyboard Characters to Host Characters screen with the cursor under X'7A'.

Determining which host character the 5308 substitutes
To determine which host character is substituted for the ASCII character that is sent when a key is pressed:

a. Use the ASCII Keyboard Character to Host Characters screen to find the hexadecimal value of the host character.

b. Use the host code page that is printed in Chapter 10 to determine which host character the hexadecimal value represents.

For example, to determine which host character is substituted for the ASCII character code x'31' in Figure 5-3 on page 5-13, you would:

a. Find the intersection of 3- and -1. The host character x'F1' is at this intersection.

b. See “Code Page 037” on page 10-3 to determine the character that corresponds to x'F1'. The host character “1” is at this intersection, so “1” is the host character that is substituted for ASCII x'31'.

Editing the keyboard translation table

To edit the ASCII Keyboard Character to Host Characters screen:

a. To change the host value that is substituted for an ASCII character, use the arrow keys to move the cursor to the host value.

   Note: The host value at the intersection of x'7F' cannot be changed.

b. Type the new hexadecimal value for the host character that you want to use. To determine the hexadecimal value of the host character that you want to use, use the host code page printed in Chapter 10. For example, the hexadecimal value of "J" in host code page 37 is "D1".

   After you type a value, the cursor moves to the next character code.

5. When the ASCII Keyboard Character to Host Characters screen is as close as possible to the host code page that is printed in Chapter 10, press Enter.

Workstation Keyboard to Host Function Keys

Note: This translation table is used only for terminals, such as the DEC VT-100 and VT-220, that do not have function keys (that is, F1 through F12 keys). Other terminals ignore any changes to this table.

For terminals that do not have function keys, host functions are emulated by pressing ESC followed by another character. As shipped, the 5308 maps these functions to the top row of keys on the keyboard. On the United States keyboard, which is the factory default:

- Host functions F1 through F10 are mapped to ESC 1 through ESC 0 respectively.
- Host functions F11 and F12 are mapped to the two keys to the right of 0.
- Host functions F13 through F24 are mapped to the combination of ESC, Shift, and the keys used for F1 through F12 respectively. For example, F1 is mapped to 1, and F13 is mapped to ESC Shift/1.

If you set up a session to use a host keyboard other than the default United States keyboard, the host functions are still emulated by pressing ESC followed by the character, but the user does not have the convenience of the character being in the top row of keys. You can use the Workstation Keyboard to Host Function Keys option to assign the host functions to the top row of keys on supported national keyboards.

To assign the host functions to the top row of keys:

1. Select the custom translation table that you want to work with from the Work with Translation Tables Menu.
2. Select **Workstation Keyboard to Host Function Keys** from the Custom Translation Table x Menu. A screen similar to the one shown in Figure 5-5 on page 5-16, appears.

This screen shows the ESC character and ESC Shift/character combinations used to emulate each of the host functions (F1 through F24). The values for F1 through F10 are assigned to 1 through 0 respectively. These assignments cannot be changed.

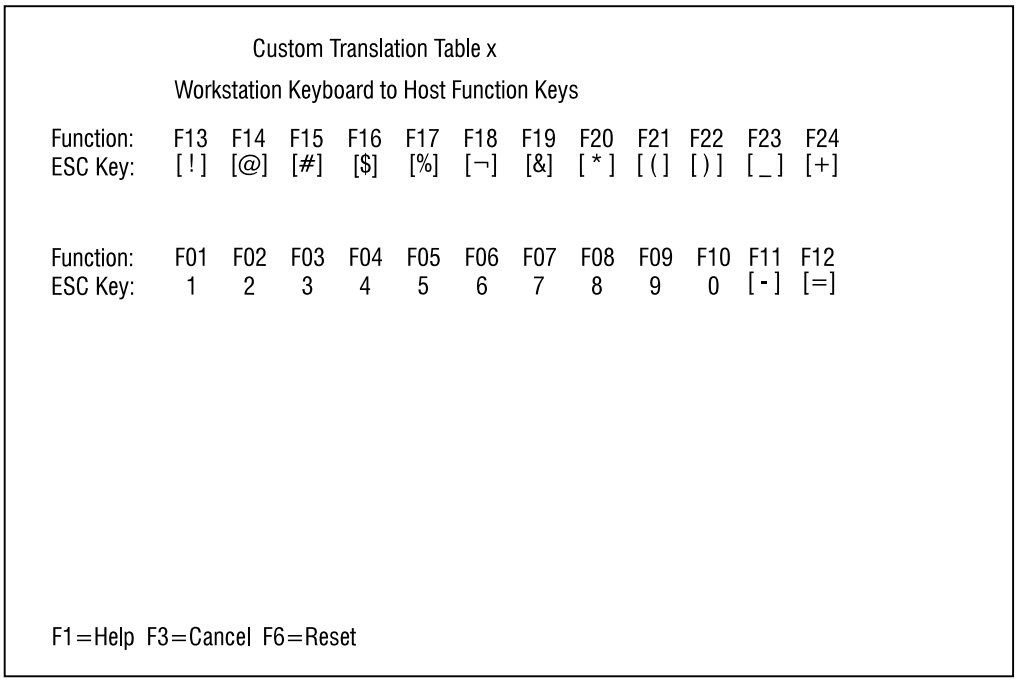


Figure 5-5. Sample Workstation Keyboard to Host Function Keys Screen

3. The cursor starts at the F11 field. To map the F11 function, press the key to the right of the 0.

   Notes:

   a. To reset the fields to the default values at any time, press the Reset key.

   b. You cannot map host functions to any United States alphanumeric characters (that is, a to z, A to Z, or 0 to 9).

4. Press Tab to move to the F12 field. To map the F12 function, press the key to the right of the one that you pressed in step 3.
5. Press Tab to move to the F13 field. To map the F13 function, press Shift/1.
6. Map the rest of the host functions to Shift and the keys used for F1 through F12. For example, to map the F14 function, press Shift/2.
7. When all the host functions are mapped, press Enter to save the table and return to the Custom Translation Table x Menu.

   Note: Duplicate characters and United States alphanumeric characters cannot be used for the host functions. If an error message appears, verify that none of the fields contain duplicate characters or a United States alphanumeric character.

Customization Problems

These customization suggestions work well for most keyboards. However, some keyboards may have problems.

If the "?" character is mapped to a function key, then the sequence ESC ? will no longer be considered the HELP function. The alternate sequence for HELP is either ESC H or ESC h (where the case of the "h" depends on the terminal type being used).

On some keyboards, the key suggested for the F12 and F24 contains diacritic characters. Using a diacritic character will work provided the terminal sends out the character (usually after pressing it twice). If the terminal does not send the character, then there are two known alternatives.

1. Some terminals allow you to enter the decimal code for the diacritic character.
2. Map the functions to some other non-diacritic characters located on the keyboard.

Saving 5308 Configuration Changes

After you make any 5308 configuration changes, you must save the changes and reboot the 5308 to activate these changes. Configuration changes do not affect the current operations of the 5308.

Note: The 5308 does *not* save:

- Configuration changes that are specified for disabled station addresses.
- Host⇔ASCII translations for more sessions than are specified in the Number of Sessions field.
- Host keyboards for more sessions than are specified in the Number of Sessions field.

To save configuration changes:

1. From the System Administrator Mode - Configure 5308 menu, select the Save Configuration Changes option. The Save Configuration Changes screen appears.
2. Do one of the following:
   - To save your changes, make sure the (*)Save Configuration Selections option is selected, **and** then press Enter. The Configure 5308 menu appears.

     If the 5308 hangs when you try to save configuration settings or to change the system administrator password, verify that a backup copy (that is *not* write protected) of the IBM 5308 ASCII to 5250 Connection System Diskette is in the diskette drive of the 5308. When the diskette is in the drive, reboot the 5308. Make your changes to the configuration or the password again, and then save your changes.
   - To discard your changes, select the Discard Configuration Selections option.
   - To return to the previous menu (instead of saving or discarding your changes), press the Cancel key.

3. Select the Return to Previous Menu option. The System Administrator Mode Options Main Menu appears.

   To activate the new configuration, you must reboot the 5308 with the keylock in the **Locked** position. Until you reboot the 5308, your previous configuration is used.

4. Reboot the 5308. For directions, see “Rebooting the 5308.”

Rebooting the 5308

Reboot your 5308 when:

- You want to temporarily restore the factory configuration for the RS-232 port that is labeled Communications Line 0. See “Emergency Configuration Procedure” on page 5-19.
- You want to activate configuration changes. See “Saving 5308 Configuration Changes” on page 5-17.
- You ran one of the 5308 diagnostic tests. See “Running the Diagnostics” on page 12-8.
- You have lost communication with the host or you cannot establish communication.

The position the keylock is in when you reboot determines whether the 5308 is in emergency or normal mode:

Emergency mode

If you reboot the 5308 when the keylock is in the **Unlocked** position, the 5308 powers on in emergency mode:

- The RS-232 port that is labeled Communications Line 0 is temporarily restored to the factory configuration.
- Only the RS-232 port that is labeled Communications Line 0 can communicate with the host. To restore normal communications to all communications lines, you must reboot the 5308 with the keylock in the Locked position.

Normal mode

If you reboot the 5308 when the keylock is in the **Locked** position, the 5308 powers on in normal mode:

- All active communications lines use the configuration that is saved for them.
- Communication with the host is permitted.

When you reboot the 5308, the following message appears and remains on your screen:

```
5308 SYSTEM IS NOW REBOOTING
```

All workstation communication ends when the 5308 is rebooted. Wait approximately 5 minutes for the 5308 to reboot. Then re-establish communications.

To reboot the 5308 system, use one of the following methods:

- Select the Reboot 5308 System option from the Operator's Console System Administrator Mode Options Main Menu.
- Press and release the Reset button on the 5308 system.
- Power the 5308 off and then on again.

Emergency Configuration Procedure

This configuration procedure is used when normal communications with the 5308 are not possible. For example, if you changed how workstations were attached to the 5308 before updating the configuration for the communications lines, you might not be able to communicate with the 5308 through your workstation. To perform an emergency configuration:

1. If any workstations attached to the 5308 are communicating with the host, have them end communications. During emergency configuration, only the RS-232 port that is labeled Communications Line 0 can communicate with the host.
2. Configure a workstation to use the settings described in "Using the Factory Default Configuration" on page 4-4.
3. Directly connect this workstation to the RS-232 port that is labeled communications line 0.
4. Put the keylock on the 5308 in the Unlocked position.
5. Reboot the 5308. For directions, see "Rebooting the 5308" on page 5-18. The factory default configuration settings (described in "Using the Factory Default Configuration" on page 4-4) are temporarily assigned to the RS-232 port that is labeled communications line 0 so that the workstation can communicate with the 5308.
6. Use normal configuration procedures to change the configuration for the communications lines as needed. For directions, see "Asynchronous Communication Configuration" on page 5-2.
7. Save your configuration changes. For directions, see "Saving 5308 Configuration Changes" on page 5-17.
8. Put the keylock in the Locked position.
9. Reboot the 5308 again to restore normal host communications to all the 5308 communications lines.
10. Re-attach workstations as needed.

Keyboard Support

The subject of keyboards can become very confusing as there are multiple settings that control how workstation keystrokes are finally interpreted at the host. Hopefully, the following terminology will help put things into perspective:

Workstation Keyboard

Each workstation has a keyboard with different characters printed on the key caps. Workstations usually have setup parameters for the user to specify the language of the attached keyboard. When the workstation is configured correctly, users expect the keyboard to send the character indicated on the

key they press. Different workstations, or the same workstation configured with different keyboards, might send different ASCII values to represent the same character.

ASCII Keyboard to Host Character Translation
The 5308 needs to translate each ASSCII character it receives from the workstation into an EBCDIC value for the host. The system administrator has the capability to configure different translation tables for each session of the 5250 station address. Custom tables can be used when the workstation is not sending standard code page 819 values (also known as ISO-1) for its characters. Custom tables are discussed later in this section.

5308's "Host" Keyboard
Because the 5308 emulates twinax devices (such as a 3196), characters are passed to the host through an emulated device keyboard. Once workstation characters have been converted to EBCDIC, the current 5308 host keyboard mapping is used to determine which "key" to press on the emulated keyboard connected to the host. The system administrator has the capability to configure different "host" keyboards for each session of each 5250 station address.

Host's "Device" Keyboard
The host has a configuration for each attached device, that includes items such as which code page and what type of keyboard is being used. It treats each session as a separate device with possibly different configurations. When the host receives a "keystroke" from a device, it uses its keyboard mapping to convert this "key" to an EBCDIC value.

With these definitions, it is imperative that the configuration of the "Host" keyboard at the 5308 and the "Device" keyboard at the host **match** for each session. Unexpected results will occur if the 5308 and the host do not agree on the keyboard being used for communication. Similarly, it is important that the 5308 and the host agree on the code page being used for each session.

The Workstation Keyboard and the 5308's ASCII Keyboard to Host Character Translation must work together for a session to correctly convert a workstation keystroke into an EBCDIC character for the host. Otherwise, unexpected characters may be sent to the host for each keystroke.

It is recommended that the Workstation Keyboard language and the Host Keyboard language match. This is not an absolute requirement; EBCDIC characters can be sent to the host using any Host Keyboard setting. However, composing characters with diacritical marks may not work unless the workstation and host keyboards match.

In some countries the host will use diacritical marks (tilde, grave accent, acute accent, umlaut, cedilla, circumflex, and over-circle) to compose characters with these marks. This is done by pressing a diacritical key followed by a legitimate alphabetic key.

Some workstations are capable of doing this composition at the workstation and transmitting the composed character to the 5308. However, some workstations (including the 5308 PC Terminal Program) do **not** perform this composition, relying on the host to perform this work. For this to work properly, it is important that the station address being used on the 5308 be configured with a country's keyboard that contains these diacritical marks. To compose characters with these marks,

press the diacritical key followed by the legitimate alphabetic key. If the 5308 is not configured properly, then the host may treat the diacritical mark as an actual character, and will **not** begin a compose sequence.

Service and Maintenance

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Chapter 6. 5308 Service Manual

Important: This section is for IBM service representatives only. For information about having your 5308 serviced, see “Contacting IBM for 5308 Service” on page 12-15.

The following field replaceable units (FRUs) are associated with models of the 5308:

- Power supply
- Twinax communication card
- Twinax Y-cable
- Memory module
- Chassis
- Video adapter
- Planar
- Configuration card
- Modem card
- Diskette drive
- Multiport RS-232 card

Start Here

When you service the 5308, use the following procedure:

1. Examine the 5308 for any external damage.
2. Test the 5308 to isolate the failing FRU.
3. Exchange the failing FRU.
4. Test the repaired 5308.

Start with “Running Basic Assurance Tests.” The repair process is complete when either:

- You exchange a failing FRU and verify that the 5308 is operational.
- You verify that the 5308 is operating correctly.

Running Basic Assurance Tests

To run the basic assurance tests:

1. Turn the 5308 off.
2. Check that the voltage selector switch is set to the correct voltage for the alternating current (AC) wall outlet.
3. Check that the power cord is connected to the back of the 5308 and to the AC wall outlet.
4. Disconnect the twinaxial cable from the 5308.
5. Turn the 5308 on.

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6. Observe the power-on boot sequence, which is as follows:
   a. The power LED comes on.
   b. Approximately 5 seconds later, the drive LED comes on for 2 seconds.
   c. Approximately 7 seconds later, the speaker beeps once.
   d. Following the speaker beep, the drive LED comes on.
   e. Approximately 35 seconds later, the status LED flashes slowly while the diagnostics run.

      Note regarding 5308-0M2s: When the diagnostics run on the 5308-0M2, it is normal for the internal modems to make noise.

   f. Approximately 1 to 3 minutes later (depending on the 5308 model), the status LED stops flashing and stays on.
   g. Directly connected terminals should display the initialization message. If the line is configured for auto baud detection, press the spacebar on the workstation multiple times (up to 10 times) so that the 5308 can determine the baud rate to use. Then the initialization message appears. For more information about establishing communications with the host, see the *5308 User's Guide*.

The boot sequence is now complete:

- If the 5308 skips any of the normal steps during booting, see "Planar" on page 6-9.
- If the power LED does not come on, see "Power Supply" on page 6-4.
- If the power LED blinks, see "Memory Module" on page 6-8 and "Planar" on page 6-9.
- If the speakers beep more than once or not at all, follow the appropriate procedure in Table 6-1 on page 6-3.

  Note: The beep sequence is different for each style planar board. See Table 6-5 on page 6-11 to help you identify your planar style.

Table 6-1. Beep Sequences		
Beep Sequence		**See:**
No beeps		“Planar” on page 6-9
STYLE 1	2 beeps	“Power Supply” on page 6-4 and “Diskette Drive” on page 6-23
	1-3-4-1	“Memory Module” on page 6-8 and “Planar” on page 6-9
	1-3-4-3	“Memory Module” on page 6-8 and “Planar” on page 6-9
	1-4-1-1	“Memory Module” on page 6-8 and “Planar” on page 6-9
	Other	“Planar” on page 6-9
STYLE 2	1-2 beeps	“Video Adapter” on page 6-9
	Other	“Memory Module” on page 6-8
STYLE 3	2 beeps	“Memory Module” on page 6-8
	3	“Memory Module” on page 6-8
	8	“Video Adapter” on page 6-9
	2-8-2	“Video Adapter” on page 6-9
	Other	“Planar” on page 6-9
Continuous tone		“Configuration Card” on page 6-20
Periodic beep		“Twinax Communications Card Diagnostics” on page 12-10
Note: Each ‘-’ represents a pause		

- If either the drive LED or status LED fail to come on, see “Diskette Drive” on page 6-23.
- If the status LED continues flashing slowly, see “Diskette Drive” on page 6-23.
- If the status LED begins to flash a series of quick flashes followed by a pause, follow the appropriate procedure in Table 6-2.

Table 6-2. LED Flash Sequences	
Flash Sequences	**See:**
2	“Planar” on page 6-9
3	“Twinax Communications Card” on page 6-5
4	“Twinax Communications Card” on page 6-5
5	“Internal Modem” on page 6-22
6	“Internal Modem” on page 6-22
7	“Multiport RS-232 Card (5308-007 Only)” on page 6-21
8	“Downlevel Twinax Communication Card” on page 6-7
9	“Too Many Twinax Communication Cards” on page 6-7
10	“Downlevel System Diskette” on page 6-24

- If the initialization message does not appear on a directly connected workstation and the communications line is configured for auto baud detection, press the spacebar multiple times (up to 10 times) so that the 5308 can determine the correct baud rate to use. For more information about establishing communications with the 5308, see the *5308 User's Guide*.
- If no terminals display the initialization message, try the procedure in "Emergency Configuration Procedure" on page 5-19. Because of differences between terminals, it is best to use a PC that is running the 5308 PC Terminal Program when you perform this procedure. If communication is established, the workstation configuration probably needs to be changed. Correct the workstation configuration, save the new workstation configuration, and reboot the 5308.
- If one workstation is operational, but another still does not connect with the 5308, run the RS-232-C Wrap Diagnostics using the directions on page 12-8.
- If the 5308 does not establish communication with the host, run the Twinax Communications Card Diagnostics using the directions on page 12-10. If these diagnostics fail to find host twinax activity, make sure the host twinax is functioning correctly.

Isolating and Replacing Faulty FRUs

Power Supply

Symptoms

- The power LED does not come on.
- The fan on the back of 5308 does not come on.

Solutions

1. Confirm the power cable is connected from the back of the 5308 to the AC wall outlet.
2. Confirm the voltage selector switch (115/230 volts) is set correctly.
3. Confirm there are no loose or damaged power wires and connectors inside the 5308.
4. Confirm the power connector on the planar is installed correctly. For the correct placement of the power connector, see "Planar" on page 6-9.
5. Confirm the power cable on the diskette drive is installed correctly.
6. Confirm that all the cards on the planar are seated correctly.
7. If you have found any incorrectly set switches or loose cables or cards, make sure that they are set or seated correctly. Run the Basic Assurance Test again.
8. If all the above are okay and the problem persists, replace the power supply.
9. If the problem persists after you replace the power supply, replace the planar.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of the 5308. See “Cover” on page 6-8.
3. Unplug the power supply connectors from the planar, the configuration card, and the diskette drive.
4. Remove the 4 power supply screws that are on the back of the 5308. For the location of these screws, see Figure 6-1 on page 6-6.
5. Remove the 2 power supply screws that are inside the 5308.
6. Lift the power supply out of the chassis.
7. Put the new power supply in the chassis.
8. Replace all 6 of the power supply screws that you removed.
9. Plug the power supply connectors into the planar, the configuration card, and the diskette drive.
10. Replace the cover of the 5308. See “Cover” on page 6-8.
11. Confirm that the voltage selector switch on the back of the power supply is set correctly.
12. Plug the power cord for the 5308 into the AC wall outlet.

Twinax Communications Card

Symptoms

- After booting the 5308, the status LED flashes quickly 3 times for the twinax card in slot 4, or 4 times for the twinax card in slot 5, and then pauses. It continues to repeat this light sequence.
- The online card diagnostics fail. For more information, see “Twinax Communications Card Diagnostics” on page 12-10.

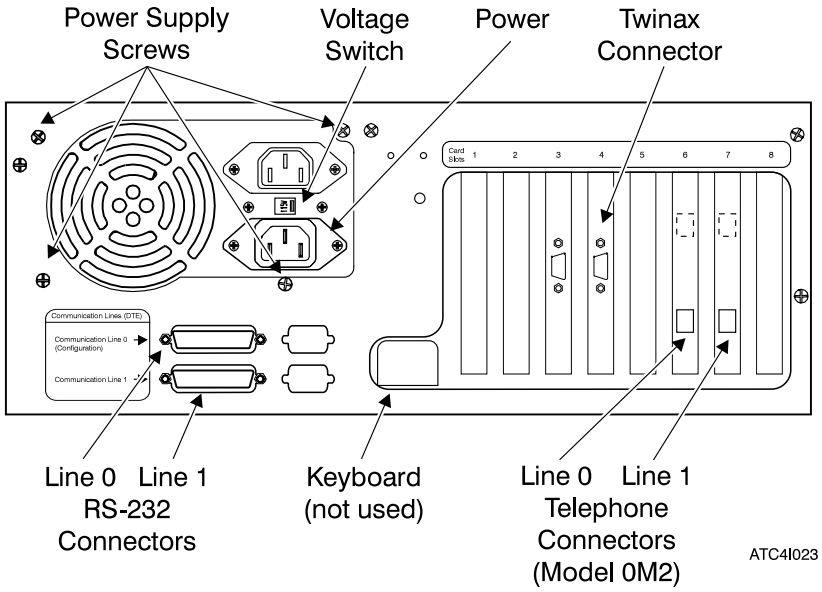
Solutions

1. Confirm that the Twinax Communications card(s) are seated correctly in their slots.
2. If the online tests failed, make sure the host connection is correctly configured and that the twinaxial workstation controller port is active.
3. If you found nothing wrong in 1 and 2, replace the appropriate twinax card.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of 5308. See “Cover” on page 6-8.
3. Remove the screw that holds the card bracket in the chassis.
4. Lift the card out of the slot.
5. Insert the new card into the slot, making sure that it is correctly seated.
6. Screw the card bracket into the chassis.
7. Replace the cover of the 5308. See “Cover” on page 6-8.

Models 5308-002 and 5308-0M2



Model 5308-007

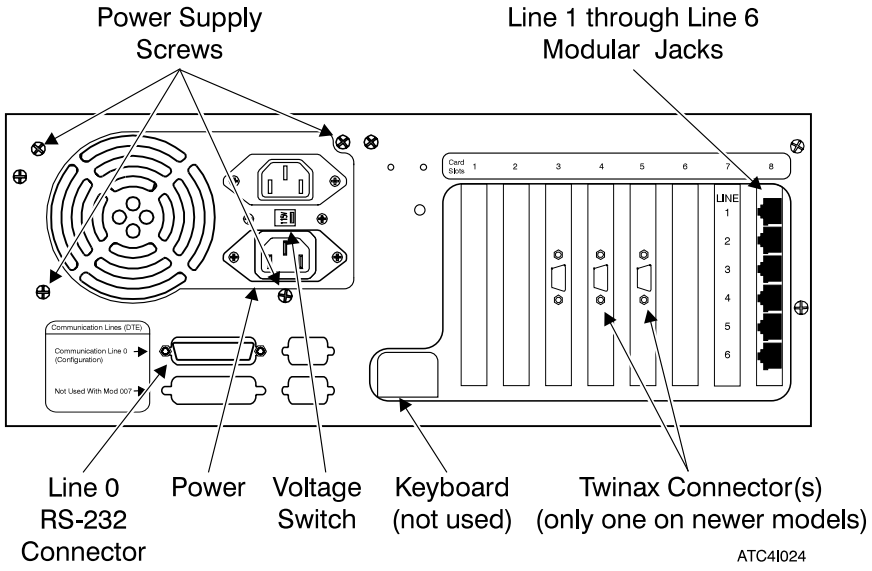


Figure 6-1. Back View of the 5308

8. Plug the 5308 back into the AC wall outlet. If a system diskette was provided with the new Twinax Communications card, check the diskette version. If the version number is newer than your current system diskette, you must configure and use the diskette that was supplied with the new card.

Downlevel Twinax Communication Card

Symptom

After booting the 5308, the status LED flashes quickly 8 times and then pauses. It continues to repeat this light sequence.

This symptom should only occur after new hardware is installed in the 5308 and indicates that a downlevel Twinax Communication Card (with P/N 88H0230 on the white label and the main chip P/N 82H4701) was found when it should have been removed. This card has been replaced with a newer Twinax Communication Card.

Solutions

This problem can be caused during:

1. Twinax Communication Card FRU replacement: The wrong FRU part number was ordered. Return FRU p/n 05J4218 and order the correct FRU p/n 05J5053.
2. Planar FRU replacement: A new Twinax Communication Card is provided with the planar. All the previous Twinax cards should have been removed and the single new card installed. Look at the card part numbers to determine which cards should be removed from the box. Only one new card is needed to run the 5308
3. Installation of an older 2- to 7-port upgrade kit: Older upgrade kits were shipped with a Twinax Communication Card and a Twinax Y-cable. You must install the new upgrade without the card or Y-cable found in the upgrade kit. See Chapter 7, “Installing the 2- to 7-Port Upgrade” on page 7-1. Remove the upgrade card to correct this problem.

Too Many Twinax Communication Cards

Symptoms

After booting the 5308, the status LED flashes quickly 9 times and then pauses. It continues to repeat this light sequence.

This symptom should occur after new hardware is installed in the box and indicates that too many Twinax Communication Cards were found.

Solutions

This problem can be caused during:

1. Twinax Communication Card FRU replacement: Instead of replacing the defective card, both cards (old and new) were installed in the box. Remove the defective card.
2. Planar FRU replacement: A new Twinax Communication Card is provided with the planar. All the previous Twinax Communication Cards should have been removed and the single new card installed. Remove the card from slot 5. Only one card is needed to run the 5308.
3. Installation of a 2- to 7-port upgrade kit: See Chapter 7, “Installing the 2- to 7-Port Upgrade” on page 7-1. The original Twinax Communication Card is replaced with the one provided in the upgrade kit. Both cards were installed in error. Remove the card in slot 5. Only one card is needed to run the 5308.

Memory Module

Symptom

- During booting, one of the following beep sequences occurs:

Table 6-3. Error Beep Sequences

Style 1 Planar	Style 2 Planar	Style 3 Planar
1-3-4-1 1-3-4-3 1-4-1-1	Other	2 3
Note: Each '-' represents a pause		

- During booting, the power LED blinks.

Solutions

1. Confirm that the memory module is firmly seated in the planar.
2. If the memory module is correctly seated in the planar, replace the memory module.
3. If the problem persists, replace the planar.

Replacement Procedure

1. Unplug the 5308 from AC wall outlet.
2. Remove the cover of 5308. See "Cover."
3. Loosen the memory module from the socket by pressing the clips that are located at either end of the module down and out. For the location of the memory module, see Figure 6-3 on page 6-14, Figure 6-4 on page 6-16, and Figure 6-5 on page 6-18.
4. Remove the module from the planar.
5. Verify that the notch on the edge of the new memory module is aligned with pin 1 on the planar. For the location of pin 1, see Figure 6-3 on page 6-14, Figure 6-4 on page 6-16, and Figure 6-5 on page 6-18.
6. If you have a SIMM memory (planar style 1 or 2), insert the modules at a 45-degree angle. If you have a DIMM memory (planar style 3), insert the module straight down. Apply pressure on the module until it snaps into place.
7. Verify that the module is correctly seated in the socket on the planar.
8. Replace the cover of the 5308. See "Cover."
9. Plug the 5308 back into the AC wall outlet.

Cover

Removal/Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the 3 cover screws in the back of the chassis.
3. To remove the cover, push the cover back and up.
4. Replace the cover and screws.

5. Plug the 5308 back into the AC wall outlet.

Video Adapter

Symptom

A defective video adapter shows different symptoms depending on which style planar board your 5308 has installed. Use the following table to locate your planar style and the corresponding symptom:

Table 6-4. Video Error Sequences

Style 1 Planar	Style 2 Planar	Style 3 Planar
Does not beep during the boot sequence.	1-2 beeps during the boot sequence.	8 beeps during the boot sequence.
Does not boot with video adapter installed, but boots successfully when video adapter is removed	Does not boot with video adapter installed, but boots successfully when video adapter is removed.	2-8-2 beeps during the boot sequence
Note: Each '-' represents a pause		

Solution

Replace video adapter.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of 5308. See "Cover" on page 6-8.
3. Remove the screw that holds the card bracket in the chassis.
4. Lift the video adapter out of the slot.
5. Insert the new video adapter in the slot, making sure that the card is correctly seated.
6. Screw the card bracket into the chassis.
7. Replace the cover of 5308. See "Cover" on page 6-8.
8. Plug the 5308 back into the AC wall outlet.

Planar

Your system can have one of three styles of planar boards. You can determine which planar board your system has by looking at the placement of components. See Figure 6-2 on page 6-11.

Symptoms

- When booted, the 5308 beeps more than one time and does not follow one of the beep sequences described in "Memory Module" on page 6-8.
- After booting the 5308, the status LED flashes quickly 2 times and then pauses. It continues to repeat this light sequence.
- The power LED does not come on. (See also "Power Supply" on page 6-4.)
- The power LED blinks.

- The asynchronous diagnostics fail on communications line 0 (all models) or communications line 1 (5308-002 and 5308-0M2).

Solutions

1. Confirm that all the cards that are plugged into the planar are seated correctly.
2. Check all the cable connections on the planar.
3. For a two beep error code:
   a. Try turning the system power off and back on.
   b. If the disk drive LED does not come on or does not turn off, see “Diskette Drive” on page 6-23.
4. If the power LED does not light:
   a. Remove all the cards from the planar.
   b. If the power LED lights after you remove all the cards, replace the cards one at a time until the power LED does not come on. Then replace the last card inserted.
5. Replace the planar.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of the 5308. See “Cover” on page 6-8.
3. Remove the configuration card. Leave the cable connected to the card. See “Configuration Card” on page 6-20.
4. Remove the video adapter. See “Video Adapter” on page 6-9.
5. Remove the twinax communications cards. See “Twinax Communications Card” on page 6-5.
6. If you are servicing a 5308-0M2, remove the internal modems. See “Internal Modem” on page 6-22.
7. If you are servicing a 5308-007, remove the multiport RS-232 card. See “Multiport RS-232 Card (5308-007 Only)” on page 6-21.
8. Unplug all the connectors from the planar.
   a. Speaker
   b. Power LED
   c. Reset Button
   d. Diskette Drive
   e. Configuration Card Ribbon Cable
   f. P8 and P9 Power Cables
   g. Line 0 (and Line 1 if model 002 or 0M2)
   h. CPU fan (style 2 and 3)
9. Unscrew and remove the keyboard grounding clip if present and discard. (This clip is used only on style 1 planars.)
10. Unscrew the 6 planar mounting screws.
11. Unhook the plastic planar standoff by squeezing the top of the standoff with pliers and lifting the planar.
12. Lift the planar from the chassis.

Note: Before continuing, you must determine which style planar board you are replacing and also the style of the replacement planar you are replacing it with.

Table 6-5. Planar Style Identifying Features

Planar Style	Identifying Features
Style 1	Four long card slots (ISA) and three short slots (PCI).
Style 2	Three long card slots (ISA) and four short slots (PCI).
Style 3	Four long card slots (ISA) and four short slots (PCI). Two DIMM memory sockets plus an Intel chipset.

Refer to Figure 6-2 to help you identify your planar board. After you identify your planar board, use Table 6-6 to identify the appropriate page to complete the planar removal/replacement procedure.

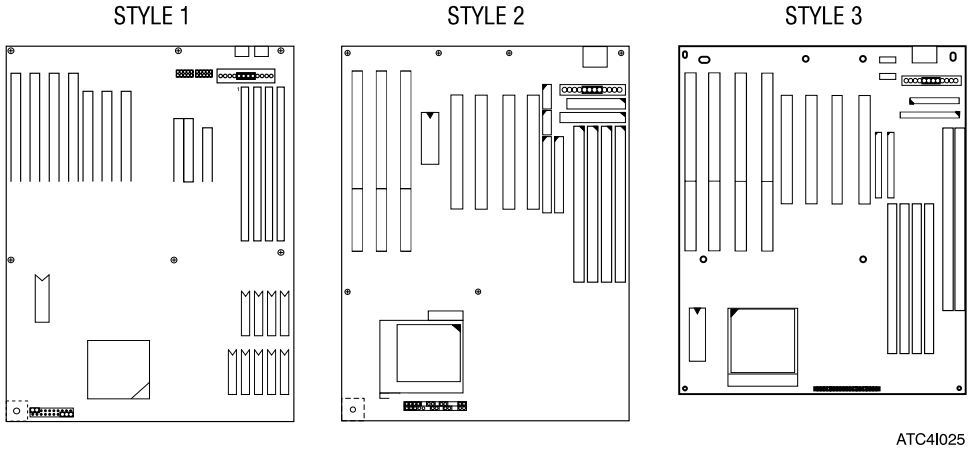


Figure 6-2. Planar Board Configuration

Table 6-6. Selecting a Planar Board Replacement Procedure

Defective Planar Board:	Replacement Planar Board:	Go To:
Style 1	Style 2	Step 1 on page 6-11
Style 2	Style 2	Step 2 on page 6-12
Style 1	Style 3	Step 1 on page 6-12
Style 2	Style 3	Step 1 on page 6-12
Style 3	Style 3	Step 1 on page 6-13
Style 3	Style 2	**Not downward compatible.** Refer to Table 6-7 on page 6-25 for correct part number.

Replacing a Style 1 or Style 2 with a Style 2 Planar Board

1. If you are replacing a Style 1 planar, remove the standoff near the memory modules and install it at the rear of the chassis.

   Warning: Failure to move the standoff causes a short circuit on the planar board. Refer to the planar board Figure 6-3 on page 6-14 for the location of the standoff that needs to be moved and Figure 6-4 on page 6-16 for the new location.

2. Remove the plastic standoff from the chassis and discard. Reposition the new plastic standoff (supplied with the new planar board) in its hole in the planar board. Peel off the paper protector exposing the adhesive.
3. Put the new Style 2 planar in the chassis, lining up all screw and standoff holes. Carefully press the plastic standoff in place in the bottom of the chassis.
4. Replace the 6 planar mounting screws. If you are replacing a Style 2 planar board with another Style 2 planar board, skip to step 8. If you are replacing a Style 1 planar board with a Style 2 planar board, continue with the next step.
5. When changing from a Style 1 to a Style 2 planar board, you must replace the flat cable(s) for Line 0 (and Line 1 if model 002 and 0M2). Remove the power supply (see "Power Supply" on page 6-4) to gain access to the cable connectors on the rear of the chassis.
6. Replace the old cable(s) with the new cable(s) supplied with the Style 2 planar board.
7. Replace the power supply.
8. Remove the SIMM from the old planar board and install it on the new planar.
9. Reconnect all the connectors to the planar. Connect the power cable to the CPU fan. For more information, see Figure 6-3 on page 6-14 and Figure 6-4 on page 6-16.
10. Replace all the cards that you removed.
11. Replace the cover of the 5308. See "Cover" on page 6-8.
12. Plug the 5308 back into the AC wall outlet.
13. If you replaced a Style 1 planar board with a Style 2 planar board, you must configure and use the diskette that is supplied with the new planar board (see Chapter 11, "Planning Forms" on page 11-1).

Replacing a Style 1 or Style 2 with a Style 3 Planar Board

1. If you are replacing a Style 1 with a Style 3 planar, remove the standoff near the memory modules and install it at the rear of the chassis.

   Warning: Failure to move the standoff causes a short circuit on the planar board. Refer to the planar board Figure 6-3 on page 6-14 for the location of the standoff that needs to be moved and Figure 6-5 on page 6-18 for the new location.
2. Remove the plastic standoff from the chassis and discard. Reposition the new plastic standoff (supplied with the new planar board) in its hole in the planar board. Do **not** peel off the paper protector exposing the adhesive.
3. Put the new Style 3 planar in the chassis, lining up all screw and standoff holes.
4. Replace the 6 planar mounting screws. If you are replacing a Style 2 planar board with a Style 3 planar board, skip to step 8 on page 6-13. If you are replacing a Style 1 planar board with a Style 3 planar board, continue with the next step.
5. When changing from a Style 1 to a Style 3 planar board, you must replace the flat cable(s) for Line 0 (and Line 1 if model 002 and 0M2). Remove the power supply (see "Power Supply" on page 6-4) to gain access to the cable connectors on the rear of the chassis.

6. Replace the old cable(s) with the new cable(s) supplied with the Style 3 planar board.
7. Replace the power supply.
8. Reconnect all the connectors to the planar. Connect the power cable to the CPU fan. For more information, see Figure 6-3 on page 6-14, Figure 6-4 on page 6-16, and Figure 6-5 on page 6-18.
9. Replace all the cards that you removed **except** the twinax communication card(s). Discard the old twinax card(s) and the Y-cable (if any). Install the new twinax card included with the planar FRU. For the model 007, this card takes the place of both old style twinax cards.

   Note: Do not replace the memory module from the old planar.
10. Replace the cover of the 5308. See "Cover" on page 6-8.
11. Plug the 5308 back into the AC wall outlet.
12. You must configure and use the diskette that is supplied with the Style 3 planar board (see Chapter 11, "Planning Forms" on page 11-1).

Replacing a Style 3 with a Style 3 Planar Board

1. Put the new Style 3 planar in the chassis, lining up all screw and standoff holes.
2. Replace the 6 planar mounting screws.
3. Reconnect all the connectors to the planar. Reconnect the power cable to the CPU fan. For more information, refer to Figure 6-5 on page 6-18.
4. Replace all the cards that you removed.

   Note: Do not replace the DIMM (memory module) from the old planar.
5. Replace the cover of the 5308. See "Cover" on page 6-8.
6. Plug the 5308 back into the AC wall outlet.

5308-002 and 5308-0M2

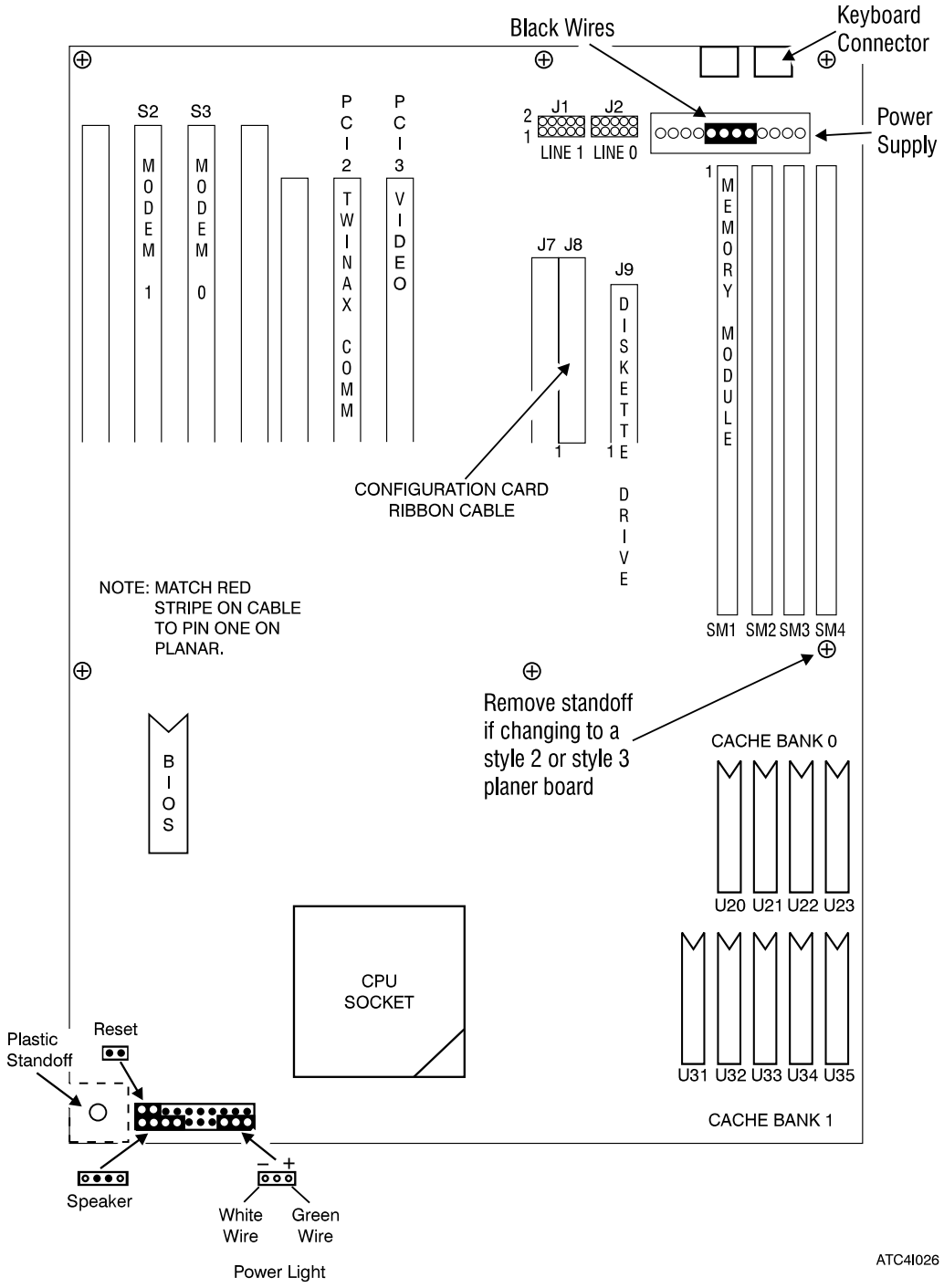


Figure 6-3 (Part 1 of 2). Diagram of 5308 Style 1 Planar Board

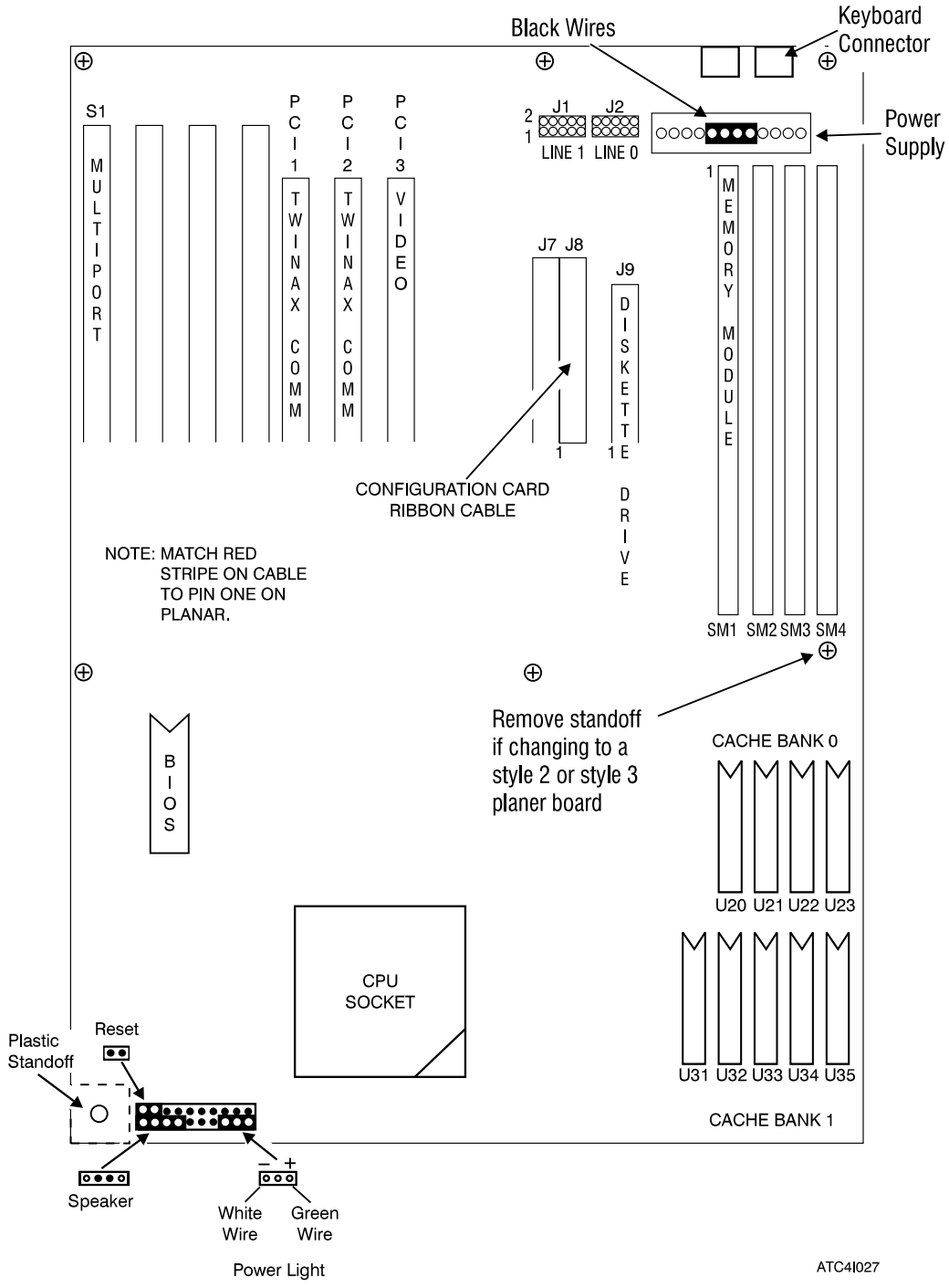
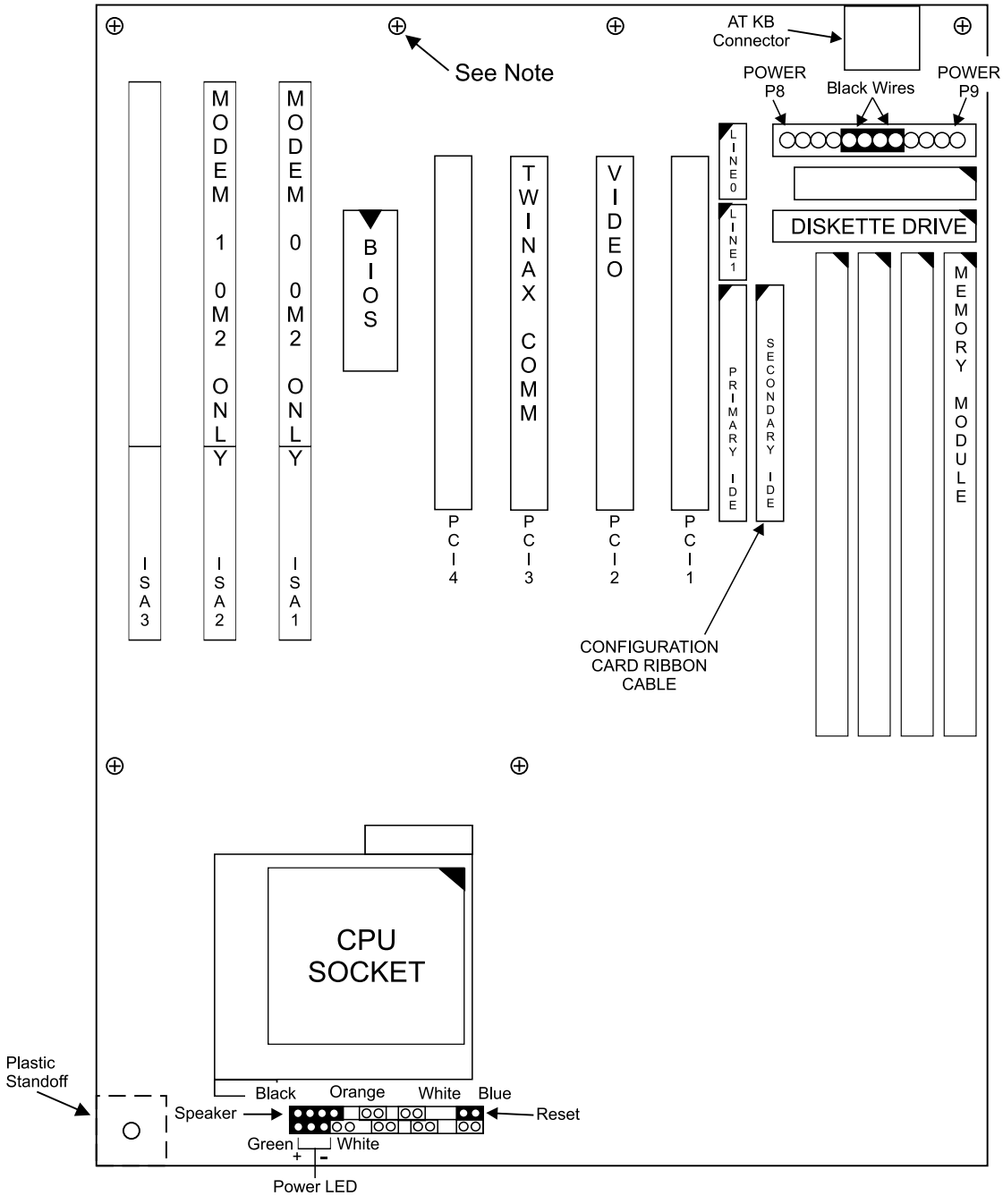


Figure 6-3 (Part 2 of 2). Diagram of 5308 Style 1 Planar Board

5308-002 and 5308-0M2

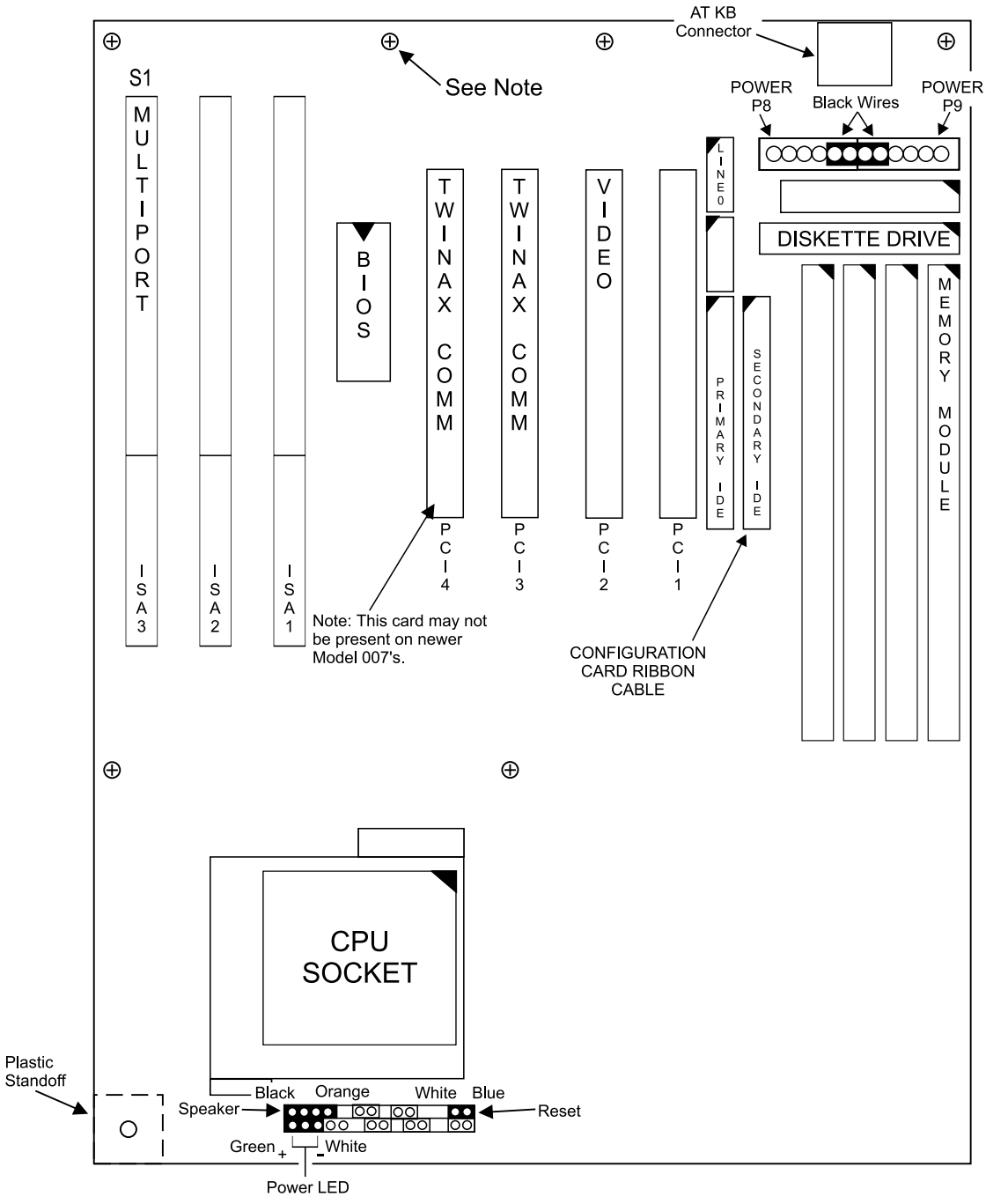


Note:
Install standoff in new location if changing from Style 1 to Style 2.

ATC4I028

Figure 6-4 (Part 1 of 2). Diagram of 5308 Style 2 Planar Board

5308-007



Note:
Install standoff in new location if changing from Style 1 to Style 2.

ATC4I029

Figure 6-4 (Part 2 of 2). Diagram of 5308 Style 2 Planar Board

5308-002 and 5308-0M2

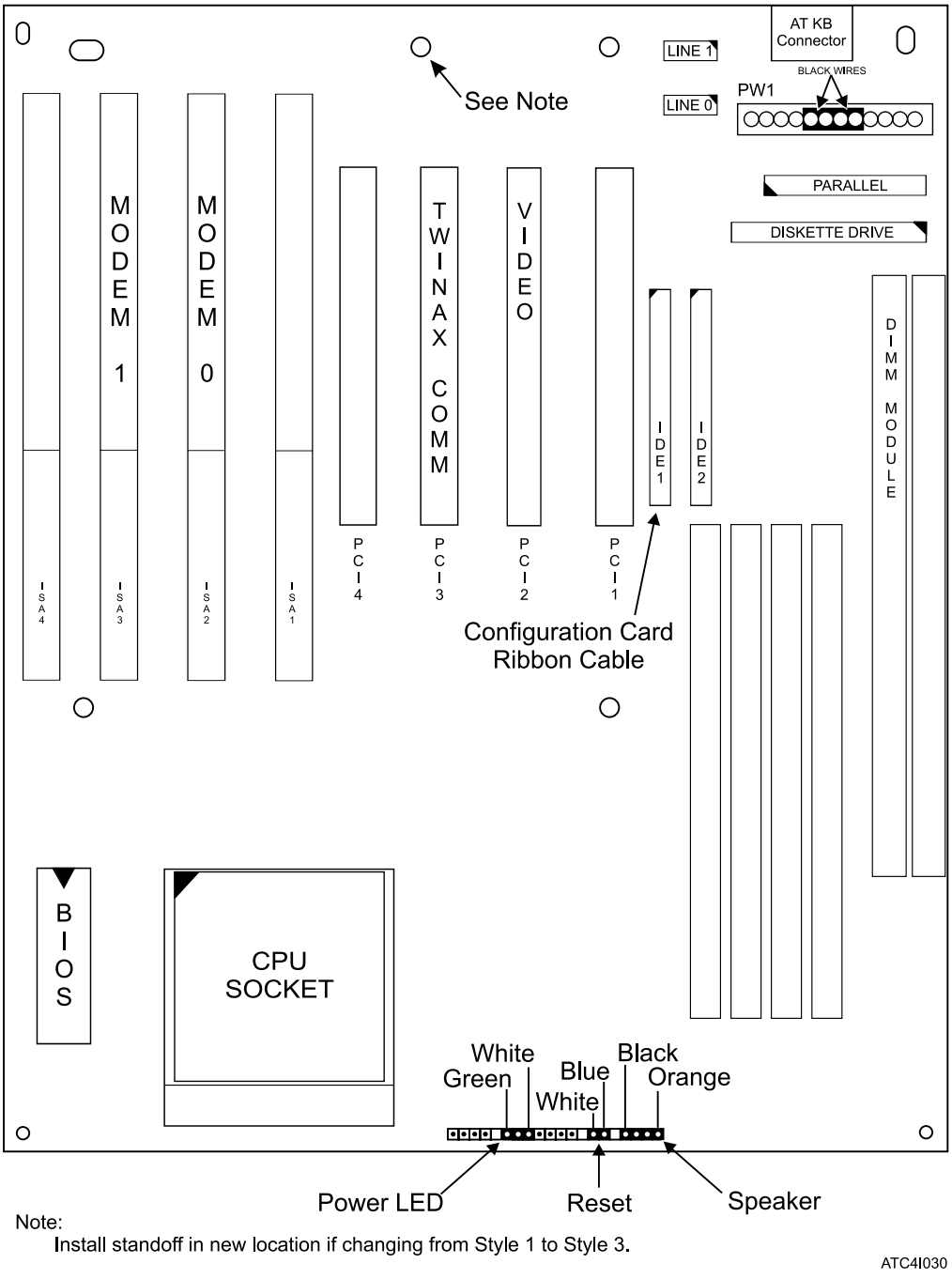


Figure 6-5 (Part 1 of 2). Diagram of 5308 Style 3 Planar Board

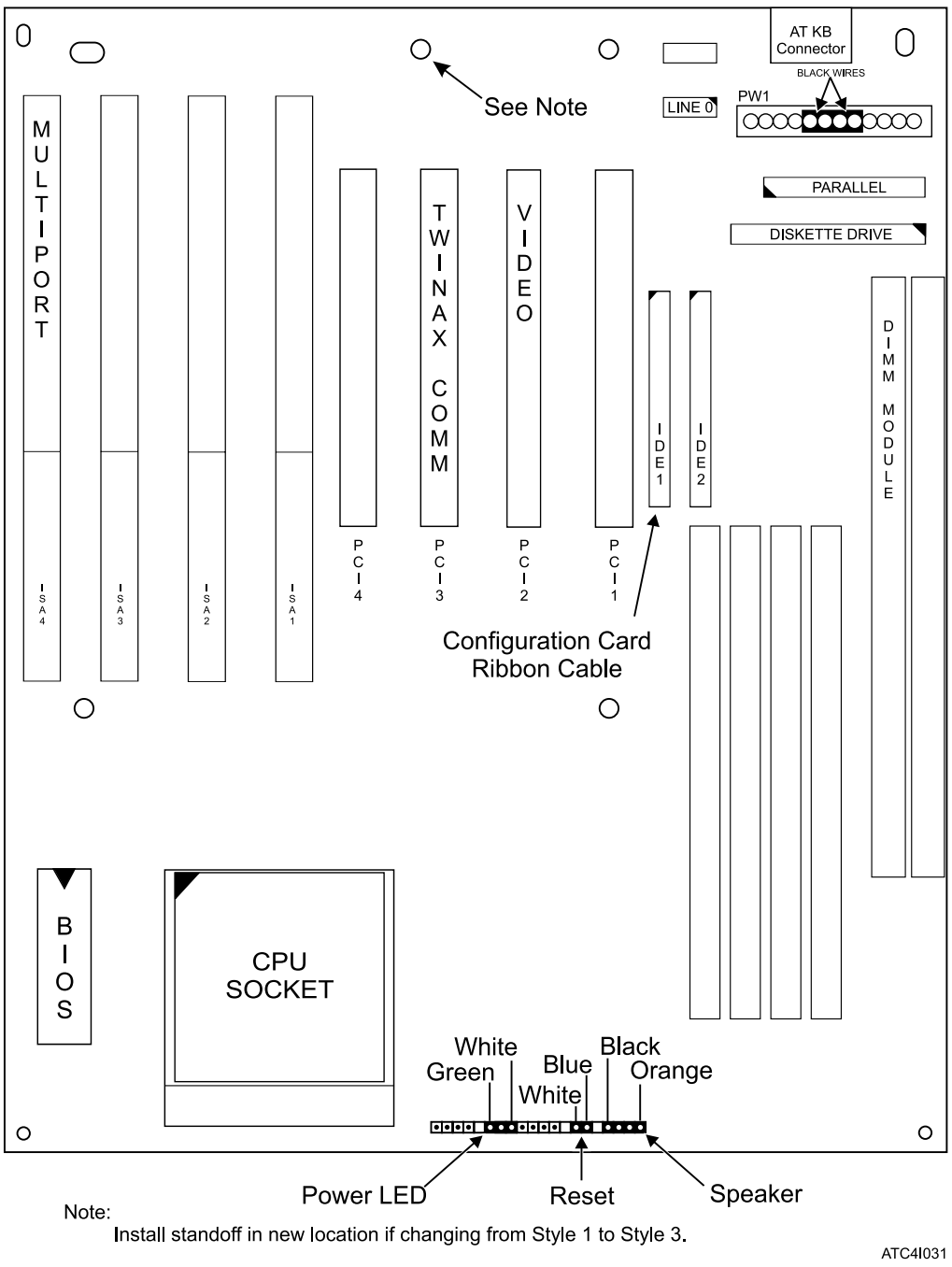


Figure 6-5 (Part 2 of 2). Diagram of 5308 Style 3 Planar Board

Configuration Card

Symptoms

- During booting, the 5308 beeps once, and then after 30 seconds beeps continuously.
- Status LED fails to light.
- Changing the keylock position has no affect on the configuration that is used when booting the 5308 or on requests for the system administrator mode password.
- The 5308-007 only recognizes two communications lines.

Solutions

1. Confirm the power is connected to the configuration card.
2. Confirm the cable from the configuration card to the planar is installed correctly. The red stripe on the cable should align with pin 1 on the planar and the configuration card.
3. Do one of the following:
   - If you are servicing a 5308-0M2, confirm the configuration card has jumper J1 installed.
   - If you are servicing a 5308-002 or a 5308-007, confirm that the configuration card does not have jumper J1 installed.
4. Confirm that the correct cables run to the B1 and L1 connectors.
5. If you are servicing a 5308-007, confirm that configuration card 2 is installed in U7 of the base card.
6. Replace the configuration card.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of the 5308. See “Cover” on page 6-8.
3. Unplug the power connector and the ribbon cable from the configuration card.
4. Remove the connectors at locations L1 and B1.
5. Remove the screw that holds the card bracket in the chassis.
6. Lift the card out of the slot.
7. Insert the new card into the slot.
8. Screw the card bracket into the chassis.
9. Replace the power connector and the ribbon cable.
10. Confirm the red stripe on the ribbon cable matches pin 1 on the configuration card.
11. Confirm that none of the cable connectors on the planar are loose.
12. Replace the B1 connector with the connector labeled ‘keylock’ (black and white wires).
13. Replace the L1 connector with the connector labeled ‘H.D.D. LED’ (red and white wires). Place the red wire on the side closest to the ‘L1’ label.

14. Replace the cover of the 5308. See “Cover” on page 6-8.
15. Plug the 5308 back into the AC wall outlet.

Multiport RS-232 Card (5308-007 Only)

Symptoms

- Status LED flashes 7 times.
- Asynchronous diagnostics fail on communications line 1, 2, 3, 4, 5, or 6.

Solutions

1. Confirm the multiport card is seated in the slot.
2. Confirm that the modular-to-RS232 conversion cables are seated correctly, and that you are using the correct cable for the workstation.
3. Confirm the jumper settings for the multiport card are:

   J1 Set the jumpers as follows:

   A 220
   B 228
   C 240
   D 248
   E 260
   F 268

   J2 All six jumpers (A through F) are set at “SHARED.”

   J7 Unjumpered (Leave jumper on center pin only.)

   J8 IRQ5
4. Replace the multiport card.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of the 5308. See “Cover” on page 6-8.
3. Label each modular-to-RS232 conversion cable so that you can identify which jack it uses.
4. Disconnect all the modular-to-RS232 conversion cables from the 5308.
5. Remove the screw that is holding the card bracket in the chassis.
6. Lift the card out of the slot.
7. Insert the new card in the slot. Make sure that the card is correctly seated.
8. Screw the card bracket into the chassis.
9. Plug all the modular-to-RS232 conversion cables back into their jacks.
10. Replace the cover of the 5308. See “Cover” on page 6-8.
11. Plug the 5308 back into the AC wall outlet.

Internal Modem

Symptoms

- After booting the 5308, the status LED flashes quickly 5 times (for modem card line 0), or 6 times (for modem card line 1), and then pauses briefly. It continues to repeat this light sequence.
- When the modem attached to the line is dialed, no answer tone is heard.

Solutions

1. Confirm for the dial tone by connecting an analog phone to the line attached to the modem.
2. Confirm the line is plugged into the LINE jack on the back of the modem.
3. Confirm the card is seated correctly in the slot on the planar.
4. Confirm the modems match the following configurations:

   Slot 6 COM3 (base I/O address 3E8) and IRQ 5
   Slot 7 COM4 (base I/O address 2E8) and IRQ 7

5. Replace the internal modem.

   a. If the light sequence has 5 quick flashes, replace the modem in slot 6.
   b. If the light sequence has 6 quick flashes, replace the modem in slot 7.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of the 5308. See “Cover” on page 6-8.
3. Remove the screw that is holding the card bracket in the chassis.
4. Lift the card out of the slot.
5. Insert the new card in the slot. Make sure that the card is correctly seated and that the correct label is on the bracket for the customer’s reference.
6. Screw the card bracket into the chassis.
7. Replace the cover of the 5308. See “Cover” on page 6-8.
8. Plug the 5308 back into the AC wall outlet.
9. If a system diskette was provided with the FRU, check the diskette version. If the version is newer than your current system diskette, you must configure and use the diskette that is supplied with the FRU.

Diskette Drive

Symptoms

- The 5308 beeps one time during booting, but the drive LED, the status LED, or both never turn on.
- The 5308 beeps one time during booting and the drive LED comes on, but the status LED does not stop flashing.
- The 5308 beeps twice during booting. Also see “Planar” on page 6-9.

Solutions

1. Confirm the power cable from power supply to the diskette drive is installed correctly.
2. Confirm the cable from the diskette drive to the planar is installed correctly. The red stripe on the cable should align with pin 1 on the planar and the diskette drive.
3. Replace the disk media with a IBM 5308 ASCII to 5250 Connection System Diskette that is known to be good.
4. Replace the diskette drive.
5. If the problem persists, replace the planar.

Replacement Procedure

1. Unplug the 5308 from the AC wall outlet.
2. Remove the cover of the 5308. See “Cover” on page 6-8.
3. Remove the IBM 5308 ASCII to 5250 Connection System Diskette.
4. Unplug the ribbon cable and the power connector from the diskette drive.
5. Remove the 4 screws that hold the drive bracket in the chassis.
6. Slide the drive and bracket back, and then lift them up and out of chassis.
7. Remove the 4 diskette drive screws.
8. Screw the new diskette drive into the bracket, as far to the front of the chassis as possible.
9. Screw the drive bracket into the chassis. The flat top screws go on top of the drive.
10. Reconnect the power connector.
11. When reconnecting the ribbon cable, use the connector with the cable twist. The red stripe should be on the right when looking from the front of the chassis.
12. Put the IBM 5308 ASCII to 5250 Connection System Diskette into the diskette drive.
13. Replace the cover of the 5308. See “Cover” on page 6-8.
14. Plug the 5308 back into the AC wall outlet.

Downlevel System Diskette

Symptom

After booting the 5308, the status LED flashes quickly 10 times and then pauses. It continues to repeat this light sequence.

This symptom should only occur after new hardware is installed in the box and indicates that a downlevel System Diskette is being used when a newer version is required.

Solution

This problem is caused when you replace the planar FRU and don't use the new System Diskette that is supplied with the new FRU. The old System Diskette should be discarded and the new diskette configured for use in the 5308.

Service Parts

Table 6-7 provides part numbers and descriptions for the field replaceable units (FRUs).

Table 6-7. 5308 FRU Part Number List

Description	**IBM Part Number**
Power Supply	05J2271
Style 3 Planar	05J5069
Video Adapter	05J2273
28.8 Kbps Modem	05J2274
SIMM memory (for Style 1 and 2 only)	05J2275
DIMM memory (for Style 3 only)	05J5051
Configuration Card 1	05J2276
Configuration Card 2	05J2277
Twinax Y-cable	05J2685
Multiport RS-232 Card	05J2278
Diskette Drive	05J2279
Twinax Communications Card	05J5053

You can also order a wrap plug (part number 69X7008) to use for the RS-232 Wrap Diagnostic tests.

Reference Information

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Chapter 7. Installing the 2- to 7-Port Upgrade

This section provides directions for upgrading a 5308-002 to a 5308-007 by installing the 2- to 7-Port Upgrade.

Hardware Checklist

Before you install the upgrade, verify that you have everything you need. The upgrade is shipped in a box that contains:

- Multiport adapter:
  - Multiport adapter card
  - Six modular-to-RS232 conversion cables (See Figure 7-1.)

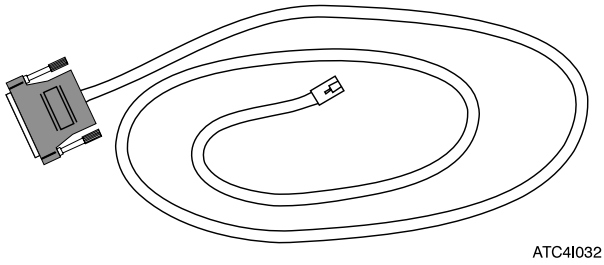
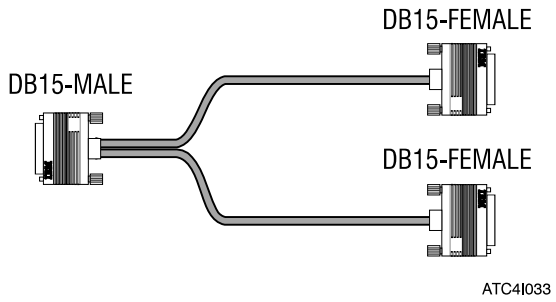


Figure 7-1. Modular-to-RS232 Conversion Cable

- Twinax Communications card
- Configuration Card-007
- Communications line label for 5308-007
- Slot filler with label for modular jacks (lines 1 through 6)
- IBM 5308 ASCII to 5250 Connection System Diskette
- 5308 PC Terminal Program Diskette
- *5308 Planning, Installation, and Maintenance Guide* (this book)
- *5308 User's Guide*
- Safety information booklet
- Customer comment card

If anything is missing or damaged, contact your point of sale for information about replacement.

| **Note:** Your kit may contain a Twinax Y-cable (see Figure 7-2). These Y-cables have been phased out and are no longer included in planar upgrade kits. If you **do** have a Y-cable, please determine the style of planar you have in your 5308 (see Figure 6-2 on page 6-11).



| *Figure 7-2. Twinax Y-cable*

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If you have a Style 1 or 2 planar, then perform the upgrade using the Y-cable as specified in the Planning, Installation, and Maintenance Manual that was in your upgrade kit.

If you have a Style 3 planar, a second Twinax Communications card does not have to be added to your 5308. Do **not** install the Twinax Communications card or the Y-cable included with the upgrade kit.

Tools

A Phillips**-head screw driver (not provided with the upgrade) is required to remove the cover of the 5308 and to install the upgrade cards.

Before Starting

The upgrade uses a different system diskette than the 5308-002. Before you begin the installation process, make a backup copy of the system diskette that came with the 2- to 7-Port Upgrade. Make sure that the tables in Chapter 11, “Planning Forms” contain the correct settings for the workstations and modems that are attached to the 5308. When you configure the upgraded 5308, you need to specify these settings again.

Installation Procedure

To install the 2- to 7-Port Upgrade:

1. Disconnect the power cable from the power outlet and then from the 5308.
2. Disconnect all signal cables from the 5308.
3. Remove the 3 screws that secure the cover (shown in Figure 7-3). Then remove the cover from the 5308 by pushing the cover back and up.

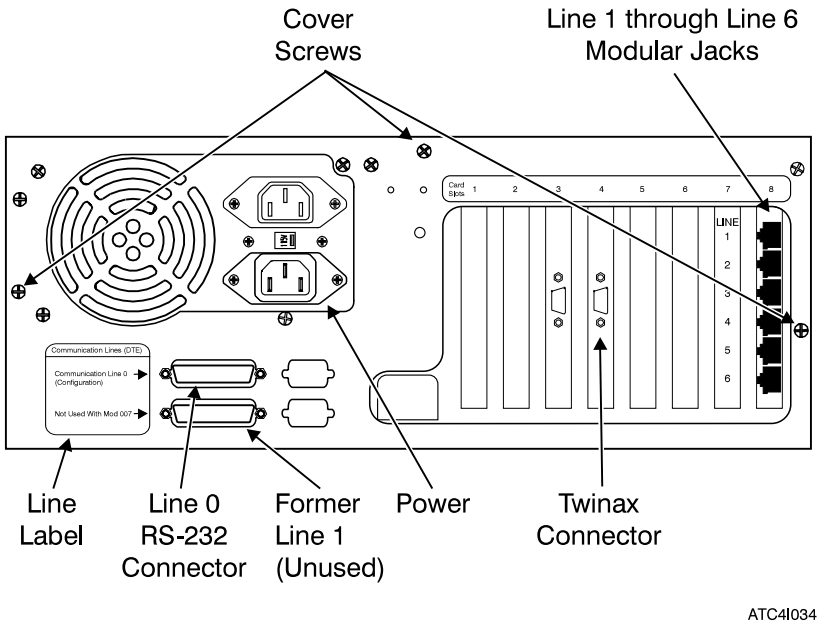


Figure 7-3. Back View of an Installed 2- to 7-Port Upgrade

4. Install the following:

   - **Multiport Adapter**

     To install the Multiport Adapter:

     a. Remove the Multiport Adapter from its packaging.

     b. Make sure the jumpers are set as follows:

        J1 Set the jumpers as follows:

        A 220
        B 228
        C 240
        D 248
        E 260
        F 268

        J2 All six jumpers (A through F) set at “SHARED”.

        J7 Unjumpered (Leave jumper on center pin only.)

        J8 IRQ5

     c. Install the Multiport Adapter in slot 8 of the 5308.

     d. Insert the six modular-to-RS232 conversion cables into the modular jacks.

     e. Replace the slot filler in slot 7 with the slot filler provided with the 2- to 7-Port Upgrade, which labels the jacks as lines 1 through 6.

   - **Twinax Communications card**

     If your upgrade kit came with a twinax Y-cable, then this cable and the accompanying twinax card are not to be used if you have a Style 3 planar board. See Figure 6-2 on page 6-11 to help you determine which planar board you have.

     For kits with no twinax Y-cable, remove the old twinax card from slot 4. Remove the new twinax card from its packaging. Install the Twinax Communications card in slot 4 of the 5308.

   - **Configuration Card-007**

     To install the Configuration Card-007:

     a. Remove the Configuration Card-007 from its packaging.

     b. Unplug the ribbon cable, which is in the connector at the top of the card that is installed in slot 1.

c. Install the Configuration Card-007 in connector U7. (See Figure 7-4.)

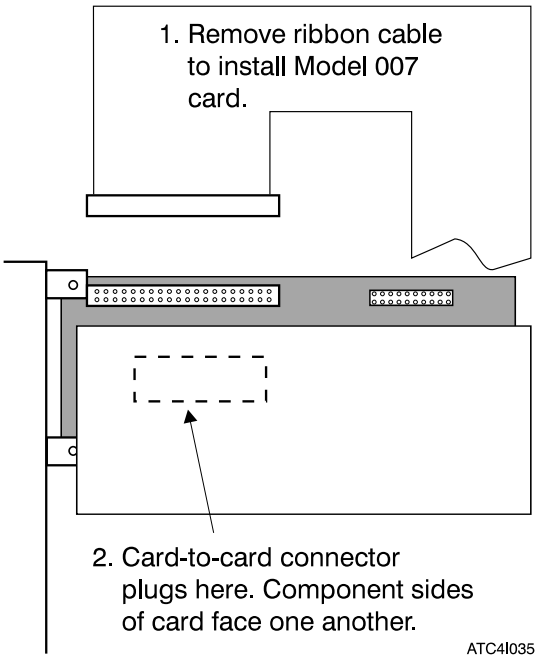


Figure 7-4. Configuration Cards

d. Plug the ribbon cable into U6 again.

- **Communications Line Label**

  The RS-232 connector that is labeled Communications Line 1 on the 5308-002 is not used by the 5308-007. Place the Communications Line Label that is provided with the 2- to 7-Port Upgrade over the 5308-002 communications line label.

5. Replace the chassis cover and the 3 screws that secure it.
6. Insert a backup copy (that is *not* write protected) of the new system diskette into the 5308 diskette drive, and power on the 5308. The system diagnostics run automatically to verify that the upgrade is installed and operating correctly.
7. Connect the 5308 to the host and to the workstations again.

Chapter 8. Wiring Diagrams

You can use the wiring diagrams in this section to make your own cables and to verify the correct wiring of existing cables.

The male end of the cable that attaches a workstation to the 5308 must have pin definitions and signals that match those shown in Table 8-1. The end of the cable that attaches to the device must have pin definitions and signals as specified by the device manufacturer.

To ensure good electromagnetic performance, use only shielded RS-232 cables. Shielded cables are constructed with electrical continuity between the metal D-shell connectors on both ends of the cable.

Table 8-1 shows the pin assignments for the EIA RS-232 interface. Only the pins that are used are listed.

Table 8-1. Pin Assignments

Pin	Signal Name	Direction
Metal D-Shell	Frame Ground (FG)	
2	Transmitted Data (TD)	Out
3	Received Data (RD)	In
4	Request to Send (RTS)	Out
5	Clear to Send (CTS)	In
6	Data Set Ready (DSR)	In
7	Signal Ground (SG)	
8	Data Carrier Detect (DCD)	In
20	Data Terminal Ready (DTR)	Out
22	Ring Indicator (RI)	

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Straight-Through Cables (Direct Connection to DCE Modems)

The wiring in Figure 8-1 is required for a straight-through cable.

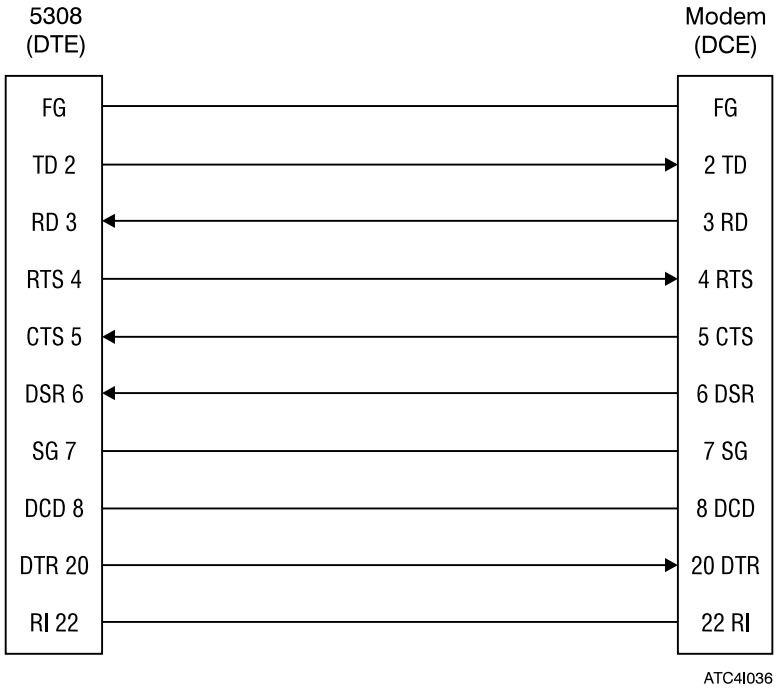


Figure 8-1. Wiring of the Straight-Through Function Cable

Null Modem Cables (Directly Connecting DTE Terminals)

The wiring in Figure 8-2 is recommended for a null modem cable or adapter.

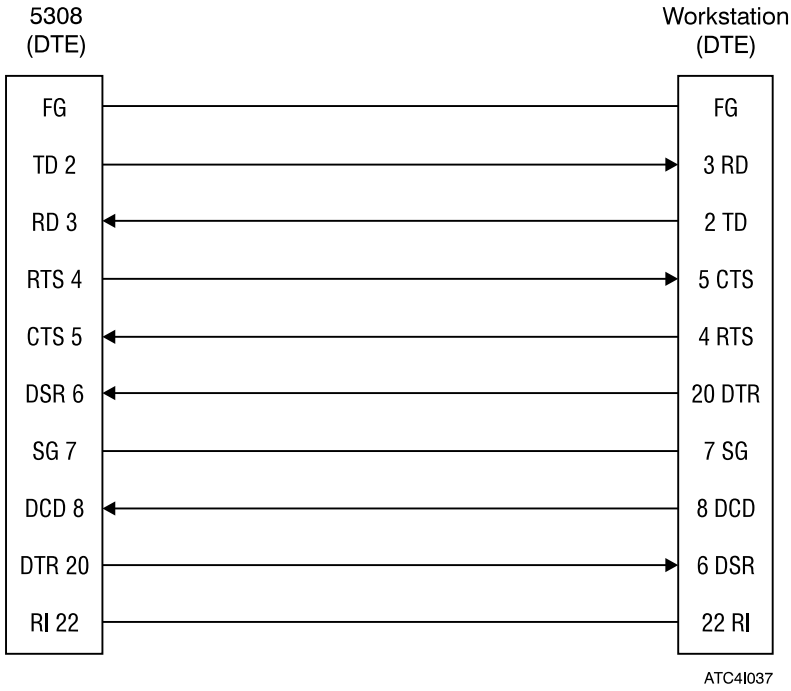


Figure 8-2. Recommended Wiring of the Null Modem Cable or Null Modem Adapter

Using Software Flow Control

To directly connect a workstation to the 5308, the cable shown in Figure 8-2 on page 8-3 is recommended. When using software flow control, the null modem cable or null modem cable adapter must meet the minimum requirements described in Figure 8-3. Almost all null modem cables meet this minimum requirement.

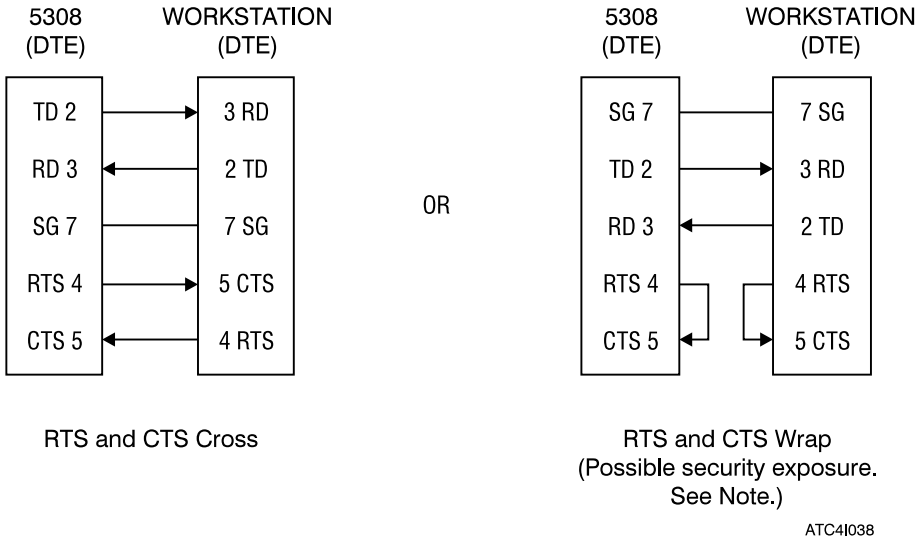


Figure 8-3. Minimum Null Modem Cable for a Direct Connection Using Software Flow Control

Note: Although the configuration shown on the right of Figure 8-3 works, it can be a security exposure. Using that configuration, the 5308 cannot detect when the workstation is powered off, and the host session is not terminated. Anyone who can power on the workstation can access the host session where the first person stopped.

Using Hardware Flow Control

To directly connect a workstation to the 5308, the cable shown in Figure 8-2 on page 8-3 is recommended. When using hardware flow control, the null modem cable must meet the minimum requirements described in Figure 8-4.

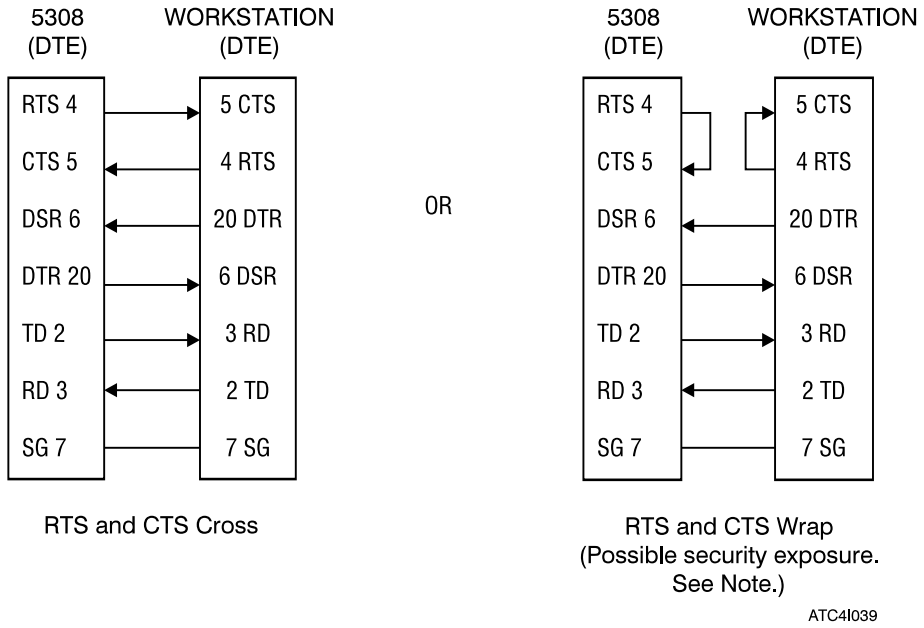


Figure 8-4. Minimum Null Modem Cable for a Direct Connection Using Hardware Flow Control

Note: Although the configuration shown on the right of Figure 8-4 works, it can be a security exposure. Using that configuration, the 5308 cannot detect when the workstation is powered off, and the host session is not terminated. Anyone who can power on the workstation can access the host session where the first person stopped.

Wrap Plug

The wiring in Figure 8-5 is required for a wrap plug that is used with the RS-232-C Wrap Diagnostics.

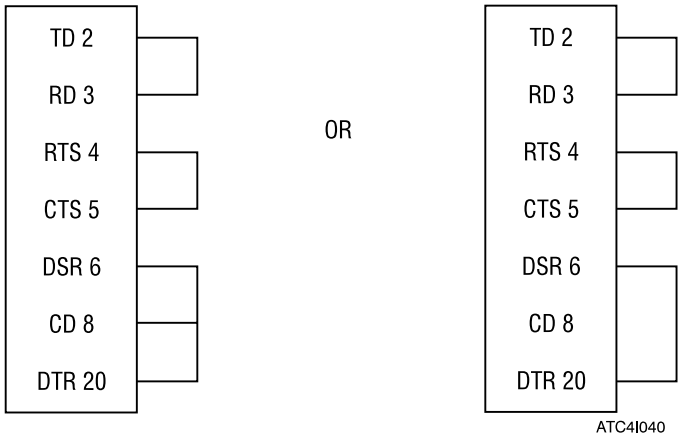


Figure 8-5. Wrap Plug Layout for Use with RS-232 Port Diagnostics

Chapter 9. Choosing a Modem Initialization String

Note: If you are using only direct connections to the 5308-002, this section does not apply.

This section provides detailed information for editing the Init (Initialization) and Hangup strings on the Modem Type/Commands screen. These settings control 5308-attached or internal modems. The 5308-0M2 internal modems use the settings listed for U.S. Robotics compatible modems. For information about setting up workstation-attached modems, see the *5308 User's Guide*.

This section also provides suggested modem initialization strings and modem hang-up strings:

- For the suggested initialization strings, see "Leased Line Operation" on page 9-5 or "Switched Line Operation" on page 9-5.
- For the suggested hang-up strings, see page 9-6.

Note: Modems ignore spaces. The modem strings shown in this section contain spaces to make them easier to read.

Configure your modem as close as possible to the guidelines in this section. If you do not understand the settings that are available for your modem, see the documentation provided with your modem or your workstation.

Selecting Your Modem Type

Do not switch between Modem Types while defining your modem. When you change your Modem Type selection, the Init and Hangup fields restore the default strings, even if you edited these fields.

For example:

1. Select **IBM 7852**. The default Init and Hangup strings for the IBM 7852 are displayed.
2. With IBM 7852 still selected, use the Tab key to move to the Init and Hangup fields. Change the Init and Hangup fields by editing them, and then press Enter. The previous menu appears.
3. Select the Modem Type/Commands option again with the IBM 7852 still selected. The Init and Hangup strings that you specified in step 2 are displayed.
4. Select the U.S. Robotics-compatible option. The default Init and Hangup strings for the U.S. Robotics-compatible option are displayed.
5. Select the IBM 7852 option. The default Init and Hangup strings for the IBM 7852 are displayed.

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Asynchronous Operation

In most cases, you should configure your modem for asynchronous operation.

Hayes Command Set (AT Commands)

The Hayes (or AT) command set recognition should be enabled.

Data Set Ready Settings

Before data transmissions begin, 5308-attached modems must raise data set ready (DSR). Modems often have a control setting that prevents DSR from being raised. For example, issuing the &F command to a IBM 7857 modem drops DSR.

If the modem has dropped DSR:

1. Try powering off and then powering on the modem to see whether DSR comes back up.
2. If DSR does not come back up, take your modem to another workstation or PC and send it the commands to reset the DSR.
3. When DSR is reset, attach the modem to the 5308 again.

Guidelines for Modem Initialization Settings

Note: Settings are not provided for supported modems when either:

- You should not use the setting with the 5308.
- The setting is not available on the modem.

When choosing an initialization string for your modem, make sure that the following settings are configured correctly:

Reset Modem to Factory Defaults

Unless you have a special configuration, the modem should be reset to factory defaults. Set the command string for this operation before any other modem settings.

The following settings are suggested:

- IBM 7852: &F
- IBM 7855: &F
- U.S. Robotics compatible: &F

Command Echo

This setting should be enabled so that commands are echoed back from the modem.

The following settings are suggested:

- IBM 7852: E1
- IBM 7855: E1
- IBM 7857: E1
- U.S. Robotics compatible: E1

Result Code Return

This setting should be enabled so that result codes (OK, ERROR, and so on) are returned by the modem.

- IBM 7852: Q0
- IBM 7855: Q0
- IBM 7857: Q0
- U.S. Robotics compatible: Q0

Result Code Format

This setting determines whether the result codes are returned in NUMERIC or WORD format. This should be set to WORD format.

- IBM 7852: V1
- IBM 7855: V1
- IBM 7857: V1
- U.S. Robotics compatible: V1

Modem Serial Port Rate

This setting controls the data rate between the modem and the 5308. This should be set to a fixed port rate if possible.

- IBM 7857: &I1
- U.S. Robotics compatible: &B1

Data Carrier Detect (DCD) Signal

DCD should be set to follow the state of the data carrier from the remote modem. DCD should NOT be forced on.

- IBM 7852: &C1
- IBM 7855: &C1
- IBM 7857: &C2
- U.S. Robotics compatible: &C1

Data Terminal Ready (DTR) Signal

DTR should be set to normal operations. (Drop carrier and go off-line when DTR dropped)

- IBM 7852: &D2
- IBM 7855: &D2
- IBM 7857: &D2
- U.S. Robotics compatible: &D2

Transmit Data Flow Control (CTS, XON/XOFF)

This command determines how the modem controls data flow between the system and the modem. For example, if the speed between the system unit and the modem is 19200 bps, and the speed between the local second remote modem is 2400 bps, the transmit buffer of the modem might overflow when the system is sending large amounts of data.

To prevent an overflow and the subsequent loss of data, the modem either sends an XOFF character or drops the CTS signal so that the system stops sending data. When enough space is available in the modems transmit buffer, the modem either sends an XON character or raises CTS so that the application resumes sending data.

For binary data transfer, CTS/RTS flow control should be selected because the modem cannot distinguish the user's data from XON/XOFF characters.

Under most configurations, hardware flow control should be enabled, while software flow control should be disabled.

- IBM 7852: &K3
- IBM 7855: &R0 \Q2
- IBM 7857: &K2
- U.S. Robotics compatible: &H1

Receive Data Hardware/Software Flow Control (RTS, XON/XOFF)

Flow control for data received by modems directly attached to the 5308 should be disabled.

- IBM 7852: &K3
- IBM 7855: \R0
- IBM 7857: &U0
- U.S. Robotics compatible: &I0 &R1

Data Compression

Data compression can significantly increase your effective transfer rate and should usually be enabled.

- IBM 7852: %C3
- IBM 7855: %C1
- IBM 7857: *E1
- U.S. Robotics compatible: &K1

Set Error Correction (ARQ)

Error control should be enabled if available.

- IBM 7852: \N3
- IBM 7857: &E1
- U.S. Robotics compatible: &M4

Data Set Ready (DSR) Signal

The modem should set DSR to be active at all times.

- IBM 7852: &S0
- IBM 7855: &S0
- IBM 7857: &C2
- U.S. Robotics compatible: &S0

Auto Answer

Part of the initialization string should contain the command to put the modem in auto-answer mode. This command is usually ATS0=*n*, where *n* is the number of rings to wait before answering.

- IBM 7852: S0=1
- IBM 7855: S0=1
- IBM 7857: S0=1
- U.S. Robotics compatible: S0=1

Switched Line Operation

The following modem initialization strings are suggested for switched line operation of 5308-attached modems:

- For an IBM 7852 Modem:

  AT &F E1 Q0 V1 X4 &C1 &D2 &K3 %C3 \N3 &S0 S0=1

- For an IBM 7855 Modem:

  AT &F E1 Q0 V1 X4 &C1 &D2 &R0 \Q2 \R0 %C1 &S0 S0=1

- For an IBM 7857 Modem:

  AT E1 Q0 V1 X2 &I1 &C2 &D2 &K2 &U0 *E1 &E1 S0=1

- For U.S. Robotics compatible modems:

  AT &F E1 Q0 V1 X4 &B1 &C1 &D2 &H1 &I0 &K1 &M4 &R1 &S0 S0=1

- For the 5308-0M2 internal modems:

  AT &F S0=1

Reducing Noise from 5308-0M2 Internal Modems: If the 5308-0M2 internal modems' speakers are too loud for the environment where the 5308 is installed, turn the speaker off by putting an M0 command in the modem initialization string.

Leased Line Operation

In a leased line configuration, the 5308-attached modem should be placed in originate mode to establish a connection to the 5308. This is usually done by sending the ATD command to the modem. A 'D' can be added to the end of the initialization string to force the modem into originate mode after the initialization string is sent.

Dial tone recognition must also be disabled when connecting through a leased line. For most modems, replacing the X4 with X0 in the initialization string disables dial tone detection.

Your modem might provide additional features and settings for operating on a leased line. For detailed information about configuring your modem for a leased line, see the documentation provided with your modem.

The best way to support leased lines follows:

- Use a workstation to set up the modem. Store the desired initialization string in the modem to be retrieved when the modem is powered on, or when DTR is dropped and raised again. This string should specify that the modem connected to the 5308 should enter the originate mode.
- Configure the 5308 to use the modem labeled "Other." This modem has a null initialization string and the 5308 will not send anything to the modem.
- The 5308 drops DTR and raises it whenever it wants to reinitialize any modem. With the string pre-stored in the leased line modem, this DTR sequence will automatically reset the modem.

Suggested Modem Hang-Up Strings

Note: This section applies to switched lines only.

The modem hang-up string instructs the modem to hang-up the phone line and go offline. The following modem hang-up strings are suggested for the 5308-attached and 5308-0M2 internal modems:

- IBM 7852 Modem: AT H0
- IBM 7855 Modem: AT H0
- IBM 7857 Modem: AT H0
- U.S. Robotics compatible modem: AT H0
- 5308-0M2 internal modem: AT H0

Chapter 10. Code Page Tables

This section describes the ASCII and EBCDIC code pages that the 5308 supports. The 5308 translates the host (EBCDIC) code pages to ASCII code page 819, which is shown on page 10-2.

For information about selecting the host to display code page mapping, see “Station Address x Configuration” on page 5-6.

For information about customizing a translation table, see “Working with Translation Tables” on page 5-7.

The supported host code pages are printed on the pages shown in Table 10-1.

Table 10-1. Code Pages Commonly Used for Countries

Country	**EBCDIC Code Page**	**See page:**
US/Canada Canadian (French) Netherlands Portugal	037	10-3
Austria/Germany	273	10-4
Denmark/Norway	277	10-5
Finland/Sweden	278	10-6
Italy	280	10-7
Spain Spanish speaking (Latin)	284	10-8
United Kingdom	285	10-9
France	297	10-10
Multinational Belgium/Switzerland	500	10-11
Iceland	871	10-12

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ASCII 819 Code Page

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0			(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000			(RSP) SP300000	° SM190000	À LA140000	Ð LD620000	à LA130000	ð LD630000
-1			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000			¡ SP030000	± SA020000	Á LA120000	Ñ LN200000	á LA110000	ñ LN190000
-2			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000			¢ SC040000	² ND021000	Â LA160000	Ò LO140000	â LA150000	ò LO130000
-3			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000			£ SC020000	³ ND031000	Ã LA200000	Ó LO120000	ã LA190000	ó LO110000
-4			$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000			¤ SC010000	´ SD110000	Ä LA180000	Ô LO160000	ä LA170000	ô LO150000
-5			% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000			¥ SC050000	µ SM170000	Å LA280000	Õ LO200000	å LA270000	õ LO190000
-6			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000			¦ SM650000	¶ SM250000	Æ LA520000	Ö LO180000	æ LA510000	ö LO170000
-7			' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000			§ SM240000	· SD630000	Ç LC420000	× SA070000	ç LC410000	÷ SA060000
-8			(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000			¨ SD170000	¸ SD410000	È LE140000	Ø LO620000	è LE130000	ø LO610000
-9			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000			© SM520000	¹ ND011000	É LE120000	Ù LU140000	é LE110000	ù LU130000
-A			* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000			ª SM210000	º SM200000	Ê LE160000	Ú LU120000	ê LE150000	ú LU110000
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000			« SP170000	» SP180000	Ë LE180000	Û LU160000	ë LE170000	û LU150000
-C			, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000			¬ SM660000	¼ NF040000	Ì LI140000	Ü LU180000	ì LI130000	ü LU170000
-D			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000			(SHY) SP320000	½ NF010000	Í LI120000	Ý LY120000	í LI110000	ý LY110000
-E			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000			® SM530000	¾ NF050000	Î LI160000	Þ LT640000	î LI150000	þ LT630000
-F			/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000				¯ SM150000	¿ SP160000	Ï LI180000	ß LS610000	ï LI170000	ÿ LY170000

Code Page 00819

Figure 10-1. ASCII Code Page 819

EBCDIC Code Pages

The code pages in this section provide a graphic display of the EBCDIC characters that the 5308 ASCII to 5250 Connection supports.

Code Page 037

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	^ SD150000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	¢ SC040000	! SP020000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	[SM060000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00037

Figure 10-2. EBCDIC Code Page 037

Code Page 273

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	ä LA170000	ü LU170000	Ö LO180000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ß LS610000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	[SM060000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	~ SD190000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ä LA180000	Ü LU180000	ö LO170000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	¦ SM650000	} SM140000	\ SM070000	] SM080000
-D	(SP050000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00273

Figure 10-3. EBCDIC Code Page 273

Code Page 277

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	¦ SM650000	@ SM050000	° SM190000	µ SM170000	¢ SC040000	æ LA510000	å LA270000	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	} SM140000	ï LI170000	$ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	# SM010000	¤ SC010000	ø LO610000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	Å LA280000	, SP080000	Æ LA520000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ø LO620000	ð LD630000	{ SM110000	Ð LD620000	¯ SM150000	ö LO170000	~ SD190000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	[SM060000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00277

Figure 10-4. EBCDIC Code Page 277

Code Page 278

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	ä LA170000	å LA270000	É LE120000	0 ND100000
-1	(RSP) SP300000	` SD130000	/ SP120000	\ SM070000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	# SM010000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	[SM060000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	} SM140000	ï LI170000	$ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	é LE110000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	§ SM240000	¤ SC010000	ö LO170000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	Å LA280000	, SP080000	Ä LA180000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ö LO180000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	¦ SM650000	~ SD190000	@ SM050000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	>> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00278

Figure 10-5. EBCDIC Code Page 278

Code Page 280

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	µ SM170000	¢ SC040000	à LA130000	è LE130000	ç LC410000	0 ND100000
-1	(RSP) SP300000	] SM080000	/ SP120000	É LE120000	a LA010000	j LJ010000	ì LI130000	# SM010000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	{ SM110000	} SM140000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	~ SD190000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ù LU130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	ć LC110000	ò LO150000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	¦ SM650000	` SD130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00280

Figure 10-6. EBCDIC Code Page 280

Code Page 284

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	¦ SM650000	ß LS610000	# SM010000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	ñ LN190000	: SP130000	« SP170000	ª SM210000	¡ SP030000	^ SD150000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	Ñ LN200000	» SP180000	º SM200000	¿ SP160000	! SP020000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00284

Figure 10-7. EBCDIC Code Page 284

Code Page 285

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¯ SM150000	[SM060000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	$ SC030000	! SP020000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	^ SD150000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	£ SC020000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	~ SD190000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00285

Figure 10-8. EBCDIC Code Page 285

Code Page 297

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	` SD130000	¢ SC040000	é LE110000	è LE130000	ç LC410000	0 ND100000
-1	(RSP) SP300000	{ SM110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	# SM010000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	@ SM050000	} SM140000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	] SM080000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	µ SM170000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	§ SM240000	ù LU130000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	à LA130000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP050000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	¦ SM650000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00297

Figure 10-9. EBCDIC Code Page 297

Code Page 500

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00500

Figure 10-10. EBCDIC Code Page 500

Code Page 871

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	þ LT630000	æ LA510000	' SD110000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ö LO170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ð LD630000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Þ LT640000	Æ LA520000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ð LD620000	` SD130000	} SM140000	@ SM050000	¯ SM150000	~ SD190000	ü LU170000	^ SD150000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	{ SM110000	] SM080000	[SM060000	\ SM070000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	Ö LO180000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00871

Figure 10-11. EBCDIC Code Page 871

Chapter 11. Planning Forms

Use a copy of the tables in this section to plan the installation or upgrade of a 5308 and to create a record of your installation or upgrade. The more thorough your plan is, the easier installing, upgrading, configuring, and maintaining your 5308 will be.

If you are installing a 5308, complete these tables (except for some of the settings in “5308 Configuration Forms” on page 11-7) before you begin the installation.

If you are installing a 2- to 7-Port Upgrade and you want to use the same configuration for communications lines 0 and 1 after the upgrade, record the settings in these tables before you power off the 5308-002 to begin the upgrade.

Host Information Form

Complete Table 11-1 so that you have a record of the information related to your host. Refer to Table 11-1 when you complete the Communications Line settings in “5250 Device Configuration Forms” on page 11-2.

Note: You can use any available station address for a communications line. For example, if addresses 0 and 1 are being used by other devices on the twinax workstation controller line:

1. You would disable the 5308 from using addresses 0 and 1.
2. You would enable the 5308 to use at least one of the following addresses: 2, 3, 4, 5, 6
3. During 5250 Device Configuration, you could assign one of the addresses that the 5308 was enabled to use to communications line 0.

Table 11-1. Host Information

Name of host							
Type of host	AS/400		S/38		S/36		
Attachment	Direct		5494 5394		6299 5299		
Cabling required to attach to host							
Station Address:	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Enable							
Disable							
Communications line							

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5250 Device Configuration Forms

Table 11-2. 5250 Device Configuration for Host Station Address 0

Device Type:	**Number of sessions:**		**Communications Line:**
3196	1		0
3197	2 (3488 only)		1
3488	3 (3488 only)		2
	4 (3488 only)		3
			4
			5
	Host⇔ASCII Translations:	**Host Keyboard:**	6
Session 1:	(-)	( )	
Session 2:	(-)	( )	
Session 3:	(-)	( )	
Session 4:	(-)	( )	

Table 11-3. 5250 Device Configuration for Host Station Address 1

Device Type:	**Number of sessions:**		**Communications Line:**
3196	1		0
3197	2 (3488 only)		1
3488	3 (3488 only)		2
	4 (3488 only)		3
			4
			5
	Host⇔ASCII Translations:	**Host Keyboard:**	6
Session 1:	(-)	( )	
Session 2:	(-)	( )	
Session 3:	(-)	( )	
Session 4:	(-)	( )	

Table 11-4. 5250 Device Configuration for Host Station Address 2

Device Type:	**Number of sessions:**		**Communications Line:**
3196	1		0
3197	2 (3488 only)		1
3488	3 (3488 only)		2
	4 (3488 only)		3
			4
			5
	Host⇔ASCII Translations:	**Host Keyboard:**	6
Session 1:	(-)	( )	
Session 2:	(-)	( )	
Session 3:	(-)	( )	
Session 4:	(-)	( )	

Table 11-5. 5250 Device Configuration for Host Station Address 3

Device Type:	**Number of sessions:**		**Communications Line:**
3196	1		0
3197	2 (3488 only)		1
3488	3 (3488 only)		2
	4 (3488 only)		3
			4
			5
	Host⇔ASCII Translations:	**Host Keyboard:**	6
Session 1:	(-)	( )	
Session 2:	(-)	( )	
Session 3:	(-)	( )	
Session 4:	(-)	( )	

Table 11-6. 5250 Device Configuration for Host Station Address 4

Device Type:	**Number of sessions:**		**Communications Line:**
3196	1		0
3197	2 (3488 only)		1
3488	3 (3488 only)		2
	4 (3488 only)		3
			4
			5
	Host⇔ASCII Translations:	**Host Keyboard:**	6
Session 1:	(-)	( )	
Session 2:	(-)	( )	
Session 3:	(-)	( )	
Session 4:	(-)	( )	

Table 11-7. 5250 Device Configuration for Host Station Address 5

Device Type:	**Number of sessions:**		**Communications Line:**
3196	1		0
3197	2 (3488 only)		1
3488	3 (3488 only)		2
	4 (3488 only)		3
			4
			5
	Host⇔ASCII Translations:	**Host Keyboard:**	6
Session 1:	(-)	( )	
Session 2:	(-)	( )	
Session 3:	(-)	( )	
Session 4:	(-)	( )	

Table 11-8. 5250 Device Configuration for Host Station Address 6

Device Type:	**Number of sessions:**		**Communications Line:**
3196	1		0
3197	2 (3488 only)		1
3488	3 (3488 only)		2
	4 (3488 only)		3
			4
			5
	Host⇔ASCII Translations:	**Host Keyboard:**	6
Session 1:	(-)	( )	
Session 2:	(-)	( )	
Session 3:	(-)	( )	
Session 4:	(-)	( )	

Cabling Forms

Figure 11-1 provides summary diagrams of the cables required for connecting a workstation to the 5308 using a direct RS-232 connection and using a modem connection. Each cable in the diagram is labeled with a letter. The letter is used to indicate these cables in the tables in this section. Complete these tables so that you have a record of the cabling for your installation.

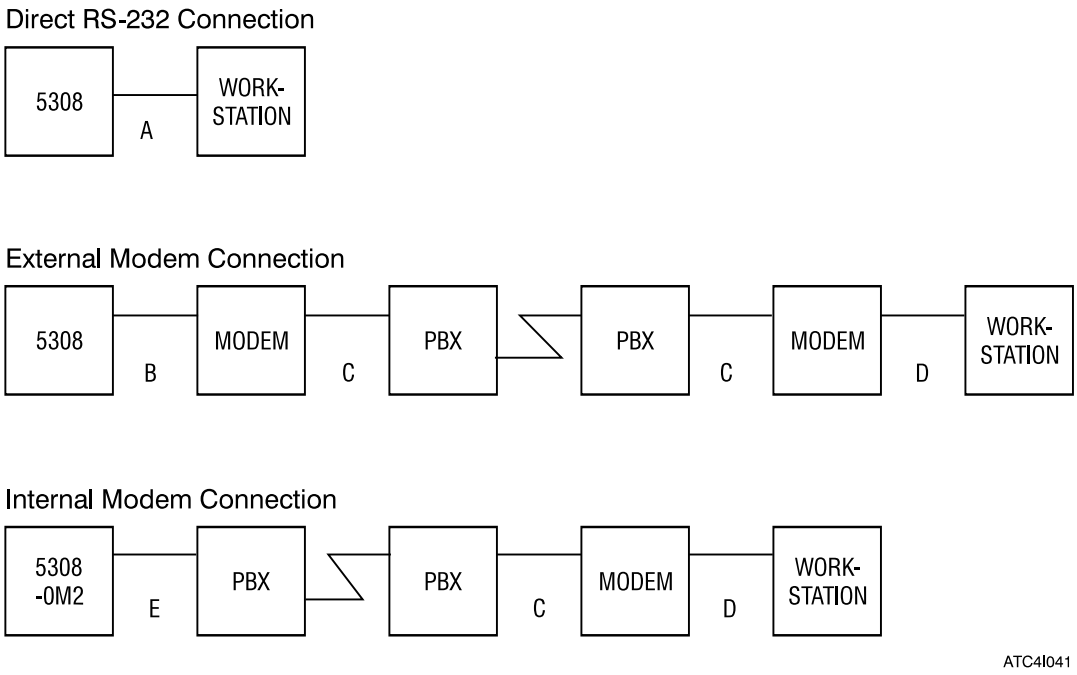


Figure 11-1. Summary of Cabling Connections

Table 11-9. Cabling Information for Communications Line 0	
Cable A (Required for initial 5308 configuration)	
Cable B	
Cable C	Often this cable is provided with the modem.
Cable D	
Cable E	This cable is provided with the 5308-0M2.
Balun, if required	
Gender adapter, if required	

Table 11-10. Cabling Information for Communications Line 1	
Cable A	
Cable B	
Cable C	Often this cable is provided with the modem.
Cable D	
Cable E	This cable is provided with the 5308-0M2.
Balun, if required	
Gender adapter, if required	

Table 11-11. Cabling Information for Communications Line 2	
Cable A	
Cable B	
Cable C	Often this cable is provided with the modem.
Cable D	
Balun, if required	
Gender adapter, if required	

Table 11-12. Cabling Information for Communications Line 3	
Cable A	
Cable B	
Cable C	Often this cable is provided with the modem.
Cable D	
Balun, if required	
Gender adapter, if required	

Table 11-13. Cabling Information for Communications Line 4	
Cable A	
Cable B	
Cable C	Often this cable is provided with the modem.
Cable D	
Balun, if required	
Gender adapter, if required	

Table 11-14. Cabling Information for Communications Line 5	
Cable A	
Cable B	
Cable C	Often this cable is provided with the modem.
Cable D	
Balun, if required	
Gender adapter, if required	

Table 11-15. Cabling Information for Communications Line 6	
Cable A	
Cable B	
Cable C	Often this cable is provided with the modem.
Cable D	
Balun, if required	
Gender adapter, if required	

5308 Configuration Forms

Complete the tables in this section so that you have a record of your asynchronous communication configuration for each communications line. For information about communications settings, see “Asynchronous Communication Configuration” on page 5-2.

Table 11-16. 5308 Configuration for Communications Line 0

ASYNCHRONOUS COMMUNICATION CONFIGURATION
(Select one value for each setting.)

Attachment:	**Baud rate:**	**Stop bits:**
Direct cable (default)	Auto (default)	1 (default)
Modem	2400	2
	4800	
	9600	**Data bits:**
	19200	7
	38400	8 (default)
	57600	
Parity:	115200	**Flow control:**
None (default)		None
Odd		Hardware
Even		Xon/Xoff (default)
		Both

MODEM TYPE/COMMANDS
(Used for modem attachment)

Modem type:

	U.S. Robotics-compatible	Other
IBM 7852		Internal
IBM 7855		
IBM 7857		

Commands:

Modem initialization string (Required for switched lines):

_____

Modem hangup string (Not used for leased lines):

_____

Table 11-17. 5308 Configuration for Communications Line 1

ASYNCHRONOUS COMMUNICATION CONFIGURATION
(Select one value for each setting.)

Attachment:
Direct cable (default)
Modem

Baud rate:
Auto (default)
2400
4800
9600
19200
38400
57600
115200

Stop bits:
1 (default)
2

Data bits:
7
8 (default)

Parity:
None (default)
Odd
Even

Flow control:
None
Hardware
Xon/Xoff (default)
Both

MODEM TYPE/COMMANDS
(Used for modem attachment)

Modem type:

U.S. Robotics-compatible
IBM 7852
IBM 7855
IBM 7857

Other
Internal

Commands:

Modem initialization string (Required for switched lines):

_____

Modem hangup string (Not used for leased lines):

_____

Table 11-18. 5308 Configuration for Communications Line 2

ASYNCHRONOUS COMMUNICATION CONFIGURATION
(Select one value for each setting.)

Attachment:
Direct cable (default)
Modem

Baud rate:
Auto (default)
2400
4800
9600
19200
38400
57600
115200

Stop bits:
1 (default)
2

Data bits:
7
8 (default)

Parity:
None (default)
Odd
Even

Flow control:
None
Hardware
Xon/Xoff (default)
Both

MODEM TYPE/COMMANDS
(Used for modem attachment)

Modem type:

U.S. Robotics-compatible
IBM 7852
IBM 7855
IBM 7857

Other
Internal

Commands:

Modem initialization string (Required for switched lines):

_____

Modem hangup string (Not used for leased lines):

_____

Table 11-19. 5308 Configuration for Communications Line 3

ASYNCHRONOUS COMMUNICATION CONFIGURATION
(Select one value for each setting.)

Attachment:	**Baud rate:**	**Stop bits:**
Direct cable (default)	Auto (default)	1 (default)
Modem	2400	2
	4800	
	9600	**Data bits:**
	19200	7
	38400	8 (default)
	57600	
Parity:	115200	**Flow control:**
None (default)		None
Odd		Hardware
Even		Xon/Xoff (default)
		Both

MODEM TYPE/COMMANDS
(Used for modem attachment)

Modem type:

	U.S. Robotics-compatible	Other
IBM 7852		Internal
IBM 7855		
IBM 7857		

Commands:

Modem initialization string (Required for switched lines):

_____

Modem hangup string (Not used for leased lines):

_____

Table 11-20. 5308 Configuration for Communications Line 4

ASYNCHRONOUS COMMUNICATION CONFIGURATION
(Select one value for each setting.)

Attachment:	**Baud rate:**	**Stop bits:**
Direct cable (default)	Auto (default)	1 (default)
Modem	2400	2
	4800	
	9600	**Data bits:**
	19200	7
	38400	8 (default)
	57600	
Parity:	115200	**Flow control:**
None (default)		None
Odd		Hardware
Even		Xon/Xoff (default)
		Both

MODEM TYPE/COMMANDS
(Used for modem attachment)

Modem type:

	U.S. Robotics-compatible	Other
IBM 7852		Internal
IBM 7855		
IBM 7857		

Commands:

Modem initialization string (Required for switched lines):

_____

Modem hangup string (Not used for leased lines):

_____

Table 11-21. 5308 Configuration for Communications Line 5

ASYNCHRONOUS COMMUNICATION CONFIGURATION
(Select one value for each setting.)

Attachment:
Direct cable (default)
Modem

Baud rate:
Auto (default)
2400
4800
9600
19200
38400
57600
115200

Stop bits:
1 (default)
2

Data bits:
7
8 (default)

Parity:
None (default)
Odd
Even

Flow control:
None
Hardware
Xon/Xoff (default)
Both

MODEM TYPE/COMMANDS
(Used for modem attachment)

Modem type:

U.S. Robotics-compatible
IBM 7852
IBM 7855
IBM 7857

Other
Internal

Commands:

Modem initialization string (Required for switched lines):

_____

Modem hangup string (Not used for leased lines):

_____

Table 11-22. 5308 Configuration for Communications Line 6

ASYNCHRONOUS COMMUNICATION CONFIGURATION
(Select one value for each setting.)

Attachment:	**Baud rate:**	**Stop bits:**
Direct cable (default)	Auto (default)	1 (default)
Modem	2400	2
	4800	
	9600	**Data bits:**
	19200	7
	38400	8 (default)
	57600	
Parity:	115200	**Flow control:**
None (default)		None
Odd		Hardware
Even		Xon/Xoff (default)
		Both

MODEM TYPE/COMMANDS
(Used for modem attachment)

Modem type:

	U.S. Robotics-compatible	Other
IBM 7852		Internal
IBM 7855		
IBM 7857		

Commands:

Modem initialization string (Required for switched lines):

_____

Modem hangup string (Not used for leased lines):

_____

Chapter 12. Troubleshooting

To troubleshoot a 5308 problem:

- See the troubleshooting section in the *5308 User's Guide* for information about messages and symptoms that are observed at the workstation.
- Check the boot sequence against the information in "Boot Sequence."
- Check the physical connections between the 5308, the host, and the workstation. See "Checking Connections" on page 12-2.
- Check the configuration of the host, 5308, and workstation. See "Checking Configurations" on page 12-3.
- If the 5308 problem is still not resolved, run the diagnostic tests to verify that the 5308 is functioning correctly. For directions, see "Running the Diagnostics" on page 12-8.

Boot Sequence

When you turn on the power switch, the boot sequence begins. This same boot sequence is invoked by pressing the RESET button on the front panel, or by selecting the Reboot 5308 System option on the Operator's Console System Administrator Mode Options Main Menu. The boot sequence runs as follows:

1. The power light comes on.
2. Approximately 5 seconds later, the drive light comes on for 2 seconds.
3. Approximately 7 seconds later, the speaker beeps once.
4. The drive light comes on immediately following the speaker beep.
5. Approximately 35 seconds later, the status light flashes slowly while the diagnostics are run.

   Note regarding the 5308-0M2: When the diagnostics run on the 5308-0M2, it is normal for the internal modem speakers to make noise.
6. Approximately 1 to 3 minutes later (depending on the model), the status light stops flashing and stays on.
7. Any directly connected terminals should display the initialization message. If the line is configured for auto baud detection, the auto baud detection routine must be completed (by pressing the spacebar at the terminal up to 10 times) before the initialization message displays. For more information, see the *User's Guide*.

The boot sequence is now complete:

- If this boot sequence completes normally, most of the 5308 is operational. If you have exhausted the troubleshooting suggestions in the *User's Guide*, go to "Checking Connections" on page 12-2 and "Checking Configurations" on page 12-3 to search for your problem.
- Otherwise, see "Boot Sequence Detected a Problem" on page 12-2.

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Boot Sequence Detected a Problem

This section lists the symptoms and the actions you should take when an error is detected during the boot sequence:

- If there were no beeps, the hardware needs to be repaired by your service representative.
- If there was more than one beep, or the speaker emits a continuous tone, the internal diagnostics found a problem that needs to be addressed by your service representative.
- If the power light does not come on, check to make sure that the voltage switch in the rear of the 5308 is set correctly. Make sure an operational power line is connected to the 5308. Otherwise, contact your service representative.
- If the status light fails to come on, there is a possibility that the media in the diskette drive is defective. Take your original 5308 System Diskette to a personal computer, and make another backup copy. Put this new backup copy into the 5308, and try to reboot again. If the 5308 comes up, discard the defective diskette, and reconfigure the 5308 back to the settings you recorded in “5250 Device Configuration Forms” on page 11-2 and “5308 Configuration Forms” on page 11-7. If the reboot is not successful, contact your service representative.
- If the status light begins to flash a series of quick flashes followed by a pause, the internal diagnostics found a problem that needs to be addressed by your service representative.

Checking Connections

This section contains the procedures for checking connections between the following:

- The 5308 and the host
- The 5308 and the workstation

Between the 5308 and the Host

To check the connections between the 5308 and the host:

- Make sure the cable between the 5308 and the host is securely fastened and is not visibly damaged.
- Make sure only the last workstation on your cable is terminated.
- If the 5308 is attached to a remote controller, check the controller to ensure that it is communicating correctly with the host. The loss of host communications can affect what the 5308 sees.
- If the 5308 is attached to a remote controller, it is possible that the terminal user saw a four-digit error code in the range of 0040 through 0054. These codes indicate problems with the remote controller. Contact the controller operator to correct these problems.

Between the 5308 and the Workstation

To check the connections between the 5308 and the workstation:

- If you are performing the initial configuration of the 5308, make sure that your workstation is connected and configured as directed in “Factory Default Configuration Settings” on page 4-5.
- Make sure the correct cable is being used for the communications line, and that it is connected to the proper 5308 connector.
  - When the terminal is directly connected to the 5308, the Communications setting should specify **Attachment = Direct**, and the terminal should be cabled to the DB25F connector for the correct communications line.
    - Terminals that are DTE should be connected with a null modem cable.
    - Terminals that are DCE should be connected with a straight-through cable.
  - When the terminal is connected through a modem to the 5308, the Communications setting should specify **Attachment = Modem**.
    - The cabling at the 5308 depends on whether an external modem is being used, or the internal modem of the model 0M2 is being used.
      - External modems should be attached with a straight-through cable to the DB25F connector for the correct communications line.
      - When the internal modem is being used, a telephone cable should be connected from the wall jack for your switched network to the **LINE** jack of the internal modem for the correct communications line.

        Note: The Internal modem of the model 0M2 does not support leased lines.
    - The cabling at the terminal depends on the type of terminal.
      - Terminals that are DCE should be connected with a null modem cable to their modem.
      - Terminals that are DTE should be connected with a straight-through cable to their modem.

Checking Configurations

This section describes the procedures for checking the configurations for the following:

- Host configuration
- 5308 configuration
- Workstation configuration

Host Configuration

To check the host configuration:

- Make sure the host is configured for the 5308. Each line of the 5308 is configured as a 3196, 3197, or 3488 display with an enhanced keyboard. The host configuration for each station address must match the setting in the 5308. To configure your host, see your host system administrator.
- Make sure the host has the correct keyboard set for the device. See the discussion on keyboards in “Keyboard Support” on page 5-19.
- If your host is a S/36, check to make sure that there are not error messages at the system console. If a user disconnected from the 5308 without first signing off from the S/36, you might not be able to reestablish with the S/36. If this happens, clear the error messages at the system console, and vary the device offline and back online.
- If your host is a S/38 running a CPF release before 6.0, it is possible that one of the devices used by the 5308 has been varied offline. This could happen if a user repeatedly turned their terminal on and off without signing on the system. This could also happen if the 5308 were repeatedly rebooted without a user signing on to the system. To correct this problem:

  1. Vary the session online using the VRYDEV command. This works if a display session was not signed on for up to eight times. The eighth time, a warning message is sent to the QSYSOPR message queue.
  2. Terminate and restart the subsystem using the TRMSBS and STRSBS commands. This becomes necessary the ninth time the session is turned off without being signed on.

  This problem can be prevented from recurring by:

  – Signing on to all sessions at least every fourth time you reboot the 5308. This resets the counter.

  – Signing on to the session at least every fourth time the user powers on his terminal. This resets the counter.

  – Installing program change number 06076 in CPF release 6.0, program change C.
- Varying the device offline and back online often corrects problems at the host.

5308 Configuration

To check the 5308 configuration:

- Make sure a backup copy (that is *not* write protected) of the IBM 5308 ASCII to 5250 Connection System Diskette is in the diskette drive of the 5308.
- If you are performing the initial installation and configuration of the 5308, see “Factory Default Configuration Settings” on page 4-5 for information about how to connect and configure the workstation so that the 5308 can be configured.

- If 5308 configuration changes are not being used, it is possible that you did not change the configuration correctly. For configuration changes to take effect, you must save the changes and reboot the 5308. To correct this situation, make sure the keylock is in the Locked position and then do one of the following:
  - If you saved the configuration changes and have not rebooted the 5308, reboot the 5308.
  - If you rebooted the 5308 without saving the changes:
    1. Change the configuration again.
    2. Save the changes from the Configure 5308 screen. For more information about saving changes, see “Saving 5308 Configuration Changes” on page 5-17.
    3. Reboot the 5308.
- Check the Communications Settings of the communications line that is causing the problem.
  - Only when the terminal **Attachment** is set to **Direct**, can you use the **Baud Rate = Auto** setting. You need to press the spacebar multiple times for the 5308 to determine the terminal’s baud rate.

    Note: You *cannot* use the Auto setting with modems.
  - If a specific baud rate is being set for **Direct** connection, you must have the exact same rate set at your terminal. Otherwise, strange characters will appear on the screen, and the 5308 will fail to connect correctly.
  - It is best to use the following default settings for both the 5308 and the terminal.

    Stop Bits 1
    Data Bits 8
    Parity None

    Any mismatch in these parameters between the 5308 and the terminal will cause unpredictable results. You should change these parameters at the 5308 only when the terminal being used cannot run at the default settings.

    Note: Once these parameters have been changed at the 5308, every terminal using that Communication Line must also have these same characteristics.
  - Make sure that the terminal is using the type of **Flow Control** that is specified by the 5308. The recommended settings for flow control are listed in “Communications” on page 5-2.
- Check the **ASCII Terminal Type** configured in the 5308. If this parameter is set to any value other than the default value of **Prompt User**, the terminal being used on that communications line must be compatible with 5308 setting. To accommodate a variety of terminal types, we recommend that you leave this parameter at the default setting.
- Check the **Station Addresses** being used. Make sure that they are the correct ones that are being used by the host. Make sure that no other devices on the twinax are using these same addresses. If multiple devices are using the same address, the SA indicator on the terminal might be blinking on and off.

- Make sure that the correct Host⇔ASCII translation table is being used and that the correct Host Keyboard is set. See the discussion on keyboards in “Keyboard Support” on page 5-19.
- If you are using a modem (internal or external) with the 5308 and you cannot establish communications with a remote terminal, it is possible that the modem initialization string controls CTS incorrectly. If CTS is blocked from being turned on, the 5308 cannot send control strings to the modem.

Data Set Ready Settings for Modems

Before data transmissions begin, 5308-attached modems must raise DSR. Modems often have a control setting that prevents DSR from being raised. For example, issuing the &F command to an IBM 7857 modem drops DSR.

If DSR is dropped:

- Try powering the modem off and then on again.
- If DSR does not come back up, take your modem to another workstation or PC and send it the correct commands to reset the DSR.
- When DSR is reset, attach the modem to the 5308 again.

Workstation Configuration

- Review “Guidelines for Display Settings” in the *User’s Guide*. It often takes some trial and error to find all the workstation settings that affect communication with the 5308. If your terminal supports different emulations, do not hesitate to try emulating another terminal that is supported by the 5308.
- If the characters appear that are different than those typed, check the Keyboard and Language settings of the workstation. See the discussion on keyboards in “Keyboard Support” on page 5-19.

  Also check which Code Page the workstation is using. The 5308, by default, maps characters that are sent from the workstation to code page 819. If the characters sent from the workstation do not map to code page 819, you must customize the translation table.

  Note: Code Page 819 is also known as ISO-1 or ISO-Latin-1.
- If you are seeing double characters for every keystroke, it is possible that you have Echo turned on, either in the terminal itself, or in the modem with which you are communicating. Turn Echo off.

  Note: It is desirable to have a modem’s Command Echo turned on.
- If you are using a modem and you keep losing your connection with the 5308, it is possible that you have the flow control set incorrectly at the terminal. Typically, modems use DTR to control whether they are in operational mode, or command mode. This switch of DTR usually tells the modem to "hang up" its communication with the remote modem. Thus, you do not want the terminal to be switching DTR for flow control. Instead, set the terminal to use XON/XOFF for flow control. This can either be passed thru the modem as data, allowing the 5308 to see this software flow control. Or, the modem that is attached to the terminal can be set up to convert use software signals as its own flow control.

- Getting modems to communicate with each other is a trial and error job at best. Guidelines are provided in this publication for the modem at the 5308, and in the *User's Guide* for the modem at the terminal end. For switched networks, you want the terminal modem to originate the call and the 5308 modem to answer. For leased lines, you want the 5308 modem to originate and the terminal modem to answer. The modems must be compatible with each other for data compression and error correction. The terminal and modem need to agree on the use of control signals such as DTR, DSR, CTS, RTS, and DCD. Settings for these signals can also affect modem to modem communication.

Keyboard Problems

Depending on the terminal being used, and the language of its keyboard, certain problems might be encountered. The following sections show you known workarounds:

Hex Function

For most terminals, the keys to begin a hexadecimal sequence to the host is:

```
ESC (grave accent)
```

This works fine when the grave accent key is considered a regular character by the terminal.

When the terminal considers the grave accent key to be a diacritic character that begins a compose sequence, it may be necessary to press the grave accent key twice in order to get the terminal to send this character to the 5308.

On some terminals, pressing the grave accent key twice does not work. If this is the case, press the following keys:

```
ESC ESC F7
```

For a VT100/VT220, this sequence is:

```
ESC ESC ESC 7
```

VT100/VT220 Function Mapping

For problems with function keys F11 through F24, see "Workstation Keyboard to Host Function Keys" on page 5-15. See also "Customization Problems" on page 5-17.

Display Problems with non-US Character Sets

The vertical bar "|" is used for different purposes by the 5308. It is used:

- In Operator Console Mode when drawing the sides of boxes
- As the host Column Separator Character.

Terminals that do not support the multinational Code Page 819 sometimes translate the vertical bar into a country-specific character. When this happens, the country-specific character is used as the sides of boxes and as the column separator character. There is nothing the user can do to change the appearance of this character on that specific terminal. To avoid this problem, use terminals such

as the IBM 3153 or personal computers running the 5308 PC Terminal Program. Both support the multinational Code Page 819.

Running the Diagnostics

Before running the diagnostics, verify that :

- The 5308 is installed correctly. For more information, see Chapter 3, “Installing the 5308.”
- The 5308 is configured correctly. For more information, see Chapter 5, “Using the 5308 Configuration Program.”
- The workstation is configured correctly. For more information, see the *5308 User’s Guide*.

RS-232-C Wrap Diagnostics

This section provides information about when and how to run the RS-232-C Wrap Diagnostics.

What the Wrap Diagnostics Do

Diagnostics run every time the 5308 boots. These boot diagnostics check everything related to the 5308 Communications Line hardware, except the drivers to the DB25 connectors. The RS-232-C Wrap Diagnostics test individual RS-232 connectors. These diagnostics supplement the boot diagnostics by making sure the signals at the connector function correctly.

The RS-232-C Wrap Diagnostics *do not*:

- Perform the thorough check of the RS-232 hardware that is provided by the boot diagnostics. The diagnostics look *only* at the signals at the connector.
- Determine whether the cable being tested is wired correctly for the configuration (that is, whether it is a null modem or a straight-through cable).
- Test the telephone connectors of the 5308-0M2.

When to Run the Wrap Diagnostics

Only run the RS-232-C Wrap Diagnostics when you suspect that the hardware of one of the communications lines is broken.

A 5308 system administrator or an IBM Service Representative might use this diagnostic to isolate a communication problem between a workstation and the 5308.

How to Run the Wrap Diagnostics

Important: Running these tests stops all host communications. Run these tests only when there are no users online. You *must* reboot the 5308 after running these tests.

The wrap diagnostics cannot test the telephone connectors on the 5308-0M2.

To run the RS-232-C Wrap Diagnostics:

1. Insert a wrap plug in the RS-232 connector line that is being tested. You can use a standard RS-232 wrap plug (a gender adapter might be required). For information about the correct wiring for the wrap plug, see “Wrap Plug” on page 8-6.

   Note: If you do not insert the wrap plug before continuing, the tests will fail immediately.

2. Access the System Administrator mode of the Operator’s Console.
3. From the System Administrator Mode Options Main Menu, select the Run 5308 System Diagnostics option.
4. Select the RS-232-C Wrap Diagnostics option.

   The RS-232-C Wrap Diagnostics screen appears. The Communications Line field displays a selection for each RS-232 connector line that can be tested:

   - If you have a 5308-002, there is one selection for the RS-232 connector that is not being used for the Operator’s Console.
   - If you have a 5308-0M2 and you are using one of the telephone line connectors for your Operator’s Console, there are two selections displayed, one for each RS-232 connector.
   - If you have a 5308-007 or a 2- to 7-Port Upgrade, there is one selection for each RS-232 connector that is not being used for the Operator’s Console.

5. Press the spacebar to select the test. This places an asterisk (*) next to the test.

   - To deselect the test, press the space bar again. This removes the asterisk next to the test.
   - To move between the test selection and the communications lines, use the Tab key.
   - To move the cursor within the Communications Line field, use the up and down arrow keys.
   - To select a communications line, press the spacebar. Only one communications line can be selected at a time.

6. To start the diagnostics, press Enter. If you do not want to run the diagnostics at this time, press the Cancel key to cancel your input and return to the previous menu.

   After the diagnostics complete, a message appears indicating whether they completed successfully (passed) or failed:

   - If the diagnostic passes with the wrap plug on the 5308 communication line, the problem is external to the 5308.
   - If the diagnostic passes with the wrap plug on the other end of a cable connected to the 5308, cable continuity was verified. Make sure the cable is wired correctly for the configuration.
   - If the diagnostics fail, contact your IBM service representative. For more information, see “Contacting IBM for 5308 Service” on page 12-15.

7. Reboot the 5308. For directions, see “Rebooting the 5308” on page 5-18.

Twinax Communications Card Diagnostics

This section provides information about when and how to view the results of the Twinax Communications Card Diagnostics.

What the Twinax Communications Card Diagnostics Do

Diagnostics run every time the 5308 boots. These boot diagnostics check everything related to the 5308 Twinax Communications Card, including the host interface. Card malfunctions are indicated by flashing an error code in the status LED and aborting the 5308 boot. With a functional card, a report is then generated about any host twinax activity found, including a duplicate address check, and the boot continues.

When to View the Results of the Twinax Communications Card Diagnostics

View the 5250 Twinax Communications Card Diagnostics results when you want to know the host interface conditions at the time the 5308 booted. If you need to know current conditions, reboot the 5308 (preferably when no users are online).

- A system administrator might use these results to determine whether other devices on the twinax line are using the same station addresses that the 5308 is configured to use.
- IBM Service Representatives might use these results to determine whether there is a problem with the card's ability to see twinax signals. Defective cables from the host to the 5308 or a defective driver on the twinax card could cause this problem.

How to View the Results of the Twinax Communications Card Diagnostics

To view the results of the Twinax Communications Card Diagnostics:

1. Access the System Administrator mode of the Operator's Console.
2. From the System Administrator Mode Options Main Menu, select the Run 5308 System Diagnostics option.
3. Select the 5250 Twinax Adapter Card Diagnostics option. The 5250 Twinax Adapter Card Diagnostics screen appears with the status found during the boot of the 5308.
4. Press the Cancel key when finished viewing the results.

Error Messages

This section provides information to resolve problems that might occur when you are:

- Accessing the System Administrator mode of the Operator's Console
- Configuring the 5308
- Testing the 5308

Accessing the System Administrator Mode

The following messages might appear when you try to access the System Administrator mode of the Operator's Console:

System Administrator Mode already in use, access denied. Press any key.

Explanation: System Administrator mode of the Operator's Console can be accessed by only one workstation at a time.

Operator Response: Try accessing System Administrator mode later.

Passwords do not match. Re-enter the password(s).

Explanation: If this message appears when you try to access System Administrator mode, the password that you specified does not match the active password.

Operator Response: Verify that you are using the correct password.

The following messages might appear when you are using the Change Password option:

Invalid password, imbedded blanks. Re-enter the password(s).

Explanation: The password contained blanks. Blanks are not permitted in passwords.

Operator Response: Select another password. For password requirements, see step 3c on page 4-4.

Invalid password, must be at least 4 characters. Re-enter the password(s).

Explanation: The password must be 4 to 8 alphanumeric characters.

Operator Response: Select another password. For password requirements, see step 3c on page 4-4.

Invalid password, not alphanumeric. Re-enter the password(s).

Explanation: The password must contain 4 to 8 alphanumeric characters. Blanks and symbols are not permitted in passwords.

Operator Response: Select another password. For password requirements, see step 3c on page 4-4.

Invalid password, preceding blanks. Re-enter the password(s).

Explanation: The password was preceded by blanks. Blanks are not permitted in passwords.

Operator Response: Select another password. For password requirements, see step 3c on page 4-4.

Invalid password, same as current password. Re-enter the password(s).

Explanation: The new password cannot be the same as the password that is active.

Operator Response: Select another password. For password requirements, see step 3c on page 4-4.

Passwords do not match. Re-enter the password(s).

Explanation: The password in the Verify New Password field does not match the password in the New Password field.

Operator Response: Complete these fields again.

Password does not match current password. Re-enter the password(s).

Explanation: The password in the Current Password field does not match the password that is active.

Operator Response: Check the password, including case, and complete the field again.

Password will be changed if the next key pressed is the Enter key.

Explanation: The password information that you entered on the Change Password screen has been accepted.

Operator Response: Do one of the following:

- To activate the new password, press Enter.
- To discard the new password, press any other key.

Configuration

The following messages might appear when you configure the 5308:

At least one station address must be enabled. Enable at least one.

Explanation: A host station address is required for each communications line.

Operator Response: Enable a station address for each communications line that you are going to configure. For directions, see “Enable/Disable Station Addresses” on page 5-5.

Cannot change selection when baud rate of 'AUTO' is selected.

Explanation: You cannot change the data bits, stop bits, or parity settings when the communications line is configured to use Auto for the baud rate. For more information about the Auto setting, see “Auto Baud” on page 4-6.

Operator Response: If you need to change the data bits, stop bits, or parity settings, use a fixed baud rate.

Maximum number of station addresses already enabled. One must be disabled.

Explanation: The maximum number of station address that can be enabled is equal to the number of communications lines that your 5308 supports.

Operator Response: Disable a station address and then select another station address. To disable a station address, move the asterisk (*) to the Disable selection and then press Enter.

No selection has been entered. Enter y/n.

Explanation: No character was typed before Enter was pressed.

Operator Response: Do one of the following:

- To reboot your 5308 so that your new configuration is activated, type **y** and press Enter.
- To continue without rebooting your 5308, press **n**. The next time you reboot your 5308, your new configuration is activated.

Duplicate key. Please enter a different key.

Explanation: While modifying the Workstation Keyboard to Host Function Keys, you have entered the same key more than once.

Operator Response: Enter a different key for one of the keys that is entered more than once.

Invalid character code. X'7F' is not allowed.

Explanation: When modifying the Host Character to ASCII Character table in hexadecimal, you cannot enter X'7F' because it is a control character.

Operator Response: Enter a hexadecimal value other than X'7F'.

Invalid code. Must be '2-9', 'a-f', 'A-F'. (X'00' through X'1F' not allowed.)

Explanation: When modifying the Host Character to ASCII Character table in hexadecimal mode, you cannot enter the values X'00' through X'1F' because they are control characters and you have entered a '0' or '1' in the first position of a hexadecimal value.

Operator Response: Enter a supported hexadecimal character in the first position.

Invalid code. Must be '4-9', 'a-f', 'A-F'. (X'00' through X'3F' not allowed.)

Explanation: When modifying the ASCII Keyboard Character to Host Characters table, you cannot enter the values X'00' through X'3F' because they are control characters and display attribute characters. You have entered a '0', '1', '2', or '3' in the first position of a hexadecimal value.

Operator Response: Enter a supported hexadecimal character in the first position.

Invalid hexadecimal character. Must be '0-9', 'a-f', or 'A-F'.

Explanation: While modifying the Host Character to ASCII Character table in hexadecimal mode or the ASCII Keyboard Character to Host Characters table, you have entered a character that is not a hexadecimal character.

Operator Response: Enter a valid hexadecimal character. Valid hexadecimal characters are '0-9', 'a-f', and 'A-F'.

Key cannot be U.S. alphanumeric character. Please input another key.

Explanation: While modifying the Workstation Keyboard to Host Function Keys, you have entered a U.S. alphanumeric character that is not allowed. U.S. alphanumeric characters are 'a-z', 'A-Z', and '0-9'.

Operator Response: Enter a character that is not a U.S. alphanumeric character.

'TestKey' was X'7F' whose code cannot be changed. Cursor placed at X'6F'.

Explanation: While using the 'TestKey' function of the ASCII Keyboard Character to Host Characters screen, you have pressed the key that generates X'7F' and then you pressed Enter. The cursor cannot be positioned at X'7F' when the ASCII Keyboard Character to Host Characters screen is redisplayed because the value at X'7F' cannot be changed. The cursor has automatically been placed at location X'6F' instead.

Operator Response: No further action is required.

Testing

The following messages might appear when you run the diagnostic tests:

At least one station address must be selected. Select at least one.

Explanation: This diagnostic test requires that at least one station address is selected.

Operator Response: To select a station address, press the spacebar next to the station address.

Maximum number of station addresses already selected. Deselect one.

Explanation: The maximum number of station address that can be selected for the diagnostic test is equal to the number of communications lines that your 5308 supports.

Operator Response: Deselect a station address and then select another station address. To deselect a station address, use the up and down arrow keys to move the cursor under the asterisk (*) for the address that you want to deselect, and then press the spacebar. Then select another station address.

No selection has been made. Make a selection or press Cancel.

Explanation: No diagnostic test is selected.

Operator Response: Do one of the following:

- To select a test, move the cursor to the test and then press the spacebar.
- To return to the previous screen, press Cancel.

One communications line must be selected. Please select one.

Explanation: This diagnostic test requires one communications line to be selected.

Operator Response: To select a communications line, press the spacebar when the cursor is positioned next to the communications line.

Only one communications line can be selected. Deselect the other one.

Explanation: A communications line is already selected. Only one communications line can be tested at a time.

Operator Response: To deselect the communications line that is already selected, move the cursor under the asterisk (*) and press the spacebar. Then select the other communications line.

Tests failed. Station address already in use.

Explanation: The 5250 Twinax Communications Card Diagnostic found another twinax device using the indicated Station Address. Multiple devices cannot use the same Station Address on a twinax line.

Operator Response: Find the other twinax device and change its address, or select a different station addresses for the 5308-attached device to use.

Contacting IBM for 5308 Service

IBM Warranty Service, Maintenance Service, IBM Hourly Service, can be obtained in the United States by calling 800-IBM-SERV (1-800-426-7378). In Canada, call IBM at 1-800-465-6666. IBM Hourly Service is available at the applicable rate and terms, including the element exchange price, if applicable.

Bibliography

You might find the following publications helpful:

- *IBM 5250 Information Display System Planning and Site Preparation Guide*, GA21-9337
- *IBM 5308 ASCII to 5250 Connection User's Guide*, G571-0024
- *IBM 5394 Remote Control Unit Operator's Guide and Problem Determination Procedures*, GA27-3805
- *IBM 5494 Remote Control Unit User's Guide, Release 3.1*, GA27-3960
- *IBM 5494 Remote Control Unit Functions Reference, Release 3.0*, SC30-3533
- *IBM 5494 Remote Control Unit Planning Guide, Release 3.1*, GA27-3936
- *IBM 6299 Midrange Hub Planning, Installation, and Maintenance Guide*, G571-0362
- *IBM 7855 Modem Model 10 Guide to Operation*, GA33-0160
- *IBM 7855 Modem Model 18 Guide to Operation*, GA33-0174
- *IBM 7857 Modem Guide to Operation*, GA13-1839
- *IBM AS/400 9402 Models 1xx and Axx-Fxx Cable Attachment*, SA41-3132
- *IBM AS/400 9404 Models Bxx-Fxx Cable Attachment*, SA41-3133
- *IBM AS/400 9406 Models Bxx-Fxx Cable Attachment*, SA41-3134
- *IBM AS/400 Local Device Configuration*, SC41-3121
- *IBM AS/400 Physical Planning Reference*, SA41-3109

Note: Softcopy documentation is provided with the IBM 7852 Modem.

Your system administrator might be able to suggest other publications related to your host system.

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Glossary

This glossary includes terms and definitions from the *American National Dictionary for Information Systems*[1] and the *Information Technology Vocabulary*.[2]

Numerics

5250 emulation. In the AS/400* system, any one of many licensed programs that allow a personal computer to perform like a 5250 display station or printer, and use the functions of an AS/400 system.

5308 ASCII to 5250 Connection. In the AS/400* system, a device that attaches asynchronous-attached workstations using ASCII encoding to the system as if they were 5250 workstations.

A

address. (1) A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A) (2) To refer to a device or an item of data by its address. (I) (A) (3) In word processing, the location, identified by an address code, of a specific section of the recording medium or storage. (T) (4) The location in the storage of a computer where data are stored. (5) A name, label, or number identifying a location in storage, a device in a system or network, or any other data source. (6) In data communication, the unique code assigned to each device or workstation connected to a network. (7) A numbering system used in network communications to identify a specific network or host with which to communicate.

ASCII (American National Standard Code for Information Interchange). The standard code, using a coded character set consisting of 7-bit coded characters (8-bits including parity check), that is used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters. (A)

Note: IBM has defined an extension to ASCII code (characters 128-255).

asynchronous (ASYNC). (1) Pertaining to two or more processes that do not depend upon the occurrence of specific events such as common timing signals. (T) (2) Without regular time relationship; unexpected or unpredictable with respect to the execution of program instructions.

asynchronous communications. A method of communications supported by the operating system that allows an exchange of data with a remote device, using either a start-stop line or an X.25 line. Asynchronous communications includes the interactive terminal facility support.

asynchronous data transfer. A physical transfer of data to or from a device that occurs without a regular or predictable time relationship following execution of an I/O request. Contrast with synchronous data transfer.

asynchronous device. A device using data transmission in which transmission of a character or a block of characters can begin at any time, but in which the bits that represent the character or block have equal time duration.

C

communication controller. (1) A device that directs the transmission of data over the data links of a network; its operation may be controlled by a program executed in a processor to which the controller is connected or it may be controlled by a program executed within the device. (T) (2) A type of communication control unit whose operations are controlled by one or more programs stored and executed in the unit. It manages the details of line control and the routing of data through a network.

communication port. (1) An access point for data entry or exit to or from a communication device such as a terminal. (2) On a personal computer, a serial port to which a stand-alone modem can be attached.

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1 The *American National Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies may be purchased from the American National Standards Institute, 11 West 42 Street, New York, New York 10036. Definitions are identified by the symbol (A) after the definition.

2 The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition; definitions from draft international standards, committee drafts, and working papers being developed by the ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

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configuration. (1) The manner in which the hardware and software of an information processing system are organized and interconnected. (T) (2) The physical and logical arrangement of devices and programs that make up a data processing system. (3) The devices and programs that make up a system, subsystem, or network.

controller. A device that coordinates and controls the operation of one or more input/output devices, such as workstations, and synchronizes the operation of such devices with the operation of the system as a whole.

D

data converter. A functional unit that transforms data from one representation to an equivalent representation. (T) (A)

data signal. A signal that represents a set of digits used to convey information, service functions, or both, and which may include check digits.

display attribute. In computer graphics, a property that is assigned to a display element, to a display segment, or to the complete display image; for example, a bright intensity or a particular color.

E

EBCDIC. Extended binary-coded decimal interchange code. A coded character set consisting of 8-bit coded characters. (A)

EBCDIC character. Any one of the symbols included in the 8-bit EBCDIC set.

emulation program (EP). A program that enables a system or a device to operate as if it were a different system or device.

emulator. (1) A combination of programming techniques and special machine features that permits a computing system to execute programs written for a different system. (2) A program that causes a computer to act as a workstation attached to another system.

H

handshaking. The exchange of predetermined signals when a connection is established between two modems.

host computer. (1) A computer used to prepare programs for use on another computer or on another data processing system; for example, a computer used to compile, link edit, or test programs to be used on another system. (2) Synonym for host processor.

I

initial program load (IPL). (1) The initialization procedure that causes an operating system to commence operation. (2) The process by which a configuration image is loaded into storage at the beginning of a work day or after a system malfunction. (3) The process of loading system programs and preparing a system to run jobs. (4) Synonymous with system restart, system startup.

interrupt request (IR). A request for processing on a particular priority level. It may be generated by the active program, the processing unit, or an I/O device.

I/O port. System hardware that enables attachment of I/O devices. Master modes but not in application mode.

K

keyboard mapping. A list, usually in a profile, that established correspondence between each key on the keyboard and the character displayed on a display screen, or an action taken by a program, when that key is pressed.

M

modem (modulator/demodulator). (1) A functional unit that modulates and demodulates signals. One of the functions of a modem is to enable digital data to be transmitted over analog transmission facilities. (T) (A) (2) A device that converts digital data from a computer to an analog signal that can be transmitted on a telecommunication line, and converts the analog signal received to data for the computer.

modulator-demodulator. See *modem*.

N

nonswitched line. (1) A connection between systems or devices that does not have to be made by dialing. Contrast with switched line. (2) A telecommunication line on which connections do not have to be established by dialing. Synonymous with leased line.

O

offline. (1) Pertaining to the operation of a functional unit that takes place either independently of, or in parallel with, the main operation of a computer. (T) (2) Neither controlled by, nor communicating with, a computer. Contrast with online.

online. (1) Pertaining to the operation of a functional unit when under the direct control of the computer. (T) (2) Pertaining to a user's ability to interact with a computer. (A) (3) Pertaining to a user's access to a computer via a terminal. (A) (4) Controlled by, or communicating with, a computer. (5) Contrast with offline.

P

parity bit. (1) A binary digit appended to a group of binary digits to make the sum of all the digits, including the appended binary digit, either odd or even as preestablished. (T) (2) A check bit appended to an array of binary digits to make the sum of all the binary digits, including the check bit, always odd or always even. (A)

port. (1) An access point for data entry or exit. (2) A connector on a device to which cables for other devices such as display stations and printers are attached. Synonymous with socket. See *communication port*, *serial port*. (3) A specific communications end point within a host. A port is identified by a port number. (4) To make the programming changes necessary to allow a program that runs on one type of computer to run on another type of computer. (5) Deprecated term for adapter.

protocol. (1) A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. (I) (2) Synonymous with line control discipline, line discipline.

R

remote host. Any host on a network except the one at which a particular operator is working. Synonymous with foreign host.

S

serial port. On personal computers, a port used to attach devices such as display devices, letter-quality printers, modems, plotters, and pointing devices such as light pens and mice; it transmits data one bit at a time.

stop signal. (1) In start-stop transmission, a signal at the end of a character that prepares the receiving device for reception of a subsequent character. (I) (2) A signal to a receiving mechanism to wait for the next signal. (A) (3) Synonymous with stop bit, stop element.

Note: A stop signal is usually limited to one signal element having any duration equal to or greater than a specified minimum value.

switched line. A telecommunication line in which the connection is established by dialing. Contrast with nonswitched line.

synchronous transmission. (1) Data transmission in which the time of occurrence of each signal representing a bit is related to a fixed time base. (I) (2) In data communication, a method of transmission in which the sending and receiving of characters are controlled by timing signals. Contrast with asynchronous transmission. (3) Synonymous with isochronous transmission.

Note: The sending and receiving devices are operated at substantially the same frequency and are kept in an appropriate phase relationship.

T

translation table. A table used to replace one or more characters with alternative characters; for example, to translate characters representing a virtual address to those representing a real address, characters representing an event to those representing a procedure call, characters of a national character set to those of another national language, or characters representing a relocated address to those representing an absolute address.

W

workstation. (1) A functional unit at which a user works. A workstation often has some processing capability. (T) (2) One or more programmable or nonprogrammable devices that allow a user to do work. (3) A terminal or microcomputer, usually one that is connected to a mainframe or to a network, at which a user can perform applications.

Note: A workstation allows a user to transmit or receive information from a computer as needed to perform a job. Microcomputers such as IBM* Personal Computers can be used in stand-alone mode or can be connected to a mainframe in terminal emulation mode. A terminal or data processing station is a workstation when it is operated by a user. Terminals and stations that operate without human intervention are not usually referred to as workstations.

workstation address. (1) In the AS/400* system, a number used in a configuration file to identify a workstation attached to a computer port. (2) In the AS/400 system, the address to which the switches on a workstation are set, or the internal address assumed by the system, if no address is specified.

workstation controller (WSC). (1) A device that provides for a direct connection of local workstations to the system. (2) In the AS/400* system, an I/O controller card in the card enclosure that provides the direct connection of local workstations to the system.

Index

Numerics

2- to 7-Port Upgrade, installing 7-1
5250 devices
  configuring 5308 for 5-5, 11-2
  configuring host for 4-1
5308 configuration forms 11-7
5308 PC Terminal Program
  description of 1-1
  requirements for 1-4
5308-002
  back view 3-3
  front view 3-8
  installing 2- to 7-Port Upgrade 7-1
  planar (service) 6-14, 6-16, 6-18
  power supply screws (service) 6-6
5308-007
  2- to 7-Port Upgrade 1-1, 7-1
  back view 3-3
  front view 3-8
  planar (service) 6-15, 6-17, 6-19
  power supply screws (service) 6-6
5308-0M2
  back view 3-3
  front view 3-8
  internal modem
    connecting through 3-7
    modem commands 9-1
    planning for 2-7
    reducing noise 9-5
  planar (service) 6-14, 6-16, 6-18
  power supply screws (service) 6-6
5308, overview
  See also configuring the 5308
  See also host-to-5308 connection
  See also illustrations
  See also workstation-to-5308 connection
  (service) 6-1
  boot sequence 3-10, 12-1
  hardware checklist 3-1
  highlights 1-2
  installing 3-1
  models available 1-1
  planning for 2-1
  planning forms 11-1
  rebooting 5-18
  requirements 1-3
  sample installations 1-2
  specifications 1-5
  supported code pages 10-1
  supported modems 1-5
  supported workstations 1-4
5308, overview *(continued)*
  troubleshooting 12-1
  upgrading 002 to 007 7-1

A

address x configuration 5-6
address, host station
  assigning 5-6
  host form 11-1
  number available 2-2
addressing, shared
  description of 1-1
  requirements for 1-4
air flow 3-2
ANSI, description of 5-8
ASCII
  code page 819 10-2
  description of 5-8
  terminal type 5-2
assigning
  host functions to keys 5-15
  host station addresses 5-6
asynchronous communication
  5308 configuration forms 11-7
  ASCII terminal type 5-2
  communications settings 5-2
  modem type/commands
    basic settings 5-4
    hang-up strings 9-6
    initialization strings 5-4, 9-2
AT modem commands 9-2
attachment setting 5-3
AUTO baud rate 4-6

B

back view of 5308
  2- to 7-Port Upgrade 7-1
  all models 3-3
  showing power supply screws (service) 6-6
backing up system diskette 3-10, 7-2
basic assurance tests (service) 6-1
baud rate
  AUTO 4-6
  setting 5-3
beep sequences (service) 6-3
bibliography X-1
boot sequence
  error detected 12-2
  normal 3-10, 12-1

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buttons on 5308 3-9

C

cables
available through IBM 2-11
determining length 2-1
for connecting workstations 2-6
for upgrade 7-1
labeling 3-2
maximum distance
connection to host 2-3
for ICS 2-3
twinax hub 2-5, 2-6
null modem 2-7, 8-3
pin assignments, RS-232 interface 8-1
planning forms 11-5
straight-through function 2-8, 8-2
summary of connections 11-5
wiring diagrams
hardware flow control requirements 8-5
null modem, recommended 8-3
software flow control requirements 8-4
straight through 8-2
changing
5308 configuration settings
5250 device configuration 5-5
asynchronous communication 5-2
emergency configuration procedure 5-19
enable/disable station addresses 5-5
initial configuration procedure 4-7
modem initialization strings 5-4, 9-1
system administrator mode password 4-3
character codes 5-8
chassis (service) 6-8
checking
configurations
5308 12-4
host 12-4
modem 12-6
workstation 12-6
connections
between 5308 and host 12-2
between workstation and 5308 12-3
checklist, hardware
for 2- to 7-Port Upgrade 7-1
for 5308 3-1
clearance for air flow 3-2
code pages
ASCII code page 819 10-2
commonly used for countries 10-1
description of 5-8
EBCDIC code pages
See EBCDIC
host⇔ASCII translations 5-7
working with translation tables 5-7
communications lines
configuring 5-2
planning forms 11-1
communications settings, asynchronous 5-2
configuration
card (service) 6-20
checking
5308 12-4
host 12-4
modem 12-6
workstation 12-6
error messages 12-12
menus and screens 4-2
configuring
5308
See configuring the 5308
host for ASCII devices 4-1
workstations 4-1
configuring the 5308
auto baud 4-6
emergency procedure 5-19
factory default configuration 4-4
for 5250 devices
address x configuration 5-6
enable/disable station addresses 5-5, 11-1
for asynchronous communication
ASCII terminal type 5-2
communications settings 5-2
modem type/commands 5-4, 9-1
forms 11-7
initial configuration
background information 4-1
procedure 4-7
settings required for 4-6
keylock 3-9, 5-18
normal procedure 5-1
operator's console
accessing 4-2
menu and screen commands 4-2
using 4-1
rebooting the 5308 5-18
saving configuration changes 5-17
system administrator mode password 4-3
working with translation tables 5-7

D

data bits setting 5-3
data set ready (DSR) modem setting 9-2, 9-4, 12-6
default configuration settings 4-5
device configuration
directions 5-5
forms 11-2
device type, host configuration 4-1
diagnostics
basic assurance test (service) 6-1

diagnostics *(continued)*
boot sequence
error detected 12-2
normal 3-10, 12-1
error messages 12-14
RS-232 wrap
directions 12-8
wrap plug (service) 6-25
wrap plug wiring 8-6
twinax communications card 12-10
direct connection
flow control 2-7, 2-8
to host 2-2, 3-4
to workstation 2-7, 3-7
diskette drive (service) 6-23
display, translation table for 5-9

E

EBCDIC
code pages
037 10-3
273 10-4
277 10-5
278 10-6
280 10-7
284 10-8
285 10-9
297 10-10
500 10-11
871 10-12
commonly used for countries 10-1
description of 5-8
electrical wiring requirements 1-6
emergency 5308 configuration 5-19
emulation type
5308 configuration 5-6
host configuration 4-1
enable/disable station addresses
directions 5-5
host form 11-1
error messages
accessing system administrator mode 12-11
changing password 12-11
configuration 12-12
testing 12-14

F

factory default configuration 4-4
factory shipped password 4-3
floor plan of installation 2-1, 3-2
flow control
considerations 2-8
direct connection 2-7, 2-8
hardware, minimum wiring for 8-5
flow control *(continued)*
modem connection 2-8
recommended wiring for 8-3
setting 5-3
software, minimum wiring for 8-4
forms
5308 installation
before installation 11-1, 11-5
during configuration 11-2, 11-7
5308-002 upgrade
before powering off 5308 11-1, 11-2, 11-7
cabling 11-5
during configuration 11-2, 11-7
list of 2-9
front view of 5308 3-8
FRU part numbers (service) 6-25
function keys, terminals without 5-15

G

glossary X-3
guidelines
for flow control 2-8
for modem strings 9-2

H

hardware checklist
for 2- to 7-Port Upgrade 7-1
for 5308 3-1
hardware flow control wiring 8-5
Hayes modem commands 9-2
host function keys 5-15
host keyboard
default 4-5
selecting 5-7
host station addresses
enable/disable 5-5
host form 11-1
number available 2-2
host-to-5308 connection
before connecting to host 3-4
checking 12-2
direct connection to the host
making connection 3-4
planning for 2-2
important note 3-4
through a remote control unit
making connection 3-5
planning for 2-4
through a twinax hub
making connection 3-6
planning for 2-5
host⇔ASCII translation 5-6
hosts
configuring for devices 4-1

hosts *(continued)*
connecting 5308 to 3-4
planning for 5308 2-2
planning form 11-1
requirements for 1-3
hourly service 2-10, 12-15
hubs, twinax
installing 5308 3-6
maximum distance
twinax cabling 2-5
UTP cabling 2-5, 2-6
planning for 5308 2-5
supported 1-1
UTP balun 3-6

I

IBM 5308 PC Terminal Program
description of 1-1
requirements for 1-4
IBM Cabling System 2-3
illustrations
back views
2- to 7-Port Upgrade installed 7-2
all models 3-3
showing power supply screws (service) 6-6
cables available 2-11
cables for upgrade 7-1
code pages 10-1
configuration cards 7-4
connections to host
direct 2-2, 3-4
through remote control unit 2-4, 3-5
through twinax hub 2-5, 3-6
connections to workstations
direct 2-7, 3-6
summary of cabling 11-5
through external modem 2-8, 3-8
through internal modem 2-7, 3-7
front view 3-8
host to ASCII character screen 5-10
keyboard to host code page screen 5-13
keyboard to host functions screen 5-16
planar cards (service)
5308-002 and 5308-0M2 6-14, 6-16, 6-18
5308-007 6-15, 6-17, 6-19
sample installations 1-2
test workstation keys screen 5-14
wiring for
connection to DCE modems 8-2
connection to DTE terminals 8-3
hardware flow control 8-5
null modem cables 8-3
software flow control 8-4
straight-through cables 8-2
wrap plug 8-6
illustrations *(continued)*
workstation ASCII characters screen 5-11
important notes
before connecting to host 3-4
before powering on 5308 3-9
system diskette 3-10
twinax communications diagnostics
wrap diagnostics 12-8
initial configuration procedure 4-6
installation
floor plan of 2-1
of 2- to 7-Port Upgrade 7-1
of 5308 3-1
of system diskette 3-10, 7-4
sample of 5308 1-2
internal modem (service) 6-22

J

jacks, modular 3-4
jumper settings, upgrade 7-3

K

key requirements
5308 PC Terminal Program 1-4
general 1-3
shared addressing 1-4
keyboard
host
default 4-5
selecting 5-7
terminal
customizing 5-12, 5-15
without function keys 5-15
translation table for 5-12
type
5308 configuration 5-7
host configuration 4-1
keylock
description of 3-9, 4-3
positions
for emergency configuration 5-18
for normal operation 4-3, 5-18
for using factory configuration 4-4

L

leased line operation 9-5
LED flash sequences
(service) 6-3
error detected during booting 12-2
normal for booting 3-10, 12-1
LEDs on 5308 3-9
lines
communication
configuring 5-2

lines *(continued)*
communication *(continued)*
planning forms 11-1
modem
leased, operation 9-5
switched, operation 9-5

M

maintenance service 2-10, 12-15
maximum cable length (to host) 2-3
memory module (service) 6-8
menu and screen commands, configuration 4-2
messages, error
accessing system administrator mode 12-11
changing password 12-11
configuration 12-12
testing 12-14
models available, 5308 1-1
modem commands
asynchronous operation
configuring 5308 5-2
configuring the modem 9-2
AT commands 9-2
guidelines for modem strings
auto answer 9-4
command echo 9-2
data carrier detect (DCD) 9-3
data compression 9-4
data set ready (DSR) 9-2, 9-4, 12-6
data terminal ready (DTR) 9-3
modem serial port rate 9-3
receive data flow control 9-4
reset modem to factory defaults 9-2
result code format 9-3
result code return 9-3
set error correction (ARQ) 9-4
transmit data flow control 9-3
hang-up strings 9-6
Hayes command set 9-2
initialization strings 5-4, 9-1
leased line operation 9-5
recommended settings 9-2
selecting modem type 5-4, 9-1
switched line operation 9-5
modem type/commands
5308 configuration form 11-7
choosing initialization strings 9-1
general information 5-4
selecting type 5-4, 9-1
modems
configuring 5308 for 5-2
connection to workstation through
external 2-8
internal (5308-0M2) 2-7
hang-up strings 9-6
modems *(continued)*
initialization strings 5-4, 9-1
supported 1-5
using leased lines 9-5
using switched lines 9-5
modular jacks on 5308 3-4
multiple sessions 5-7
multiport RS-232 card (service) 6-21

N

national language support
5250 device configuration forms 11-2
code pages 10-1
host keyboard 5-5, 5-7
host⇔ASCII translations 5-7
voltage switch setting 3-3, 3-9
working with translation tables 5-7
noise, 5308-0M2 internal modems
during booting 3-10
reducing 9-5
null modem adapter or cable
minimum requirements
for hardware flow control 8-5
for software flow control 8-4
recommended wiring 8-3

O

operating environment 1-5
operator's console
accessing 4-2
menus and screens 4-2
system administrator mode password 4-3
using 4-1
ordering information
customer parts 2-9
service parts (service) 6-25
overview of the 5308
highlights 1-2
requirements 1-3
sample installations 1-2
specifications 1-5

P

parity setting 5-4
parts associated with the 5308
(service) 6-25
customer 2-9
ordering 2-9
password, system administrator mode 4-3
PC 5308 Terminal Program
description of 1-1
requirements for 1-4

physical specifications 1-5
pin assignments, RS-232 interface 8-1
planar (service) 6-9
planning
  forms
    5250 device configuration 11-2
    5308 configuration 11-7
    5308 installation 2-9
    5308-002 upgrade 2-9
    cabling 11-5
    host 11-1
  host-to-5308 connection
    direct 2-2
    IBM Cabling System 2-3
    maximum cable lengths 2-3
    through remote control unit 2-4
    through twinax hub 2-5
    twinaxial cabling 2-3
    unshielded twisted pair cabling 2-4
  laying out the installation
    determining cable lengths 2-1
    maximum number of workstations 2-2
  ordering information
    (service) 6-25
    customer 2-9
  security, auditability and control 2-9
  workstation-to-5308 connection
    direct 2-7
    flow control 2-8
    through external modem 2-8
    through internal modem 2-7
power connector on 5308 3-3
power supply
  (service) 6-4
  description of 1-6
powering on the 5308
  boot sequence 3-10, 12-1
  important note 3-9
  keylock
    description of 3-9, 4-3
    position 4-4, 5-18
  system diskette 3-9
  voltage switch setting 3-9
procedures
  calculating equivalent distance 2-4
  determining cable lengths 2-1
  emergency configuration 5-19
  FRU isolation (service) 6-1
  initial configuration 4-6
  installation
    2- to 7-Port Upgrade 7-1
    5308 3-1
  normal configuration 5-1
  planning 2-1
  troubleshooting 12-1
product specifications
  electrical wiring requirements 1-6
  operating environment 1-5
  physical specifications 1-5
  power supply 1-6
publications, related xix, X-1

R

README files xvii
rebooting the 5308 5-18
remote control units
  installing 5308 3-5
  maximum number
    of sessions 2-5
    of workstations 2-4
  planning for 5308 2-4
  supported 1-1
replacing FRUs (service)
  chassis 6-8
  configuration card 6-20
  diskette drive 6-23
  internal modem 6-22
  memory module 6-8
  multiport RS-232 card 6-21
  ordering information 6-25
  planar 6-9
  power supply 6-4
  twinax communications card 6-5
  video adapter 6-9
requirements
  5308 PC Terminal Program 1-4
  for 5308 initial configuration 4-6
  for AUTO baud 4-6
  for electrical wiring 1-6
  for system administrator mode password 4-4
  general 1-3
  shared addressing 1-4
RS-232 interface
  connectors on 5308 3-4
  diagnostics
    description of 12-8
    directions 12-8
    important note 12-8
    wrap plug (service) 6-25
    wrap plug wiring 8-6
  pin assignments 8-1

S

sample installations 1-2
saving configuration changes 5-17
security 2-9
service and maintenance (service)
  basic assurance tests 6-1
  beep sequences 6-3

service and maintenance (service) *(continued)*
chassis 6-8
configuration card 6-20
diskette drive 6-23
FRU part numbers 6-25
internal modem 6-22
LED flash sequences 6-3
memory module 6-8
multiport RS-232 card 6-21
planar 6-9
power supply 6-4
start here 6-1
twinax communications card 6-5
video adapter 6-9
service contracts 2-10, 12-15
sessions
maximum number of 2-2
translation tables for 5-9
software flow control wiring 8-4
solutions (service)
chassis 6-8
configuration card 6-20
diskette drive 6-23
internal modem 6-22
memory module 6-8
multiport RS-232 card 6-21
planar 6-9
power supply 6-4
twinax communications card 6-5
video adapter 6-9
specifications, product
electrical wiring requirements 1-6
operating environment 1-5
physical specifications 1-5
power supply 1-6
station addresses
enable/disable 5-5
host form 11-1
number available 2-2
stop bits setting 5-3
straight-through function cable 2-8, 8-2
switched line operation 9-5
symptoms (service)
chassis 6-8
configuration card 6-20
diskette drive 6-23
internal modem 6-22
memory module 6-8
multiport RS-232 card 6-21
planar 6-9
power supply 6-4
twinax communications card 6-5
video adapter 6-9
system administrator mode
error messages
accessing 12-11
changing password 12-11
system administrator mode *(continued)*
password
changing 4-3
description of 4-3
factory shipped 4-3
rules for 4-4
system diskette
backing up 3-10, 7-2
for upgrade 7-2
important note 3-10
installation of 3-10, 4-1, 7-4
stores configuration settings 4-1

T

telephone connectors on 5308-0M2 3-4
Terminal Program, 5308 PC
description of 1-1
requirements for 1-4
tests
basic assurance test (service) 6-1
boot sequence
error detected 12-2
normal 3-10, 12-1
error messages 12-14
RS-232 wrap
directions 12-8
wrap plug (service) 6-25
wrap plug wiring 8-6
twinax communications card 12-10
tools, for installing
2- to 7-Port Upgrade 7-2
5308 3-1
translation tables
about 5-8
customizing
display 5-9
keyboards 5-12, 5-15
keys for host functions 5-15
for sessions 5-9
troubleshooting
boot sequence
error detected 12-2
normal 3-10, 12-1
checking configurations
5308 configuration 12-4
data set ready (DSR) settings for modems 12-6
host configuration 12-4
workstation configuration 12-6
checking connections
between the 5308 and the host 12-2
between the 5308 and the workstation 12-3
error messages
changing password 12-11
configuration 12-12
system administrator mode 12-11
testing 12-14

troubleshooting *(continued)*
  having your 5308 serviced 12-15
  running diagnostics
    basic assurance tests (service) 6-1
    boot sequence 3-10, 12-1
    RS-232 wrap 12-8
    twinax communications card 12-10
twinax communications card
  (service) 6-5
  diagnostics
    description of 12-10
    directions for 12-10
    important note
twinax connectors on 5308 3-3
twinax hubs
  installing 5308 3-6
  maximum distance
    twinax cabling 2-5
    UTP cabling 2-5, 2-6
  planning for 5308 2-5
  supported 1-1
  UTP balun 3-6
twinaxial cabling 2-3

U

unshielded twisted pair cabling 2-4
upgrade (2- to 7-Port Upgrade)
  back view of installed 7-2
  before starting 7-2
  hardware checklist 7-1
  jumper settings 7-3
  procedure for 7-2
  tools 7-2
using
  configuration menus and screens 4-2
  factory default configuration 4-4
  keylock 4-3, 4-4, 5-18
  operator's console 4-1
  planning forms 2-9, 11-1
UTP balun 3-6

V

video adapter (service) 6-9
voltage switch setting 3-3, 3-9

W

warranty service 2-10, 12-15
wiring diagrams
  cable for DCE modems 8-2
  cable for DTE terminals 8-3
  null modem, minimum requirements
    for hardware flow control 8-5
    for software flow control 8-4
wiring diagrams *(continued)*
  null modem, recommended 8-3
  RS-232 pin assignments 8-1
  straight-through cables 8-2
  wrap plug for RS-232 diagnostics 8-6
working with translation tables 5-7
workstation-to-5308 connection
  checking 12-3
  direct connection to 5308
    making connection 3-7
    of DCE modems 8-2
    of DTE terminals 8-3
    planning for 2-7
  flow control 2-8
  through an external modem
    making connection 3-8
    planning for 2-8
  through an internal modem
    making connection 3-7
    planning for 2-7
workstations
  configuring 4-1
  connecting to 5308 3-6
  planning for connection 2-6
  supported 1-4
wrap plug wiring 8-6

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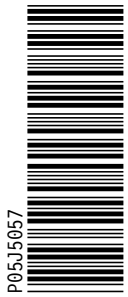
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