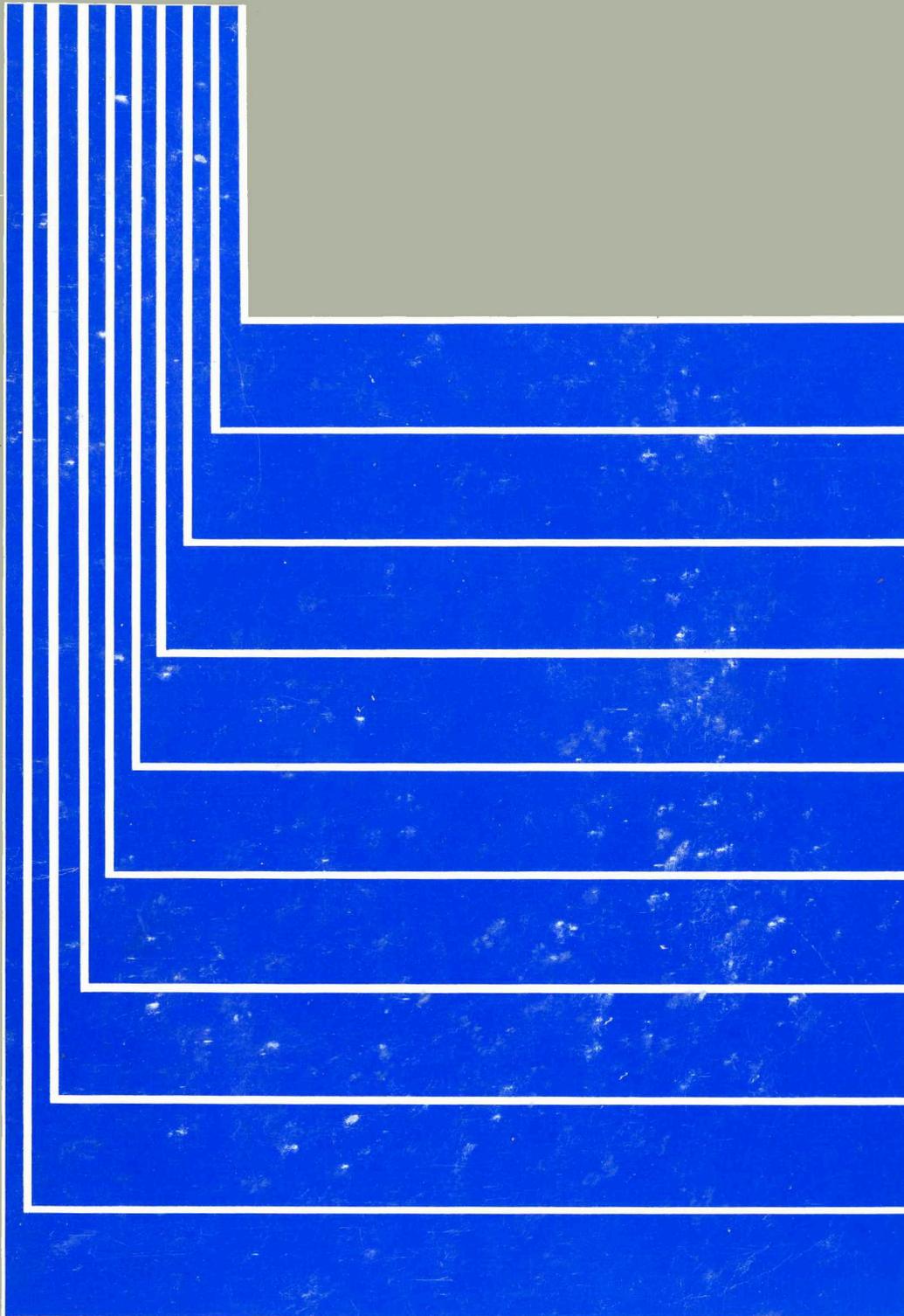


# End-User Reference

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**IBM 3708**  
**Network**  
**Conversion Unit**



# End-User Reference

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## **IBM 3708 Network Conversion Unit**

GA27-3765-01

**Second Edition (February 1988)**

This edition obsoletes GA27-3765-0.

Changes are made periodically to the information herein; before using this publication in connection with the operation of IBM systems or equipment, consult the latest *IBM System/370, 30XX and 4300 Processors Bibliography*, GC20-0001; *System/38 Bibliography*, GH30-0233; and *8100 Bibliography*, GC20-8100, for the editions that are applicable and current.

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|---------------------------|-------------------------|
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| Room 725                  | Small Business Division |
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## About This Book

This book is a reference for users of terminals attached to an IBM 3708 Network Conversion Unit. Footnotes in Chapters 1 through 4 are provided for the system administrator or system engineer who is responsible for the 3708. The footnotes may not be of interest to terminal operators and other end users.

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## How This Book Is Organized

This book contains four chapters and three appendixes:

Chapter 1, “Logging on to the 3708” gives instructions for logging on to the 3708 and lists any error messages that may be displayed.

Chapter 2, “Operating in Full-Screen Mode” describes how to operate in protocol conversion mode (full-screen mode).

Chapter 3, “Operating in Line-by-Line and ASCII Pass-through Modes” describes how to operate in protocol enveloping (line-by-line) and ASCII pass-through modes.

Chapter 4, “Common Problems and What to Do” describes how to solve common problems you may have during logging on or operating in protocol conversion or protocol enveloping modes.

Appendix A, “Flowchart of 3708 Logon Process” contains a flow diagram of the logon process.

Appendix B, “Setting up Your Terminal” contains the recommended switch settings for the supported terminals.

Appendix C, “Terminal Keyboard Maps” contains keyboard maps for the terminals supported by the 3708.

This book also contains a glossary and an index.

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## Related 3708 Library Information

The following list describes books and information for the 3708:

- *IBM 3708 Network Conversion Unit Planning and Installation*, GA27-3766, describes how you can plan for and install the 3708.
- *IBM 3708 Network Conversion Unit Setup*, GA27-3611, is shipped with the 3708 and describes how to set up and test the 3708, how to handle setup problems, and how to prepare the 3708 for relocation.
- *IBM 3708 Network Conversion Unit Description*, GA27-3768, describes the external interfaces and operational characteristics of the 3708.
- *IBM 3708 Network Conversion Unit Problem Determination*, GA27-3767, provides procedures for solving problems with the 3708.
- Unpacking instructions are printed on the 3708 shipping carton and show how to unpack the 3708.

- *IBM 3708 Network Conversion Unit Problem Report, GA27-3638*, which is shipped with the 3708, provides a means of recording problem diagnosis information, which is used by repair center representatives.
- *IBM 3708 Network Conversion Unit Registration Address Form, GX27-3734*, is shipped with the 3708. This card must be completed and returned to IBM for you to automatically receive notification of changes in the 3708 microcode.
- IBM 3708 reference cards describe the keyboard functions of ASCII displays that can be connected to a 3708 and describe the general procedures for terminal users. See Appendix C, “Terminal Keyboard Maps” for a list of the end-user devices and the reference card order numbers.

---

## Changes Since the Last Edition

This edition contains the following new information:

- Instructions for logging on to the 3708 using the short logon screens
- Descriptions of two new non-3270 functions. The following features are available by entering key sequences:
  - Terminal logon initialization sequence (TLIS) refresh
  - 2/4 color toggle
- Switch settings and keyboard maps for the following terminals
  - FALCO 500®
  - IBM 3151
  - IBM 3163/3164 VT100/3708 Emulation Cartridge (Feature 8313)
  - WY-50®.



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## Chapter 1. Logging on to the 3708

This chapter describes the 3708 logon screens and gives instructions for logging on to the 3708. It also lists error messages that may be displayed.

---

### Things to Know Before Logging on

There are four logon screens:

- C1 - Port Password
- C2 - Terminal Type
- C3 - Host Selection
- C4 - Logon Indication.

Depending on how the 3708 is configured, you may see these logon screens displayed in their full or short screen formats. The 3708 configuration also determines how many of the screens you see. You may see all, none, or only some of the logon screens.

### Full Screen Format and Operation

When you log on to the 3708, you might see full screens like this:

```
(1)=====IBM 3708===EC A58809=====RID 3708-008-01-0000222=====PORT 07=====
(2)C3: Type the number of the desired connection:

(3)1-HOSTNAM1
    2-HOSTNAM2
    3-HOSTNAM3
    4-HOSTNAM4

(4) To disconnect from the 3708, type "####."

(5)

(6)====> _
```

Figure 1-1. A 3708 Logon Screen - Full Screen Format

(1) contains the following information:

- EC number — The Engineering Change number for the 3708
- RID number — The Repair Identification number for the 3708
- Port number — The 3708 port to which you are connected.

(2) contains the following information:

- The screen number (for example, C3)
- The instructions for the screen (for example, Type the number of the desired connection:)

(3) contains the responses that you may select (not all logon screens have this area).

(4) contains the message: To disconnect from the 3708 type "####."

(5) is the message line; if you enter an invalid response, an error message is displayed here.

(6) is the input area (the cursor is positioned here automatically when the 3708 completes transmitting the screen to your display).

**Note:** During the 3708 logon screen processing, your display is not operating in full-screen mode. Full screen editing functions, such as CLEAR SCREEN and HOME cannot be used. Therefore, the data for each screen may not appear at the top of the display.

## Input Area and Responses

To type your response, use:

- Alphabetic keys (for example, A, e, P)
- Numeric keys (for example, 1, 2, 3)
- Symbolic keys (for example, %, &, \$)
- The backspace key (the key that sends a backspace character).

You cannot use editing keys (for example, delete or insert).

**Note:** For many terminals, the key labeled as a Cursor Left key does not send a backspace character, even though it may appear to move the cursor back one position on your screen. For example, if you type "1", "cursor left", and "2", the 1 is not replaced by the 2 unless the cursor left key actually generates a backspace character.

To enter your response, use one of the following keys as the ENTER key:

- A key that generates a carriage return (CR) character (normally, this would be the key marked ENTER, SEND, or NEW LINE)
- A period key (.)
- A key that has been set up for the port as a line turn-around character<sup>C1</sup>.

The keyboard maps in Appendix C, "Terminal Keyboard Maps" show what characters or functions each key is assigned. Refer to Appendix C or your system administrator if you do not know what key to use.

---

<sup>C1</sup> **Configuration Note:** The line turn-around characters are one of the protocol enveloping configuration parameters. For the 3708, the port option OPERATING MODE must be 1 or 2 for the protocol enveloping options to be presented.

## Short Screen Format and Operation

If your configuration includes short logon screens, you may see screens like this:

```
(1)=====IBM 3708===EC A58809=====RID 3708-008-01-0000222=====PORT 07=====
(2)C2: Type the number of your terminal:
(3)====> _
```

Figure 1-2. A 3708 Logon Screen - Short Screen Format

(1) contains the following information:

- EC number — The Engineering Change number for the 3708
- RID number — The Repair Identification number for the 3708
- Port number — The 3708 port to which you are connected.

(2) contains the following information:

- The screen number (for example, C2)
- The instructions for the screen (for example, Type the number of your terminal:).

(3) contains the input area (the cursor is positioned here automatically when the 3708 completes transmitting the screen to your device).

**Note:** During the 3708 logon screen processing, your display is not operating in full-screen mode. Full screen editing functions, such as CLEAR SCREEN and HOME cannot be used.<sup>C2</sup> Therefore, the data for each screen may not appear at the top of the display.

If the 3708 port has been configured for short logon screens, the 3708 transmits only the screen divider, screen title, and the input line for each screen. If you have a question, enter a question mark (?) to display the information for a full screen. The 3708 also displays the full logon screen if you enter an invalid response. The full-screen display continues until you enter a correct response. After you supply the correct response, the 3708 displays the next logon screen configured for that port.

## Operation Without Logon Screens

If you do not have logon screens, the first information normally sent to your terminal (after a physical connection has been established) is a message from your host. At this point, anything you enter at your terminal is sent to the host.<sup>T1</sup>

<sup>C2</sup> **Configuration Note:** If the port is configured for protocol conversion mode only, and the terminal type is recognized by the 3708, the screen is cleared before logon screens are displayed. The screen is cleared only if no message is to be displayed on the message line. The terminal types can be chosen by the user at logon or defined during port configuration for default terminal types.

<sup>T1</sup> **Technical Note:** The SSCP-SLU session is used for this traffic.

## Other Features

During the logon process, you can prevent the entire logon screen from being displayed, or you can disconnect from the 3708.

### Preventing the Display of Entire Screens

To prevent the entire screen from being displayed, press the BREAK key.<sup>c3</sup> You may want to do this if you have a remote connection with a slow line speed. After you press the BREAK key, input your response.

### Disconnecting from the 3708

To disconnect from the 3708 during the logon process, type #### followed by one of the ENTER keys. (The period is included inside the quotes on the screen because the period can be used as an ENTER key. Refer to "Input Area and Responses" on page 1-2.) The 3708 disconnects your modem or terminal and then attempts to establish the connection again. For a directly attached terminal, there is a short pause (there may be an indication on your device that host communication has been lost), then the first configured logon screen appears again. For a remotely attached terminal, you need to dial the 3708 again to log on.

---

<sup>c3</sup> **Configuration Note:** For the BREAK to be accepted, the port must be configured as a half duplex control unit. For the 3708, the protocol enveloping option FULL DUPLEX CONTROL UNIT must be set to 0.

## Logging on

The following discussion guides you through the steps required for logging on.

**Note:** Refer to “Error Messages” on page 1-9 for all logon error messages.

### Step 1. Establishing the Connection

If the terminal is directly connected, turn on the power to the terminal. If the terminal is remotely connected, turn on the power to the terminal and modem, then establish the connection through the modem.

After establishing the connection, you should see the first configured logon screen. If you do not see a logon screen, press the carriage return key on your terminal (this could be the ENTER, SEND, or NEW LINE key; see your system administrator if you do not know which key to press). If no logon screens appear or the Logon Indication Screen (C4) appears,<sup>C4</sup> go to step 5.

### Step 2. Entering the Port Password

If a logon screen other than the port password screen (C1)<sup>C5</sup> appears, go to step 3.

If screen C1 appears, type your password, then press the ENTER key.

```
====IBM 3708===EC A58809====RID 3708-008-01-0000222====PORT 07====
C1: Type port password

To disconnect from the 3708, type "###."

====> _
```

Figure 1-3. 3708 Port Password Screen (C1)

If you enter the password incorrectly, `INCORRECT PASSWORD` is displayed in the message line, and you can try again several times.<sup>C6</sup> If you do not enter the correct password before reaching the configured number of tries, the device is disconnected automatically.

<sup>C4</sup> **Configuration Note:** If the port has been set to run without the 3708 logon screens (LOGON SCREENS EXCLUDED = Y), no logon screens appear. Appendix A, “Flowchart of 3708 Logon Process” is a diagram showing the logon process, including how various configuration options affect the flow through the 3708 logon screens.

<sup>C5</sup> **Configuration Note:** For the 3708, if port option PASSWORD is set to blanks or the port password screen is suppressed during configuration, the port password screen is not displayed at all.

<sup>C6</sup> **Configuration Note:** For the 3708, the number of times you can enter a password before being disconnected is determined by port option RETRY LIMIT.

### Step 3. Entering the Terminal Type

If a logon screen other than the terminal type screen (C2) appears<sup>C7</sup> at your terminal, go to Step 4. If screen C2 appears, type in the number that corresponds to your terminal type, then press the ENTER key.

```
=====IBM 3708===EC A58809=====RID 3708-008-01-0000222=====PORT 07=====  
C2: Type the number of your terminal:  
  
1 -IBM 3101                6 -TV 910                16 -HP 2621B  
1A-IBM PC/FTTERM COLOR    7 -TV 950                17 -DG D210  
1B-IBM PC/FTTERM MONO     8 -LS ADM3A             18 -ROLM DISPLAY  
2 -IBM 3161/62/63         9 -ADDS VP              19 -BEEHIVE ATL 078  
2A-IBM 3151/61/62/63 (3708 FEATURE) 10 -HAZEL 1500          20 -UDT01  
2B-IBM 3151               11 -HAZEL ESP I          21 -UDT02  
2C-IBM 3151/62 (MODEL 5 EMULATION) 12 -HAZEL ESP II       22 -UDT03  
3 -IBM 3164               13 -NT DISPLAY          23 -UDT04  
3B-IBM 3164 (3708 FEATURE) 14 -TT 5410            24 -UDT05  
4 -DEC VT52              15 -TT 5420            25 -UDT06  
5 -DEC VT100/220  
5A-DEC VT220  
5B-FALCO 500 (DEC VT200 MODE)  
5C-WYSE 50  
For trademark acknowledgements, see 3708 publications  
  
To disconnect from the 3708, type "####."  
  
====> _
```

Figure 1-4. 3708 Terminal Type Selection Screen (C2)

If you enter an invalid number, **INCORRECT RESPONSE** is displayed on the message line. Enter a valid number. You can try again an unlimited number of times.

The selections shown in Figure 1-4 are examples only. Depending on the 3708 configuration, selection 24 and 25 may not appear on the screen. The selections for user-defined terminals, UDT01 through UDT04, may be replaced with the names defined during configuration.<sup>C8</sup>

<sup>C7</sup> **Configuration Note:** For the 3708, if port option **OPERATING MODE** is set to 0, or **DEVICE CLASS** is set to 2, then protocol enveloping is the only mode allowed for the port, and the terminal type screen is not displayed.

<sup>C8</sup> **Configuration Note:** The user-defined terminal selections 24 and 25 are not supported if the 3708 is configured for enhanced UDTs. To configure a UDT name, you must define enhanced UDTs.

## Step 4. Selecting a Host

If a logon screen other than the Host Selection Screen (C3) appears, go to Step 5.

If screen C3 appears, type the number that corresponds to the host to which you want to connect, then press the ENTER key.

```
=====IBM 3708===EC  A58809=====RID 3708-008-01-0000222=====PORT 07=====
C3: Type the number of the desired connection:

1-HOSTNAM1
2-HOSTNAM2
3-HOSTNAM3
4-HOSTNAM4

To disconnect from the 3708, type "####."

====> _
```

Figure 1-5. 3708 Host Selection Screen (C3)

If you enter an invalid number **INCORRECT RESPONSE** is displayed on the message line. Enter a valid number. You can try again for an unlimited number of times.

### SNA Hosts

If you choose an SNA host but the host path is unavailable,<sup>T2</sup> **HOST UNAVAILABLE, RETRY LATER** is displayed on the message line. You can try again at any time.

If you choose an SNA host but the 3708 is unavailable,<sup>T3</sup> **IBM 3708 RESTRICTING THIS CONNECTION, RETRY LATER** is displayed on the message line. You can try again at any time.

### ASCII Hosts

If you choose an ASCII host, but the host is either not connected to the 3708 or is in session with another user, the host selection screen is displayed again with **HOST UNAVAILABLE, RETRY LATER** on the message line. You can try again at any time.

If you choose an ASCII host, and the host is available, a screen is displayed with the message **ASCII HOST CONNECTED**. Refer to "ASCII Pass-through Mode" on page 3-2 for information on how to operate in ASCII pass-through mode.

<sup>T2</sup> **Technical Note:** The availability of the SNA host is determined by the receipt of an **ACTIVATE LU (ACTLU)** command. If this has not yet been received for the LU associated with your port, the **HOST UNAVAILABLE, RETRY LATER** error message is displayed.

<sup>T3</sup> **Technical Note:** The 3708 is available as long as a buffer shortage does not exist. Any buffer shortage should be temporary in nature. If the problem persists, the configuration of the 3708 may need to be modified.

## Step 5. Logging on to the SNA Host

If the 3708 Logon Indication Screen (C4) is configured, the following screen is displayed.

```
====IBM 3708===EC  A58809====RID 3708-008-01-0000222====PORT 07====  
C4: You can now type your system logon  
  
To disconnect from the 3708, type "####."  
  
====> _
```

Figure 1-6. 3708 Logon Indication Screen (C4)

**Note:** The logon indication screen may be immediately followed by a screen from your host, depending on your installation.

After the logon indication screen (C4) is displayed (or, if no logon screens are being used), anything entered on the screen is sent to the host. (Four “#” characters (####) followed by an ENTER key can still be used to terminate your connection.)

Normally at this time, you would type in a logon request, or your host might log the terminal on automatically. In both cases, the host sends a command to the 3708 to start the session. The command contains information that tells the 3708 what mode is to be used for the session: line-by-line, or full-screen.<sup>T4</sup>

See your system administrator to determine which mode you are using. Refer to Chapter 3, “Operating in Line-by-Line and ASCII Pass-through Modes” for information on how to operate your device when in the line-by-line mode, and to Chapter 2, “Operating in Full-Screen Mode” for information on operations in full-screen mode.

<sup>T4</sup> **Technical Note:** To initiate the SNA session, the host sends a BIND. The Bind contains an LU-type field that tells the 3708 what mode to use: LU type 1 is specified for a line-by-line session, and LU type 2 is used for a full-screen session.

---

## Error Messages

When logging on, the following messages may be displayed in the error message line of the logon screens.

### **BASIC CONFIGURATION IN USE, CALL SUPERVISOR**

**Meaning:** This message can indicate a 3708 internal error has occurred or a procedural error occurred at your site when powering on the 3708. Your site's 3708 configuration is not in use; the IBM-supplied configuration is active. You cannot access any hosts.

**Action:** Notify your system administrator or operator.

### **INCORRECT PASSWORD**

**Meaning:** You did not type in the correct password. This message may also occur if you attempted to use cursor movement keys other than the Backspace key.

**Action:** Enter your response again.

### **INCORRECT RESPONSE**

**Meaning:** Your response was unacceptable for some reason. You may have selected a value that is not a valid response. This message may also occur if you attempted to use cursor movement keys other than the Backspace key.

**Action:** Enter your response again.

### **HOST UNAVAILABLE, RETRY LATER**

**Meaning:** The host you have selected is not available. For an ASCII host, another user may already be accessing the host. For an SNA host, this normally indicates that the network is not yet initialized or has failed.

**Action:** Enter your response again. If the problem persists, contact your system administrator.

### **IBM 3708 RESTRICTING THIS CONNECTION, RETRY LATER**

**Meaning:** There is a temporary buffer shortage within the 3708.

**Action:** Try again later.



---

## Chapter 2. Operating in Full-Screen Mode

When operating in full-screen mode, your terminal appears to the host as a 3270 terminal with full-screen edit capabilities. (This mode is also called *protocol conversion*.) In this mode, your terminal's keyboard performs the 3270 functions listed below.

- Cursor Left
- Cursor Right
- Cursor Up
- Cursor Down
- Tab
- Backtab
- New Line
- Home
- Erase EOF
- Erase Input
- Insert
- Delete
- Reset
- DUP
- FM
- Enter
- Clear
- PF1 to PF24
- PA1, PA2, PA3
- SYS REQ
- DEV CNCL
- CURSR SEL
- ATTN
- Print
- IDENT.

In full-screen mode, the following functions may also be used:

- Null/Blank
- Type-ahead
- Status On/Off
- Refresh
- Resume Display
- Resume Printer
- Suspend Display
- Suspend Printer
- Terminal Controlled Print Functions
- Terminal Logon Initialization Sequence (TLIS) Refresh
- 2/4 Color Toggle.

Each of these functions is described in this chapter. Appendix C, "Terminal Keyboard Maps" contains the key sequences that you should use for your terminal to cause these functions. For example, on many terminals, pressing ESC then 1 invokes the PF1 function.

---

## Understanding the Display Image

The screen of your terminal shows you a display image. An example of a display image is shown in Figure 2-1 on page 2-3. The format of this image varies according to the application program you are using. The image may contain areas that you use to enter data to be processed by the application program; it may also contain areas that are used only for display of information to you. 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 may be working with both formatted and unformatted screens.

The screen shown in our sample display image is an example of a formatted screen.

An actual 3270 terminal has a special “operator information area” below the last data line of the screen. This area is used to display operating and status messages that are associated with your terminal operation. The 3708 provides the same type of information in a status line. The status line is displayed in a special area below the last data line of the screen or over the last data line of the screen, depending on the type of terminal you are using. The status line is shown as the last line in the example on page 2-3. Refer to “Reading the Status Line” on page 2-12 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 fields are input fields for that particular application.

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

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

```
Employee Information Record

Employee Name: _
Employee Address: _
Identification Number:
Salary:

Enter employee information, then press ENTER.
To exit this function, press PF3.

4BMYJOB P 70
```

Figure 2-1. Example of a Display Image

## Numeric Fields

Numeric fields are fields that normally contain only numbers or the characters minus (-), period (.) or DUP. In the example, the fields following **Identification Number:** and **Salary:** would probably have been established as numeric fields.

When a numeric field is defined in the display image, the 3708 allows you to enter any characters except lower case alphabetic characters in the normal way. You can override the numeric attribute of the field by entering a blank character in the first position of the field. Any character (including lower case alphabetic) can be entered while the blank is in the first position of the field. If your input requires a valid character in the first position as well, you must enter this character after having typed all the remaining characters. (If you want to enter a lower case alphabetic character into a numeric field that is only 1 byte long, first enter a blank into the field, and then you can overlay the blank with the lower case alphabetic character.)

## Protected Fields

Protected fields are areas on the screen where you cannot type. For example, you cannot change field names. A “go elsewhere” message (X <-OP-> X) is displayed on the 3708's status line if you attempt to change any data in a protected field. (To recover and enter data, press 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 so that the data in the field is not displayed on the screen. A non-display field can be an input field or a protected field. In the example, the salary field is a non-display field; you cannot see the information in the field.

## Field Attribute Locations

For each field that the host application defines, one position on the screen is reserved as a field attribute location. This location is used to store the attributes of the field, and therefore, cannot be altered by keystrokes from the terminal. If you attempt to enter a character from your keyboard when the cursor is located on a field attribute location, your keyboard is locked; use the Reset function, and position the cursor elsewhere to enter data.

---

<sup>T1</sup> **Technical Note:** Every time you press a key (or in some cases ALT or CTRL plus another key) on your terminal, a hexadecimal (ASCII) code is transmitted to the 3708. These codes are used to identify the function you want to do. The 3708 does what is necessary to perform the function: it may send other hexadecimal codes back to the terminal that 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.

---

## Using Your Keyboard

This section describes the keyboard maps shown in Appendix C and the function of the keys on 3270 and non-3270 terminals.

### 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 3708 do not 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 then 1 invokes the PF1 function on many of the supported terminals.)<sup>T1</sup>

The keyboard map defined for your terminal type describes the function the 3708 associates with a particular key sequence, and it tells you which keys on the keyboard to press to execute each function.

**Note:** The keyboard maps are found in Appendix C. 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 to be used as a convenient reference.

### Terminal Controlled Keys

Your terminal may provide typematic operation for some or all keys on the keyboard. (When a typematic key is pressed, its function is repeated as long as the key remains pressed.) See your terminal manual for details. Also, your terminal may have keys such as SHIFT and LOCK. You should refer to the documentation for the terminal for a description of how it supports them. The 3708 does not change the function of these keys.

### 3270 Functions

This section describes the functions the 3708 associates with each of the keys on the keyboard of a 3270 terminal.

- **Cursor Movement functions (Cursor Up, Cursor Down, Cursor Right, and Cursor Left).**

This set of four functions moves the cursor one location at a time into any character location. Using these functions, the cursor may 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 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 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 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 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 a field. All four functions can cause the cursor to wrap from the end of the last line on the display to the beginning of the top line.

**Tab** Moves the cursor to the first character location of the next input field. In a screen with no input fields, the cursor is moved to the upper left hand corner of the screen.

**Backtab** When the cursor is located in the field attribute location or the first character position of an input field, the backtab function moves the cursor to the first character position of the preceding input field. When the cursor is located in any character position of an input field, other than the first position, this function moves the cursor to the first position of that field. If there are no input fields, the cursor is positioned to the upper left corner of the screen.

**New Line** Moves the cursor to the first input character position of the next line. If the next line has no input fields, the cursor is moved to the next line containing an input field. If the screen contains no fields, the cursor is repositioned to the first position of the next line.

**Home** Moves the cursor to the first input character position on the screen. If there are no input fields, the cursor is positioned to the upper left hand corner of the screen.

- **Erase EOF (End of Field)<sup>OP1</sup>**

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). If the field spans more than one line, only the remainder of the current line is erased. The cursor does not move.

Using this function when the cursor is located in an attribute character position or in a protected field locks the keyboard. The "go elsewhere" status line message (X <-OP->), is displayed. To unlock the keyboard, press the Reset Key sequence defined for your terminal and reposition the cursor.

- **Erase Input <sup>OP1</sup>**

This function erases the characters (sets them to nulls) in all input fields and then moves the cursor to the first input position 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.

---

<sup>OP1</sup> **Operational Note:** The following 3270 functions cannot be used when operating as the 3708 control terminal: Erase EOF, Erase Input, DUP, FM, PA keys, Clear, CURSR SEL, ATTN, SYS REQ and Delete.

- **Insert**

The insert function places the keyboard in insert mode. This mode allows you to insert a character or characters into the middle of an input field without changing the characters that are 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 position in the field beyond the cursor, entering a character causes the new character to be entered at the cursor position. 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 position occupied by the cursor at the time of the insert operation is a null, no shifting occurs.
- After all null characters at or beyond the cursor position 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 OP > >) is displayed on the status line. To unlock the keyboard, press 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 only to the end of the current line.
- Using this function when the cursor is located in an attribute character position or is in a protected field locks the keyboard. The “go elsewhere” status line message (X <-OP->) is displayed. To unlock the keyboard, press the Reset Key sequence defined for your terminal and reposition the cursor.
- If the display is in enhanced null/blank processing mode, characters can be inserted when the field contains either trailing blanks or nulls.

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

- **Delete<sup>OP2</sup>**

If the cursor is located in an input field, using the Delete function removes the character at the position 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 position 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, subsequent rows are not affected.

Using this function when the cursor is located in an attribute character position or is in a protected field locks the keyboard. The “go elsewhere” status line message (X <-OP->X) is displayed. To unlock the keyboard, press the Reset Key sequence defined for your terminal and reposition the cursor.

---

<sup>OP2</sup> **Operational Note:** The following 3270 functions cannot be used when operating as the 3708 control terminal: Erase EOF, Erase Input, DUP, FM, PA keys, Clear, CURSR SEL, ATTN, SYS REQ and Delete.

- **Reset**

The Reset function is used to recover from a locked keyboard condition. It does not reset a locked condition that results from the execution of a command for the terminal (X CLOCK on the status line).

Reset ends the IDENT operation (the original printer ID is displayed on the status line) and terminates Insert mode.

- **DUP<sup>OP2</sup>**

Using the DUP function causes an asterisk (\*) to be displayed at the current cursor position. Also, a Tab key operation is performed causing the cursor to be moved to the first position 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 an attribute character position or is in a protected field locks the keyboard. The “go elsewhere” status line message (X <-OP-> X) is displayed. To unlock the keyboard, press the Reset Key sequence defined for your terminal and reposition the cursor.

- **FM (Field Mark)<sup>OP3</sup>**

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

Using this function when the cursor is located in an attribute character position or is in a protected field locks the keyboard. The “go elsewhere” status line message (X <-OP-> X) is displayed. To unlock the keyboard, press the Reset Key sequence defined for your terminal and reposition the cursor.

- **Program Attention Functions (Enter, Clear, PF keys, and PA keys)<sup>OP3</sup>**

These functions cause the 3708 to transfer information to the host program. An Attention IDentification character (AID) is sent to the host that identifies which of the functions was used to cause the transfer.

The Clear function changes all positions on the screen to nulls and moves the cursor to the upper left hand corner.

**Note:** Using a PF key or PA key function while SSCP is displayed on the status line, locks the keyboard. The “function not supported” message (X -F) is displayed on the status line. To unlock the keyboard, press the Reset Key sequence defined for your terminal and reposition the cursor.

---

<sup>OP3</sup> **Operational Note:** The following 3270 functions cannot be used when operating as the 3708 control terminal: Erase EOF, Erase Input, DUP, FM, PA keys, Clear, CURSR SEL, ATTN, SYS REQ and Delete.

- **SYS REQ (System Request)<sup>OP3</sup>**

You can use the SYS REQ function to switch from communication with your application program to communication with the host control program. 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 logoff command.

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

- **DEV CNCL (Device Cancel)**

If your keyboard is locked because of a “printer busy” condition (X PRTBSY 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 a 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.

- **CURSR SEL (Cursor Select)<sup>OP4</sup>**

This function allows the selector-light-pen-detection function to be performed from the keyboard. See “Using Light Pen Emulation” on page 2-19 for a description of how this function is used.

- **ATTN<sup>OP4</sup>**

The ATTN function is used to signal an attention condition to the host.

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, press the Reset Key sequence defined for your terminal and reposition the cursor.

- **Print**

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

- **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.

---

<sup>OP4</sup> **Operational Note:** The following 3270 functions cannot be used when operating as the 3708 control terminal: Erase EOF, Erase Input, DUP, FM, PA keys, Clear, CURSR SEL, ATTN, SYS REQ and Delete.

## Non-3270 Functions

The following functions are available by entering key sequences, but they are not normal 3270 functions. These functions are provided by the 3708 to make data entry at your terminal easier, to enable you to use the auxiliary port of your terminal for printing, and to allow you to control the display of the status line.

- **Null/Blank**

The Null/Blank function either sets or resets (toggles) enhanced null/blank processing mode. When the mode is active, **N/B** appears on the status line.

Enhanced null/blank mode allows you to use either the space bar or the cursor movement keys to edit and separate fields. When you enter data, the 3708 converts imbedded nulls (nulls between two characters in a field) to blanks.

When in null/blank mode, the Insert function operates differently. Either trailing nulls or trailing blanks can be pushed off the end of the field when in insert mode. This saves you from having to explicitly delete trailing blanks in order to insert characters.

- **Type-ahead**

The Type-ahead function either sets or resets (toggles) Type-ahead mode. When the mode is active, **TYP** appears on the status line.

Type-ahead mode allows you to queue several characters for processing. You can continue to enter key sequences (data or AID characters) while a previous sequence is being processed. For example, if you wanted to page forward five times in a file-editing program without using Type-ahead, you would have to enter the appropriate PF key sequence once, wait for the screen to be updated with the next page of data, then repeat this process four more times.

Using Type-ahead, you can press the PF key five times, without waiting for the screen update to occur between each. Once the 3708 has received the screen update from the host for the first PF key and has processed it, but before the 3708 begins updating your screen, the next PF key is sent to the host.

Depending on the response time from your host, this may result in a partial screen update occurring, and then being overlaid by a subsequent screen, or intermediate screens may not be displayed at all.

- **Status On/Off**

The Status On/Off function is used to display the 3708 status line. You can turn the status line on or off at almost any time. If the keyboard is locked, enter the Status On/Off key sequence to see the status line. See "Reading the Status Line" on page 2-12 for detailed information on the status line emulation.

The Status On/Off function cannot be used if your terminal supports an addressable area for status messages. If this area is supported, the 3708 always displays the status messages below the last data line. There is no need to toggle this function on and off.

- **Refresh**

The Refresh function causes the 3708 to clear your display screen and send the screen image again. This is most useful when you are using a dial-in facility, and parity errors cause incorrect characters to appear on the screen.

- **Resume Display, Resume Printer, Suspend Display, Suspend Printer**

These functions enable you to control whether the 3708 sends data to the display or to a printer attached to the auxiliary port of your terminal. If the interaction with your display is interrupted too often by data being sent to the printer, you can invoke the Suspend Printer function. This stops traffic to the printer until you use Resume Printer. Similarly, you can speed up printer traffic by using the Suspend Display function.

The only functions that you can use while the display is suspended are: Resume Display, Suspend Printer, and Resume Printer.

Once you have used the Suspend Display function, you must enter the Resume Display key sequence to use your display.

These functions are not available for terminals that do not have an auxiliary port. See "Using a Display With an Attached Printer" on page 2-22 for information about using the auxiliary port printer function.

- **Terminal Controlled Print Functions**

You may be able to use special print keys on your terminal to print screen information on a printer attached to your terminal. For example, with the IBM 3101, the key labeled Print Line can be used to print one line of the display image. See your system administrator to find out if such keys can be used on your terminal.

- **Terminal Logon Initialization Sequence (TLIS) Refresh**

This function enables you to request that the 3708 transmit the initialization sequence configured for your terminal. If there are no initialization sequences defined or coded for a terminal, this function is ignored.

You can use this function to reset your terminal if the setup parameters have been changed accidentally.

- **2/4 Color Toggle**

The 2/4 Color Toggle function can be used to emulate the 2/4 color feature in 3270 displays. When defined for your terminal, you can use this key sequence to toggle between two and four types of color or highlighting for your screen.<sup>C1</sup>

---

<sup>C1</sup> **Configuration Note:** When the toggle is set for four colors, the 3708 transmits the sequences defined for Color 1, 2, 3, and 4. These sequences can be defined as color sequences or any other visual attribute, such as reverse video or underlining. When the toggle is set for two colors, the 3708 transmits the sequences defined for HIGHLIGHT ON and HIGHLIGHT OFF. These sequences can be defined as highlighting sequences or any other visual attribute, such as colors, reverse video, or underlining.

## Reading the Status Line

The status line informs you of the status of your host and printer sessions and notifies you of error conditions. If your terminal has a special addressable status line below the last data line on the screen, the 3708 displays status messages there. If your terminal does not support a special addressable status line, the status messages are displayed on the last data line on the screen, and you must use the Status On/Off function to see the status line.

Remember the following facts if you use the last data line on the screen as the status line:

- When a status message is displayed, you can view the application data in the last line by moving the cursor into the line or by entering data. The next time a condition occurs that causes an update, the status line message appears again.
- The status line defaults to “off” when you begin your session.
- When the status line is not displayed and input is inhibited, the cursor moves to the lower right hand corner of the screen, and the terminal’s bell sounds. You may then use the Status On/Off function to display the status line. The message explains why your keyboard is locked.

## Status Line Format

The status line is 80 characters long. They are arranged as follows:

|              |                  |                   |                |               |                    |                   |                |          |
|--------------|------------------|-------------------|----------------|---------------|--------------------|-------------------|----------------|----------|
| 1            | 2                | 3-10              | 11-38          | 39-40         | 41-44              | 45-47             | 61-65          | 66-80    |
| Ready Status | Device Emulation | Session Indicator | Session Status | Insert Status | Null /Blank Status | Type-ahead Status | Printer Status | Reserved |

Figure 2-2. IBM 3708 Status Line Format

The following is a description of the fields and codes in the format:

### Ready Status

4

**Meaning:** The 3708 is running and operating normally.

**Action:** None

### Device Emulation

B

**Meaning:** The 3708 is using 3270 online B protocols. There are two basic protocol rules that govern communication with 3270 applications: A and B. The 3708 uses B.

**Action:** None

## Session Indicator

### MYJOB

**Meaning:** The session is connected to the host application or to the 3708 control terminal.

**Action:** None

### SSCP

**Meaning:** The session is connected to the system operator (SSCP control program).

**Action:** None

## Session Status

NNN codes, which can appear in the Session Status field, are described in “NNN Codes” on page 2-17.

### X CLOCK

**Meaning:** The system needs time to perform the requested function. The host application automatically unlocks the keyboard.

**Action:** Wait for the condition to clear.

### X PC *nnn*

**Meaning:** Program Check. The 3708 detected an SNA data-stream error in the data from the host.

**Action:** See “NNN Codes” on page 2-17 for information.

### X CC *nnn*

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

**Action:** See “NNN Codes” on page 2-17 for information.

### X ?+

**Meaning:** Input not understood.

**Action:** Press the Reset key sequence defined for the terminal, check the screen, and try to enter the data again.

### X -F

**Meaning:** Minus Function. The requested function is currently unavailable.

**Action:** Press the Reset key sequence defined for the terminal.

### X PRTNW

**Meaning:** Printer Not Working. The printer assigned to the terminal is not active and no other printers in the class are available. The 3708 discards the print request.

**Action:** Press the Reset key sequence defined for the terminal, activate the printer, and try the function again.

### **X PRTBSY**

**Meaning:** Printer Busy. The printer assigned to the terminal is busy and the 3708 has put the request in the queue.

**Action:** Wait for the printer to finish or press the DEV CNCL key sequence defined for the terminal to cancel the print request.

### **X OP X**

**Meaning:** Operator Unauthorized. You requested a printer or print class that you are not authorized to use.

**Action:** Press the Reset key sequence defined for the terminal and retry the IDENT function specifying another print ID. To obtain authorization for that printer, contact the system administrator.

### **X <-OP-> X**

**Meaning:** That Entry Prohibited Here. The entry you tried is invalid for that position on the screen. For example, entering data into a protected field is invalid.

**Action:** Press the Reset key sequence defined for the terminal; move the cursor to the correct position on the screen.

### **X OP >**

**Meaning:** Too Much Data Entered. You tried to enter too much data into a field on the screen.

**Action:** Press the Reset key sequence defined for the terminal and enter the correct amount of data.

### **X OP#**

**Meaning:** Numeric. You tried to enter a lowercase alphabetic character into a numeric field.

**Action:** Press the Reset key sequence for the terminal and enter the correct data in the field. To enter a lowercase alphabetic character in the field, override the numeric lock feature by typing a blank into the first character position of the field. When a blank occupies this position, enter any character into the field.

### **X OP#?**

**Meaning:** Wrong Number. You entered an unacceptable number. This occurs when you use the IDENT function to assign a printer and the number is out of range or non-numeric.

**Action:** Press the Reset key sequence for the terminal and enter the correct data into the field.

## **X PARITY**

**Meaning:** Parity Error. The 3708 detected a parity error in the data coming from the terminal. If the type-ahead key queuing function is on, the 3708 purges all characters that follow the character with the parity error.

**Action:** Press the Reset key sequence defined for the terminal and enter the data again.

## **X FRAME**

**Meaning:** Frame Error. The 3708 detected a framing error on data from the terminal. If the type-ahead key queuing function is on, the 3708 purges all characters following the character with the parity error.

**Action:** Press the Reset key sequence defined for the terminal and enter the data again.

## **X OVRFLO**

**Meaning:** 3708 Receive Queue Overflow. The receive queue can overflow when the following conditions occur:

- The host response time is very slow
- The 3708 is sending data too fast (for example, doing file transfer applications).

**Action:** Press the Reset key sequence defined for the terminal and enter the data again.

## **X STATLN**

**Meaning:** Status Line Required for IDENT. The 3708 requires the status line to be on before assigning printers.

**Action:** Press the Reset key sequence defined for the terminal, turn on the 3708 status line, and try the IDENT function again.

## **X WAIT**

**Meaning:** Wait for the 3708 to finish. The 3708 displays this message when you initiate a host data transfer while the 3708 is in slowdown mode. This condition occurs when the 3708 runs low on buffer space because of overloading.

**Action:** Press the Reset key sequence defined for the terminal. Continue to enter data characters, or try an Enter function. If the slowdown condition has been cleared, the data is sent to the host.

## **X HOST**

**Meaning:** An upstream link has recorded a Receiver Not Ready (RNR) from host. The host is temporarily unable to accept more data.

**Action:** Press the Reset key sequence defined for the terminal and try the function again.

## Insert Status

^

**Meaning:** You can insert characters into the middle of fields.

**Action:** None.

## Null Blank Status

N/B

**Meaning:** Null/blank processing is enabled.

**Action:** None.

## Type-Ahead Status

TYP

**Meaning:** The type-ahead key queuing function is enabled.

**Action:** None.

## Printer Status

P *nn*

**Meaning:** Printer Assignment. The display is authorized to use printer address *nn*. Numbers may range from 1 to 31 for individual printers and from 70 to 85 for printer classes.

**Action:** None. To use a different printer or class, use the IDENT key sequence to redefine the printer access.

PRNT

**Meaning:** Printer Printing. The printer identified by *nn* is currently printing the information.

**Action:** None.

P \_

**Meaning:** Printer Assignment. This value appears when you press the IDENT key sequence to assign printer access.

**Action:** Type in the number of the printer or class.

## NNN Codes

The NNN codes appear in the Session Status field when one of the following occurs:

- The host generates an invalid SNA data stream, which is indicated by a Program Check (PC *nnn*).
- The communication link with the host fails, which is indicated by a Communication Check (CC *nnn*).

When the host application or system recovers, the status line is automatically cleared. If it is not cleared, contact the system administrator.

| NNN Code | Explanation   | -RSP sent to the host |
|----------|---|-----------------------|
| PC 401   | Invalid command received.   | 1003                  |
| PC 402   | The 3708 received an invalid (out of range) address following an SBA, RA, or EUA command.               | 1005                  |
| PC 403   | The 3708 received data after a Read, Read Modified, or EAU command.                                     | 1003                  |
| PC 404   | The data stream ended before the 3708 received all of the required bytes of an SBA, RA, or EAU command. | 1005                  |
| PC 411   | The LU type 1 RU received was longer than in the BIND specification.                                    | 1002                  |
| PC 413   | The 3708 did not try to do the requested function.  | 1003                  |
| PC 422   | A NO Response is not allowed.   | 400A                  |
| PC 423   | The format indicator (FI) bit is not allowed, or the FI should have been sent but was not.              | 400F                  |
| PC 430   | A sequence number error has occurred.   | 2001                  |
| PC 431   | A bracket error has occurred.   | 2002                  |
| PC 432   | A bracket error has occurred.   | 2003                  |
| PC 433   | A data traffic reset has occurred.  | 2005                  |
| PC 434   | A direction error has occurred.   | 2004                  |
| PC 440   | A session limit has been exceeded.  | 0815                  |
| PC 442   | The request is not executable.  | 081C                  |
| PC 443   | A change direction is required.   | 0829                  |
| PC 445   | ACTLU is not equal to COLD or ERP.  | 0821                  |
| PC 450   | A profile error has occurred.   | 0821                  |
| PC 451   | A primary protocol error has occurred.  | 0821                  |
| PC 452   | A secondary protocol error has occurred.  | 0821                  |
| PC 453   | A common protocol error has occurred.   | 0821                  |
| PC 454   | A screen size specification error has occurred.   | 0821                  |
| PC 455   | An LU profile error has occurred.   | 0821                  |
| PC 456   | An LU type-1 error has occurred.  | 0821                  |
| PC 457   | BIND for cryptography was specified but is not supported by the 3708.                                   | 0821                  |
| CC 518   | The 3708 received a segment with improperly sequenced TH MPF bits.                                      | 8007                  |

---

## Communicating with the Host Control Program

After you start communicating with your application in full-screen mode, you can communicate with the host control program by using the SYS REQ function. When you press the SYS REQ key sequence, your screen clears and SSCP replaces MYJOB in the status line.

When sending messages to the control program, you are no longer in full-screen mode. You can only type in a message (up to 256 characters) beginning at the current cursor position. When you press Enter, the data (excluding nulls) beginning with the original cursor position and extending 256 positions (or extending to the end of the screen) is transmitted to the host.

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

When SSCP is displayed, the following functions are not available:

- PF1 to PF24
- PA1 to PA3
- ATTN.

If you press one of these key sequences, the keyboard is locked, and the “invalid function” status line message (X -F) is displayed. To unlock the keyboard, press 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. The screen clears, and MYJOB replaces SSCP in the status line.

A common use of this function is to log off the application that is running. You would use the SYS REQ key sequence to start communication with the host control program, then type in a logoff request as defined for your installation.<sup>OP6</sup>

---

<sup>OP6</sup> **Operational Note:** Data transfer while in control program mode occurs on the SSCP-SLU session; application data transfer occurs on the PLU-SLU session.

---

## Using Light Pen Emulation

A *selector light pen* is a light-sensitive pen that can detect the light emitted from characters displayed on certain 3270 displays. 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 3708 allows you to emulate this light pen function using the Cursor Select function. This 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 can obtain different results.

### 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 and press the Cursor Select key sequence. The question mark (?) is changed to a greater than (>) symbol. To reverse your selection, press the Cursor Select key sequence again. The greater than (>) symbol is replaced by a question mark (?).

### Attention Fields

An attention field is identified by either a space, null, or ampersand (&) in the first position of the field. Place the cursor anywhere in the field that you wish to attention, then press the Cursor Select key sequence. When you press the Cursor Select key sequence (when 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.

---

## Printing Screen Images (Local Copy)

The 3708 emulates the 3270 local copy function. This function allows you to obtain a printed copy of your display screen. You can copy to either a printer attached to another port of the 3708 control unit or to a printer attached to the auxiliary port of your terminal.<sup>C1</sup> (See “Using a Display With an Attached Printer” on page 2-22 for more information on using a printer attached to your terminal.)

### Print ID

The print ID associated with your terminal is displayed at the right side of the status line. This ID specifies to which print class or printer your local copy requests are sent. The valid IDs are in the ranges 70 to 85 for print classes and 01 to 10 for printers. When the ID is a class, the first available printer in that class prints your job. When the ID is a specific printer, your request is sent to that printer. Your job is printed 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 access any printers, your ID is 00.

### Changing the Print ID

To change the print ID associated with your display, use the IDENT function. (The status line must be displayed before IDENT can work.) The IDENT function allows you to specify a new print ID that remains active until you either log off your host application or change the ID again. At the right side of the status line is the message P *nn*. 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 replaces the P *nn* with P *\_ \_*. You can now type the port number or class that you want as the new ID. The ID must be entered as two characters; for example, if you are assigning the printer on port 1, enter 01. When you have entered both characters, your assignment is either accepted or one of the following conditions apply:

- If your terminal is not authorized to use the printer or any printer in the class, the status line displays an “operator unauthorized” message (X OP X), and the original ID remains unchanged.
- If you enter an invalid ID, the status line displays an “invalid function” message (X -F), and the original ID remains unchanged.

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

**Note:** If your terminal has a special addressable status line below the last data line on the screen, the cursor is positioned at the end of the last data when you use the IDENT function. When you enter the new ID, the characters are displayed as if you actually entered them directly into the ID field in the status line.

---

<sup>C1</sup> **Configuration Note:** The local copy function is controlled by the printer authorization matrix information that is part of the 3708 configuration. The matrix defines printer classes to be assigned to particular printers, and it also defines which displays may use which printers.

## 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 printers are all busy. While queued, a “printer busy” message (X PRTBSY) displays on your status line, and your keyboard is locked.

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

## Printer not Working

In some cases, the printer you have requested may not be available because the power is not on, or the printer is not connected to the 3708. In this case, a “printer not working” message (X PRTNW) displays on your status line. Your request is discarded. Use the Reset key sequence to unlock your keyboard.

## Cancelling a Print Request

When a print request has not started, you can cancel it by using the DEV CNCL (Device Cancel) function. Your keyboard is unlocked, and the print request is removed from the queue. You cannot cancel a request once printing has begun (that is, when PRNT is on the status line).

## Host-Initiated Local Copy

It is possible for the host application to cause a local copy of a screen that it has sent to your display. When this occurs, your terminal functions as if you entered the Print key sequence. If the request was queued because the printer is not available, you can cancel it using the Device Cancel function as described above.

---

## Using a Display With an Attached Printer

If your terminal has a locally attached printer, the 3708 can send data to both the display and the printer.<sup>C2</sup>

### Functions that Control Data Flow

The 3708 uses the printer only when the display is operating in full-screen mode. Once your display is operating in full-screen mode, an indication is sent to the host that the printer is available. At this time, the printer can be used for printing host data, for printing copies of screens from your display, or for printing copies of screens from displays on other ports (local copy function).

For most terminal types, the 3708 sends control information to the terminal, which directs subsequent data to either the display or the printer. The 3708 shares the line, sending some data for the display and then some for the printer, when data for both has been received.

In some cases, you may find it inconvenient to have data sent to your printer when you are trying to perform interactive functions at the display. Four keyboard functions are available that allow you to control the data flow to your terminal:

**Suspend Display** This function prevents data from being sent to the display. It remains in effect until you enter the Resume Display key sequence.

**Resume Display** This function allows data to be sent to the display.

**Suspend Printer** This function prevents data from being sent to the printer. It remains in effect until you enter the Resume Printer key sequence.

**Note:** If data is being printed when this function is issued, the printer might not stop immediately.

**Resume Printer** This function allows data to be sent to the printer.

You can request these functions at any time from the keyboard, even when a keyboard is locked.

---

<sup>C2</sup> **Configuration Note:** For the 3708, the port that you access must be configured with DEVICE TYPE = 4 to allow a terminal of this type to be used. The support provided for this function is called Multiple LU. It allows your display and your printer to simultaneously share a single port while maintaining an appearance of two distinct LUs to an SNA host.

**Notes:**

1. Some displays allow you to initiate a print of the display screen's contents to the AUX port. (See Terminal Controlled Print Functions in "Non-3270 Functions" on page 2-10.) This is another way to use your auxiliary port printer. Do not attempt this type of copy while the 3708 is sending data to the printer.
2. The printer control functions used for direct attach printers are not allowed in this environment (PA1, PA2, Hold Print/Enable Print, and Cancel Print). All characters received from the terminal are considered by the 3708 to be data from the display, and only valid keyboard functions are allowed.

## **Devices Requiring Manual Intervention**

Some terminals require the operator to select the auxiliary port manually for printing to occur.

**Note:** Of the default terminal types supported by the 3708, the IBM 3101 and the Hazeltine 1500 operate in this manner. If you are using a User-Defined Terminal (UDT) with a printer attached to it, see your system administrator to learn if your terminal's printer must be controlled this way.

To control this kind of terminal, use the four printer control keyboard functions (Suspend Display, Resume Display, Suspend Printer, and Resume Printer) described in the following paragraphs.

- To allow data to go to the printer, do the following:
  1. Enter the Suspend Display key sequence. This key sequence prevents any data from being sent by the 3708.
  2. Manually turn on the auxiliary port of your terminal.
  3. Enter the Resume Printer key sequence. This action informs the 3708 that data may be sent to the printer.
- When printing is finished or to suspend printing, do the following:
  1. Enter the Suspend Printer key sequence. This key sequence prevents the 3708 from sending any data.
  2. Manually turn off the auxiliary port of your terminal.
  3. Enter the Resume Display key sequence. This informs the 3708 that data may be sent for the display.

For these type terminals, the 3708 assumes the printer is in a suspended condition when the session with the display is started.

---

## Differences in Function for the 3270 and Terminals Attached to 3708

This section describes the differences in function for the 3270 terminals and terminals attached to the 3708. Some of these differences are described previously in this chapter.

- The 3708 provides several functions not available on a 3270. These are described in "Non-3270 Functions" on page 2-10.
- As described previously in this chapter, the terminal that you attach to the 3708 may provide typematic keys and cursor appearance control that differ from an actual 3270 terminal. You must become familiar with your specific terminal type to use the functions that it provides.
- The ERASE EOF function clears only to the end of the current line. On a 3270 terminal, this function clears all characters remaining in the field, including those on subsequent lines.
- The Insert function allows you to insert characters only to the end of the current line. On a 3270 terminal, if you insert characters into the middle of a field that spans more than one line, all characters in the field are shifted. The character on the end of one line is moved to the beginning of the next line.
- When using the Print function, the port number of the printer actually executing the print is not shown on the status line. Instead, PRNT appears in the position where the Print ID is normally shown. On a 3270 terminal, when printing is in progress, the port number of the selected printer is shown instead of the Print ID.

---

## Chapter 3. Operating in Line-by-Line and ASCII Pass-through Modes

This section describes line-by-line and ASCII pass-through modes and defines the break sequence for each.

---

### Line-by-Line Mode

Line-by-line mode means that you send only one line of data to the host at a time. After you receive a read prompt (for example, the command ENTER DATA), you can type a line of data. To send the data to the host, press one of the line turnaround characters that is defined for your system. Typical line turnaround characters are carriage return (CR) and line feed (LF). If you do not know which key to press, see your system administrator.

To interrupt data coming from the host, or signal the host for a specific application, use the BREAK key. The BREAK key can operate in one of the following ways:

- The signal may cause the host to stop sending data to the terminal.
- It may cause the host to send a new line of data.
- It may cause the host to clear the line of data that you have on the current line.

See your system administrator to find out how the break key works for your system.

To communicate with the system services control point (SSCP) session, type the system request simulation string followed by an SSCP message (the default is 99999; see your system administrator if you need help). The SSCP message can be up to 251 bytes long and must end with a defined line turnaround character. The 3708 transmits the message to the SSCP and returns you to your application.<sup>OP1</sup>

---

<sup>OP1</sup> **Operational Note:** If you enter the system request simulation string followed by a line turn around character, VTAM issues a USS message 2 (Command Unrecognized) and return you to your application.

---

## ASCII Pass-through Mode

When you select an ASCII host from the 3708 host selection screen, you are operating in ASCII pass-through mode. When you receive the message ASCII HOST CONNECTION ESTABLISHED, you can begin communicating with the ASCII host. 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.

If a break sequence is defined for the ASCII host, you can use the sequence to terminate the ASCII host session. The break sequence works as follows:

1. Log off the ASCII host.
2. Press the key on the terminal that causes a BREAK.
3. Type in the 3-character break sequence (see the system administrator).

The 3708 ends the session with the ASCII host, and the host selection menu is displayed at the terminal.<sup>OP2</sup>

**Note:** The break sequence does not terminate the ASCII host session. To terminate the session with the ASCII host, you must log off the ASCII host, then enter the break sequence.

---

<sup>OP2</sup> **Operational Note:** When the termination sequence has been detected by the 3708, the ASCII host is made available for other users. The physical line to the ASCII host is not disconnected.

---

## Chapter 4. Common Problems and What to Do

The sections in this chapter help you determine the action to take when you have a problem. There are three different modes in which problems can occur:

- During 3708 logon
- In full-screen mode (protocol conversion)
- In line-by-line mode (protocol enveloping).

When you have a problem, go to the section for the mode in which you were operating. Check the left column for the symptom. The middle column describes the probable causes and the right column describes the action you should take to resolve your problem.

## Common Problems during 3708 Logon

This section describes problems that can occur during the 3708 logon procedure.

| Symptom  | Probable Cause  | Action   |
|--|---|--|
| Extra, missing, or unintelligible characters on the screen | Incorrect line speed  | Check the speed settings on the device (and modem) to verify that they are compatible with the 3708 port speed definition.           |
|  | Incorrect parity  | Check the parity settings on the device (and modem) to verify that they are compatible with the 3708 port parity definition.         |
|  | Line trouble (or noise)   | For switched connections, hang up and establish a new connection. For non-switched connections, contact your carrier representative. |
| Nothing on the display screen                              | Port defined for auto-baud/auto-parity or EIA 422A connection                             | Press the carriage return key.   |
|  | Terminal inoperative  | Verify that your display has power and is operative; use the problem determination documentation associated with your terminal.      |
|  | 3708 Logon screens excluded   | Press your CR key and logon to your host.  |
|  | No connection for switched line   | Establish a connection to the 3708 through your modem.   |
|  | Incorrect modem settings  | Verify your modem settings using the documentation associated with your modem.   |
| Incorrect line speed or parity settings                    | Verify that your display's speed and parity settings are compatible with the 3708's port. |  |

| <b>Symptom</b>   | <b>Probable Cause</b>      | <b>Action</b>  |
|--|----------------------------|--|
| ENTER not accepted                                     | 3708 configuration         | Press the period (.) key. See your system administrator. |
| Characters not displayed at display when typing in     | 3708 configuration         | See your system administrator.                           |
| Double characters displayed on screen                  | Incorrect terminal setting | Turn off local echoing of characters by the terminal.    |
| Cannot dial back into a switched port after hanging up | Modem                      | See your system administrator.                           |

## Common Problems in Full-Screen Mode (Protocol Conversion)

This section describes problems that can occur while in full-screen mode.

| Symptom  | Probable Cause  | Action   |
|--|---|--|
| Extra, missing, or unintelligible characters on the screen | <p>Incorrect terminal type specified</p> <p>Incompatible terminal mode</p> <p>Line trouble (or noise)</p> | <p>Repeat the logon procedure. When the 3708 Terminal Type Selection screen appears, type the number that corresponds to the terminal you are using.</p> <p>Verify that your terminal is set to emulate the correct terminal type. For example, the IBM 3161 should be set to emulate an IBM 3101 if you are choosing option 1 on the 3708 logon screens.</p> <p>Enter the REFRESH function key sequence to clear the screen. This action 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 non-switched connections, contact your carrier representative.</p> |
| Display screen shifted up one line                         | Incorrect Auto-scroll or Auto-NL settings   | Refer to Appendix B, "Setting up your Terminal" and verify that your display does not have auto-scroll or auto-newline set to on.  |
| ENTER not accepted   | Keyboard Locked   | Check the 3708 status line to determine cause of keyboard lock. Press your reset key sequence to clear the condition.  |
| Session ends unexpectedly                                  | <p>Host connection lost</p> <p>Inactivity time out (switched, or EIA 422A connections)</p>                | <p>See your system administrator.</p> <p>You may have left the terminal idle too long. See your system administrator for details.</p>  |

| <b>Symptom</b>   | <b>Probable Cause</b>   | <b>Action</b>   |
|--|---|---|
| Double characters displayed on screen                          | Incorrect terminal setting  | Turn off local echoing of characters by the terminal.   |
| Receiving incorrect characters                                 | 3708 configuration  | See your system administrator.  |
| Display is disconnected when logging off from host application | 3708 configuration  | See your system administrator.  |
| Cursor in lower right hand corner, no input allowed            | If the 3708 status line is not displayed, the cursor is placed in the lower right corner when a keyboard locked condition exists. | Activate the status line display with the Status On/Off function to view the input inhibited message (refer to "Reading the Status Line" on page 2-12). |
| IDENT does not work  | 3708 configuration  | See your system administrator.  |

## Common Problems in Line-by-Line Mode (Protocol Enveloping)

This section describes problems that can occur while in line-by-line mode.

| Symptom  | Probable Cause  | Action   |
|--|---|--|
| Extra, missing, or unintelligible characters on the screen | Line trouble (or noise)   | For switched connections, hang up and establish a new connection. For non-switched connections, contact your carrier representative. |
| ENTER not accepted   | Incorrect turnaround character  | See your system administrator.   |
| Session ends unexpectedly                                  | Host connection lost<br>Inactivity time out (switched, or EIA 422A connections) | See your system administrator.<br>Redefine or suppress the 3708's inactivity timer.  |
| Characters not displayed at display when typing in         | 3708 configuration  | See your system administrator.   |
| Double characters displayed on the screen                  | Incorrect terminal setting  | Turn off local echoing of characters by the terminal.  |
| Receiving incorrect characters                             | 3708 configuration  | See your system administrator.   |
| Display is disconnected when logging off host application  | 3708 configuration  | See your system administrator.   |
| BREAK does not stop data to the display                    | 3708 configuration  | See your system administrator.   |
| A CR does not occur at the end of the line                 | Host configuration  | See your system administrator.   |
| Backspace does not work                                    | Host configuration  | See your system administrator.   |

---

## Appendix A. Flowchart of 3708 Logon Process

The flowchart in this appendix takes you through the 3708 logon process, to the point that you enter either Protocol Conversion mode, Protocol Enveloping mode, or ASCII Pass-through mode.

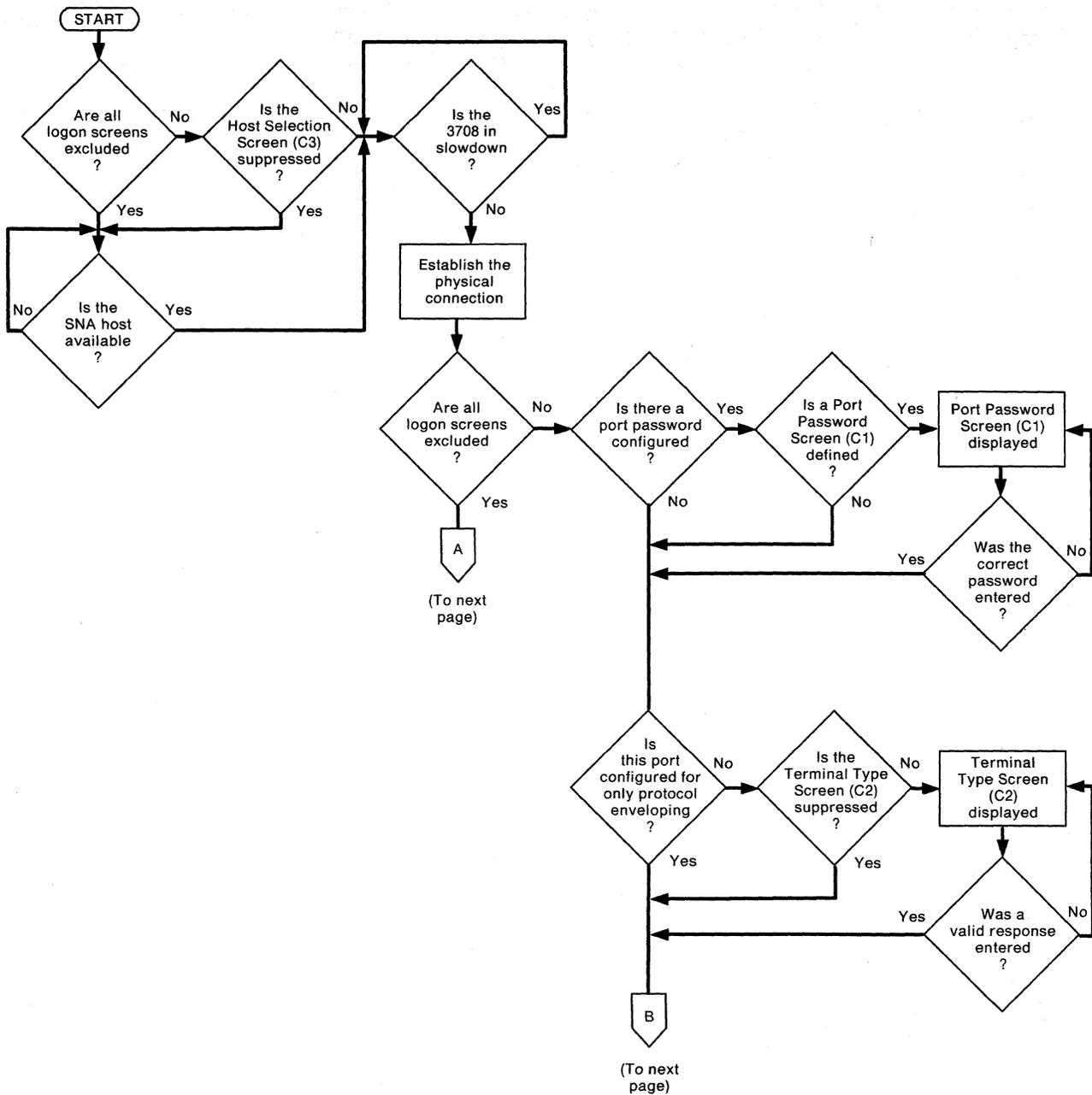


Figure A-1 (Part 1 of 2). Flowchart of the IBM 3708 Logon Process

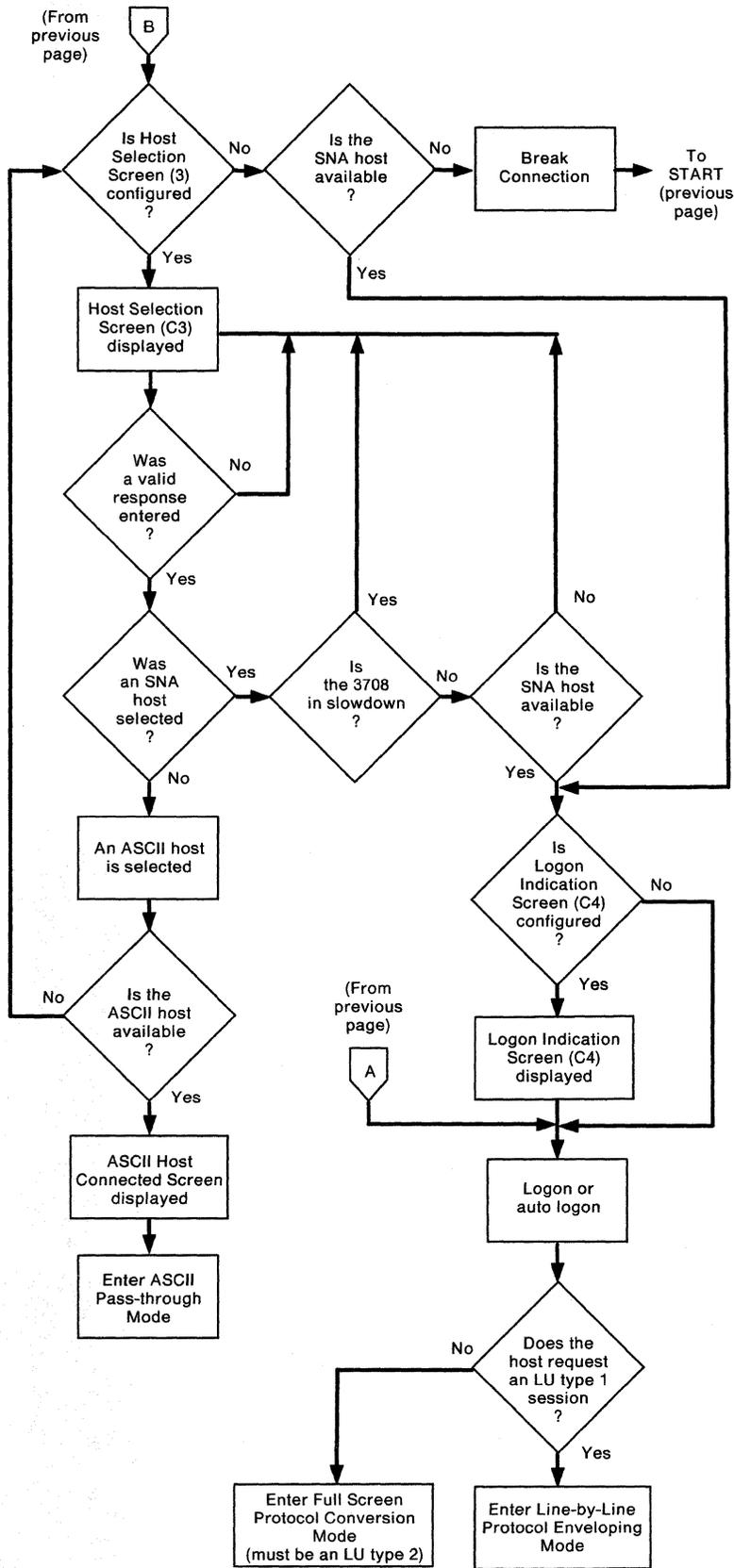


Figure A-1 (Part 2 of 2). Flowchart of the IBM 3708 Logon Process



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## Appendix B. Setting up Your Terminal

This appendix discusses the advantage of using your terminal's scrolling ability and shows you the switch settings that you should use for your terminals.

---

### Using Scrolling

Using your terminal's scrolling ability makes the logon screens much more readable. When you set scrolling on, a new line displays on the bottom line of the screen and the previous line moves up one. Later, if you use your terminal in full-screen mode, this function may be unavailable. When you operate in full-screen mode, your terminal must not perform an auto linefeed or auto newline function — this means that when a character is displayed in the last column of a line, the terminal should not automatically position the cursor at the beginning of the next line.

Some terminals provide separate settings to control scrolling and the auto linefeed functions; others merge the two into one function. If your device has separate settings, turn the auto linefeed function off and the scrolling function on. For example, for the IBM 3101, setting the following switches enables scrolling during logon, and disables the auto newline function:

| Function | Switch Setting |
|----------|----------------|
| AUTO NL  | off            |
| AUTO LF  | off            |
| SCROLL   | on             |

Similarly, the setting for the IBM 3151, 3161, 3162, 3163, and 3164 follows:

| Function | Switch Setting |
|----------|----------------|
| AUTO LF  | off            |
| SCROLL   | jump or smooth |

If your device does not have separate settings, and if you plan to use full-screen mode later, set the terminal for AUTO NL off or SCROLL off. Your 3708 logon screens will wrap from the bottom line of the screen to the top.

---

### Setting Your Terminal's Switches

The remainder of this appendix shows you the switch settings to use for your type of terminal. Your terminal should be set with these values when attached to the 3708. 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 of the terminal.

---

## Default Terminal Switch Settings

The following tables give the default switch settings for the terminals supported by the 3708.

### ADDS Viewpoint®

| Switch                  | Setting        | Note |
|-------------------------|----------------|------|
| BAUD RATE               | ---            | 1    |
| AUTO SCROLL             | DISABLED       |      |
| AUTO LINEFEED           | DISABLED       |      |
| LINE MODE               | FULL<br>DUPLEX |      |
| PARITY                  | ---            | 1    |
| CHARACTER<br>DISPLAY    | ---            | 2    |
| DISPLAY PARITY<br>ERROR | ---            | 1    |
| SCREEN REFRESH<br>RATE  | ---            | 3    |
| CHARACTER SET           | ---            | 4    |
| CURSOR DISPLAY          | ---            | 2    |
| CURSOR FORMAT           | ---            | 2    |

#### Notes:

1. This setting must match the configuration of the 3708.
2. The function described by this switch has no effect on the 3708.
3. This selection must match the power line frequency. In the USA, this is set to 60 Hz.
4. The character set must match the translate table used on the 3708.

## 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      | ---         | 3    |
| CURSOR FORMAT        | ---         | 3    |
| CHARACTER CASE       | UPPER/LOWER |      |
| CURSOR HOME          | ---         | 3    |
| KEY CLICK            | ---         | 3    |

### Notes:

1. This setting must match the configuration of the 3708.
2. This selection must match the power line frequency. In the USA, this is set to 60 Hz.
3. The function designated by this switch has no effect on 3708 operation.

## Beehive™ ATL-78

| Option                         | Selection | Note |
|--------------------------------|-----------|------|
| TRANSMIT BAUD RATE             | ---       | 1,2  |
| RECEIVE BAUD RATE              | ---       | 1,2  |
| WORD LENGTH                    | 7 BITS    |      |
| PARITY                         | ---       | 1    |
| STOP BITS                      | ---       | 1    |
| RECEIVED DATA ERROR CHECK      | NO        |      |
| INTERFACE                      | EIA 232C  | 1,3  |
| DUPLEX                         | FULL      |      |
| AUTO-ECHO                      | NO        |      |
| XON/XOFF                       | ---       | 1    |
| TRANSPARENT PRINTING           | YES       |      |
| GO ONLINE AFTER BLOCK TRANSMIT | NO        |      |
| SLOW TRANSMIT                  | NO        |      |

### Notes:

1. This configuration must match the configuration of the 3708.
2. The transmit baud rate must equal the receive baud rate.
3. EIA 422A can also be chosen.
4. Auxiliary port options must match the attached printer.

## Data General® D210 Display Terminal

| Switch           | Position | Note |
|------------------|----------|------|
| BAUD RATE        | ---      | 1    |
| PARITY           | ---      | 1    |
| 50/60 HZ         | ---      | 2    |
| TERMINAL<br>MODE | DG       |      |

### Notes:

1. This setting must match the configuration of the 3708.
2. This setting must match the power line frequency. In the USA, this is set to 60 Hz.

## DEC® VT100 and VT52

| Switch           | Setting | Note |
|------------------|---------|------|
| SCROLL           | ---     | 1    |
| AUTOREPEAT       | ---     | 1    |
| SCREEN           | ---     | 1    |
| CURSOR           | ---     | 1    |
| MARGIN BELL      | ---     | 1    |
| KEYCLICK         | ---     | 1    |
| ANSI/VT52        | ANSI    | 6    |
| AUTO<br>XON/XOFF | ---     | 2    |
| #E/3             | ---     | 3    |
| WRAPAROUND       | OFF     |      |
| NEWLINE          | OFF     |      |
| INTERLACE        | ---     | 3    |
| PARITY SENSE     | ---     | 2    |
| PARITY           | ---     | 2    |
| BITS PER CHAR    | 7       |      |
| POWER            | ---     | 4    |
| T SPEED          | ---     | 2,5  |
| R SPEED          | ---     | 2,5  |

### Notes:

1. User preference; this is a VT 100 local option.
2. This setting must match the configuration of the 3708.
3. The function designated by this switch has no effect on 3708 operation.
4. This selection must match the power line frequency. In the USA, this is set to 60 Hz.
5. The transmit speed and the receive speed must be the same.
6. Not an option on the VT52.

## DEC® VT220 (Emulating a VT100)

| Setup Item             | Selection          | Note |
|------------------------|--------------------|------|
| ON LINE/LOCAL          | ON LINE            |      |
| KEYBOARD LANGUAGE      | ---                | 1    |
| 80/132 COLUMNS         | 80                 |      |
| CONTROL REPRESENTATION | INTERPRET          |      |
| AUTO WRAP              | NO AUTO WRAP       |      |
| TERMINAL MODE          | VT-100 MODE        |      |
| CURSOR KEYS            | NORMAL CURSOR KEYS |      |
| TRANSMIT SPEED         | ---                | 2    |
| RECEIVE SPEED          | ---                | 2    |
| DATA-BITS/PARITY       | ---                | 2    |
| STOP BITS              | ---                | 2    |
| LOCAL ECHO             | NO LOCAL ECHO      |      |
| HOST PORT SELECTION    | ---                | 3    |

### Notes:

1. Select the correct terminal operation for the national keyboard being used.
2. This setting must match the configuration of the 3708.
3. DATA LEADS ONLY should be used for a direct-connect line and MODEM CONTROL should be used for a line using an external modem.
4. All other items are determined by user preference or have no effect on 3708 operation.

## DEC® VT220

| Setup Item             | Selection          | Note |
|------------------------|--------------------|------|
| ON LINE/LOCAL          | ON LINE            |      |
| KEYBOARD LANGUAGE      | ---                | 1    |
| 80/132 COLUMNS         | 80                 |      |
| CONTROL REPRESENTATION | INTERPRET          |      |
| AUTO WRAP              | NO AUTO WRAP       |      |
| TERMINAL MODE          | VT-220 MODE        |      |
| CURSOR KEYS            | NORMAL CURSOR KEYS |      |
| TRANSMIT SPEED         | ---                | 2    |
| RECEIVE SPEED          | ---                | 2    |
| DATA-BITS/PARITY       | ---                | 2    |
| STOP BITS              | ---                | 2    |
| LOCAL ECHO             | NO LOCAL ECHO      |      |
| HOST PORT SELECTION    | ---                | 3    |

### Notes:

1. Select the correct terminal operation for the national keyboard being used.
2. This setting must match the configuration of the 3708.
3. DATA LEADS ONLY should be used for a direct-connect line and MODEM CONTROL should be used for a line using an external modem.
4. All other items are determined by user preference or have no effect on 3708 operation.

**FALCO 500®**

| Switch        | Position         | Note |
|---------------|------------------|------|
| WINDOW BEGIN  | 1                |      |
| WINDOW SIZE   | 39               |      |
| SCREEN SIZE   | 26               |      |
| PAGE SIZE     | 40               |      |
| PAGE NUMBER   | 1                |      |
| TERMINAL MODE | VT200 7-bit      |      |
| WRAP          | NO WRAP          |      |
| NEW LINE      | NO NEW LINE      |      |
| USER KEYS     | USER KEYS UNLOCK |      |
| COLUMN        | 80               |      |
| LINES         | 25               |      |
| SCROLL        | JUMP or SMOOTH   |      |
| DIM PORT      | --               | 3    |
| SCR SAVER     | --               | 3    |
| KEY CLICK     | --               | 3    |
| AUTO REPEAT   | --               | 4    |
| SPEED         |                  | 1    |
| PARITY        |                  | 1    |
| BITS          | 7                |      |
| STOP BITS     | --               | 1    |
| MODEM         |                  | 2    |
| XMIT XOFF     |                  |      |
| BUFFERS       | --               | 3    |
| COMM. MODE    | ONLINE           |      |
| MODE          | FDX              |      |
| VIDEO         | --               | 3    |
| MARGIN BELL   | --               | 3    |
| STATUS        | No Status        |      |

**Notes:**

1. This setting must match the configuration of the 3708.
2. This option does not affect the 3708.
3. User preference; this is a FALCO 500® local option.

## Hazeltine ESPRIT I™

| Switch           | Position    | Note |
|------------------|-------------|------|
| HI-INTENSITY     | ENABLE      |      |
| REVERSE VIDEO    | ---         | 1    |
| INTERFACE        | EIA         |      |
| LEAD IN          | ESC         |      |
| EMULATE          | HAZELTINE   |      |
| END OF MESSAGE   | CR          |      |
| BAUD RATE        | ---         | 2    |
| PARITY           | ---         | 2    |
| ANL TRUNCATE     | OFF         |      |
| HALF/FULL DUPLEX | FULL DUPLEX |      |
| AUTO LF/CR       | CR          |      |

### Notes:

1. User preference; this is an ESPRIT I local option.
2. This setting must match the configuration of the 3708.

## Hazeltine ESPRIT II™

| Switch            | Position       | Note |
|-------------------|----------------|------|
| INTERFACE         | EIA            |      |
| BAUD RATE         | ---            | 1    |
| LEAD IN           | ESC            |      |
| COMMUNICATION     | FULL<br>DUPLEX |      |
| EMULATION         | HAZELTINE      |      |
| WRAPAROUND        | NO             |      |
| LINE<br>FREQUENCY | ---            | 2    |
| PARITY            | ---            | 1    |
| AUTO LINE FEED    | OFF            |      |
| UNDERLINE         | OFF            |      |
| HIGH INTENSITY    | ON             |      |
| REVERSE VIDEO     | ---            | 3    |

### Notes:

1. This setting must match the configuration of the 3708.
2. This selection must match the power line frequency. In the USA, this is 60 Hz.
3. User preference; this is an ESPRIT II local option.

## Hazeltine 1500

| Switch              | Position       | Note |
|---------------------|----------------|------|
| BAUD RATE           | ---            | 1    |
| PARITY              | ---            | 1    |
| HALF/FULL<br>DUPLEX | FULL<br>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 3708.
2. User preference; this is a Hazeltine 1500 local option.

## Hewlett-Packard 2621B Interactive Terminal

| Switch                       | Position  | Note |
|------------------------------|-----------|------|
| BAUD RATE                    | ---       | 1    |
| ECHO                         | REMOTE    |      |
| KEYBOARD                     | ---       | 2    |
| PARITY                       | ---       | 1    |
| XON/XOFF                     | ---       | 1    |
| ENQ/ACK                      | DISABLED  |      |
| AUTO LINE FEED               | DISABLED  |      |
| LINE/CHARACTER MODE          | CHARACTER |      |
| RETURN/ENTER KEY STRING      | CR        |      |
| ESCAPE SEQUENCE TRANSMISSION | ENABLED   |      |
| SPACE OVERWRITE LATCH        | DISABLED  |      |
| WRAPAROUND CURSOR            | DISABLED  |      |
| SHORT TRANSFER TRIGGER       | DISABLED  |      |
| LONG TRANSFER WARNING        | DISABLED  |      |
| DATA SPEED SELECT            | ---       | 3    |

### Notes:

1. This setting must match the configuration of the 3708.
2. This setting must match the keyboard attached to the 2621B.
3. This allows the operation of modems that support dual speed data transmission.

## IBM PC/FTTERM (Color and Monochrome)

| Switch                             | 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                        | ---     | 3    |
| INACTIVITY TIME OUT IN MINUTES     | ---     | 4    |
| EXTENDED CODES                     | ---     | 5    |
| NAME OF HOST FILE TRANSFER COMMAND |         | 3    |

### Notes:

1. This setting must match the configuration of the 3708.
2. Choose the communication port that is connected to the 3708.
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 PC in 3101 Emulation Mode

| Switch                           | Position | Note |
|----------------------------------|----------|------|
| LINE SPEED                       | ---      | 1    |
| BLOCK MODE                       | N        |      |
| HALF-DUPLEX                      | N        |      |
| PARITY                           | ---      | 1    |
| STOP BITS                        | ---      | 1    |
| AUTOMATIC NEW LINE               | N        |      |
| 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    |

**Note:** This setting must match the configuration of the 3708.

## IBM 3101 Models 10, 12, 13, 20, 22, 23

| Switch        | Position | Note |
|---------------|----------|------|
| CHAR/BLOCK    | CHAR     |      |
| HDX/FDX       | FDX      |      |
| 232C/422      | 232C     | 1,2  |
| PRTS/CRTS     | PRTS     |      |
| REVCH         | OFF      |      |
| TURN AROUND   | CR       |      |
| DUAL/MONO     | DUAL     |      |
| STOP1/STOP2   | ---      | 2    |
| PARITY        | ---      | 2    |
| SEND LINE     | ---      | 3    |
| NULL SUPP     | ---      | 3    |
| TIME FILL     | ---      | 3    |
| AUTO NL       | OFF      |      |
| AUTO LF       | OFF      |      |
| CR/CR.LF      | CR       |      |
| SCROLL        | OFF      |      |
| REV VIDEO     | ---      | 4    |
| BLINK CURSOR  | ---      | 4    |
| I/O RATE/MAIN | ---      | 2    |
| I/O RATE AUX  | ---      | 5    |

### Notes:

1. EIA 422A can also be chosen for 3101-13 or 3101-23.
2. This setting must match the configuration of the 3708.
3. The function designated by this switch has no effect on 3708 operation.
4. User preference; this is a 3101 local option.
5. 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 3151 ASCII Display Station

| Setup Item                         | Selection | Note |
|------------------------------------|-----------|------|
| <b>General</b>                     |           |      |
| MACHINE MODE                       | IBM 3151  |      |
| SCREEN                             | --        | 3    |
| ROW AND COLUMN                     | 24 x 80   | 6    |
| SCROLL                             | ---       | 5    |
| AUTO LF                            | OFF       |      |
| CRT SAVER                          | ---       |      |
| LINE WRAP                          | OFF       |      |
| FORCING INSERT                     | ---       |      |
| TAB                                | ---       |      |
| TERMINAL ID                        | ---       |      |
| PRINT                              | N/A       |      |
| <b>Communication</b>               |           |      |
| OPERATING MODE                     | ECHO      |      |
| LINE SPEED (bps)                   | ---       | 2,4  |
| WORD LENGTH (bits)                 | 7         |      |
| PARITY                             | ---       | 2,4  |
| STOP BIT                           | ---       | 2,4  |
| TURNAROUND CHARACTER               | CR        |      |
| INTERFACE                          | EIA-232C  | 1    |
| LINE CONTROL                       | PRTS      |      |
| BREAK SIGNAL (ms)                  | 500       |      |
| SEND NULL SUPPRESS                 | ---       |      |
| PACING                             | N/A       |      |
| <b>Keyboard/Printer – Keyboard</b> |           |      |
| ENTER                              | RETURN    |      |
| RETURN                             | NEW LINE  |      |
| NEW LINE                           | CR        |      |
| SEND                               | ---       |      |
| INSERT CHARACTER                   | SPACE     |      |

| Keyboard/Printer — Printer |     |   |
|----------------------------|-----|---|
| LINE SPEED (bps)           | --- | 4 |
| WORD LENGTH (bits)         | 7   |   |
| PARITY                     | --- | 4 |
| STOP BIT                   | --- | 4 |
| CHARACTERS                 | --- | 3 |

The following feature cartridges are available for the 3151. These cartridges enhance the usability and functional characteristics of the terminals connected to the 3708:

- IBM 3151 Cartridge to Emulate IBM and DEC® Terminals (Feature No. 8235)
- IBM 3151 Connectivity Feature Cartridge (Feature No. 8525)
- IBM 3151 Expansion Feature Cartridge (Feature No. 8535).

The setup for these feature cartridges is as described above with the following exceptions:

| Setup Item          | Selection           | Note |
|---------------------|---------------------|------|
| MACHINE MODE        | SYSTEM ATTACH       |      |
| ROW AND COLUMN      | 25 x 80 or 28 x 132 | 6    |
| NUMBER OF VIEWPORTS | 1                   |      |
| NUMBER OF PAGES     | 1                   |      |
| PRINT               | HOST                |      |
| PACING              | ON                  | 2    |
| RETURN              | SEND                |      |
| SEND                | CR                  |      |

**Notes:**

1. EIA-422A can be supported for 3151 models 310 and 410.
2. This setting must match the configuration of the 3708.
3. The function designated by this item has no effect on 3708 operation.
4. The selections for the auxiliary port must match the configuration of the connected printer.
5. SCROLL must be set to either Jump or Smooth.
6. The 3151 Model 310 or 410 with the Expansion Feature Cartridge supports Model 5 Emulation (28 x 132).

## IBM 3161 ASCII Display Station

| Setup Item           | Selection |                | Note |
|----------------------|-----------|----------------|------|
| MACHINE MODE         | IBM 3161  |                |      |
| OPERATING MODE       | ECHO      |                |      |
|                      | Main Port | Auxiliary Port |      |
| INTERFACE            | RS-232C   | N/A            | 1,2  |
| LINE CONTROL         | PRTS      | N/A            |      |
| LINE SPEED           | ---       | ---            | 2,4  |
| PARITY               | ---       | ---            | 2,4  |
| TURNAROUND CHARACTER | CR        | N/A            |      |
| STOP BIT             | ---       | ---            | 2,4  |
| WORD LENGTH          | 7         | 7              |      |
| RESPONSE DELAY       | 100       | N/A            |      |
| BREAK SIGNAL         | 500       | N/A            |      |
| TERMINAL ID          | ---       | ---            | 3    |

| Select Item | Selection | Note |
|-------------|-----------|------|
| ENTER       | RETURN    |      |
| RETURN      | NEWLINE   |      |
| RETURN (2)  | CR        |      |
| TAB         | ---       | 3    |
| LINE WRAP   | OFF       |      |
| AUTO LF     | OFF       |      |
| SEND        | ---       | 3    |
| SEND NULL   | ---       | 3    |
| INSERT      | SPACE     |      |
| TRACE       | ---       | 3    |
| CRT SAVER   | ---       | 3    |
| SCROLL      | ---       | 5    |
| PRINT       | ---       | 3    |
| PRINT NULL  | ---       | 3    |
| PRINT EOL   | ---       | 3    |
| LINE END    | ---       | 3    |

An **IBM 3161 with Enhanced 3708 Attachment (Feature No. 8371)** is also available. It enhances the usability and functional characteristics of the terminal attached to the 3708. The setup for this cartridge is described above with the following exceptions:

| Setup Item     | Selection | Note |
|----------------|-----------|------|
| OPERATING MODE | ECHO*     |      |
| ENTER          | SEND      |      |
| SEND           | CR        |      |
| PRINT          | HOST      |      |

**Notes:**

1. RS-422A can also be chosen for the 3161 Model 12.
2. This setting must match the configuration of the 3708.
3. The function designated by this item has no effect on 3708 operation.
4. The selections for the auxiliary port must match the configuration of the display.
5. SCROLL must be set to either Jump or Smooth.

## IBM 3162 ASCII Display Station

| Setup Menu                          | Selection | Note |
|-------------------------------------|-----------|------|
| <b>General</b>                      |           |      |
| MACHINE MODE                        | IBM 3162  |      |
| SCREEN                              | --        | 3    |
| ROW AND COLUMN                      | 24 x 80   | 2    |
| SCROLL                              | ---       | 5    |
| AUTO LF                             | OFF       |      |
| FORCING INSERT                      | ---       | 3    |
| CRT SAVER                           | ---       | 3    |
| LINE WRAP                           | OFF       |      |
| TAB                                 | ---       | 3    |
| TERMINAL ID                         | ---       | 3    |
| PRINT                               | N/A       |      |
| <b>Communication</b>                |           |      |
| OPERATING MODE                      | ECHO      |      |
| LINE SPEED (bps)                    | ---       | 2,4  |
| WORD LENGTH (bits)                  | 7         |      |
| PARITY                              | ---       | 2,4  |
| STOP BIT                            | ---       | 2,4  |
| TURNAROUND CHARACTER                | CR        |      |
| INTERFACE                           | RS-232C   | 1,2  |
| LINE CONTROL                        | PRTS      |      |
| BREAK SIGNAL (ms)                   | 500       |      |
| SEND NULL SUPPRESS                  | ---       | 3    |
| <b>Keyboard/Printer -- Keyboard</b> |           |      |
| ENTER                               | RETURN    |      |
| RETURN                              | NEW LINE  |      |
| NEW LINE                            | CR        |      |
| SEND                                | ---       | 3    |
| INSERT CHARACTER                    | SPACE     |      |

| Keyboard/Printer — Printer |     |   |
|----------------------------|-----|---|
| LINE SPEED (bps)           | --- | 4 |
| WORD LENGTH (bits)         | 7   | 4 |
| PARITY                     | --- | 4 |
| STOP BIT                   | --- | 4 |
| CHARACTERS                 | --- | 3 |

An IBM 3162 with 3708/3710 Support Functions (Feature No. 8232) is also available. This cartridge enhances the usability and functional characteristics of the terminal connected to the 3708. The setup for this cartridge is as described above with the following exceptions:

| Setup Menu     | Selection           | Note |
|----------------|---------------------|------|
| ROW AND COLUMN | 25 x 80 or 28 x 132 | 6    |
| PRINT          | HOST                |      |
| OPERATING MODE | ECHO - 3708/10      |      |
| ENTER          | SEND                |      |
| SEND           | CR                  |      |

**Notes:**

1. RS-422A can be supported for the 3162 Model 12/32.
2. This setting must match the configuration of the 3708.
3. The function designated by this item has no effect on 3708 operation.
4. The selections for the auxiliary port must match the configuration of the display.
5. SCROLL must be set to either Jump or Smooth.
6. If IBM 3151/62 (MODEL 5 EMULATION) is chosen as the terminal ID, the screen size 28 x 132 is supported on this feature cartridge.

## IBM 3163 ASCII Display Station

| Setup Item           | Selection |                | Note |
|----------------------|-----------|----------------|------|
| MACHINE MODE         | IBM 3163  |                |      |
| OPERATING MODE       | ECHO      |                |      |
|                      | Main Port | Auxiliary Port |      |
| INTERFACE            | RS-232C   | N/A            | 1,2  |
| LINE CONTROL         | PRTS      | N/A            |      |
| LINE SPEED           | ---       | ---            | 2,4  |
| PARITY               | ---       | ---            | 2,4  |
| TURNAROUND CHARACTER | CR        | N/A            |      |
| STOP BIT             | ---       | ---            | 2,4  |
| WORD LENGTH          | 7         | 7              |      |
| RESPONSE DELAY       | 100       | N/A            |      |
| BREAK SIGNAL         | 500       | N/A            |      |
| TERMINAL ID          | ---       | ---            | 3    |

| Select Item | Selection | Note |
|-------------|-----------|------|
| ENTER       | RETURN    |      |
| RETURN      | NEWLINE   |      |
| NEWLINE     | CR        |      |
| TAB         | ---       | 3    |
| LINE WRAP   | OFF       |      |
| AUTO LF     | OFF       |      |
| SEND        | ---       | 3    |
| SEND NULL   | ---       | 3    |
| INSERT      | SPACE     |      |
| TRACE       | ---       | 3    |
| CRT SAVER   | ---       | 3    |
| SCROLL      | ---       | 5    |
| PRINT       | ---       | 3    |
| PRINT NULL  | ---       | 3    |
| PRINT EOL   | ---       | 3    |
| LINE END    | ---       | 3    |

An IBM 3163/3164 VT100/3708 Emulation Cartridge (Feature No. 8313) is also available. It enhances the usability and functional characteristics of the terminal attached to the 3708. The setup for this cartridge is described above with the following exceptions:

| Setup Item     | Selection     | Note |
|----------------|---------------|------|
| OPERATING MODE | SYSTEM ATTACH |      |
| ENTER          | SEND          |      |
| SEND           | CR            |      |
| PRINT          | HOST          |      |

**Notes:**

1. RS-422A can also be chosen for the 3163 Model 12.
2. This setting must match the configuration of the 3708.
3. The function designated by this item has no effect on 3708 operation.
4. The selections for the auxiliary port must match the configuration of the display.
5. SCROLL must be set to either Jump or Smooth.

## IBM 3164 ASCII Display Station

| Setup Item           | Selection |                | Note |
|----------------------|-----------|----------------|------|
| MACHINE MODE         | IBM 3164  |                |      |
| OPERATING MODE       | ECHO      |                |      |
|                      | Main Port | Auxiliary Port |      |
| INTERFACE            | RS-232C   | N/A            | 1,2  |
| LINE CONTROL         | PRTS      | N/A            |      |
| LINE SPEED           | ---       | ---            | 2,4  |
| PARITY               | ---       | ---            | 2,4  |
| TURNAROUND CHARACTER | CR        | N/A            |      |
| STOP BIT             | ---       | ---            | 2,4  |
| WORD LENGTH          | 7         | 7              |      |
| RESPONSE DELAY       | 100       | N/A            |      |
| BREAK SIGNAL         | 500       | N/A            |      |
| TERMINAL ID          | ---       | ---            | 3    |

| Select Item | Selection | Note |
|-------------|-----------|------|
| ENTER       | RETURN    |      |
| RETURN      | NEWLINE   |      |
| NEWLINE     | CR        |      |
| TAB         | ---       | 3    |
| LINE WRAP   | OFF       |      |
| AUTO LF     | OFF       |      |
| SEND        | ---       | 3    |
| SEND NULL   | ---       | 3    |
| INSERT      | SPACE     |      |
| TRACE       | ---       | 3    |
| CRT SAVER   | ---       | 3    |
| SCROLL      | ---       | 5    |
| PRINT       | ---       | 3    |
| PRINT NULL  | ---       | 3    |
| PRINT EOL   | ---       | 3    |
| LINE END    | ---       | 3    |

An IBM 3163/3164 VT100/3708 Emulation Cartridge (Feature No. 8313) is also available. It enhances the usability and functional characteristics of the terminal attached to the 3708. The setup for this cartridge is described above with the following exceptions:

| Setup Item     | Selection     | Note |
|----------------|---------------|------|
| OPERATING MODE | SYSTEM ATTACH |      |
| ENTER          | SEND          |      |
| SEND           | CR            |      |
| PRINT          | HOST          |      |

**Notes:**

1. RS-422A can also be chosen for the 3164 Model 12.
2. This setting must match the configuration of the 3708.
3. The function designated by this item has no effect on 3708 operation.
4. The selections for the auxiliary port must match the configuration of the display.
5. SCROLL must be set to Jump.

## Lear Siegler ADM 24E Video Display Terminal

| Feature   | Selection     | Note |
|---|---------------|------|
| SCROLL METHOD                                       | ---           | 1    |
| FULL SCREEN BACKGROUND                              | ---           | 2    |
| KEY CLICK   | ---           | 2    |
| RETURN KEY CONFIGURATION                            | CR            |      |
| SCROLL MODE   | NON-SCROLL    |      |
| AUTO NEW LINE                                       | OFF           |      |
| KEYBOARD CONFIGURATION                              | ---           | 1    |
| PRIMARY LANGUAGE GROUP                              | ---           | 3    |
| LINE 25 DEFINITION                                  | HOST MESSAGES |      |
| LINE 25 DISPLAY                                     | ---           | 1    |
| AUDIBLE BELL  | ON            |      |
| CURSOR DEFINITION                                   | ---           | 2    |
| FILL 1 SUPPRESSION                                  | OFF           |      |
| NUMBER OF LINES FOR PAGE 1                          | 24            |      |
| NUMBER OF LINES FOR PAGE 2                          | ---           | 1    |
| FUNCTION KEY LEGEND NO.                             | ---           | 1    |
| TYPEWRITER TABS                                     | NONE          |      |
| TABBING MODE  | ---           | 1    |
| INTERNATIONAL LANGUAGE                              | ---           | 3    |
| ATTRIBUTES  | NON-EMBEDDED  |      |
| SEND/PRINT: ATTRIBUTE +<br>LANGUAGE CHANGES IN TEXT | NON-EMBEDDED  |      |
| EDIT KEY SEQUENCE TRANSMISSION                      | ON            |      |
| NULL SUPPRESSION                                    | ON            |      |
| DEL(ETE) SUPPRESSION                                | OFF           |      |
| FILL CHARACTER #1                                   | SPACE         |      |
| FILL CHARACTER #2                                   | NULL          |      |
| FILL CHARACTER #3                                   | ---           | 1    |
| FILL CHARACTER #4                                   | ---           | 1    |
| FILL CHARACTER #5                                   | ---           | 1    |
| FILL CHARACTER #6                                   | ---           | 1    |
| FILL CHARACTER #7                                   | ---           | 1    |
| FILL CHARACTER #8                                   | ---           | 1    |
| DUPLEX  | FULL          |      |
| PARITY (HOST)                                       | ---           | 4    |

| Feature                               | Selection    | Note |
|---------------------------------------|--------------|------|
| BUSY/READY INDICATION (HOST)          | XON/XOFF     |      |
| BAUD RATE (HOST)                      | ---          | 4    |
| X-ON CHARACTER (HOST)                 | DC1          |      |
| X-OFF CHARACTER (HOST)                | DC3          |      |
| PARITY (PRINTER)                      | ---          | 5    |
| BUSY/READY INDICATION (PRINTER)       | ---          | 5    |
| PRINTER BUSY                          | ---          | 5    |
| BAUD RATE (PRINTER)                   | ---          | 5    |
| PRINT BUFFER SIZE (NUMBER OF K-BYTES) | ---          | 5    |
| X-ON CHARACTER (PRINTER)              | ---          | 5    |
| X-OFF CHARACTER (PRINTER)             | ---          | 5    |
| USER PROGRAM PRESENT (P1)             | OFF          |      |
| USER PROGRAM PRESENT (P2)             | OFF          |      |
| LINE FREQUENCY                        | ---          | 6    |
| DATA TRANSMISSION MODE                | CONVERSATION |      |
| ANSWERBACK                            | OFF          |      |
| ANSWERBACK MESSAGE                    | ---          | 1    |
| SCREEN SAVE                           | ---          | 1    |
| LIGHT PEN (OPTIONAL)                  | OFF          |      |
| MODEM CONTROL (OPTIONAL)              | OFF          |      |
| FILL 5 PLACEMENT                      | ---          | 1    |

**Notes:**

1. The function designated by this option has no effect on 3708 operation.
2. User preference; this is an ADM 24E local option.
3. The character set must match the translate table used by the 3708.
4. This selection must match the configuration of the 3708.
5. This selection must match the setup of the connected printer.
6. This selection must match the power line frequency. In the USA, this is set to 60 Hz.
7. Function key F1 must be redefined to generate SOH S (X'0153'), and function key F10 must be redefined to generate SOH R (X'0152') instead of the default values to use the ADM 24E terminal.

## Lear Siegler ADM 3A Dumb Terminal®

| Switch           | Setting  | Note |
|------------------|----------|------|
| BAUD RATE        | ---      | 1    |
| HDX-FDX          | FDX      |      |
| EIA 232CL        | EIA 232C |      |
| AUTO NL-OFF      | DISABLED |      |
| LC EN-UC         | LC EN    |      |
| PARITY ODD-EVEN  | ---      | 1    |
| DATA 7-8         | 7 BIT    |      |
| 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      | ---      | 2    |
| GT-LK            | GT       |      |

### Notes:

1. This setting must match the configuration of the 3708.
2. The function designated by this switch has no effect on 3708 operation.
3. This selection must match the power line frequency. In the USA, this is set to 60 Hz.

## Lear Siegler ADM 31 Intermediate Terminal™ Video Display Unit

| Switch                               | Setting      | Note |
|--------------------------------------|--------------|------|
| BAUD RATE(MODEM)                     | ---          | 1    |
| BAUD RATE (PRINTER)                  | ---          | 2    |
| PRINTER BUSY CONTROL                 | ---          | 2    |
| EIA 232C/DIRECT CONNECT/CURRENT LOOP | EIA 232C     |      |
| PRINTER BUSY ACTIVE                  | ---          | 2    |
| CURSOR                               | ---          | 3    |
| ATTRIBUTE CHARACTER DISPLAYED        | OFF          |      |
| DOT STRETCHING MODE                  | DISABLED     |      |
| BLANKING/UNDERLINE                   | ---          | 4    |
| NULLS                                | ON           |      |
| BREAK KEY                            | OFF          |      |
| REFRESH RATE                         | ---          | 5    |
| DATA BITS                            | 7 DATA BITS  |      |
| PARITY                               | ---          | 1    |
| STOP BITS                            | ---          | 1    |
| BIT 8 1/0                            | ---          | 4    |
| BLOCK/CONVERSATION MODE              | CONVERSATION |      |
| FULL/HALF DUPLEX                     | FULL DUPLEX  |      |
| PRINTER PORT SELECTIONS              | ---          | 2    |
| POLLING ADDRESS                      | ---          | 4    |

### Notes:

1. This setting must match the configuration of the 3708.
2. This setting must match the configuration of the connected printer.
3. User preference; this is an ADM 31 local option.
4. The function designated by this switch has no effect on 3708 operation.
5. This selection must match the power line frequency. In the USA, this is set to 60 Hz.

## Northern Telecom Displayphone™

| Option            | Selection   | Note |
|-------------------|-------------|------|
| PROTOCOL STANDARD | ANSI        |      |
| SCREEN WIDTH      | 80          |      |
| DISPLAY MODE      | ---         | 1    |
| DUPLEX            | FULL DUPLEX |      |
| PARITY            | ---         | 2    |
| BAUD RATE         | ---         | 2    |
| TERMINAL ID       | ---         | 1    |

### Notes:

1. The function designated by this switch has no effect on 3708 operation.
2. This selection must match the configuration of the 3708.

**ROLM® Cypress™, Cedar™, and Juniper™**

| Option          | Selection | Note |
|-----------------|-----------|------|
| TERMINAL TYPE   | IBM 3270  |      |
| BAUD RATE       | ---       | 1    |
| PARITY          | ---       | 1    |
| ECHOPLEX        | YES       |      |
| ENTER-KEY VALUE | CR        |      |

**Note:** This selection must match the configuration of the 3708.

## Teletype 5410 Asynchronous Display Terminal

| Option         | Selection | Note |
|----------------|-----------|------|
| SPEED          | ---       | 1    |
| PARITY         | ---       | 1    |
| DUPLEX         | FULL      |      |
| SCREEN         | 80        |      |
| RETURN KEY     | CR        |      |
| RECEIVED LF    | INDEX     |      |
| LABELS         | ---       | 2    |
| MONITOR MODE   | OFF       |      |
| KEY CLICK      | ---       | 2    |
| AUTOWRAP       | OFF       |      |
| CURSOR         | ---       | 2    |
| BUILT-IN MODEM | NO        | 3    |

### Notes:

1. This selection must match the configuration of the 3708.
2. User preference; this is a Teletype 5410 local option.
3. If the Teletype 5410 internal modem is used, this selection should be YES.

## Teletype 5420 Buffered Display

| Option           | Selection | Note |
|------------------|-----------|------|
| SPEED            | ---       | 1    |
| DUPLEX           | FULL      |      |
| SEND PARITY      | ---       | 1    |
| CHECK PARITY     | YES       |      |
| 132 COLUMNS      | OFF       |      |
| MEMORY ACCESS    | SCROLL    |      |
| CLOCK            | ASYNCR    |      |
| RETURN KEY       | CR        |      |
| NEWLINE ON LF    | NO        |      |
| AUTOWRAP         | OFF       |      |
| CURSOR           | ---       | 2    |
| KEYCLICK         | ---       | 2    |
| MARGIN BELL      | ---       | 2    |
| KEYBOARD MODEL   | 5420      |      |
| TRANSMISSION     | CHAR      |      |
| LINE SEND        | ---       | 3    |
| BLOCK SEND       | ---       | 3    |
| SEND FROM        | ---       | 3    |
| SEND EDIT SEQ    | YES       |      |
| SEND GRAPHICS    | NO        |      |
| ENTER KEY        | CR        |      |
| FIELD SEPARATOR  | ---       | 3    |
| BLOCK TERMINATOR | ---       | 3    |
| ANSWER BACK      | ---       | 3    |
| LINES PER PAGE   | ---       | 3    |
| PAGINATION       | OFF       |      |
| PRINTER MODEL    | ---       | 4    |
| PRINTER SPEED    | ---       | 4    |
| FLOW CONTROL     | ---       | 4    |
| ALARM            | ---       | 4    |

### Notes:

1. This selection must match the configuration of the 3708.
2. User preference; this is a Teletype 5420 local option.
3. The function designated by this switch has no effect on 3708 operation.
4. When a printer is connected to the auxiliary port, the setting for the 5420 must match the settings on the printer.

## TeleVideo® 910

| Switch             | Position             | Note |
|--------------------|----------------------|------|
| BAUD RATE          | ---                  | 1    |
| WORD STRUCTURE     | 7-BIT WORD STRUCTURE |      |
| PARITY             | ---                  | 1    |
| EVEN/ODD PARITY    | ---                  | 1    |
| STOP BITS          | ---                  | 1    |
| AUTOWRAP           | NO WRAPAROUND        |      |
| CR/CRLF            | CR                   |      |
| TERMINAL SELECTION | STANDARD 910         |      |
| 60 HZ/50 HZ        | ---                  | 2    |
| CURSOR             | ---                  | 3    |
| HALF/FULL DUPLEX   | FULL DUPLEX          |      |
| SCREEN             | ---                  | 3    |
| DSR                | CONNECTED            |      |
| CARRIER DETECT     | CONNECTED            |      |
| DTR                | CONNECTED            |      |

### Notes:

1. This function must match the configuration of the 3708.
2. Must be set to the power line frequency. In the USA, this is set to 60 Hz.
3. User preference; this is a TV 910 local option.

## TeleVideo® 912C

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

### Notes:

1. This setting must match the configuration of the 3708.
2. The character set must match the translate table used on the 3708.
3. This selection must match the power line frequency. In the USA, this is set to 60 Hz.
4. User preference; this is a TV912 local option.
5. The function designated by this switch has no effect on 3708 operation.

## TeleVideo® 950

| Switch               | Position       | Note |
|----------------------|----------------|------|
| BAUD RATE            | ---            | 1    |
| WORD STRUCTURE       | 7 BIT          |      |
| STOP BITS            | ---            | 1    |
| PRINTER BAUD RATE    | ---            | 2    |
| EDIT MODE            | DUPLEX<br>EDIT |      |
| CURSOR               | ---            | 3    |
| PARITY               | ---            | 1    |
| DISPLAY PRESENTATION | ---            | 3    |
| COMMUNICATION MODE   | FULL<br>DUPLEX |      |
| POWER                | ---            | 4    |
| KEY CLICK            | ---            | 3    |

### Notes:

1. This setting must match the configuration of the 3708.
2. When a printer is attached to the auxiliary port, the baud rate configured on the printer must match the baud rate configured on the TV 950.
3. User preference; this is a TV 950 local option.
4. This selection must match the power line frequency. In the USA, this is set to 60 Hz.

**WY-50®**

| Switch               | Position            | Note |
|----------------------|---------------------|------|
| HANDSHAKE            | XON<br>XOFF<br>NONE |      |
| SCREEN               | 80                  |      |
| CURSOR               | --                  | 3    |
| MODE                 | FDX                 |      |
| KEYS?                | US/UK               |      |
| RET/ENTER            | CR/CR               |      |
| COMPATIBLE MODE      | WY50                |      |
| ENHANCED             |                     |      |
| SCRL                 | --                  | 3    |
| STATUS               |                     |      |
| SCREEN SAVER         | --                  | 3    |
| PROT                 |                     |      |
| TEXT                 | OFF                 |      |
| BLK-END              |                     |      |
| AUTO-NL              | OFF                 |      |
| CR                   | CR                  |      |
| AUX AUTO-SCROLL      | --                  | 2    |
| DATA BIT             | 7                   |      |
| STOP BIT             | --                  | 1    |
| PARITY BIT           | --                  | 1    |
| MODEM PORT BAUD RATE | --                  | 1    |

**Notes:**

1. This setting must match the configuration of the 3708.
2. When a printer is attached to the auxiliary port, the baud rate configured on the printer must match the baud rate configured on the WY-50.
3. User preference; this is a WY-50 local option.
4. This function does not affect the 3708.

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## Appendix C. Terminal Keyboard Maps

This appendix contains a full set of keyboard maps for terminals supported by the IBM 3708.

The following table lists the end-user devices and the corresponding IBM 3708 network conversion unit reference card order number.<sup>1</sup>

| <b>End-User Device</b>  | <b>Form No.</b> |
|---|-----------------|
| IBM 3101 Display Terminal Models 10, 12, 13, 20, 22, and 23                             | SX27-3633       |
| IBM Personal Computer (PC) in 3101 Emulation Mode with standard 3101 keyboard functions | SX27-3635       |
| IBM 3151, 3161, 3162, 3163, and 3164  | SX27-3862       |
| IBM 3151, 3161, 3162, 3163, and 3164 (3708 Feature)                                     | SX27-3867       |
| ADDS Viewpoint® Display Station   | SX27-3636       |
| ADDS Viewpoint®/78  | SX27-3706       |
| Beehive™ ATL-078  | SX27-3645       |
| Data General Dasher® D210 Display Terminal  | SX27-3652       |
| DEC® Model VT52   | SX27-3637       |
| DEC® Model VT100  | SX27-3638       |
| DEC® Model VT220  | SX27-3639       |
| DEC® Model VT220 (Emulating a VT100)  | SX27-3790       |
| FALCO 500®  | SX27-3864       |
| Hazeltine Esprit I™ and II™   | SX27-3640       |
| Hazeltine 1500  | SX27-3641       |
| Hewlett-Packard 2621B Interactive Terminal  | SX27-3651       |
| Lear Siegler ADM 24E  | SX27-3703       |
| Lear Siegler ADM 3A Dumb Terminal®  | SX27-3642       |
| Lear Siegler ADM 31™  | SX27-3704       |
| Northern Telecom Displayphone™  | SX27-3653       |
| ROLM Cedar  | SX27-3649       |
| ROLM Cypress  | SX27-3648       |
| ROLM Juniper  | SX27-3650       |
| Teletype 5410 Async. Display Terminal   | SX27-3646       |
| Teletype 5420   | SX27-3647       |
| TeleVideo® 910  | SX27-3643       |
| TeleVideo® 912C   | SX27-3705       |
| TeleVideo® 950  | SX27-3644       |
| WY-50®  | SX27-3865       |
| User-Defined Terminal   | SX27-3654       |

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<sup>1</sup> The list of displays contains several trademarks and registered trademarks. Viewpoint is a registered trademark of Applied Digital Data Systems, Inc. BEEHIVE is a trademark of BEEHIVE International. Dasher is a registered trademark of the Data General Corporation. DEC is a registered trademark of the Digital Equipment Corporation. ESPRIT I and ESPRIT II are trademarks of Esprit Systems, Inc. FALCO 500 is a registered trademark of Falco Data Products, Inc. Dumb Terminal is a registered trademark of Lear Siegler, Inc. Displayphone is a trademark of Northern Telecom, Inc. TeleVideo is a registered trademark of TeleVideo Systems, Inc. WY-50 is a registered trademark of Wyse Technology.

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

|           |               |       |   |   |   |    |   |   |   |   |   |   |     |      |   |
|-----------|---------------|-------|---|---|---|----|---|---|---|---|---|---|-----|------|---|
| ATR       | ERASE EOL/EOF | ~     | ! | @ | # | \$ | % | ^ | & | * | ( | ) | -   | =    | ← |
| ESC       | ERASE EOB     | →     | Q | W | E | R  | T | Y | U | I | O | P | [   | ]    | ← |
| PRINT MSG | SEND MSG      | Ⓢ     | A | S | D | F  | G | H | J | K | L | : | "   | {    | ↵ |
| PRINT     |               | ↑     | > | Z | X | C  | V | B | N | M | : | : | ?   | ↑    | ← |
|           |               | RESET |   |   |   |    |   |   |   |   |   |   | ALT | SEND |   |

|          |          |   |   |   |
|----------|----------|---|---|---|
| DEL      | BREAK    | 7 | 8 | 9 |
| INS CHAR | DEL CHAR | 4 | 5 | 6 |
| ↑        | ↓        | 1 | 2 | 3 |
| ←        | →        | , | 0 | . |

| TO PERFORM THIS FUNCTION | TYPE           | TO PERFORM THIS FUNCTION | TYPE           |
|--------------------------|----------------|--------------------------|----------------|
| ATTN                     | ALT a          | PF10                     | ESC 0          |
| BACKTAB                  | ESC →          | PF11                     | ESC -          |
| CANCEL PRINT (Note 3)    | CANCEL         | PF12                     | ESC =          |
| CLEAR                    | CLEAR or ALT c | PF13                     | ESC !          |
| CURSOR SELECT            | ESC k          | PF14                     | ESC @          |
| DELETE                   | DEL            | PF15                     | ESC #          |
| DEV CNCL                 | ALT x          | PF16                     | ESC \$         |
| DOWN (CURSOR)            | ↓              | PF17                     | ESC %          |
| DUP                      | ALT d          | PF18                     | ESC ^          |
| ENTER                    | ↵              | PF19                     | ESC &          |
| ERASE EOF                | ERASE EOL/EOF  | PF20                     | ESC *          |
| ERASE INPUT              | ERASE INPUT    | PF21                     | ESC (          |
| FIELD MARK               | ALT f          | PF22                     | ESC )          |
| HOME                     | ALT ←          | PF23                     | ESC _          |
| IDENT                    | ESC z          | PF24                     | ESC +          |
| INSERT MODE              | ESC DEL        | PRINT                    | ALT p          |
| LEFT (CURSOR)            | ←              | PRINT LINE (Note 3)      | PRINT LINE     |
| NEW LINE                 | ALT j          | PRINT MESSAGE (Note 3)   | PRINT MSG      |
| NULL/BLANK               | ESC n          | PRINT PAGE (Note 3)      | PRINT PAGE     |
| PA1                      | ESC ,          | REFRESH                  | ESC r          |
| PA2                      | ESC .          | RESET                    | ALT r          |
| PA3                      | ESC /          | RESUME DISPLAY           | ALT y          |
| PF1                      | PF 1 or ESC 1  | RESUME PRINTER           | ESC p          |
| PF2                      | PF 2 or ESC 2  | RIGHT (CURSOR)           | →              |
| PF3                      | PF 3 or ESC 3  | STATUS ON/OFF            | ALT w or ESC ? |
| PF4                      | PF 4 or ESC 4  | SUSPEND DISPLAY          | ALT t          |
| PF5                      | PF 5 or ESC 5  | SUSPEND PRINTER          | ESC o          |
| PF6                      | PF 6 or ESC 6  | SYS REQ                  | ESC s          |
| PF7                      | PF 7 or ESC 7  | TAB                      | →              |
| PF8                      | PF 8 or ESC 8  | TYPE AHEAD               | ESC t          |
| PF9                      | ESC 9          | UP (CURSOR)              | ↑              |

## 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. This function is provided on IBM 3101 terminals with Model 2X designations only.

# IBM PC Emulating a 3101

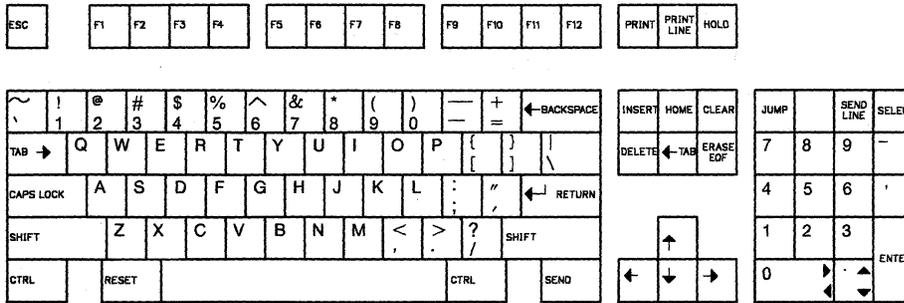
|    |     |      |   |   |   |    |   |   |   |   |   |   |   |   |           |          |             |        |   |
|----|-----|------|---|---|---|----|---|---|---|---|---|---|---|---|-----------|----------|-------------|--------|---|
| F1 | F2  | Esc  | 1 | @ | # | \$ | % | ^ | & | * | ( | ) | - | = | ←         | Num Lock | Scroll Lock |        |   |
| F3 | F4  | ←    | Q | W | E | R  | T | Y | U | I | O | P | [ | ] | ←         | 7 Home   | 8 ↑         | 9 PgUp | - |
| F5 | F6  | Ctrl | A | S | D | F  | G | H | J | K | L | : | " | ~ | ←         | 4 ←      | 5           | 6 →    |   |
| F7 | F8  | ↑    |   | Z | X | C  | V | B | N | M | , | . | ? | ↑ | Print     | 1 End    | 2 ↓         | 3 PgDn | + |
| F9 | F10 | Alt  |   |   |   |    |   |   |   |   |   |   |   |   | Caps Lock | 0 Ins    | Del         |        |   |

| TO PERFORM THIS FUNCTION | TYPE               | TO PERFORM THIS FUNCTION | TYPE         |
|--------------------------|--------------------|--------------------------|--------------|
| ATTN                     | Ctrl a             | PF9                      | F9 or Esc 9  |
| BACKTAB                  | ← or Esc →         | PF10                     | F10 or Esc 0 |
| CLEAR                    | Home or Ctrl c     | PF11                     | Esc -        |
| CURSOR SELECT            | Esc k              | PF12                     | Esc =        |
| DELETE                   | Del                | PF13                     | Esc !        |
| DEV CNCL                 | Ctrl x             | PF14                     | Esc @        |
| DOWN (CURSOR)            | ↓                  | PF15                     | Esc #        |
| DUP                      | Ctrl d             | PF16                     | Esc \$       |
| ENTER                    | ↵                  | PF17                     | Esc %        |
| ERASE EOF                | End                | PF18                     | Esc ^        |
| ERASE INPUT              | Ctrl Home          | PF19                     | Esc &        |
| FIELD MARK               | Ctrl f             | PF20                     | Esc *        |
| HOME                     | Ctrl PgUp or Esc H | PF21                     | Esc (        |
| IDENT                    | Esc z              | PF22                     | Esc )        |
| INSERT MODE              | Ins or Esc Del     | PF23                     | Esc _        |
| LEFT (CURSOR)            | ←                  | PF24                     | Esc +        |
| NEW LINE or Ctrl j       | Ctrl ↵ or Ctrl j   | PRINT                    | Ctrl p       |
| NULL/BLANK               | Esc n              | REFRESH                  | Esc r        |
| PA1                      | Ctrl F1 or Esc ,   | RESET                    | Ctrl r       |
| PA2                      | Ctrl F2 or Esc .   | RESUME DISPLAY           | Ctrl y       |
| PA3                      | Ctrl F3 or Esc /   | RESUME PRINTER           | Esc p        |
| PF1                      | F1 or Esc 1        | RIGHT (CURSOR)           | →            |
| PF2                      | F2 or Esc 2        | STATUS ON/OFF            | Ctrl w       |
| PF3                      | F3 or Esc 3        | SUSPEND DISPLAY          | Ctrl t       |
| PF4                      | F4 or Esc 4        | SUSPEND PRINTER          | Esc o        |
| PF5                      | F5 or Esc 5        | SYS REQ                  | Esc s        |
| PF6                      | F6 or Esc 6        | TAB                      | →            |
| PF7                      | F7 or Esc 7        | TYPE AHEAD               | Esc t        |
| PF8                      | F8 or Esc 8        | UP (CURSOR)              | ↑            |

## 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.

# IBM 3151, 3161, 3162, 3163, and 3164

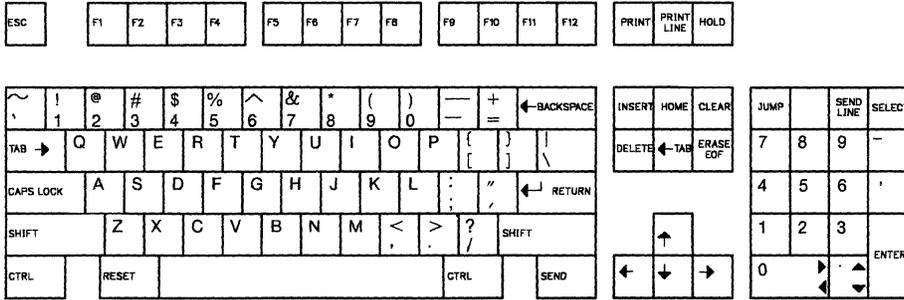


| TO PERFORM THIS FUNCTION | TYPE                | TO PERFORM THIS FUNCTION | TYPE                        |
|--------------------------|---------------------|--------------------------|-----------------------------|
| ATTN                     | CTRL a              | PF9                      | F9 or ESC 9                 |
| BACKTAB                  | ESC TAB             | PF10                     | F10 or ESC 0                |
| CLEAR                    | CLEAR               | PF11                     | F11 or ESC -                |
| CURSOR SELECT            | CTRL k              | PF12                     | F12 or ESC =                |
| DELETE                   | DELETE              | PF13                     | F13 or ESC ~                |
| DEV CNCL                 | CTRL x              | PF14                     | F14 or ESC @                |
| DOWN (CURSOR)            | ↓                   | PF15                     | F15 or ESC #                |
| DUP                      | CTRL d              | PF16                     | F16 or ESC \$               |
| ENTER                    | RETURN              | PF17                     | F17 or ESC %                |
| ERASE EOF                | ERASE EOF or CTRL e | PF18                     | F18 or ESC ^                |
| ERASE INPUT              | Er Inp              | PF19                     | F19 or ESC &                |
| FIELD MARK               | CTRL f              | PF20                     | F20 or ESC *                |
| HOME                     | HOME                | PF21                     | F21 or ESC (                |
| IDENT                    | CTRL z              | PF22                     | F22 or ESC )                |
| INSERT MODE              | INSERT              | PF23                     | F23 or ESC _                |
| LEFT (CURSOR)            | ←                   | PF24                     | F24 or ESC +                |
| NEW LINE                 | CTRL j              | PRINT                    | CTRL p or PRINT (3151 only) |
| NULL/BLANK               | ESC N               | REFRESH                  | ESC r                       |
| PA1                      | PA1 or ESC m RETURN | RESET                    | CTRL r or RESET (3151 only) |
| PA2                      | PA2 or ESC n RETURN | RESUME DISPLAY           | CTRL y                      |
| PA3                      | PA3 or ESC o RETURN | RESUME PRINTER           | ESC p                       |
| PF1                      | F1 or ESC 1         | RIGHT (CURSOR)           | →                           |
| PF2                      | F2 or ESC 2         | STATUS ON/OFF            | CTRL w                      |
| PF3                      | F3 or ESC 3         | SUSPEND DISPLAY          | CTRL t                      |
| PF4                      | F4 or ESC 4         | SUSPEND PRINTER          | ESC O                       |
| PF5                      | F5 or ESC 5         | SYS REQ                  | ESC s                       |
| PF6                      | F6 or ESC 6         | TAB                      | TAB                         |
| PF7                      | F7 or ESC 7         | TLIS REFRESH (3151/3164) | ESC T                       |
| PF8                      | F8 or ESC 8         | TYPE AHEAD               | ESC t                       |
|                          |                     | UP (CURSOR)              | ↑                           |
|                          |                     | 2/4 COLOR TOGGLE (3164)  | ESC \                       |

## 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.

# IBM 3151, 3161, 3162, 3163, and 3164 (3708 Feature)



| TO PERFORM THIS FUNCTION | TYPE                | TO PERFORM THIS FUNCTION | TYPE               |
|--------------------------|---------------------|--------------------------|--------------------|
| ATTN                     | CTRL a              | PF9                      | F9 or ESC 9        |
| BACKTAB                  | ← TAB or ESC TAB    | PF10                     | F10 or ESC 0       |
| CLEAR                    | CLEAR               | PF11                     | F11 or ESC -       |
| CURSOR SELECT            | CTRL k              | PF12                     | F12 or ESC =       |
| DELETE                   | DELETE              | PF13                     | F13 or ESC ~ SEND  |
| DEV CNCL                 | CTRL x              | PF14                     | F14 or ESC @ SEND  |
| DOWN (CURSOR)            | ↓                   | PF15                     | F15 or ESC # SEND  |
| DUP                      | CTRL d              | PF16                     | F16 or ESC \$ SEND |
| ENTER                    | SEND                | PF17                     | F17 or ESC % SEND  |
| ERASE EOF                | ERASE EOF or CTRL e | PF18                     | F18 or ESC ^ SEND  |
| ERASE INPUT              | Er Inp              | PF19                     | F19 or ESC & SEND  |
| FIELD MARK               | CTRL f              | PF20                     | F20 or ESC * SEND  |
| HOME                     | HOME                | PF21                     | F21 or ESC ( SEND  |
| IDENT                    | CTRL z              | PF22                     | F22 or ESC ) SEND  |
| INSERT MODE              | INSERT              | PF23                     | F23 or ESC _ SEND  |
| LEFT (CURSOR)            | ←                   | PF24                     | F24 or ESC + SEND  |
| NEW LINE                 | RETURN or CTRL j    | PRINT                    | PRINT or CTRL p    |
| NULL/BLANK               | ESC N               | REFRESH                  | ESC r              |
| PA1                      | PA1                 | RESET                    | RESET or CTRL r    |
| PA2                      | PA2                 | RESUME DISPLAY           | CTRL y             |
| PA3                      | PA3                 | RESUME PRINTER           | ESC p              |
| PF1                      | F1 or ESC 1         | RIGHT (CURSOR)           | →                  |
| PF2                      | F2 or ESC 2         | SUSPEND DISPLAY          | CTRL t             |
| PF3                      | F3 or ESC 3         | SUSPEND PRINTER          | ESC O              |
| PF4                      | F4 or ESC 4         | SYS REQ                  | ESC s              |
| PF5                      | F5 or ESC 5         | TAB                      | TAB                |
| PF6                      | F6 or ESC 6         | TYPE AHEAD               | ESC t              |
| PF7                      | F7 or ESC 7         | UP (CURSOR)              | ↑                  |
| PF8                      | F8 or ESC 8         | 2/4 COLOR TOGGLE (3164)  | ESC \              |

## 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.

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|      |       |   |   |    |   |   |   |   |   |   |   |   |        |            |
|------|-------|---|---|----|---|---|---|---|---|---|---|---|--------|------------|
| ESC  | !     | @ | # | \$ | % | ^ | & | * | ( | ) | _ | = | ~      | BACK SPACE |
| TAB  | Q     | W | E | R  | T | Y | U | I | O | P | { | } |        | /          |
| CTRL | LOCK  | A | S | D  | F | G | H | J | K | L | : | " | RETURN |            |
| DEL  | SHIFT | Z | X | C  | V | B | N | M | < | > | ? | / | SHIFT  | BREAK      |

|    |      |    |
|----|------|----|
| F1 | F2   | F3 |
| 7  | ↑    | 9  |
|    | 8    |    |
| ←  | HOME | →  |
| 4  | 5    | 6  |
|    | ↓    |    |
| 1  | 2    | 3  |
|    | 0    | .  |

| TO PERFORM THIS FUNCTION | TYPE       | TO PERFORM THIS FUNCTION | TYPE           |
|--------------------------|------------|--------------------------|----------------|
| ATTN                     | ESC A      | PF9                      | ESC 9          |
| BACKTAB                  | ESC TAB    | PF10                     | ESC 0          |
| CLEAR                    | CTRL c     | PF11                     | ESC -          |
| CURSOR SELECT            | ESC k      | PF12                     | ESC =          |
| DELETE                   | DEL        | PF13                     | ESC !          |
| DEV CNCL                 | CTRL x     | PF14                     | ESC @          |
| DOWN (CURSOR)            | ↓          | PF15                     | ESC #          |
| DUP                      | CTRL d     | PF16                     | ESC \$         |
| ENTER                    | RETURN     | PF17                     | ESC %          |
| ERASE EOF                | CTRL e     | PF18                     | ESC ^          |
| ERASE INPUT              | ESC i      | PF19                     | ESC &          |
| FIELD MARK               | ESC f      | PF20                     | ESC *          |
| HOME                     | HOME       | PF21                     | ESC (          |
| IDENT                    | ESC d      | PF22                     | ESC )          |
| INSERT MODE              | ESC DEL    | PF23                     | ESC _          |
| LEFT (CURSOR)            | ←          | PF24                     | ESC +          |
| NEW LINE                 | ESC RETURN | PRINT                    | CTRL p         |
| NULL/BLANK               | ESC n      | REFRESH                  | ESC r          |
| PA1                      | ESC ,      | RESET                    | CTRL r         |
| PA2                      | ESC .      | RESUME DISPLAY           | CTRL y         |
| PA3                      | ESC /      | RESUME PRINTER           | ESC p          |
| PF1                      | ESC 1      | RIGHT (CURSOR)           | →              |
| PF2                      | ESC 2      | STATUS ON/OFF            | ESC w or ESC ? |
| PF3                      | ESC 3      | SUSPEND DISPLAY          | CTRL t         |
| PF4                      | ESC 4      | SUSPEND PRINTER          | ESC o          |
| PF5                      | ESC 5      | SYS REQ                  | ESC s          |
| PF6                      | ESC 6      | TAB                      | TAB            |
| PF7                      | ESC 7      | TYPE AHEAD               | ESC a          |
| PF8                      | ESC 8      | UP (CURSOR)              | ↑              |

## 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.

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# ADDS VIEWPOINT®/78

|              |            |       |   |   |   |    |   |   |   |   |   |   |   |     |       |     |            |     |      |      |   |
|--------------|------------|-------|---|---|---|----|---|---|---|---|---|---|---|-----|-------|-----|------------|-----|------|------|---|
| ATK          | CURSOR DEL | ~     | ! | @ | # | \$ | % | ^ | & | * | ( | ) | _ | +   | ←     | DUP | FIELD MARK | PF9 | PF14 | PF16 |   |
| ESC          |            | →     | Q | W | E | R  | T | Y | U | I | O | P | ⌘ | ↵   | ↵     | ↵   | ↵          | ↵   | ↵    | ↵    | ↵ |
| CURSOR BLINK | ERASE EOF  | ␣     | A | S | D | F  | G | H | J | K | L | : | ; | }   | ↵     | ↵   | ↵          | ↵   | ↵    | ↵    | ↵ |
| □            | ▢          | ↑     | < | Z | X | C  | V | B | N | M | , | . | ? | /   | ↵     | ↵   | ↵          | ↵   | ↵    | ↵    | ↵ |
|              |            | RESET |   |   |   |    |   |   |   |   |   |   |   | ALT | ENTER |     |            |     |      |      |   |

| TO PERFORM THIS FUNCTION | TYPE              | TO PERFORM THIS FUNCTION | TYPE        |
|--------------------------|-------------------|--------------------------|-------------|
| ATTN                     | ATTN              | PF9                      | PF9         |
| BACKTAB                  | ←                 | PF10                     | PF10        |
| CLEAR                    | CLEAR             | PF11                     | PF11        |
| CURSOR SELECT            | CURSOR SEL        | PF12                     | PF12        |
| DELETE                   | ⌘                 | PF13                     | PF13        |
| DEV CNCL                 | DEV CNCL or ALT x | PF14                     | PF14        |
| DOWN (CURSOR)            | ↓                 | PF15                     | PF15        |
| DUP                      | DUP               | PF16                     | PF16        |
| ENTER                    | ENTER             | PF17                     | PF17        |
| ERASE EOF                | ERASE EOF         | PF18                     | PF18        |
| ERASE INPUT              | ERASE INPUT       | PF19                     | PF19        |
| FIELD MARK               | FIELD MARK        | PF20                     | PF20        |
| HOME                     | ↵                 | PF21                     | PF21        |
| IDENT                    | IDENT             | PF22                     | PF22        |
| INSERT MODE              | ↵                 | PF23                     | PF23        |
| LEFT (CURSOR)            | ←                 | PF24                     | PF24        |
| NEW LINE                 | ↵                 | PRINT                    | □           |
| NULL/BLANK               | ESC n             | REFRESH                  | ALT r       |
| PA1                      | PA1               | RESET                    | RESET       |
| PA2                      | PA2               | RESUME DISPLAY           | unavailable |
| PA3                      | PA3               | RESUME PRINTER           | unavailable |
| PF1                      | PF1               | RIGHT (CURSOR)           | →           |
| PF2                      | PF2               | STATUS ON/OFF            | unavailable |
| PF3                      | PF3               | SUSPEND DISPLAY          | unavailable |
| PF4                      | PF4               | SUSPEND PRINTER          | unavailable |
| PF5                      | PF5               | SYS REQ                  | SYS REQ     |
| PF6                      | PF6               | TAB                      | →           |
| PF7                      | PF7               | TYPE AHEAD               | ESC a       |
| PF8                      | PF8               | UP (CURSOR)              | ↑           |

**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.

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# BEEHIVE™ ATL-078

|              |            |       |   |   |   |    |   |   |   |   |   |   |   |   |   |     |            |   |   |   |
|--------------|------------|-------|---|---|---|----|---|---|---|---|---|---|---|---|---|-----|------------|---|---|---|
| ATTN         | CURSOR SEL | ~     | ! | @ | # | \$ | % | ^ | & | * | ( | ) | = | + | ← | DUP | FIELD MARK | 7 | 8 | 9 |
|              |            | 1     | 2 | 3 | 4 | 5  | 6 | 7 | 8 | 9 | 0 | - | = | ← | → | ↵   | ↵          | 4 | 5 | 6 |
| CURSOR BLANK | ERASE EOF  | Q     | W | E | R | T  | Y | U | I | O | P | ; | ' | ] | ↵ | ↵   | ↵          | 1 | 2 | 3 |
|              |            | ↑     | < | Z | X | C  | V | B | N | M | , | . | ? | ↵ | ↵ | ↵   | ↵          | . | 0 | . |
|              |            | RESET |   |   |   |    |   |   |   |   |   |   |   |   |   | ALT | ENTER      |   |   |   |

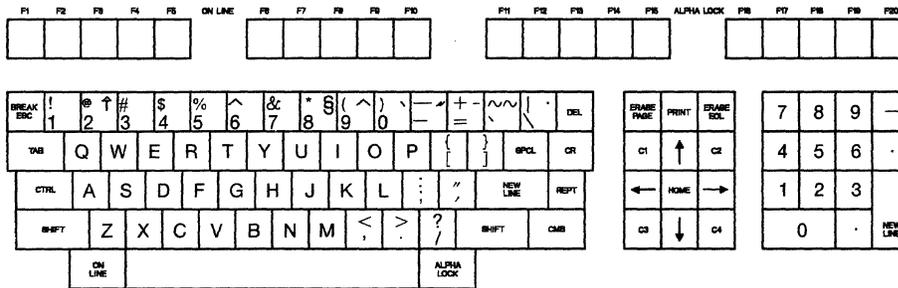
| TO PERFORM THIS FUNCTION | TYPE           | TO PERFORM THIS FUNCTION | TYPE        |
|--------------------------|----------------|--------------------------|-------------|
| ATTN                     | ALT a          | PF9                      | PF9         |
| BACKTAB                  | ESC ←          | PF10                     | PF10        |
| CLEAR                    | CLEAR or ALT c | PF11                     | PF11        |
| CURSOR SELECT            | CURSOR SEL     | PF12                     | PF12        |
| DELETE                   | ↵              | PF13                     | PF13        |
| DEV CNCL                 | DEV CNCL       | PF14                     | PF14        |
| DOWN (CURSOR)            | ↓              | PF15                     | PF15        |
| DUP                      | DUP            | PF16                     | PF16        |
| ENTER                    | ENTER          | PF17                     | PF17        |
| ERASE EOF                | ERASE EOF      | PF18                     | PF18        |
| ERASE INPUT              | ERASE INPUT    | PF19                     | PF19        |
| FIELD MARK               | FIELD MARK     | PF20                     | PF20        |
| HOME                     | ↵ or ESC       | PF21                     | PF21        |
| IDENT                    | IDENT          | PF22                     | PF22        |
| INSERT MODE              | ↵              | PF23                     | PF23        |
| LEFT (CURSOR)            | ←              | PF24                     | PF24        |
| NEW LINE                 | ↵              | PRINT                    | ALT p       |
| NULL/BLANK               | Esc n          | REFRESH                  | ALT u       |
| PA1                      | PA1            | RESET                    | RESET       |
| PA2                      | PA2            | RESUME DISPLAY           | ALT f       |
| PA3                      | PA3            | RESUME PRINTER           | ALT l       |
| PF1                      | PF1            | RIGHT (CURSOR)           | →           |
| PF2                      | PF2            | STATUS ON/OFF            | unavailable |
| PF3                      | PF3            | SUSPEND DISPLAY          | ALT d       |
| PF4                      | PF4            | SUSPEND PRINTER          | ALT k       |
| PF5                      | PF5            | SYS REQ                  | SYS REQ     |
| PF6                      | PF6            | TAB                      | →           |
| PF7                      | PF7            | TYPE AHEAD               | Esc a       |
| PF8                      | PF8            | UP (CURSOR)              | ↑           |

## Notes:

1. For key sequences that begin with Esc, press and release Esc (the unlabeled key immediately below ATTN) and then press the other key.
2. For key sequences that begin with ALT, press and hold ALT while pressing the other key.

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# DATA GENERAL DASHER® D210



| TO PERFORM THIS FUNCTION | TYPE         | TO PERFORM THIS FUNCTION | TYPE               |
|--------------------------|--------------|--------------------------|--------------------|
| ATTN                     | CTRL a       | PF9                      | F9 or ESC 9        |
| BACKTAB                  | ESC TAB      | PF10                     | F10 or ESC 0       |
| CLEAR                    | ERASE PAGE   | PF11                     | F11 or ESC -       |
| CURSOR SELECT            | ESC k        | PF12                     | F12 or ESC =       |
| DELETE                   | DEL          | PF13                     | F13 or ESC !       |
| DEV CNCL                 | ESC X        | PF14                     | F14 or ESC @       |
| DOWN (CURSOR)            | ↓            | PF15                     | F15 or ESC #       |
| DUP                      | CTRL d       | PF16                     | SHIFT F1 or ESC \$ |
| ENTER                    | NEW LINE     | PF17                     | SHIFT F2 or ESC %  |
| ERASE EOF                | CTRL e       | PF18                     | SHIFT F3 or ESC ^  |
| ERASE INPUT              | ESC I        | PF19                     | SHIFT F4 or ESC &  |
| FIELD MARK               | CTRL f       | PF20                     | SHIFT F5 or ESC *  |
| HOME                     | HOME         | PF21                     | SHIFT F6 or ESC (  |
| IDENT                    | ESC D        | PF22                     | SHIFT F7 or ESC )  |
| INSERT MODE              | ESC DEL      | PF23                     | SHIFT F8 or ESC _  |
| LEFT (CURSOR)            | ←            | PF24                     | SHIFT F9 or ESC +  |
| NEW LINE                 | ESC NEW LINE | PRINT                    | CTRL p             |
| NULL/BLANK               | ESC N        | REFRESH                  | ESC R              |
| PA1                      | C1 or ESC ,  | RESET                    | CTRL r             |
| PA2                      | C2 or ESC .  | RESUME DISPLAY           | unavailable        |
| PA3                      | ESC /        | RESUME PRINTER           | unavailable        |
| PF1                      | F1 or ESC 1  | RIGHT (CURSOR)           | →                  |
| PF2                      | F2 or ESC 2  | STATUS ON/OFF            | ESC W or ESC ?     |
| PF3                      | F3 or ESC 3  | SUSPEND DISPLAY          | unavailable        |
| PF4                      | F4 or ESC 4  | SUSPEND PRINTER          | unavailable        |
| PF5                      | F5 or ESC 5  | SYS REQ                  | ESC S              |
| PF6                      | F6 or ESC 6  | TAB                      | TAB                |
| PF7                      | F7 or ESC 7  | TYPE AHEA                | ESC A              |
| PF8                      | F8 or ESC 8  | UP (CURSOR)              | ↑                  |

## 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.

# DEC® VT52

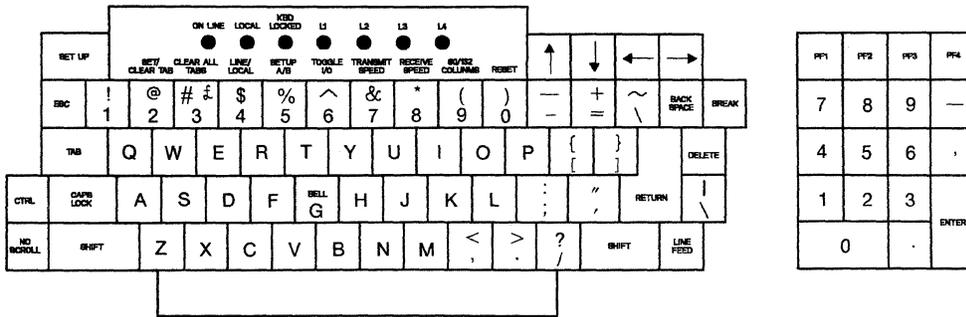
| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE:                 |
|--------------------------|-------------------------|--------------------------|-----------------------|
| ATTN                     | Ctrl a                  | PF9                      | Numeric 9 or Esc 9    |
| BACKTAB                  | Backspace or Esc Tab    | PF10                     | Numeric Blue or Esc 0 |
| CLEAR                    | Ctrl c                  | PF11                     | Numeric Red or Esc -  |
| CURSOR SELECT            | Esc k                   | PF12                     | Numeric Gray or Esc = |
| DELETE                   | Delete                  | PF13                     | Esc !                 |
| DEV CNCL                 | Ctrl x                  | PF14                     | Esc @                 |
| DOWN (CURSOR)            | ↓                       | PF15                     | Esc #                 |
| DUP                      | Ctrl d                  | PF16                     | Esc \$                |
| ENTER                    | Return or Numeric Enter | PF17                     | Esc %                 |
| ERASE EOF                | Ctrl e                  | PF18                     | Esc ^                 |
| ERASE INPUT              | Esc i                   | PF19                     | Esc &                 |
| FIELD MARK               | Ctrl f                  | PF20                     | Esc *                 |
| HOME                     | Esc H                   | PF21                     | Esc (                 |
| IDENT                    | Esc z                   | PF22                     | Esc )                 |
| INSERT MODE              | Esc Del                 | PF23                     | Esc _                 |
| LEFT (CURSOR)            | ←                       | PF24                     | Esc +                 |
| NEW LINE                 | Linefeed                | PRINT                    | Ctrl p                |
| NULL/BLANK               | Esc n                   | REFRESH                  | Ctrl u                |
| PA1                      | Esc ,                   | RESET                    | Ctrl r                |
| PA2                      | Esc .                   | RESUME DISPLAY           | unavailable           |
| PA3                      | Esc /                   | RESUME PRINTER           | unavailable           |
| PF1                      | Numeric 1 or Esc 1      | RIGHT (CURSOR)           | →                     |
| PF2                      | Numeric 2 or Esc 2      | STATUS ON/OFF            | Ctrl w                |
| PF3                      | Numeric 3 or Esc 3      | SUSPEND DISPLAY          | unavailable           |
| PF4                      | Numeric 4 or Esc 4      | SUSPEND PRINTER          | unavailable           |
| PF5                      | Numeric 5 or Esc 5      | SYS REQ                  | Esc S                 |
| PF6                      | Numeric 6 or Esc 6      | TAB                      | Tab                   |
| PF7                      | Numeric 7 or Esc 7      | TLIS REFRESH             | ESC T                 |
| PF8                      | Numeric 8 or Esc 8      | TYPE AHEAD               | Esc a                 |
|                          |                         | UP (CURSOR)              | ↑                     |

## 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 key pad.

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# DEC® VT100



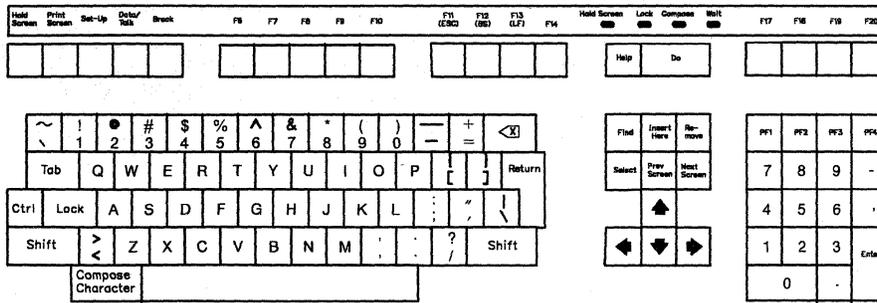
| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE               |
|--------------------------|-------------------------|--------------------------|--------------------|
| ATTN                     | CTRL a                  | PF9                      | Numeric 9 or ESC 9 |
| BACKTAB                  | BACKSPACE or ESC TAB    | PF10                     | PF1 or ESC 0       |
| CLEAR                    | CTRL c                  | PF11                     | PF2 or ESC -       |
| CURSOR SELECT            | ESC k                   | PF12                     | PF3 or ESC =       |
| DELETE                   | DELETE                  | PF13                     | ESC !              |
| DEV CNCL                 | CTRL x                  | PF14                     | ESC @              |
| DOWN (CURSOR)            | ↓                       | PF15                     | ESC #              |
| DUP                      | CTRL d                  | PF16                     | ESC \$             |
| ENTER                    | RETURN or Numeric ENTER | PF17                     | ESC %              |
| ERASE EOF                | CTRL e                  | PF18                     | ESC ^              |
| ERASE INPUT              | ESC f                   | PF19                     | ESC &              |
| FIELD MARK               | CTRL f                  | PF20                     | ESC *              |
| HOME                     | ESC H                   | PF21                     | ESC (              |
| IDENT                    | ESC z                   | PF22                     | ESC )              |
| INSERT MODE              | ESC DELETE              | PF23                     | ESC _              |
| LEFT (CURSOR)            | ←                       | PF24                     | ESC +              |
| NEW LINE                 | LINE FEED               | PRINT                    | CTRL p             |
| NULL/BLANK               | ESC n                   | REFRESH                  | CTRL u             |
| PA1                      | ESC ,                   | RESET                    | CTRL r             |
| PA2                      | ESC .                   | RESUME DISPLAY           | CTRL y             |
| PA3                      | ESC /                   | RESUME PRINTER           | ESC p              |
| PF1                      | Numeric 1 or ESC 1      | RIGHT (CURSOR)           | →                  |
| PF2                      | Numeric 2 or ESC 2      | STATUS ON/OFF            | CTRL w or ESC ?    |
| PF3                      | Numeric 3 or ESC 3      | SUSPEND DISPLAY          | CTRL t             |
| PF4                      | Numeric 4 or ESC 4      | SUSPEND PRINTER          | ESC o              |
| PF5                      | Numeric 5 or ESC 5      | SYS REQ                  | ESC S              |
| PF6                      | Numeric 6 or ESC 6      | TAB                      | TAB                |
| PF7                      | Numeric 7 or ESC 7      | TLIS REFRESH             | ESC T              |
| PF8                      | Numeric 8 or ESC 8      | TYPE AHEAD               | ESC a              |
|                          |                         | UP (CURSOR)              | ↑                  |

## 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 key pad.

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# DEC® VT220



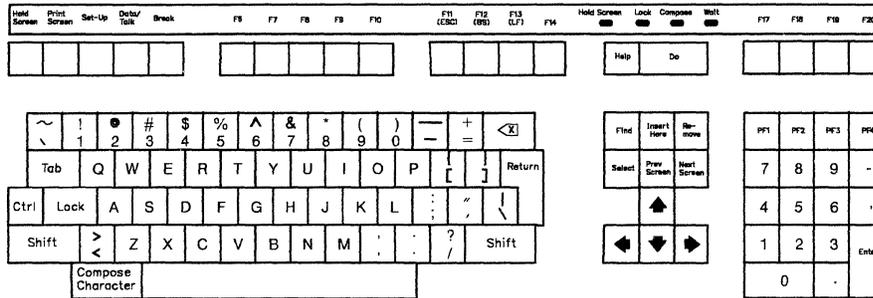
| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE          |
|--------------------------|-------------------------|--------------------------|---------------|
| ATTN                     | Ctrl a                  | PF10                     | PF1           |
| BACKTAB                  | Find or Ctrl b          | PF11                     | PF2 or ESC -  |
| CLEAR                    | Ctrl c                  | PF12                     | PF3           |
| CURSOR SELECT            | Ctrl k                  | PF13                     | F6            |
| DELETE                   | <X>                     | PF14                     | F7            |
| DEV CNCL                 | Ctrl x                  | PF15                     | F8            |
| DOWN (CURSOR)            | ↓                       | PF16                     | F9            |
| DUP                      | Ctrl d                  | PF17                     | F10           |
| ENTER                    | Return or Numeric Enter | PF18                     | F11           |
| ERASE EOF                | Ctrl e                  | PF19                     | F12           |
| ERASE INPUT              | Remove                  | PF20                     | F13           |
| FIELD MARK               | Ctrl f                  | PF21                     | F14           |
| HOME                     | Ctrl h                  | PF22                     | Help          |
| IDENT                    | Ctrl z                  | PF23                     | Do            |
| INSERT MODE              | Insert Here             | PF24                     | F17           |
| LEFT (CURSOR)            | ←                       | PRINT                    | PF4 or Ctrl p |
| NEW LINE                 | Select                  | PRINT SCREEN             | Print Screen  |
| NULL/BLANK               | Ctrl l                  | REFRESH                  | Prev Screen   |
| PA1                      | F18                     | RESET                    | Ctrl r        |
| PA2                      | F19                     | RESUME DISPLAY           | Ctrl y        |
| PA3                      | F20                     | RESUME PRINTER           | Ctrl v        |
| PF1                      | Numeric 1               | RIGHT (CURSOR)           | →             |
| PF2                      | Numeric 2               | STATUS ON/OFF            | Ctrl w        |
| PF3                      | Numeric 3               | SUSPEND DISPLAY          | Ctrl g        |
| PF4                      | Numeric 4               | SUSPEND PRINTER          | Ctrl u        |
| PF5                      | Numeric 5               | SYS REQ                  | Next Screen   |
| PF6                      | Numeric 6               | TAB                      | Tab           |
| PF7                      | Numeric 7               | TLIS REFRESH             | Ctrl 3 t      |
| PF8                      | Numeric 8               | TYPE AHEAD               | Ctrl t        |
| PF9                      | Numeric 9               | UP (CURSOR)              | ↑             |

## 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 key pad.

DEC is a registered trademark of Digital Equipment Corporation.

# DEC® VT220 Emulating a DEC VT100

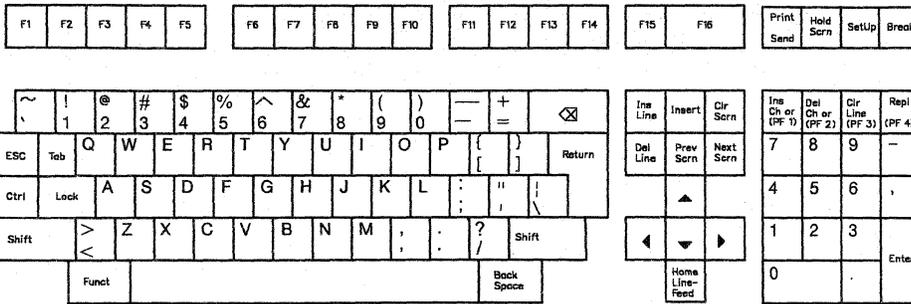


| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE            |
|--------------------------|-------------------------|--------------------------|-----------------|
| ATTN                     | Ctrl a                  | PF10                     | PF1             |
| BACKTAB                  | Find or Ctrl b          | PF11                     | PF2 or ESC -    |
| CLEAR                    | Ctrl c                  | PF12                     | PF3             |
| CURSOR SELECT            | Ctrl k                  | PF13                     | F6              |
| DELETE                   | <X>                     | PF14                     | F7              |
| DEV CNCL                 | Ctrl x                  | PF15                     | F8              |
| DOWN (CURSOR)            | ↓                       | PF16                     | F9              |
| DUP                      | Ctrl d                  | PF17                     | F10             |
| ENTER                    | Return or Numeric Enter | PF18                     | F11             |
| ERASE EOF                | Ctrl e                  | PF19                     | F12             |
| ERASE INPUT              | Remove                  | PF20                     | F13             |
| FIELD MARK               | Ctrl f                  | PF21                     | F14             |
| HOME                     | Ctrl h                  | PF22                     | F15             |
| IDENT                    | Ctrl z                  | PF23                     | F16             |
| INSERT MODE              | Insert Here             | PF24                     | F17             |
| LEFT (CURSOR)            | ←                       | PRINT                    | PF4 or Ctrl p   |
| NEW LINE                 | Select                  | PRINT SCREEN             | PRINT SCREEN    |
| NULL/BLANK               | Ctrl l                  | REFRESH                  | Prev Screen     |
| PA1                      | F18                     | RESET                    | Ctrl r          |
| PA2                      | F19                     | RESUME DISPLAY           | Ctrl y          |
| PA3                      | F20                     | RESUME PRINTER           | Ctrl v          |
| PF1                      | Numeric 1               | RIGHT (CURSOR)           | →               |
| PF2                      | Numeric 2               | STATUS ON/OFF            | Ctrl w or ESC ? |
| PF3                      | Numeric 3               | SUSPEND DISPLAY          | Ctrl g          |
| PF4                      | Numeric 4               | SUSPEND PRINTER          | Ctrl u          |
| PF5                      | Numeric 5               | SYS REQ                  | Next Screen     |
| PF6                      | Numeric 6               | TAB                      | TAB             |
| PF7                      | Numeric 7               | TLIS REFRESH             | ESC T           |
| PF8                      | Numeric 8               | TYPE AHEAD               | Ctrl t          |
| PF9                      | Numeric 9               | UP (CURSOR)              | ↑               |

## 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 key pad.

# FALCO® 500



| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE                       |
|--------------------------|-------------------------|--------------------------|----------------------------|
| ATTN                     | Ctrl a                  | PF9                      | F9                         |
| BACKTAB                  | Ins Line or ESC Tab     | PF10                     | F10                        |
| CLEAR                    | Clr Scrn or Ctrl c      | PF11                     | F11                        |
| CURSOR SELECT            | Ctrl k                  | PF12                     | F12                        |
| DELETE                   | <X>                     | PF13                     | F13 or ESC !               |
| DEV CNCL                 | Ctrl x                  | PF14                     | F14 or ESC @               |
| DOWN (CURSOR)            | ↓                       | PF15                     | F15 or ESC                 |
| DUP                      | Ctrl d                  | PF16                     | F16 or Numeric 1 or ESC \$ |
| ENTER                    | Return or Numeric Enter | PF17                     | Numeric 2 or ESC %         |
| ERASE EOF                | Ctrl e                  | PF18                     | Numeric 3 or ESC ^         |
| ERASE INPUT              | ESC i                   | PF19                     | Numeric 4 or ESC &         |
| FIELD MARK               | Ctrl f                  | PF20                     | Numeric 5 or ESC *         |
| HOME                     | Home or ESC h           | PF21                     | Numeric 6 or ESC (         |
| IDENT                    | Ctrl z                  | PF22                     | Numeric 7 or ESC )         |
| INSERT MODE              | Insert                  | PF23                     | Numeric 8 or ESC _         |
| LEFT (CURSOR)            | ←                       | PF24                     | Numeric 9 or ESC +         |
| NEW LINE                 | LineFeed                | PRINT                    | Repl (PF4) or Ctrl p       |
| NULL/BLANK               | ESC n or Numeric .      | REFRESH                  | Prev Scrn                  |
| PA1                      | Ins Ch (PF1) or ESC ,   | RESET                    | Ctrl r                     |
| PA2                      | Del Ch (PF2) or ESC .   | RESUME DISPLAY           | Ctrl y                     |
| PA3                      | Clr Line (PF3) or ESC / | RESUME PRINTER           | ESC p or Numeric 0         |
| PF1                      | F1                      | RIGHT (CURSOR)           | →                          |
| PF2                      | F2                      | SUSPEND DISPLAY          | ESC d                      |
| PF3                      | F3                      | SUSPEND PRINTER          | ESC o                      |
| PF4                      | F4                      | SYS REQ                  | Next Scrn                  |
| PF5                      | F5                      | TAB                      | Tab                        |
| PF6                      | F6                      | TLIS REFRESH             | ESC T                      |
| PF7                      | F7                      | TYPE AHEAD               | Ctrl t                     |
| PF8                      | F8                      | UP (CURSOR)              | ↑                          |

## 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 key pad.

FALCO is a registered trademark of FALCO Data Products.

# HAZELTINE ESPRIT I® and II®

|           |      |   |   |    |   |   |   |   |   |   |   |       |           |            |
|-----------|------|---|---|----|---|---|---|---|---|---|---|-------|-----------|------------|
| ESC       | !    | @ | # | \$ | % | ^ | & | * | ( | ) | - | =     | ~         | BACK SPACE |
| TAB       | Q    | W | E | R  | T | Y | U | I | O | P | { | }     |           | BREAK      |
| CAPS LOCK | A    | S | D | F  | G | H | J | K | L | ; | ' | /     | RETURN    | RUB OUT    |
| SHIFT     | Z    | X | C | V  | B | N | M | < | > | ? | / | SHIFT | LINE FEED |            |
|           | CTRL |   |   |    |   |   |   |   |   |   |   |       |           |            |

|            |       |         |               |
|------------|-------|---------|---------------|
| LOCAL      | AUX ← | BLOCK → | DEL LINE INS  |
| CLEAR HOME | UC ↑  | DC ↓    | PGD CLEAR FLD |
| 7          | 8     | 9       | .             |
| 4          | 5     | 6       | ,             |
| 1          | 2     | 3       | ENTER         |
| 0          | .     |         |               |

| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE               |
|--------------------------|-------------------------|--------------------------|--------------------|
| ATTN                     | CTRL a                  | PF9                      | Numeric 9 or ESC 9 |
| BACKTAB                  | SHIFT TAB               | PF10                     | ESC 0              |
| CLEAR                    | SHIFT CLEAR or CTRL c   | PF11                     | ESC -              |
| CURSOR SELECT            | ESC k                   | PF12                     | ESC =              |
| DELETE                   | RUB OUT                 | PF13                     | ESC !              |
| DEV CNCL                 | CTRL x                  | PF14                     | ESC @              |
| DOWN (CURSOR)            | ↓                       | PF15                     | ESC #              |
| DUP                      | CTRL d                  | PF16                     | ESC \$             |
| ENTER                    | RETURN or Numeric ENTER | PF17                     | ESC %              |
| ERASE EOF                | CTRL e                  | PF18                     | ESC ^              |
| ERASE INPUT              | ESC I                   | PF19                     | ESC &              |
| FIELD MARK               | CTRL f                  | PF20                     | ESC *              |
| HOME                     | HOME                    | PF21                     | ESC (              |
| IDENT                    | ESC d                   | PF22                     | ESC )              |
| INSERT MODE              | ESC RUB OUT             | PF23                     | ESC _              |
| LEFT (CURSOR)            | ←                       | PF24                     | ESC +              |
| NEW LINE                 | LINE FEED               | PRINT                    | ESC P              |
| NULL/BLANK               | ESC n                   | REFRESH                  | ESC R              |
| PA1                      | ESC ,                   | RESET                    | CTRL r             |
| PA2                      | ESC .                   | RESUME DISPLAY           | CTRL y             |
| PA3                      | ESC /                   | RESUME PRINTER           | ESC p              |
| PF1                      | Numeric 1 or ESC 1      | RIGHT (CURSOR)           | →                  |
| PF2                      | Numeric 2 or ESC 2      | STATUS ON/OFF            | CTRL w             |
| PF3                      | Numeric 3 or ESC 3      | SUSPEND DISPLAY          | CTRL t             |
| PF4                      | Numeric 4 or ESC 4      | SUSPEND PRINTER          | ESC o              |
| PF5                      | Numeric 5 or ESC 5      | SYS REQ                  | ESC S              |
| PF6                      | Numeric 6 or ESC 6      | TAB                      | TAB                |
| PF7                      | Numeric 7 or ESC 7      | TLIS REFRESH             | ESC T              |
| PF8                      | Numeric 8 or ESC 8      | TYPE AHEAD               | ESC a              |
|                          |                         | UP (CURSOR)              | ↑                  |

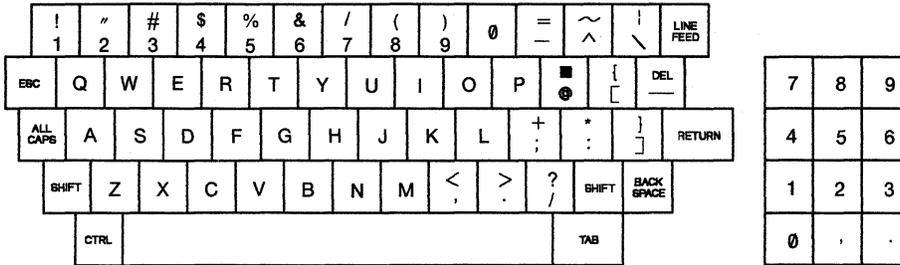
**Notes:**

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 key pad.

ESPRIT I and ESPRIT II are trademarks of Esprit Systems, Inc.

# HAZELTINE 1500

|      |       |       |       |
|------|-------|-------|-------|
| HOME | CLEAR | BREAK | RESET |
|------|-------|-------|-------|

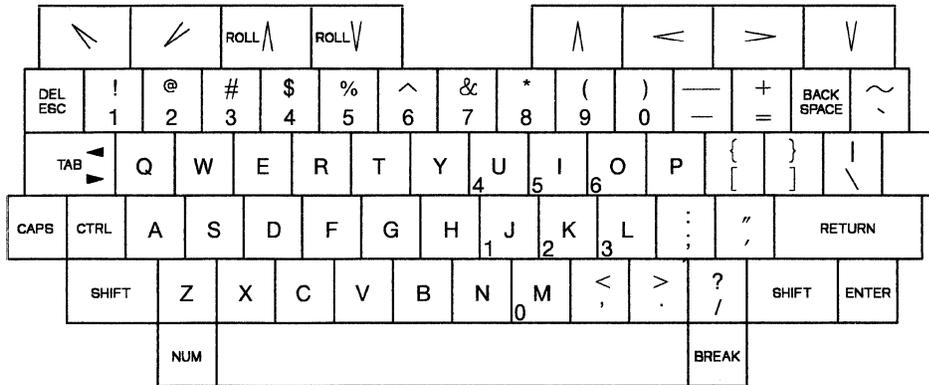


| TO PERFORM THIS FUNCTION | TYPE            | TO PERFORM THIS FUNCTION | TYPE            |
|--------------------------|-----------------|--------------------------|-----------------|
| ATTN                     | CTRL a          | PF9                      | ESC 9           |
| BACKTAB                  | ESC TAB         | PF10                     | ESC 0           |
| CLEAR                    | CLEAR or CTRL c | PF11                     | ESC -           |
| CURSOR SELECT            | ESC k           | PF12                     | ESC ^           |
| DELETE                   | DEL             | PF13                     | ESC !           |
| DEV CNCL                 | CTRL x          | PF14                     | ESC "           |
| DOWN (CURSOR)            | CTRL j          | PF15                     | ESC #           |
| DUP                      | CTRL d          | PF16                     | ESC \$          |
| ENTER                    | RETURN          | PF17                     | ESC %           |
| ERASE EOF                | CTRL e          | PF18                     | ESC &           |
| ERASE INPUT              | ESC I           | PF19                     | ESC '           |
| FIELD MARK               | CTRL f          | PF20                     | ESC (           |
| HOME                     | HOME            | PF21                     | ESC )           |
| IDENT                    | ESC d           | PF22                     | ESC             |
| INSERT MODE              | ESC DEL         | PF23                     | ESC =           |
| LEFT (CURSOR)            | CTRL h          | PF24                     | ESC LINEFEED    |
| NEW LINE                 | ESC RETURN      | PRINT                    | ESC P           |
| NULL/BLANK               | ESC n           | REFRESH                  | ESC r           |
| PA1                      | ESC ,           | RESET                    | CTRL r          |
| PA2                      | ESC .           | RESUME DISPLAY           | CTRL y          |
| PA3                      | ESC /           | RESUME PRINTER           | ESC p           |
| PF1                      | ESC 1           | RIGHT (CURSOR)           | CTRL l          |
| PF2                      | ESC 2           | STATUS ON/OFF            | CTRL w or ESC ? |
| PF3                      | ESC 3           | SUSPEND DISPLAY          | CTRL t          |
| PF4                      | ESC 4           | SUSPEND PRINTER          | ESC o           |
| PF5                      | ESC 5           | SYS REQ                  | ESC s           |
| PF6                      | ESC 6           | TAB                      | TAB             |
| PF7                      | ESC 7           | TYPE AHEAD               | ESC a           |
| PF8                      | ESC 8           | UP (CURSOR)              | CTRL k          |

## 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.

# HEWLETT-PACKARD 2621B

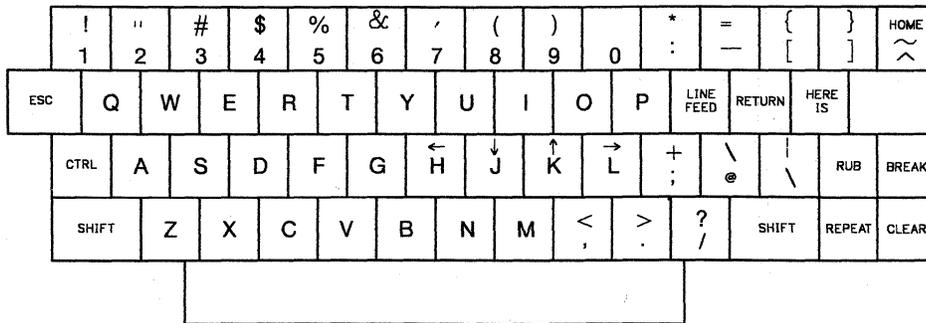


| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE            |
|--------------------------|-------------------------|--------------------------|-----------------|
| ATTN                     | CTRL a                  | PF9                      | ESC 9           |
| BACKTAB                  | TAB ◀                   | PF10                     | ESC 0           |
| CLEAR                    | CTRL c                  | PF11                     | ESC -           |
| CURSOR SELECT            | ESC k                   | PF12                     | ESC =           |
| DELETE                   | DEL                     | PF13                     | ESC !           |
| DEV CNCL                 | CTRL x                  | PF14                     | ESC @           |
| DOWN (CURSOR)            | ↓ or CTRL j             | PF15                     | ESC #           |
| DUP                      | CTRL d                  | PF16                     | ESC \$          |
| ENTER                    | ENTER or RETURN         | PF17                     | ESC %           |
| ERASE EOF                | CTRL e                  | PF18                     | ESC ^           |
| ERASE INPUT              | ESC E                   | PF19                     | ESC &           |
| FIELD MARK               | CTRL f                  | PF20                     | ESC *           |
| HOME                     | ↖ or ESC H              | PF21                     | ESC (           |
| IDENT                    | ESC d                   | PF22                     | ESC )           |
| INSERT MODE              | ESC DEL                 | PF23                     | ESC _           |
| LEFT (CURSOR)            | ← or CTRL h             | PF24                     | ESC +           |
| NEW LINE                 | ESC ENTER or ESC RETURN | PRINT                    | CTRL p          |
| NULL/BLANK               | ESC n                   | REFRESH                  | ESC R           |
| PA1                      | ESC ,                   | RESET                    | CTRL r          |
| PA2                      | ESC .                   | RESUME DISPLAY           | unavailable     |
| PA3                      | ESC /                   | RESUME PRINTER           | unavailable     |
| PF1                      | F1 or ESC 1             | RIGHT (CURSOR)           | → or CTRL l     |
| PF2                      | F2 or ESC 2             | STATUS ON/OFF            | CTRL w or ESC ? |
| PF3                      | F3 or ESC 3             | SUSPEND DISPLAY          | unavailable     |
| PF4                      | F4 or ESC 4             | SUSPEND PRINTER          | unavailable     |
| PF5                      | F5 or ESC 5             | SYS REQ                  | ESC S           |
| PF6                      | F6 or ESC 6             | TAB                      | TAB ▶           |
| PF7                      | F7 or ESC 7             | TYPE AHEAD               | ESC a           |
| PF8                      | F8 or ESC 8             | UP (CURSOR)              | ↑ or CTRL k     |

## 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.

# LEAR SIEGLER ADM 3A Dumb Terminal®



| TO PERFORM THIS FUNCTION | TYPE                  | TO PERFORM THIS FUNCTION | TYPE            |
|--------------------------|-----------------------|--------------------------|-----------------|
| ATTN                     | CTRL a                | PF9                      | ESC 9           |
| BACKTAB                  | ESC ← or ESC CTRL i   | PF10                     | ESC 0           |
| CLEAR                    | CTRL c or SHIFT CLEAR | PF11                     | ESC :           |
| CURSOR SELECT            | ESC k                 | PF12                     | ESC -           |
| DELETE                   | RUB                   | PF13                     | ESC !           |
| DEV CNCL                 | CTRL x                | PF14                     | ESC “           |
| DOWN (CURSOR)            | CTRL J or ↓           | PF15                     | ESC #           |
| DUP                      | CTRL d                | PF16                     | ESC \$          |
| ENTER                    | RETURN                | PF17                     | ESC %           |
| ERASE EOF                | CTRL e                | PF18                     | ESC &           |
| ERASE INPUT              | ESC i                 | PF19                     | ESC `           |
| FIELD MARK               | CTRL f                | PF20                     | ESC (           |
| HOME                     | HOME                  | PF21                     | ESC )           |
| IDENT                    | ESC d                 | PF22                     | ESC {           |
| INSERT MODE              | ESC RUB               | PF23                     | ESC *           |
| LEFT (CURSOR)            | CTRL h or ←           | PF24                     | ESC =           |
| NEW LINE                 | ESC RETURN            | PRINT                    | CTRL p          |
| NULL/BLANK               | ESC n                 | REFRESH                  | ESC r           |
| PA1                      | ESC ,                 | RESET                    | CTRL r          |
| PA2                      | ESC .                 | RESUME DISPLAY           | CTRL y          |
| PA3                      | ESC /                 | RESUME PRINTER           | ESC p           |
| PF1                      | ESC 1                 | RIGHT (CURSOR)           | CTRL l or →     |
| PF2                      | ESC 2                 | STATUS ON/OFF            | CTRL w or ESC ? |
| PF3                      | ESC 3                 | SUSPEND DISPLAY          | CTRL t          |
| PF4                      | ESC 4                 | SUSPEND PRINTER          | ESC o           |
| PF5                      | ESC 5                 | SYS REQ                  | ESC s           |
| PF6                      | ESC 6                 | TAB                      | ESC → or CTRL i |
| PF7                      | ESC 7                 | TYPE AHEAD               | ESC a           |
| PF8                      | ESC 8                 | UP (CURSOR)              | CTRL k or ↑     |

## 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 begin with SHIFT, press and hold SHIFT while pressing the other key.

Dumb Terminal is a registered Trademark of Lear Siegler, Inc.

# LEAR SIEGLER ADM 24E

|        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |               |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|---------------|
| ESCAPE | F 17 | F 18 | F 19 | F 20 | F 21 | F 22 | F 23 | F 24 | F 25 | F 26 | F 27 | F 28 | F 29 | F 30 | F 31 | F 32 | ALT | SET UP STATUS |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|---------------|

|          |   |   |   |    |   |   |   |   |   |   |   |       |               |            |
|----------|---|---|---|----|---|---|---|---|---|---|---|-------|---------------|------------|
| !        | @ | # | £ | \$ | % | ^ | & | * | ( | ) | - | =     | ~             | BACK SPACE |
| 1        | 2 | 3 | 4 | 5  | 6 | 7 | 8 | 9 | 0 | - | = | ~     | BACK SPACE    |            |
| TAB ←    | Q | W | E | R  | T | Y | U | I | O | P | { | }     | LINE FEED     |            |
| CAP LOCK | A | S | D | F  | G | H | J | K | L | ; | ' | /     | RETURN        |            |
| SHIFT    | Z | X | C | V  | B | N | M | < | > | ? | ~ | SHIFT | PAGE NEW LINE |            |
| CONTROL  |   |   |   |    |   |   |   |   |   |   |   | CLEAR |               |            |

|                  |                  |
|------------------|------------------|
| LAND             | PAGE ERASE LINE  |
| LINE INSERT CHAR | LINE DELETE CHAR |
| ↑                | ↓                |
| ←                | →                |
| HOME             |                  |

|                |                 |        |       |
|----------------|-----------------|--------|-------|
| PAGE SEND LINE | PAGE PRINT LINE | DELETE | BREAK |
| 7              | 8               | 9      | -     |
| 4              | 5               | 6      | .     |
| 1              | 2               | 3      | RIGHT |
| 0              | .               |        | RESET |

| TO PERFORM THIS FUNCTION | TYPE                            | TO PERFORM THIS FUNCTION | TYPE                  |
|--------------------------|---------------------------------|--------------------------|-----------------------|
| ATTN                     | CTRL z                          | PF10                     | F10 or ESC 0          |
| BACKTAB                  | TAB ←                           | PF11                     | F11 or ESC -          |
| CLEAR                    | CTRL c                          | PF12                     | F12 or ESC =          |
| CURSOR SELECT            | ESC k                           | PF13                     | F13 or ESC !          |
| DELETE                   | LINE DELETE CHAR                | PF14                     | F14 or ESC @          |
| DEV CNCL                 | CTRL x                          | PF15                     | F15 or ESC #          |
| DOWN (CURSOR)            | ↓                               | PF16                     | F16 or ESC \$         |
| DUP                      | CTRL d                          | PF17                     | ESC %                 |
| ENTER                    | RETURN or Numeric ENTER         | PF18                     | ESC ^                 |
| ERASE EOF                | PAGE ERASE LINE                 | PF19                     | ESC &                 |
| ERASE INPUT              | ESC i                           | PF20                     | ESC *                 |
| FIELD MARK               | CTRL f                          | PF21                     | ESC (                 |
| HOME                     | HOME                            | PF22                     | ESC )                 |
| IDENT                    | ESC d                           | PF23                     | ESC _                 |
| INSERT MODE              | LINE INSERT CHAR                | PF24                     | ESC +                 |
| LEFT (CURSOR)            | ←                               | PRINT                    | CTRL p                |
| NEW LINE                 | ESC RETURN or ESC Numeric ENTER | PRINT LINE               | PAGE PRINT LINE       |
| NULL/BLANK               | ESC n                           | PRINT PAGE               | SHIFT PAGE PRINT LINE |
| PA1                      | ESC ,                           | REFRESH                  | ESC r                 |
| PA2                      | ESC .                           | RESET                    | CTRL r                |
| PA3                      | ESC /                           | RESUME DISPLAY           | CTRL y                |
| PF1                      | F1 or ESC 1                     | RESUME PRINTER           | ESC p                 |
| PF2                      | F2 or ESC 2                     | RIGHT (CURSOR)           | →                     |
| PF3                      | F3 or ESC 3                     | STATUS ON/OFF            | unavailable           |
| PF4                      | F4 or ESC 4                     | SUSPEND DISPLAY          | CTRL t                |
| PF5                      | F5 or ESC 5                     | SUSPEND PRINTER          | ESC o                 |
| PF6                      | F6 or ESC 6                     | SYS REQ                  | ESC s                 |
| PF7                      | F7 or ESC 7                     | TAB                      | TAB →                 |
| PF8                      | F8 or ESC 8                     | TYPE AHEAD               | ESC a                 |
| PF9                      | F9 or ESC 9                     | UP (CURSOR)              | ↑                     |

## 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 key pad.

# LEAR SIEGLER ADM 31

|                 |   |                 |    |                |   |                |   |               |   |               |   |          |                     |      |   |       |              |       |   |              |                 |              |  |  |
|-----------------|---|-----------------|----|----------------|---|----------------|---|---------------|---|---------------|---|----------|---------------------|------|---|-------|--------------|-------|---|--------------|-----------------|--------------|--|--|
| CLEAR<br>INVERT |   | CLEAR<br>DELETE |    | LINE<br>INVERT |   | LINE<br>DELETE |   | LINE<br>ERASE |   | PAGE<br>ERASE |   | ESC      |                     | RUB  |   | BREAK |              | PRINT |   | SEND<br>LINE |                 | SEND<br>PAGE |  |  |
| !               | " | #               | \$ | %              | & | /              | ( | )             | - | =             | ~ |          | BACK TAB<br>TAB     | 7    | 8 | 9     |              |       |   |              |                 |              |  |  |
| 1               | 2 | 3               | 4  | 5              | 6 | 7              | 8 | 9             | 0 | -             | ~ |          | RETURN              | 4    | 5 | 6     | TAB          |       |   |              |                 |              |  |  |
| CTRL            | Q | W               | E  | R              | T | Y              | U | I             | O | P             | { | }        |                     |      |   |       | LINE<br>FEED | 1     | 2 | 3            | NUMERIC<br>KEYS |              |  |  |
| ○ CAP<br>LOCK   | A | S               | D  | F              | G | H              | J | K             | L | +             | * | ⊙        |                     |      |   |       | LINE<br>FEED | 1     | 2 | 3            |                 |              |  |  |
| SHIFT           | Z | X               | C  | V              | B | N              | M | <             | > | ?             | / | SHIFT    | PAGE<br>NEW<br>LINE |      | . | 0     | .            |       |   |              |                 |              |  |  |
| CLEAR           |   |                 |    |                |   |                |   |               |   |               |   | FUNCTION |                     | HOME | ↓ | ↑     | ←            | →     |   |              |                 |              |  |  |

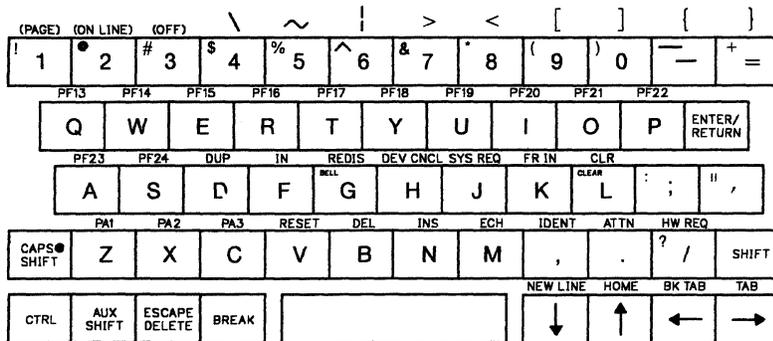
| TO PERFORM THIS FUNCTION | TYPE                     | TO PERFORM THIS FUNCTION | TYPE               |
|--------------------------|--------------------------|--------------------------|--------------------|
| ATTN                     | ESC t                    | PF9                      | Numeric 9 or ESC 9 |
| BACKTAB                  | BACK TAB                 | PF10                     | ESC 0              |
| CLEAR                    | CTRL c                   | PF11                     | ESC -              |
| CURSOR SELECT            | ESC k                    | PF12                     | ESC ^              |
| DELETE                   | RUB or CHAR DELETE       | PF13                     | ESC !              |
| DEV CNCL                 | CTRL x                   | PF14                     | ESC "              |
| DOWN (CURSOR)            | ↓                        | PF15                     | ESC #              |
| DUP                      | CTRL d                   | PF16                     | ESC \$             |
| ENTER                    | RETURN or Numeric RETURN | PF17                     | ESC %              |
| ERASE EOF                | PAGE ERASE               | PF18                     | ESC &              |
| ERASE INPUT              | ESC i                    | PF19                     | ESC †              |
| FIELD MARK               | CTRL f                   | PF20                     | ESC (              |
| HOME                     | HOME                     | PF21                     | ESC )              |
| IDENT                    | ESC d                    | PF22                     | ESC _              |
| INSERT MODE              | ESC RUB                  | PF23                     | ESC =              |
| LEFT (CURSOR)            | ←                        | PF24                     | ESC ~              |
| NEW LINE                 | ESC RETURN               | PRINT                    | CTRL p             |
| NULL/BLANK               | ESC n                    | REFRESH                  | ESC r              |
| PA1                      | ESC ,                    | RESET                    | CTRL r             |
| PA2                      | ESC .                    | RESUME DISPLAY           | unavailable        |
| PA3                      | ESC /                    | RESUME PRINTER           | unavailable        |
| PF1                      | Numeric 1 or ESC 1       | RIGHT (CURSOR)           | →                  |
| PF2                      | Numeric 2 or ESC 2       | STATUS ON/OFF            | CTRL w             |
| PF3                      | Numeric 3 or ESC 3       | SUSPEND DISPLAY          | unavailable        |
| PF4                      | Numeric 4 or ESC 4       | SUSPEND PRINTER          | unavailable        |
| PF5                      | Numeric 5 or ESC 5       | SYS REQ                  | ESC s              |
| PF6                      | Numeric 6 or ESC 6       | TAB                      | TAB                |
| PF7                      | Numeric 7 or ESC 7       | TYPE AHEAD               | ESC a              |
| PF8                      | Numeric 8 or ESC 8       | UP (CURSOR)              | ↑                  |

## 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 key pad.

Lear Siegler ADM 31 Intermediate Terminal™ Video Display Unit  
Intermediate Terminal is a trademark of Lear Siegler, Inc.

# NORTHERN TELECOM DISPLAYPHONE™

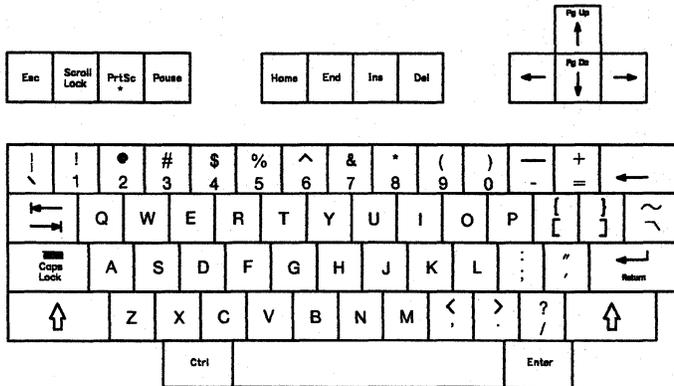


| TO PERFORM THIS FUNCTION | TYPE                 | TO PERFORM THIS FUNCTION | TYPE                 |
|--------------------------|----------------------|--------------------------|----------------------|
| ATTN                     | CTRL a               | PF9                      | ESCAPE 9             |
| BACKTAB                  | ESCAPE b or ESCAPE ← | PF10                     | ESCAPE 0             |
| CLEAR                    | CTRL c               | PF11                     | ESCAPE -             |
| CURSOR SELECT            | ESCAPE k             | PF12                     | ESCAPE =             |
| DELETE                   | DELETE               | PF13                     | ESCAPE !             |
| DEV CNCL                 | CTRL x               | PF14                     | ESCAPE @             |
| DOWN (CURSOR)            | ↓                    | PF15                     | ESCAPE #             |
| DUP                      | CTRL d               | PF16                     | ESCAPE \$            |
| ENTER                    | ENTER/RETURN         | PF17                     | ESCAPE %             |
| ERASE EOF                | CTRL e               | PF18                     | ESCAPE ^             |
| ERASE INPUT              | ESCAPE i             | PF19                     | ESCAPE &             |
| FIELD MARK               | CTRL f               | PF20                     | ESCAPE *             |
| HOME                     | ESCAPE H or ESCAPE ↑ | PF21                     | ESCAPE (             |
| IDENT                    | ESCAPE d             | PF22                     | ESCAPE )             |
| INSERT MODE              | ESCAPE DELETE        | PF23                     | ESCAPE _             |
| LEFT (CURSOR)            | ←                    | PF24                     | ESCAPE +             |
| NEW LINE                 | ESCAPE ENTER/RETURN  | PRINT                    | CTRL p               |
| NULL/BLANK               | ESCAPE n             | REFRESH                  | ESCAPE r             |
| PA1                      | ESCAPE ,             | RESET                    | CTRL r               |
| PA2                      | ESCAPE .             | RESUME DISPLAY           | unavailable          |
| PA3                      | ESCAPE /             | RESUME PRINTER           | unavailable          |
| PF1                      | ESCAPE 1             | RIGHT (CURSOR)           | →                    |
| PF2                      | ESCAPE 2             | STATUS ON/OFF            | CTRL w or ESCAPE ?   |
| PF3                      | ESCAPE 3             | SUSPEND DISPLAY          | unavailable          |
| PF4                      | ESCAPE 4             | SUSPEND PRINTER          | unavailable          |
| PF5                      | ESCAPE 5             | SYS REQ                  | ESCAPE s             |
| PF6                      | ESCAPE 6             | TAB                      | ESCAPE t or ESCAPE → |
| PF7                      | ESCAPE 7             | TYPE AHEAD               | ESCAPE a             |
| PF8                      | ESCAPE 8             | UP (CURSOR)              | ↑                    |

## Notes:

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

# ROLM® CEDAR™



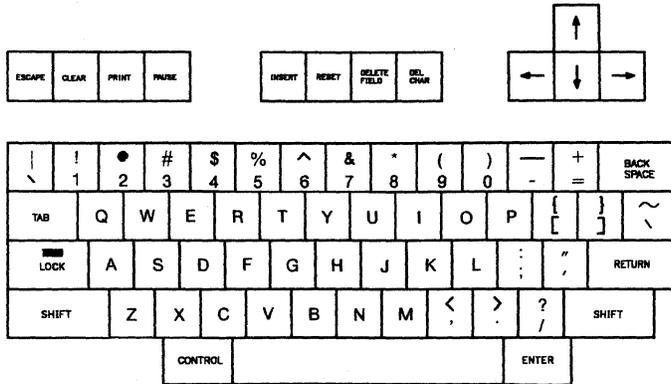
| TO PERFORM THIS FUNCTION | TYPE                  | TO PERFORM THIS FUNCTION | TYPE                   |
|--------------------------|-----------------------|--------------------------|------------------------|
| ATTN                     | Ctrl a                | PF9                      | F9 or Esc 9 or Ctrl 9  |
| BACKTAB                  | ←                     | PF10                     | F10 or Esc 0 or Ctrl 0 |
| CLEAR                    | Scroll Lock           | PF11                     | Esc - or Ctrl -        |
| CURSOR SELECT            | Esc k                 | PF12                     | Esc = or Ctrl =        |
| DELETE                   | Del                   | PF13                     | Esc ! or Ctrl q        |
| DEV CNCL                 | Ctrl                  | PF14                     | Esc @ or Ctrl w        |
| DOWN (CURSOR)            | ↓                     | PF15                     | Esc # or Ctrl e        |
| DUP                      | Ctrl d                | PF16                     | Esc \$ or Ctrl r       |
| ENTER                    | Enter                 | PF17                     | Esc % or Ctrl t        |
| ERASE EOF                | Del Field             | PF18                     | Esc ^ or Ctrl y        |
| ERASE INPUT              | Ctrl x or Esc i       | PF19                     | Esc & or Ctrl u        |
| FIELD MARK               | Ctrl f                | PF20                     | Esc * or Ctrl I        |
| HOME                     | Home or Esc h         | PF21                     | Esc ( or Ctrl o        |
| IDENT                    | Esc d or Ctrl ;       | PF22                     | Esc ) or Ctrl p        |
| INSERT MODE              | Ins                   | PF23                     | Esc _ or Ctrl [        |
| LEFT (CURSOR)            | ←                     | PF24                     | Esc + or Ctrl ]        |
| NEW LINE                 | Return                | PRINT                    | Esc l                  |
| NULL/BLANK               | Esc n                 | REFRESH                  | Esc r                  |
| PA1                      | Esc , or Ctrl j       | RESET                    | End                    |
| PA2                      | Esc . or Ctrl k       | RESUME DISPLAY           | Esc y or Ctrl b        |
| PA3                      | Esc / or Ctrl l       | RESUME PRINTER           | Esc p or Ctrl n        |
| PF1                      | F1 or Esc 1 or Ctrl 1 | RIGHT (CURSOR)           | →                      |
| PF2                      | F2 or Esc 2 or Ctrl 2 | STATUS ON/OFF            | Ctrl s or ESC ?        |
| PF3                      | F3 or Esc 3 or Ctrl 3 | SUSPEND DISPLAY          | Esc t                  |
| PF4                      | F4 or Esc 4 or Ctrl 4 | SUSPEND PRINTER          | Esc o                  |
| PF5                      | F5 or Esc 5 or Ctrl 5 | SYS REQ                  | Esc s or Ctrl Return   |
| PF6                      | F6 or Esc 6 or Ctrl 6 | TAB                      | →                      |
| PF7                      | F7 or Esc 7 or Ctrl 7 | TYPE AHEAD               | Esc a                  |
| PF8                      | F8 or Esc 8 or Ctrl 8 | UP (CURSOR)              | ↑                      |

## 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. F1 through F10 are soft keys.

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# ROLM® CYPRESS™



| TO PERFORM THIS FUNCTION | TYPE            | TO PERFORM THIS FUNCTION | TYPE                 |
|--------------------------|-----------------|--------------------------|----------------------|
| ATTN                     | CTRL a          | PF9                      | Esc 9 or CTRL 9      |
| BACKTAB                  | CTRL TAB        | PF10                     | Esc 0 or CTRL 0      |
| CLEAR                    | CLEAR           | PF11                     | ESC - or CTRL -      |
| CURSOR SELECT            | ESC k           | PF12                     | ESC = or CTRL =      |
| DELETE                   | DELETE CHAR     | PF13                     | ESC ! or CTRL q      |
| DEV CNCL                 | CTRL            | PF14                     | ESC @ or CTRL w      |
| DOWN (CURSOR)            | ↓               | PF15                     | ESC # or CTRL e      |
| DUP                      | CTRL d          | PF16                     | ESC \$ or CTRL r     |
| ENTER                    | ENTER           | PF17                     | ESC % or CTRL t      |
| ERASE EOF                | DELETE FIELD    | PF18                     | ESC ^ or CTRL y      |
| ERASE INPut              | CTRL x or ESC i | PF19                     | ESC & or CTRL u      |
| FIELD MARK               | CTRL f          | PF20                     | ESC * or CTRL l      |
| HOME                     | ESC h or CTRL h | PF21                     | ESC ( or CTRL o      |
| IDENT                    | ESC d or CTRL ; | PF22                     | ESC ) or CTRL p      |
| INSERT MODE              | INSERT          | PF23                     | ESC _ or CTRL [      |
| LEFT (CURSOR)            | ←               | PF24                     | ESC + or CTRL ]      |
| NEW LINE                 | RETURN          | PRINT                    | ESC l                |
| NULL/BLANK               | ESC n           | REFRESH                  | ESC r                |
| PA1                      | ESC , or CTRL j | RESET                    | RESET                |
| PA2                      | ESC . or CTRL k | RESUME DISPLAY           | ESC y or CTRL b      |
| PA3                      | ESC / or CTRL l | RESUME PRINTER           | ESC p or CTRL n      |
| PF1                      | ESC 1 or CTRL 1 | RIGHT (CURSOR)           | →                    |
| PF2                      | ESC 2 or CTRL 2 | STATUS ON/OFF            | CTRL S or ESC ?      |
| PF3                      | ESC 3 or CTRL 3 | SUSPEND DISPLAY          | ESC t                |
| PF4                      | ESC 4 or CTRL 4 | SUSPEND PRINTER          | ESC o                |
| PF5                      | ESC 5 or CTRL 5 | SYS REQ                  | ESC s or CTRL RETURN |
| PF6                      | ESC 6 or CTRL 6 | TAB                      | TAB                  |
| PF7                      | ESC 7 or CTRL 7 | TYPE AHEAD               | ESC a                |
| PF8                      | ESC 8 or CTRL 8 | UP (CURSOR)              | ↑                    |

## Notes:

1. For key sequences that begin with ESC, press and release ESCAPE; then press the other key.
2. For key sequences that begin with CTRL, press and hold CONTROL while pressing the other key.
3. F1 through F10 are soft keys.

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# ROLM® JUNIPER™

|    |     |      |   |   |   |    |   |   |   |   |   |   |   |   |           |          |             |        |
|----|-----|------|---|---|---|----|---|---|---|---|---|---|---|---|-----------|----------|-------------|--------|
| F1 | F2  | Esc  | 1 | @ | # | \$ | % | ^ | & | * | ( | ) | - | = | ←         | Num Lock | Scroll Lock |        |
| F3 | F4  | ←    | Q | W | E | R  | T | Y | U | I | O | P | [ | ] | ←         | 7 Home   | 8 ↑         | 9 PgUp |
| F5 | F6  | Ctrl | A | S | D | F  | G | H | J | K | L | : | ; | ' | ~         | 4 ←      | 5           | 6 →    |
| F7 | F8  | ↑    | Z | X | C | V  | B | N | M | , | . | / | ? | ↑ | 1 End     | 2 ↓      | 3 PgDn      | +      |
| F9 | F10 | Alt  |   |   |   |    |   |   |   |   |   |   |   |   | Caps Lock | 0 Ins    | Del         |        |

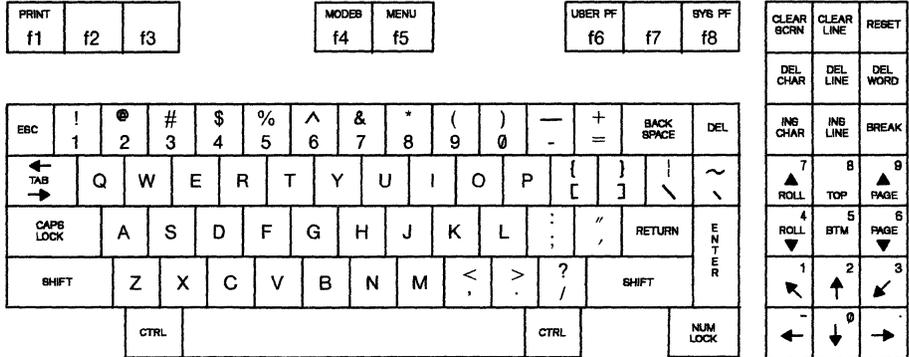
| TO PERFORM THIS FUNCTION | TYPE                  | TO PERFORM THIS FUNCTION | TYPE                   |
|--------------------------|-----------------------|--------------------------|------------------------|
| ATTN                     | Ctrl a                | PF9                      | F9 or Esc 9 or Ctrl 9  |
| BACKTAB                  | ←                     | PF10                     | F10 or Esc 0 or Ctrl 0 |
| CLEAR                    | Shift F1              | PF11                     | Esc - or Ctrl -        |
| CURSOR SELECT            | Esc k                 | PF12                     | Esc = or Ctrl =        |
| DELETE                   | Del                   | PF13                     | Esc ! or Ctrl q        |
| DEV CNCL                 | Ctrl /                | PF14                     | Esc @ or Ctrl w        |
| DOWN (CURSOR)            | ↓                     | PF15                     | Esc # or Ctrl e        |
| DUP                      | Ctrl d                | PF16                     | Esc \$ or Ctrl r       |
| ENTER                    | ↵                     | PF17                     | Esc % or Ctrl t        |
| ERASE EOF                | Ctrl End              | PF18                     | Esc ^ or Ctrl y        |
| ERASE INPUT              | Ctrl x or Esc i       | PF19                     | Esc & or Ctrl u        |
| FIELD MARK               | Ctrl f                | PF20                     | Esc * or Ctrl I        |
| HOME                     | Home or Esc h         | PF21                     | Esc ( or Ctrl o        |
| IDENT                    | Esc d or Ctrl ;       | PF22                     | Esc ) or Ctrl p        |
| INSERT MODE              | Ins                   | PF23                     | Esc _ or Ctrl [        |
| LEFT (CURSOR)            | ←                     | PF24                     | Esc + or Ctrl ]        |
| NEW LINE                 | Shift ↵               | PRINT                    | Esc l                  |
| NULL/BLANK               | Esc n                 | REFRESH                  | Esc r                  |
| PA1                      | Esc , or Ctrl j       | RESET                    | Shift F2               |
| PA2                      | Esc . or Ctrl k       | RESUME DISPLAY           | Esc y or Ctrl b        |
| PA3                      | Esc / or Ctrl l       | RESUME PRINTER           | Esc p or Ctrl n        |
| PF1                      | F1 or Esc 1 or Ctrl 1 | RIGHT (CURSOR)           | →                      |
| PF2                      | F2 or Esc 2 or Ctrl 2 | STATUS ON/OFF            | Ctrl s or ESC ?        |
| PF3                      | F3 or Esc 3 or Ctrl 3 | SUSPEND DISPLAY          | Esc t                  |
| PF4                      | F4 or Esc 4 or Ctrl 4 | SUSPEND PRINTER          | Esc o                  |
| PF5                      | F5 or Esc 5 or Ctrl 5 | SYS REQ                  | Esc s or Ctrl ↵        |
| PF6                      | F6 or Esc 6 or Ctrl 6 | TAB                      | →                      |
| PF7                      | F7 or Esc 7 or Ctrl 7 | TYPE AHEAD               | Esc a                  |
| PF8                      | F8 or Esc 8 or Ctrl 8 | UP (CURSOR)              | ↑                      |

## 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.

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# TELETYPE 5410



| TO PERFORM THIS FUNCTION | TYPE                   | TO PERFORM THIS FUNCTION | TYPE            |
|--------------------------|------------------------|--------------------------|-----------------|
| ATTN                     | Ctrl a                 | PF9                      | Esc 9           |
| BACKTAB                  | BACKSPACE or ESC TAB   | PF10                     | ESC 0           |
| CLEAR                    | CTRL c                 | PF11                     | ESC -           |
| CURSOR SELECT            | ESC k                  | PF12                     | ESC =           |
| DELETE                   | DEL                    | PF13                     | ESC !           |
| DEV CNCL                 | CTRL x                 | PF14                     | ESC @           |
| DOWN (CURSOR)            | ↓                      | PF15                     | ESC #           |
| DUP                      | CTRL d                 | PF16                     | ESC \$          |
| ENTER                    | RETURN                 | PF17                     | ESC %           |
| ERASE EOF                | CTRL e                 | PF18                     | ESC ^           |
| ERASE INPUT              | ESC i                  | PF19                     | ESC &           |
| FIELD MARK               | CTRL f                 | PF20                     | ESC *           |
| HOME                     | ↖                      | PF21                     | ESC (           |
| IDENT                    | ESC d                  | PF22                     | ESC )           |
| INSERT MODE              | ESC DEL                | PF23                     | ESC _           |
| LEFT (CURSOR)            | ←                      | PF24                     | ESC +           |
| NEW LINE                 | LINEFEED or ESC RETURN | PRINT                    | CTRL p          |
| NULL/BLANK               | ESC n                  | REFRESH                  | ESC r           |
| PA1                      | ESC ,                  | RESET                    | CTRL r          |
| PA2                      | ESC .                  | RESUME DISPLAY           | CTRL y          |
| PA3                      | ESC /                  | RESUME PRINTER           | ESC p           |
| PF1                      | ESC 1                  | RIGHT (CURSOR)           | →               |
| PF2                      | ESC 2                  | STATUS ON/OFF            | CTRL w or ESC ? |
| PF3                      | ESC 3                  | SUSPEND DISPLAY          | CTRL t          |
| PF4                      | ESC 4                  | SUSPEND PRINTER          | ESC o           |
| PF5                      | ESC 5                  | SYS REQ                  | ESC s           |
| PF6                      | ESC 6                  | TAB                      | TAB             |
| PF7                      | ESC 7                  | TYPE AHEAD               | ESC a           |
| PF8                      | ESC 8                  | UP (CURSOR)              | ↑               |

**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.

# TELETYPE 5420

|    |    |    |
|----|----|----|
| f1 | f2 | f3 |
|----|----|----|

|    |    |
|----|----|
| f4 | f5 |
|----|----|

|    |    |    |
|----|----|----|
| f6 | f7 | f8 |
|----|----|----|

|       |           |   |      |    |   |   |   |   |   |   |   |       |            |     |     |        |             |
|-------|-----------|---|------|----|---|---|---|---|---|---|---|-------|------------|-----|-----|--------|-------------|
| ESC   | !         | Ⓢ | #    | \$ | % | ^ | & | * | ( | ) | - | +     | BACK SPACE | DEL | CLR | SET UP | DIS-CON BRK |
| TAB   | Q         | W | E    | R  | T | Y | U | I | O | P | [ | ]     |            | ~   | 7   | 8      | 9           |
| CTRL  | A         | S | D    | F  | G | H | J | K | L | : | " | /     | RETURN     | 4   | 5   | 6      |             |
| SHIFT | Z         | X | C    | V  | B | N | M | , | . | ? | / | SHIFT | LINE FEED  | 1   | 2   | 3      |             |
|       | CAPS LOCK |   | CTRL |    |   |   |   |   |   |   |   |       | NUM LOCK   |     | ←   | ↑      | →           |

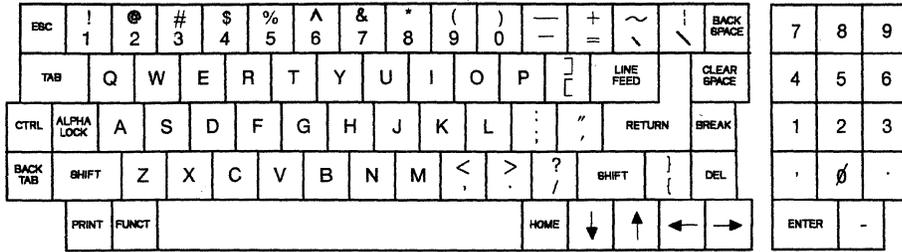
| TO PERFORM THIS FUNCTION | TYPE:                | TO PERFORM THIS FUNCTION | TYPE:           |
|--------------------------|----------------------|--------------------------|-----------------|
| ATTN                     | CTRL a               | PF9                      | Esc 9           |
| BACKTAB                  | BACKSPACE or ESC TAB | PF10                     | Esc 0           |
| CLEAR                    | CTRL c               | PF11                     | ESC -           |
| CURSOR SELECT            | ESC k                | PF12                     | ESC =           |
| DELETE                   | DEL CHAR or DEL      | PF13                     | ESC !           |
| DEV CNCL                 | CTRL x               | PF14                     | ESC @           |
| DOWN (CURSOR)            | ↓                    | PF15                     | ESC #           |
| DUP                      | CTRL d               | PF16                     | ESC \$          |
| ENTER                    | ENTER or RETURN      | PF17                     | ESC %           |
| ERASE EOF                | CTRL e               | PF18                     | ESC ^           |
| ERASE INPUT              | ESC i                | PF19                     | ESC &           |
| FIELD MARK               | CTRL f               | PF20                     | ESC *           |
| HOME                     | ↖                    | PF21                     | ESC (           |
| IDENT                    | ESC d                | PF22                     | ESC )           |
| INSERT MODE              | ESC DEL              | PF23                     | ESC _           |
| LEFT (CURSOR)            | ←                    | PF24                     | ESC +           |
| NEW LINE                 | ESC RETURN           | PRINT                    | CTRL p          |
| NULL/BLANK               | ESC n                | REFRESH                  | ESC r           |
| PA1                      | ESC ,                | RESET                    | CTRL r          |
| PA2                      | ESC .                | RESUME DISPLAY           | CTRL y          |
| PA3                      | ESC /                | RESUME PRINTER           | ESC p           |
| PF1                      | ESC 1                | RIGHT (CURSOR)           | →               |
| PF2                      | ESC 2                | STATUS ON/OFF            | CTRL w or ESC ? |
| PF3                      | ESC 3                | SUSPEND DISPLAY          | CTRL t          |
| PF4                      | ESC 4                | SUSPEND PRINTER          | ESC o           |
| PF5                      | ESC 5                | SYS REQ                  | ESC s           |
| PF6                      | ESC 6                | TAB                      | TAB             |
| PF7                      | ESC 7                | TYPE AHEAD               | ESC a           |
| PF8                      | ESC 8                | UP (CURSOR)              | ↑               |

## 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.

Teletype 5420 Buffered Display

# TELEVIDEO® 910



| TO PERFORM THIS FUNCTION | TYPE             | TO PERFORM THIS FUNCTION | TYPE            |
|--------------------------|------------------|--------------------------|-----------------|
| ATTN                     | CTRL a or CTRL z | PF10                     | ESC 0           |
| BACKTAB                  | ESC TAB          | PF11                     | ESC -           |
| CLEAR                    | CTRL c           | PF12                     | ESC =           |
| CURSOR SELECT            | ESC k            | PF13                     | ESC !           |
| DELETE                   | DEL              | PF14                     | ESC ~           |
| DEV CNCL                 | CTRL x           | PF15                     | ESC #           |
| DOWN (CURSOR)            | ↓                | PF16                     | ESC \$          |
| DUP                      | CTRL d           | PF17                     | ESC %           |
| ENTER                    | ENTER or RETURN  | PF18                     | ESC ^           |
| ERASE EOF                | CTRL e           | PF19                     | ESC &           |
| ERASE INPUT              | ESC i            | PF20                     | ESC *           |
| FIELD MARK               | CTRL f           | PF21                     | ESC (           |
| HOME                     | HOME             | PF22                     | ESC )           |
| IDENT                    | ESC d or ESC z   | PF23                     | ESC _           |
| INSERT MODE              | ESC DEL          | PF24                     | ESC +           |
| LEFT (CURSOR)            | ←                | PRINT                    | CTRL p          |
| NEW LINE                 | ESC RETURN       | REFRESH                  | ESC r           |
| NULL/BLANK               | ESC n            | RESET                    | CTRL r          |
| PA1                      | ESC ,            | RESUME DISPLAY           | CTRL y          |
| PA2                      | ESC .            | RESUME PRINTER           | ESC p           |
| PA3                      | ESC /            | RIGHT (CURSOR)           | →               |
| PF1                      | ESC 1            | STATUS ON/OFF            | CTRL w or ESC ? |
| PF2                      | ESC 2            | SUSPEND DISPLAY          | CTRL t          |
| PF3                      | ESC 3            | SUSPEND PRINTER          | ESC o           |
| PF4                      | ESC 4            | SYS REQ                  | ESC s           |
| PF5                      | ESC 5            | TAB                      | TAB             |
| PF6                      | ESC 6            | TOGGLE AUX PORT          | PRINT           |
| PF7                      | ESC 7            | TYPE AHEAD               | ESC t or ESC a  |
| PF8                      | ESC 8            | UP (CURSOR)              | ↑               |
| PF9                      | ESC 9            |                          |                 |

## 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.

# TELEVIDEO® 912C

|          |            |      |   |    |   |   |   |   |      |   |   |   |           |             |            |   |   |   |
|----------|------------|------|---|----|---|---|---|---|------|---|---|---|-----------|-------------|------------|---|---|---|
| ESC      | !          | @    | # | \$ | % | ^ | & | * | (    | ) | _ | = | ~         |             | BACK SPACE | 7 | 8 | 9 |
| TAB      | Q          | W    | E | R  | T | Y | U | I | O    | P | ] | [ | LINE FEED | CLEAR SPACE |            | 4 | 5 | 6 |
| CTRL     | ALPHA LOCK | A    | S | D  | F | G | H | J | K    | L | : | ; | "         | RETURN      | BREAK      | 1 | 2 | 3 |
| BACK TAB | SHIFT      | Z    | X | C  | V | B | N | M | <    | > | ? | / | SHIFT     | }           | DEL        | . | ∅ | . |
|          | BLOCK COPY | FNCT |   |    |   |   |   |   | HOME | ↓ | ↑ | ← | →         |             | ENTER      | - |   |   |

| TO PERFORM THIS FUNCTION | TYPE                    | TO PERFORM THIS FUNCTION | TYPE            |
|--------------------------|-------------------------|--------------------------|-----------------|
| ATTN                     | CTRL z                  | PF10                     | ESC 0           |
| BACKTAB                  | ESC TAB                 | PF11                     | ESC -           |
| CLEAR                    | CTRL c                  | PF12                     | ESC =           |
| CURSOR SELECT            | ESC k                   | PF13                     | ESC !           |
| DELETE                   | DEL                     | PF14                     | ESC @           |
| DEV CNCL                 | CTRL x                  | PF15                     | ESC #           |
| DOWN (CURSOR)            | ↓                       | PF16                     | ESC \$          |
| DUP                      | CTRL d                  | PF17                     | ESC %           |
| ENTER                    | ENTER or RETURN         | PF18                     | ESC ^           |
| ERASE EOF                | CTRL e                  | PF19                     | ESC &           |
| ERASE INPUT              | ESC CTRL e              | PF20                     | ESC *           |
| FIELD MARK               | CTRL f                  | PF21                     | ESC (           |
| HOME                     | HOME                    | PF22                     | ESC )           |
| IDENT                    | ESC z                   | PF23                     | ESC _           |
| INSERT MODE              | ESC DEL                 | PF24                     | ESC +           |
| LEFT (CURSOR)            | ←                       | PRINT                    | CTRL p          |
| NEW LINE                 | ESC ENTER or ESC RETURN | REFRESH                  | ESC r           |
| NULL/BLANK               | ESC n                   | RESET                    | CTRL r          |
| PA1                      | ESC ,                   | RESUME DISPLAY           | unavailable     |
| PA2                      | ESC .                   | RESUME PRINTER           | unavailable     |
| PA3                      | ESC /                   | RIGHT (CURSOR)           | →               |
| PF1                      | ESC 1                   | STATUS ON/OFF            | CTRL w or ESC ? |
| PF2                      | ESC 2                   | SUSPEND DISPLAY          | unavailable     |
| PF3                      | ESC 3                   | SUSPEND PRINTER          | unavailable     |
| PF4                      | ESC 4                   | SYS REQ                  | ESC s           |
| PF5                      | ESC 5                   | TAB                      | TAB             |
| PF6                      | ESC 6                   | TYPE AHEAD               | ESC t           |
| PF7                      | ESC 7                   | UP (CURSOR)              | ↑               |
| PF8                      | ESC 8                   |                          |                 |
| PF9                      | ESC 9                   |                          |                 |

## 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.

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# TELEVIDEO® 950

|                      |               |      |    |    |    |    |    |    |    |     |      |                |                |                |                |               |               |      |
|----------------------|---------------|------|----|----|----|----|----|----|----|-----|------|----------------|----------------|----------------|----------------|---------------|---------------|------|
| SET UP<br>TAB SOURCE | F1            | F2   | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11  | CHAR<br>INSERT | CHAR<br>DELETE | LINE<br>INSERT | LINE<br>DELETE | LINE<br>ERASE | PAGE<br>ERASE | SEND |
| LOC<br>ESC<br>ESC    | !             | @    | #  | \$ | %  | ^  | &  | *  | (  | )   | _    | +              | ~              |                | BACK<br>SPACE  |               |               |      |
| TAB                  | Q             | W    | E  | R  | T  | Y  | U  | I  | O  | P   | ]    | [              | LINE<br>FEED   |                | CLEAR<br>SPACE |               |               |      |
| CTRL                 | ALPHA<br>LOCK | A    | S  | D  | F  | G  | H  | J  | K  | L   | :    | "              | RETURN         | BREAK          |                |               |               |      |
| BACK<br>TAB          | SHIFT         | Z    | X  | C  | V  | B  | N  | M  | <  | >   | ?    | /              | SHIFT          | }              | {              | DEL           |               |      |
|                      | PRINT         | FNCT |    |    |    |    |    |    |    |     | HOME | ↓              | ↑              | ←              | →              | ENTER         | -             |      |

| TO PERFORM THIS FUNCTION | TYPE                       | TO PERFORM THIS FUNCTION | TYPE               |
|--------------------------|----------------------------|--------------------------|--------------------|
| ATTN                     | CTRL z                     | PF10                     | F10 or ESC 0       |
| BACKTAB                  | ESC TAB                    | PF11                     | F11 or ESC -       |
| CLEAR                    | CTRL c                     | PF12                     | SHIFT F1 or ESC =  |
| CURSOR SELECT            | ESC k                      | PF13                     | SHIFT F2 or ESC !  |
| DELETE                   | DEL                        | PF14                     | SHIFT F3 or ESC @  |
| DEV CNCL                 | CTRL x                     | PF15                     | SHIFT F4 or ESC #  |
| DOWN (CURSOR)            | ↓                          | PF16                     | SHIFT F5 or ESC \$ |
| DUP                      | CTRL d                     | PF17                     | SHIFT F6 or ESC %  |
| ENTER                    | ENTER or RETURN            | PF18                     | SHIFT F7 or ESC ^  |
| ERASE EOF                | CTRL e                     | PF19                     | SHIFT F8 or ESC &  |
| ERASE INPUT              | ESC CTRL e                 | PF20                     | SHIFT F9 or ESC *  |
| FIELD MARK               | CTRL f                     | PF21                     | SHIFT F10 or ESC ( |
| HOME                     | HOME                       | PF22                     | SHIFT F11 or ESC ) |
| IDENT                    | ESC z                      | PF23                     | ESC _              |
| INSERT MODE              | ESC DEL                    | PF24                     | ESC +              |
| LEFT (CURSOR)            | ←                          | PRINT                    | CTRL p             |
| NEW LINE                 | ESC ENTER or<br>ESC RETURN | PRINT PAGE (80 CHAR)     | PRINT              |
| NULL/BLANK               | ESC n                      | PRINT PAGE               | SHIFT PRINT        |
| PA1                      | ESC ,                      | REFRESH                  | ESC r              |
| PA2                      | ESC .                      | RESET                    | CTRL r             |
| PA3                      | ESC /                      | RESUME DISPLAY           | CTRL y             |
| PF1                      | F1 or ESC 1                | RESUME PRINTER           | ESC p              |
| PF2                      | F2 or ESC 2                | RIGHT (CURSOR)           | →                  |
| PF3                      | F3 or ESC 3                | STATUS ON/OFF            | unavailable        |
| PF4                      | F4 or ESC 4                | SUSPEND DISPLAY          | CTRL t             |
| PF5                      | F5 or ESC 5                | SUSPEND PRINTER          | ESC o              |
| PF6                      | F6 or ESC 6                | SYS REQ                  | ESC s              |
| PF7                      | F7 or ESC 7                | TAB                      | TAB                |
| PF8                      | F8 or ESC 8                | TLIS REFRESH             | ESC T              |
| PF9                      | F9 or ESC 9                | TYPE AHEAD               | ESC t              |
|                          |                            | UP (CURSOR)              | ↑                  |

## 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.

# WY-50®

|    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |       |       |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-------|-------|
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | F14 | F15 | F16 | SetUp | Break |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-------|-------|

|           |       |   |   |    |   |   |   |   |   |   |   |   |           |                |               |               |               |          |       |  |  |
|-----------|-------|---|---|----|---|---|---|---|---|---|---|---|-----------|----------------|---------------|---------------|---------------|----------|-------|--|--|
| Esc       | 1     | @ | # | \$ | % | ^ | & | * | ( | ) | _ | + | Backspace | Del            | Line INS Char | Line DEL Char | Scrn CLR Line | Ins Repl |       |  |  |
| Tab       | Q     | W | E | R  | T | Y | U | I | O | P | { | } | ~         | Print Send     | 7             | 8             | 9             | -        |       |  |  |
| Ctrl      | A     | S | D | F  | G | H | J | K | L | : | " | ' | Return    | Prev PAGE Next | 4             | 5             | 6             | ,        |       |  |  |
| Func      | Shift | Z | X | C  | V | B | N | M | < | > | ? | / | Shift     | ▲              | Home          | 1             | 2             | 3        | Enter |  |  |
| Caps Lock |       |   |   |    |   |   |   |   |   |   |   |   |           | :              | ◀             | ▼             | ▶             | 0        | .     |  |  |

| TO PERFORM THIS FUNCTION | TYPE                       | TO PERFORM THIS FUNCTION | TYPE                |
|--------------------------|----------------------------|--------------------------|---------------------|
| ATTN                     | Esc A                      | PF9                      | F9 or Esc 9         |
| BACKTAB                  | Esc Tab                    | PF10                     | F10 or Esc 0        |
| CLEAR                    | Scrn CLR or Ctrl c         | PF11                     | Shift F11 or Esc -  |
| CURSOR SELECT            | Esc x                      | PF12                     | Shift F12 or Esc =  |
| DELETE                   | Line DEL Char              | PF13                     | F13 or Esc !        |
| DEV CNCL                 | Ctrl x                     | PF14                     | Shift F14 or Esc @  |
| DOWN (CURSOR)            | ↓                          | PF15                     | Shift F15 or Esc #  |
| DUP                      | Ctrl d                     | PF16                     | Shift F16 or Esc \$ |
| ENTER                    | Return or Numeric Enter    | PF17                     | Shift F7 or Esc %   |
| ERASE EOF                | Ctrl e                     | PF18                     | Shift F8 or Esc ^   |
| ERASE INPUT              | Ctrl n                     | PF19                     | Shift F9 or Esc &   |
| FIELD MARK               | Ctrl f                     | PF20                     | Shift F10 or Esc *  |
| HOME                     | Home                       | PF21                     | Shift F11 or Esc (  |
| IDENT                    | Esc z                      | PF22                     | Shift F12 or Esc )  |
| INSERT MODE              | Line INS Char or Backspace | PF23                     | Shift F13 or Esc _  |
| LEFT (CURSOR)            | ←                          | PF24                     | Shift F14 or Esc +  |
| NEW LINE                 | Ctrl j                     | Print                    | PRINT               |
| NULL/BLANK               | Esc n                      | REFRESH                  | Esc r               |
| PA1                      | Esc , or Esc u             | RESET                    | Ctrl r              |
| PA2                      | Esc . or Esc v             | RESUME DISPLAY           | Ctrl y              |
| PA3                      | Esc / or Esc 4 w           | RESUME PRINTER           | Esc p               |
| PF1                      | F1 or Esc 1                | RIGHT (CURSOR)           | →                   |
| PF2                      | F2 or Esc 2                | STATUS ON/OFF            | Esc ? or Ctrl w     |
| PF3                      | F3 or Esc 3                | SUSPEND DISPLAY          | Ctrl t              |
| PF4                      | F4 or Esc 4                | SUSPEND PRINTER          | Esc o               |
| PF5                      | F5 or Esc 5                | SYS REQ                  | Esc s               |
| PF6                      | F6 or Esc 6                | TAB                      | Tab                 |
| PF7                      | F7 or Esc 7                | TLIS REFRESH             | Esc T               |
| PF8                      | F8 or Esc 8                | TYPE AHEAD               | Esc t               |
|                          |                            | UP (CURSOR)              | ↑                   |

## 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.

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## USER-DEFINED TERMINAL

| TO PERFORM THIS FUNCTION | TYPE | TO PERFORM THIS FUNCTION | TYPE |
|--------------------------|------|--------------------------|------|
| ATTN                     |      | PF9                      |      |
| BACKTAB                  |      | PF10                     |      |
| CLEAR                    |      | PF11                     |      |
| CURSOR SELECT            |      | PF12                     |      |
| DELETE                   |      | PF13                     |      |
| DEV CNCL                 |      | PF14                     |      |
| DOWN (CURSOR)            |      | PF15                     |      |
| DUP                      |      | PF16                     |      |
| ENTER                    |      | PF17                     |      |
| ERASE EOF                |      | PF18                     |      |
| ERASE INPUT              |      | PF19                     |      |
| FIELD MARK               |      | PF20                     |      |
| HOME                     |      | PF21                     |      |
| IDENT                    |      | PF22                     |      |
| INSERT MODE              |      | PF23                     |      |
| LEFT (CURSOR)            |      | PF24                     |      |
| NEW LINE                 |      | PRINT                    |      |
| NULL/BLANK               |      | REFRESH                  |      |
| PA1                      |      | RESET                    |      |
| PA2                      |      | RESUME DISPLAY           |      |
| PA3                      |      | RESUME PRINTER           |      |
| PF1                      |      | RIGHT (CURSOR)           |      |
| PF2                      |      | STATUS ON/OFF            |      |
| PF3                      |      | SUSPEND DISPLAY          |      |
| PF4                      |      | SUSPEND PRINTER          |      |
| PF5                      |      | SYS REQ                  |      |
| PF6                      |      | TAB                      |      |
| PF7                      |      | TYPE AHEAD               |      |
| PF8                      |      | UP (CURSOR)              |      |
|                          |      | TLIS REFRESH             |      |
|                          |      | 2/4 COLOR TOGGLE         |      |

### Notes:

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



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## List of Abbreviations

|                  |   |                |   |
|------------------|---|----------------|---|
| <b>ACTLU</b>     | activated logical unit                                      | <b>DEV D</b>   | device description                                  |
| <b>ACTPU</b>     | activated physical unit                                     | <b>DEVTYPE</b> | device type   |
| <b>ADDS</b>      | applied digital data systems                                | <b>DFC</b>     | data flow control                                   |
| <b>AID</b>       | attention identification                                    | <b>DISC</b>    | disconnect  |
| <b>ANSI</b>      | American National Standards Institute                       | <b>DM</b>      | disconnect mode                                     |
| <b>APF</b>       | Application Productivity Facility                           | <b>DR</b>      | definite response                                   |
| <b>ASCII</b>     | American National Standard Code for Information Interchange | <b>DRS</b>     | data rate select                                    |
| <b>BB</b>        | begin bracket   | <b>DSC</b>     | data stream compatibility                           |
| <b>BC</b>        | begin chain   | <b>DSR</b>     | data set ready                                      |
| <b>BEL</b>       | bell function   | <b>DTE</b>     | data terminal equipment                             |
| <b>BETB</b>      | between bracket state                                       | <b>DTR</b>     | data terminal ready                                 |
| <b>BIU</b>       | basic information unit                                      | <b>DUP</b>     | duplicate   |
| <b>BM</b>        | bottom margin   | <b>EAU</b>     | erase all unprotected                               |
| <b>BS</b>        | back space  | <b>EB</b>      | end brackets  |
| <b>CBA</b>       | current buffer address                                      | <b>EBCDIC</b>  | extended binary coded decimal interface character   |
| <b>CD</b>        | change direction  | <b>EC</b>      | end chain, also engineering change                  |
| <b>CICS/VS</b>   | Customer Information Control System/virtual storage         | <b>EEIF</b>    | extended error information field                    |
| <b>CNM</b>       | communication network management                            | <b>EEPROM</b>  | electrically erasable programmable read only memory |
| <b>CNMI</b>      | Communication Network Management Initialization             | <b>EFI</b>     | expedited flow indicator                            |
| <b>CR</b>        | carriage return   | <b>EM</b>      | end of message                                      |
| <b>CR</b>        | command reject  | <b>EMPL</b>    | Emulation Protocol Layer                            |
| <b>CR/LF</b>     | command reject/line feed                                    | <b>ENP</b>     | enable presentation                                 |
| <b>CSU</b>       | customer setup unit   | <b>EOF</b>     | end of file   |
| <b>CTLADR</b>    | control unit address  | <b>EOL</b>     | end of line   |
| <b>CTS</b>       | clear to send   | <b>ERI</b>     | exception response indicator                        |
| <b>CUD</b>       | control unit description                                    | <b>ERP</b>     | error recovery procedure                            |
| <b>CURSR SEL</b> | cursor select   | <b>ESC</b>     | escape  |
| <b>DACTLU</b>    | deactivate logical unit                                     | <b>EUA</b>     | erase unprotected to address                        |
| <b>DACTPU</b>    | deactivate physical unit                                    | <b>EWA</b>     | erase/write alternate                               |
| <b>DAF</b>       | destination address field                                   | <b>EW</b>      | erase/write   |
| <b>DAF'</b>      | destination address field prime (local address of SLU)      | <b>EX</b>      | exception response                                  |
| <b>DCD</b>       | data carrier detect   | <b>FCS</b>     | frame check sequence                                |
| <b>DEC</b>       | Digital Equipment Corporation                               | <b>FDX</b>     | full duplex data flow                               |
| <b>DEV CNCL</b>  | device cancel   | <b>FF</b>      | form feed   |
| <b>DEVADR</b>    | device address  | <b>FIC</b>     | first in chain                                      |
|                  |   | <b>FID</b>     | format identification                               |
|                  |   | <b>FIS</b>     | first in segment                                    |

|               |   |                |   |
|---------------|---|----------------|---|
| <b>FM</b>     | function management                                     | <b>NPDA</b>    | Network Problem Determination Application     |
| <b>FMD</b>    | function management data                                | <b>NRM</b>     | normal response mode                          |
| <b>FR</b>     | frame reject  | <b>NRZI</b>    | non-return to zero inverted                   |
| <b>FRMR</b>   | frame reject  | <b>NS</b>      | network services                              |
| <b>FTTERM</b> | IBM PC/HOST File Transfer and Terminal Emulator Program | <b>NTO</b>     | Network Terminal Option                       |
| <b>GE</b>     | graphics escape   | <b>OAF'</b>    | origin address field                          |
| <b>HDX</b>    | half-duplex data flow                                   | <b>OC</b>      | operations check                              |
| <b>HT</b>     | horizontal tab  | <b>OIC</b>     | only in chain                                 |
| <b>IC</b>     | insert cursor   | <b>OIS</b>     | only in segment                               |
| <b>IML</b>    | initial microprogram load                               | <b>PA</b>      | program access                                |
| <b>IMS/VS</b> | Information Management System/Virtual Storage           | <b>PC</b>      | protocol conversion or personal computer      |
| <b>INB</b>    | in bracket  | <b>PEND.BB</b> | pending beginning bracket                     |
| <b>INP</b>    | inhibit presentation                                    | <b>PI</b>      | pacing indicator                              |
| <b>IRS</b>    | interchange record separator                            | <b>PIU</b>     | path information unit                         |
| <b>IRS</b>    | inter-record separator                                  | <b>PLU</b>     | primary logical unit                          |
| <b>LED</b>    | light emitting diode                                    | <b>PRID</b>    | procedure-related identifier                  |
| <b>LF</b>     | line feed   | <b>PRNT</b>    | printer printing                              |
| <b>LIC</b>    | last in chain   | <b>PRTS</b>    | permanent request to send                     |
| <b>LIS</b>    | last in segment   | <b>PT</b>      | program tab                                   |
| <b>LM</b>     | left margin   | <b>PU</b>      | physical unit                                 |
| <b>LTA</b>    | line turnaround   | <b>QRI</b>     | queued response indicator                     |
| <b>LU</b>     | logical unit  | <b>RA</b>      | repeat to address                             |
| <b>LUSTAT</b> | logical unit status                                     | <b>RAM</b>     | random access memory                          |
| <b>MDT</b>    | modified data tag                                       | <b>RAS</b>     | reliability, availability, and serviceability |
| <b>MIC</b>    | middle in chain   | <b>RB</b>      | read buffer                                   |
| <b>MIS</b>    | middle in segment                                       | <b>RCV</b>     | receive                                       |
| <b>MLU</b>    | multiple logical unit                                   | <b>RECFMS</b>  | record formatted maintenance statistics       |
| <b>MPF</b>    | mapping field   | <b>REQMS</b>   | request maintenance statistics                |
| <b>MPL</b>    | maximum presentation line                               | <b>RH</b>      | request/response header                       |
| <b>MPP</b>    | maximum presentation position                           | <b>RI</b>      | ring indicate                                 |
| <b>msec</b>   | milliseconds  | <b>RM</b>      | read modified                                 |
| <b>NC</b>     | network control   | <b>RMA</b>     | read modified all                             |
| <b>NCCF</b>   | Network Communication Control Facility                  | <b>RNR</b>     | receive not ready                             |
| <b>NCP</b>    | Network Control Program                                 | <b>RR</b>      | received ready                                |
| <b>NDAP</b>   | Network Determination Aid Processor                     | <b>RSP</b>     | response                                      |
| <b>NDM</b>    | normal disconnect mode                                  | <b>RTM</b>     | response time monitoring                      |
| <b>NL</b>     | new line  | <b>RTR</b>     | ready to receive                              |
| <b>NLDM</b>   | Network Logical Data Manager                            | <b>RTS</b>     | request to send                               |
| <b>NMVT</b>   | network management vector transport                     | <b>RU</b>      | request/response unit                         |

|                |                               |                 |   |
|----------------|-------------------------------|-----------------|---|
| <b>RxC</b>     | receive clock                 | <b>TAF</b>      | target address field  |
| <b>RxD</b>     | receive data                  | <b>TC</b>       | test control  |
| <b>SA</b>      | set attribute                 | <b>TCAM</b>     | telecommunication access method                                     |
| <b>SBA</b>     | set buffer address            | <b>TH</b>       | transmission header   |
| <b>SC</b>      | session control               | <b>TM</b>       | top margin  |
| <b>SCS</b>     | SNA character string          | <b>TRN</b>      | transparent   |
| <b>SDLC</b>    | synchronous data link control | <b>TS</b>       | transmission services   |
| <b>SDT</b>     | start data traffic            | <b>TSO</b>      | time sharing option   |
| <b>SF</b>      | start field                   | <b>TSO/VTAM</b> | time sharing option for the Virtual Telecommunication Access Method |
| <b>SHF</b>     | set horizontal format         | <b>TxC</b>      | transmit clock  |
| <b>SHUTC</b>   | shutdown complete             | <b>TxD</b>      | transmit data   |
| <b>SHUTD</b>   | shutdown                      | <b>UA</b>       | unnumbered acknowledgment   |
| <b>SLD</b>     | set line density              | <b>UDT</b>      | user-defined terminal   |
| <b>SLU</b>     | secondary logical unit        | <b>VCS</b>      | vertical channel select   |
| <b>SNA</b>     | systems network architecture  | <b>VT</b>       | vertical tab  |
| <b>SNF</b>     | sequence number field         | <b>VTAM</b>     | virtual telecommunication access method                             |
| <b>SNRM</b>    | set normal response mode      | <b>W</b>        | write   |
| <b>SNRT</b>    | set normal response time      | <b>WCC</b>      | write control character   |
| <b>SOH</b>     | start of heading              | <b>X OP X</b>   | input inhibited operator unauthorized                               |
| <b>SSCP</b>    | system services control point | <b>X PRTBSY</b> | input inhibited printer busy  |
| <b>SVF</b>     | set vertical format           | <b>X PRTNW</b>  | input inhibited printer not working                                 |
| <b>SYS REQ</b> | system request                | <b>XID</b>      | exchange identification   |



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# Glossary

This glossary contains terms and abbreviations that are used in this manual. It includes terms and definitions from *IBM Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699. Symbols used in this glossary are as follows:

- An asterisk (\*) identifies definitions from the *American National Dictionary for Information Processing*, published by the Computer and Business Equipment Manufacturers Association.
- The symbol (CCITT/ITU) identifies definitions from the *CCITT Sixth Plenary Assembly Orange Book, Terms and Definitions* and working documents published by the International Telecommunication Union, Geneva, 1978.
- The symbol (ISO) identifies definitions from published sections of the *ISO Vocabulary of Data Processing*, developed by the International Standards Organization, Technical Committee 97, Subcommittee 1.
- The symbol (TC97) identifies definitions from drafts and working papers under development by the International Standards Organization, Technical Committee 97, Subcommittee 1.

**Advanced Communications Function for the Network Control Program (ACF/NCP).** An IBM program product that provides communication controller support for single-domain and multiple-domain networks.

**alert.** In NetView or NPDA, a notification about a high priority event that warrants immediate attention. This data-base record is generated for certain event types that are defined by user-constructed filters.

**ANSI X3.64.** American National Standard Additional Controls for use with American National Standard Code for Information Interchange (ASCII). A standard that defines a set of control functions that augments ASCII control functions as described in ANSI X3.4 and that controls input and output for two-dimensional character-imaging devices, such as displays or printers.

**ASCII.** \* American National Standard Code for Information Interchange. 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.

**ASCII pass-through.** For the 3708, the transmission of unmodified data between an ASCII device and an ASCII host (NCP).

**ASCII pass-through mode.** For an ASCII device attached to a 3708, a mode of operation in which the device communicates with an ASCII host (NCP).

**asynchronous.** Without regular time relationship; unexpected or unpredictable with respect to the execution of a program's instructions.

**configuration.** (1) (TC97) The arrangement of a computer system or network as defined by the nature, number, and the chief characteristics of its functional units. More specifically, the term configuration may refer to a hardware configuration or a software configuration. (2) The devices and programs that make up a system, subsystem, or network.

**control terminal.** For the 3708, a display attached to a 3708 that enables an operator to communicate with the 3708 to control and monitor the 3708 and to define the 3708 configuration.

**control terminal mode.** For an ASCII device attached to a 3708, a mode of operation in which the device functions as the control terminal for the 3708.

**data link.** (1) \* The physical means of connecting one location to another for the purpose of transmitting and receiving data. (2) (TC97) The assembly of parts of two data terminal equipments (DTEs) that are controlled by a link protocol, and that, together with the interconnecting data circuit, enable data to be transferred from a data source to a data sink. (3) The interconnecting data circuit between two or more equipments operating in accordance with a link protocol; it does not include the data source and the data sink. (4) In SNA, synonym for link(3).

**data link escape character (DLE).** (ISO) A transmission control character that changes the meaning of a limited number of contiguously following characters or coded representations and that is used exclusively to provide supplementary transmission control characters.

**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.

**DCE.** Data circuit-terminating equipment.

**decode.** (1) (ISO) To convert data by reversing the effect of some previous encoding. (2) To interpret a code. (3) Contrast with encode.

**display.** (1) \* (ISO) A visual presentation of data. (2) (TC97) In word processing, a device for visual

presentation of information on any temporary character-imaging device. (3) (TC97) To present data visually.

**DTE.** Data terminal equipment.

**duplex.** \* In data communication, pertaining to a simultaneous two-way independent transmission. Synonymous with full duplex.

**EBCDIC.** \* Extended binary-coded decimal interchange code. A coded character set consisting of 8-bit coded characters.

**EEPROM.** \* Electrically erasable programmable read-only memory located in the base unit of the 3708.

**EPROM.** \* Erasable programmable read-only memory located in the cartridge of the 3708.

**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. (2) To use programming techniques and special machine features to permit a computing system to execute programs written for another system.

**encode.** (1) \* (ISO) To convert data by the use of a code or a coded character set in such a manner that reconversion to the original form is possible. Encode is sometimes loosely used when complete reconversion is not possible. (2) \* (ISO) Contrast with decode.

**full duplex.** See duplex.

**half duplex.** (1) \* In data communication, pertaining to an alternate, one way at a time, independent transmission. (2) \* Contrast with duplex.

**host (NCP).** (TC97) A processor that controls all or part of a user application network.

**keyboard mapping.** For an ASCII device attached to the 3708 in protocol conversion mode, a table that defines which ASCII keyboard sequences are equivalent to 3270 functions.

**logical unit (LU).** In SNA, a port through which an end user accesses the SNA network to communicate with another end user and through which the end user accesses the functions provided by system services control points (SSCPs).

**Network Logical Data Manager (NLDM).** An IBM program product that collects and correlates LU-LU session-related data and provides the user with online access to the data. It runs as a Network Communications Control Facility (NCCF) communication network management application program.

**Network Problem Determination Application (NetView or NPDA).** An IBM program product that helps the user identify network problems from a central control point using interactive display techniques.

**Network Terminal Option (NTO).** An IBM program product that extends the capabilities of the ACF/NCP to support a select group of non-SNA devices.

**nonswitched line.** A telecommunication line on which connections do not have to be established by dialing. Contrast with switched line.

**spacing.** (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.

**physical unit (PU).** In SNA, the component that manages and monitors the resources (such as attached links and adjacent link stations) of a node, as requested by an SSCP through an SSCP-SSCP session.

**platen.** (TC97) The part of a document copying machine, usually in the form of a glass plate that can be curved, upon which the original is placed for copying. A backing, usually cylindrical, against which printing mechanisms strike or otherwise deposit ink to produce an image.

**point-to-point connection.** A connection established between two data stations for data transmission. The connection may include switching facilities.

**primary logical unit (PLU).** In SNA, the logical unit (LU) that contains the primary half-session for a particular LU-LU session. Contrast with secondary logical unit.

**printer authorization matrix.** A matrix stored in the 3274 control unit that establishes printer assignment and classification.

**program attention key.** On a display device keyboard, a key that produces an interruption to solicit program action.

**program function key.** (1) (TC97) On a typewriter, a control by which a specified machine function is set, released, or performed. (2) (TC97) In computer graphics, a button or switch that may be operated to send a signal to the computer program controlling the display. (3) On a terminal, a key, such as an ATTENTION or ENTER key, that causes the transmission of a signal not associated with a printable or displayable character. Detection of the signal usually causes the system to perform some predefined function for the operator.

**protocol.** (1) (CCITT/ITU) A specification for the format and relative timing of information exchanged

between communicating parties. (2) In SNA, the meanings of and the sequencing rules for the following: requests and responses used for managing the network, transferring data, and synchronizing the states of network components.

**protocol conversion.** For the 3708, the changing of start-stop data sent from an ASCII device to an SNA host (NCP) into 3270 data, or the changing of 3270 data sent from an SNA host (NCP) to an ASCII device into ASCII start-stop data.

**protocol conversion mode.** For an ASCII device attached to a 3708, a mode of operation in which the device communicates with an SNA host (NCP) as though it were a 3270 device.

**protocol enveloping.** For the 3708, the adding of SNA headers to data sent from an ASCII device to an SNA host (NCP), or the removing of SNA headers from data sent from an SNA host (NCP) to an ASCII device.

**protocol enveloping mode.** For an ASCII device attached to a 3708, a mode of operation in which the device communicates with an SNA host (NCP) as though it were an NTO device.

**RAM.** Random access memory.

**routing.** (1) The assignment of the path by which a message reaches its destination. (2) In SNA, the forwarding of a message unit along a particular path through a network, as determined by parameters carried in the message unit, such as the destination network address in a transmission header.

**secondary logical unit (SLU).** In SNA, the logical unit (LU) that contains the secondary half-session for a particular LU-LU session. Contrast with primary logical unit.

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

**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.

**Synchronous Data Link Control (SDLC).** A discipline for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchanges may be duplex or half duplex over switched or nonswitched links. The configuration of the link connection may be point-to-point,

multipoint, or loop. SDLC conforms to subsets of the Advanced Data Communication Control Procedures of the American Standards Institute and High-Level Data Link Control (HDLC) of the International Standards Organization.

**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.

**translate table.** For the 3708, 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.

**user-defined terminal.** An ASCII display that is attached to the 3708 and that operates in protocol conversion mode using a keyboard map defined by the user.

**user-defined terminal table.** A table, which contains information for a keyboard map used to define a terminal, that a customer creates in storage.

**wraparound.** (1) (TC97) In computer graphics, the display at some point on the display space of the display elements whose coordinates lie outside of the display space. (2) (TC97) In display-based word processing equipment, the automatic disposition of a printable line of text onto two or more display lines necessitated by the horizontal limits of the display. (3) The continuation of an operation from the maximum addressable location in storage to the first addressable location. (4) The continuation of register addresses from the highest register address to the lowest.

**3270 data stream.** Data being transferred from or to an allocated primary or tertiary device, or to the host (NCP) system, as a continuous stream of data and 3270 Information Display System control elements in character form.

**3270 data-stream compatibility (DSC).** The facility that provides access to System/370 applications that communicate with 3270 Information Display System terminals.

**3708 Network Conversion Unit.** A device that allows ASCII devices to communicate with an SNA host (NCP) by providing protocol conversion and protocol enveloping and that allows ASCII devices to communicate with an ASCII host (NCP) by providing ASCII pass-through.



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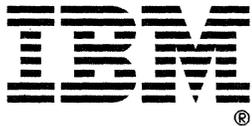
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