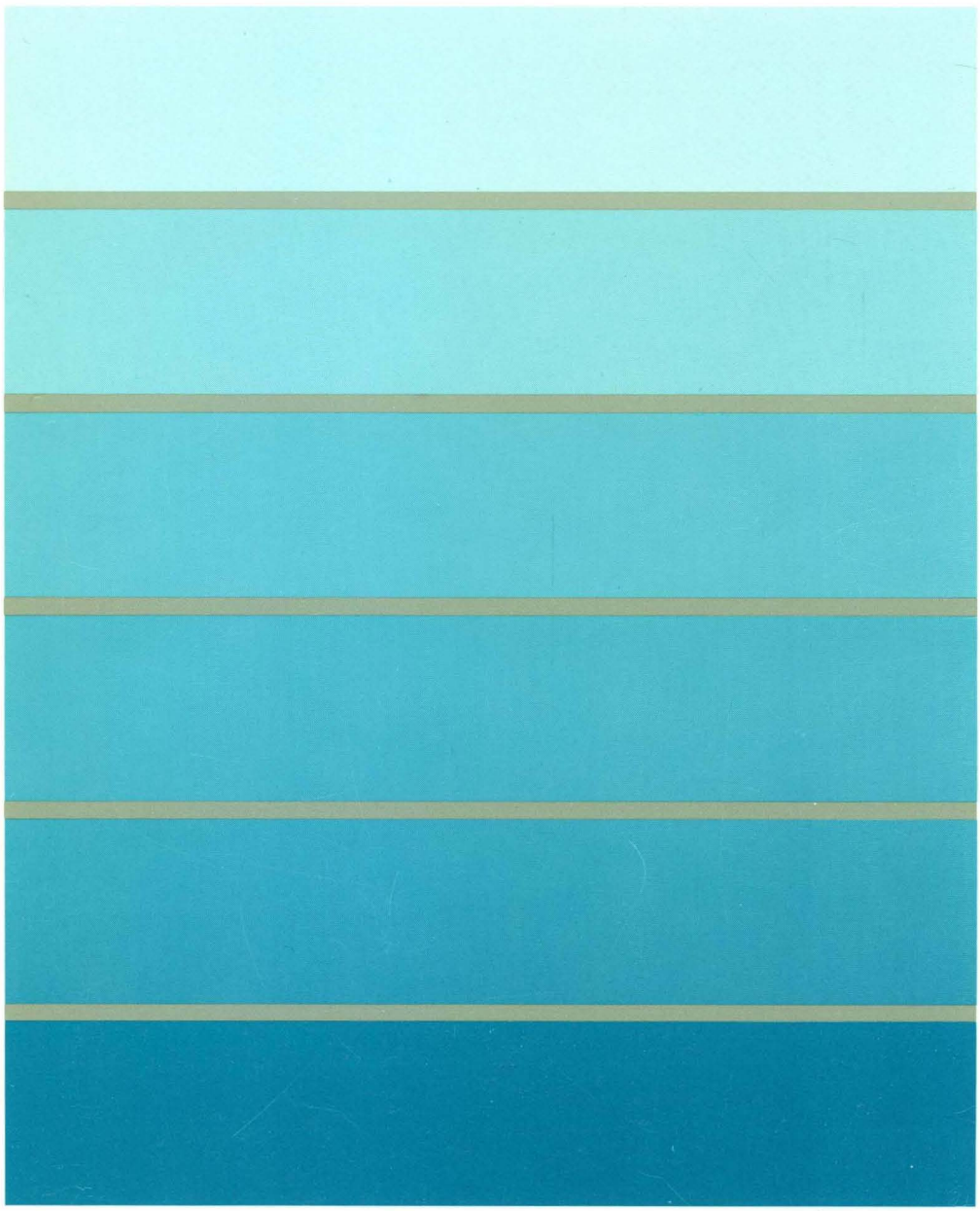
3174 Establishment Controller

GA23-0332-02

Terminal User's Reference for Expanded Functions



3270 Information Display System

3174 Establishment Controller

GA23-0332-02

Terminal User's Reference for Expanded Functions

Third Edition (May 1989)

This major revision obsoletes and replaces GA23-0332-1.

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United States

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Additional IBM Statement

This warning is also applicable to all attaching units produced for use in the U.S.A. that have been manufactured after December 31, 1980. A notice of compliance has been affixed within the customer access area of all affected units.

Instructions to User:

Properly shielded and grounded cables and connectors must be used for connection to peripherals in order to meet FCC emission limits. Proper cables are available through IBM marketing channels, or from dealers of computer accessories. IBM is not responsible for any radio or television interference caused by using other than recommended cables or by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

United Kingdom

Warning: This IBM product is made to high Safety standards. It complies inherently with Telecommunications safety standard BS6301. It is not designed to provide protection from excessive voltages appearing externally at its interfaces. Therefore, when this product is connected to a public telecommunications network via any other equipment, and you connect to this product items not supplied by IBM United Kingdom Ltd., you must comply with mandatory telecommunications safety requirements.

You may do this either by choosing products which also are approved as complying to BS6301 or British Telecom Technical Guide No. 26, or by the use of approved safety barriers. Consult the local office of your public telecommunications operator, for advice and permission to make the connections.

Canadian Department of Communications compliance statement

This equipment does not exceed Class B limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

Avis de conformité aux normes du ministère des Communications du Canada

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

Choosing the Right Book from the 3174 Library

The 3174 library contains information for installing, customizing, operating, maintaining, and programming the data stream for the 3174 controller. The list below shows the manuals you need to perform these tasks.

To Organize Library Materials:

Binders and Inserts, SBOF-0089
- Binder, SX23-0331
- Inserts, SX23-0332

To Become Familiar with the 3174:

Master Index, GC30-3515
3174 Introduction, GA27-3850
3270 Information Display System Introduction, GA27-2739

To Prepare Your Site for the 3174:

Site Planning, GA23-0213
Physical Planning Template, GX27-2999

To Set Up and Operate the 3174:

Models 1L, 1R, 2R, 3R, 11L, 11R, 12R, and 13R User's Guide, GA23-0337
Models 51R, 52R, 53R, 61R, 62R, and 63R User's Guide, GA23-0333
Models 81R, 82R, 91R, and 92R User's Guide, GA23-0313

To Plan for and Customize the 3174:

Configuration Support A and S

Planning Guide, GA27-3844
Utilities Guide, GA27-3853
Central Site Customizing User's Guide, GA23-0342

Configuration Support B

Planning Guide, GA27-3862
Utilities Guide, GA27-3863
Central Site Customizing User's Guide, GA23-3868

To Install Features or Convert Models on the 3174:

Encrypt/Decrypt Adapter Installation and Removal Instructions, GA23-0262
Fixed Disk Installation and Removal Instructions, GA27-3864
Diskette Drive Installation and Removal Instructions, GA23-0263
Terminal Multiplexer Adapter Installation and Removal Instructions, GA23-0265
Model Conversion Instructions, GA23-0295
Token-Ring Network Feature Installation and Removal Instructions, GA23-0329
Storage Expansion Feature Installation and Removal Instructions, GA23-0330
Communications Adapter Installation and Removal Instructions, GA27-3830
Asynchronous Emulation Adapter Installation and Removal Instructions, GA23-0341
Concurrent Communication Adapter Installation and Removal Instructions, GA27-3851

To Plan for and Use the Asynchronous Emulation Adapter Feature:

Planning Guide, GA27-3844 or GA27-3862
Utilities Guide, GA27-3853 or GA27-3863
Terminal User's Reference for Expanded Functions, GA23-0332

To Use the Multiple Logical Terminals Function:

Planning Guide, GA27-3844 or GA27-3862
Utilities Guide, GA27-3853 or GA27-3863
Terminal User's Reference for Expanded Functions, GA23-0332

To Perform Problem Determination:

Customer Problem Determination, GA23-0217
Status Codes, GA27-3832

To Obtain Data Stream Programming and Reference Information:

Functional Description, GA23-0218
Data Stream Programmer's Reference, GA23-0059
3174 Character Set Reference, GA27-3831
3270 Character Set Reference, GA27-2837
3270 X.25 Operation, GA23-0204

To Perform Maintenance (Service Personnel):

Models 1L, 1R, 2R, 3R, 11L, 11R, 12R, and 13R Maintenance Information, SY27-2572
Models 51R, 52R, 53R, 61R, 62R, and 63R Maintenance Information, SY27-2573
Models 81R, 82R, 91R, and 92R Maintenance Information, SY27-2584

To Find Translations of Safety Notices:

Safety Notices, GA27-3824

Preface

This publication tells terminal users how to use the Multiple Logical Terminals (MLT) function, and how to use their display stations and printers in 3270-emulation mode, ASCII-emulation mode, and ASCII pass-through mode.

Who This Book Is For

This book is for terminal users and for the person who plans for the information needs of terminal users.

How This Book Is Organized

This book has four chapters:

Chapter 1, "Multiple Logical Terminals (MLT) Feature," describes the Multiple Logical Terminals (MLT) function and how to use it.

Chapter 2, "3270 Emulation and ASCII Pass-Through," describes 3270 functions when you are using an ASCII display station connected to an IBM host, and ASCII functions when you are using an ASCII display station to go to an ASCII host through a 3174 Establishment Controller.

Chapter 3, "ASCII Emulation," describes ASCII functions when you are using a 3270 display station or personal computers emulating a 3270 connected to an ASCII host. It also describes the ASCII functions on PCs that are emulating a 3270 device.

Chapter 4, "Common Problems and What to Do," describes some common problems that you may encounter in 3270-emulation, ASCII-emulation, or ASCII pass-through mode, and how to solve them.

This book has two appendixes:

Appendix A, "Terminal Keyboard Maps," contains a full set of keyboard maps for ASCII-emulation and 3270-emulation supported by the 3174 Establishment Controller.

Appendix B, "Setting Up Your Terminal," shows the "switch" settings that should be used for your type of terminal.

How to Use This Book

You need to use only part of this book: which part depends on whether you have MLT, and on whether you are in ASCII-emulation, 3270-emulation, or ASCII pass-through mode.

If You Have MLT

You need to read Chapter 1 to use the MLT function.

If You Are Working from an ASCII Terminal

You need to read Chapter 2 if you are working from an ASCII terminal, that is, if you are in 3270-emulation mode or in ASCII pass-through mode. Refer to Chapter 4 if you have any problems on your display station, such as garbled characters on the screen. Appendix A provides a keyboard map for your terminal, and Appendix B provides the setup selections you should have on your modem and terminal.

If You Are Working from a 3270 Terminal

You need to read Chapter 3 if you are working from a 3270 terminal, that is, if you are working with a 3270 communicating with a 3270 type host or you are in ASCII-emulation mode. Refer to Chapter 4 if you have any problems on your display station, such as your session's ending unexpectedly. Of course, if you also have MLT, you will need to read Chapter 1 as well.

Related Publications

IBM 3101 Display Terminal: Description, GA18-2033

IBM 5841 1200 bps Modem Guide to Operations, GA27-3649

IBM 5842 2400 bps Modem Guide to Operations, GA27-3738

IBM 5853 2400 bps Modem Guide to Operations, GA27-3799

DEC[1] *VT100*[1] *User's Guide*, EK-VT100-UG003

Keyboard maps are available on reference cards for the supported terminals. The terminals and the form numbers of the reference cards are listed in Appendix A.

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[1] Trademarks of Digital Equipment Corporation

Summary of Changes

Third Edition (May 1989)

This revision supports 3174 Configuration A Release 5, Configuration S Release 5, and Configuration B Release 1. Where applicable information has been revised or added for:

- PF Key Operation for the ASCII and 3270 Emulation Connection Menus
- VT100 Emulation
- 3101 Emulation
- Modem Setup Information
- Host Identification (For Configuration B Release 1 Only)
- Skip LT and Restore LT (For Configuration B Release 1 Only)

Changes and additions to the text and illustrations are indicated by vertical lines to the left of the change.

Contents

Figures

Chapter 1. Multiple Logical Terminals (MLT) Feature

Multiple Logical Terminal (MLT) Function

This chapter applies to 3270-type terminals only.

The MLT function enables 3270-type terminals to interact with as many as five host sessions (LTs). Each session can be connected to a 3270 host or an ASCII host. The display station screen and keyboard are owned by a single session at a time. This session is the *active session*. The other sessions are maintained in the 3174 and are called *background sessions*. There is no MLT support on ASCII devices.

Change-Screen Key Sequence

You access the different sessions that have been defined for your display station by using the *change-screen key sequence.* When you use this key sequence, the current active session is saved in the background and the next background session becomes the active session, in a round-robin fashion. None of the background sessions are affected by anything you key in during the active session.

The Change Screen keys are:

Keyboard Type	**Key Sequence**
Base (non-Text)	ALT-Insert
Base (Text)	ALT-PA2
Converged	ALT-PA2
Enhanced	ALT-Home

Refer to Figure 1-1 through Figure 1-4 for illustrations of the Change Screen key locations.

When the Change Screen key is pressed to switch between sessions (LTs) for the first time, storage is allocated and the host is notified of the power on as each LT is reached. An insufficient storage error (2%%) is logged in the Operation Information Area (OIA) or status line of a blank screen when controller resources will not support an LT. Press Reset to continue using your active session. You will not be able to use the change-screen sequence to access other sessions.

Note: For Configuration B support, insufficient storage to support an LT causes only that LT to be skipped. The Change Screen key, the Skip This LT key, and the Restore All Skipped LTs key remain active. On subsequent cycles through change-screen sequence the LT will be skipped until sufficient storage is available to support it. If sufficient storage does becomes available, the change-screen sequence causes skipped LTs to be restored for use. If you elect to skip an LT with insufficient storage using the Skip This LT key, you must later restore it using the Restore All Skipped LTs key if sufficient storage becomes available.

If this change-screen sequence does not work, see your system administrator for the correct sequence; the key sequence may have been defined differently during customizing.

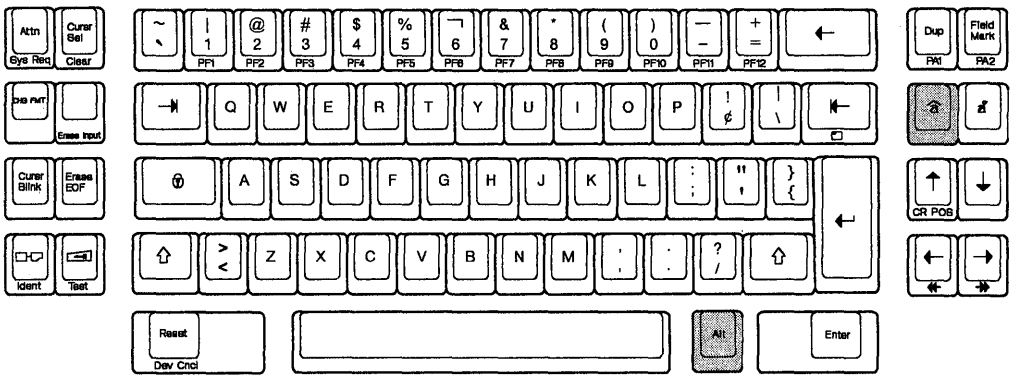


Figure 1-1. Change-Screen Keys on a Base Keyboard. Press and hold **Alt**; then press the **insert** key.

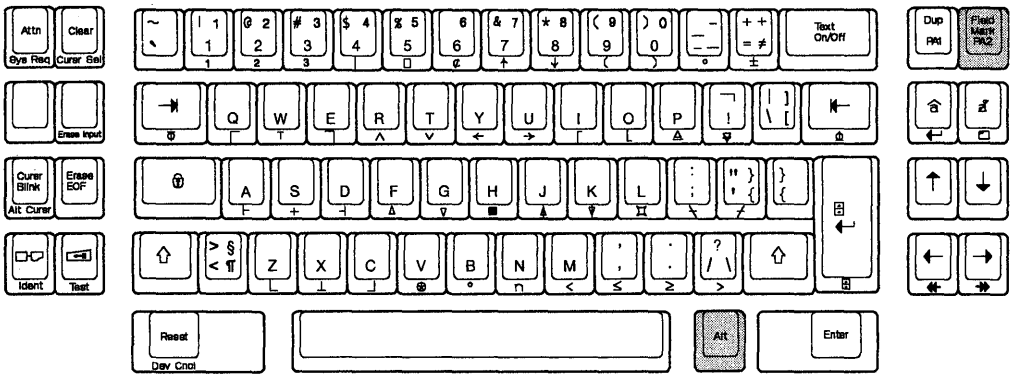


Figure 1-2. Change-Screen Keys on a Base Text QWERTY Keyboard. Press and hold **Alt**; then press **PA2**.

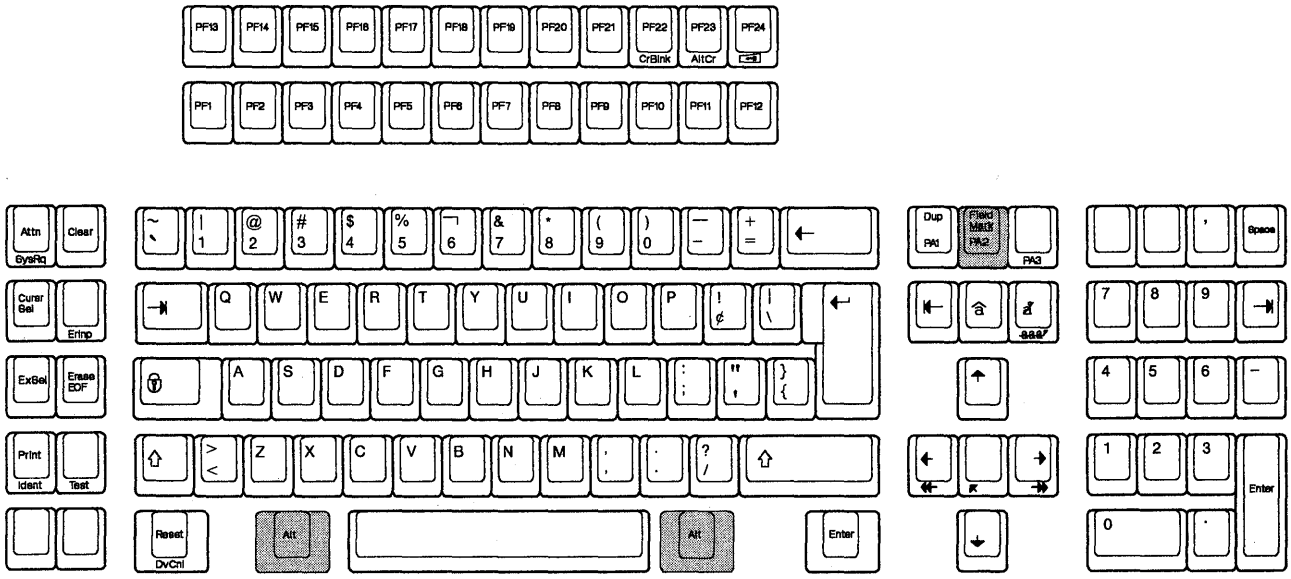


Figure 1-3. Change-Screen Keys on a Converged Keyboard. Press and hold **Alt**; then press **PA2**.

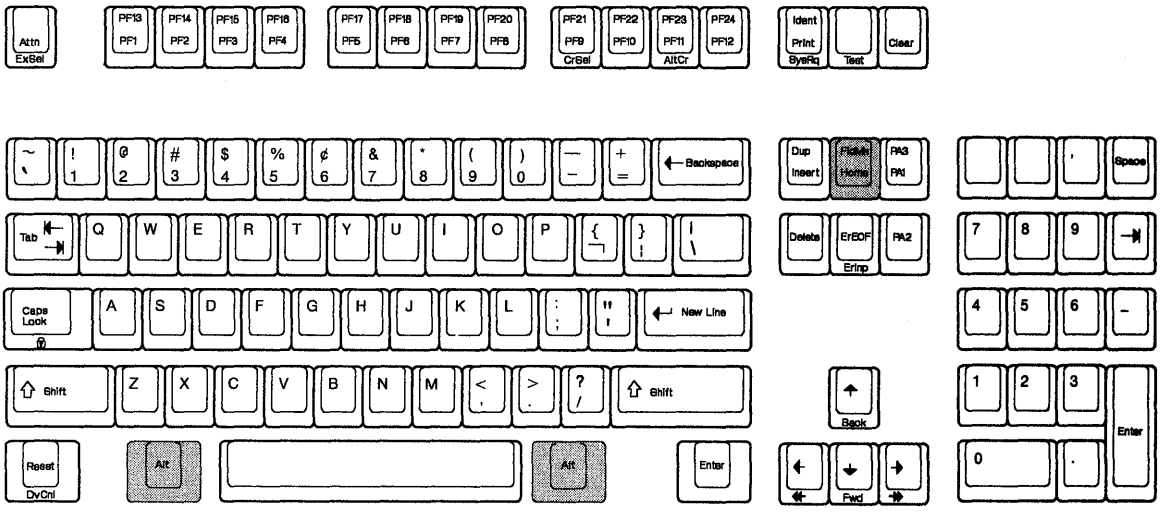


Figure 1-4. Change-Screen Keys on an IBM Enhanced Keyboard. Press and hold **Alt**; then press **Home**.

Skipping and Restoring LTs

The following keys are defined in extension (or Extended Select) mode for Configuration B support only:

S The Skip This LT key.

R The Restore All Skipped LTs key.

When you mark an LT as skipped using the Skip This LT key, no error indication appears.

The Limited LT Skip Function allows you to modify the logical terminal assignment (LTA) change-screen sequence. LTs can be marked as skipped and removed from the change-screen sequence by pressing the Skip This LT key. Pressing the Skip This LT key causes the current LT to be skipped, and a change-screen sequence to the next LT.

Once an LT has been marked as skipped, it will be skipped on subsequent change-screen sequences until the Restore This LT key is pressed or the controller is reloaded.

Session Indicators

The logical terminal (LT) identifier, located in the fourth column of the lower left corner of your screen, allows you to differentiate between multiple sessions. Each time you use the change-screen key sequence, the indicator will reflect which session is active.

Session	LT Identifier
First (Primary)	LT-1
Second	LT-2
Third	LT-3
Fourth	LT-4
Fifth	LT-5

If the display is turned on as a single-session display and only one session is defined on the port, the indicator position remains blank. If the display is turned on as a single-session display because of a lack of resources to support multiple sessions, the indicator written is an LT-X. This is a signal that you have a configuration error; you should notify your system administrator if this happens.

Note: The LT identifier will appear only as a number from 1 to 5 if you have X.21 or X.25 host communication protocol.

Error Messages

If an LT is specified in the LTA list but is not supported, an appropriate error indication will appear upon initial access. The LT is skipped until the controller can support it. The following types of errors cause an LT to be skipped:

- Insufficient storage (2%%)
- Adapter not present (399)
- Adapter not customized (399)
- Adapter failure (325).

Host Identifier (Configuration B Support)

The host identifier (or station set identifier for ASCII hosts), gives additional information about your session, and is updated each time you use the change screen sequence. The host identifier differs depending on the type of host the session is communicating with, IBM or ASCII.

Note: The Host Identifier is not displayed during Test Mode, AEA port wrap, Change Format mode, or while the Connection Menu is displayed.

IBM Hosts (3270 type): The host identifier is three characters in length and qualifies the LT indicator by specifying which link, host and session index were defined for this session.

ASCII Hosts: This host identifier qualifies the LT indicator by specifying the Station Set number associated with the ASCII host in use by a VT100 or 3101 Emulation session. This field is two characters in length and may range from 1-30.

Host Descriptor (Configuration B Support)

The host descriptor (or station set descriptor for ASCII hosts) is used to identify the host that a session is communicating with. The host descriptor status line area is updated each time you use the change-screen sequence.

Like the host identifier, the host descriptor varies depending on the type of host your session is communicating with.

IBM Hosts (3270 type): This field may contain the host descriptor which has a maximum length of 20 characters.

ASCII Hosts: When in VT100 or 3101 emulation mode, the station set descriptor is displayed in this position. If the station set descriptor is greater than 20 characters in length, only the first 20 characters are displayed.

The host descriptor, if defined, overlays a portion of the status line normally used by the following indicators:

- Shift indicators
- Caps Lock area
- Extended Graphics Mode
- VT100 or 3101 Host Emulation Area
- Programmable Symbols indicators

If no host description was defined, the indicators normally displayed in this area appear. If an update to any of the over-written areas occurs while the host descriptor is displayed, the host descriptor is erased and the original areas appear in the status line. The host descriptor may also be removed by pressing the RESET key.

Note: The host descriptor is not displayed during Test Mode, AEA port wrap, Change Format mode, while the Connection Menu is displayed, if an LT identifier of LT-X appears in the status line, or if no IBM host was defined during customizing.

Operational Characteristics

1. Momentary shift states (such as ALT and UPSHIFT) are maintained across sessions. The shift state is updated for the active session and transferred to the next session when you use the change-screen key sequence.

   Modes (such as APL and INS) and static shifts (such as SHIFT LOCK and CAPSLOCK) are maintained on an individual-session basis.

2. Entry Assist parameters (such as margins and tabs) are maintained on an individual-session basis.

3. Security key operations apply to all sessions.

   Note: For Configuration B support, the security key operations apply to active sessions only.

4. Programmed Symbol Set is supported only for the primary session.

5. Device attachment, magnetic stripe reader (MSR), and selector pen operations are applied to the active session and maintained on an individual-session basis.

6. The display switches, Mono/Dual, 2/4 Color, and Test/Normal, apply to all sessions.

7. The actions of the Test key apply only to the active session. Only one session, per display, is allowed to access the Test utility at a time. Trying to access the Test utility more than once causes an Operator Retry error.

8. Cursor mode, Print ID, and the clicker function apply across all sessions on a device basis.

   Note: For Configuration B support, the Print ID function applies only to the LTs that are on the same host link.

9. The change-screen key sequence is not always valid to use. You cannot use it when:
   - The controller microcode does not support MLT.
   - The controller is not customized to support MLT on this terminal.
   - The security key is off.
   - The keyboard is in extension or extended select mode.
   - Entry Assist setup mode is in effect.
   - The color convergence online test is in effect.
10. When the following temporary conditions are present, using the change-screen key sequence causes a keyboard-inhibit condition. Table 1-1 shows the indicators you will see in the operator information area.

Table 1-1. Keyboard-Inhibit Conditions and Indicators in MLT

Condition	Indicator
Device status pending	X ?+
Parity error conditions	X 204
Nonescaping key sequence (the nonescaping key sequence is terminated)	X ?+

11. If you use the change-screen key sequence, the Print ID sequence in use is terminated.

MLT with ASCII Emulation

The MLT feature is available on 3270 display stations working in ASCII-emulation mode. The change-screen key sequence is the same as for normal 3270 display station operation. If you have modified the position of the change-screen key through the Modify Keyboard procedure and you are connecting to an ASCII host, your change-screen key will revert to its original position during the ASCII host session; that is, it will appear as it does in Figures 1-1 through 1-4.

If the session with an ASCII host is a background session, the data flow is not suspended. However, the ASCII host may provide a means to stop unsolicited data. What this means to you is that any data received from a host for a background session is lost unless you ask the host to stop sending data by using NO SCROLL or XOFF.

If the background session is broken, you will find out when you try to access that session. The connection menu is displayed with an error message. If no host session (either 3270 or ASCII) is active for an LT, then the connection menu is displayed when that LT is the active one.

No notices are sent to the active session.

MLT with Personal Computers in 3270-Emulation Mode

An IBM Personal Computer (PC), Personal System/2® (PS/2), 3270 PC, or 3194 Display Station, emulating a 3270 terminal operating in CUT mode, may not send all keystrokes to the 3174 Establishment Controller. For example, many key sequences that require an ALT shift are ignored by the emulation program and not sent to the 3174. Because of this feature, you might need to use a different set of keystrokes on a PC emulating a 3270 than on an actual 3270 terminal. It is possible, usually, to obtain patches or newer source code that passes these expanded function keystrokes to the 3174. It is also possible to use the alternate keystroke sequences defined for these functions when the keyboard is in extension mode.

The change-screen key sequence on a 3270 Personal Computer or 3194 Display Station is ExSel followed by the insert key. To access different sessions from an IBM Personal Computer or Personal System/2 (PS/2), press and release Home; then press the insert key. If this change-screen key sequence does not work, see your system administrator for the correct sequence; the key sequence may have been defined differently during customization.

Change-Screen Patches

Table 1-2 contains a list of PC products and tells whether the ALT insert key sequence will work as the change-screen key and, if not, what patch can be put on the PC to make it work. For information regarding patches on products not listed, contact your IBM representative.

Table 1-2. Change-Screen Key Patches

Product		ALT Insert Work in Base Product?	Patch Number
PC with 3270 Emulation Program, Entry Level	Version 1.0	No	EE00010
	Version 1.1	No	None
	Version 1.2	No	IR00194
3270 Personal Computer	Version 2.1	No	IR52091
	Version 3.0	No	IR52091
3194 Display Station	Release 1.1	No	KG52091
	Release 2.0	Yes	Not applicable
	Release 2.1	Yes	Not applicable

Alternate Change-Screen Key Sequences

The change-screen key sequence on a Base (non-Text) keyboard is: press and hold ALT; then press the insert key (normal change-screen key). If ALT-Insert does not perform the change-screen function on the terminal, use the alternate change-screen key sequence that is provided when the keyboard is in extension mode. See Table 1-3 for the MLT change-screen key sequence to use for your terminal. For example, if you are using a 3194, you press and release extension mode and then press the insert key.

Personal System/2 is the registered trademark of International Business Machines Corporation

Table 1-3. Alternate Change-Screen and Extension-Mode Key Sequences		
Product	**MLT Change-Screen Key**	**Extension-Mode Key**
Base (Non-Text)	Press and hold ALT; then press the insert key (normal change-screen key).	Press and hold ALT; then press ERASE EOF.
PC or PS/2 with 3270 Emulation Program, Entry Level, or similar 3270 emulation program	Extension mode, followed by the insert key.	Defined in customizing question 168.
3270 Personal Computer	Press and release extension mode; then press the insert key.	ExSel.
3194 Display Station	Press and release ExSel; then press the insert key.	ExSel.

Keyboard Extension Mode

Keyboard extension mode is like a keyboard shift; the difference is that a shift lasts until you press a key to return the keyboard to its normal state, while keyboard extension mode lasts for only one keystroke. Table 1-3 shows how to put your base keyboard into extension mode. For converged and enhanced keyboards, the Extended Select (ExSel) key shifts the keyboard into extension mode.

The extension-mode indicator (►) appears in the operator information area when you enter extension mode. When you press another key, you leave extension mode and the indicator disappears.

Not all your keys will be active while the keyboard is in extension mode. Figure 1-5 shows the active keys and their function.

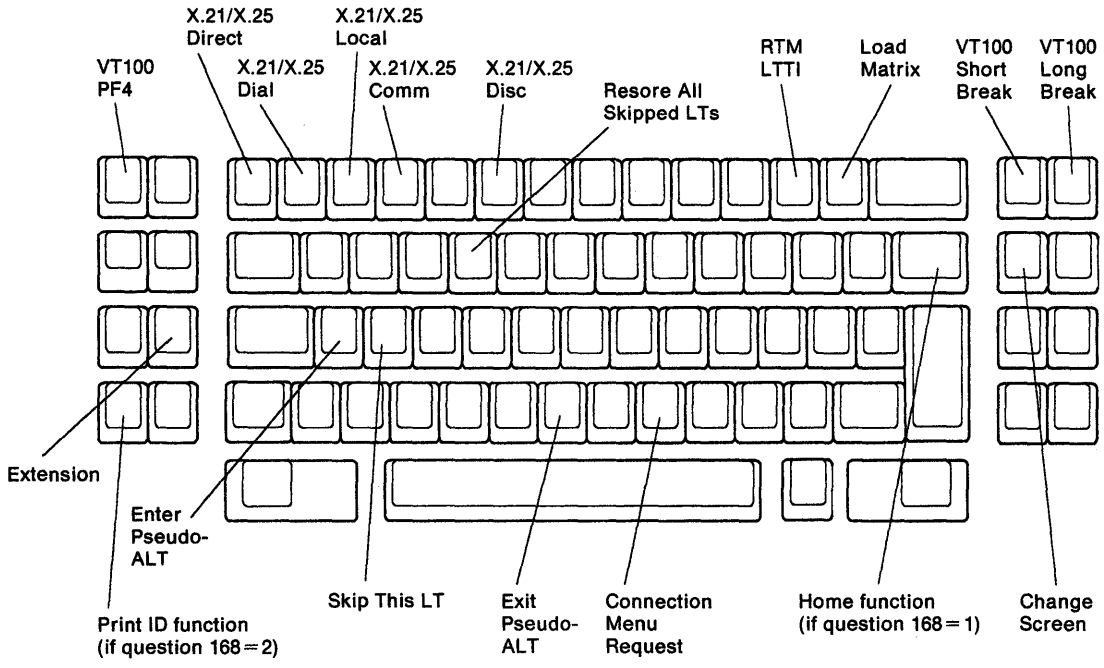


Figure 1-5. Keys Active in Keyboard Extension Mode (Base non-Text Key board)

Note: Skip This LT and Restore All Skipped LTs functions are supported by Configuration B only.

Refer to "DEC VT100 Emulation" on page 3-4 for a description of the VT100 functions in figure 1-5. Refer to the *3174 Functional Description*, GA23-0218 for the descriptions of the remaining functions.

Customized Extension Mode Keys

As explained previously, an additional change-screen function has been provided in keyboard extension mode. However, some terminals do not provide an extension-mode key. For these terminals, use customizing question 168. (Question 168 is described in the *3174 Planning Guide,* GA27-3844.) This question allows you to define an additional extension-mode key (either Home or Print ID). In many instances, the Home key is the best choice because Home is normally a nonshifted key on PC keyboards and provides easier operator access. The change-screen key sequence would then be to press and release Home, and then to press the insert key. If the Home key is selected as the additional extension-mode key, access to the Home function is changed. You must press the Home key twice to return the cursor to Home. The Print ID key is affected in the same way if it is chosen as the additional extension-mode key.

Note: Changing the extension-mode key to Home or Print ID will affect all Base keyboards and all keyboards emulating 3278-type keyboards. It will not affect Converged keyboards in native mode or IBM Enhanced keyboards unless those keyboards are used in 3278 or 3279-emulation mode.

Chapter 2. 3270 Emulation and ASCII Pass-Through

Introduction

This chapter describes the two operating modes for an ASCII terminal. These modes are:

- **3270 terminal emulation mode**

  With this function, your ASCII terminal or printer can emulate a 3270 display station or printer for connection to a 3270 host or for using the Connection Menu or test mode.

- **ASCII pass-through mode**

  With this function, your ASCII terminal can connect to ASCII hosts or to public data networks through the 3174 Establishment Controller. Refer to "ASCII Pass-Through Mode" on page 2-22.

Getting Connected to a Host

The first thing you need to do before you can work in 3270-emulation mode is to get your ASCII display station to communicate with the 3270 host. To do this, you must first connect your display station to the controller. Then, you may have to use the Connection Menu to establish a connection with the host. (The Connection Menu is a list of host names and host status, from which you select the host you want to connect to.)

Connecting to the Controller

Perform the following steps to get connected to the controller.

1. Turn on the power on your ASCII display station.
   a. If you are connected through a switched line, dial in.
      1) *Auto-call* modem: Enter the dial digits from your keyboard, for example, ATD 3853426 for a Hayes[1] modem. You may get messages from the modem; the modem procedures can be found in your modem documentation.
      2) *Normal dial* modem: Make the connection from your phone, listen for the answer tone, and switch the phone appropriately.
   b. If you are connected through a direct or nonswitched line, follow your local procedure for logging on.
   c. If you are not sure what kind of connection you have, ask your system administrator.
2. If you do not see a prompt, press the CR key (carriage return), type a period (.), and press the CR key again. (You may have to repeat this step a few times.) Refer to the keyboard map in Appendix A to see what the CR key is on your keyboard. For instance, on an IBM 3101, the CR key is the new line (◄┘) key.

[1] Trademark of Hayes Microcomputer Products, Inc.

Some, all, or none of the following steps may apply to you. Follow the step only if that menu appears on your display screen. You must respond to prompts within 30 seconds, or you will receive a warning. If you still do not respond, you will be disconnected. If you type a response incorrectly, backspace and type the response again; the cursor movement keys do not work. Until you identify the terminal type (step 4), the only keys that work are alphanumerics, space, backspace, and carriage return.

3. Type in your password if you see:

```
PLEASE ENTER YOUR PASSWORD =======>
```

4. A terminal type menu similar to the following example may appear. Type in the two-character code that corresponds to your display station:

```
TERMINAL TYPE MENU.  PLEASE CHOOSE ONE OF THE TERMINAL TYPES DISPLAYED BELOW.

IBM 3101                I1          DEC VT100                V1
IBM 3163                I3

ENTER NUMBER THAT CORRESPONDS TO YOUR TERMINAL

======>
```

5. A prompt for the keyboard map you want to use may appear:

```
USE SPECIFIC KEYBOARD MAP (1=YES 0=NO)? ======>
```

Specific Map Type in a **1** to use the specific map for the terminal type chosen. This map minimizes the number of keystrokes for commonly used functions.

Note: If you entered **FC** (FTTERM Color) or **FM** (FTTERM Mono) the Terminal Type menu, you need to enter a **1** at the specific keyboard prompt for FTTERM to operate properly.

Universal Map Type in a **0** to use the universal map. You might want to use the universal map if you use more than one type of terminal. This map is the same for all display station types, but the correlation between the real key and the mapped key is not always as obvious as it is in the specific map for each display station. For example, ESC 1 is the Universal mapped key for PF1, but in the ADDS Viewpoint/78 keyboard map there is a PF1.

6. If you previously answered **Yes** to the Attached Printer Prompt (Question 781), the following screen appears now.

```
DO YOU HAVE A PRINTER ATTACHED TO THIS TERMINAL?

(1=YES 0=NO)? ======>
```

When this screen appears, users of ASCII display stations with attached printers can decide whether to let the AEA manage an attached printer as a separate device on the same line .

Establishing the Host Connection

At this point, you will normally be connected to a host application, either 3270 or ASCII, and you can use 3270 emulation or ASCII pass-through procedures. Otherwise, the Connection Menu is displayed, and you can request a different host connection.

To connect to a host:

1. Type in the number or name from the Connection Menu of the host to which you want to connect.
2. When you see READY on the screen, you are normally connected to the ASCII host. Sometimes, you may have to dial the host manually by typing in the dial number. (Consult your system administrator for the dial number.)

Using the Connection Menu

You use the Connection Menu (see Figure 2-1) to request a different host session or to check the status of a host link. The Connection Menu contains a list of all the possible host destinations and provides information you need to connect to a host. If you are authorized, you can select a destination from this menu.

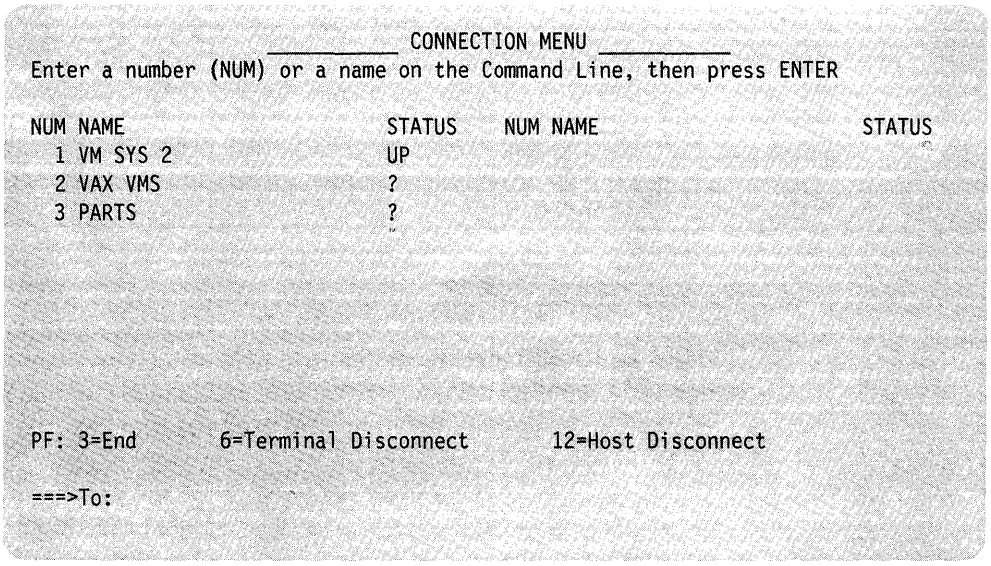


Figure 2-1. Sample Connection Menu (3270 Emulation). Type in the number or name of the host you want to connect to.

The following lists describe the messages that show the status of the host and the functions of the PF keys.

Status	**Meaning**
UP	The host appears active and available.
?	Host status cannot be determined. A request to establish a session with the host will succeed or provide more detailed status information.
DOWN	The host is inactive, or all the ports that could access it are broken.
BUSY	The host is active, but all the ports to it are in use.
DIAL	The host is accessed through a switched port. A request to connect to the host will succeed or provide more detailed status information.

PF Keys	**Function**
PF3	PF3 returns you to the session you left. On an SNA controller, if you press PF3 without having connected to a new host, the previously connected host session will resume. On a non-SNA controller, the previously connected *ASCII* host session will resume. If the previous connection was to the 3270 host, the connection will be reestablished; however, it may be necessary for you to log on again.
PF6	PF6 breaks the connection between the 3174 and your ASCII terminal. This releases your terminal port for other users and, if you are using a dial connection, disconnects the switched connection, ending telephone charges.
PF12	PF12 breaks the connection between the 3174 and the host if you are connected to an ASCII host. This releases the host port for other users and, if you are using a dial connection, disconnects the switched connection, ending telephone charges.

To return to the Connection Menu, do the following:

- If you are connected to an IBM host, use the menu call sequence. This is the extension mode-mapped key, followed by m. For example, on an IBM 3161, you press ALT L m. On a Lear Siegler ADM 5, you press ESC B m.
- If you are connected to an ASCII host, press ESC backspace, or use BREAK to disconnect from the ASCII host (provided your host recognizes BREAK as a disconnect).

3270 Display Station Emulation

When your ASCII display station is in 3270-emulation mode, it appears to the host as a 3270 terminal with full-screen edit capabilities. In this mode, you use your terminal's keyboard to enter all 3270 graphics and to perform the 3270 functions listed below:

- ATTN
- Backtab
- Clear
- Cursor Left
- Cursor Right
- Cursor Up
- Cursor Down
- Cursor Fast Left
- Cursor Fast Right
- CURSR SEL
- Delete
- DEV CNCL
- DUP
- Enter
- Erase EOF
- Erase Input
- Extension Mode
- Field Mark
- Home
- IDENT
- Insert
- New Line
- PA1, PA2
- PF1 – PF24
- Print
- Reset
- SYS REQ
- Tab
- TEST.

The following functions are also provided in 3270 emulation:

- Status On/Off
- Refresh
- Break.

Each of these functions is described in this chapter. Appendix A contains the key sequences that you should use for your terminal to request these functions. For example, on many terminals, pressing ESC 1 invokes the PF1 function.

The Display Image

The screen of your terminal is used to show you a display image. An example of a display image is shown in Figure 2-2. The format of this image varies, depending on the application program you are using. The image might contain areas that you will use to enter data to be processed by the application program; it might also contain areas that are used only to display information to you. Both of these areas are called *fields*.

When a screen is divided into fields, it is known as a *formatted screen*. A screen that the program has not divided into fields is known as an *unformatted* screen.

Each job that you work on could use a different format or none at all; therefore, you might be working with both formatted and unformatted screens.

The screen shown in the sample display image (Figure 2-2) is an example of a formatted screen.

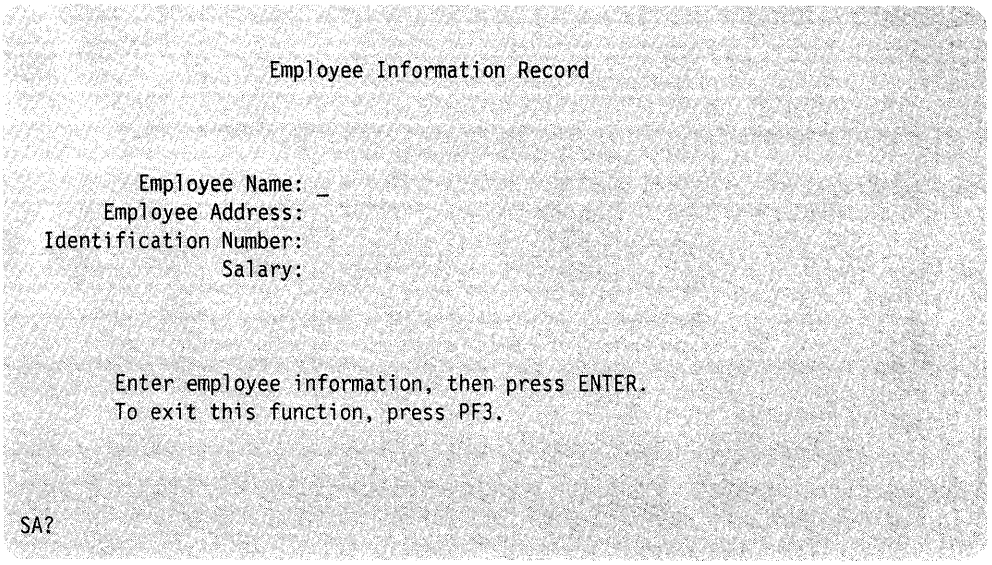


Figure 2-2. Example of a Display Image

An actual 3270 terminal has an operator information area (or status line) on the last line of the screen. This area is used to display operating and status messages associated with your terminal operation. The status line is displayed on line 24 or line 25 of the screen, depending on the type of terminal you are using. If your display station has only 24 lines, you must type in a key sequence (called *Status On/Off* in the keyboard maps) to view it. The status line is shown as the last line in the example. Refer to "Status Line" on page 2-13 for a description of the status line.

Input Fields

An input field is one into which you can enter data. Each application program user's guide should tell you which are the input fields for that particular job.

In the example, the area after `Employee Name:` is an input field.

The number and names of fields that you see on your screen depends on the job you are doing and on the application program that is operating in the host system.

Numeric Fields

Numeric input fields are fields that normally contain only the characters 0—9, the decimal sign, the minus sign, and DUP (or the equivalent of those keys). In the example, the fields following `Identification Number:` and `Salary:` were probably established as numeric fields. When you move the cursor into the numeric field, the NUM indicator is displayed in the operator information area.

Operating any other function that can enter a displayable character causes an input-inhibited condition. Use the Reset key sequence to enable the keyboard (if it was disabled).

The numeric lock restriction can be overridden on terminals connected to the Asynchronous Emulation Adapter (AEA) since they emulate a typewriter keyboard. To override on a 3270 typewriter keyboard, enter any uppercase character or symbol. On ASCII keyboards, only characters or symbols that correspond to the 3270 uppercase characters will override the numeric fields. Refer to the appropriate keyboard map in Appendix A for these characters.

Protected Fields

Protected fields are areas on the screen in which you cannot type. You cannot change field names, for instance. A go elsewhere message (X < * >) is displayed on the status line if you attempt to change any data in a protected field. (To recover and enter data, use the Reset key sequence and move the cursor to an unprotected area of the screen.)

In the example, the areas containing `Employee Name:`, `Employee Address:`, `Identification Number:`, and `Salary:` are all protected fields. Also, the area in the second half of the screen that contains instructions to the operator is a protected field.

Nondisplay Fields

The application program can define a field as *nondisplayable*. A nondisplay field can be an input field or a protected field. The data in the field is not displayed on the screen. In the example, the salary field is a nondisplay field; you cannot see the information in the field.

Using Your Keyboard

This section contains a brief discussion of keyboard maps and terminal-controlled keys, and a more detailed description of terminal functions.

Keyboard Maps

At a 3270 terminal, the keyboard functions are associated with one key on the keyboard. For example, you press the PF1 key for the PF1 function. However, the ASCII terminals that are supported by the 3174 Establishment Controller do not always have keys labeled to match all the possible 3270 functions. Therefore, you sometimes must press two keys to cause one function (for example, pressing ESC and then 1 causes the PF1 function on many of the supported terminals).[T1]

The keyboard map defined for your terminal type describes what keyboard function the 3174 associates with the key sequences you press on the keyboard.

Note: The keyboard maps are found in Appendix A. Your system administrator can obtain, for each terminal type, a reference card that contains the appropriate keyboard map. These cards fold so that they can stand next to your terminal for convenient reference.

[T1] ***Technical Note:*** Every time you press a key (or, sometimes, "Alt" or "Ctrl" plus another key) on your terminal, a unique ASCII code representing that key is transmitted to the 3174. These codes identify the function you want to do. The 3174 does what is necessary to perform the function: it may send other hexadecimal codes back to the terminal, which will cause the cursor to be repositioned, it may initiate the transmission of data to the host, or it may echo back a data character for display on the screen.

Terminal-Controlled Keys

The terminal acts independently of the controller for the following functions. The function of these keys is not altered.

- For some or all keys on the keyboard, your terminal may provide typematic operation. When a typematic key is pressed, its function is repeated when the key remains pressed. See your terminal manual for details.
- Setup keys may be used.
- Local print may be used.
- Cursor mode keys (block or underline) may be used.

3270 Functions

ATTN: The ATTN function is used to signal an attention condition to the host (SNA only).

Using ATTN during a print IDENT operation causes the ID operation to end. The keyboard locks, and the previous printer ID and the function not supported message (X -f) are displayed on the status line. To unlock the keyboard, use the Reset key sequence defined for your terminal and reposition the cursor.

Program Attention Functions (Enter, Clear, PF Keys, and PA Keys): These functions cause the transfer of information to the host program. An attention identification (AID) character is sent to the host, which identifies the function used to cause the transfer. (Note that the AID characters are not typematic.)

The clear function clears all positions on the screen to nulls and positions the cursor to the upper left corner.

Cursor Movement Functions (Cursor Up, Cursor Down, Cursor Right, Cursor Left, Cursor Fast Right, and Cursor Fast Left): Cursor Up, Down, Right, and Left move the cursor one location at a time into any character location. Cursor Fast Right and Fast Left move the cursor two locations at a time. Using these functions, the cursor can be moved into any location, including unprotected and protected fields.

The following functions are all capable of causing the cursor to wrap:

- If the cursor is located in the last position of a line and you use the cursor right function, the cursor moves to in the first position of the next line.
- If the cursor is located in the first position of a line and you use the cursor left function, the cursor moves to in the last position of the previous line.
- If the cursor is located in the first line of the screen and you use the cursor up function, the cursor moves to in the last line of the screen, without changing the column position.
- If the cursor is located in the last line of the screen and you use the cursor down function, the cursor moves to in the first line of the screen, without changing the column position.

Cursor Movement Functions (Tab, Backtab, New Line, and Home): The following functions move the cursor to the first position in an input field:

- Tab: Moves the cursor to the first character location of the next input field. In a screen with no input fields, the cursor moves to the upper left corner of the screen.
- Backtab: When the cursor is located in the first character location of an input field, the backtab function moves the cursor to the first character location of the preceding input field. When the cursor is located in any character location of an input field, other than the first location, this function moves the cursor to the first location of that field. If there are no input fields, the cursor moves to the upper left corner of the screen.
- New Line: Moves the cursor to the first input character location of the next line. If the next line has no input fields, the cursor moves to the next line containing an input field. If the screen contains no input fields, the cursor moves to the upper left corner of the screen.
- Home: Moves the cursor to the first input character position on the screen. If there are no input fields, the cursor moves to the upper left corner of the screen.

CURSR SEL (Cursor Select): This function allows the selector-light-pen-detection function to be performed from the keyboard. See "Light Pen Emulation" on page 2-19 for a description of how this function is used.

Delete: If the cursor is located in an input field, using the delete function deletes the character at the location occupied by the cursor. The cursor does not move. All remaining characters in the field to the right of the cursor and on the same line shift one location to the left. The empty position at the end of the row or field contains a null character. If the input field occupies more than one row, following rows are not affected.

Using this function when the cursor is located in a protected field locks the keyboard (the go elsewhere status line message (X < * >) is displayed). To unlock the keyboard, use the Reset key sequence defined for your terminal and reposition the cursor.

DEV CNCL (Device Cancel): If your keyboard is locked because of a printer busy condition (X 0-0( ) on the status line), and you wish to cancel your print request, you should use the DEV CNCL function.

Using the DEV CNCL function during an IDENT operation causes the operation to end. The previous printer ID is displayed on the status line.

Once the printing has begun, the DEV CNCL function has no effect.

DUP: Using the DUP function causes an asterisk (*) to be displayed at the current cursor location. Also, a Tab key operation is performed, causing the cursor to be moved to the first location of the next input field. The DUP character provides a means of informing the application program that a duplicate operation is required for the rest of the field in which it is located.

Using this function when the cursor is located in a protected field locks the keyboard (the go elsewhere status line message (X < * >) is displayed). To unlock the keyboard, use the Reset key sequence defined for your terminal and reposition the cursor.

Erase EOF (End of Field): If the cursor is located in an input field, this function erases the characters from the cursor to the end of the field. Erased characters are set to nulls, even if the field covers more than one line. The cursor does not move.

Using this function when the cursor is located in a protected field locks the keyboard (the go elsewhere status line message (X < * >) is displayed). To unlock the keyboard, use the Reset key sequence defined for your terminal and reposition the cursor.

Erase Input: This function erases the characters (sets them to nulls) in all input fields and then moves the cursor to the first input location on the screen. If the screen contains no input fields, nothing is cleared and the cursor moves to the upper left corner of the screen. If the screen contains no fields at all, the entire screen is cleared and the cursor moves to the upper left corner.

FM (Field Mark): Using the FM function causes a semicolon (;) to be displayed at the current cursor location. The field mark character is used to inform the application program of the end of a field (in an unformatted screen) or of a subfield (in a formatted screen).

Using this function when the cursor is located in a protected field locks the keyboard (the go elsewhere status line message (X < * >) is displayed). To unlock the keyboard, use the Reset key sequence defined for your terminal and reposition the cursor.

IDENT: The IDENT function is used to assign the printer or the print class to be used when a local copy function is initiated. See "Printing Screen Images (Local Copy)" on page 2-20.

Insert: The insert function places the keyboard in an insert mode of operation. This mode allows you to insert a character or characters into the middle of an input field without changing the characters already displayed there. An insert symbol (^) is displayed in the status line to remind you that insert mode is active.

The following items apply while the keyboard is in insert mode:

- If the cursor is located in an input field having a null character in any location in the field beyond the cursor, entering a character causes the new character to be entered at the cursor location. All remaining characters within the field (except for null characters and characters to the right of a null character) are shifted one position to the right. If the location occupied by the cursor at the time of the insert operation is a null, no shift occurs.
- After all null characters at or beyond the cursor location in the field have been overwritten, or if there are no null characters, attempting to enter another character locks the keyboard (the more than indicator (X *>) is displayed on the status line). To unlock the keyboard, use the Reset key sequence defined for your terminal and reposition the cursor.

- If the current field spans more than one line of the screen, the insert operates in the entire field.

To exit insert mode, use the key sequence for Reset. Pressing Enter, Cursor Select, or any other function that causes host communication also exits insert mode.

Print: The print function causes the current screen to be printed. See "Printing Screen Images (Local Copy)" on page 2-20.

Reset: The reset function is used to recover from a keyboard-locked condition.

The reset function does not reset a locked condition resulting from a command being executed for the terminal (X ( ) on the status line).

Reset causes the IDENT operation to end (the original printer ID is displayed on the status line).

Reset causes insert mode to end.

SYS REQ (System Request): You can use the SYS REQ function to switch from communication with your application program to communication with the host control program (SNA only). On non-SNA attached terminals, X -f is displayed for nonsupported terminals when SYS REQ is pressed. SYS REQ causes the screen to be cleared.

You can log off your application program using the SYS REQ function. Enter the SYS REQ key sequence to communicate with the host control program; then enter the log off command.

See "Host Control Program Communication" on page 2-18 for a description of how your terminal operates when you are communicating with the host control program.

TEST: The TEST function is used to start and end some problem determination functions. The display screen is cleared, with the cursor in the first position of the first line. Refer to the *3174 User's Guide* for your model for more information about the TEST function.

Non-3270 Functions

The following functions are available by entering key sequences, but are not normal 3270 functions. These functions are provided by the 3174.

Status On/Off: The status on/off function is used to display the 3174 status line when the display station is connected, when it does not have a 25th line, and when it is in 3270-emulation mode. If the keyboard is locked, enter the Status On/Off key sequence to see the status line. See "Status Line" on page 2-13 for detailed information on the status line emulation.

The status on/off function cannot be used if your terminal uses a 25th line for status.

Refresh: The refresh function causes the 3174 to clear your display screen and send the screen image again. This function is most useful when you are using a dial-in facility and communication errors cause incorrect characters to appear on the screen.

Break: The break function allows you to disconnect from the controller. (The disconnect process takes 5 seconds.) Switched connections must be reestablished. Nonswitched connections are reestablished immediately, but a fresh autobaud sequence (if necessary) and prompting sequence (for instance, terminal type and keyboard map type) are initiated. This function is useful if errors are made during the original prompting sequence or if you get unexpected or garbled results on the screen.

Status Line

The status line informs you of status and performance information associated with your controller and IBM host and, also, notifies you of error conditions. If your terminal has an accessible 25th line, the status line is displayed there. If your terminal's 25th line is unavailable, the status is displayed on the 24th line; you must use the status on/off sequence (usually ESC ?) to see the status line.

Notes:

If you must use the 24th line for status:

1. The status line defaults to off when you begin your session.
2. When the status line is not displayed and an input-inhibited condition occurs, the cursor no longer moves. You can then use the status on/off function (usually ESC ?) to display the status line. The information there explains the reason that your keyboard is locked.

Status Line Format

The status line is 80 characters long. The characters are arranged as shown in Figure 2-3 on page 2-15. The first column in Figure 2-3 on page 2-15 tells you in which column of the display station screen you will find the indicator. The second column shows the indicator you will see if your display station does **not** have special graphic characters. Use the third column if your terminal **does** have special graphic characters that the 3270 uses. The last column provides a brief description of the symbol.

Table 2-1 (Page 1 of 2). Status Line Format

Character Position	3270 Emulation	3270 Symbol	Meaning
1	S	S	Attached to the 3174
2	A or B	A or B	Non-SNA or SNA
3	?, P or *	? P or *	Connected to the host (?), the SSCP (P), or the application (*)
3 – 6	TEST	TEST	Test mode
9 – 16	X ( )	X ( )	Wait
	X SYSTEM	X SYSTEM	System wait

Table 2-1 (Page 2 of 2). Status Line Format

Character Position	3270 Emulation	3270 Symbol	Meaning
	X %nnn	X nn or X nnn	Machine check
	X-Xz_nnn	X nnn	Communication check
	X PROGnnn	X PROG nn or X PROG nnn	Bad host data
	X ?+	X ?+	Input not accepted
	X -f	X -f	Missing function
	X O-%	X O-%	Printer not working
	X O-O( )	X O-O( )	Printer busy
	X O-O( )( )	X O-O( )( )	Printer very busy
	X *X	X X	Not authorized
	X < * >	X < * >	Go elsewhere
	X *>	X *>	Too much data
	X NUM	X NUM	Numeric data only
	X *#?	X *#?	Wrong printer ID
37 – 41	^	^	Insert mode
	NUM	NUM	Numeric field
	>	>	Extension mode entered
60 – 64	O-Onn	O-O nn	Assigned printer
	O-*nn	O-* nn	Printing
	O-%nn	O-% nn	Printer failure
	O-O_ _	O-O_ _	Assign printer
	O-O??	O-O??	Printer ID changed

Notes:

1. Columns 1 through 6 contain attachment indicators.
2. Columns 9 through 16 contain inhibit, or "do not enter," indicators.
3. Columns 37 through 41 contain shift or mode indicators.
4. Columns 60 through 64 contain copy print indicators.
5. All the other characters are blank.

Figure 2-3 gives an example of a possible status line. The first line is the sample status line. The column numbers below the status line tell you which column a character will appear in. Following the column numbers is an explanation of the characters in the example; for instance, NUM appears in columns 39 through 41, meaning that the cursor is in a numeric field.

```
SB*     X-Xz_505                    NUM                    O-031

12345678901234567890123456789012345678901234567890123456789012345678901234567890
         1         2         3         4         5         6         7         8
```

Character	Meaning
S	Attached to the 3174
B	SNA
*	Connected to the application
X -Xz 505	Communication check
NUM	Numeric field
O-031	Assigned printer is 31

Figure 2-3. Sample Status Line in 3270 Emulation

Status Line Graphics and Meanings

Ready Status: The first column always contains an S.

Do Not Enter: The X symbol in location 9 of the status line tells you that you cannot enter any additional information from your keyboard. The symbol to the right of the X explains the reason for the keyboard lock condition. The symbols in this list are 3270 symbols. If your terminal does not have special graphic characters, look at Table 2-1 to see what the 3270-emulation character is.

X ( )

Meaning: Wait. Time is required for the system to perform the requested function. Your keyboard will be automatically unlocked by the host application.

Action: Wait for the condition to clear.

X PROG*nnn*

Meaning: Bad host data. A programming error was detected in data received from the host system. The error number *nnn* defines the type of program check. Refer to the *3174 Status Codes* for error numbers.

Action: If the condition does not clear itself, see your system administrator.

X -X_z*nnn*

Meaning: Communication Check. A condition in the network is preventing communication with the host.

Action: If the condition does not clear itself, see your system administrator.

X ?+

Meaning: Input not accepted.

Action: Use the Reset key sequence defined for your terminal, check your screen, and enter the data again.

X -f

Meaning: Missing function. The function you attempted is either never allowed or not allowed in the current state of your terminal.

Action: Use the Reset key sequence.

X %*nnn*

Meaning: Machine check. The error number *nnn* defines the type of machine check. Refer to the *3174 Status Codes* for error numbers.

Action: If the condition does not clear itself, see your system administrator.

X O-O ( )

Meaning: Printer busy. The printer or class you attempted to use is busy. Your request has been queued.

Action: Either wait for your print to occur or use the DEV CNCL key sequence to cancel the request.

X O-O ( ) ( )

Meaning: Printer very busy. The printer or class you attempted to use is busy. Your request has been queued.

Action: Either wait for your print to occur or use the DEV CNCL key sequence to cancel the request.

X *X

Meaning: Not authorized. You have requested a print ID or print class you are not authorized to access.

Action: Use the Reset key sequence. Enter another print ID using the IDENT function.

X < * >

Meaning: Go elsewhere. You have attempted an action that is invalid for the terminal's screen position. For example, you attempted to enter data into a protected field.

Action: Use the Reset key sequence.

X * >

Meaning: Too much data. You have tried to enter too much data into a field on your terminal's screen.

Action: Use the Reset key sequence.

X NUM

Meaning: Numeric data only. You have tried to enter a lowercase alphabetic character into a numeric field.

Action: Use the Reset key sequence.

X *#?

Meaning: Wrong printer ID. You have entered an unacceptable number. This normally occurs when you assign an invalid number while using the IDENT function.

Action: Use the Reset key sequence.

Mode Indicators: The mode indicators are displayed in locations 37 through 41 of the status line. They tell you what mode your keyboard is using.

^ This symbol is displayed when you are in insert mode. To exit insert mode, use the Reset key sequence.

NUM This symbol is displayed when you are in a numeric field.

▶ This symbol is displayed when you are in extended select mode. To exit extended mode, use the Reset key sequence.

Printer Status: The Printer Status messages are displayed in locations 60 through 64 of the status line. These messages are used during print operations (local copy) and during the IDENT function.

O-O*nn*

Meaning: Assigned printer. Your display is authorized to use printer ID *nn*. Numbers may range from 01 to 55 for individual printers and from 70 to 85 for printer classes. If you do not have a printer to copy to, the indicator is not displayed.

Action: None. If you want to use a different printer or class, use the IDENT key sequence to redefine your printer access.

O-****nn***

Meaning: Printer printing. The printer is currently printing your screen.

Action: None.

O-O_ _

Meaning: Printer Assignment. This message appears when you use the IDENT key sequence to assign printer access.

Action: Type in the number of the desired printer or class. Refer to "Print ID" on page 2-21.

O-O??

Meaning: Printer ID changed.

Action: Type in the number of the desired printer or class. Refer to "Print ID" on page 2-21.

O-%nn

Meaning: Printer failure. When the printer stops during a local copy operation (out of paper, paper jam, etc.; a *data check* on the printer does not fall in this category), the Printer Failure symbol replaces the Printer Printing symbol and the print is terminated. The keyboard locks and the Printer Not Working symbol is also displayed, calling the operator's attention to the failure. The Printer Failure symbol always specifies the failing printer, not the print class.

Action: Use the DEV CNCL key sequence to clear the keyboard-locked condition. Try your print request again after starting the printer, or use IDENT to change your print ID and request a different printer.

Host Control Program Communication

After you have started communicating with your application, you can communicate with the host control program by using the SYS REQ function. When you use the SYS REQ key sequence, your screen is cleared and SSCP is displayed in the lower left corner of the operator information area.

When sending messages to the control program, you can only type in a message beginning at the current cursor location. The message can be up to 256 characters long. When you press Enter the data, excluding nulls beginning with the original cursor location and extending 256 positions or to the end of the screen is transmitted to the host.

Data received from the control program is displayed at the current cursor location.

When SSCP is displayed in the operator information area the following functions are not available:

- PF1 – PF24
- PA1 – PA3
- ATTN.

If you use one of these key sequences, the keyboard is locked and the invalid function status line message (X -f) is displayed. To unlock the keyboard, use the Reset key sequence defined for your terminal and reposition the cursor.

To return to your application program session, enter the SYS REQ key sequence again.

A common use of this function is to log off the active application. You would use the SYS REQ key sequence to start communication with the host control program, then type in a log off request as defined for your installation.

Light Pen Emulation

A *selector light pen* is a light-sensitive pen that can detect the light emitted from characters displayed on certain 3270 display stations. With the pen, you can select from a list or table of displayed items and can then cause those selections to be passed to the application program. The 3174 allows you to emulate this light pen function using the Cursor Select function. This emulation is done by positioning the cursor (using normal cursor movement functions) in the field that you wish to select, and then entering the Cursor Select key sequence. Depending on the way that the host program has defined the field, you obtain various responses.

Selection Fields

A selection field is identified by a question mark (?) in the first position of a field. To select the field, position the cursor anywhere in the field that you want to select, and then use the Cursor Select key sequence. The question mark is changed to a greater than (>) symbol. To reverse your selection, use the Cursor Select key sequence again. The greater than (>) symbol is replaced by a question mark (?).

Attention Fields

An attention field is identified by a space or a null or an ampersand (&) in the first position of the field. Place the cursor anywhere in the field that you wish to signal as an attention; then use the Cursor Select key sequence. When you use the Cursor Select key sequence and the cursor is in an attention field, information about all fields that you have either selected with Cursor Select or modified with normal keyboard input is transmitted to the host program.

ASCII Display Host Addressable Printer Support

A printer connected to an auxiliary port on an ASCII display that supports remote access to its auxiliary port can be defined as a second host addressable LU on the 3174 port to which the display is connected. The printer can then be used in system mode. This support operates only in 3270 emulation mode.

If a printer is connected to an auxiliary port on a display and is not defined to the 3174, the printer can be used only for screen copy operations that are initiated by the user. Screen copy must be a completely local function, the 3174 will not echo any character sequences back to the terminal.

The following terminals support the ASCII Display Addressable Printer:

- ADDs Viewpoint A2
- DEC VT100, VT241
- IBM 3151, 3161, 3162, 3163, 3164
- IBM File Transfer and Terminal Emulator Program (FTTERM), Color and Monochrome
- Lear Siegler ADM11, ADM12, 1178
- TeleVideo 970

Input from devices that are connected to the auxiliary port of a display is not explicitly supported; any such input is assumed to be for the display.

3270 Printer Emulation

ASCII printers operate in 3270-emulation mode to act as if they were 3287 printers. They can be used as host printers, shared printers, and local copy printers.

Some items to consider in 3270 printer emulation follow:

- Some features of the 3287 printer, such as Extended Character Set Adapter and Extended Print Buffer, are not supported.
- The maximum print position (MPP) is always 132.
- Lines per inch (LPI) is always set to match the ASCII printer default; it cannot be changed at the host.
- The ASCII printer must provide upper- and lowercase, or be able to fold received characters into all-uppercase or all-lowercase characters.
- The default page length is 66 lines.
- If the printer does not accept form feed, the controller sends line feeds (LF) until the page length count is reached.
- Nulls are not suppressed for ASCII printers.
- Printer conditions such as Check and Hold Print can be used, but no indicator lights are provided.
- The ASCII printer cannot bring up the Connection Menu or use the test functions available to the ASCII display station.
- LU1 SCS transparent data must be in ASCII format because the AEA does not convert transparent data.

IBM 3287 printers provide several operator controls. The ones provided by the emulation are available only if the ASCII printer has a keyboard. Available operator controls are Hold Print (XOFF), Enable Print (XON), Cancel Print (active only in SNA SCS mode), PA1 and PA2 (active only in SNA SCS mode), Form Feed, and Index. The following table shows the 3270 printer key with the corresponding ASCII printer mapping.

3270 Printer Key	ASCII Printer Mapping
HOLD PRINT	CTRL S
ENABLE PRINT	CTRL Q
CANCEL PRINT	C
PA1	1
PA2	2
FORM FEED	CTRL L
INDEX	CTRL J

Printing Screen Images (Local Copy)

This function allows you to obtain a printed copy of your display screen. You can copy to a printer attached to another port of the 3174 controller.[C1]

[C1] ***Configuration Note:*** The local copy function is controlled by the printer authorization matrix information that is part of the 3174 configuration viewable in online test mode. The matrix defines printer classes to be assigned to particular printers, and it also defines which displays may use which printers.

The copy printer operation is normally limited to display stations and printers both operating in 3270 mode. However, this support is extended to allow a 3270 display station in ASCII-emulation mode to perform a local copy. The target printer must be in 3270 mode, and the IDENT process that is used to alter the copy printer assignment (if necessary) must be done while the 3270 display station is in 3270 mode (connected to a normal 3270 host or the Connection Menu).

Print ID

The print ID associated with your terminal is displayed at the right side of the status line. This ID specifies which print class or which printer your local copy requests are sent to. The valid IDs are in the ranges 70 – 85 for print classes and 01 – 55 for printers. Use the 2-character ID provided by your system administrator. When the ID is a class, the first printer in that class that becomes available prints your job. When the ID is a specific printer, your request is sent to that printer, and the job prints when that printer is available.

The default ID is assigned to your terminal at the beginning of your session. If you are not authorized to use a copy printer, you do not see anything on the screen where the print ID is normally displayed.

Changing the Print ID

To change the print ID associated with your display, use the IDENT function. (The status line should be displayed before IDENT can work.) The IDENT function allows you to specify a new print ID that remains active until you change the ID again. At the right side of the status line is the message 0-0nn. The *nn* represents the current printer ID assigned to the display.

To change the ID, enter the IDENT key sequence defined for your terminal. This action replaces the 0-0nn with the 0-0_ _. You can now type the port number or class that you want to have as the new ID. Enter the ID as two characters; that is, for the printer on 1, you should enter 01. When you have entered both characters, either the 3174 accepts your assignment or one of the following applies:

- If your terminal is not authorized to use the printer ID you entered, the status line displays a message indicating operator unauthorized (X *X).
- If you enter an invalid ID, the status line displays a message indicating invalid function (X -f). The original ID is not changed and is displayed again when you reset.

To exit the IDENT function, use the Reset key sequence.

Note: The cursor remains where it was, but the digits you type replaces the underscores.

Printing

When the ID is set, you can start local copies using the PRINT key sequence for your terminal. When you attempt this function, your print request may be queued because the printer or printers are all busy. While print requests are queued, you see a printer busy message (X 0-0 ( )) on your status line, and your keyboard is locked.

Once the print request is accepted for printing, the 0-0nn indicator on your status line is replaced with 0-*nn. When the print is completed, your print ID is restored and the keyboard is unlocked.

Printer Not Working

Sometimes, the printer you have requested may not be available because it is not turned on or is not connected to the 3174. Here, you receive a printer not working message (X 0-%) on your status line. Your request has been discarded, and you must use the DEV CNCL key to unlock your keyboard.

Canceling a Print Request

When a local copy has been requested but has not yet begun printing, that is, 0-*nn is not displayed, you can cancel it by using the DEV CNCL function. Your keyboard will be unlocked and the print request removed from the queue. You can cancel a request while X 0-0 ( ) or X 0-0 ( ) ( ) is displayed on the status line.

Host-Initiated Local Copy

It is possible for the host application you are using to cause a local copy of a screen it has sent to your display. When this occurs, X ( ) is displayed on the status line from the time of the initial request to the end of the print. The keyboard is not unlocked until the print is completed or terminated.

Differences Users May See in 3270 Emulation

You must become familiar with your specific terminal type to use the functions it provides. Following are some of the differences you may see between actual 3270 and 3270-emulation mode:

- Response time may increase because of the line transmission speed.
- Some display station features, such as indicator lines and intensify capabilities, are not available.
- Differences between the ASCII display keyboards and the 3270 keyboards sometimes require a two- or three-key sequence to achieve the effect of pressing one key on a 3270 keyboard.
- For printers, Set Line Density is not available. Also, many printers are limited in the use of PA or Cancel keys and indicator lights.
- Changing the printer address works a little differently. The cursor does not move to the printer address digits in the indicator line when you press the IDENT key, as it would in 3270. Instead, the cursor remains where it was, but when the address digits are keyed in, they appear at the proper place in the indicator line.

ASCII Pass-Through Mode

When your ASCII display station is connected to an ASCII host through a 3174 controller, you are operating in ASCII pass-through mode. When you receive the Ready message, you can begin communicating with the ASCII host.

Note: The Ready message appears when connected to the modem for manual call ports on an ASCII host. On a leased line the host is assumed available and the Ready message appears whenever the port is connected.

The set of rules that you should follow when in this mode are determined by the ASCII host application. Contact the system administrator if you have questions about the ASCII host.

All key sequences that can be used when talking directly to the ASCII host can also be used when using ASCII pass-through, except for the ESC backspace sequence, which is used to call the Connection Menu.

You do not need to reset all the setup options for your display station to match the ASCII host you are connecting to. The AEA corrects what was configured for that host.

Modem Operations

Following are some differences that you may see when attaching to a smart modem through the AEA.

- You may not always be able to gain access to the host you select because the port through which the connection is made is selected from a pool of ports that may already be busy.
- The phone number of the ASCII host you connect to can be stored at customization time so that a call can be placed automatically when a connection with that host is requested.
- The options of manually dialing (keying in the phone number on your display station keyboard) and testing modems from a display station are available.
- Some modem features, such as audible call progress signaling and switch-to-voice features, cannot be used.

Chapter 3. ASCII Emulation

Introduction

The 3174 Establishment Controller provides an ASCII-emulation mode for 3270 terminals. With this function, your 3270 terminal or printer can emulate an ASCII display station or printer for connection to ASCII hosts or public data networks using the DEC VT100 or IBM 3101 data stream. You access the different hosts by using the Connection Menu.

Getting Connected to a Host

The first thing you need to do before you can work in ASCII-emulation mode is to get your 3270 display station to communicate with an ASCII host.

Establishing the Host Connection

The following steps tell you how to establish this connection.

1. Turn on the power on your display station.
2. You should see the READY message on your screen if you are immediately connected to an ASCII host, and either VT100 or 3101 should appear in the operator information area. (This means that you do not have to use the Connection Menu unless you want to select a different host; for example, if you see the 3270 host logo, you may want to use the Connection Menu to connect to an ASCII host.) Otherwise, you will see the Connection Menu.

Using the Connection Menu

The Connection Menu (Figure 3-1) allows you to connect to the different hosts that your terminal can access. For example, if your display station can access more than one host, you select the host you want to connect to from the Connection Menu.

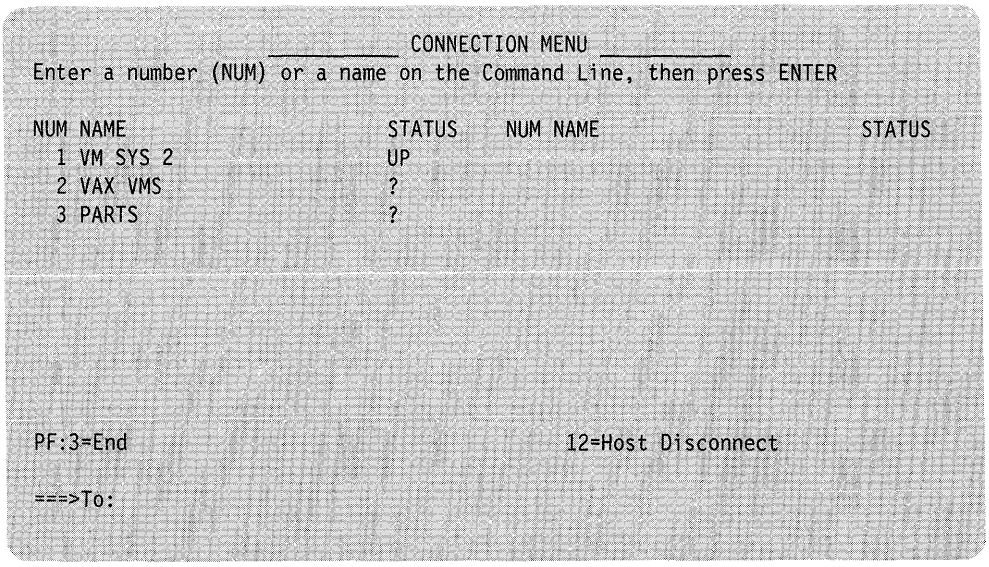


Figure 3-1. Sample Connection Menu (ASCII Emulation). Type in the number or name of the host you want to connect to.

You use the Connection Menu to request a different host session or to check the status of a host. The Connection Menu contains a list of all the possible host destinations and provides information you need to use to connect to a host. If you are authorized, you may select a destination from this menu.

The following lists describe the messages that show the status of the host and the functions of the PF keys:

Status	Meaning
UP	The host appears active and available.
?	Host status cannot be determined. A request to establish a session with the host either succeeds or provides more detailed status information.
DOWN	The host is inactive, or all the ports that could access it are broken.
BUSY	The host is active, but all the ports to it are in use.
DIAL	The host is accessed through a switched port. A request to connect to the host either succeeds or provides more detailed status information.

PF Keys	Function
PF3	Pressing PF3 returns you to the session you left. On an SNA controller, if you press PF3 without connecting to a new host, the previously connected host session resumes. On a non-SNA controller, the previously connected *ASCII* host session resumes. If the previous connection was to the 3270 host, the connection is reestablished; however, it may be necessary for you to log on again.
PF12	Pressing PF12 breaks the connection between the 3174 and the host if you are connected to an ASCII host. This releases the host port for other users and, if you are using a dial connection, disconnects the switched connection, ending telephone charges.

To get to a host from the Connection Menu, type in the number or name from the Connection Menu of the host you want to connect to.

Notes:

1. To return to the Connection Menu, use the extension mode as follows:
   - Base keyboard: Press ALT Erase EOF (you can see the extension mode indicator in the operator information area); then type **m**.
   - Converged keyboard: Press Extension mode and type **m**.
   - IBM Enhanced keyboard: Press Extension mode and type **m**.
2. To update the Connection Menu (that is, to have the controller refresh the status column of the menu), press Enter.
3. If you want to connect to a dial host, you may have to key in the dial number manually after you see the READY message on the screen. Your system administrator can tell you what your dial number is.
4. Either VT100 or 3101 appears on the indicator line, depending on which data stream is used by the ASCII host.

5. If your host is configured for leased lines, the AEA does not check whether the host is active. If the host is inactive, you receive the Ready prompt, but no response from the host. If this happens and if multiple leased lines are configured for the host, you can return to the Connection Menu and try the connection again. The AEA attempts to connect to a different port each time.

DEC VT100 Emulation

The DEC VT100 asynchronous terminal closely follows the ANSI X3.64 standard. When you use a 3270 display station to emulate a VT100, you can use many applications developed for the VT100. If you are not familiar with VT100 operation, you may want to refer to the *DEC VT100 User's Guide*.

Using Your Keyboard

The keyboard map defines the translation that occurs when you are using a 3270 display station to emulate a VT100 display station. Many keys on the 3270 display keyboard have different functions during emulation of the VT100. The three keyboard maps for VT100 data stream emulation are shown in Appendix A. **Select the VT100 keyboard map that corresponds to the type of 3270 keyboard you are using.** For example, if you are using a Converged keyboard, use the VT100 Emulation Using a Converged Keyboard map. If you are not sure what type of 3270 keyboard you have, see the keyboard diagrams in Chapter 1.

CAPS LOCK Key

The CAPS LOCK key (shift lock on the Base and Converged keyboards) allows the transmission of uppercase alphabetic characters only. The CAPS LOCK function affects only the 26 alphabetic keys: all numeric and special symbol keys remain in lowercase.

Typematic Keys

Keys that are typematic on a 3270 keyboard continue to be typematic during VT100 emulation, and vice versa. The keys that are nontypematic on the VT100 are ESC, NO SCROLL, TAB, RETURN, and keys pressed with CTRL. Only ESC and NO SCROLL have nontypematic 3270 equivalents: the remainder are typematic.

CTRL Key

VT100 emulation send any of the standard ANSI 3.4 (ASCII) control codes. You generate these characters by pressing the ALT key (=CTRL) and the character key in question. For example, ALT A generates the SOH control code. Note that some ALT combinations use different graphics than VT100.

BREAK Key

The mapped BREAK key produces a short break of 0.2333 second; a SHIFT BREAK produces a long break of 3.5 seconds. The CTRL BREAK function generates the answerback message.VT100.

Function Keys

The mapped versions of VT100 function keys send the same codes to the host as the real VT100 keys. See Figure 3-2.

Table 3-1. Cursor Key Mode

	Code Sent	
Key	**Set**	**Reset**
Cursor Up	ESC 0 A	ESC (left bracket) A
Cursor Down	ESC 0 B	ESC (left bracket) B
Cursor Right	ESC 0 C	ESC (left bracket) C
Cursor Left	ESC 0 D	ESC (left bracket) D
Note: Cursor Key Mode is set by the application using escape sequences.		

Table 3-2. Keypad Mode

	Code Sent	
Key	**Numeric**	**Application**
0	0	ESC 0 p
1	1	ESC 0 q
2	2	ESC 0 r
3	3	ESC 0 s
4	4	ESC 0 t
5	5	ESC 0 u
6	6	ESC 0 v
7	7	ESC 0 w
8	8	ESC 0 x
9	9	ESC 0 y
-	-	ESC 0 m
,	,	ESC 0 l
.	.	ESC 0 n
ENTER	CR	ESC 0 M
PF1	ESC 0 P	ESC 0 P
PF2	ESC 0 Q	ESC 0 Q
PF3	ESC 0 R	ESC 0 R
PF4	ESC 0 S	ESC 0 S
Note: Keypad Mode is set by the application using escape sequences.		

Figure 3-2. VT100 Function Key Map

A number of VT100 keyboard functions are not supported by the emulation.

These keys are used exclusively for VT100 setup mode, which is handled by 3174 customization. The key functions are:

SETUP	The SETUP key is used to put the display into setup mode. This mode is not supported. A VT100 is customized through setup.
SET/CLEAR TAB	Terminal-defined tab stops are not supported.
CLEAR ALL TABS	Terminal-defined tab stops are not supported.
LINE LOCAL	LOCAL mode is not supported. LOCAL mode allows the user to type at the display without sending any data to the host. 3270 display stations can be tested with the IBM tests provided.
SETUP A B	This key allows the user to shift between setup screens; setup mode is not supported.
TOGGLE 1 0	TOGGLE 1 0 is used to change setup values; setup mode is not supported.
TRANSMIT SPEED	Baud rate is set during 3174 customizing (Q733).
RECEIVE SPEED	Baud rate is set during 3174 customizing (Q733).
80/132 COLUMNS	The emulation does not support the 132-column screen size.
RESET	RESET is used to change all VT100 configuration options to their permanently stored values.
SHIFT S	While in setup mode, entering an uppercase **S** saves configuration settings. This function is not supported.

Setup

A VT100 has a variety of setup options that can be used to match the terminal to host capabilities or to make the terminal easier to use. Some of these setup features are emulated by the AEA feature. Most of them are specified during 3174 customization. Some can be altered from the host using control sequences handled by the emulation.

The following table summarizes the VT100 setup options and indicates whether the AEA feature supports them.

Setup Feature	AEA Support ?
ANSI/VT52 Mode	No
Answerback Message	No
Auto Repeat	No
Bits per character	No
Characters per line (80/132)	No
Interlace	No
Line/Local	No
Parity Sense	No
Pound sign display	No
Power	No

Setup Feature	AEA Support ?
Screen Background	No
Smooth Scroll	No
Tabs	No
Auto XON/XOFF	Yes
Cursor	Yes
Keyclick	Yes
Margin Bell	Yes
New Line	Yes
Parity	Yes
Receive Speed	Yes
Screen Brightness	Yes
Transmit Speed	Yes
Wrap around (autowrap)	Yes

ANSI/VT52 Mode (Not mapped): VT100s can emulate their predecessor, the VT52. The AEA does not support setup as a VT52; it does support most VT52 escape sequences and the VT100 escape sequence that enters and exits VT52 emulation mode.

Answerback Message (Not mapped): The answerback feature allows a message to be sent to the host when CTRL-BREAK (ALT-Field Mark) is pressed or when the host requests it by sending ENQ. The AEA sends an answerback message (VT100), but the text of the answerback message is stored in the 3174 and cannot be altered through setup or customization.

Auto Repeat (Not mapped): The VT100 can disable its typematic keyboard action. 3270 typematic keys remain typematic during VT100 emulation.

Bits per character (Not mapped): This option defines whether a VT100 sends 7 or 8 data bits per character. When it sends 8, the high bit is set to 0. The AEA always sends 7 data bits.

Characters per line (80/132) (Not mapped): The VT100 display can switch between 80 columns and 132 columns; 3178s do not support this feature.

Interlace (Not mapped): This option is used for a high-resolution hardware feature on VT100.

Line/Local (Not mapped): Local mode is not supported. (See the LINE/LOCAL key discussion above.)

Pound sign display (Not mapped): The VT100 can display a British pound sign (£) in place of an octothorp (#).

Power (Not mapped): VT100 offers a choice of 50- or 60-cycle power. This is supported differently for 3270 displays.

Screen Background (Not mapped): Reverse video is not supported on 3178 displays.

Smooth Scroll (Not mapped): VT100 can scroll one display line at a time (jump scroll) or one raster line at a time (smooth scroll). 3270 displays do not have a smooth scroll capability.

Tabs (Not mapped): Local setting of tab stops is not supported, but the host may define tab stops with an escape sequence.

Auto XON/XOFF (Mapped): This option is supported by specifying at customization the type of flow control used by the ASCII host.

Cursor (Mapped): 3270 displays support both block and underscore cursors.

Keyclick (Mapped): 3270 displays provide a keyclick control.

Margin Bell (Mapped): An AEA customization option controls whether the audible alarm is sounded when the cursor is 10 spaces from the end of a line.

New Line (Mapped): An AEA customization option controls whether the new line key sends carriage return and line feed or just carriage return.

Parity (Mapped): The ASCII host's use of odd or even parity is specified at customizing.

Parity Sense (Not Mapped): Parity is always checked.

Receive Speed (Mapped): The VT100 allows the receive and transmit speeds to be specified independently, but the AEA supports only a single common speed. The AEA supports the following VT100 speeds: 300, 600, 1200, 2400, 4800, 9600, and 19 200 bps. The speed the host uses is specified at customization. The following VT100 speeds are not supported: 50, 75, 110, 134.5, 150, 200, 1800, 2000, and 3600.

Screen Brightness (Mapped): 3270 displays provide a screen brightness control.

Transmit Speed (Mapped): See Receive Speed.

Wraparound (autowrap) (Mapped): An AEA customization option defines whether the cursor moves to the next line or remains in column 80 after a character is typed there.

Status Line Format

The status line characters are arranged as shown in Table 3-3. The first column in the table tells you in which column of the display station screen you find the indicator. The second column shows the indicator you see on your 3270 display station. The third column shows the light-emitting diode (LED) label on the VT100 display station. The last column explains the symbol.

Table 3-3. VT100-Emulation Status Line Format			
Character Position	**ASCII Emulation**	**VT100 Label**	**Meaning**
9 – 17	X nnn	KBDLOCKED	Machine check
	X ?+	KBDLOCKED	Input not accepted
	X 0	KBDLOCKED	Security key
	X	KBDLOCKED	Printer down
	X	KBDLOCKED	Printer busy
	X	KBDLOCKED	Printer very busy
21 – 29	X	KBDLOCKED	Wait (XOFF received)
46 – 50	VT100	ON LINE	VT100 mode active
	VT52	ON LINE	VT52 mode active
75 – 80	>1234<	L1, L2, L3, L4	Programmable LEDs

Table 3-4 shows the symbols you see on the status line to denote 3174 attachment, shift, modes, and printer status. These indicators do not map VT100 status; rather, they show the 3270 attachment indicators that remain valid in ASCII-emulation mode.

Table 3-4. 3174 VT100-Emulation Status Line Format			
Character Position	**Symbol Used**	**3270 Usage**	**Meaning**
1	S	3174 attach	Attached to the 3174
4	LT–*n*	MLT indicator	Logical terminal number
18 – 20	nnn	Station set identifier	Specifies the Station Set number of the ASCII host in use by this session (Configuration B support only)
31 – 50		Station set descriptor	Specifies the name assigned to the ASCII host used by this session (Configuration B support only)
36 – 40		Shift	Upshift
		Mode	Extended select
60 – 64	nn	Printer status	Assigned printer
	nn	Printer status	Printing
		Printer status	Printer failure
	??	Printer status	Printer ID changed

Figure 3-3 on page 3-10 gives an example of a possible status line. The column numbers below the status line tell you in which column a character appear. The characters in the example are explained at the bottom of the figure.

```
S                                          VT100          ▭▭31          > 3 <
12345678901234567890123456789012345678901234567890123456789012345678901234567890
         1         2         3         4         5         6         7         8
```

Character	Meaning
S	Attached to the 3174
VT100	VT100 mode active
▭▭ 31	Printer 31 assigned
> 3 <	LED number 3 is lit

Figure 3-3. Sample Status Line in VT100 Emulation

Host Data Streams

The AEA's VT100 emulation supports all ASCII control codes in the same way as a VT100 does:

Control Character	Action Taken
NUL	Ignored on input.
ENQ	Transmit an answerback message.
BEL	Sounds the terminal's audible alarm.
BS	Back Space one character — if at the left margin, the BS is ignored.
HT	Tab cursor to the next tab stop, or to the right margin.
LF	Causes a line feed or new line.
VT	Interpreted as line feed (LF).
FF	Interpreted as LF.
CR	Move cursor to left margin.
SO	Used to invoke the Character Set mapped into G1. Only the DEC Special Graphics Character Set is supported.
SI	Used to invoke the Character Set mapped into G0. Only the DEC Special Graphics Character Set is supported.
DC1 (XON)	Causes terminal to resume transmission and keyboard to unlock.
DC3 (XOFF)	Causes the terminal to stop transmitting all characters except XOFF and XON. The keyboard locks, and the Wait symbol (clock) appears.
CAN	If received during a control sequence, the sequence is immediately terminated, and a parity symbol is displayed.
SUB	Interpreted as CAN.
ESC	Introduces a control sequence.
DEL	Ignored on input.

All other ASCII control codes are ignored by the VT100 and by the AEA when emulating VT100.

If an XON or XOFF control character is received during an escape sequence, the AEA (unlike the VT100) will interrupt the escape sequence and send any remaining characters to the display station.

Most device control in VT100 is done with escape sequences. The map accepts all the escape sequences handled by the VT100 and performs the same function as VT100 for most of them. Where the requested function is not performed, the sequence is still parsed and any associated parameters are skipped so that the rest of the data stream can be processed correctly.

Table 3-5 lists all the escape sequences supported by a standard VT100 and indicates the support or nonsupport of the AEA's VT100 emulation. Refer to VT100 documentation for a complete description of VT100 device control. Those sequences that the AEA does not support completely are discussed in the notes after the following table.

Table 3-5 (Page 1 of 2). VT100 Emulation Escape Sequences

Description	Escape Sequence	AEA Support	See Note
Change line to 1W 1H	ESC # 5	Yes	
Change line to 2H bot half	ESC # 4	Yes	1
Change line to 2H top half	ESC # 3	Yes	2
Change line to 2W	ESC # 6	Yes	3
Cursor Backward	ESC [Pn D	Yes	
Cursor Down	ESC [Pn B	Yes	
Cursor Forward	ESC [Pn C	Yes	
Cursor Position	ESC [Pn;Pn H	Yes	
Cursor Position Report	ESC [Pn;Pn R	Yes	
Cursor Up	ESC [Pn A	Yes	
Define Scrolling Region	ESC [Pn;Pn r	Yes	
Device Attr report	ESC [?1;Ps c	Yes	
Device Attributes (old)	ESC Z	No	4
Device Attribute query	ESC [Pn c	Yes	
Device Status Report	ESC [Ps n	Yes	
DEC Req/Rept Term Parms	ESC [Pn;..;Pn x	Yes	
DECANM - ANSI/VT52 Mode	ESC [? 2 h	Yes	5
DECARM - Auto Repeat Mode	ESC [? 8 h	No	6
DECAWM - Auto Wrap Mode	ESC [? 7 h	Yes	
DECCKM - Cursor Key Mode	ESC [? 1 h	Yes	
DECCOLM - 80/132 column Mode	ESC [? 3 h	No	7
DECINLM - Interlace Mode	ESC [? 9 h	No	8
DECOM - Origin Mode	ESC [? 6 h	Yes	
DECSCLM - Smooth Scroll Mode	ESC [? 4 h	No	9

Table 3-5 (Page 2 of 2). VT100 Emulation Escape Sequences

Description	Escape Sequence	AEA Support	See Note
DECSCNM - Screen Background	ESC [? 5 h	No	10
Erase in Display	ESC [Ps J	Yes	
Erase in Line	ESC [Ps K	Yes	
Fill Screen with E's	ESC # 8	Yes	
Graphic Processor Off	ESC 2	No	11
Graphic Processor On	ESC 1	No	12
Hard Copy	ESC # 7	No	13
Horizontal and Vertical Pos.	ESC [Pn;Pn f	Yes	
Horizontal Tab Set	ESC H	Yes	
Index	ESC D	Yes	
Invoke Tests	ESC [2;Ps y	No	14
Keypad Mode = Application	ESC =	Yes	
Keypad Mode = Numeric	ESC >	Yes	
Load Programmable LEDs	ESC [Ps;..;Ps q	Yes	
Lock Keyboard	ESC :	Yes	
New Line Mode	ESC [20 h	Yes	
Next Line	ESC E	Yes	
Reset to Initial State	ESC c	Yes	
Reset DEC Mode	ESC [? Ps l	Yes	
Reset Mode	ESC [Ps l	Yes	
Restore Cursor and Attrib.s	ESC 8	Yes	
Reverse Index	ESC M	Yes	
Save Cursor and Attributes	ESC 7	Yes	
Select Graphic Rendition	ESC [Ps;..;Ps m	Yes	15
Set Char Set 0 = special	ESC (0	Yes	16
Set Char Set 0 = Alt ROM	ESC (1	No	
Set Char Set 0 = AROM+sp	ESC (2	No	
Set Char Set 0 = UK	ESC (A	No	
Set Char Set 0 = USASCII	ESC (B	Yes	
Set Char Set 1 = special	ESC) 0	Yes	16
Set Char Set 1 = Alt ROM	ESC) 1	No	
Set Char Set 1 = AROM+sp	ESC) 2	No	
Set Char Set 1 = UK	ESC) A	No	
Set Char Set 1 = USASCII	ESC) B	Yes	
Tab Clear	ESC [Ps g	Yes	
Unlock Keyboard	ESC ;	Yes	

Notes:

1. Change line to two-high bottom half (mapped)
2. Change line to two-high top half (mapped)
3. Change line to two-wide (mapped)

   Characters that are two lines high or two character positions wide cannot be constructed on 3178 displays. Double-width characters are emulated by inserting a space after every character supposed to be double width. Double-height characters are emulated by inserting a blank line as the bottom half of any line supposed to be double height.
4. Device Attributes (old) (not mapped).

   This sequence is no longer used—the DA sequence is now preferred and is supported by the emulation.
5. DECANM—ANSI/VT52 Mode (mapped)

   VT100s can emulate their predecessor, the VT52. The AEA supports the VT100 escape sequence that enters VT52 emulation mode and most of the escape sequences provided by VT100's VT52 subset:

Description	Escape Sequence	AEA Support
Cursor Up	ESC A	Yes
Cursor Down	ESC B	Yes
Cursor Right	ESC C	Yes
Cursor Left	ESC D	Yes
Select Special Graphics	ESC F	No
Select ASCII Character Set	ESC G	Yes
Cursor Home	ESC H	Yes
Reverse Line Feed	ESC I	Yes
Erase to End Of Screen	ESC J	Yes
Erase to End Of Line	ESC K	Yes
Cursor Position	ESC Y Pn Pn	Yes
Identify	ESC Z	Yes
Enter Alt Keypad Mode	ESC =	Yes
Exit Alt Keypad Mode	ESC >	Yes
Graphics Processor On	ESC 1	No
Graphics Processor Off	ESC 2	No
Enter ANSI Mode	ESC <	Yes
Identify Response	ESC / Z	Yes

   Those not supported have the same restrictions as the corresponding VT100 sequences.
6. DECARM—Auto Repeat Mode (not mapped)
7. DECCOLM—80/132 column Mode (not mapped)
8. DECINLM—Interlace Mode (not mapped)
9. DECSCLM—Smooth Scroll Mode (not mapped)
10. DECSCNM—Screen Background (not mapped)

    These mode setting escape sequences allow the program to control various setup options. They are not supported by the AEA, because the corresponding setup options are not supported. See the description in the setup section.
11. Graphic Processor Off (not mapped)
12. Graphic Processor On (not mapped)

    These sequences start and stop a hardware feature of VT100 that is not emulated by the AEA.
13. Hard Copy (not mapped)

The 3270 display cannot attach a printer. Therefore, this command is not supported.

14. Invoke Tests (not mapped)

    The tests started by this sequence are not needed in a 3270 environment.

15. Select Graphic Rendition (mapped)

    This sequence is used to intensify, underscore, blink, or reverse screen characters on a VT100 display. The AEA maps these with field intensify on 3270 displays and is not able to highlight on a character-by-character basis but only on minimum units of words surrounded by spaces.

16. Set Character Set 0/1 (mapped)

    This sequence is used to invoke the ASCII character code set and special graphics sets including one containing figure drawing characters and mathematical symbols.

    For the VT100s, the ASCII character codes **ESC (0**, **ESC (B**, **ESC) 0**, and **ESC) B**, are used to define G1 and G0 with the ASCII character code set or the Special Graphics code set which contains figure drawing characters and mathematical symbols. 3270 terminals cannot display all these characters or symbols. The AEA will, however, recognize the ESC sequence and draw figures using an emulated graphics subset. The ESC sequences in conjunction with the SI (Shift-In) and SO (Shift-Out) characters will place the AEA in Special Graphics mode or ASCII Character mode. While in Graphics mode the AEA will map some of the graphics characters to 3270 characters and display others as blanks, as indicated in the table below.

Hex Code	US Character	Special Graphics Character	3270 Emulated Character
5F	-	Blank	Blank
60	-	Diamond	Blank
61	a	Checkerboard	Blank
62	b	Horizontal Tab (HT)	Blank
63	c	Form Feed (FF)	Blank
64	d	Carriage Return (CR)	Blank
65	e	Line Feed (LF)	Blank
66	f	Degree Symbol	Blank
67	g	Plus/Minus	Blank
68	h	New Line (NL)	Blank
69	i	Vertical Tab (VT)	Blank
6A	j	Lower-right Corner	+
6B	k	Upper-right Corner	+
6C	l	Upper-left Corner	+
6D	m	Lower-right Corner	+
6E	n	Crossing Lines	+
6F	o	Horizontal Line - Scan 1	-
70	p	Horizontal Line - Scan 3	-
71	q	Horizontal Line - Scan 5	-
72	r	Horizontal Line - Scan 7	-
73	s	Horizontal Line - Scan 5	-
74	t	Left "T"	+
75	u	Right "T"	+
76	v	Left "T"	+
77	w	Top "T"	+
78	x	Vertical Bar	Vertical Bar
79	y	Less than or equal to	Blank
7A	z	Greater than or equal to	Blank
7B		Pi	Blank
7C	|	Not equal to	Blank
7D		UK pound sign	Blank
7E	-	Centered dot	Blank

3101 Emulation

The 3101 can operate in block or character mode. In block mode, the terminal displays and holds keystrokes, performs local editing (insert/delete), and forwards modified fields to the host when the operator presses SEND. Character mode is more like VT100—all keystrokes are processed by the host before being echoed back and displayed. Only **character mode** is supported by the AEA's 3101 emulation. If you are unfamiliar with 3101 operation, refer to the *IBM 3101 Display Terminal Description*, GA18-2033.

Using Your Keyboard

The keyboard map defines the translation that occurs when you are using a 3270 display station to emulate a 3101 display station. The 3101 and 3270 keyboards are similar; the main differences are in the ASCII bracket and caret symbols. The three keyboard maps for 3101 data stream emulation are shown in Appendix A. Select the 3101 keyboard map that corresponds to the type of 3270 keyboard you are using. For example, if you are using a 3278 keyboard, use the IBM 3101 Emulation Using a Base Keyboard map. If you are not sure what type of 3270 keyboard you have, see the keyboard diagrams in Chapter 1.

Typematic Keys

Keys that are typematic on a 3270 keyboard continue to be typematic during 3101 emulation. The 3101 and 3270 keyboards have the same typematic keys except for keys pressed with CTRL (ALT on a 3270), which are typematic on the 3270 but not on the 3101.

ALT Key

The emulation sends any of the standard ANSI 3.4 (ASCII) control codes. You generate these characters by pressing the ALT key (=CTRL) and the character key in question; for example, ALT A generates the SOH control code.

Break Key

The break key (FIELD MARK or PA2 on the keyboard) produces a break signal of 500 milliseconds.

Function Keys

The mapped versions of 3101 function keys send the same codes to the line as the real keys:

Key	Code Sent	Key	Code Sent
CURSOR UP	ESC A	PF1	ESC a CR
CURSOR DOWN	ESC B	PF2	ESC b CR
CURSOR LEFT	ESC C	PF3	ESC c CR
CURSOR RIGHT	ESC D	PF4	ESC d CR
HOME	ESC H	PF5	ESC e CR
NEW LINE	CR or CR/LF	PF6	ESC f CR
CLEAR	ESC L	PF7	ESC g CR
ERASE INPUT	ESC K	PF8	ESC h CR
ERASE EOL/EOF	ESC I		
ERASE EOS	ESC J		

The following 3101 keyboard functions are not supported by the emulation:

- Block Mode keys:

  ATTR
  PRGM MODE
  SEND MSG
  SEND
  SEND LINE
  INS CHAR
  INS LINE
  CANCEL
  DEL CHAR
  DEL LINE

- Auxiliary printer control keys:

  AUX
  PRINT LINE
  PRINT MSG

- The 3101 LOCAL mode key.

Setup

A 3101 has a variety of setup options that can be used to match the terminal-to-host capabilities, or to make the terminal easier to use. Some of these setup features are emulated by the AEA. Most of them are specified during 3174 customization.

The following table summarizes the setup options supported by 3101s and indicates AEA support or nonsupport. Refer to the notes after the table for details on some of the setup options.

Set-up Feature	AEA Support	Reason
Aux Line Speed	No	Block Mode only
Block/Character Mode	No	Block Mode only
Half or Full Duplex	No	Full Duplex only
Null Suppress	No	Block Mode only
Permanent or Controlled RTS	No	Duplex only
Reverse Channel Use	No	Duplex only
Reverse Video	No	See Note 1
Send Line Option	No	Block Mode only
Time Fill Characters	No	Block Mode only
Auto Line Feed on CR in	Yes	See Note 2
Auto Line Feed on CR out	Yes	See Note 3
Auto New Line – column 80	Yes	See Note 4
Cursor Blink	Yes	See Note 5
Line Turn Character	Yes	See Note 6
Mono-Case/Dual-Case	Yes	See Note 7
Parity = Odd, Even, Mark, Space	Yes	See Note 8
EIA 232D, 422A, or Current	Yes	See Note 9
Scrolling on/off	Yes	See Note 10
Speed setting	Yes	See Note 11
1 or 2 Stop Bits	Yes	See Note 12

Notes:

1. Not supported by 3270 displays.
2. Customizing option.
3. Customizing option.
4. Customizing option.
5. 3270 keyboard option.
6. Customizing option.
7. Supported via the 3270 display's mono/dual case display switch.
8. Customizing option.
9. The AEA supports only EIA 232D attachment.
10. Scrolling mode can be specified at customizing.
11. The AEA supports the following 3101 speeds: 300, 600, 1200, 2400, 4800, and 9600 bps. Speeds not supported are 110, 150, 200, and 1800 bps.
12. Customizing option.

Status Line Format

The status line characters are arranged as shown in Table 3-6. The first column in the table tells you in which column of the display station screen you find the indicator. The second column shows the indicator you see on your ASCII display station. The third column shows the 3101 indicator. The last column explains the symbol.

Table 3-6. IBM 3101-Emulation Status Line Format

Character Position	ASCII Emulation	3101 Indicator	Meaning
9 – 17	X ?+	LOCK –RE-KEY	Input not accepted
21 – 29	X SYSTEM	SYSTEM COMMAND	System wait
46 – 50	3101	Light 2	3101 mode active
60 – 64	▭▬nn	PRINTING	Printing

Table 3-7 shows the symbols you see on the status line to denote 3174 attachment, shift, modes, and printer status.

Table 3-7. 3174 3101-Emulation Status Line Format

Character Position	Symbol Used	3270 Usage	Meaning
1	S	3174 attach	Attached to the 3174
4	LT – *n*	MLT indicator	Logical terminal number
18 – 20	nnn	Station set identifier	Specifies the Station Set number of the ASCII host in use by this session (Configuration B support only)
31 – 50		Station set descriptor	Specifies the name assigned to the ASCII host used by this session (Configuration B support only)
9 – 17	✖ nn	Input inhibit	Machine check
	✖	Input inhibit	Security key
	✖	Input inhibit	Printer not working
	✖	Input inhibit	Printer busy
	✖	Input inhibit	Printer very busy
36 – 44	▶	Keyboard mode	Extended select
	⬆	Shift	Upshift
60 – 64	nn	Printer status	Assigned printer
	nn	Printer status	Printing
		Printer status	Printer failure
	??	Printer Status	Printer ID changed

Figure 3-4 gives an example of a possible status line. The characters in the example are explained after the column numbers.

```
S                                                  3101          31
12345678901234567890123456789012345678901234567890123456789012345678901234567890
         1         2         3         4         5         6         7         8
```

Character	Meaning
S	Attached to the 3174
3101	3101 mode active
31	Printer 31 assigned

Figure 3-4. Sample Status Line in IBM 3101-Emulation

Host Data Streams

The AEA's 3101 emulation supports most of the ASCII control codes in the same way as the 3101 does:

Control Character	Action Taken
NUL	Receipt of more than seven NULLS in a row causes a logical keyboard lock.
BEL	Sounds the terminal's audible alarm.
BS	Backspace the cursor one position.
HT	Horizontal Tab cursor to next Tab Stop.
VT	Moves the cursor to next lower line.
FF	Causes Erase Input function if SCROLL mode is OFF. Moves the cursor to the next lower line if SCROLL mode is ON.
DLE.EOT	Disconnect
CR	Moves the cursor to the first character position of the current line (or next lower line).
ESC	Introduces a control sequence (see below).

The following ASCII controls are not mapped:

Control Character	Action Taken
DLE.STX	Enter transparent mode (not supported)
DLE.ETX	Exit transparent mode (not supported)

All other ASCII control codes are ignored by the 3101 and are ignored by the AEA when emulating 3101.

Most device control in the 3101 is done with escape sequences. The map accepts all the escape sequences handled by the 3101 and does the same function as the 3101 for most of them. Where the requested function is not done, the sequence is still parsed and any associated parameters are skipped so that the rest of the data stream can be processed correctly.

Table 3-8 lists all the escape sequences supported by a standard 3101, and indicates AEA support or nonsupport. Refer to 3101 documentation for a complete description of 3101 device control. Those sequences that the AEA does not support are used only in block mode.

Table 3-8 (Page 1 of 2). 3101 Emulation Escape Sequences

Description	Escape Sequence	AEA Support
Back Tab (2X only)	ESC 2	No
Cancel (2X only)	ESC S	No
Clear All (inc tabs)	ESC L	Yes
Clear Tab	ESC 1	Yes
Cursor Down	ESC B	Yes

Table 3-8 (Page 2 of 2). 3101 Emulation Escape Sequences

Description	Escape Sequence	AEA Support
Cursor Home	ESC H	Yes
Cursor Left	ESC D	Yes
Cursor Right	ESC C	Yes
Cursor Up	ESC A	Yes
Delete Character (Blk Mode)	ESC Q	No
Delete Line (Blk Mode)	ESC O	No
Erase to end of Line	ESC I	Yes
Erase to end of Screen	ESC J	Yes
Erase Screen (leave tabs)	ESC K	Yes
Insert Character (Blk Mode)	ESC P	No
Insert Cursor	ESC Z	Yes
Insert Line (Blk Mode)	ESC N	No
Keyboard Lock	ESC :	Yes
Keyboard Unlock	ESC ;	Yes
Print Line (2X only)	ESC U	No
Print Message (2X only)	ESC V	No
Print Page (2X only)	ESC W	No
Read Buffer (Blk Mode only)	ESC 8	No
Read Cursor Address	ESC 5	Yes
Read Setup Switch	ESC 7 x y	Yes
Read Status	ESC 6 x y	Yes
Set Buffer Address	ESC X x y	Yes
Set Control	ESC 9 x	Yes
Set Cursor Address	ESC Y x y	Yes
Set Tab	ESC 0	Yes
Start Field (2X only)	ESC 3	No
Write Send Mark (2X only)	ESC E	No

ASCII Printer Emulation

The AEA allows 3287-class printers to emulate ASCII printers. All ASCII characters can be printed by the 3270 printers supported by the AEA if they are set up to print International Alphabet number 1 or 5. The ASCII graphic character set is a subset of these code sets. Also, the AEA supports the basic set of ASCII control codes shown in Table 3-9.

Table 3-9 (Page 1 of 2). ASCII Control Codes

Character	Hex Code	Action Taken
BEL	X'07'	Sound audible alarm

Table 3-9 (Page 2 of 2). ASCII Control Codes		
Character	**Hex Code**	**Action Taken**
CR	X'0D'	Carriage return
FF	X'0C'	Form feed
HT	X'09'	Tab – Skip to next multiple of 8
LF	X'0A'	New line
US	X'1F'	Carriage, line feed
VT	X'0B'	New line
XON (DC1)	X'11'	Resume sending
XOFF (DC3)	X'13'	Stop sending

Advanced ASCII printer capabilities, such as underscoring, programmable fonts, and color, are not supported.

Some ASCII printers send status indications to the host on detecting conditions such as out of paper, buffer full, and broken parts. The AEA gives an indication, using flow control indicators, that its buffer is full or that it is not ready to print, but does not otherwise send status to the host. The 3270 printer hold print control stops the host from sending data if the host supports flow control.

ASCII Emulation Function on PCs Emulating 3270 Devices

A PC attached to the terminal adapter operating in CUT mode can use the ASCII emulation function. Using the terminal in ASCII-emulation mode requires learning some new keystrokes. Many of these keystrokes require an ALT shift sequence, for example, the control code characters in VT100-emulation mode are typed using ALT-shift.

Because some emulation type terminals do not notify the 3174 of ALT shift changes, a *pseudo-ALT* shift is provided. You initiate pseudo-ALT shift by entering extension mode and typing the **A** key. You deactivate it by reentering extension mode and typing the **B** key.

In the following example, assume you want to type in ALT / on a 3194 Display Station. Enter extension mode by pressing the ExSel key and initiate psuedo-ALT by typing an **A**; now type the */*. Reenter extension mode by pressing the ExSel key and deactivate the pseudo-ALT by typing a **B**. All keys typed in this mode are interpreted by the controller as ALT shift keys. Refer to Table 1-3 to see what the extension-mode key is for your terminal.

In the figures on pages A-12 through A-15, this pseudo-ALT shift is designated ***ALT*** and extension mode is designated **EXTM**.

The keyboard maps define the translation that occurs during VT100 emulation. Some keys on the 3270 display station keyboard have different functions during VT100 emulation. Terminals in 3270-emulation mode have a different translation to perform.

The figures on pages A-12 through A-15 show the key mappings from the default key assignments. Many CUT emulators provide keyboard definition facilities. It is

recommended that you **not** use keyboard definition facilities with ASCII emulation. The results are unpredictable, especially if keys are moved from one shift to another. The figures on pages A-13 and A-15 are the maps for VT100 emulation; the figures on pages A-12 and A-14 are the maps for IBM 3101 emulation.

Differences Users May See in ASCII Emulation

As a 3270 user accustomed to controller keystroking, you may see a slight difference in keying response time when you are connected to an ASCII host, especially when dial lines are used. Following are some of the differences you may see if your display station and keyboard are communicating with an ASCII host that uses a DEC VT100[1] data stream, or an IBM 3101 data stream.

DEC VT100 Data Stream Emulation

The appearance of the display screen, and the use of the keyboard on a 3270 that is emulating a DEC VT100, matches a real DEC VT100 very closely. However, you might notice some differences:

- The Select Character Set escape sequences for US ASCII are **ESC (B** and **ESC) B**. The Select Character Set escape sequences for Special Graphics are **ESC (0** and **ESC) 0**. These sequences are recognized by the AEA. All other Select Character Set sequences are regarded as invalid, and the command is discarded. These sequences allow the terminal to emulate the VT100's figure-drawing capability. However, the graphics characters displayed are different from those displayed by a real VT100. For example, ┼ is displayed as +, and characters that cannot be emulated are displayed as blanks.
- The Set Column Mode escape sequence used to change the width of the display line to 132 characters is not available in ASCII-emulation mode. The wraparound setup feature setting determines what happens to characters beyond column 80.
- The setup options provided by ASCII emulation (such as Auto XON/XOFF, margin bell, and parity) can be changed only during controller customizing.

IBM 3101 Data Stream Emulation

The only significant difference between an IBM 3101 and ASCII emulation using the 3101 data stream is that the block mode function on a 3101 is not available in ASCII emulation:

- Most of the 3101 screen edit functions, such as delete and insert character, work only in block mode. Therefore, they are not available in ASCII-emulation mode unless the 3101 application provides an equivalent function.
- Highlighting and other field attributes are block mode functions; they are not available.

[1] Trademark of Digital Equipment Corporation.

Scrolling

You see a difference in screen scrolling when you are in ASCII-emulation mode. IBM 3270 display stations cannot roll the screen up one line at a time to make room for new data, so the full screen is written from the controller instead. If the controller is heavily used, less frequent and partial updates are used so that performance is not degraded for other users.

You can stop the scrolling by doing the following:

Data Stream	Do This
VT100	Use the 3270 mapped version of the NO-SCROLL key (backtab) to stop; use the NO-SCROLL key (backtab) again to resume.
3101	Use ALT S for XOFF to stop; use ALT Q for XON to resume. **Note:** Not all 3101 hosts observe this protocol; it is application-dependent.

Copy Printers

The copy printer operation (using the 3270 PRINT key) works during ASCII emulation just as it does in normal 3270 sessions, except that IDENT (used to alter the printer address) must be done in 3270 mode. The copy printer operation is normally limited to display stations and printers both operating in 3270 mode. However, this support is extended to allow a 3270 display station in ASCII-emulation mode to perform a local copy. The target printer must be in 3270 mode, and the IDENT process that is used to alter the copy printer assignment (if necessary) must be done while the 3270 display station is in 3270 mode (connected to a normal 3270 host or the Connection Menu).

Modem Operations

When you select an ASCII host from the Connection Menu, the host is usually called automatically. This means that, when you select an ASCII host with stored dial digits, the 3174 control unit selects a port that can get to the host, and places the call by sending the dial string to the modem attached to the port.

You also have the capability of manually dialing an ASCII host by typing in dial digits at the keyboard. When you select a host that must be dialed manually, the 3174 selects a port that can get to the host, and establishes a connection between the display station and the modem as if the modem were a host on a direct connection. You can then type in commands to the modem and receive its responses.

Chapter 4. Common Problems and What to Do

Common Problems in 3270 Emulation

Symptom	Probable Cause	Action
Extra, missing, or unintelligible characters on the screen	Incorrect terminal type specified	Use BREAK to disconnect; then repeat the connection procedure. When the terminal type menu appears, type the number that corresponds to the terminal you are using.
	Incompatible terminal mode	Verify that your terminal is set up to emulate the correct terminal type.
	Setup mismatch with customizing	Read the setup information for your terminal by going into setup mode. Refer to Appendix B and verify that your terminal setup matches the information in that appendix. Consult your system administrator.
	Telephone line trouble (or noise)	Enter the REFRESH function key sequence to clear and rewrite the entire screen. Clearing the screen should remove incorrect characters resulting from intermittent line hits. If the problem persists or is severe, for switched connections, hang up and establish a new connection; for nonswitched connections, contact your telephone company representative.
Nothing appears on the screen.	The controller may be waiting for an autobaud sequence.	Press the Carriage Return (CR) key, type a period (.), and then press the CR key again. Do this several times.
	No connection	Check your cables.
	Setup mismatch with customizing	Read the setup information for your terminal by going into setup mode. Refer to Appendix B and verify that your terminal setup matches the information in that appendix. Consult your system administrator.
	Keyboard locked	Check the status line to determine the cause of the keyboard lock. Press ESC ? to view the status line if your terminal does not have a 25th line. Use your Reset key sequence to clear the condition.
	Flow control hang	Send XON (CTRL Q).
	Modem Problems	Check that data is arriving at the 3174 and it is the same as the data keyed at the ASCII terminal.
Display screen shifted up one line	Incorrect auto-scroll or auto-NL settings	Refer to Appendix B, and verify that your display does not have auto-scroll or auto-newline set to ON.

Symptom	Probable Cause	Action
Keystrokes not accepted	Keyboard locked	Check the status line to determine the cause of the keyboard lock. Press ESC ? to view the status line if your terminal does not have a 25th line. Use your Reset key sequence to clear the condition.
Session ends unexpectedly	Host connection lost	Consult your system administrator.
	Inactivity time-out	You might have left the terminal idle too long. Consult your system administrator for details.
Double characters displayed on screen	Incorrect terminal setting	Turn off local echoing of characters by the terminal.
Receiving incorrect characters	Customizing error	Consult your system administrator.

Note: For printer problems in 3270 emulation, refer to Chapter 2.

Common Problems in ASCII Emulation

Symptom	Probable Cause	Action
Extra, missing, or unintelligible characters on the screen	Telephone line trouble (or noise)	For switched connections, hang up and establish a new connection. For nonswitched connections, contact your carrier representative.
	Host data stream configuration error	Consult your system administrator.
ENTER not accepted	Incorrect turnaround character	Consult your system administrator.
Session ends unexpectedly	Host connection lost	Consult your system administrator.
	Inactivity time-out	You might have left the terminal idle too long. Consult your system administrator for details.
Host does not echo characters	Line problems	For nonswitched connections, the AEA does not check whether the host is active. Return to the Connection Menu, disconnect, and try the connection again.
No data from host	Host received NO-SCROLL (XOFF)	Use ALT Q to send XON to the host.

Status Codes

The status codes listed in 4-1 may appear, with the appropriate messages, in the message area of the Connection Menu. If a status code appears that is not listed here, see the *3174 Establishment Controller Status Codes,* GA27-3832, or call your system administrator.

Table 4-1 (Page 1 of 2). Status Codes

Status Code	Meaning	Action
802 01	You attempted to connect to a host that you are not authorized to use.	Select only your default host.
802 02	You attempted to establish communication with an ASCII printer before the Asynchronous Emulation Adapter (AEA) port was available for use. The switched disconnect timer has to expire before this AEA port becomes available.	Wait until the time-out period is over; then try to establish the connection.
802 03	You attempted to establish communication with an ASCII host, but all the AEA ports going to that host are busy.	Try the connection request later.
802 04	An outgoing call on an Asynchronous Emulation Adapter (AEA) port occurred at the same time a call was coming in.	Try the connection request later.
802 05	The host connection is in progress.	No action is required. Wait until the host connection is completed.
802 06	You pressed PF3 to return to a previous host connection, but a previous host connection does not exist.	Select a host.
802 07	You attempted to test an Asynchronous Emulation Adapter (AEA) port that is being used.	Verify that you entered the correct port number in the test request.
803 01	You attempted to communicate with an ASCII host, but the keyboard attached to the terminal is not supported for 3270-terminal-to-ASCII-host communication.	Use a terminal that has a keyboard supported for communication with an ASCII host. The supported keyboards are: • U.S. English typewriter keyboard • APL keyboard • Text keyboard • Converged keyboard with numeric keypad • IBM Enhanced keyboard with numeric keypad.
803 02	You entered an invalid host number.	Select from the Connection Menu a host number that has a host name next to it, or type in the host name you want to use.
803 03	You entered invalid data to select another host. The Connection Menu contains the valid data.	Enter a valid host number or name.
803 04	You pressed an invalid key.	Press a valid key. If the problem continues, check the keyboard map for the terminal you are using.
804 10 804 20	The inactivity timer expired because of no data flow activity on this port. The connection is broken.	Select a host number or name from the Connection Menu.

Table 4-1 (Page 2 of 2). Status Codes

Status Code	Meaning	Action
815 20	The incoming call was received while an outgoing call was in progress on an Asynchronous Emulation Adapter (AEA) port.	Try the connection request.
818 20	The communication connection was dropped. The host sent the DLE EOT sequence in the 3101 data stream to cause a disconnect.	None: this is a normal operation. Try the connection request.

Appendix A. Terminal Keyboard Maps

How to Use the Keyboard Maps

This appendix contains a full set of keyboard maps for ASCII and 3270 terminals supported by the 3174 Establishment Controller AEA feature. These maps minimize keystrokes for frequently used 3270 key functions. If you use several different ASCII terminals on a regular basis, however, you may find it easier to use the universal keyboard map, so that you do not have to remember the specific map for each keyboard. The universal keyboard map is the same for all display station types, but the correlation between the real key and the mapped key is not always as obvious as it is in the specific map for each display station. If you chose the specific map when you were connecting to the host and later find that you want to use the universal map, the universal map will *usually* work, anyway.

The keyboard maps map character graphics (including Space) as the actual character graphics, except for the following.

Key	3270 Code
[	¢
]	¦
^	¬

The character translations are made on all ASCII terminal keyboard maps.

The keyboard maps use the following notational conventions:

- For key sequences that begin with ESC, press and release ESC and then press the other key.
- For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.
- For key sequences that begin with ALT, press and hold ALT while pressing the other key.

Case usually does not matter: When you see ESC **a**, for example, you can type **A** or **a**. However, if you see an uppercase letter on the keyboard map translation, you *must* type the uppercase letter.

The 3270-emulation mode provides a map for the extension mode key (ALT Erase EOF) for the following functions:

- The Response Time Monitor (RTM) function
- New Extension Mode functions
- X.21/X.25 functions that request the Connection Menu.

Entry Assist functions are not supported from ASCII display stations.

In ASCII-emulation mode, some keystroke sequences, especially control codes (that is, key sequences that begin with ALT, such as ALT G or ALT /) are generated differently on an IBM PC, PS/2, 3270 PC, or 3194 Display Station, that uses an IBM 3270 terminal emulator. For more details, refer to"ASCII Emulation Function on PCs Emulating 3270 Devices" on page 3-22 .

Following are the terminals[1] and the corresponding 3174 reference card form numbers:

Terminal	Form Number
IBM 3101	G126-0206
IBM 3151, 3161, 3162, 3163, 3164	G126-0207
IBM Base Keyboard	G126-0216
IBM Converged Keyboard	G126-0217
IBM Enhanced Keyboard	G126-0218
IBM 3270 PCs and 3194 Functions	GX27-3876
IBM PC, PC/XT, and PC/AT Functions (3270 Keys)	GX27-3877
ADDS Viewpoint A2	G126-0197
ADDS Viewpoint	G126-0198
DEC VT52	G126-0202
DEC VT100	G126-0200
DEC VT241	G126-0201
Esprit Executive 10/78	G126-0204
Hazeltine 1500 Video Display Terminal	G126-0203
Hewlett-Packard 2621B Interactive Terminal	G126-0205
Lear Siegler ADM 3A Dumb Terminal	G126-0208
Lear Siegler ADM 5 Dumb Terminal	G126-0219
Lear Siegler ADM 11, ADM 12	G126-0209
Lear Siegler 1178	G126-0210
TeleVideo 912	G126-0211
TeleVideo 970	G126-0212
Universal Keyboard	G126-0199

Note: For FTTERM keyboard maps, refer to the *FTTERM User's Guide* in the FTTERM program package.

[1] This list contains several trademarks. Viewpoint is a trademark of Applied Digital Data Systems, Inc. Esprit is a trademark of Esprit Systems, Inc. Hazeltine is a trademark of Hazeltine Corp. Hewlett-Packard is a trademark of Hewlett-Packard Company. Lear Seigler, ADM, and Dumb Terminal are trademarks of Lear Siegler, Inc. TeleVideo is a trademark of TeleVideo Systems, Inc.

ASCII Emulation Keyboard Maps

Keyboard Identification

The following illustrations are to help you identify whether you have an IBM Base, Converged, or Enhanced keyboard. Look closely at the unshaded cursor movement keys. The layouts of these keys are unique for each keyboard type and should be an aid in identifying your keyboard.

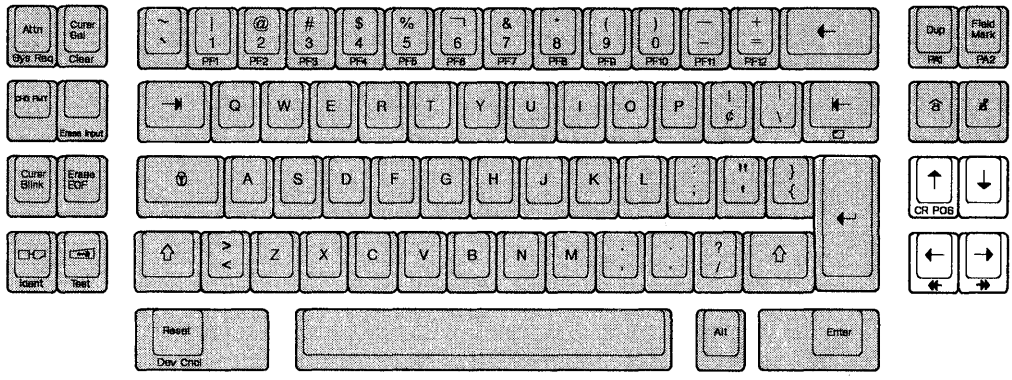


Figure A-1. IBM Base Keyboard

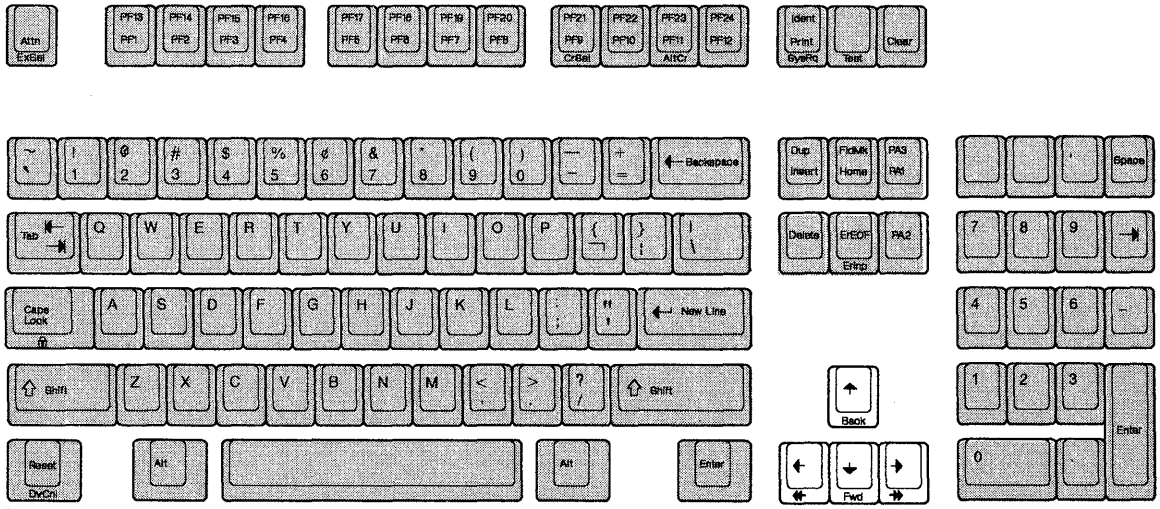


Figure A-2. IBM Enhanced Keyboard

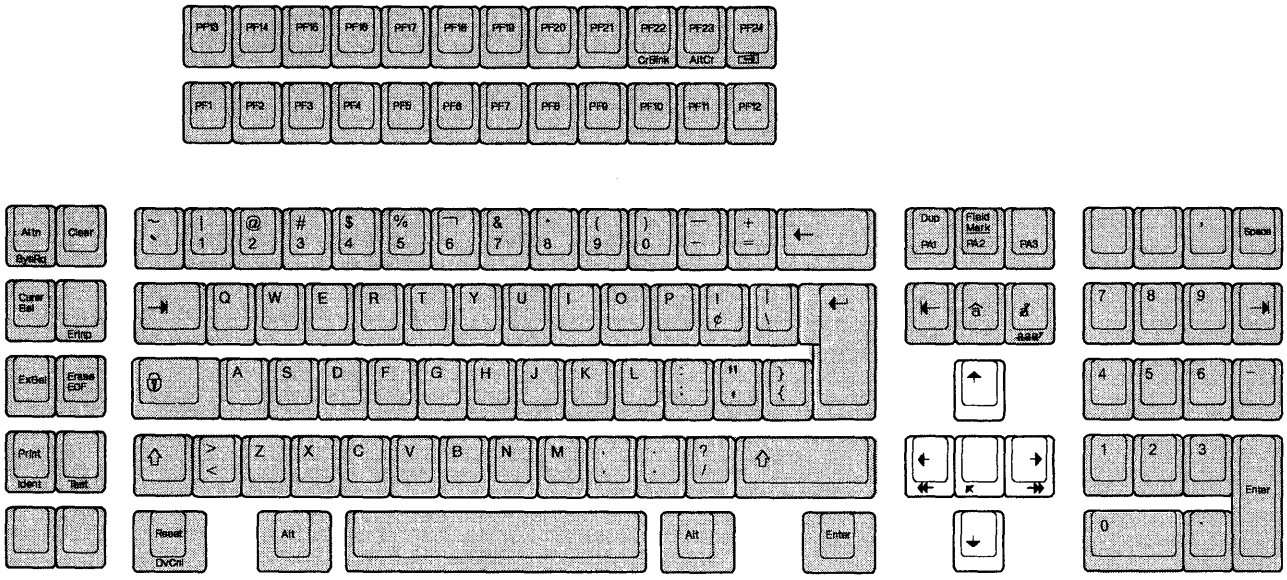


Figure A-3. IBM Converged Keyboard

Note: Converged keyboards without a keypad should be configured as a 3278 (Base) keyboard to obtain the full ASCII emulation mapping. Refer to your terminal setup instructions for details and to the appropriate keyboard maps in this Appendix.

All other keyboards should be operated in their native mode.

Keyboard Map for

IBM 3101 Emulation Using a 3270 Base Keyboard

KEYBOARD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
ALT [	ALT Space
ALT A-Z	ALT A-Z
ALT \	ALT ¢
ALT =	ALT \
ALT {	ALT =
ALT -	ALT <
ALT '	ALT /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	!
← → ↑ ↓	← → ↑ ↓
← ⇥ ↖	← ⇥ ↖
⇧	⇧
Ⓐ	Ⓐ
Space	Space
ALT	ALT
↵	↵ or ENTER
LINE FEED	ALT ↵
DEL	⌫
BREAK	FIELD MARK
ESC	ATTN
CLEAR	CLEAR
ERASE EOL/EOF	ERASE EOF
ERASE INPUT	ERASE INPUT
ERASE EOS	CURSR SEL
RESET	RESET
Clicker Key	🔊
"local screen copy"	PRINT

KEYPAD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
0-9	0-9
,.	,.
PF1 through PF8	PF1 through PF8

Notes:

1. For key sequences that begin with ALT or CTRL, press and hold ALT or CTRL while pressing the other key.
2. In ASCII Emulation mode, Text keyboards will function as Typewriter or APL keyboards. Text keyboard users should note the following:
   - The Text keyboard ! and ¬ function as an ! on Typewriter keyboards, the ¬ function is shifted numeric 6.
   - The CLEAR and CURSR SEL keys are labeled opposite of how they function on the Text keyboard.
   - PA1 and PA2 keys are the ALT of the marked PA1 and PA2 keys, while DUP and FIELD MARK are unshifted versions of those keys.
   - The TEXT ON/OFF key maps to Back Space on Typewriter keyboards.

Keyboard Map for

VT100 Emulation Using a 3270 Base Keyboard

KEYBOARD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
CTRL Space	ALT Space
CTRL A-Z	ALT A-Z
CTRL [	ALT ¢
CTRL \	ALT \
CTRL]	ALT =
CTRL ~	ALT <
CTRL ?	ALT /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	!
← → ↑ ↓	← → ↑ ↓
← ⇥	← ⇥
SHIFT	⇧
CAPS LOCK	⇪
CTRL	ALT
RETURN	↵ or ENTER
LINE FEED	ALT ↵
DELETE	⌫
ESC	ATTN
BREAK	FIELD MARK
SHIFT BREAK (Long BREAK)	SHIFT FIELD MARK
CTRL BREAK (Answerback)	ALT FIELD MARK
NO SCROLL	⇤
BELL	ALT G
"local screen copy"	PRINT

KEYPAD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
0-9	ALT 0-9
,.-	ALT ,.-
PF1	CURSOR SEL
PF2	erase input key
PF3	ERASE EOF
PF4	Unlabeled key below ATTN
ENTER	DUP

Notes:

1. For key sequences that begin with ALT or CTRL, press and hold ALT or CTRL while pressing the other key.

2. In ASCII Emulation mode, Text keyboards will function as Typewriter or APL keyboards. Text keyboard users should note the following:

   - The Text keyboard ! and ¬ function as an ! on Typewriter keyboards, the ¬ function is shifted numeric 6.
   - The CLEAR and CURSR SEL keys are labeled opposite of how they function on the Text keyboard.
   - PA1 and PA2 keys are the ALT of the marked PA1 and PA2 keys, while DUP and FIELD MARK are unshifted versions of those keys.
   - The TEXT ON/OFF key maps to Back Space on Typewriter keyboards.

Keyboard Map for

IBM 3101 Emulation Using a 3270 Converged Keyboard

KEYBOARD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
ALT [	ALT Space
ALT A-Z	ALT A-Z
ALT \	ALT ¢
ALT =	ALT \
ALT {	ALT =
ALT -	ALT <
ALT '	ALT /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	!
← → ↑ ↓	← → ↑ ↓
← ⇥ ↖	← ⇥ ↖
⇧	⇧
Ⓐ	Ⓐ
Space	Space
ALT	ALT
↵	↵ or ENTER
LINE FEED	ALT ↵
DEL	⌫
BREAK	PA2
ESC	ATTN
CLEAR	CLEAR
ERASE EOL/EOF	ERASE EOF
ERASE INPUT	ERASE INPUT
ERASE EOS	CURSR SEL
RESET	RESET
Clicker Key	🔊
"local screen copy"	PRINT

KEYPAD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
0-9	0-9
, .	, .
PF1 through PF8	PF1 through PF8

Note: For key sequences that begin with ALT or CTRL, press and hold ALT or CTRL while pressing the other key.

Keyboard Map for

VT100 Emulation Using a 3270 Converged Keyboard

KEYBOARD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
CTRL Space	ALT Space
CTRL A-Z	ALT A-Z
CTRL [	ALT ¢
CTRL \	ALT \
CTRL]	ALT =
CTRL ~	ALT <
CTRL ?	ALT /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	!
← → ↑ ↓	← → ↑ ↓
← ⇥	← ⇥
SHIFT	⇧
CAPS LOCK	⇪
CTRL	ALT
RETURN	↵ or ENTER
LINE FEED	ALT ↵
DELETE	⌫
ESC	ATTN
BREAK	PA2
SHIFT BREAK (Long BREAK)	SHIFT PA2 (FIELD MARK)
CTRL BREAK (Answerback)	DUP
NO SCROLL	⇤
BELL	ALT G
"local screen copy"	PRINT

KEYPAD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
0-9	Numeric pad 0-9
,.-	Numeric pad ,.-
PF1 through PF4	PF1 through PF4
ENTER	Numeric pad ENTER

Note: For key sequences that begin with ALT or CTRL, press and hold ALT or CTRL while pressing the other key.

Keyboard Map for

IBM 3101 Emulation Using a 3270 Enhanced Keyboard

KEYBOARD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
ALT [	ALT Space
ALT A-Z	ALT A-Z
ALT \	ALT ¬
ALT =	ALT \
ALT {	ALT =
ALT -	ALT ¦
ALT '	ALT /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	¦
Cursor Left Right Up Down	← → ↑ ↓
Back Space, Tab, Home	← → ⇱
Shift	⇧
Shift Lock	⇪
Space	Space
ALT	ALT
↵	↵ or ENTER
LINE FEED	ALT↵
DEL	🖉
BREAK	PA2
ESC	ATTN
CLEAR	CLEAR
ERASE EOL/EOF	ERASE EOF
ERASE INPUT	ERASE INPUT
ERASE EOS	CURSR SEL
RESET	RESET
Clicker Key	🔊
"local screen copy"	PRINT

KEYPAD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
0-9	0-9
,	,
PF1 through PF8	PF1 through PF8

Note: For key sequences that begin with ALT or CTRL, press and hold ALT or CTRL while pressing the other key.

Keyboard Map for

VT100 Emulation Using a 3270 Enhanced Keyboard

KEYBOARD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
CTRL Space	ALT Space
CTRL A-Z	ALT A-Z
CTRL [	ALT |
CTRL \	ALT \
CTRL]	ALT =
CTRL ~	ALT ¦
CTRL ?	ALT /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	¦
← → ↑ ↓	← → ↑ ↓
← ⇥	← ⇥
SHIFT	⇧
CAPS LOCK	ⓐ
CTRL	ALT
RETURN	↵ or ENTER
LINE FEED	ALT ↵
DELETE	⌫
ESC	ATTN
BREAK	PA2
SHIFT BREAK (Long BREAK)	Shift PA2
CTRL BREAK (Answerback)	DUP
NO SCROLL	⇤
BELL	ALT G
"local screen copy"	PRINT

KEYPAD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
0-9	Numeric pad 0-9
,.-	Numeric pad ,.-
PF1 through PF4	PF1 through PF4
ENTER	Numeric pad ENTER

Note: For key sequences that begin with ALT or CTRL, press and hold ALT or CTRL while pressing the other key.

Keyboard Map for

IBM 3101 Emulation Using a 3270 PC or 3194

KEYBOARD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
ALT [	*ALT* Space
ALT A-Z	*ALT* A-Z
ALT \	*ALT* ¢
ALT =	*ALT* \
ALT {	*ALT* =
ALT -	*ALT* <
ALT '	*ALT* /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	!
← → ↑ ↓	← → ↑ ↓
Backspace, tab, home	Backspace, tab, home
SHIFT	Shift
CAPS LOCK	Not available
ALT	*ALT*
↵	↵ or ENTER
LINE FEED	ALT ↵
Clear	Clear
DELETE	Delete
ESC	ATTN
BREAK	Field Mark
Erase EOL/EOF	Erase EOF
ERASE INPUT	ErInp
Erase EOS	CrSel
Reset	Reset
Clicker	Not available
"local screen copy"	Print

KEYPAD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
0-9	0-9
,-	,-
PF1-PF8	PF1-PF8
Menu Request	EXTM M

Note: *ALT* is the pseudo-ALT key; EXTM is the extension-mode key. Refer to page 3-10 for a description of these keys.

Keyboard Map for

VT100 Emulation Using a 3270 PC or 3194

KEYBOARD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
CTRL Space	*ALT* Space
CTRL A-Z	*ALT* A-Z
CTRL [	*ALT* ¢
CTRL \	*ALT* \
CTRL]	*ALT* =
CTRL ~	*ALT* <
CTRL ?	*ALT* /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{} \~	{} \~
back quote	back quote
^	¬
[	¢
]	!
← → ↑ ↓	← → ↑ ↓
Backspace, tab	Backspace, tab
SHIFT	Shift
CAPS LOCK	Not available
CTRL	*ALT*
RETURN	↵ or ENTER
LINE FEED	*ALT* ↵
DELETE	Delete
ESC	ATTN
BREAK	EXTM PA1
SHIFT BREAK (Long BREAK)	EXTM PA2
CTRL BREAK (Answerback)	PA2
NO SCROLL	Backtab
BELL	*ALT* G
"local screen copy"	Print

KEYPAD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
0-9	PF1 - PF10
,.-	*ALT* ,.-
PF1	CrSel
PF2	ErInp
PF3	ERASE EOF
PF4	EXTM SysReq
ENTER	DUP
Menu request	EXTM M

Note: *ALT* is the pseudo-ALT key; EXTM is the extension-mode key. Refer to page 3-10 for a description of these keys.

Keyboard Map for

IBM 3101 Emulation for the:
IBM PC
IBM PC XT™
IBM Personal Computer AT®

KEYBOARD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
ALT [	*ALT* Space
ALT A-Z	*ALT* A-Z
ALT \	*ALT* ¢
ALT =	*ALT* \
ALT {	*ALT* =
ALT -	*ALT* <
ALT '	*ALT* /
|@#$%&*()_-+=:;"'><,.?/!	|@#$%&*()_-+=:;"'><,.?/!
{} \~	{} \~
back quote	back quote
^	¬
[	¢
]	¦
← → ↑ ↓	← → ↑ ↓
Backspace, tab, home	Backspace, tab, home
SHIFT	Shift
CAPS LOCK	Not available
ALT	*ALT*
New Line	New Line or ENTER
Clear	Clear
DELETE	Delete
ESC	ATTN
BREAK	FM
Erase EOL/EOF	Er EOF
ERASE INPUT	Er Inp
Erase EOS	Cursr Sel
Reset	Reset
Clicker	Not available
"local screen copy"	PrtSc

KEYPAD

TO PERFORM THIS 3101 FUNCTION:	TYPE:
0-9	0-9
,.-	,.-
PF1-PF8	PF1-PF8
Menu Request	EXTM M

Note: *ALT* is the pseudo-ALT key; EXTM is the extension-mode key. Refer to page 3-10 for a description of these keys.

Personal Computer XT is a trademark of International Business Machines Corporation

Personal Computer AT is a registered trademark of International Business Machines Corporation

Keyboard Map for

VT100 Emulation for the:
IBM PC
IBM PC XT
IBM Personal Computer AT

KEYBOARD

TO PERFORM THIS VT100 FUNCTION:	TYPE:
A-Z, a-z, 0-9, Space	A-Z, a-z, 0-9, Space
CTRL Space	*ALT* Space
CTRL A-Z	*ALT* A-Z
CTRL [	*ALT* ¢
CTRL \	*ALT* \
CTRL]	*ALT* =
CTRL ~	*ALT* <
CTRL ?	*ALT* /
|@#$%&*()_-+=:;"'><,.?/|	|@#$%&*()_-+=:;"'><,.?/|
{}\~	{}\~
back quote	back quote
^	¬
[	¢
]	¦
← → ↑ ↓	← → ↑ ↓
Backspace, tab	Backspace, tab
SHIFT	Shift
CAPS LOCK	Not available
CTRL	*ALT*
Return	New Line or ENTER
LINE FEED	*ALT* New Line
DELETE	Delete
ESC	ATTN
BREAK	FM
SHIFT BREAK (Long BREAK)	EXTM PA2
CTRL BREAK (Answerback)	PA2
NO SCROLL	Backtab
BELL	*ALT* G
"local screen copy"	PrtSc

KEYPAD

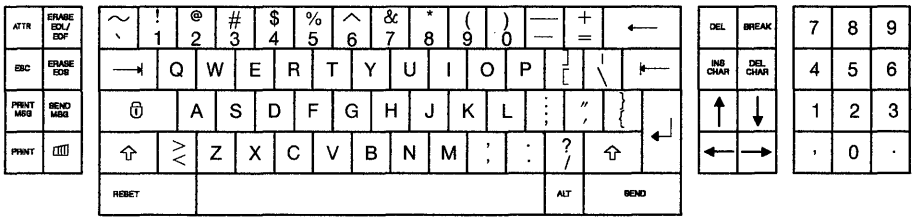
TO PERFORM THIS VT100 FUNCTION:	TYPE:
0-9	PF1 - PF10
,.-	*ALT* ,.-
PF1	Cursor Sel
PF2	Er Inp
PF3	Er EOF
PF4	Chg Fmt
ENTER	DUP
Menu request	EXTM M

Note: *ALT* is the pseudo-ALT key; EXTM is the extension-mode key. Refer to page 3-10 for a description of these keys.

3270 Emulation Keyboard Maps

Keyboard Map for

IBM 3101 (Models 10, 12, 13, 20, 22, 23)



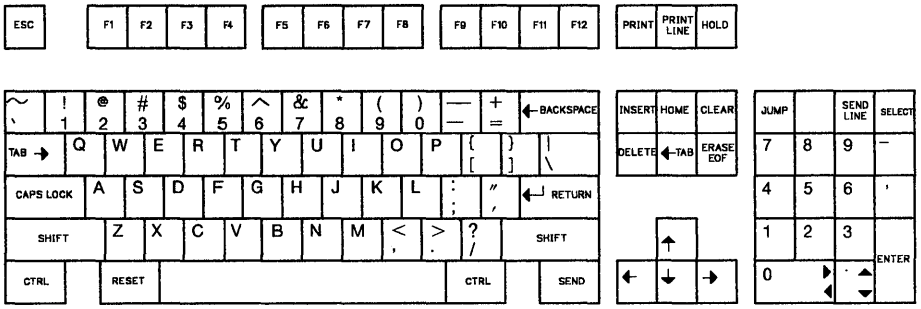
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	ALT a
BACKTAB	ESC →
CLEAR	CLEAR
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	ALT v
CURSOR FAST RIGHT	ALT u
CURSOR SELECT	ALT k
DELETE	DEL
DEV CNCL	ALT x
DUP	ALT d
ENTER	↵
ERASE EOF	ERASE EOL/EOF
ERASE INPUT	ERASE INPUT
Extension Mode	ALT l
FIELD MARK	ALT f
HOME	ESC h
IDENT	ESC z
INSERT MODE	ESC DEL
NEW LINE	←
PA1	ESC ,
PA2	ESC .
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC -
PF12	ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	ALT p
REFRESH	ESC r
RESET	ALT r
STATUS ON/OFF	ESC ?
SYS REQ	ESC s
TAB	→
TEST	ALT t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with ALT, press and hold ALT while pressing the other key.

Keyboard Map for

IBM 3151, 3161, 3162, 3163, and 3164



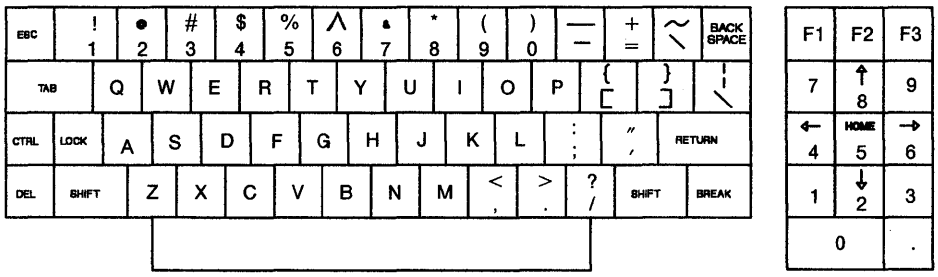
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	← TAB
CLEAR	CLEAR
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	CTRL k
DELETE	DELETE
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	ENTER or SEND
ERASE EOF	ERASE EOF
ERASE INPUT	ER INP
Extension Mode	CTRL l
FIELD MARK	CTRL f
HOME	HOME
IDENT	ESC z
INSERT MODE	INSERT
NEW LINE	RETURN
PA1	PA1
PA2	PA2
PF1	F1
PF2	F2
PF3	F3
PF4	F4
PF5	F5
PF6	F6
PF7	F7
PF8	F8
PF9	F9
PF10	F10
PF11	F11
PF12	F12
PF13	SHIFT F1
PF14	SHIFT F2
PF15	SHIFT F3
PF16	SHIFT F4
PF17	SHIFT F5
PF18	SHIFT F6
PF19	SHIFT F7
PF20	SHIFT F8
PF21	SHIFT F9
PF22	SHIFT F10
PF23	SHIFT F11
PF24	SHIFT F12
PRINT	CTRL p
REFRESH	ESC r
RESET	CTRL r
RESUME PRINT	CTRL c
STATUS ON/OFF	ESC ?
SUSPEND PRINT	CTRL b
SYS REQ	ESC s
TAB	TAB →
TEST	CTRL t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.
3. For keys F13 through F24, press and hold SHIFT while pressing F1 through F12.

Keyboard Map for

ADDS Viewpoint A2

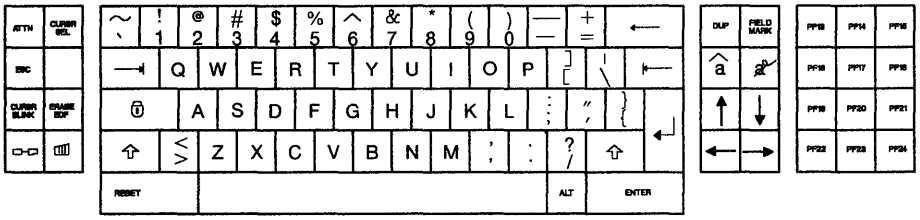


TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	ESC a
BACKTAB	ESC TAB
CLEAR	CTRL c
CURSOR DOWN	SHIFT ↓
CURSOR LEFT	SHIFT ←
CURSOR RIGHT	SHIFT →
CURSOR UP	SHIFT ↑
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL n
CURSOR SELECT	ESC k
DELETE	DEL
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	RETURN
ERASE EOF	CTRL e
ERASE INPUT	ESC i
Extension Mode	ESC b
FIELD MARK	CTRL f
HOME	HOME
IDENT	ESC d
INSERT MODE	ESC DEL
NEW LINE	BACKSPACE
PA1	F1
PA2	F2
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC -
PF12	ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	CTRL p
REFRESH	ESC r
RESET	CTRL r
RESUME PRINT	ESC p
STATUS ON/OFF	ESC ?
SYS REQ	ESC s
SUSPEND PRINT	ESC o
TAB	TAB
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.

Keyboard Map for
ADDS Viewpoint/78



TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	ATTN
BACKTAB	←
CLEAR	CLEAR
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	ALT ←
CURSOR FAST RIGHT	ALT →
CURSOR SELECT	CURSR SEL
DELETE	⌫
DEV CNCL	DEV CNCL
DUP	DUP
ENTER	ENTER
ERASE EOF	ERASE EOF
ERASE INPUT	ERASE INPUT
Extension Mode	ALT ERASE EOF
FIELD MARK	FIELD MARK
HOME	Home
IDENT	IDENT
INSERT MODE	^a
NEW LINE	↵
PA1	PA1
PA2	PA2
PF1	PF1
PF2	PF2
PF3	PF3
PF4	PF4
PF5	PF5
PF6	PF6
PF7	PF7
PF8	PF8
PF9	PF9
PF10	PF10
PF11	PF11
PF12	PF12
PF13	PF13
PF14	PF14
PF15	PF15
PF16	PF16
PF17	PF17
PF18	PF18
PF19	PF19
PF20	PF20
PF21	PF21
PF22	PF22
PF23	PF23
PF24	PF24
PRINT	⎙
REFRESH	ALT R
RESET	RESET
STATUS ON/OFF	ESC ?
SYS REQ	SYS REQ
TAB	→
TEST	TEST

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with ALT, press and hold ALT while pressing the other key.

Keyboard Map for

DEC VT52

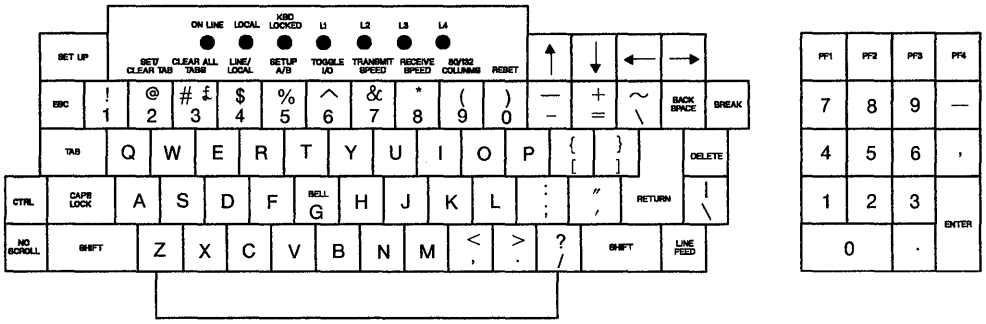
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	Backspace or ESC Tab
CLEAR	CTRL c
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	ESC k
DELETE	Delete
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	Return or Enter
ERASE EOF	CTRL e
ERASE INPUT	ESC i
Extension Mode	CTRL b
FIELD MARK	CTRL f
HOME	ESC h
IDENT	ESC z
INSERT MODE	ESC Del
NEW LINE	Line Feed
PA1	Numeric 0 or ESC ,
PA2	Numeric . or ESC .
PF1	Numeric 1 or ESC 1
PF2	Numeric 2 or ESC 2
PF3	Numeric 3 or ESC 3
PF4	Numeric 4 or ESC 4
PF5	Numeric 5 or ESC 5
PF6	Numeric 6 or ESC 6
PF7	Numeric 7 or ESC 7
PF8	Numeric 8 or ESC 8
PF9	Numeric 9 or ESC 9
PF10	Numeric Blue or ESC 0
PF11	Numeric Red or ESC -
PF12	Numeric Gray or ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	CTRL p
REFRESH	ESC u
RESET	CTRL r
STATUS ON/OFF	CTRL ?
SYS REQ	ESC s
TAB	TAB
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.
3. For key sequences that contain "Numeric," press the appropriate key on the numeric keypad.

Keyboard Map for

DEC VT100



TO PERFORM THIS 3270 FUNCTION: **TYPE:**

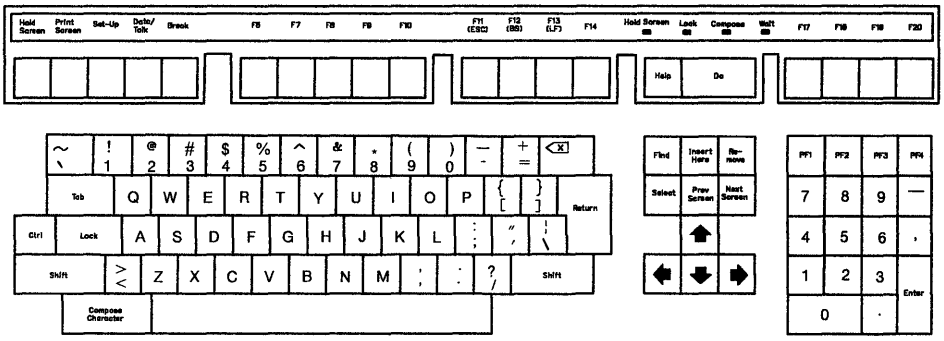
ATTN — CTRL a
BACKTAB — ESC TAB or BACKSPACE
CLEAR — CTRL c
CURSOR DOWN — ↓
CURSOR LEFT — ←
CURSOR RIGHT — →
CURSOR UP — ↑
CURSOR FAST LEFT — CTRL v
CURSOR FAST RIGHT — CTRL u
CURSOR SEL — ESC k
DELETE — DELETE
DEV CNCL — CTRL x
DUP — CTRL d
ENTER — RETURN or Num. ENTER
ERASE EOF — CTRL e
ERASE INPUT — ESC i
Extension Mode — CTRL b
FIELD MARK — CTRL f
HOME — ESC h
IDENT — ESC d
INSERT MODE — ESC DELETE
NEW LINE — LINE FEED
PA1 — ESC ,
PA2 — ESC .
PF1 — Numeric 1 or ESC 1
PF2 — Numeric 2 or ESC 2
PF3 — Numeric 3 or ESC 3
PF4 — Numeric 4 or ESC 4
PF5 — Numeric 5 or ESC 5
PF6 — Numeric 6 or ESC 6
PF7 — Numeric 7 or ESC 7
PF8 — Numeric 8 or ESC 8
PF9 — Numeric 9 or ESC 9
PF10 — PF1 or ESC 0
PF11 — PF2 or ESC -
PF12 — PF3 or ESC =
PF13 — ESC !
PF14 — ESC @
PF15 — ESC #
PF16 — ESC $
PF17 — ESC %
PF18 — ESC ^
PF19 — ESC &
PF20 — ESC *
PF21 — ESC (
PF22 — ESC)
PF23 — ESC _
PF24 — ESC +
PRINT — CTRL p
REFRESH — ESC r
RESET — CTRL r
RESUME PRINT — ESC p
STATUS ON/OFF — ESC ?
SUSPEND PRINT — ESC o
SYS REQ — ESC s
TAB — TAB
TEST — ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.
3. For key sequences that contain "Numeric," press the appropriate key on the numeric keypad.

Keyboard Map for

DEC VT241



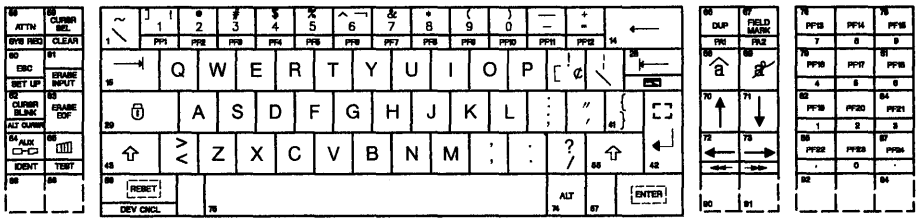
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	Ctrl a
BACKTAB	Ctrl h or ESC Tab
CLEAR	Ctrl c
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	Ctrl v
CURSOR FAST RIGHT	Ctrl u
CURSOR SELECT	ESC k
DELETE	Re-move
DEV CNCL	Ctrl x
DUP	Ctrl d
ENTER	Return or Numeric Enter
ERASE EOF	Ctrl e
ERASE INPUT	ESC i
Extension Mode	Ctrl b
FIELD MARK	Ctrl f
HOME	ESC h
IDENT	ESC d
INSERT MODE	Insert Here
NEW LINE	Ctrl j or LF
PA1	ESC ,
PA2	ESC .
PF1	Numeric 1 or ESC 1
PF2	Numeric 2 or ESC 2
PF3	Numeric 3 or ESC 3
PF4	Numeric 4 or ESC 4
PF5	Numeric 5 or ESC 5
PF6	Numeric 6 or ESC 6
PF7	Numeric 7 or ESC 7
PF8	Numeric 8 or ESC 8
PF9	Numeric 9 or ESC 9
PF10	PF1 or ESC 0
PF11	PF2 or ESC -
PF12	PF3 or ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	Ctrl p
REFRESH	ESC r
RESET	Ctrl r
RESUME PRINT	Ctrl l
STATUS ON/OFF	ESC ?
SUSPEND PRINT	Ctrl g
SYS REQ	ESC s
TAB	TAB
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with Ctrl, press and hold Ctrl while pressing the other key.
3. For key sequences that contain "Numeric," press the appropriate key on the numeric keypad.
4. ESC is Ctrl [.

Keyboard Map for

Esprit Executive 10/78



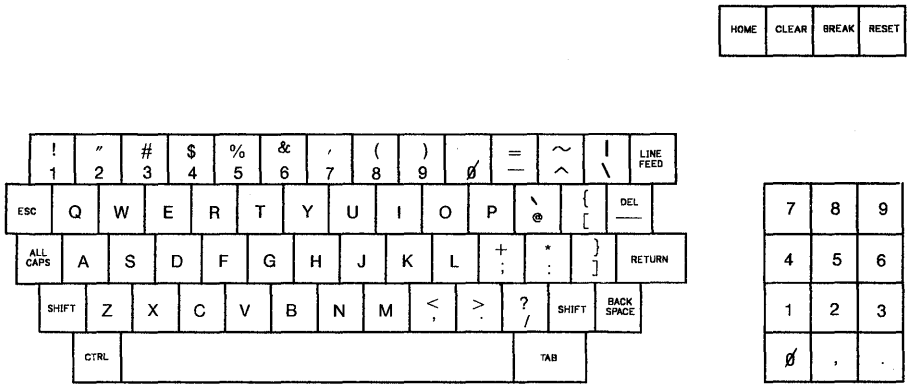
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	ATTN
BACKTAB	←
CLEAR	CLEAR
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	←←
CURSOR FAST RIGHT	→→
CURSOR SELECT	CURSR SEL
DELETE	a
DEV CNCL	DEV CNCL
DUP	DUP
ENTER	ENTER
ERASE EOF	ERASE EOF
ERASE INPUT	ERASE INPUT
Extension Mode	ALT I
FIELD MARK	FIELD MARK
HOME	Home
IDENT	IDENT
INSERT MODE	a
NEW LINE	←
PA1	PA1
PA2	PA2
PF1	PF1
PF2	PF2
PF3	PF3
PF4	PF4
PF5	PF5
PF6	PF6
PF7	PF7
PF8	PF8
PF9	PF9
PF10	PF10
PF11	PF11
PF12	PF12
PF13	PF13
PF14	PF14
PF15	PF15
PF16	PF16
PF17	PF17
PF18	PF18
PF19	PF19
PF20	PF20
PF21	PF21
PF22	PF22
PF23	PF23
PF24	PF24
PRINT	▭→▱
REFRESH	ESC r
RESET	RESET
STATUS ON/OFF	ESC ?
SYS REQ	SYS REQ
TAB	→
TEST	TEST

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with ALT, press and hold ALT while pressing the other key.
3. For key sequences that contain "Numeric," press the appropriate key on the numeric keypad.

Keyboard Map for

Hazeltine 1500 Video Display Terminal



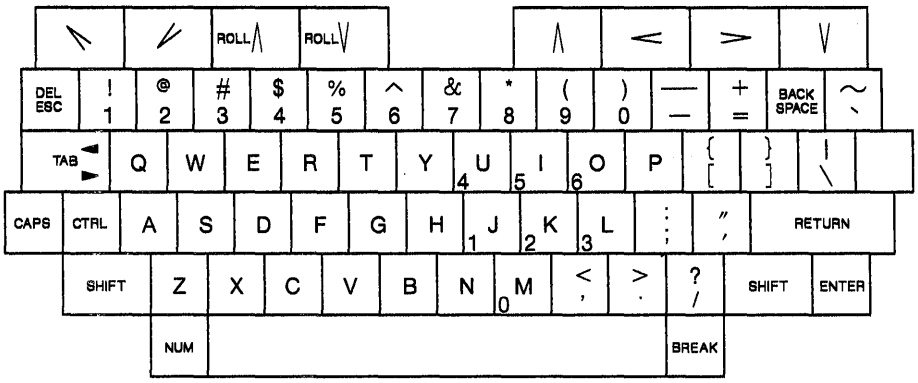
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	ESC TAB
CLEAR	CLEAR
CURSOR DOWN	CTRL j or LINE FEED
CURSOR LEFT	CTRL h
CURSOR RIGHT	CTRL l
CURSOR UP	CTRL k
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	ESC k
DELETE	DEL
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	RETURN
ERASE EOF	CTRL e
ERASE INPUT	ESC i
Extension Mode	ESC b
FIELD MARK	CTRL f
HOME	HOME
IDENT	ESC d
INSERT MODE	ESC DEL
NEW LINE	ESC RETURN
PA1	ESC ,
PA2	ESC .
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC -
PF12	ESC ^
PF13	ESC !
PF14	ESC "
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC &
PF19	ESC '
PF20	ESC (
PF21	ESC)
PF22	ESC ;
PF23	ESC =
PF24	ESC LINE FEED
PRINT	CTRL p
REFRESH	ESC r
RESET	CTRL r
STATUS ON/OFF	ESC ?
SYS REQ	ESC s
TAB	TAB
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.
3. The Hazeltine 1500 does not display ~ ; use ▮ for the 3270 back quote.

Keyboard Map for

Hewlett-Packard 2621B Interactive Terminal



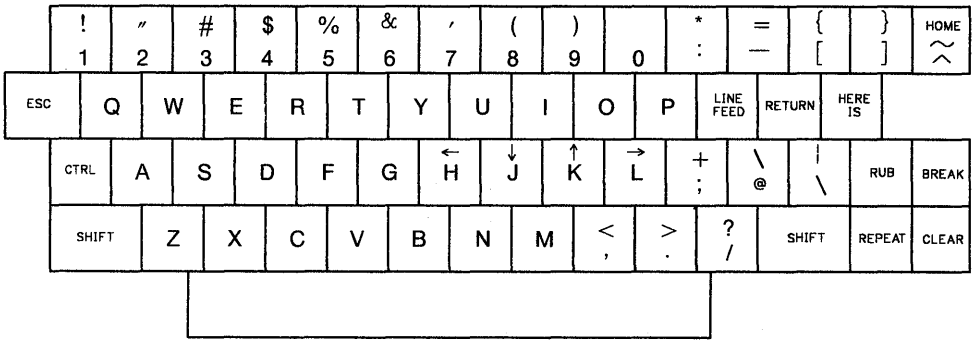
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	SHIFT-TAB
CLEAR	CTRL c
CURSOR DOWN	∨
CURSOR LEFT	<
CURSOR RIGHT	>
CURSOR UP	∧
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	ESC k
DELETE	DEL
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	RETURN
ERASE EOF	CTRL e
ERASE INPUT	ESC e
Extension Mode	CTRL b
FIELD MARK	CTRL f
HOME	\
IDENT	ESC z
INSERT MODE	ESC DEL
NEW LINE	BACKSPACE
PA1	ESC ,
PA2	ESC .
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC -
PF12	ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	CTRL p
REFRESH	ESC r
RESET	CTRL r
STATUS ON/OFF	ESC ?
SYS REQ	ESC s
TAB	TAB
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.

Keyboard Map for

Lear Siegler ADM 3A Dumb Terminal



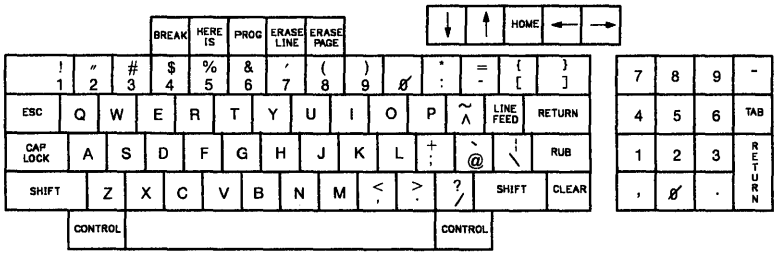
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	ESC CTRL i
CLEAR	CTRL c
CURSOR DOWN	CTRL ↓
CURSOR LEFT	CTRL ←
CURSOR RIGHT	CTRL →
CURSOR UP	CTRL ↑
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	ESC k
DELETE	RUB
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	RETURN
ERASE EOF	CTRL e
ERASE INPUT	ESC i
Extension Mode	ESC b
FIELD MARK	CTRL f
HOME	CTRL HOME
IDENT	ESC d
INSERT MODE	ESC RUB
NEW LINE	ESC RETURN
PA1	ESC ,
PA2	ESC .
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC :
PF12	ESC -
PF13	ESC !
PF14	ESC "
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC &
PF19	ESC '
PF20	ESC (
PF21	ESC)
PF22	ESC {
PF23	ESC *
PF24	ESC =
PRINT	CTRL p
REFRESH	ESC r
RESET	CTRL r
STATUS ON/OFF	ESC ?
SYS REQ	ESC s
TAB	CTRL i
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.

Keyboard Map for

Lear Siegler ADM 5 Dumb Terminal



TO PERFORM THIS 3270 FUNCTION: — **TYPE:**

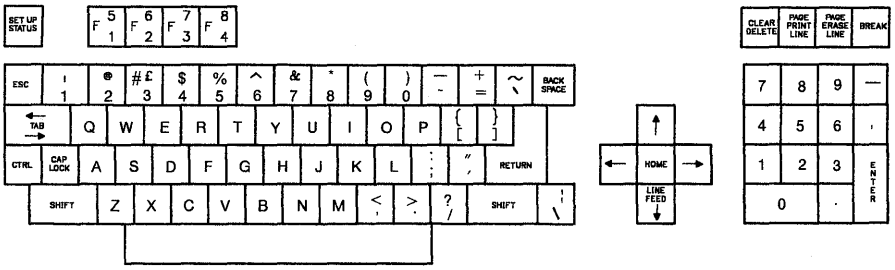
ATTN — CTRL a
BACKTAB — ESC TAB
CLEAR — CTRL c
CURSOR DOWN — ↓
CURSOR LEFT — ←
CURSOR RIGHT — →
CURSOR UP — ↑
CURSOR FAST LEFT — CTRL v
CURSOR FAST RIGHT — CTRL u
CURSOR SELECT — ESC k
DELETE — RUB
DEV CNCL — CTRL x
DUP — CTRL d
ENTER — RETURN
ERASE EOF — CTRL e
ERASE INPUT — ESC i
Extension Mode — ESC b
FIELD MARK — CTRL f
HOME — HOME
IDENT — ESC d
INSERT MODE — ESC RUB
NEW LINE — ESC RETURN
PA1 — ESC ,
PA2 — ESC .
PF1 — ESC 1
PF2 — ESC 2
PF3 — ESC 3
PF4 — ESC 4
PF5 — ESC 5
PF6 — ESC 6
PF7 — ESC 7
PF8 — ESC 8
PF9 — ESC 9
PF10 — ESC 0
PF11 — ESC :
PF12 — ESC -
PF13 — ESC !
PF14 — ESC "
PF15 — ESC #
PF16 — ESC $
PF17 — ESC %
PF18 — ESC &
PF19 — ESC '
PF20 — ESC (
PF21 — ESC)
PF22 — ESC *
PF23 — ESC =
PF24 — ESC {
PRINT — CTRL p
REFRESH — ESC r
RESET — CTRL r
STATUS ON/OFF — ESC ?
SYS REQ — ESC s
TAB — TAB
TEST — ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CONTROL while pressing the other key.

Keyboard Map for

Lear Siegler ADM 11, ADM 12



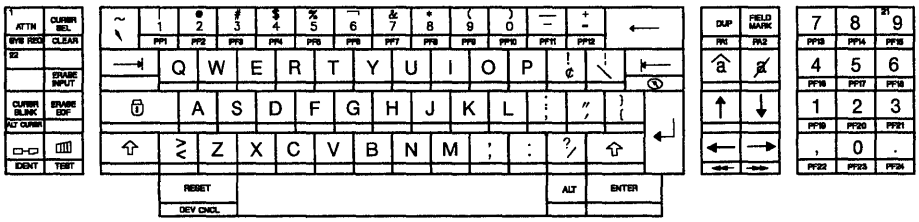
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	ESC a
BACKTAB	SHIFT TAB
CLEAR	CLEAR
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	ESC k
DELETE	DELETE
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	RETURN
ERASE EOF	CTRL e
ERASE INPUT	ERASE PAGE
Extension Mode	ESC b
FIELD MARK	CTRL f
HOME	HOME
IDENT	PRINT PAGE
INSERT MODE	ESC DELETE
NEW LINE	ESC RETURN
PA1	F1
PA2	F2
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC -
PF12	ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	PRINT LINE
REFRESH	ESC r
RESET	CTRL r
RESUME PRINT	ESC p
SUSPEND PRINT	ESC o
SYS REQ	ESC s
TAB	TAB
TEST	CTRL t

Notes:

1. For key sequences that begin with ESC, press and release ESCAPE and then press the other key.
2. For key sequences that begin with CTRL, press and hold CONTROL while pressing the other key.
3. For key sequences that contain "Numeric," press the appropriate key on the numeric keypad.

Keyboard Map for

Lear Siegler ADM 1178



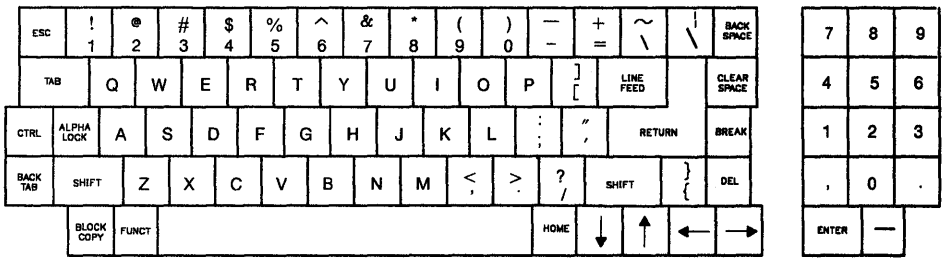
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	ATTN
BACKTAB	←
CLEAR	CLEAR
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	←←
CURSOR FAST RIGHT	→→
CURSOR SELECT	CURSR SEL
DELETE	⌀
DEV CNCL	DEV CNCL
DUP	DUP
ENTER	ENTER
ERASE EOF	ERASE EOF
ERASE INPUT	ERASE INPUT
Extension Mode	ALT ERASE EOF
FIELD MARK	FIELD MARK
HOME	↖
IDENT	IDENT
INSERT MODE	â
NEW LINE	↵
PA1	PA1
PA2	PA2
PF1	PF1
PF2	PF2
PF3	PF3
PF4	PF4
PF5	PF5
PF6	PF6
PF7	PF7
PF8	PF8
PF9	PF9
PF10	PF10
PF11	PF11
PF12	PF12
PF13	PF13
PF14	PF14
PF15	PF15
PF16	PF16
PF17	PF17
PF18	PF18
PF19	PF19
PF20	PF20
PF21	PF21
PF22	PF22
PF23	PF23
PF24	PF24
PRINT	⎙
REFRESH	ALT r
RESET	RESET
RESUME PRINT	ALT p
SUSPEND PRINT	ALT o
SYS REQ	SYS REQ
TAB	→
TEST	TEST

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with ALT, press and hold ALT while pressing the other key.
3. For key sequences that contain "Numeric," press the appropriate key on the numeric keypad.

Keyboard Map for

TeleVideo 912



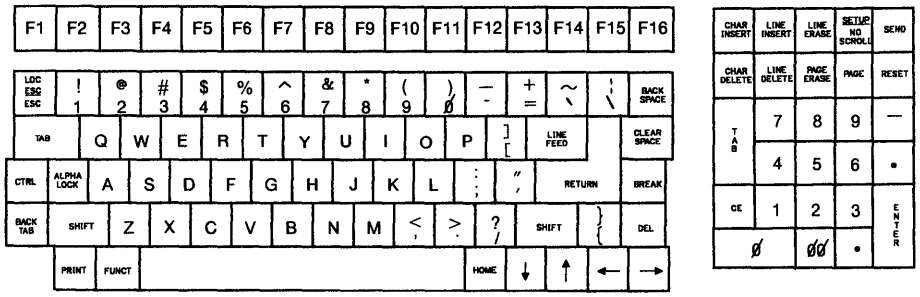
TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	ESC TAB
CLEAR	CTRL c
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	ESC k
DELETE	DEL
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	ENTER or RETURN
ERASE EOF	CTRL e
ERASE INPUT	ESC i
Extension Mode	CTRL b
FIELD MARK	CTRL f
HOME	HOME
IDENT	ESC z
INSERT MODE	ESC DEL
NEW LINE	ESC RETURN
PA1	ESC ,
PA2	ESC .
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC -
PF12	ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	CTRL p
REFRESH	ESC r
RESET	CTRL r
STATUS ON/OFF	ESC ?
SYS REQ	ESC s
TAB	TAB
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.

Keyboard Map for

TeleVideo 970



TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	BACK TAB
CLEAR	CLEAR
CURSOR DOWN	↓
CURSOR LEFT	←
CURSOR RIGHT	→
CURSOR UP	↑
CURSOR FAST LEFT	SHIFT ←
CURSOR FAST RIGHT	SHIFT →
CURSOR SELECT	ESC k
DELETE	DEL
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	ENTER or RETURN
ERASE EOF	LINE DELETE
ERASE INPUT	LINE ERASE
Extension Mode	CTRL b
FIELD MARK	CTRL f
HOME	HOME
IDENT	ESC z
INSERT MODE	CHAR INSERT
NEW LINE	LINE FEED
PA1	ESC , or FUNCT A
PA2	ESC . or FUNCT B
PF1	F1
PF2	F2
PF3	F3
PF4	F4
PF5	F5
PF6	F6
PF7	F7
PF8	F8
PF9	F9
PF10	F10
PF11	F11
PF12	F12
PF13	F13
PF14	F14
PF15	F15
PF16	F16
PF17	SHIFT F1
PF18	SHIFT F2
PF19	SHIFT F3
PF20	SHIFT F4
PF21	SHIFT F5
PF22	SHIFT F6
PF23	SHIFT F7
PF24	SHIFT F8
PRINT	PAGE
REFRESH	ESC r
RESET	CTRL r
RESUME PRINT	ESC p
SUSPEND PRINT	ESC o
SYS REQ	ESC s or SEND
TAB	TAB
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.

Keyboard Map for
Universal

TO PERFORM THIS 3270 FUNCTION:	TYPE:
ATTN	CTRL a
BACKTAB	CTRL b
CLEAR	CTRL c
CURSOR DOWN	CTRL j
CURSOR LEFT	CTRL h
CURSOR RIGHT	CTRL l
CURSOR UP	CTRL k
CURSOR FAST LEFT	CTRL v
CURSOR FAST RIGHT	CTRL u
CURSOR SELECT	ESC k
DELETE	DEL or RUBOUT
DEV CNCL	CTRL x
DUP	CTRL d
ENTER	RETURN or CTRL m
ERASE EOF	CTRL e
ERASE INPUT	ESC i
Extension Mode	ESC b
FIELD MARK	CTRL f
HOME	ESC h
IDENT	ESC z or ESC d
INSERT MODE	ESC DEL or ESC RUBOUT
NEW LINE	CTRL z
PA1	ESC ,
PA2	ESC .
PF1	ESC 1
PF2	ESC 2
PF3	ESC 3
PF4	ESC 4
PF5	ESC 5
PF6	ESC 6
PF7	ESC 7
PF8	ESC 8
PF9	ESC 9
PF10	ESC 0
PF11	ESC -
PF12	ESC =
PF13	ESC !
PF14	ESC @
PF15	ESC #
PF16	ESC $
PF17	ESC %
PF18	ESC ^
PF19	ESC &
PF20	ESC *
PF21	ESC (
PF22	ESC)
PF23	ESC _
PF24	ESC +
PRINT	CTRL p
REFRESH	ESC r
RESET	CTRL r
RESUME PRINT	ESC p
STATUS ON/OFF	ESC ?
SUSPEND PRINT	ESC o
SYS REQ	ESC s
TAB	TAB or CTRL i
TEST	ESC t

Notes:

1. For key sequences that begin with ESC, press and release ESC and then press the other key.
2. For key sequences that begin with CTRL, press and hold CTRL while pressing the other key.

Appendix B. Setting Up Your Terminal

This chapter describes how to set up modems and ASCII terminals that are connected to an Asynchronous Emulation Adapter (AEA) port.

Modem Specifications and Setup

IBM 5841, 5842, 5853, Hayes SmartModem[1] 300 and 1200, and Micom Data Modems Models 3012 and 3024 are auto-call modems supported for communication to ASCII hosts. The dial strings may be either stored in the 3174 at customizing or entered from a display station keyboard (manual dial).

For automatic calling (auto-call), the AEA's interface to IBM, Hayes, and Micom intelligent modems conforms to the specification in the documentation supplied with each modem. For manual calling, the AEA acts only as a conduit for a user-to-modem conversation; the user represents the interface to the auto-call modem and must have a detailed understanding of the modem's commands and responses.

These modems should conform to the following general specifications:

- Asynchronous, EIA 232D transmission
- Auto-answer or auto-call
- 9- to 11-bit character frame (includes 1 start bit, 7 data bits, 1 parity bit [optional], and 1 or 2 stop bits).

[1] Trademark of Hayes Microcomputer Products, Inc.

IBM 5841, 5842, and 5853 Setup

IBM 5841, 5842, and 5853 modems are operated in Attention Command Set (AT) mode; any parameters set by commands that are required for operation with the AEA feature are the same as for Hayes modems. However, the switch settings for IBM modems are not compatible with Hayes, and must be set as specified here.

The six front panel switches must be in the "out" position. In addition, the eight configuration switches must be set as described in Table B-1 or Table B-2 on page B-4.

Table B-1. IBM 584x Modem Switch Settings

Switch Number	Option Name	Switch Setting	Description
1	Receive Line Signal Detect (RLSD). (Also known as Carrier Detect [CD] or Data Carrier Detect [DCD])	On	Carrier Detect is raised at connection time.
2	Reset to Default Options on Loss of DTR	Off	When this switch is set to OFF, the 3174 can reset the modem to a known state by dropping DTR. If register settings are not required for special installation requirements, this reset can be used to avoid unexpected results that can arise from previous use. Not used on 5841.
3	Transmit Timing Option (Synchronous mode only)	Not relevant	
4	Asynchronous or Synchronous Mode	On	Asynchronous mode is used.
5	Source of Data Terminal Ready (DTR)	On	AEA controls DTR.
6	Transmit Clocking from Remote Modem (Synchronous mode only)	Not relevant	
7	Request to Send (RTS)	Off	AEA controls RTS.
8	Data Set Ready (DSR)	Off (5842) On (5841)	DSR is raised at connection (5842). DSR is always on (5841).

Table B-2. IBM 5853 Modem Switch Settings

Switch Number	Option Name	Switch Setting	Description
1	Error Checking Link (ECL) Failure Activity	On	If the modem fails to establish an error-checking link, or the error-checking link is terminated, or the inactivity timer times out the modem changes to a non-ECL connection. Use with the ECL front panel switch.
2	Reset to Default Options on Loss of DTR	On	Modem configuration changes are saved and not reset when DTR turns off.
3	Modem-to-Modem Flow Control	ON	The modems send XON and XOFF characters to control data flow between themselves. This switch is ignored if ECL is active.
4	Speed Buffering	On	The modem's AEA interface speed will be the same as the modem's telephone line speed.
5	Modem-to-AEA Flow Control	On	The modem uses XON and XOFF characters when it wants the AEA to stop sending data.
6	Receive Line Signal Detector (RSLD)	On	The modem turns on RLSD when it detects carrier from the remote modem.
7	Ready For Sending (RFS)	On	The modem turns on RFS in response to RTS turning on.
8	Data Set Ready (DSR)	On	The modem turns on DSR to signal the AEA that a connection has been established.

Hayes SmartModem 1200 Setup

A Hayes SmartModem 1200 should be set up as described in Table B-3. Once the Hayes modem is turned on, many of the operating parameters or default values may be overridden by keyboard commands entered during Online Test 12 (/12 test). Refer to the appropriate *3174 User's Guide* and *3174 Extended Problem Determination* GA23-0217 for Test 12 procedures. In Table B-4 on page B-6, a register number is the Hayes Register number that can be set by sending commands to the modem from the keyboard.

Note: Modems that operate at 2400 bps and some that operate at 1200 bps do not have configuration switches. These modems must be configured prior to attachment to the 3174 and must be consistent with the options shown in Table B-1 on page B-3, Table B-3, and Table B-4 on page B-6.

Table B-3. Hayes SmartModem 1200 Configuration Switch Settings

Switch Number	Option Name	Switch Setting	Description
1	Data Terminal Ready (DTR)	Up	The station supports DTR.
2	Connection indication state format	Up	The results are sent as messages in English (also see V command).
3	Connection state indication	Down	Results are sent (also see Q command).
4	Command mode echo	Up	All characters sent to the modem while it is in command state are echoed back to the display.
5	Automatic answer	Up	The modem answers incoming calls (after a number of rings specified in register S0 [default=1]).
6	Carrier Detect (CD) lead handling	Up	Carrier Detect reflects carrier (Down during command mode).
7	Telephone jack	Not relevant	Up = Single-line RJ11 jack Down = Multiple-line RJ12 or RJ13 jack. Should match your installation.
8	Command mode recognition	Down	The modem recognizes its commands before connection and its command mode escape during a connection.

Table B-4. Hayes SmartModem 1200 Register Settings	
Register Number	**Description**
0	Ring to answer on. See switch 5 in Table B-3 on page B-5. Not relevant to AEA operation.
2	Escape code. Not relevant to AEA operation.
3	Carriage return code. Command and result code terminator can be changed for non-standard equipment. Set to 13 (default).
4	Line feed code. Line feed follows carriage return when English result codes are selected. Set to 10 (default).
5	Backspace code. Not relevant to AEA operation.
6	Wait for dial tone (default=2 seconds). The amount of time the modem waits for dial tone. Not relevant to AEA operation.
7	Wait for carrier (default=30 seconds). The amount of time the modem waits for the remote station to answer before terminating the call. Not relevant to AEA operation.
8	Pause time (caused by comma in dial string; default=2 seconds). Not relevant to AEA operation.
9	Carrier Detect Delay. Not relevant to AEA operation.
10	Delay time between carrier loss and outage notification (default=0.7 second). Not relevant to AEA operation.
11	Tone dialing speed (default=0.07 second). Should be set to match the central telephone switch or private branch exchange (PBX). Not relevant to AEA operation.
12	Escape to command mode guard time (default=1 second). Not relevant to AEA operation.
16	Self Test mode (default=0). This may be set to 1 by using online Test 12 to run modem tests. For auto-call operation, register 16 must be set to 0 (default).

Micom Data Modems

S1 and S2 switch groups on Micom's 3012 and 3024 modems should be set to OFF. Other setup options can be set by using the modem's configuration menu. This menu is accessed by using online Test 12 (see the appropriate *3174 User's Guide* for the procedure). The default settings are suitable to AEA operation.

ASCII Station Setup

Default Terminal Switch Settings

Your terminal should be set with these values when attached to the 3174. For some terminal types, these switch settings are actual switches on the device. For others, the switch settings are values that are set from the keyboard using a setup or configuration mode for the terminal.

Note: Function keys should be left in their default settings.

The following tables give the default switch settings for the terminals supported by the 3174.

IBM 3101 Display Terminal

Switch	Position	Note
CHAR/BLOCK	CHAR	
HDX/FDX	FDX	
232C/422	232C	
PRTS/CRTS	PRTS	
REVCH	OFF	
TURNAROUND	CR	
DUAL/MONO	DUAL	
STOP1/STOP2	---	1
PARITY	---	1
SEND LINE	---	2
NULL SUPP	---	2
TIME FILL	---	2
AUTO NL	OFF	
AUTO LF	OFF	
CR/CR.LF	CR	
SCROLL	OFF	
REV VIDEO	---	3
BLINK CURSOR	---	3
I/O RATE - MAIN	---	1
I/O RATE - AUX	---	4

Notes:

1. This setting must match the configuration of the 3174.
2. The function designated by this switch has no effect on the 3174.
3. User preference: this is a 3101 local option.
4. When a printer is connected to the auxiliary port, the baud rate configured on the printer must match the baud rate on the 3101.

IBM/PC/FTTERM (Color and Monochrome)

Option	Setting	Note
LINE SPEED	---	1
HALF-DUPLEX	N	
PARITY	---	1
STOP BITS	---	1
AUTOMATIC LINE FEED	N	
CARRIAGE RETURN	Y	
CHARACTER SENT AT END OF MESSAGE	2	1
SCROLLING	N	
PROMPT CHARACTER FROM HOST	0	
START/STOP ENABLED	Y	1
COMMUNICATION PORT	---	2
HOST SYSTEM	---	4
INACTIVITY TIME OUT IN MINUTES	---	5
EXTENDED CODES	---	5
NAME OF HOST FILE TRANSFER COMMAND		3

Notes:

1. This setting must match the configuration of the 3174.
2. Choose the communication port that is connected to the 3174.
3. These are necessary for file transfer operations to function correctly.
4. This pertains to file transfer and may need to be modified for your system.
5. User preference: this is a FTTERM local option.

IBM 3151 ASCII Display Station

Setup Item	Selection	Note
General		
MACHINE MODE	IBM 3151	
SCREEN	---	2
ROW AND COLUMN	24 x 80	
SCROLL	---	4
AUTO LF	OFF	
CRT SAVER	---	
LINE WRAP	OFF	
FORCING INSERT	---	
TAB	---	
TERMINAL ID	---	
PRINT	N/A	
Communication		
OPERATING MODE	ECHO	
LINE SPEED (bps)	---	1, 3
WORD LENGTH (bps)	7	
PARITY	---	1, 3
STOP BIT	---	1, 3
TURNAROUND CHARACTER	CR	
INTERFACE	EIA-232C	
LINE CONTROL	PRTS	
BREAK SIGNAL (ms)	500	
SEND NULL SUPPRESS	---	
PACING	N/A	
Keyboard/Printer — Keyboard		
ENTER	RETURN	
RETURN	NEW LINE	
NEW LINE	CR	
SEND	---	
INSERT CHARACTER	SPACE	
Keyboard/Printer — Printer		
LINE SPEED (bps)	---	3
WORD LENGTH (bits)	7	
PARITY	---	3
STOP BIT	---	3
CHARACTERS	---	2

Notes:

1. This setting must match the configuration of the 3174.
2. The function designated by this item has no effect on 3174 operation.
3. The selection for the auxiliary port must match the configuration of the connected printer.
4. SCROLL must be set to either Jump or Smooth.

IBM 3161, 3163, or 3164 Display Station

Setup Item	Selection	Note
MACHINE MODE	---	1
OPERATING MODE	ECHO	
INTERFACE	EIA-232C	
LINE CONTROL	PRTS	
LINE SPEED	---	2, 3
PARITY	---	2, 3
TURNAROUND CHARACTER	CR	
STOP BIT	---	2, 3
WORD LENGTH	7	
RESPONSE DELAY	100	
BREAK SIGNAL	500	
TERMINAL ID	---	4

Select Item	Selection	Note
ENTER	SEND	
RETURN	NEWLINE	
NEWLINE	CR	
TAB	---	4
LINE WRAP	OFF	
CRT SAVER	---	4
AUTO LF	OFF	
SCROLL	---	5
SEND	---	4
SEND NULL	---	4
INS CHAR	---	4
TRACE	---	4

Notes:

1. This item must be set to match the machine, for example, set 3161 for a 3161 display station.
2. This setting must match the configuration of the 3174.
3. Selections for the auxiliary port must match the configuration of the connected printer.
4. The function designated by this switch has no effect on the 3174.
5. For the 3163 and 3164, SCROLL may be set to either JUMP or SMOOTH. For the 3161, set SCROLL to ON.
6. If your terminal has programmable function keys, they should be left at their default setting. If the function keys are altered, the 3270 PF key functions will not work correctly.

IBM 3162 Display Station

Setup Item	Selection	Note
MACHINE TYPE	IBM3162	
SCREEN	NORMAL	
ROW & COLUMN	24x80	
SCROLL	NO	
AUTO LF	OFF	
FORCING INSERT	OFF	
CRT SAVER	---	1
LINE WRAP	OFF	
TAB	---	1
TERMINAL ID	---	1
OPERATING MODE	ECHO	
LINE SPEED (bps)	---	2
WORD LENGTH (bits)	7	
PARITY	---	2
STOP BIT	---	2
TURNAROUND CHAR	CR	
INTERFACE	RS-232	
LINE CTL	PRTS	
BREAK SIGNAL (ms)	500	
SEND NULL SUPPRESS	OFF	
PACING	---	1
ENTER	SEND	
RETURN	LF	
NEW LINE	CR	
SEND	---	1
INSERT CHAR	---	1
PRINTER OPTIONS	---	1

Notes:

1. The function designated by this item has no effect on the 3174.
2. This setting must match the configuration of the 3174.
3. If your terminal has programmable function keys, they should be left at their default setting. If the function keys are altered, the 3270 PF key functions will not work correctly.

ADDS Viewpoint A2

Switch	Setting	Note
BAUD RATE	---	1
AUTO SCROLL	DISABLED	
AUTO LINEFEED	DISABLED	
LINE MODE	FULL DUPLEX	
PARITY	---	1
CHARACTER DISPLAY	---	2
DISPLAY PARITY ERROR	---	2
SCREEN REFRESH RATE	---	3
CHARACTER SET	US (Domestic)	
CURSOR DISPLAY	---	2
CURSOR FORMAT	---	2

Notes:

1. This setting must match the configuration of the 3174.
2. The function described by this switch has no effect on the 3174.
3. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.

ADDS Viewpoint /78

Switch	Setting	Note
BAUD RATE	---	1
VIDEO HIGHLIGHT	FULL	
AUTO SCROLL	DISABLE	
AUTO LINEFEED	DISABLE	
DISPLAY PARITY ERROR	ENABLE	
PARITY	---	1
SCREEN REFRESH RATE	---	2
CURSOR SUPPRESS	VISUAL	
CURSOR FORMAT	---	3
CHARACTER CASE	UPPER/LOWER	
CURSOR HOME	ENABLED	
KEY CLICK	---	3

Notes:

1. This setting must match the configuration of the 3174.
2. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.
3. The function described by this switch has no effect on the 3174.

DEC VT52 and VT100

Switch	Setting	Note
SCROLL	---	1
AUTOREPEAT	---	1
SCREEN	---	1
CURSOR	---	1
MARGIN BELL	---	1
KEY CLICK	---	1
ANSI/VT52	ANSI	2, 3
AUTO XON/XOFF	---	3
#L/3	#	
WRAPAROUND	OFF	
NEWLINE	OFF	
INTERLACE	---	4
PARITY SENSE	---	3
PARITY	---	3
BITS PER CHARACTER	7	
POWER	---	5
T SPEED	---	3, 6
R SPEED	---	3, 6
BRIGHTNESS	---	1
CHARACTERS PER LINE	80	
LINE/LOCAL	LINE	
TABS	---	4

Notes:

1. User preference: this is a VT100 local option.
2. This selection is not an option on the VT52.
3. This setting must match the configuration of the 3174.
4. The function designated by this switch has no effect on the 3174.
5. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.
6. The transmit speed and the receive speed must be the same.

DEC VT241

Setup Item	Selection	Note
On-Line/Local	On-Line	
Set-Up=	Set-Up=English	
Keyboard	North American	
Columns	80 Columns	
Controls	Interpret Controls	
Auto Wrap	No Auto Wrap	
Scroll	No Scroll	
Text/screen	---	1
Display	---	1
Text cursor	---	
Cursor style	---	1
Mode	VT200, 7-bit controls	
VT100 mode Term ID		3
User defined keys	---	1
User features	---	1
Char set mode	Multinational	
Keypad	---	1
Cursor keys	Normal cursor keys	
New line	No new line	
Transmit	---	2
Receive	Receive=transmit	
XOFF	XOFF at 64	
Bits/parity	---	2
Stop bit	---	2
Local echo	No local echo	
Port	---	2
Disconnect/Delay	---	3
Transmit	Limited transmit	3
Printer Set-Up	---	1
Keys	Typewriter Keys	
Lock	---	1
Auto Repeat	---	1
Keyclick	---	1
Margin Bell	No Margin Bell	
Warning Bell	No Warning Bell	

Setup Item	Selection	Note
Break	Break	
Auto Answerback	No Auto Answerback	
Answerback=	---	1
Answerback concealed	---	1
Tab Set-Up	---	3
Graphics Set-Up	---	3
4010/4014 Set-Up	---	3

Notes:

1. User preference: this is a VT240 local option.
2. This setting must match the configuration of the 3174.
3. The function designated by this switch has no effect on the 3174.

Esprit Executive 10/78

Switch	Position	Note
KEYBOARD	3278	
PF CLUSTER	PF	
LEAD IN	ESC	
COMM MODE	FULL DUPLEX	
ATT MODE	CHAR	
SCROLL	NO	
AUTO NEW LINE	NO	
DIAGNOSTIC	NO	
CURSOR	---	1
FRAME RATE	---	2
BAUD RATE MAIN	---	3
BAUD RATE AUX	---	1
PARITY MAIN	---	3
PARITY AUX	---	1
CAPS LOCK	---	1
LOCAL PRINT	---	1

Notes:

1. User preference: this is a local option.
2. This selection must match the power line frequency. In the USA, this switch is set to 60 Hz.
3. This setting must match the configuration of the 3174.

Hazeltine 1500 Video Display Terminal

Switch	Position	Note
BAUD RATE	---	1
PARITY	---	1
HALF/FULL DUPLEX	FULL DUPLEX	
AUTO LF/CR	CR	
U/L CASE	---	2
STD/REV VIDEO	---	2
INTERFACE	EIA	

Notes:

1. This setting must match the configuration of the 3174.
2. User preference: this is a Hazeltine 1500 local option.

Hewlett-Packard 2621B Interactive Terminal

Switch	Position	Note
BAUD RATE	---	1
ECHO	REMOTE	
INVERSE VIDEO/UNDERLINE		2
PRIMARY CHAR SET	ASCII	3
LANGUAGE	USASCII	3
PARITY	---	1
XON/XOFF	ENABLED	1
ENQ/ACK	DISABLED	
AUTO LINE FEED	DISABLED	
LINE/CHARACTER MODE	CHARACTER	
RETURN/ENTER KEY STRING	CR	
DATA SPEED SELECT	---	4
LONG TRANSFER WARNING	DISABLED	
SHORT TRANSFER TRIGGER	DISABLED	
WRAPAROUND CURSOR	DISABLED	
SPACE OVERWRITE LATCH	DISABLED	
ESCAPE SEQUENCE TRANSMISSION	ENABLED	

Notes:

1. This setting must match the configuration of the 3174.
2. If you are using the standard keyboard, switch 5 specifies the highlighting mode (inverse video or underline).
3. This setting must match the keyboard attached to the 2621B. Only the USASCII is supported.
4. This allows the operation of modems that support dual-speed data transmissions. If you change line speed, you must reconnect and refresh the autobaud sequence will be required.

Lear Siegler ADM 3A Dumb Terminal

Switch	Setting	Note
BAUD RATE	---	1
HDX-FDX	FDX	
RS232-CL	RS232	
AUTO NL-OFF	DISABLED	
LC EN-UC	LC EN	
PARITY ODD-EVEN	---	1
DATA 7-8	7	
STOP 1-2	---	1
PARITY-INH	---	1
BIT 8 0-1	---	2
12 LINE-24 LINE	24 LINE	
50 HZ-60 HZ	---	3
DISABLE-CLR SCRN	CLR SCRN	
DISABLE-KB LOCK	DISABLE	
UC DISP-U/L DISP	U/L DISP	
SPACE-ADV	SPACE	
EOT-OFF	OFF	---
ETX-OFF	OFF	---
CODE-SEC	OFF	---
202-OFF	OFF	
103-OFF	103	
LOCAL-OFF	OFF	
CUR CTL-OFF	CUR CTL	
NORM-FILL	NORM	
BEEP ON-OFF	---	4
GT-LK	GT	

Notes:

1. This setting must match the configuration of the 3174.
2. The function designated by this switch has no effect because the DATA 7-8 switch is set to 7.
3. This selection must match the power line frequency. In the USA, this switch is set to 60 Hz.
4. The switch is set to user preference.

Lear Siegler ADM 5 Dumb Terminal

Switch	Setting	Note
BAUD RATE	---	1
AUTO NL	DISABLED	
50 HZ-60 HZ	---	2
RS232 - CUR LP	RS232	
HDX-FDX	FDX	
BIT 8 = 0/1	---	3
ENPR - DISPR	---	1
1 STOP - 2 STOP	---	1
ODD-EVEN	---	1
7 BIT - 8 BIT	7	
EOT	OFF	
ETX	OFF	
CODE	OFF	
202	OFF	
103	103	1
LOCAL	OFF	
GT-LK	GT	
NORM-FILL	NORM	

Notes:

1. This setting must match the configuration of the 3174.
2. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.
3. The function designated by this switch has no effect because 7 BIT - 8 BIT is set to 7.

Lear Siegler ADM 11 and Lear Siegler ADM 12

Feature	Selection	Note
CLICK	---	1
ONLINE	Y	
CURSOR BLINK	---	1
STATUS	NORM	
WRAP	N	
NEWLINE	N	
BPS	---	2
BITS	7	
BIT 8	---	1
PTY ENABLE	---	2
PTY	---	2
SET DUPLEX MODE	FDX	
CHRS/FNC	---	1
FNC KEYS	---	1
SO/SI	---	1
FREQ(Hz)	---	3
HANDSHAKE	---	2
REV XON/XOFF	ENA	
BUSY		1
ANSBK	---	1
SCREEN SAVE	---	1
KEYBOARD	US/UK	
ADM3A MODE	N	
MODE	ADM	
LEAD IN	ESC	
SCROLL	N	
580 COMP.	---	1
CURSOR HOME	---	1

Notes:

1. The function designated by this switch has no effect on the 3174.
2. This setting must match the configuration of the 3174.
3. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.

Lear Siegler ADM 1178

Switch	Setting	Note
CLICK	---	1
ONLINE	Y	
CURSOR BLINK	---	1
STATUS	NORM	
WRAP	N	
BPS	---	2
BITS	7	
BIT 8	---	1
PTY ?	---	2
PTY	---	2
DUPLEX	FDX	
HZ	---	3
HANDSHAKE	---	2
XON/XOFF	---	2
BUSY	---	1
ANSBK	---	1
NUMERIC	---	1
SCREEN SAVE	---	1
ATTRIBUTES	---	1
LOCK (alpha/shift)	---	1
INDICATE SHIFT	---	1
LOCK (local/transmit)	---	1
LOCK RELEASE	---	1
KEYBD	3278	
SCROLL	N	

Notes:

1. The function designated by this switch has no effect on the 3174.
2. This setting must match the configuration of the 3174.
3. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.

TeleVideo 912

Switch	Setting	Note
BAUD RATE	---	1
CHARACTER SET	---	2
HALF/FULL DUPLEX	FULL DUPLEX	
REFRESH	---	3
PARITY	---	1
STOP BITS	---	1
DATA BITS	7 BITS	
PARITY SELECT	---	1
CURSOR	---	4
DSR	DSR ON P3-6	5
CD	DCD ON P3-8	5
DTR	DTR ON WHEN TERM ON	5
INTERFACE	EIA 232 INPUT	
AUTO LINE FEED AT CR	JUMPER NOT INSTALLED	5
EOT AT END OF SEND	JUMPER NOT INSTALLED	5
AUTO LINE FEED IN COL 80	JUMPER INSTALLED	5
PAGE/EXTENSION	---	6

Notes:

1. This setting must match the configuration of the 3174.
2. The character set must match the translate table used in the 3174.
3. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.
4. User preference: this is a TeleVideo 912C local option.
5. Refer to the terminal setup manual (*TeleVideo Operator's Manual Models 912C/920*, B30001-001).
6. The function designated by this switch has no effect on the 3174.

TeleVideo 970

Switch	Position	Note
AUTOPG	SINGLE	
AUTOTAB	---	1
AUTOWRAP	NO WRAP	
BAUD (Main Port)	---	2
BAUD (Printer Port)	---	1
BREAK KEY	EXEC	
CHAR/LN	80	
COMM	CNV	
CTRL REP	PROC	
CURSOR ATTR	---	3
CURSOR STYLE	---	3
DATA BITS (Main)	7	
DATA BITS (Printer)	---	1
DUPLEX	FDX	
EDIT BOUND	PG	
EDITING EXT	DSPL	
1ST CHAR SET	U.S.	
GUARDED XFR	---	1
HORZ EDIT	RT	
INS/RPLC	RPLC	
KEYCLICK	---	3
LN ATTR	NOR	
LN XFER	---	1
LF/NEWLN	LN FEED	
LN/PG	24	
MULTI-AREA XFER	---	1
PG XFER	---	1
PARITY (Main)	---	2
PARITY (Printer)	---	1
POWER/HZ	---	4
PRINT STA	---	1
RCV CTRL (Main)	---	2
SCRN BACK	---	3
SCR SAVER	---	1
SCROLL	---	3
2ND CHAR SET	---	1
SEND/RCV	NO ECHO	
STOP BIT (Main)	---	2
STOP BIT (Printer)	---	3
25TH LINE	MSG	

Switch	Position	Note
VERT EDIT	---	3
XFER EXEC	---	3
XFER TERM	---	3
XMIT CTRL (Main)	XON/XOFF	2
XMIT CTRL (Printer)	---	3

Notes:

1. The function designated by this switch has no effect on the 3174.
2. This setting must match the configuration of the 3174.
3. This switch is set to user preference.
4. This selection must match the power line frequency.
   In the USA, this switch is set to 60 Hz.

List of Abbreviations

A

ACK. Acknowledge.

AEA. Asynchronous Emulation Adapter.

Alt. Alternate.

ANSI. American National Standards Institute.

APL. A Programming Language.

ASCII. American National Standard Code for Information Interchange.

ATTN. Attention.

B

bps. Bits per second.

C

C. Celsius.

char. Character.

cncl. Cancel.

comm. Communication.

CR. Carriage return.

CRT. Cathode-ray tube.

CTL. Control.

ctrl, CTRL. Control.

CUT. Control unit terminal.

D

dec. decimal

DEL. The delete character.

dev. Device.

DLE. Data link escape.

DSR. Data set ready.

DTR. Data terminal ready.

dup, DUP. Duplicate.

E

EIA. Electronic Industries Association.

ENQ. Enquiry.

EOF. End of file.

EOT. End-of-transmission character.

ESC. Escape.

ETX. End of Text.

F

F. Fahrenheit.

FCC. Federal Communications Commission.

FF. Forms feed.

FM. (1) Frequency modulation. (2) Function management. (3) Field mark.

H

hex. Hexadecimal.

HT. Horizontal Tab.

Hz. Hertz.

I

ID. Identification, identifier.

Ident. Identification.

INS. Insert.

I/O. Input/output.

K

KB. Kilobyte; 1024 bytes.

L

L. Left.

LED. Light-emitting diode.

LF. Line feed.

LT. Logical terminal.

LU. Logical unit.

M

MLT. Multiple logical terminals.

modem. Modulator-demodulator.

MSR. Magnetic stripe reader.

N

NL. New Line.

No. Number.

NUL. Null.

NUM. Numeric.

O

OIA. Operator infromation area

P

PA. Program access

PAM. Printer authorization matrix.

PBX. Private branch exchange.

PC. Personal Computer.

pF. Picofarad.

PF. Program function.

PS. Programmed symbols.

R

Req. Request.

RTM. Response Time Monitor.

RTS. Request to send.

S

SA. Set attribute

SCS. SNA character string.

SI. Supress index

SNA. Systems Network Architecture.

SOH. Start-of-heading character.

SSCP. System services control point.

STX. Start of text.

U

U.K. United Kingdom

U.S. United States.

X

XOFF. Transmitter off.

XON. Transmitter on.

Glossary

This glossary includes terms and definitions from the *IBM Dictionary of Computing: Information Processing, Personal Computing, Telecommunications, Office Systems, IBM-specific Terms*, SC20-1699.

The terms in this glossary are defined here as they apply to the 3270 Information Display System.

A

active. Able to communicate on the network. An adapter is active if it is able to pass tokens on the network.

active logical terminal (LT). In MLT, the currently displayed logical terminal. Synonymous with *foreground logical terminal*. Contrast with *background logical terminal*.

adapter. A general term for a device that provides some transitional function between two or more devices.

address. (1) A value that identifies a register, a particular part of storage, a data source, or a data sink. The value is represented by one or more characters. (2) To refer to a device or an item of data by its address. (3) In word processing, the location, identified by an address code, of a specific section of the recording medium or storage. (4) The location in the storage of a computer where data is stored. (5) In data communication, the unique code assigned to each device or work station connected to a network.

AEA port. A communication connector on the Asynchronous Emulation Adapter (AEA).

American National Standard Code for Information Interchange (ASCII). A standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters.

application. The use to which an information processing system is put, for example, a payroll application, an airline reservation application, or a network application.

application program. (1) A program written for or by a user that applies to the user's work, such as a program that does inventory control or payroll. (2) A program used to connect and communicate with stations in a network, enabling users to perform application-oriented activities.

ASCII emulation. The ability of a 3270 display station or printer to communicate with an ASCII host using the DEC VT100 or IBM 3101 data stream.

ASCII pass-through. The transmission of unmodified data between ASCII display stations or printers and an ASCII host or public data network.

ASCII pass-through mode. For an ASCII device attached to a 3174, a mode of operation in which the device communicates with an ASCII host.

asynchronous. (1) Without regular time relationship; unexpected or unpredictable with respect to the execution of program instructions. (2) In asynchronous data transmissions, data characters may be sent or received at any time; no modem clocking is used to establish bit timing.

Asynchronous Emulation Adapter (AEA). In the 3174 Establishment Controller, an adapter that enables an ASCII terminal to communicate with a 3270 host using the 3270 data stream, an ASCII terminal to communicate with an ASCII host through the 3174, and a 3270 terminal to communicate with an ASCII host using the DEC VT100 data stream or the IBM 3101 data stream.

attach. To connect a device logically to a 3174 adapter, so that it can communicate over the network.

attachment feature. The circuitry by which a cable from a local terminal or a modem for a remote terminal is attached to a 3792 Auxiliary Control Unit or a 3791 Controller.

attention (ATTN). An occurrence external to an operation that could cause an interruption of the operation.

attention field. In the 3270 Information Display System, a detectable field in which the designator character is a null, a space, or an ampersand.

attention identifier (AID). (1) A code in the inbound 3270 data stream that identifies the source or type of data that follows. (2) A character in a data stream indicating that the user has pressed a key, such as Enter, that requests an action by the system.

attribute. (1) A characteristic. (2) A terminal display language or transformation definition language (TDL) keyword that specifies a particular quality for the TDL object with which it is associated.

audible alarm. (1) An alarm that is sounded when designated events occur that require operator attention

or intervention before system operation can continue. (2) A special feature that sounds a short, audible tone automatically when a character is entered from the keyboard into the next-to-last character position on the screen. The tone can also be sounded under program control.

auto-answer. See *automatic answering.*

autobaud. In the 3174 AEA feature, the process of determining the line speed and parity settings of a connecting display station from a specific sequence of characters (CR . CR) entered from the keyboard. ASCII hosts may also support automatic speed and parity detection, but the character sequence they require may differ.

auto-call. See *automatic calling.*

automatic answering. (1) Answering in which the called data terminal equipment (DTE) automatically responds to the calling signal.

Note: The call may be established whether or not the called DTE is attended.

(2) A machine feature that permits a station to respond without operator action to a call it receives over a switched line. See also *manual answering.* Contrast with *automatic calling.*

automatic calling. (1) Calling in which the elements of the selection signal are entered into the data network contiguously at the full data signaling rate. (2) A machine feature that permits a station to initiate a connection with another station over a switched line without operator action. (3) Synonymous with auto-call. See also *manual calling.* Contrast with *automatic answering.*

B

backbone. In a multiple-ring local area network, a high-speed link to which the rings are connected by means of bridges. A backbone may be configured as a bus or as a ring.

background logical terminal (LT). In MLT, any logical terminal that is not currently displayed. Contrast with *active logical terminal (LT).*

blink. An extended highlighting attribute value (for emphasis) of a field or character.

bracket. In SNA, one or more chains of request units (RUs) and their responses, which are exchanged between two LU-LU half-sessions and represent a transaction between them. A bracket must be completed before another bracket can be started. Examples of brackets are data base inquiries/replies, update transactions, and remote job entry output sequences to work stations.

bridge. (1) A functional unit that connects two local area networks (LANs) that use the same logical link control (LLC) procedure but may use different medium access control (MAC) procedures. (2) See also *backbone* and *gateway.*

Note: A bridge connects networks or systems of the same or similar architectures, whereas a gateway connects networks or systems of different architectures.

buffer. (1) A routine or storage used to compensate for a difference in rate of flow of data, or time of occurrence of events, when transferring data from one device to another. (2) An isolating circuit used to prevent a driven circuit from influencing the driving circuit. (3) To allocate and schedule the use of buffers. (4) A portion of storage used to hold input or output temporarily.

buffer address. The address of a location in the buffer.

C

card. In the 3174 Establishment Controller, a unit of electronic circuitry contained in a plastic casing (or cassette) and providing the controller with a specialized function, for example, a Terminal Adapter or an Encrypt/Decrypt Adapter.

central site customizing. The process of tailoring control unit microcode for each controller in a network, at the central site.

change-screen key. In MLT, a key or sequence of keys on a display station keyboard used to change sessions, one at a time, with up to five different hosts.

channel-attached. Pertaining to attachment of devices directly by data channels (I/O channels) to a computer. Synonym for *local.* Contrast with *telecommunication-attached.*

channel-to-channel adapter. A hardware device that can be used to connect two channels on the same computing system or on different systems.

character mode. A mode in which input is treated as alphanumeric data, rather than graphic data.

character position. A location on the screen at which 1 character can be displayed; also, an addressed location in the buffer at which 1 character can be stored.

character set. (1) A defined collection of characters. (2) A group of characters used for a specific reason, for example, the set of characters a printer can print. (3) The collection of graphic characters required to support a specific language.

cluster. A station that consists of a control unit (a cluster controller) and the terminals attached to it.

command. An instruction that directs a control unit or device to perform an operation or a set of operations.

communication adapter. (1) A circuit card with associated software that enables a processor, controller, or other device to be connected to a network. (2) See *EIA communication adapter*, *V.35 communication adapter*, and *X.21 communication adapter*.

configuration. The arrangement of a computer system or network as defined by the nature, number, and chief characteristics of its functional units. More specifically, the term *configuration* may refer to a hardware configuration or a software configuration. See also *system configuration.*

Connection Menu. A menu on the screen of a display station attached to the 3174 Establishment Controller, from which a user can select an available host.

control character. (1) A character whose occurrence in a particular context specifies a control function. (2) A character used to specify that a control unit is to perform a particular operation.

control codes. (1) Code points and their assigned control function meanings. (2) The hexadecimal values hex 00 through hex 3F, and hex FF in the 3270 data stream. ASCII control codes are the hexadecimal values hex 00 through hex 1F and 7F.

Control (CTL) disk. A customized diskette or fixed disk containing the microcode that describes a particular controller's attached terminals, and its method of attachment to the host.

Control (CTL) diskette. A customized diskette containing the microcode that describes a particular controller's attached terminals, and its method of attachment to the host.

controller. A unit that controls input/output operations for one or more devices.

control unit. A general term for any device that provides common functions for other devices or mechanisms. Synonym for controller.

control unit terminal (CUT). A terminal that relies on the 3174 to interpret the data stream. Examples are the 3178, 3179, 3278 Model 2, and 3279 Model S2A.

control unit terminal (CUT) mode. A host-interactive mode that enables an IBM 3270 Personal Computer customized in this mode to run only one session emulating a 3178, 3179, 3278 Model 2, or 3279 Model S2A.

conversion. (1) In programming languages, the transformation between values that represent the same data item but belong to different data types. Information may be lost as a result of conversion because accuracy of data representation varies among different data types. (2) The process of changing from one method of data processing to another or from one data processing system to another. (3) The process of changing from one form of representation to another, for example, to change from decimal representation to binary representation.

copy operation. An operation that copies the contents of the buffer from one terminal to another terminal attached to the same control unit.

cursor. (1) A movable, visible mark used to indicate the position at which the next operation will occur on a display surface. (2) A unique symbol that identifies a character position in a screen display, usually the character position at which the next character to be entered from the keyboard will be displayed.

customization. Procedures that tailor the control unit microcode to fit the various types of display stations and printers and the method of host attachment that a particular control unit will handle.

customizing keyboard. A keyboard used to type in the customizing responses; this keyboard must be a Typewriter, Data Entry, APL (with APL off), or Text (with Text off) keyboard with a QWERTY layout. (On a QWERTY layout, the first six characters on the left side of the top row of alphabetic characters are Q, W, E, R, T, Y.)

D

data stream. (1) All data transmitted through a data channel in a single read or write operation. (2) A continuous stream of data elements being transmitted, or intended for transmission, in character or binary-digit form, using a defined format. See also *data stream format*.

data stream format. In SNA, the format of the data elements (end-user data) in the request unit (RU). See also *3270 data stream* and *SNA character string (SCS)*.

Data Terminal Ready (DTR) flow control. A procedure for a communicating device to signal its readiness to receive data by raising the DTR lead on an EIA 232D interface.

decrypt. To convert encrypted data into clear data. Contrast with *encrypt*.

destination. Any point or location, such as a node, station, or a particular terminal, to which information is to be sent.

device. A mechanical, electrical, or electronic contrivance with a specific purpose.

disk. A direct-access data storage medium, which may be either flexible (diskette) or hard (fixed disk).

diskette. A flexible magnetic disk enclosed in a protective container.

diskette drive. The mechanism used to seek, read, and write data on diskettes.

display field. (1) An area in the display buffer that contains a set of characters that can be manipulated or operated upon as a unit. (2) A group of consecutive characters (in the buffer) that starts with an attribute character (defining the characteristics of the field) and contains one or more alphanumeric characters. The field continues to, but does not include, the next attribute character.

display frame. (1) In computer graphics, an area in storage in which a display image can be recorded. (2) In computer micrographics, an area on a microform in which a display image can be recorded.

display station. An input/output device containing a display screen and an attached keyboard that allows a user to send information to or receive information from the system.

dot. One point in a printer or display block matrix.

duplex. Pertaining to communication in which data can be sent and received at the same time. Synonymous with *full duplex*.

E

EIA communication adapter. A communication adapter conforming to EIA standards that can combine and send information on two lines at speeds up to 19.2 kbps.

EIA 232D. An electrical interface defined by the Electronics Industries Association for establishing connections and controlling data flow between data terminal equipment and data communication equipment. The interface has been adapted to allow communication between DTEs.

emulate. (1) To imitate one system with another, primarily by hardware, so that the imitating system accepts the same data, executes the same computer programs, and achieves the same results as the imitated computer system.

emulation. (1) The imitation of all or part of one system by another, primarily by hardware, so that the imitating system accepts the same data, executes the same programs, and achieves the same results as the imitated computer system. (2) The use of programming techniques and special machine features to permit a computing system to execute programs written for another system. (3) Imitation; for example, imitation of a computer or device. (4) See *terminal emulation*. (5) Contrast with *simulation*.

encrypt. To scramble data or convert it, before transmission, to a secret code that masks the meaning of the data to any unauthorized recipient. Contrast with *decrypt*.

F

field. See *display field*.

file. A named set of records stored or processed as a unit.

fixed disk. A rigid magnetic disk used in a fixed disk drive.

flow control. (1) In data communication, control of the data transfer rate. (2) In SNA, the process of managing the rate at which data traffic passes between components of the network. The purpose of flow control is to optimize the rate of flow of message units with minimum congestion in the network, that is, neither to overflow the buffers at the receiver or at intermediate routing nodes nor to leave the receiver waiting for more message units. (3) The methods used to control the flow of information across a network.

foreground logical terminal (LT). Synonym for *active logical terminal (LT)*.

frame. (1) The portion of a tape, on a line perpendicular to the reference edge, on which binary characters can be written or read simultaneously. (2) A housing for machine elements. (3) The hardware support structure, covers, and all electrical parts mounted therein that are packaged as one entity for shipping. (4) A formatted display. See *display frame*.

full duplex. Synonym for *duplex*.

G

gateway. (1) A functional unit that connects two computer networks of different network architectures.

Note: A gateway connects networks or systems of different architectures. A bridge interconnects networks or systems with the same or similar architectures.

generate. In 3174 central site customizing, to write a Control diskette containing the customizing data for a particular controller. Also, to print a mailing address label and a diskette label for a particular control unit.

get. In 3174 central site customizing, to select the type of data you want and store it in working copy.

H

half-duplex. In data communication, pertaining to transmission in only one direction at a time. Contrast with *duplex*.

hertz (Hz). A unit of frequency equal to 1 cycle per second.

hexadecimal. (1) Pertaining to a selection, choice, or condition that has 16 possible values or states. (2) Pertaining to a fixed-radix numeration system, with radix of 16. (3) Pertaining to a numbering system with base of 16; valid numbers use the digits 0 through 9 and characters A through F, where A represents 10 and F represents 15.

host logical unit (LU). An SNA logical unit (LU) located in a host processor, for example, an ACF/VTAM application program.

host system. (1) A data processing system used to prepare programs and operating environments for use on another computer or controller. (2) The data processing system to which a network is connected and with which the system can communicate. (3) The controlling or highest-level system in a data communication configuration; for example, a System/38 is the host system for the work stations connected to it.

I

input/output (I/O). (1) Pertaining to a device whose parts can perform an input process and an output process at the same time. (2) Pertaining to a functional unit or channel involved in an input process, output process, or both, concurrently or not, and to the data involved in such a process. (3) Pertaining to input, output, or both.

interface. (1) A shared boundary between two functional units, defined by functional characteristics, common physical interconnection characteristics, signal characteristics, and other characteristics as appropriate. (2) A shared boundary. An interface may be a hardware component to link two devices or a portion of storage or registers accessed by two or more computer programs. (3) Hardware, software, or both, that links systems, programs, or devices.

J

jack. A connecting device to which a wire or wires of a circuit may be attached and that is arranged for insertion of a plug.

K

keyboard definition. A customizing procedure for defining a maximum of four modified keyboard layouts for modifiable keyboards only. Most characters, symbols, and functions can be relocated, duplicated, or deleted from almost any keyboard position.

L

leased line. Synonym for *nonswitched line*.

light pen. A light-sensitive pick device that is used by pointing it at the display surface.

line speed. (1) The rate at which data is transmitted from one point to another over a telecommunication line. (2) The number of binary digits that can be sent over a telecommunication line in 1 second, expressed in bits per second (bps).

link. The logical connection between nodes including the end-to-end link control procedures.

local. Pertaining to a device accessed directly without use of a telecommunication line. Synonym for *channel-attached*. Contrast with *remote*.

location. With reference to a 3174, a place within the 3174 chassis where a particular card or adapter is inserted.

logical terminal (LT). In MLT, one of five sessions available to share one display station.

logical unit (LU). In SNA, a port through which an end user accesses the SNA network in order to communicate with another end user and through which the end user accesses the functions provided by system services control points (SSCPs). An LU can support at least two sessions, one with an SSCP and one with another LU, and may be capable of supporting many sessions with other logical units.

M

main storage. Program-addressable storage from which instructions and other data can be loaded directly into registers for subsequent processing.

maintenance analysis procedure (MAP). A maintenance document that gives an IBM service representative a step-by-step procedure for tracing a symptom to the cause of a failure.

manual answering. (1) Answering in which a call is established only if the called user signals a readiness to receive the call by means of a manual operation. (2) Operator actions to prepare a station to receive a

call on a switched line. Contrast with *automatic answering*.

manual calling. (1) Calling that permits the entry of selection signals from a calling data station at an undefined character rate. (2) Operator actions to place a call over a switched line. Contrast with *automatic calling*.

mark. A symbol or symbols that indicate the beginning or the end of a field, a word, an item of data or a set of data such as a file, record, or block.

memory. Program-addressable storage from which instructions and other data can be loaded directly into registers for subsequent execution or processing. Synonymous with *main storage*.

microcode. (1) One or more microinstructions. (2) A code, representing the instructions of an instruction set, that is implemented in a part of storage that is not program-addressable. (3) To design, write, and also to test one or more microinstructions.

modem (modulator/demodulator). 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.

multidrop (network). A network configuration in which there are one or more intermediate nodes on the path between a central node and an endpoint node.

multiple logical terminal (MLT). In the 3174, a function that provides a CUT-attached, fixed-function display station with the ability to interact with as many as five host sessions. Each session is processed as though it were a separate display station.

N

native mode. A 3179 or 3180 operational mode that uses the full capabilities of those models' display and keyboard.

network. (1) An arrangement of nodes and connecting branches. Connections are made between data stations. (2) A configuration of data processing devices and software connected for information interchange.

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

online test. A diagnostic test or data collection program that is run without interrupting the normal operation of the 3174 and its associated terminals.

operator information area (OIA). The area below the line near the bottom of the display area where graphics and alphanumeric characters are displayed to define the status of the terminal or the system to the operator.

P

pacing. (1) A technique by which a receiving station controls the rate of transmission of a sending station to prevent overrun. (2) In SNA, a technique by which a receiving component controls the rate of transmission of a sending component to prevent overrun or congestion.

parity. (1) A transmission error-checking scheme in which an extra bit is added to some unit of data, usually a byte, in order to make the total number of one bits even or odd. For the AEA feature, odd, even, mark, space, or no-parity coding is supported. No-parity means that no parity bit is sent or expected. Mark and space mean that the parity position is always set to one or zero, respectively, and that received parity is not checked. (2) The state of being either even-numbered or odd-numbered.

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 pre-established. (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.

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.

primary session. In MLT, the primary session is the first session defined on a port.

printer authorization matrix (PAM). A matrix stored in the controller that establishes printer assignment and classification.

private branch exchange (PBX). An automatic or manual private telephone exchange for transmission of calls to and from the public telephone network.

program access (PA) key. On a display device keyboard, a key that produces a call to a program that performs display operations. See also *program function (PF) key*.

program function (PF) key. On a display device keyboard, a key that passes a signal to a program to

call for a particular display operation. See also *program access (PA) key*.

programmable symbols (PS). Customer-defined symbols. There are a maximum of 190 symbols in a programmed symbol set.

programmed symbol set (PSS). A set of fonts that can be system-defined or defined by the user and to which a code can be assigned.

programmed symbols (PS). In the 3270 Information Display System, an optional feature that stores up to six user-definable, program-loadable character sets of 190 characters each in terminal read/write storage for display or printing by the terminal.

protected field. (1) In word processing, preset data or an area that cannot be changed or overridden by an operator without altering the program. (2) On a display device, a display field in which a user cannot enter, modify, or erase data. Contrast with *unprotected field*.

protocol. (1) A set of semantic and syntactic rules that determine the behavior of functional units in achieving communication. (2) In SNA, the meanings of and the sequencing rules for requests and responses used for managing the network, transferring data, and synchronizing the states of network components.

put. In 3174 central site customizing, to store data from the working copy into a library member.

R

read-only memory (ROM). A computer's storage area whose contents cannot be modified.

register. A storage device having a specified storage capacity such as a bit, byte, or computer word, and usually intended for a special purpose.

remote. Pertaining to a system, program, or device that is accessed through a telecommunication line.

Response Time Monitor (RTM). A network management tool that measures and records the transaction times of inbound host attention (AID) operations from display stations that communicate with the host.

return code. (1) A code used to influence the execution of succeeding instructions. (2) A value returned to a program to indicate the results of an operation requested by that program.

ring interface adapter. A device that assumes the basic data transmission functions of node, such as frame recognition, address decoding, error checking, buffering of frames, fault detection, and, in Token-Ring Networks, token generation.

ring network. A network configuration where a series of attaching devices are connected by unidirectional transmission links to form a closed path.

S

selector pen. A pen-like instrument that can be attached to a display station. When a program using full-screen processing is assigned to the display station, the pen can be used to select items on the screen or to generate an attention. Synonym for *light pen*.

session. (1) In network architecture, an association of facilities necessary for establishing, maintaining, and releasing connections for communication between stations. (2) In MLT, synonymous with logical terminal (LT). (3) In SNA, a logical connection between two network addressable units that can be activated, tailored to provide various protocols, and deactivated as requested.

Set Attribute (SA) order. (1) An order that specifies an attribute-type-value pair defining the property to be applied to subsequent characters in the data stream. An SA order is required for each property assigned. (2) An order that associates attributes in the EAB with individual characters.

simulate. (1) To represent certain features of the behavior of a physical or abstract system by the behavior of another system; for example, to represent a physical phenomenon by means of operations performed by a computer or to represent the operations of a computer by those of another computer. (2) To imitate one system with another, primarily by software, so that the imitating system accepts the same data, executes the same computer programs, and achieves the same results as the imitated system. (3) Contrast with *emulate*.

simulation. (1) The representation of selected characteristics of the behavior of one physical or abstract system by another system. In a digital computer system, simulation is done by software; for example, (a) the representation of physical phenomena by means of operations performed by a computer system, and (b) the representation of operations of a computer system by those of another computer system. (2) Contrast with *emulation*.

SNA character string (SCS). A character string composed of EBCDIC controls, optionally intermixed with end-user data, that is carried within a request/response unit.

staging adapter. (1) An addition to a System/370 Model 158 or 168 Integrated Storage Control (ISC) feature that enables the integrated storage control to operate in a 3850 Mass Storage System. (2) An IBM

3850 Model 3 Storage Control, which is a 3830 Model 2 Storage Control that has been modified to operate in a 3850 Mass Storage System.

station. (1) An input or output point of a system that uses telecommunication facilities; for example, one or more systems, computers, terminals, devices, and associated programs at a particular location that can send or receive data over a telecommunication line. (2) A location in a device at which an operation is performed, for example, a read station. (3) In SNA, a link station.

stop bit. Synonym for *stop signal*.

stop signal. In start-stop transmission, a signal at the end of a character that prepares the receiving device for reception of a subsequent character. Synonymous with *stop bit*.

storage. A unit into which recorded text can be entered, in which it can be retained and processed, and from which it can be retrieved. See also *memory*.

Suppress Index (SI) order. An order that generates the suppress index character, valid only for the 3288 Model 2 printer. This character inhibits a line index to allow overprinting.

switched line. A telecommunication line in which the connection is established by dialing. Contrast with *nonswitched* line.

synchronous. (1) Pertaining to two or more processes that depend on the occurrences of a specific event, such as common timing signal. (2) Occurring with a regular or predictable time relationship.

system configuration. A process that specifies the devices and programs that form a particular data processing system.

system services control point (SSCP). In SNA, the focal point within an SNA network for managing the configuration, coordinating network operator and problem determination requests, and providing directory support and other session services for end users of the network. Multiple SSCPs, cooperating as peers, can divide the network into domains of control, with each SSCP having a hierarchical control relationship to the physical units and logical units within its domain.

Systems Network Architecture (SNA). The description of the logical structure, formats, protocols, and operational sequences for transmitting information units through, and controlling the configuration and operation of, networks.

T

telecommunication-attached. Pertaining to the attachment of devices by teleprocessing lines to a host processor. Synonym for *remote*. Contrast with *channel-attached*.

terminal. In data communication, a display station or printer capable of sending or receiving information.

terminal adapter (TA). An adapter that provides control for a maximum of 32 terminals; each BNC connector (four in all) on the terminal adapter can control either one terminal that is directly attached or as many as eight terminals that are attached through a terminal multiplexer adapter (located in the 3174) or a 3299 Terminal Multiplexer (located outside the 3174).

terminal emulation. The capability of a microcomputer, personal computer, 3270 CUT mode display station, 3270 printer, ASCII display station, or ASCII printer to operate as if it were a particular type of terminal linked to a processing unit and to access data.

terminal multiplexer. A device, such as the 3299 Terminal Multiplexer, for interleaving the signals for many devices onto a single coaxial cable.

terminal multiplexer adapter (TMA). This adapter is connected to the terminal adapter in the 3174 and provides control for a maximum of eight terminals.

terminal port. (1) In a network, the functional unit of a node through which data can enter or leave the network. (2) The part of a processor that is dedicated to a single data channel for the purpose of receiving data from or transferring data to one or more external or remote devices.

terminal type menu. A list of all the available names and terminal types for a given port.

time-out. (1) An event that occurs at the end of a predetermined period of time that began at the occurrence of another specified event. (2) A time interval allotted for certain operations to occur; for example, response to polling or addressing before system operation is interrupted and must be restarted. (3) A terminal feature that logs off a user if an entry is not made within a specified period of time.

token. In a local area network, the symbol of authority passed among data stations to indicate the station temporarily in control of the transmission medium.

Note: A token is a particular message or bit pattern that signifies permission to transmit.

Token-Ring Network. (1) A ring network that allows unidirectional data transmission between data stations by a token-passing procedure over one transmission

medium so that the transmitted data returns to the transmitting station. (2) A network that uses a ring topology, in which tokens are passed in a circuit from node to node. A node that is ready to send can capture the token and insert data for transmission.

translate table. A table that defines the translation of ASCII to EBCDIC and EBCDIC to ASCII and that allows the use of special characters and nonstandard codes.

type. In the 3174 Establishment Controller, the identifying number of a card. For example, 9150 is the type number of the terminal adapter in the 3174.

U

unprotected field. A displayed field in which a user can enter, modify, or delete data. Contrast with *protected field.*

update. In 3174 central site customizing, to tailor a library member's customizing data, in working copy, and put it back to the library diskette.

V

V.35 communication adapter. A communication adapter that can combine and send information on one line at speeds up to 64 kbps, and conforms to the CCITT V.35 standard.

W

wraparound. The continuation of an operation (for example, a read operation or a cursor movement operation) from the last character position in a buffer to the first character position in the buffer.

write. To make a permanent or transient recording of data in a storage device or on a data medium.

X

X.21. In data communication, a recommendation of the International Telegraph and Telephone Consultative Committee (CCITT) that defines the interface between data terminal equipment and public data networks for digital leases and circuit switched synchronous services.

X.21 communication adapter. A communication adapter that can combine and send information on one line at speeds up to 64 kbps, and that conforms to CCITT X.21 standards.

X.25. In data communication, a recommendation of the CCITT that defines the interface between data terminal equipment and packet switching networks.

3

3270 data stream. (1) The commands, control codes, orders, attributes, and data or structured fields for 3270 devices, that are transmitted inbound to an application program or outbound to a terminal. (2) Data being transferred from or to an allocated primary or tertiary device, or to the host system, as a continuous stream of data and 3270 Information Display System control elements in character form.

3270 emulation. The use of a program that allows a device or system such as a personal computer or a System/38 to operate in conjunction with a host system as if it were a 3270-series display station or control unit.

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