

Course 40600

Service Education  
Technical Awareness Information

# IBM 3174 Asynchronous Emulation Adapter Feature

# 3174

This publication is primarily intended for use by IBM personnel enrolled in TAI 40600.

**First Edition (November 1987)**

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available outside the United States.

A form for readers' comments has been provided at the back of this book. If the form has been removed, address your comments to IBM Corporation, Service Education, PO Box 390, Department H170, Building 947, Poughkeepsie, NY 12602.

Please include the order number in your comments.

© Copyright International Business Machines Corporation 1987

## General Information

---

### Technical Awareness Information (TAI)

This mode of delivery has been selected because you are trained on the basic 3174 Subsystem Control Unit. No additional skills are required to service the 3174 Subsystem Control Unit with the Asynchronous Emulation Adapter (AEA) feature, but there is information you should have to aid in servicing the 3174 with this feature. The information presented does not require the Field Instruction System (FIS) and is contained in this single document.

You are encouraged to send the author any comments about this TAI document. Because this is a new approach to providing update information to previous training, we are especially interested in your opinion. A reader's comment form is provided at the back of this document for your convenience.

---

### Prerequisites

- Course Number 75021—3174 Subsystem Control Unit

---

### TAI Description

This TAI document provides 3174 base trained CEs with additional technical information in order to service the 3174 with the AEA. The increased connectivity to ASCII devices/hosts provided by this feature is explained along with typical ASCII subsystem configurations.

The MLT (Multiple Logical Terminals) function of Release 3 microcode is presented along with its application in the ASCII subsystem.

New tests are presented along with updates to the maintenance package, online test screens, and some of the customizing screens so that the CE will be familiar with the new service environment created by the AEA feature and Release 3 microcode.

### Materials and Instructions

Approximately one hour is needed to read this TAI. Pay particular attention to the new subsystem configurations created by this feature and to the changes to online test and customizing screens with which you are already familiar.

**Note:** Time is recorded as service code 51 on QSAR.

## Related Publications

*IBM 3174 Asynchronous Emulation Adapter Feature, ZZ25-8524 (this document)*

*IBM 3174 Subsystem Control Unit, Asynchronous Emulation Adapter: Introduction, GA23-0331*

*IBM 3174 Subsystem Control Unit, Terminal User's Reference for Expanded Functions, GA23-0332*

*IBM 3174 Subsystem Control Unit, Models 1L, 1R, 2R, and 3R User's Guide, GA23-0337*

*IBM 3174 Subsystem Control Unit, Customer Extended Problem Determination, GA23-0217*

*IBM 3174 Subsystem Control Unit, Maintenance Information, SY27-2572*

*IBM 3174 Subsystem Control Unit, Customizing Guide, GA23-0214.*

## **Contents**

<b>Introduction</b>	1
Terminology	1
Terminal and Host Operating Sequence	1
<b>AEA Feature</b>	3
Asynchronous Emulation Adapter Hardware	3
Communications Links and Associated Hardware	6
<b>Physical and Logical Paths</b>	7
Physical Path	7
Logical Path	7
Printers	8
Display Units	9
Connectivity	10
AEA Major Functions	11
<b>ASCII Subsystem Configurations</b>	13
Host Attachment	16
<b>Dual Control Units</b>	19
<b>Multiple Logical Terminals (MLT)</b>	21
Active and Background Sessions	21
Change Screen Key	21
Case Study	22
MLT Customizing Scenario	22
MLT Operation Scenario	23
<b>Customizing</b>	25
Stations and Sets	25
Port Type and Port Sets	26
Customizing Screen Changes	28
Problem Determination Assistance	33
<b>Maintenance Package Updates</b>	35
New MAPs	35
New Status Codes	35
New Tests	35
Offline Tests	35
Online Tests	36
<b>Teleprocessing Network Support</b>	45
<b>Summary</b>	47
<b>List of Abbreviations</b>	49
<b>Glossary</b>	51
<b>Index</b>	53



## Figures

1.	ASCII Terminal and Host Operation	2
2.	Asynchronous Emulation Adapter Hardware	4
3.	AEA I/O Panel	5
4.	Communications Equipment	6
5.	Physical and Logical Paths	7
6.	Printer Logical Path	8
7.	Display Unit Logical Path	9
8.	Overall Connectivity with AEA Feature	10
9.	3270 Terminal Emulation	13
10.	ASCII Terminal Emulation	14
11.	ASCII Passthrough	15
12.	Connection Menu	16
13.	Connection Menu Option 1	17
14.	Connection Menu Option 2	17
15.	7232 Connection Diagram	19
16.	Multiple Logical Terminal Operation	22
17.	Host Set and Terminal Set	25
18.	Port Sets	26
19.	Connected Terminal and Port Sets	27
20.	Customize Control Diskette Menu	28
21.	Host Attachment	29
22.	Port Assignment	30
23.	Printer Authorization Matrix (PAM)	31
24.	Completed Printer Authorization Matrix (PAM)	32
25.	Main Menu for Test 12	36
26.	Asynchronous Emulation Adapter Port Tests Menu for Test 12	38
27.	Logs Menu for Test 1	39
28.	Log Record Display Panel for Test 1	40
29.	Hardware Configuration Table for Test 2	41
30.	Status Summary for Test 3	42
31.	Display Control Blocks Menu for Test 6	43



---

## **Introduction**

The 3174 Asynchronous Emulation Adapter (AEA) feature and Release 3 micro-code provide the customer with increased connectivity by allowing the customer to:

- Use an ASCII device to communicate with an ASCII host
- Use an ASCII device to communicate with an IBM host
- Use a 3270 device to communicate with an ASCII host
- Use a 3270 CUT device in MLT (Multiple Logical Terminal) mode to have multiple sessions with ASCII and IBM hosts.

---

## **Terminology**

In order to understand the 3174 AEA subsystem more thoroughly, you need to understand the terms used in this TAI. These terms are explained in the "Glossary" on page 51.

---

## **Terminal and Host Operating Sequence**

To help you further understand ASCII terminals and hosts, refer to Figure 1 on page 2 to see what is involved in entering and displaying data at an ASCII terminal.

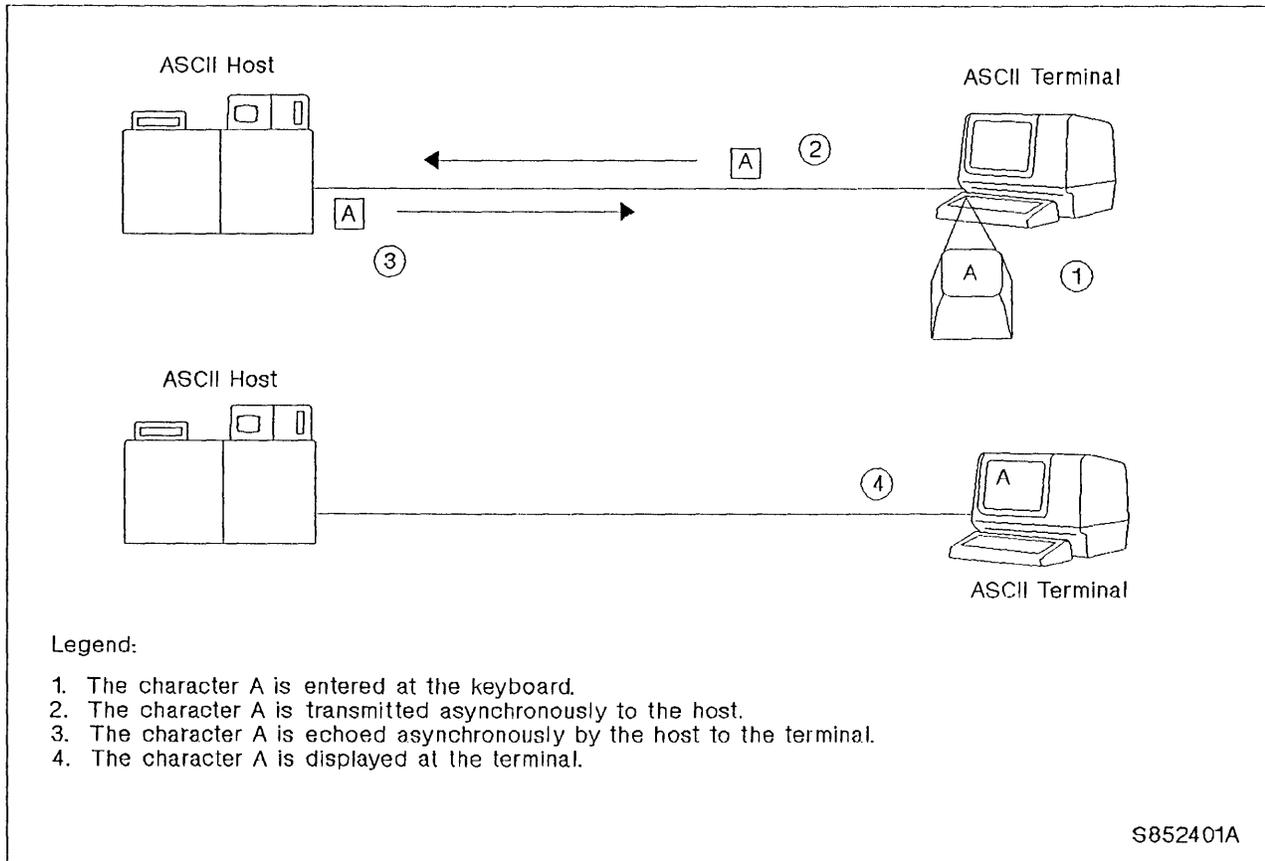


Figure 1. ASCII Terminal and Host Operation. This diagram depicts the sequence of events from the time the character "A" is entered at the ASCII terminal keyboard until it is displayed on the ASCII terminal screen.

This same sequence between ASCII hosts and terminals takes place for all data that is entered and displayed at an ASCII terminal.

For ASCII printers, the sequence is similar, except that the data is sent, not echoed, from the host. It is sent one-character-at-a-time, asynchronously to the printer until all the desired data is printed.

This procedure of transferring data, one-character-at-a-time, asynchronously in seven bit code, is referred to as ASCII protocol. This is in contrast to 3270 protocol, where the EBCDIC data is transferred multiple-characters-at-a-time in a 3270 data stream.

Keep these concepts in mind as the AEA feature and subsystem configurations are explained.

---

## **AEA Feature**

The AEA feature provides the capability to attach ASCII devices to the 3174 in addition to those 3270 devices that can be attached to a particular 3174 model.

---

### **Asynchronous Emulation Adapter Hardware**

The Asynchronous Emulation Adapter feature hardware is installed by the customer. Each AEA along with its associated cables and port connectors is capable of connecting eight ASCII devices, comprising any of the following types:

- Hosts
- Display units
- Printers.

The 3174 Models 1L, 1R, and 2R support the installation of up to three AEA cards. When three AEA cards are installed, the 3174 is capable of connecting 24 ASCII devices, comprising the types listed.

Models 51R and 52R support the installation of one AEA card and, therefore, are capable of connecting eight ASCII devices, comprising the types listed.

**Note:** The 3174 Models 51R and 52R cannot contain both the Asynchronous Emulation Adapter feature and the IBM Token-Ring Network 3270 Gateway feature. Furthermore, the AEA feature is not available in a 3174 Model 53R.

Each AEA is identified by a hardware group (HG) number and each AEA port is identified by an AEA port number (see Figure 2 on page 4).

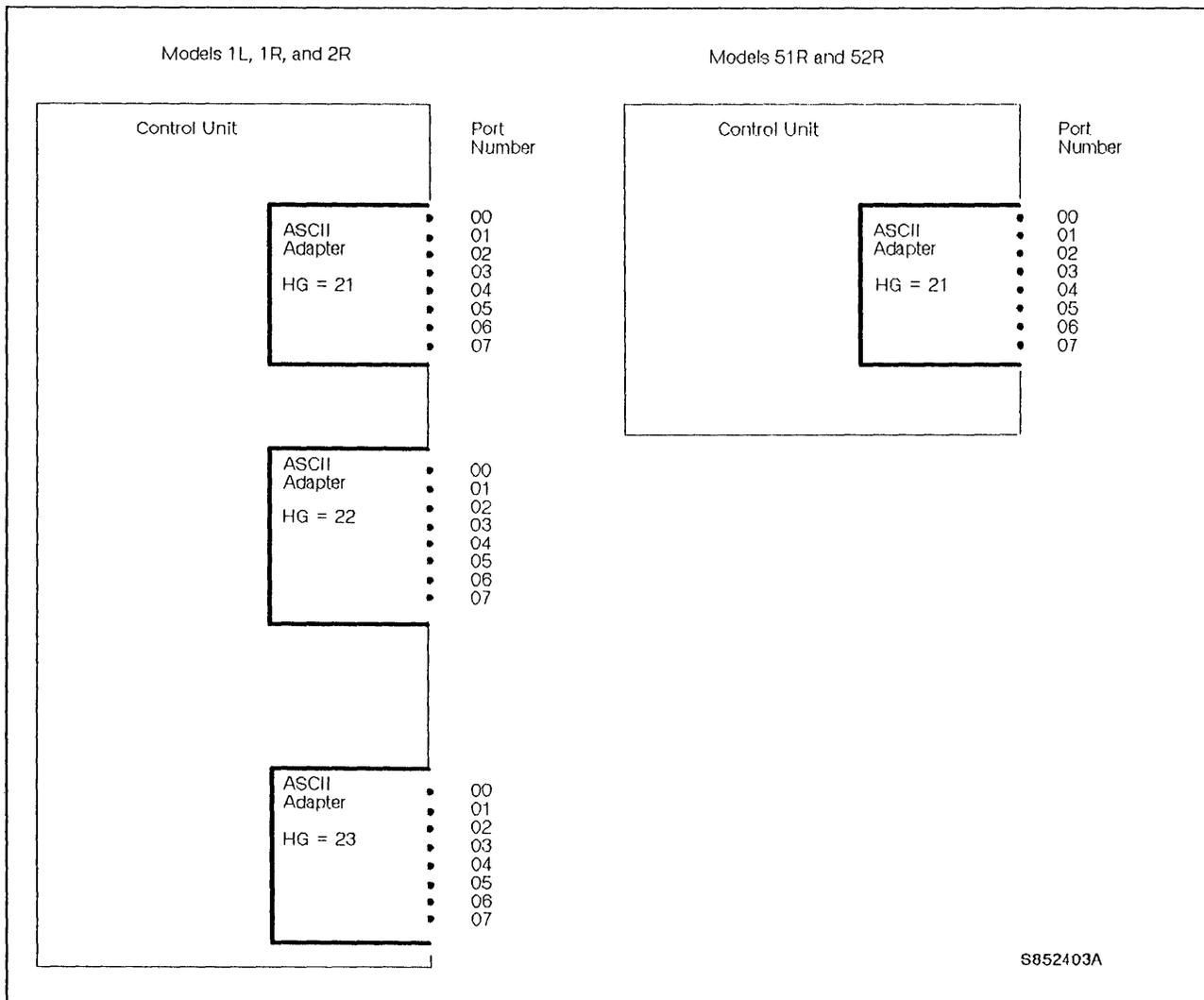


Figure 2. Asynchronous Emulation Adapter Hardware

In addition to adapter card(s), the feature also includes an internal cable between each adapter card and an I/O panel. The I/O panel has eight 25-pin D-shell connectors. The AEA port connectors are numbered 0 through 7 and provide the method of connecting the communications link cables (see Figure 3 on page 5).

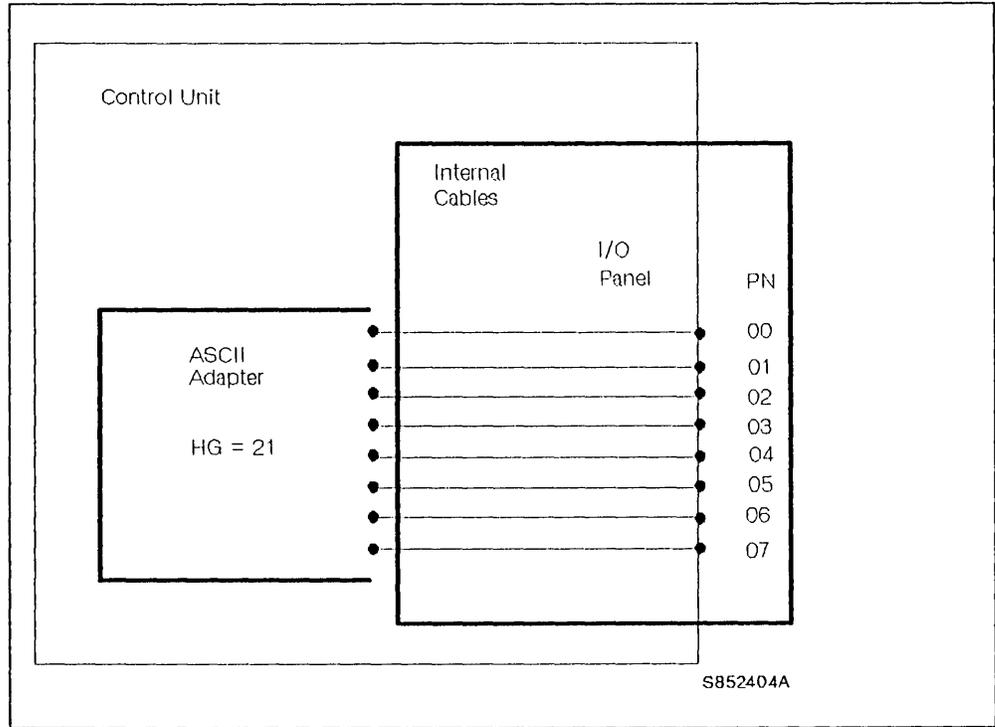


Figure 3. AEA I/O Panel

## Communications Links and Associated Hardware

Three types of communications links as shown in Figure 4 are available.

1. Direct cable from the AEA to the host, display unit, or printer
2. Nonswitched link, consisting of dedicated modems and customer-owned/leased telephone lines
3. Switched link, consisting of programmable<sup>1</sup> modems with access to the public dial telephone network.

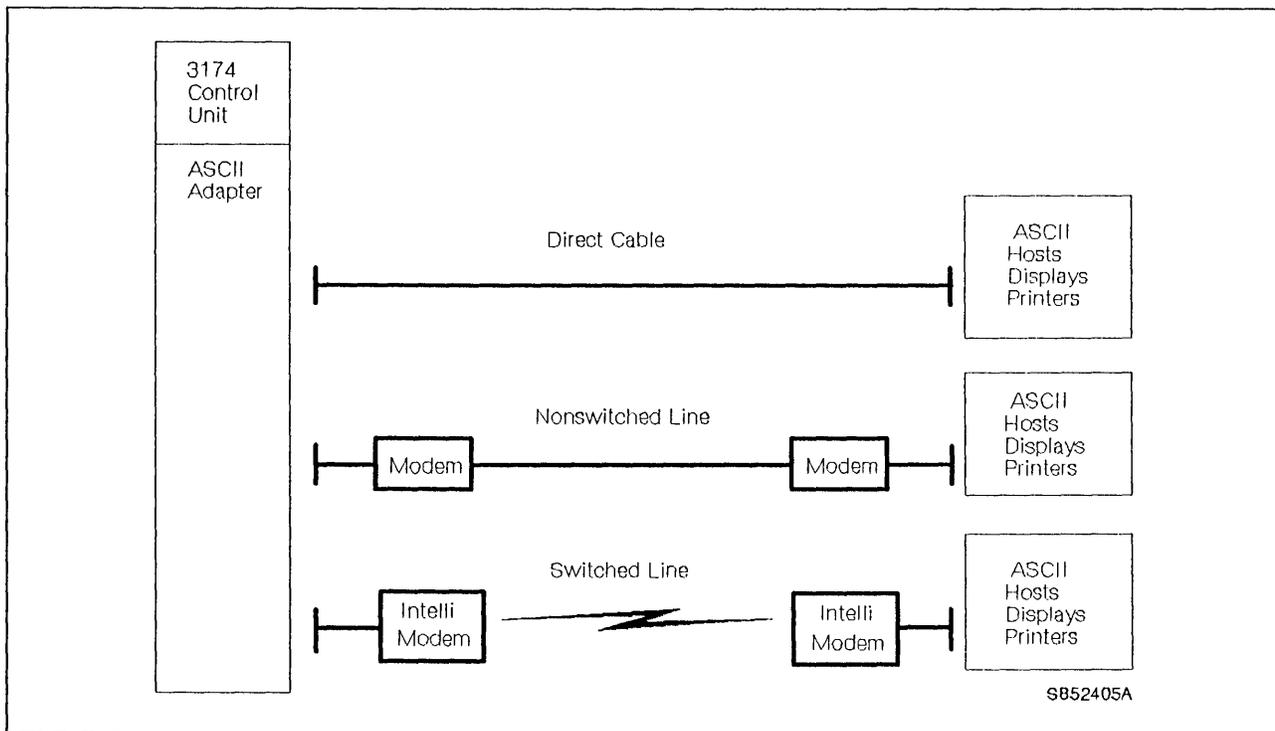


Figure 4. Communications Equipment

<sup>1</sup> Also referred to as a smart or intelligent modem.

## Physical and Logical Paths

### Physical Path

The physical path between the control unit and various hosts, display units, and printers is determined by the hardware installed. Once this hardware is installed, the physical path generally remains the same.

### Logical Path

The logical path is determined by customizing. This is accomplished by either selecting a default host or presenting a Connection Menu from which the host is chosen by the display unit user. The ability to customize the logical path makes it easier to change terminal user access to more than one host, particularly when adding new hosts (see Figure 5).

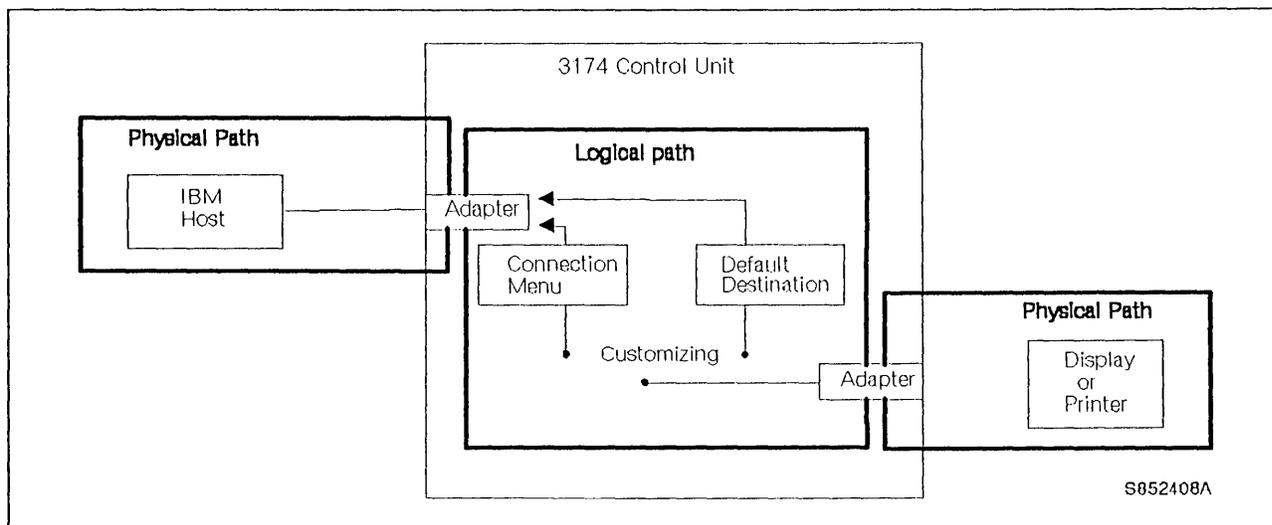


Figure 5. Physical and Logical Paths

## Printers

Printers must be assigned to a host default destination. The host may be either an IBM host or an ASCII host (see Figure 6).

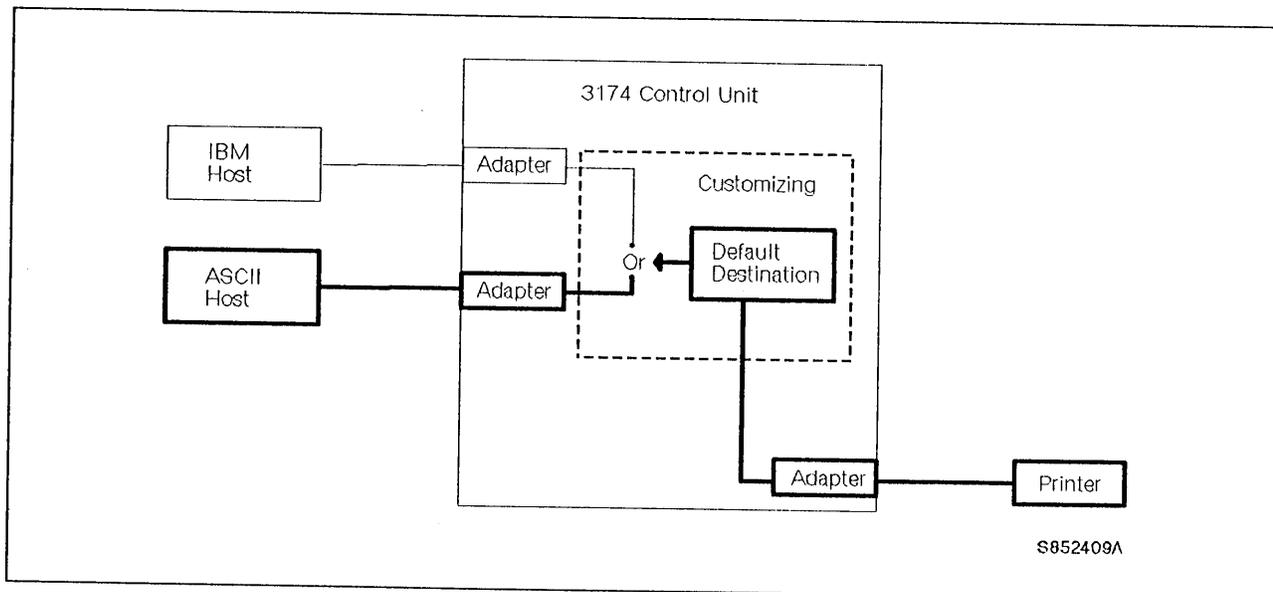


Figure 6. Printer Logical Path

## Display Units

Display units may be assigned to the Connection Menu or to a default host. If assigned to a default host, then the path is the same as the one for printers (see Figure 7).

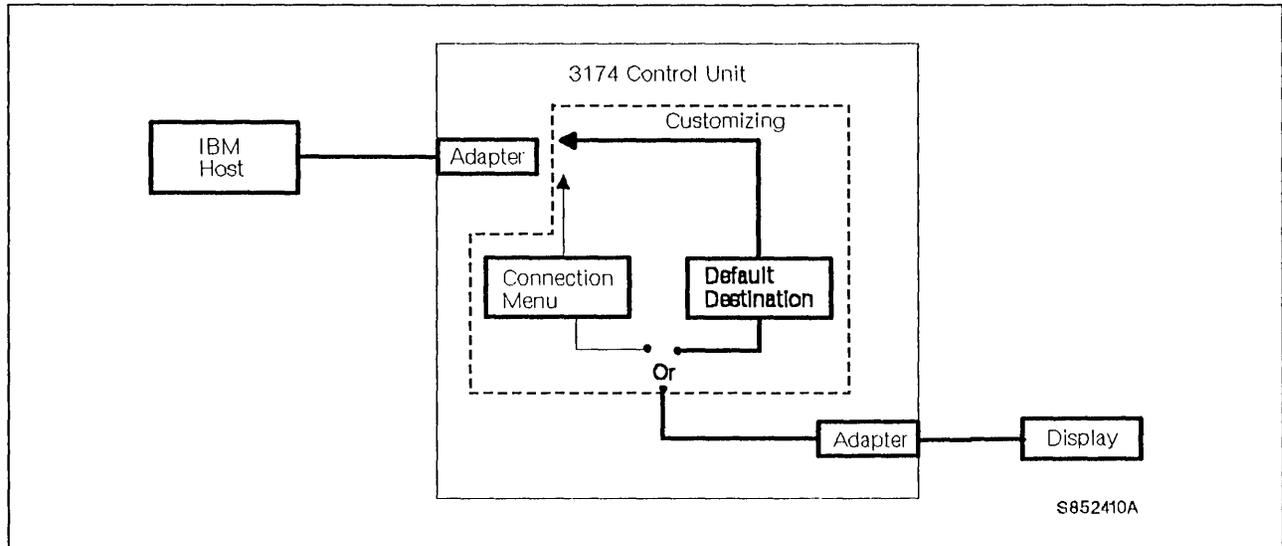


Figure 7. Display Unit Logical Path

## Connectivity

As the overall connectivity of the 3174 with AEA feature is described, refer to Figure 8.

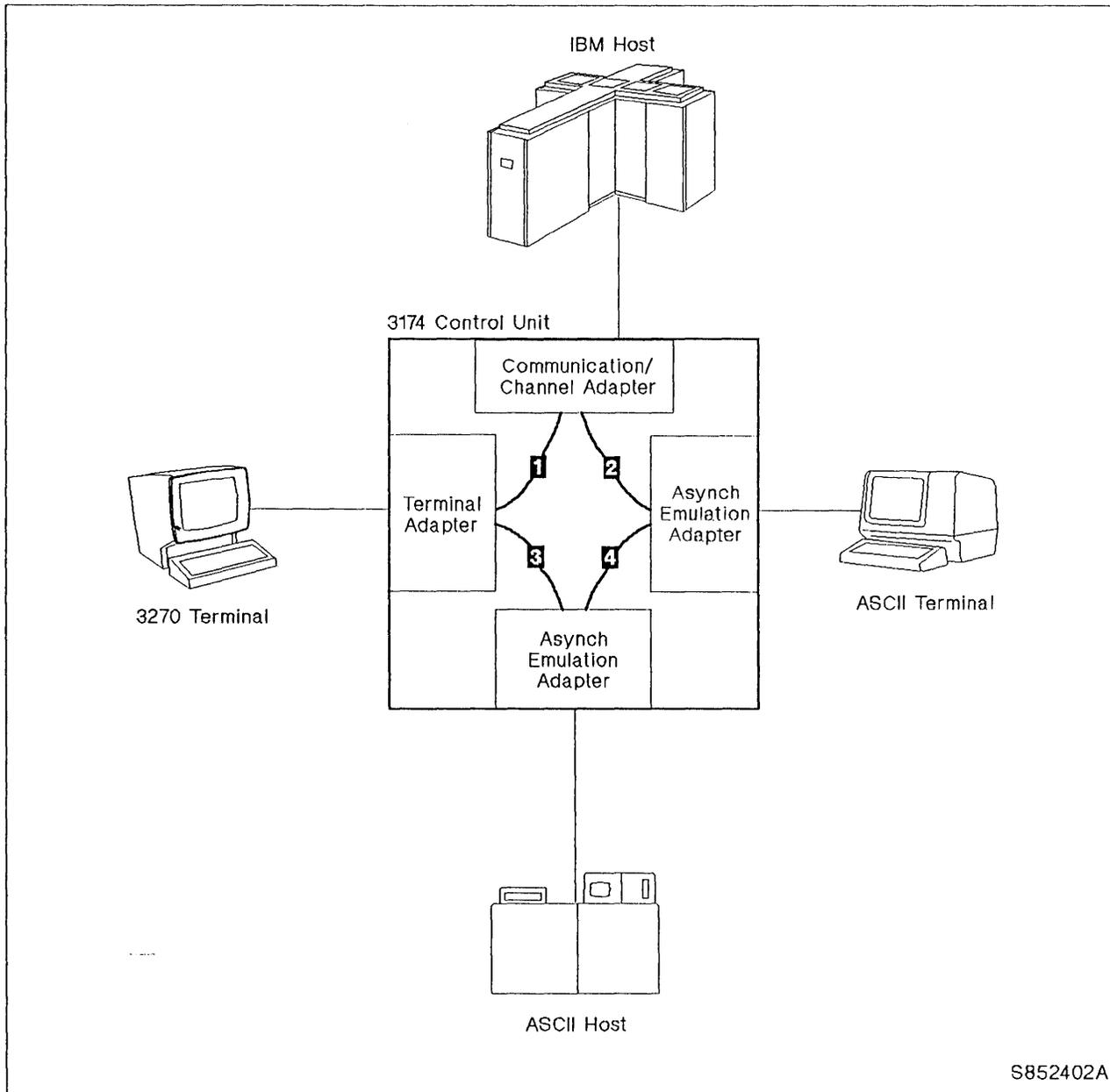


Figure 8. Overall Connectivity with AEA Feature. Two AEAs are shown to illustrate overall connectivity and the three major functions performed by the AEA.

**Traditional Operation:** Path **1** shows the traditional path between 3270 terminals and the IBM host.

## AEA Major Functions

The Asynchronous Emulation Adapter provides three major functions:

**3270 Terminal Emulation:** For this function, path **2** shows that the AEA feature provides a connection between the ASCII terminals and the IBM host. The AEA converts the ASCII protocol to 3270 protocol, and sends the data through an IBM host interface adapter to the IBM host. Likewise, the AEA converts 3270 protocol to ASCII protocol, and sends the data to the ASCII terminal. The AEA feature enables ASCII display stations to emulate, that is, appear to the IBM host to be either an IBM 3178 Display station Model C2 or an IBM 3279 Color Display Station Model 2A (four color display). ASCII printers can emulate an IBM 3287 Printer Model 2.

**ASCII Terminal Emulation:** For this function, path **3** shows that the AEA provides a connection between the 3270 terminals and the ASCII host. The AEA converts 3270 protocol to ASCII protocol, and sends the data to the ASCII host. Likewise, the AEA converts ASCII protocol to 3270 protocol, and sends the data to the 3270 terminal. The AEA enables 3270 display stations to emulate, that is, appear to the ASCII host to be either an IBM 3101 or a DEC<sup>2</sup> VT100 display station. IBM 3270 printers can emulate ASCII printers.

**ASCII Passthrough:** For this function, path **4** shows that the AEA feature provides a connection between ASCII terminals and ASCII hosts, or public data networks. The AEA does not do any protocol conversion in this mode of operation.

---

<sup>2</sup> Registered trademark of the Digital Equipment Corporation.



## ASCII Subsystem Configurations

Figure 9 shows 3270 terminal emulation with ASCII terminals communicating with an IBM host. The ASCII display units and printers can be connected to the AEA's directly or with a communications link and modems.

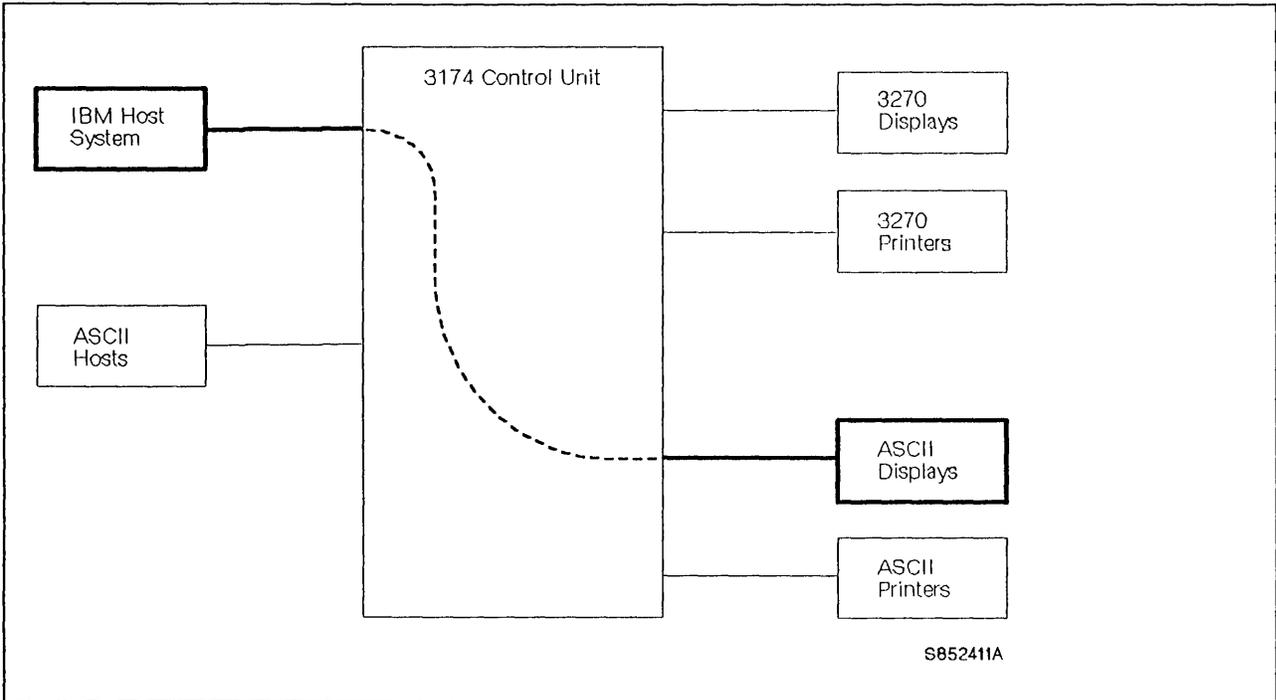


Figure 9. 3270 Terminal Emulation. ASCII Terminals Communicating with an IBM Host.

Regardless of the method used to connect ASCII terminals to the AEA ports, the display screens appear just as they would on a 3270 terminal. This includes the operator information area at the bottom of the screen.

**Note:** Some ASCII terminals are capable of displaying only 24 lines. In order to display the 25th line (operator information line) on these terminals, it must be requested by a key sequence.

Figure 10 shows ASCII terminal emulation with 3270 display stations communicating with an ASCII host. The ASCII hosts can be connected to the AEA's directly or with a communications link and modems.

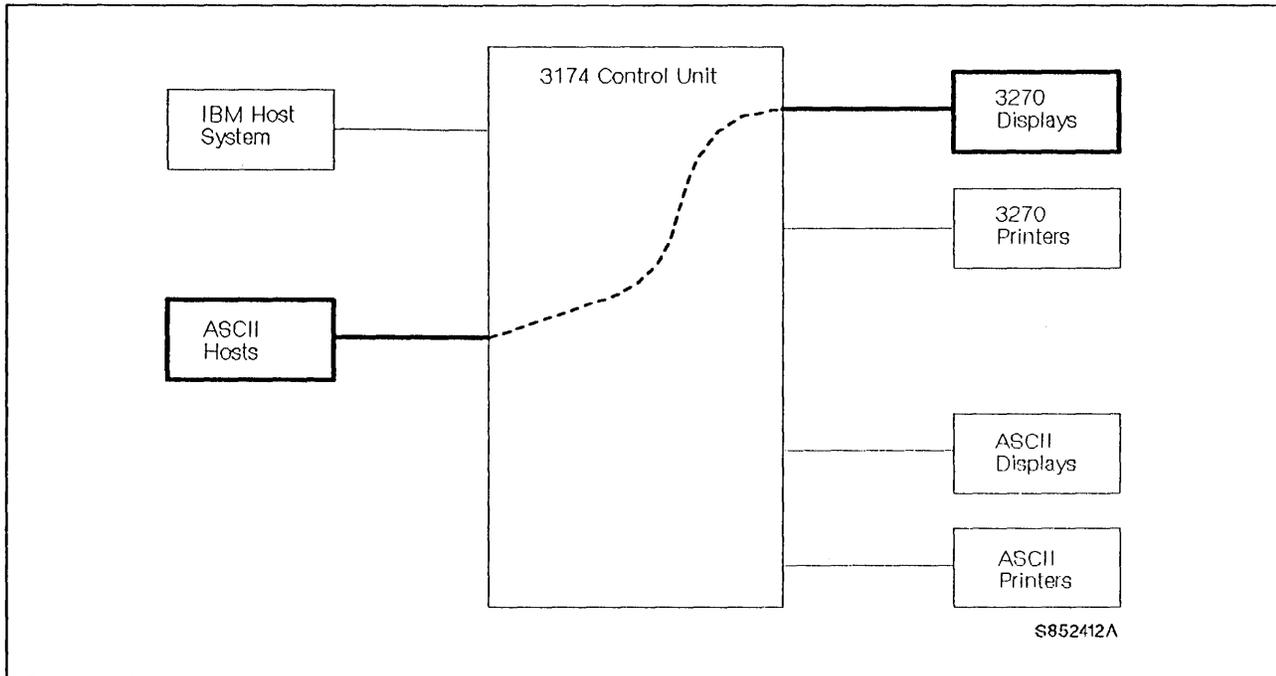


Figure 10. ASCII Terminal Emulation. IBM 3270 Terminals Communicating with an ASCII Host.

Regardless of the method used to connect the ASCII host to the AEA ports, the display screens appear just as they would on an ASCII terminal.

Figure 11 shows ASCII terminals communicating in ASCII passthrough mode with an ASCII host via AEAs. There is no protocol conversion; the 3174 merely passes the data between the ASCII host and the ASCII terminals.

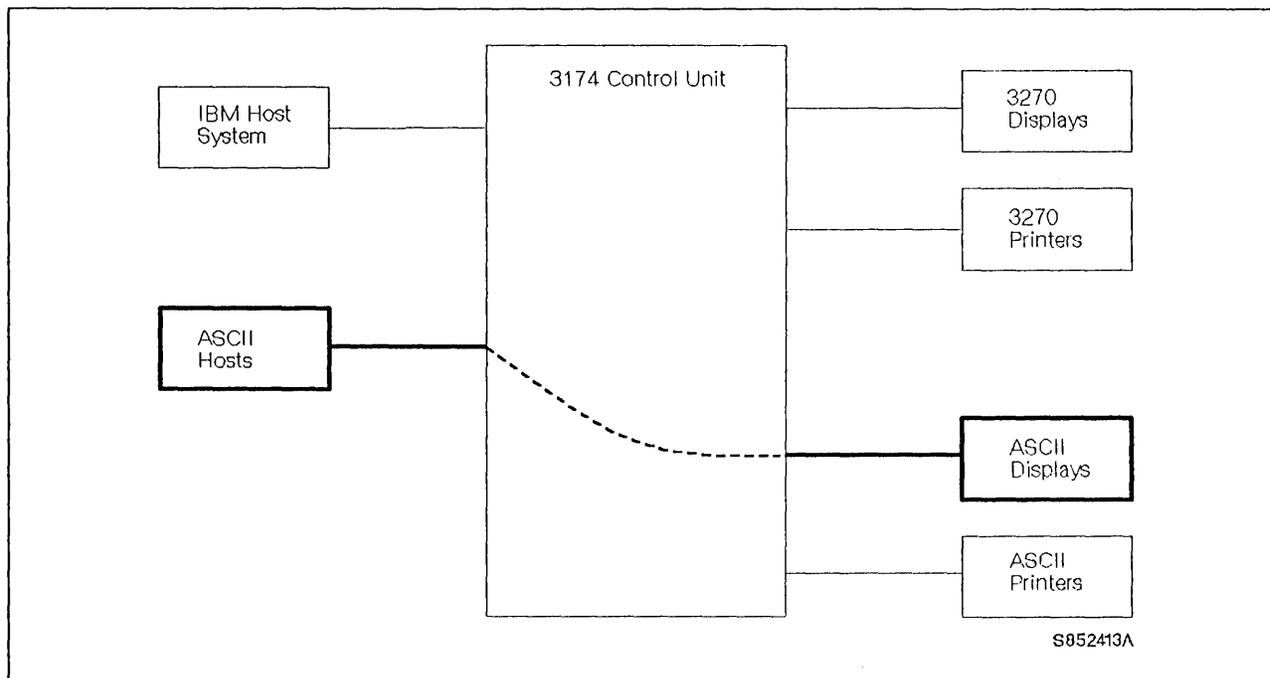


Figure 11. ASCII Passthrough. ASCII Terminals Communicating with an ASCII Host.

The display screens at the ASCII terminals, of course, remain unchanged from normal.

## Host Attachment

ASCII host attachment is through any of the AEA ports. Links to ASCII hosts can carry only one session at a time; when all paths are in use, requests for sessions are not granted until a session ends and a path is available.

**Default Destination:** In general, a *destination* is a host to which a terminal user has access. A *default destination* can be specified by customizing; the default destination is the host to which an ASCII terminal is connected when the user calls into an AEA port on the 3174. If a default destination is not specified, the user is presented at connection time with a *Connection Menu* that consists of a list of host destinations from which the user can select a particular host or application.

**Connection Menu:** Figure 12 shows the Connection Menu that lists all the host connections that can be accessed by the display unit user. Hosts are identified by customizing. The Connection Menu also provides host availability status information. If a path is available to that host, a connection will be made.

```

                _____ CONNECTION MENU _____ 1 of 1
Enter a number (NUM) or a name on the Command Line, then press ENTER:

NUM  NAME                STATUS  NUM  NAME
  1  VM SYS2                15
  2  XY GRAPHICS           16
  3  PARTS                  17
  4                                18
  5                                19
  6                                20
  7                                21
  8                                22
  9                                23
 10                                24
 11                                25
 12                                26
 13                                27
 14                                28

PF1= HELP  3= END
PF7= BACK  8= FWD

==>T0:

```

Figure 12. Connection Menu. The selections that are displayed on this menu are a result of AEA customizing.

During customizing there are two options available when presenting the Connection Menu for selection.

1. The terminal user may be presented with the Connection Menu but is only allowed to select the default host assigned. See Figure 13.

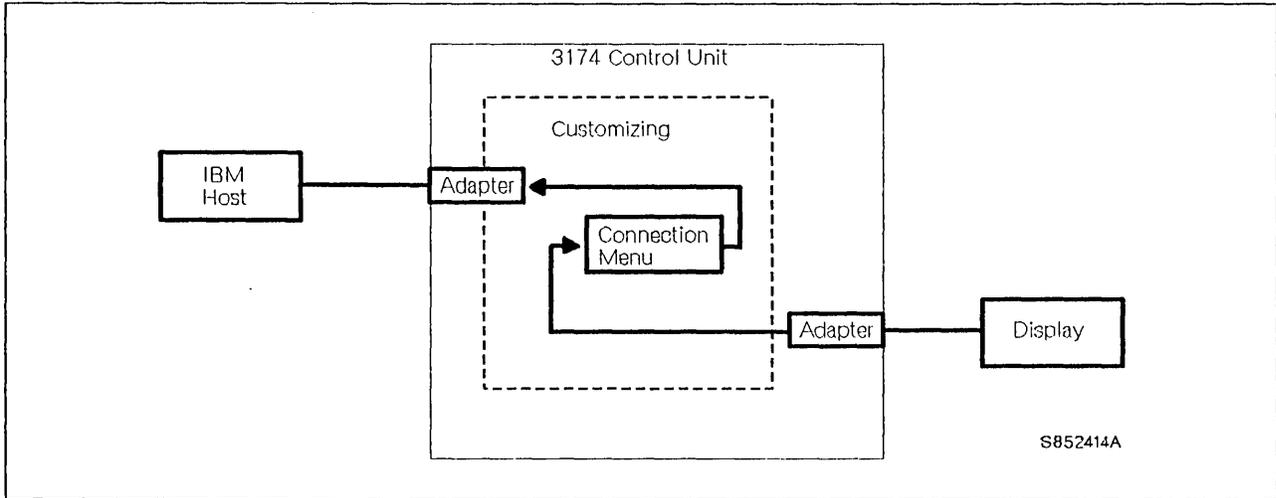


Figure 13. Connection Menu Option 1

2. The terminal user may be presented the Connection Menu and be allowed to select any one of the hosts from the list. See Figure 14.

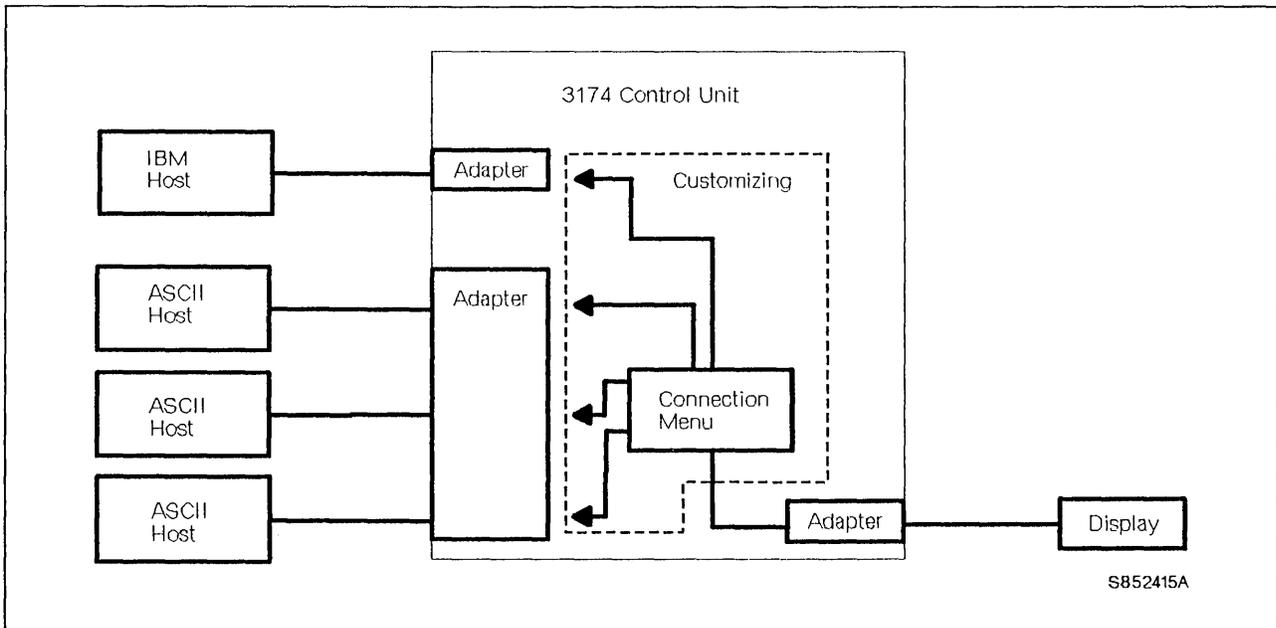


Figure 14. Connection Menu Option 2



## Dual Control Units

No discussion of host attachment is complete without presenting the 7232 Dual Control Unit Terminal Multiplexer (see Figure 15).

The 7232 Dual Control Unit Terminal Multiplexer Model 001 (available with RPQ 8K1670) is an enhanced version of the 3299 Model 2 Terminal Multiplexer. It provides 3299 Model 2 functions and, in addition, can be attached to two 3174 control units (any model). Attached CUT (control unit terminal) devices can then toggle-switch between the two 3174s. The two 3174s can be attached to two different hosts using the same or different protocols on the host links. Selection is under control of the operator using the change screen key, which is described in the next section, "Multiple Logical Terminals."

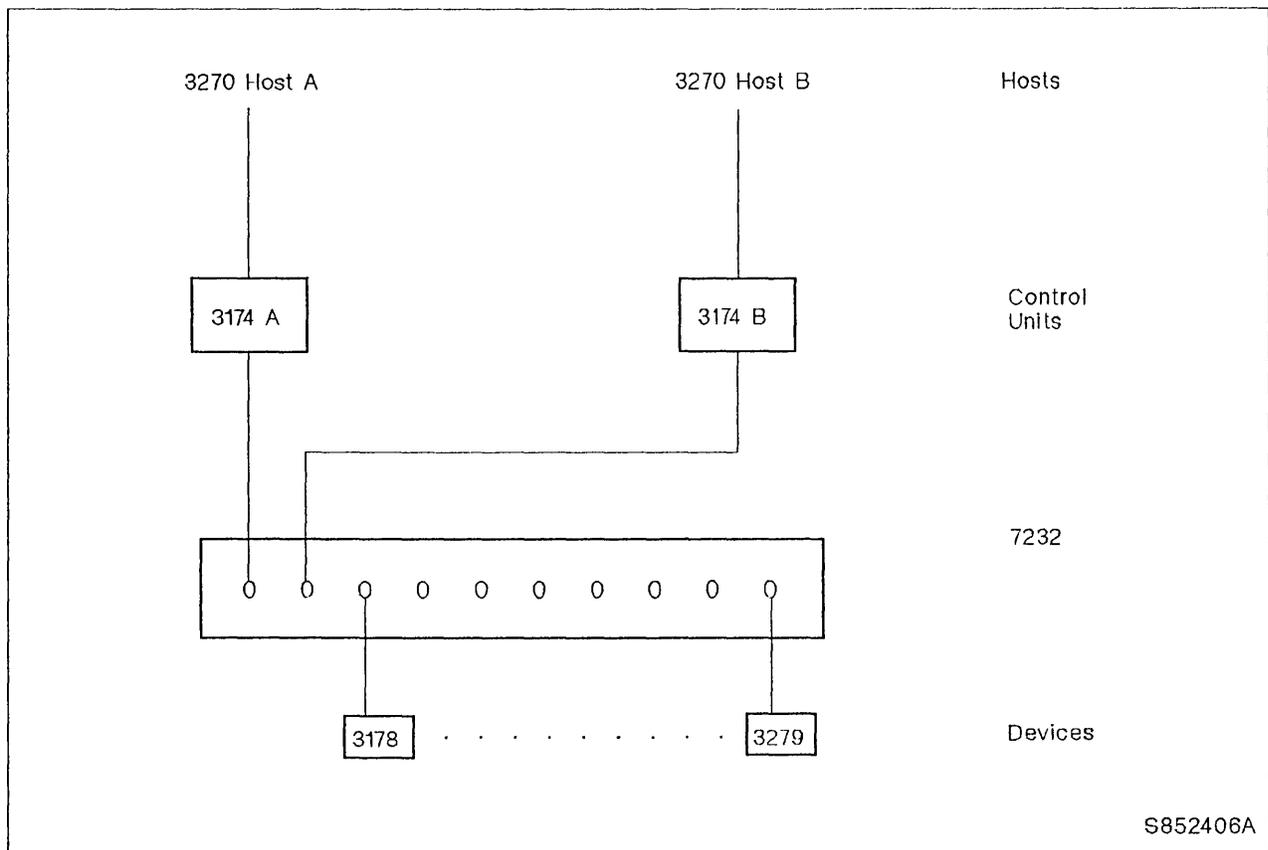


Figure 15. 7232 Connection Diagram. The 7232 allows any CUT device to connect to either of two 3174 Subsystem Control Units.



## **Multiple Logical Terminals (MLT)**

The 3174 ASCII subsystem is even further enhanced by the MLT function, available with Release 3 microcode.

The MLT function allows the terminal user to interact with up to five host sessions from a 3270 CUT device. The host sessions are logical terminals (LT1 through LT5) that can be connected to a single IBM host, one or more ASCII host(s), or both. Access to these hosts is made through either the Connection Menu or the Default Destination Procedure, which is a function of customizing.

**Note:** MLT is not supported for ASCII terminals or 3270 DFT terminals.

### **Active and Background Sessions**

The display screen shows one session at a time; any keys that are pressed are used by that session. This is called the *active session*. The other sessions are maintained in the 3174 Subsystem Control Unit and are called *background sessions*.

### **Change Screen Key**

Different sessions that have been defined for a terminal by customizing are accessed by using the *change screen key*. When this key sequence is used, the current active session is saved in the background and the next background session becomes the active session in a round-robin fashion. None of the background sessions are affected by anything that is entered during the active session. The change screen key varies with the keyboard type. On a base text QWERTY keyboard, press and hold ALT, then press PA2.

## Case Study

While reading the following customizing scenario, refer to Figure 16.

### MLT Customizing Scenario

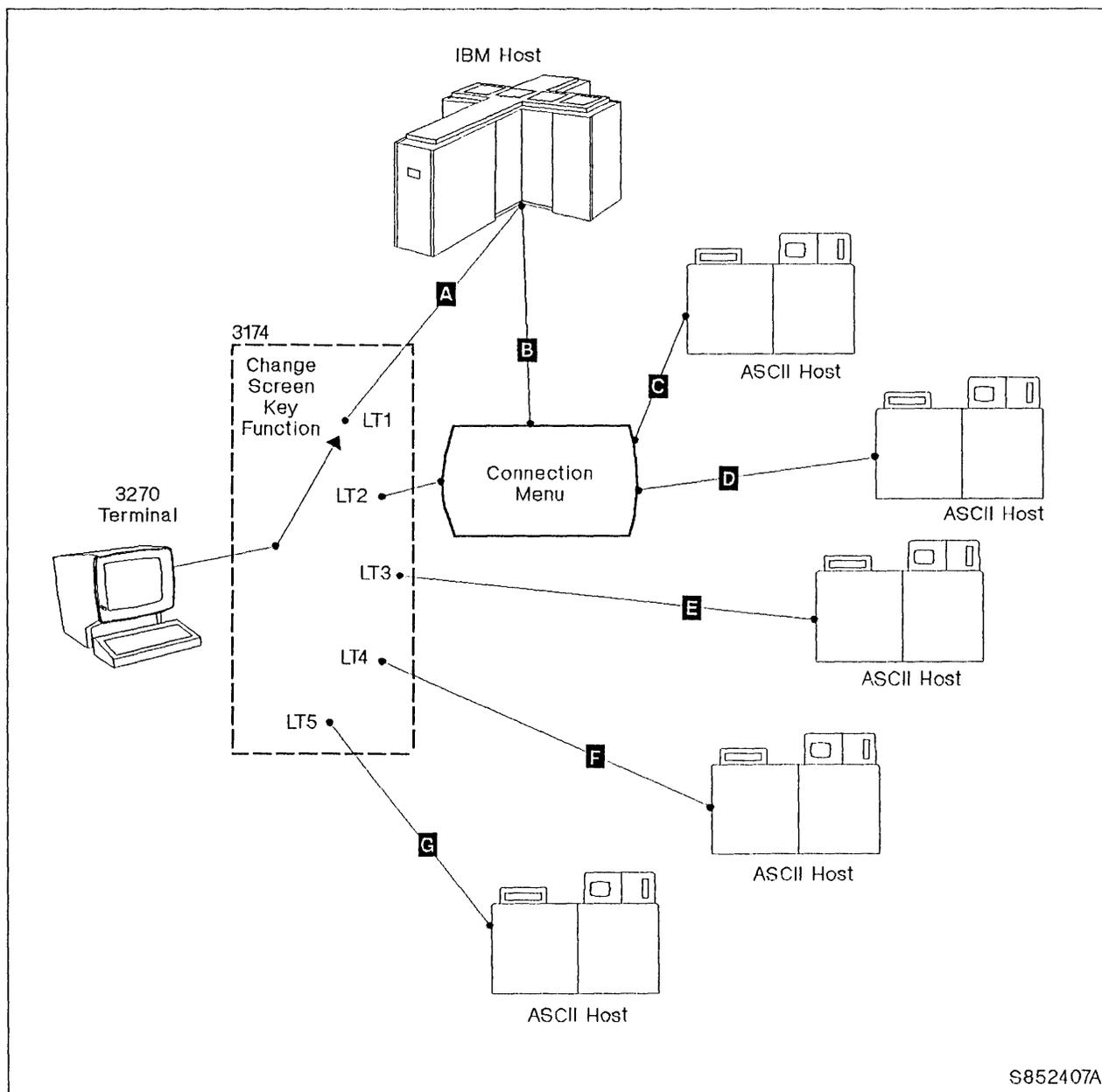


Figure 16. Multiple Logical Terminal Operation. Each activation of the change screen key selects LT1, LT2, LT3, LT4, and LT5 in sequence in round-robin fashion.

The 3270 CUT device is customized for AEA with five logical terminals (LT1 through LT5).

- LT1 is customized to have the IBM host as the default destination.
- LT2 is customized to have the Connection Menu as the default destination.
- LT3 is customized to have ASCII host 3 as the default destination.
- LT4 is customized to have ASCII host 4 as the default destination.
- LT5 is customized to have ASCII host 5 as the default destination.

## MLT Operation Scenario

The following scenario is depicted on Figure 16 on page 22 and takes you through a typical MLT operation from the power-on of the 3270 CUT device through the selection of different host sessions.

- When the operator powers on the 3270 device, the LT1 display on the 3270 terminal is from IBM host session **A**.
- When the operator presses the change screen key, the LT2 display on the 3270 terminal is the Connection Menu.
  - The operator selects IBM host session **B** from the Menu list.
  - The operator performs some transactions using session **B**, then terminates the session.
- The 3270 terminal display is again the Connection Menu for LT2.
  - The operator selects ASCII host session **C** from the menu list.
  - The operator performs some transactions using host session **C**, then terminates the session.
- The 3270 terminal display is again the Connection Menu for LT2.
  - The operator selects ASCII host session **D** from the menu list.
  - The operator perform some transactions using host session **D** and terminates the session.
- When the Connection Menu for LT2 returns to the screen, the operator presses the change screen key and the LT3 display on the 3270 terminal is ASCII host session **E** on ASCII host 3.
- The operator presses the change screen key and the LT4 display on the 3270 terminal is ASCII host session **F** on ASCII host 4.
  - The operator performs some transactions on host session **F**, then terminates the session.
- The operator presses the change screen key and the LT5 display on the 3270 terminal is ASCII host session **G** on ASCII host 5.

**Note:** If the operator continues to press the change screen key, the round-robin sequence of LT1, LT2, LT3, LT4, LT5, LT1, etc. is repeated.

By using the AEA feature, the MLT function, and tying it all together with special customizing, you can see that the customer has considerable terminal/host connectivity beyond what has been previously available.



---

## Customizing

Customizing for 3174, as you know from the 3174 base course (75021), is a customer responsibility. For the AEA feature, the customer is required to define the:

- Connection type
- Operational characteristics of the equipment installed
- Physical equipment path
- Logical path.

Once the physical and logical paths have been identified, the customer is required to summarize the information into sets for entry into the AEA customizing panels.

---

## Stations and Sets

The term *station* is used in the customizing procedures to differentiate between the traditional 3270 operation and the additional access provided by the AEA feature. A station may be either an:

- IBM or ASCII host
- 3270 or ASCII display unit
- 3270 or ASCII printer.

Many of the stations have the same characteristics. Therefore, provisions have been made for entering and storing station common information as a station set, thus eliminating the need to enter the same information many times (see Figure 17).

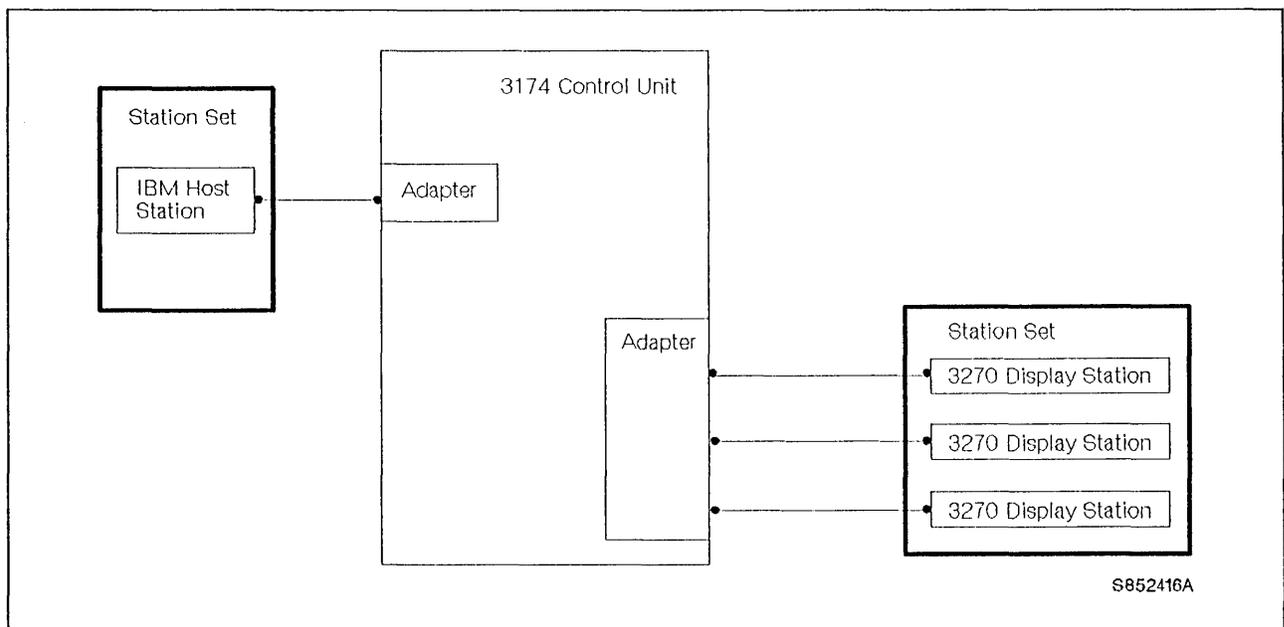


Figure 17. Host Set and Terminal Set

## Port Type and Port Sets

The port type is used to identify the physical connection to the 3270 terminal adapter and the AEAs. The 3270 terminal adapter ports accept the traditional coaxial type cables used to connect 3270 type terminals. The AEA ports accept the cables used to connect direct, nonswitched, and switched communication links.

Many of the port types (direct, nonswitched, switched) may be the same for a given station set. Provisions have been made to group these ports into port sets as shown in Figure 18.

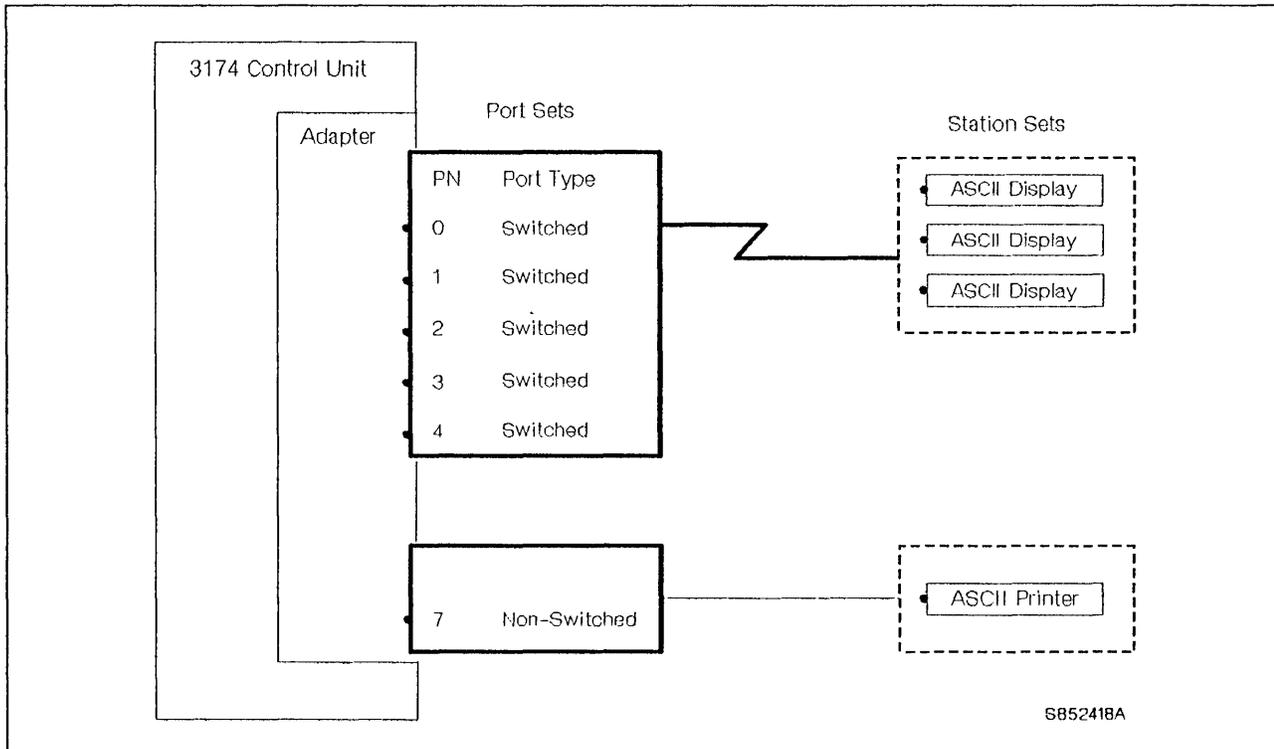


Figure 18. Port Sets

Port sets may be used by more than one display station set, provided that the *station types* of the station sets are different. The different station types are needed to ensure that the control unit can determine to which station set a connection should be made when both station sets have the same port type (see Figure 19).

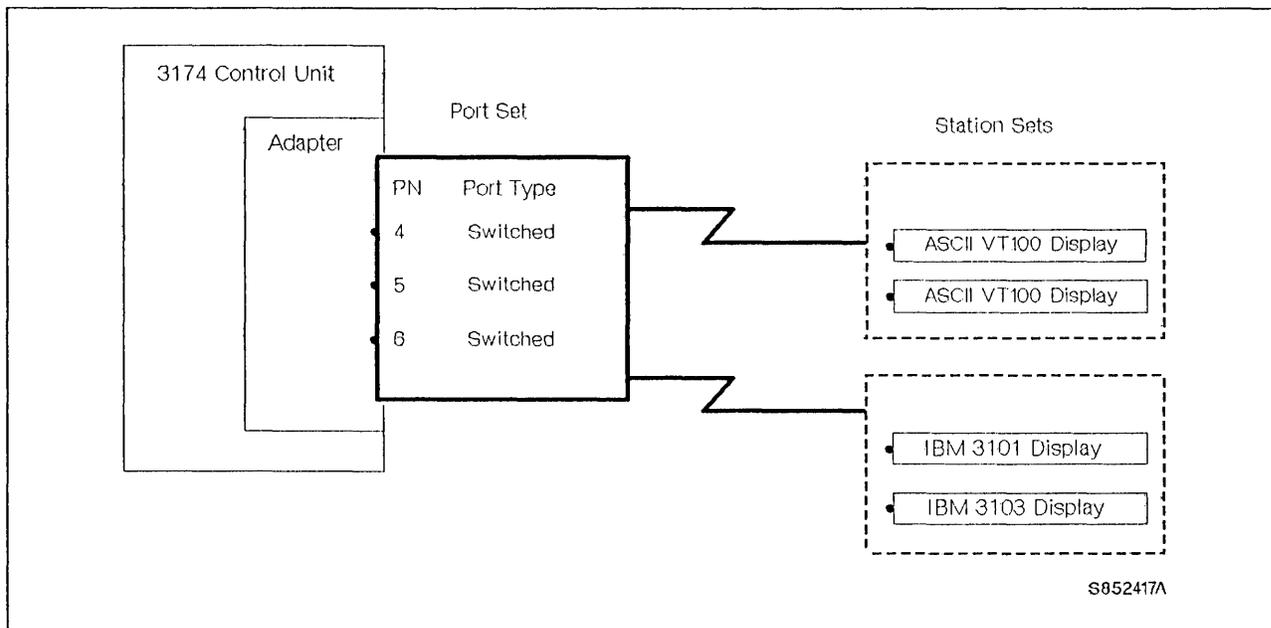


Figure 19. Connected Terminal and Port Sets

## Customizing Screen Changes

You should be familiar with some of the customizing process and some of the customizing screens from the base course. This portion points out how AEA affects those screens with which you are already familiar.

**Customize Control Diskette Menu:** Figure 20 shows the Customize Control Diskette Menu screen. Notice that option 5, AEA Configure, has been added to the menu. Selecting this option presents the customer with a number of panels with responses to questions that describe the configuration of hardware and software for both 3270 and ASCII devices.

```

          _____ Customize Control Diskette Menu _____

Select option; press ENTER

Option   Description

   1     Configure

   2     Define PAM

   3     Merge RPQs

   4     Modify Keyboards

   5     AEA Configure

Select ==> __

PF:  3=Quit                12=File

```

Figure 20. Customize Control Diskette Menu. The addition of Option 5 allows the customer to configure for the AEA feature.

Figure 21 on page 29 shows the Local (SNA) attachment screen. Notice that the host attachment panel for Local (SNA) has Questions 110 and 178 added. Question 110 is for the MLT level in order to reserve the appropriate amount of 3174 storage depending on the amount of MLT functional support the customer desires. Question 178 is for the customizing of 7232 Dual Control Unit Terminal Multiplexer switching.

These additions also apply to the other host attachment panels [Local (Non-SNA), SDLC, etc.] as well.

Local (SNA)			
104 - XX	108 - 0000000	110 - 0	116 - 0
121 - 01	125 - 00000000	127 - 0 0	
132 - 0 0 0 0	136 - 0 0 0 0	137 - 0 0 0 0	138 - 0
141 - A	165 - 0	166 - A	
173 - 00000000	175 - 000000	178 - 0	
213 - 1	215 - 00000	220 - 0	
222 - 0	223 - 10	224 - 2	225 - 4

Figure 21. Host Attachment. Questions 110 and 178 have been added.

Figure 22 on page 30 depicts the port assignment customizing panel. Notice that eight port assignments each have been added for hardware groups 21, 22, and 23, corresponding to the maximum of three AEAs. This is where the customer assigns the primary decimal addresses to the AEA ports.

117: Port Assignment													
LT=000							116=n CC/MMM/HOST						
C@	#IS	LT1	LT2	LT3	LT4	LT5	C@	#IS	LT1	LT2	LT3	LT4	LT5
	P	S1	S2	S3	S4			P	S1	S2	S3	S4	
26-00	---	---	---	---	---	---	26-01	---	---	---	---	---	---
26-02	---	---	---	---	---	---	26-02	---	---	---	---	---	---
26-04	---	---	---	---	---	---	26-05	---	---	---	---	---	---
26-06	---	---	---	---	---	---	26-07	---	---	---	---	---	---
26-08	---	---	---	---	---	---	26-09	---	---	---	---	---	---
26-10	---	---	---	---	---	---	26-11	---	---	---	---	---	---
26-12	---	---	---	---	---	---	26-13	---	---	---	---	---	---
26-14	---	---	---	---	---	---	26-15	---	---	---	---	---	---
26-16	---	---	---	---	---	---	26-17	---	---	---	---	---	---
26-18	---	---	---	---	---	---	26-19	---	---	---	---	---	---
26-20	---	---	---	---	---	---	26-21	---	---	---	---	---	---
26-22	---	---	---	---	---	---	26-23	---	---	---	---	---	---
26-24	---	---	---	---	---	---	26-25	---	---	---	---	---	---
26-26	---	---	---	---	---	---	26-27	---	---	---	---	---	---
26-28	---	---	---	---	---	---	26-29	---	---	---	---	---	---
26-30	---	---	---	---	---	---	26-31	---	---	---	---	---	---
21-00	---	---	---	---	---	---	21-01	---	---	---	---	---	---
21-02	---	---	---	---	---	---	21-03	---	---	---	---	---	---
21-04	---	---	---	---	---	---	21-05	---	---	---	---	---	---
21-06	---	---	---	---	---	---	21-07	---	---	---	---	---	---
22-00	---	---	---	---	---	---	22-01	---	---	---	---	---	---
22-02	---	---	---	---	---	---	22-03	---	---	---	---	---	---
22-04	---	---	---	---	---	---	22-05	---	---	---	---	---	---
22-06	---	---	---	---	---	---	22-07	---	---	---	---	---	---
23-00	---	---	---	---	---	---	23-01	---	---	---	---	---	---
23-02	---	---	---	---	---	---	23-03	---	---	---	---	---	---
23-04	---	---	---	---	---	---	23-05	---	---	---	---	---	---
23-06	---	---	---	---	---	---	23-07	---	---	---	---	---	---

Figure 22. Port Assignment. Port assignments for a maximum of three AEA's have been added.

The top portion of Figure 23 on page 31 shows where the customer defines printers that are to be used for copy operations. The customer can now also define **AEA attached printers** for local, shared, or system printing. This is done by entering the appropriate hardware group (21, 22, or 23) and port number for each of the printer definition entries.

Refer to the lower right portion of Figure 23 on page 31. Notice that the customer can define AEA attached displays that are authorized to use printers that have been defined in the top portion. This is done by defining the displays for hardware groups 21, 22, and 23.

PAM Definition																					
Entry	Printer Port		Mode	Class																	
	7	8		01234		56789		01234													
1	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5	—	-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Entry	TA Display Port						AEA Display Port					
	26	1		1		26	21	22	23			
	0	1	1	1	1	3	0	0	0	0		
	01234	56789	01234	56789	01234	56789	01	01234567	01234567	01234567		
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		

Figure 23. Printer Authorization Matrix (PAM). ASCII printers may be defined by specifying the appropriate AEA hardware group and port number in the upper portion. Authorized ASCII displays may be defined by specifying the appropriate AEA hardware group and port number for the matching entry in the lower portion.

For an example of how an ASCII display can be authorized to use a 3270 printer for local copy operations, refer to Figure 24 on page 32.

- The customer defined an IBM 3287 Terminal Adapter attached printer (hardware group 26), port 2 for local copy. This was done by completing *printer* definition Entry 1.
- The customer defined an AEA attached ASCII display on port 3 of the first AEA (hardware group 21) in *display* definition Entry 1.

In this example, the ASCII display on port 3 of the first AEA is authorized to use the Terminal Adapter attached printer (IBM 3287) on port 2 for local copy (printing) operations.

PAM Definition											
Entry	Printer Port		Mode	Class							
	7	8		01234	56789	01234	56789	01234	56789	01234	56789
1	26	- 02	1	.....	.....	.....	.....	.....	.....	.....	.....
2	-	- -	-	.....	.....	.....	.....	.....	.....	.....	.....
3	-	- -	-	.....	.....	.....	.....	.....	.....	.....	.....
4	-	- -	-	.....	.....	.....	.....	.....	.....	.....	.....
5	-	- -	-	.....	.....	.....	.....	.....	.....	.....	.....

Entry	TA Display Port						AEA Display Port					
	26	0	1	1	3	0	26	21	22	23	0	0
	01234	56789	01234	56789	01234	56789	01	01234567	01234567	01234567	01234567	01234567
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....X.....
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Figure 24. Completed Printer Authorization Matrix (PAM). The IBM 3287 Printer attached to the TA hardware group 26, port 2 is defined for local copy in Entry 1. The ASCII display on AEA, hardware group 21, port 3 is authorized to use this printer for local copy operations.

---

## Problem Determination Assistance

Customizing for the AEA feature and the MLT function is more complex than that on a basic machine. Therefore, it is the intent of this portion to clarify the role of customizing problem determination assistance to the customer.

**Customizing Problems:** You have just looked at a few of the areas of customizing that have changed as a result of the AEA feature and the MLT function. There is also additional AEA customizing that requires special training and is not covered in this TAI document.

When you are servicing the 3174 and you suspect that the problem is caused by a customizing error that you cannot recognize, the IBM SE has special training and should be contacted for further problem determination assistance.



---

## Maintenance Package Updates

The maintenance approach to the 3174 with AEA feature remains unchanged. However, the maintenance package has been updated to accommodate the AEA feature.

---

### New MAPs

The following new MAPs have been added to the MIM for troubleshooting AEA problems:

- ASCII Problem Entry
- Direct Connection Port(s)—any failure
- Leased Connection Port(s)—any failure
- Switched Connection Port(s)—any failure.

---

### New Status Codes

New status codes have been added to the Status Code Chart in the MIM that are associated with the AEA feature.

---

### New Tests

New offline and online tests have been added to diagnose problems associated with the AEA feature. As previously, you are directed by the MAPs and procedures in the MIM when to run the appropriate test(s).

#### Offline Tests

The basic Asynchronous Emulation Adapter offline tests are hardware groups 21, 22, or 23, corresponding to the three AEAs that are available on the floor models.

**Note:** Only hardware group 21 is available on the 51R and 52R models.

The optional AEA offline test provides an AEA port driver/receiver wrap test on any of the eight AEA ports. The test is initiated by specifying the hardware group (21, 22, or 23), a function number (FN) of 01, and a function parameter (FP) of 00 through 07. This test does not require a wrap plug to be installed.

## Online Tests

Figure 25 shows the Test 12 Menu screen. Test 12 has been added to provide an access to testing for an AEA terminal, port, or programmable<sup>1</sup> modem. It also provides a status summary and capability to reset error counters on any or all AEAs. The options are:

- 1 —AEA port test menu
- 2 —Display status summary
- 3 —Reset line errors on all AEA HGs
- 3,n —Reset line errors on HG n

Asynchronous Emulation Adapter Tests	
Option	Description
1	AEA port test menu
2	Display status summary
3	Reset line errors on all AEA HGs
3,n	Reset line errors on all HG (n=21-23)
Note:	
- Option 1 exits from 3174 TEST mode	
To go directly to other tests, enter: /Test,option	
Select option; press ENTER ==> _	
PF: 3=Quit	12=Test menu

Figure 25. Main Menu for Test 12

Figure 26 on page 38 shows the Asynchronous Emulation Adapter Port Tests menu.

- *Option 1:* Provides a facility to test a smart modem through its asynchronous emulation adapter port, provided that port is not presently in session. Access and manipulation of the modem, using that modem's command syntax, enables the following:

- Modem and Customizing Test

This function provides access to internal diagnostic and customizing procedures built into certain smart modems. There are two reasons why this function is important:

1. By running diagnostics internal to the modem, you are able to isolate a problem to the asynchronous communication equipment on a specific port, provided proper operation of the asynchronous emulation adapter port has already been verified.
2. By customizing the modem to certain specifications, you can ensure proper operation or verify whether or not the modem has been customized correctly for normal operations.

- Modem Dial-Out Function

This function enables you to test the dial-out capability of the modem. By providing a number of a phone close by or the number of an actual ASCII dial-in port to the modem, you can verify proper operation of the modem.

- *Option 2:* Provides access to an asynchronous emulation adapter port not presently in session. This access allows you to perform a wrap test on the asynchronous emulation adapter port.

**Note:** The asynchronous emulation adapter wrap plug (P/N 61X4602) must be installed on the port connector before invoking the wrap test.

If a modem cable is attached to the port being tested, you can also test it by installing the wrap plug at the modem end providing that the modem end connector is male/female compatible with the wrap plug.

- *Option 3:* Provides a means of verifying an ASCII terminal's ability to receive data correctly. From the invoking terminal, you can send data through the asynchronous emulation adapter port connector to a terminal not presently in session. This test verifies the data path and operation of the terminal receiving the data.

The override settings are indicated by WXYZZZ,

where:

W = Line Speed  
X = Parity  
Y = Flow Control  
Z = Stop Bits.

**Notes:**

1. If you enter override settings, you may need to change the parameters on the ASCII device(s) you are testing.
2. The actual WXYZZZ values are given in a table in the MIM and you are directed by the MAPs when to enter them.

These parameters are used by the control unit to communicate with ASCII devices. They are entered during customizing and this test allows you to temporarily change them without changing the actual customizing.



## Major Changes

Some of the existing online test screens with which you are already familiar have been changed with the availability of the AEA feature and Release 3 microcode.

**Logs Menu for Test 1:** Figure 27 shows the Logs Menu screen for Test 1. Notice that Option 4 has been changed. All errors in the event log for the port number on a specific hardware group will display when you enter 4,n,m

where:

- n** is a specific port number from 0 through 31
- m** is a specific hardware group from 0 through 99.

For example, if you enter 4,5,21, all the errors in the event log for port number 5 of the AEA in hardware group 21 (first AEA) will be displayed.

Notice that Option 7 has been added. Entering 7 (Change log mode) changes the log mode from *Normal* to *Intensive* or vice versa. The current log mode is noted on the Logs Menu screen for Test 1. Normal mode is regularly used for logging errors. Intensive mode was created to record those high frequency loggable errors that are not recorded in Normal mode. Because of the high frequency of errors, Intensive mode should only be used when needed. To guard against continued use, the control unit changes the log mode back to Normal when a 76-hour timer expires.

```

                _____ Logs Menu _____

Option      Description

   1         Response time log
   2         All events logged
  3,n        Hardware group (n=0-99)
  4,n        Port n (n=0-31)
  4,n,m      Port n,hardware group m (n=0-31,m=0-99)
  5,xxxx     Status code (replace x's with search digits)
  6,n        Logical terminal (n=0-254)
   7         Change log mode (normal/intensive)

To go directly to other tests, enter: /Test,option
Select option; press ENTER ==> _

PF:  3=Quit                               12=Test menu
    
```

Figure 27. Logs Menu for Test 1. Option 4 has been modified to allow searching for port logs on the AEA hardware groups as well as the TA hardware group. Option 7 has been added to allow toggle switching of the log mode between normal and intensive modes.

Figure 28 shows the screen, "Log Records - All." Notice the PHG (Primary Hardware Group) and CHG (Connection Hardware Group), which are the hardware groups associated with the error. The PHG field contains 00 or 99 if the error is not associated with a particular hardware group, or if the hardware group cannot be identified. 00 or 99 are not displayed in the CHG field.

For example, a 3270 terminal that is experiencing errors during an ASCII host session would have 26 in the PHG field and 21, 22, or 23 in the CHG field.

```

_____ Log Records - All _____

(Day/Time since last POR: 000/08:11)
Day Time SC QA PHG_PN CHG_PN LT Extended data bytes (B1-B6)
B1 B3 B5 B7 B9 B11 B13 B15
000 08:11 0315 58 16 9210 1100 01XX XXXX XXXX XXXX XXXX XXXX
000 00:03 0500 01 16
000 00:02 0503 01 16
000 00:02 3174 01 00
015 21:48 0402 02 16 26_02 002 0000 0003 F350 0000
015 21:22 0401 03 16 26_06 006 0001 0004 3C40 4000
015 21:20 0209 51 26 16 008
015 21:19 0201 51 26 16 008
015 21:07 3174 01 00
015 20:01 0311 01 87 9052 1900

SC=Status Code QA=Qualifier HG=Hardware Group PN=Port number
PHG_PN=PrimaryHG_PN CHG_PN=ConnectionHG_PN LT=Logical terminal

To go directly to other tests, enter: /Test,Option
Select test; press ENTER ==> _

PF: 3=Quit 8=Fwd 12=Test menu

```

Figure 28. Log Record Display Panel for Test 1. HG (hardware group) has been modified to PHG\_PN (primary hardware group—port number) and CHG\_PN (connection hardware group—port number) has been added.

Figure 29 on page 41 depicts the hardware configuration table screen. Notice that the AEA adapters and associated cable assemblies are listed and identified by hardware group, FRU type, and location in the 3174.

\_\_\_\_\_ Hardware Configuration Table \_\_\_\_\_

HG	TYPE	LC	DESCRIPTION	SC	HG	TYPE	LC	DESCRIPTION	SC
00	9001	00	Invalid Card/Cond		22	9540	62	AEA Cable Assembly	
01	9154	21	File Adpt		23	9333	12	Async Emul Adpt	
01	9110	01	Diskette Drive 1	32XY	23	9540	63	AEA Cable Assembly	
01	9110	02	Diskette Drive 2		26	9154	21	Terminal Adapter	
08	9500	18	Timer		26	9172	15	Term Mpx Adpt 00-07	
09	9010	05	Ops Panel Adpt		26	9172	16	Term Mpx Adpt 08-15	
09	9521	06	Ops Panel Assembly		26	9172	11	Term Mpx Adpt 16-23	
11	9253	22	Type 1 Com Adpt-XXX		26	9172	12	Term Mpx Adpt 24-31	
11	9273	22	Type 2 Com Adpt-XXX		31	9350		Token-ring Adpt	
16	9210	11	Channel Adpt		46	9030	25	Enc/Decrypt Adpt	
16	9230	10	Channel Drv/Recvr		87	9051	19	Storage 512K	
21	9333	14	Async Emul Adpt		87	9051	20	Storage 512K	
21	9540	61	AEA Cable Assembly		87	9052		Storage 1MEG	
22	9333	13	Async Emul Adpt						

Select Test; press ENTER ==> \_

PF: 3=Quit                      12=Test Menu

Figure 29. Hardware Configuration Table for Test 2. This table shows the maximum configuration for Models 1L, 1R, 2R, and 3R. Only those FRUs that are physically installed are displayed in this table. A 1-Mb base storage is available. Either two 512 K-byte cards are installed or one 1-Mb card. Up to 3-Mb of storage can be installed.

XXX indicates the type of cable or wrap plug installed.

Figure 30 shows the status summary screen. There are a few changes to the Test 3 display. They are described in detail in the 3174 MIM and a brief description is given here:

- *Attach*: An uppercase M in this line represents a terminal that is attached to a controller through a 7232 Dual Control Unit Terminal Multiplexer.
- *Status*: A lowercase s in this line indicates that the terminal is presently communicating with another controller through a 7232 Dual Control Unit Terminal Multiplexer or, in other words, is in the switched state.
- *Host*: This line has been added and represents the type of host to which the terminal is currently connected or if no host is configured. For MLT ports, a blank, a 3, or an A represent the foreground session only.

**Blank** = No current host  
**x** = No host sessions configured  
**3** = IBM host connection established  
**A** = ASCII host connection established.

```

                _____ Status Summary - HG 26 _____
Port          00 02 04 06 08 10 12 14 16 18 20 22 24 26 28 30
Address       01 03 05 07 09 11 13 15 17 19 21 23 25 27 29 31
Attach        m m m m m m m d                x M M M M M M m m m m m m
Status        1 1 1 1 0 0 1 0 1 0 0 0 0 0 0 0 - - 1 0 s 1 1 0 1 0 0 1 0 0 1
Terminal      v v v v ? v v v p                p p v v v v v v v v i i v v v
Cable         . . . . . : . .                . . . | . . . . . . . . . .
Cable Max     . . . . . * : . .                . . : * . : . . . . : : *
Host          3 3 3 A      3 A 3                3 3  x x 3      3
LU            + + +      + +                +      +      +

    d = direct      - = off (error)      i = DFT device      . = 0 errors
    m = multiplexer x = unconfigured      ? = unknown        : = 1-5 err
    1 = on          p = printer           + = in session      | = 6-15 err
    0 = off        v = video display     3=3270 A=ASCII      * = > 15 err
Connection number:  Outgoing call 914-555-1234

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==> _

PF:  2=Quit                12=Test Menu

```

Figure 30. Status Summary for Test 3. The Attach and Status lines have been changed. The Host line has been added.





---

## Teleprocessing Network Support

With the availability of the AEA feature, you can see that telecommunications network problem determination may become more complex. The maintenance package directs you, through MAPs and procedures in the MIM, to run the appropriate test(s) to do initial AEA telecommunications network problem determination.

When you suspect that there is an AEA network problem that you cannot solve using the maintenance package, specialized IBM support is available. It is called the IBM Network Support Center, located in Atlanta. The Network Support Center is staffed by personnel with specialized telecommunications network training. They normally work with customers and CEs to solve telecommunications network problems and can be reached by calling any of the following numbers:

WATS	1-800-426-2472
Tie Line	596-5070
Outside IBM	(404)-984-5070



---

## Summary

You should now have an overall understanding of the additional connectivity available to the customer afforded by the AEA feature, Multiple Logical Terminals function, and the 7232 Dual Control Unit Terminal Multiplexer. More detailed descriptions are contained in the documents listed under "Related Publications" on page iv.

Although the subsystem configurations can be considerably more complex than in the past, the maintenance approach remains unchanged; it is directed by MAPs and procedures in the MIM. When you cannot solve a problem using the maintenance package, specialized support is available; the IBM SE for customizing problems and the Network Support Center for telecommunications problems.

This concludes the technical awareness information for the 3174 Asynchronous Emulation Adapter. It is a good time to review any areas where you feel you need a better understanding.



## List of Abbreviations

This list defines important or unique abbreviations used in this course. If you feel that an abbreviation should be added to the list, please send a comment to the author or use the Reader's Comment Form at the back of this book.

<b>AEA</b>	ASCII Emulation Adapter	<b>I/O</b>	Input/Output
<b>ASCII</b>	American National Standard Code for Information Interchange	<b>LT</b>	Logical Terminal
<b>CE</b>	Customer Engineer	<b>Mb</b>	Megabyte
<b>CHG</b>	Connection Hardware Group	<b>MAP</b>	Maintenance Analysis Procedure
<b>CUT</b>	Control Unit Terminal	<b>MIM</b>	Maintenance Information Manual
<b>DFT</b>	Distributed Function Terminal	<b>MLT</b>	Multiple Logical Terminals
<b>EBCDIC</b>	Extended Binary-Coded Decimal Interchange Code	<b>P/N</b>	Part Number
<b>EIA</b>	Electronic Industries Association	<b>PAM</b>	Printer Authorization Matrix
<b>FN</b>	Function Number	<b>PHG</b>	Primary Hardware Group
<b>FP</b>	Function Parameter	<b>PN</b>	Port Number
<b>FRU</b>	Field Replaceable Unit	<b>RPQ</b>	Request for Price Quotation
<b>HG</b>	Hardware Group	<b>SDLC</b>	Synchronous Data Link Control
		<b>SE</b>	Systems Engineer
		<b>SNA</b>	Systems Network Architecture
		<b>TA</b>	Terminal Adapter
		<b>TAI</b>	Technical Awareness Information
		<b>TMA</b>	Terminal Multiplexer Adapter



## Glossary

This glossary defines important or unique terms as they are used in this course. If you do not find the term you are looking for, refer to the index or to the book *Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699.

If you feel that a term should be added to the list, please send a comment to the author or use the Reader's Comment Form at the back of this book.

**Asynchronous Transmission.** Transmission in which each character is individually synchronized (usually by the use of start elements and stop elements) This is in contrast to synchronous transmissions such as *Bisynchronous* (Bisync) and SLDC (*Synchronous Data Link Control*) which depend upon the receiving station being synchronized with the transmitting station in order for the receiving station to decode the data being transmitted.

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

**ASCII Host.** The processor, running an application program or programs, that communicates with terminals using ASCII protocol.

**ASCII Terminal.** A display or printer that communicates with its host using ASCII protocol.

**Change screen key.** A 3270 display terminal key used to select host sessions with the Multiple Logical Terminal (MLT) function and to switch between each of two 3174 control units with a 7232 Dual Control Unit Terminal Multiplexer. On a base QWERTY keyboard, the change screen key function is invoked by pressing and holding the ALT key and then, pressing the PA2 key.

**EBCDIC.** A set of 256 characters, each represented by eight bits.

**Modem.** (modulator-demodulator) A device that modulates and demodulates signals transmitted over data communication facilities. One of the functions of a modem is to enable digital data to be transmitted over analog transmission facilities. See also smart modem.

**Protocol.** (1) A specification for the format and relative timing of information exchanged between communicating parties. (2) The set of rules governing the operation of functional units of a communications system that must be followed if communication is to be achieved.

**QWERTY Keyboard.** A 3270 terminal keyboard in which the first six alphabetic characters on the second row from the top are QWERTY.

**Smart Modem.** A modem that is capable of responding to remotely originated test and customizing commands.

**3270 Host.** The processor, running an application program or programs, that communicates with terminals using 3270 protocol.

**3270 Terminal.** A display or printer that communicates with its host using 3270 protocol.



---

# Index

## A

- active sessions 21
- AEA feature 3
- AEA port wrap 37
- all logs 40
- analysis procedure, maintenance (MAP) 35
- ASCII data path test 37
- ASCII passthrough 11
- ASCII printers 2
- ASCII protocol 2
- ASCII subsystem configurations 13
  - communications link 13
  - modems 13
- ASCII terminal emulation 11
- assignment, port 29
- assistance, problem determination 33
- asynchronous emulation adapter hardware 3

## B

- background sessions 21

## C

- case study, MLT 22
  - customizing scenario, MLT 22
  - MLT customizing scenario 22
  - MLT operation scenario 23
  - operation scenario, MLT 23
  - scenario, MLT customizing 22
  - scenario, MLT operation 23
- change log mode 39
- change screen key 19, 21
- communications link 13
- communications links, hardware 6
- connection menu 16, 21
- control diskette menu, customize 28
- copy, local 31
- customize control diskette menu 28
- customizing 25, 28, 29
- customizing override 37
- customizing problems 33
  - IBM systems engineer 33
- customizing test, smart modem 36

## D

- data path test, ASCII 37
- DEC VT100 11
- default destination 16
- destination 16
- destination, default 16
- diskette menu, control 28
- diskette menu, customize 28
- display control blocks menu 43
- dual control units 19

## F

- flow control 37

## G

- general information iii

## H

- hardware 3
- hardware configuration table 40
- hardware group, connection 40
- hardware group, primary 40
- hardware, communications links 6
  - connectivity 10
  - major functions 11

## I

- instructions iii
- intensive log mode 39
- introduction 1
  - ASCII device 1
  - ASCII host 1
  - IBM host 1
  - multiple logical terminal 1

## K

- key, change screen 19, 21

## L

- line speed 37
- local copy 31
- local printing 31
- local/SNA 28
- log mode, change 39
- logs menu 39

**M**

maintenance analysis procedure (MAP) 35  
 major changes 39  
 MAP (maintenance analysis procedure) 35  
 materials iii  
 matrix, printer authorization (PAM) 30  
 menu, connection 21  
 menu, customize control diskette 28  
 microcode, release 3 21  
 MLT (multiple logical terminals) 21  
 MLT operation 22  
 modem 36  
 modem customizing test 36  
 modem test 36  
 modems 13  
 multiple logical terminals (MLT) 21  
 multiplexer, 7232 dual control unit terminal 19

**N**

network problem determination 45  
 network support center 45  
 network support, telecommunications 45  
 normal log mode 39

**O**

offline tests 35  
 online tests 36  
     test 12, using 36  
 override settings 37

**P**

PAM (printer authorization matrix) 30, 31  
 parameters, customizing override 37  
 parity 37  
 port assignment 29  
 port wrap, AEA 37  
 prerequisites iii  
 primary hardware group 40  
 printer authorization matrix (PAM) 30, 31  
 printing, local 31  
 problem determination assistance 33  
     customizing problems 33  
 protocol conversion 15  
 protocol conversion path 11  
 protocol, ASCII 2  
 protocol, 3270 2

**R**

related publications iv  
 release 3 microcode 21  
 round-robin fashion 23

**S**

screen, change key 19  
 SE (systems engineer) 33  
 sessions, active 21  
 sessions, background 21  
 settings, customizing override 37  
 smart modem 36  
 smart modem customizing test 36  
 smart modem test 36  
 status codes 35  
 status summary 42  
 stop bits 37  
 summary 47  
 support, telecommunications network 45  
 systems engineer (SE) 33

**T**

TAI description iii  
 telecommunications network support 45  
 terminology 1  
 test 1, using 39  
 test 12, using 36  
 test 2, using 40  
 test 3, using 42  
 test 6, using 43  
 test, smart modem 36  
 test, smart modem customizing 36  
 tests 35  
     offline tests 35  
     online tests 36

**Numerics**

3270 protocol 2  
 3270 terminal emulation 11  
 7232 dual control unit terminal multiplexer 19  
 76-hour timer 39

**IBM Internal Use Only**

IBM 3174 Asynchronous Emulation Adapter Feature  
Technical Awareness Information  
TAI 40600

**READER'S  
COMMENT  
FORM**

ZZ25-8524-00

You may use this form to communicate your comments about this publication, its organization, or subject, with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you. Your comments will be sent to the author's department for whatever review and action, if any, are deemed appropriate.

**Note:** Copies of IBM publications are not stocked at the location to which this form is addressed. Please direct any requests for copies of publications, or for assistance in using your IBM system, to your IBM representative or to the IBM branch office serving your locality.

Possible topics for comment are clarity, accuracy, completeness, organization, coding, retrieval, and legibility.

If you wish a reply, give your name, company, mailing address, and date.

---

---

---

Thank you for your cooperation. See the other side for mailing instructions.

**IBM Internal Use Only**

ZZ25-8524-0

**READER'S COMMENT FORM**

Please Do Not Staple

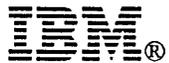
---

IBM Internal Mail  
(Mail in sealed envelope  
for US Mail)

International Business Machines Corporation  
Department H70/Building 947  
PO Box 390  
Poughkeepsie, NY 12602

Please Do Not Staple

---



ZZ25-8524-00

Printed in U.S.A.



ZZ25-8524-00

