3745 Communication Controller Models A
3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:

Physical Planning

GA27-4238-01

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Note

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

Second Edition (October 2001)

This edition applies to the 3745 Communication Controller Models A and 3746 Nways® Multiprotocol Controller Models 900 and 950.

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Safety

First see the following manual: *3745 Communication Controller All Models, 3746 Nways Multiprotocol Controller Models 900 and 950 Safety Information*, GA33-0400.

Notice to Users

The IBM 3746 Expansion Unit Model 900 and IBM 3746 Nways Multiprotocol Controller Model 950 are manufactured according to the International Safety Standard IEC 60950.

Active Remote Couplers (ARCs) and the X.21 Interface, housed within the IBM 3746 Expansion Unit Model 900 and IBM 3746 Nways Multiprotocol Controller Model 950, and supplied by IBM, do not use or contain excessive voltages. An excessive voltage is one that exceeds 42.4 V peak ac or 60 V dc. They interface with the IBM 3746 Expansion Unit Model 900 and IBM 3746 Nways Multiprotocol Controller Model 950 using Safety Extra Low Voltages (SELV) only.

What Is New in This Edition

This edition has been revised to include the changes resulting from the new Service Processor (SP) Type 4, Network Node Processor (NNP) Types 4 and 5, and color display 6331-M2N Model E54.

The technical changes and additions are indicated by a vertical line (|) to the left of the change.

About This Guide

The *3745/3746 Planning Series* is designed to help you plan the installation and configuration of the IBM 3745 Communication Controller Models A and IBM 3746 Nways® Multiprotocol Controller Models 900 and 950. The *Planning Series* also describes the information you must gather to install and integrate 3746 Controllers into Advanced Peer-to-Peer Networking®/High-Performance Routing (APPN®/HPR) and Internet Protocol (IP) environments.

The *3745/3746 Planning Series* consists of a set of Planning Guides that replace, update and obsolete the *Planning Guide*.

Who Should Use the 3745/3746 Planning Series

The *3745/3746 Planning Series* is intended for network planners, network specialists, and system programmers responsible for collecting the information required for the installation and network integration of 3745 Communication Controller Models A and 3746 Expansion Unit Model 900 in an SNA environment, as well as the 3746-950 and 3746-900 as APPN/HPR network nodes and IP routers.

How the 3745/46 Planning Series Is Organized

Important:

1. If you already use the existing *Planning Guide*, IBM recommends that you read the new *Planning Series* to learn about new features and to become familiar with the new structure in which planning information is presented.
2. When planning the installation and configuration of 3746 controllers you must use the *IBM 3745 Communication Controller Models A, IBM 3746 Nways Multiprotocol Controller, Models 900 and 950: Overview*along with the *3745/3746 Planning Series* to have all required information.
3. The 3745/3746 documentation is updated periodically in response to your needs and to reflect product evolutions. Because of the time delay necessary to update hard media (books that are printed and available on CD-ROM), it is highly recommended that you periodically check the IBM 3745/3746 documentation on the Web for the latest versions of the documents (see “Additional Information on the Web” on page xxiii).

Refer to the appropriate Planning Guide for the parameters to be customized for the installation and operation of:

- 3745 Communication Controller Models A
- 3746 Nways Multiprotocol Controller Models 900 and 950
- Network Node Processor (NNP)
- Multiaccess Enclosure (MAE)
- Service Processor
- Distributed Console Access Facility (DCAF) and TME® 10 remote consoles
- Java™ Console
- Network management

When you define 3746 resources controlled by NCP, record the information in the worksheets provided for the Controller Configuration and Management application.

The *3745/3746 Planning Series* consists of the following planning guides:

Overview, Installation, and Integration, **GA27-4234**
Starts with a general overview of 3746 planning and then explains the various 3745 and 3746 installation and upgrade scenarios.

The guide also explains the options available for the basic integration of the controller and its service processor into your network. There are MOSS-E worksheets for these options, which are to be filled out for the IBM service representative who does the actual controller installation or upgrade. The appendixes:

- Show the panels of the MOSS-E service processor customization function
- Describe the support offered by each level of the 3746 Licensed Internal Code

ESCON Channels, **GA27-4237**
After an overview of ESCON® architecture and the adapters, the publication explains the configuration and tuning. This can be done with either the ESCON Generation Assistant (EGA) tool or the Controller Configuration Management (CCM) tool.

The publication also includes examples of various types of ESCON configurations.

Note: For information about using ESCON adapters on the MAE, refer to the *Multiaccess Enclosure Planning* guide.

Token Ring and Ethernet, **GA27-4236**
Helps you with the configuration and definitions of your 3746 Network Node token-ring adapters (TRAs) for APPN/HPR-, IP-, and NCP-controlled traffic.

There are MOSS-E worksheets for the token-ring information needed by the IBM service representative to install or update your machine.

Although no longer available from IBM, the guide explains 3746 Ethernet support and Ethernet adapter configuration.

The token-ring (IEEE 802.5) and Ethernet (IEEE 802.3) standards are discussed in the appendixes.

Note: For Multiaccess Enclosure Ethernet information, refer to the *Multiaccess Enclosure Planning* guide.

Serial Line Adapters, **GA27-4235**
Provides an overview of the serial line adapters, and describes the support for X.25, frame relay, PPP, and SDLC.

The two ways that the 3746 supports ISDN (LIC16 adapter[1] and terminal adapters) are explained, including how ISDN lines can be used as backups for other types of lines.

[1] No longer available

An appendix describes the frame-relay support in each NCP level since frame relay was introduced in NCP Version 6.

Note: For Multiaccess Enclosure ISDN information, refer to *Multiaccess Enclosure Planning*.

Physical Planning, **GA27-4238**

Gives information to help you plan the physical site used by the 3745/3746 frames, Service Processor, and Network Node Processor: the physical dimensions, electrical characteristics, and so on. It also gives this information for the various components of the 3745/3646, such as the Multiaccess Enclosure, Controller Extension, LICs, LCBs, ARCs, and so on.

The cable descriptions include feature codes (FCs) and part numbers used when ordering them.

The guide includes and explains the controller installation sheets, which show what IBM has installed on your machines.

Plugging sheets for keeping track of your installed LICs, ARCs, and cables are provided along with examples and explanations of their use.

Note: This type of information for the Multiaccess Enclosure is in the *Multiaccess Enclosure Planning* guide.

Management Planning Guide, **GA27-4239**

Starts with a management overview covering:

- The Tivoli® NetView® program
- Performance management
- Service Processor
- Network Node Processor
- APPN Topology Integrator

Then there are chapters about:

- APPN/HPR Network Node management
- NetView Performance Monitor
- Remote console support
- IBM Remote Support Facility
- 3746 IP router management
- Multiaccess Enclosure APPN/HPR Network Node management
- X.25 network

There are MOSS-E worksheets for the network management parameters needed by the IBM service representative to install or upgrade your machine.

The guide also explains MOSS-E Service Processor Customization.

There is an example of ESCON Management Information Base (MIB) definitions.

Note: For Multiaccess Enclosure management information, refer to the *Multiaccess Enclosure Planning* guide.

Multiaccess Enclosure Planning, **GA27-4240**

Provides information about the Multiaccess Enclosure and its adapters (ATM, ESCON, and so on) and how to configure them.

For information about:

- Multiaccess Enclosure APPN/HPR Network Node management, refer to the *3745/3746 Planning Series: Management Planning Guide*
- Physical site planning and the cables, refer to the *3745/3746 Planning Series: Physical Planning*

Protocol Descriptions, **GA27-4241**

Is an in-depth description of these protocols used by the 3746:

- APPN/HPR
- IP

The detailed discussions of how the 3746 and Multiaccess Enclosure support these protocols help you understand the purpose of the protocol parameter definitions and what types of information are needed for the most efficient operation of your 3745/3746-connected networks.

CCM Planning Worksheets (online)

These example worksheets for the 3746 and MAE can be used to plan the actual definitions of the many CCM parameters you need to configure for your 3746.

These worksheets are available in PDF format at:

ibm.com/networking/did/3746bks.html#Customer

Where to Find More Information

While planning a migration, you must use the following documents in addition to the *3745/3746 Planning Series* guides:

- IBM *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180
- IBM *3745 Communication Controller All Models, 3746 Nways Multiprotocol Controller Model 900: Console Setup Guide*, SA33-0158 (This guide contains information about remote console access to 3745/3746-900s via an SNA/subarea, APPN, or TCP/IP path and using a modem.)

Also, you may need to use the following additional documents:

- IBM *3746 Nways Multiprotocol Controller Model 900 and 950: Controller Configuration and Management: User's Guide*, SH11-3081 (IBM recommends that you prepare controller definitions before installing a 3746. To obtain a stand-alone version of the Controller Configuration and Management that runs on an OS/2® workstation, contact your IBM marketing representative.)
- *3746 Nways Multiprotocol Controller Model 950: User's Guide*, SA33-0356 (This guide contains information about routine operations, installing and testing the communication line adapters, service processor, and remote consoles.)
- *Planning for Integrated Networks*

Be sure to use the latest editions of these documents. This will ensure that you have up-to-date and complete information about the 3746 controllers.

The following *IBM International Technical Support Organization* redbooks provide useful information about 3746 implementation:

- *APPN Architecture and Product Implementations Tutorial*, GG24-3669

- *IBM 3746 Nways Multiprotocol Controller Model 950 and IBM Model 900: APPN Implementation Guide*, GG24-2536
- *Subarea Network to APPN Network Migration Guide*, SG24-4656
- *IBM 3746 Nways Multiprotocol Controller Model 950 and Model 900: IP Implementation Guide*, SG24-4845

Be sure to see the other relevant documents listed in the bibliography at the back of this guide.

Additional Information on the Web

You can access the latest news and information about IBM network products, customer service and support, and information about microcode upgrades at:

www.ibm.com/

The latest versions of the *Planning Series* and other 3745/3746 documentation are available in PDF format at:

www.ibm.com/networking/did/3746bks.html#Customer

CD-ROM

Starting with engineering change F12380, the Licensed Internal Code (LIC) is shipped on a CD-ROM. The complete 3745/3746 documentation set is also included on the CD-ROM.

Examples: 3745 Models A and 3746 *Planning Series*, 3746 NNP and Service Processor Installation and Maintenance Guides, CCM *User's Guide*, 3746-950 *User's Guide*, and others. See the bibliography for the complete name and form number of the books.

3745/3746 documentation is in PDF format. Acrobat Reader for OS/2® is included on the CD-ROM to allow you to read the PDF files and print all or part of a book.

Accessing CD-ROM Information

To access the CD-ROM from a service processor equipped with a CD-ROM drive, use the following procedure:

1. Install the CD-ROM in the service processor CD-ROM drive.
2. In the MOSS-E main panel, open the **View** menu and select **Information**.
3. Double-click **CD-ROM documentation**. Your browser automatically opens and displays the documentation home page.
4. Click any highlighted text (blue and underlined) to go to the material that interests you:
   a. Click **Documentation** to access 3745/3746 books.
   b. Click the icon marked PDF that corresponds to the item that interests you.

      The Acrobat Reader automatically opens and displays the file in the full-panel mode. Use the **Page Up** and **Page Down** keys to move through the document.

      Press **Esc** to display the Reader menus that allow you to print all or part of the file.

      When you close the Acrobat Reader, you return to the browser.

      When you close the browser, you return to the MOSS-E Documentation menu.

Each document file has one or more of the following identifiers:

- Date
- Form number
- Engineering change level
- Revision code.

Check these identifiers on future releases of the CD-ROM to see if the documents that you use have been updated.

How to Use the 3745/3746 Planning Series

Your Responsibility as a Customer

You are responsible for performing the tasks listed in Table 1. These tasks are not performed by IBM personnel as part of the machine installation and basic operations. They can, however, be performed by IBM on a fee basis.

Table 1 (Page 1 of 3). Customer Tasks

Task	Where to Find Information
Network design:	Network design is not covered in this book. Refer to the following IBM books for SNA, APPN/HPR, and IP network planning guidance: • *Planning for Integrated Networks* • IBM redbooks: – *Subarea Network to APPN Network Migration Guide* – *IBM 3746 Nways Multiprotocol Controller Model 950 and IBM Model 900: APPN Implementation Guide* – *IBM 3746 Nways Multiprotocol Controller Model 950 and IBM Model 900: IP Implementation Guide* – *IBM Nways 2216 Multiaccess Connector Description* – *IBM 2216 Multiaccess Connector ESCON Solutions*
Physical planning: Before the IBM service representative arrives to install your controller, make sure that you have met the necessary requirements for the following: • Electric power • Floor space with service clearances • Space for the cables • The RSF switched line • The Controller Expansion (FC 5023) • Other components (such as the service processor).	"Physical Planning Details" chapter in the *3745/3746 Planning Series: Physical Planning*
Controller hardware configuration definitions: Decide what type of attachments (lines) and how many of each type you need.	This input is necessary for the IBM ordering system (CF3745). For more information, refer to the *3745/3746 Planning Series: Physical Planning*.

Table 1 (Page 2 of 3). Customer Tasks	
Task	**Where to Find Information**
Software definitions and tuning: • ESCON port, host link, and station definitions; ESCON resource, TCP/IP, and VTAM® tuning	Refer to: • "ESCON Adapters" chapter in the *3745/3746 Planning Series: ESCON Channels* • "ESCON Channel Adapter" chapter in the *3745/3746 Planning Series: Multiaccess Enclosure Planning* • "ESCON Configuration Examples" chapter in the *3745/3746 Planning Series: ESCON Channels*
• Token-ring port and station definitions; PU and LU maximum limits; port sharing with NCP-controlled traffic; duplicate addresses; token-ring APPN, IP, and/or NCP resource tuning and VTAM tuning	• "Token-Ring Adapters" chapter in the *3745/3746 Planning Series: Token Ring and Ethernet*
• Serial line (SDLC, PPP, frame-relay, and X.25) port and station definitions; location of CLPs, LICs, LCBs, and ARCs; maximum CLA line connectivity; CLP backups	• "Serial Line Adapters" chapter in the *3745/3746 Planning Series: Serial Line Adapters* • "3746 SDLC Support" chapter in the *3745/3746 Planning Series: Serial Line Adapters*
• Multiaccess Enclosure: hardware planning and configuration; software configuration and tuning	• *3745/3746 Planning Series: Multiaccess Enclosure Planning* • *3745/3746 Planning Series: Physical Planning*
• Use of the Controller Configuration and Management (CCM) application.	• *IBM Controller Configuration and Management User's Guide*, SH11-3081. Also refer to: • *IBM 3746 Nways Multiprotocol Controller Model 950 and IBM Model 900: APPN Implementation Guide* (an IBM redbook) • *IBM 3746 Nways Multiprotocol Controller Model 950 and IBM Model 900: IP Implementation Guide* (an IBM redbook).
Filling out: • 3746 plugging sheets To keep a record of the processors and couplers (and their addresses) installed in the 3746 frame.	Refer to: • "Plugging Sheets for 3745 and 3746" chapter in the *3745/3746 Planning Series: Physical Planning*
• *CCM User's Guide*, SH11-3081 worksheets To plan the 3746 and MAE logical resource definitions. They can then be used when configuring the 3746 and MAE using the CCM.	• *3745/3746 Planning Series: CCM Planning Worksheets*

Table 1 (Page 3 of 3). Customer Tasks	
Task	**Where to Find Information**
NetView definitions in VTAM, the MOSS-E, NPM, CCM, NetView/360, and Tivoli NetView (formerly NetView for AIX) for: • APPN traffic • IP traffic • NetView alert path	Refer to: • "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide* • "3746 APPN/HPR Network Node Management" chapter in the *3745/3746 Planning Series: Management Planning Guide* • "3746 IP Router Management" chapter in the *3745/3746 Planning Series: Management Planning Guide*.
Controller, service processor, and network node processor definitions. For example: • Link IPL port information • Password management • NetView alert reporting path definitions • DCAF LU definitions • Ethernet port definitions for SNMP • Service processor token-ring and IP LAN addresses	Refer to "Controller and Service Processor Integration" chapter in the *3745/3746 Planning Series: Overview, Installation, and Integration*. Fill out the worksheets in the various *Planning Series* guides. These worksheets are used by the IBM service representative during installation.
Remote console definitions (using DCAF): • Ensure that the necessary hardware and software is available for the type of console attachment chosen • Service processor definitions for DCAF • DCAF installation and configuration on the remote console	Refer to: • "Remote Customer Consoles" chapter in the *3745/3746 Planning Series: Management Planning Guide* • For the 3746-900, refer to the *3745 Console Setup Guide* • For the 3746-950, refer to the *IBM 3746 Nways Multiprotocol Controller Model 950 User's Guide*
Connection to the IBM remote support facility (RSF): • Service processor connection (modem) definitions • Customer definitions for RSF records.	Refer to the "Connecting to the IBM Remote Support Facility" chapter in the *3745/3746 Planning Series: Management Planning Guide*
Problem determination through the MOSS-E and NetView	For the 3746-900, refer to: • *Problem Analysis Guide* accessed online from the MOSS-E • *3745 Models A: Alert Reference Guide* • *3745 All Models: Advanced Operators Guide*

Finding Your Way Around in the New Planning Series

If you are familiar with the layout of the old *3745 Communication Controller Models A and 3746 Models 900 and 950: Planning Guide*, GA33-0457, Table 2 should help you find which of the eight new books of the planning series contains the information that you need.

Note: Some of the chapters in the *Planning Guide* have been split into two or more new chapters in one or more new guides.

Table 2 (Page 1 of 2). Location of Old Planning Guide Chapters in New Planning Guides

Old Planning Guide		**New Planning Series Book**	
Chapter	**Chapter Name**	**Chapters**	**Guide Name**
1	3745 and 3746 General Information	--	Not included in the new guides
2	APPN/HPR Overview	1	*Protocol Descriptions*
3	Internet Protocol (IP) Overview	2	*Protocol Descriptions*
4	3746 ATM Support	4	*Multiaccess Enclosure Planning*
5	Token-Ring/802.5	B	*Token-Ring and Ethernet*
6	Ethernet Overview	C	*Token-Ring and Ethernet*
7	Frame Relay Overview	4, 5	*Serial Line Adapters*
8	Point-to-Point Protocol (PPP) Overview	4	*Serial Line Adapters*
9	X.25 Overview	2, 3, 5, 7	*Serial Line Adapters* *Management Planning*
10	ISDN Adapters	8	*Serial Line Adapters*
11	ESCON Overview	1	*ESCON Channels*
12	3745 and 3746 Installation and Upgrade Scenarios	2	*Overview, Installation, and Integration*
13	Configuration Scenarios	6	*Multiaccess Enclosure Planning*
14	3746 Planning Overview	1	*Overview, Installation, and Integration*
15	ESCON Adapters	1, 2, 3	*ESCON Channels*
16	Token-Ring Adapters	1, 2, 3	*Token-Ring and Ethernet*
17	Ethernet Adapters	4, 5	*Token-Ring and Ethernet*
18	Serial Line Adapters	1	*Serial Line Adapters*
19	3746 SDLC Support	3, 4	*Serial Line Adapters*
20	Multiaccess Enclosure	1	*Multiaccess Enclosure Planning*
21	Multiaccess Enclosure Adapters Overview	2	*Multiaccess Enclosure Planning*
22	ESCON Channel Adapter	8	*Multiaccess Enclosure Planning*
23	Multiaccess Enclosure ISDN Support	5	*Multiaccess Enclosure Planning*
24	3746 Configuration Overview	--	Not included in the new guides
25	Welcome to the CCM	--	Not included in the new guides
26	Multiaccess Enclosure Configuration	7	*Multiaccess Enclosure Planning*
27	3746 Base Frame ESCON Configuration Examples	1	*ESCON Channels*
28	Configuring the MAE ESCON Channel Adapter	8	*Multiaccess Enclosure Planning*

Table 2 (Page 2 of 2). Location of Old Planning Guide Chapters in New Planning Guides			
Old Planning Guide		**New Planning Series Book**	
Chapter	**Chapter Name**	**Chapters**	**Guide Name**
29	3746 Management Overview	1	*Management Planning*
30	3746 APPN/HPR Network Node Management	2	*Management Planning*
31	3746 IP Router Management	6	*Management Planning*
32	MAE APPN/HPR Network Node Management	2	*Management Planning*
33	MAE IP Router Management	6	*Management Planning*
34	Controller and Service Processor	3	*Overview, Installation, and Integration*
35	Customer Consoles and DCAF	4 1 1	*Management Planning* *Overview, Installation, and Integration* *Token-Ring and Ethernet*
36	Connecting to the IBM Remote Support Facility	5	*Management Planning*
37	Performance Management with NetView Performance Monitor	3	*Management Planning*
37	3746 IP Router Management	6	*Management Planning*
38	MOSS-E Worksheets for Controller Installation (3745)	A A A	*Overview, Installation, and Integration* *Management Planning* *Token-Ring and Ethernet*
39	Parameter Cross-Reference Table	B	*Overview, Installation, and Integration*
40	CCM Worksheets for Controller Configuration Definitions	1	*CCM Planning Worksheets* (online)
41	Multiaccess Enclosure Worksheets	2	*CCM Planning Worksheets* (online)
42	Familiarizing Yourself with the Installation Sheets	2	*Physical Planning*
43	Plugging Sheets for the 3746 Nways Multiprotocol Controller	3	*Physical Planning*
44	Physical Planning Details	1	*Physical Planning*
A	3746-9x0 Microcode Levels (EC)	D	*Overview, Installation, and Integration*
B	ESCOM MIB	A	*Management Planning*
C	MOSS-E Service Processor Customization Function	C	*Overview, Installation, and Integration*

Chapter 1. Physical Planning Details

This chapter contains the physical planning information needed for the:

- 3745 Communication Controller Models 17A, 21A, 31A, 41A, and 61A
- 3746 Expansion Units Models A11, A12, L13, L14 and L15

  Note: 3745 Models 21A and 41A and 3746 Models A11, A12, L13, L14 and L15 are no longer available from IBM.
- 3746 Nways Multiprotocol Controller Models 900 and 950
- Controller Expansion (FC 5023).
- For physical planning information about 3745 Models 130, 150, 160, 170, 210, 310, 410, and 610, refer to *IBM System/360, System/370, 4300 Processor Input/Output Equipment Installation Manual-Physical Planning,* GC22-7064.

  Note: 3745 Models 130, 150, 160, 210, 310, 410, and 610 are no longer available from IBM.

Plan Views

The figures are not drawn to scale. The measurements shown in parentheses are in inches.

Your machine configuration may not exactly match one of the plan views on the following pages.

Total Length

The minimum total length of your configuration is the sum of:

1. All the frame lengths

   plus

2. The floor loading security clearance (the total end clearance: X + Y)

   plus

3. 60 mm (2.7 in.) for the two side covers.

Total End Clearance

As a general rule, the total end clearance (X + Y) can be distributed on either side of your configuration in any amount. For example, if X + Y = 100 mm, then X can be from 0 to 100 mm (0 to 3.9 in.) with the remaining clearance given to Y.

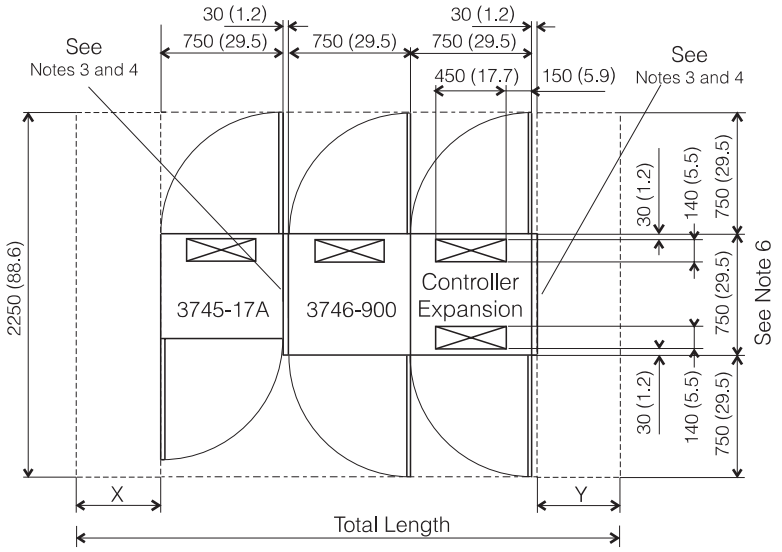
Total Width

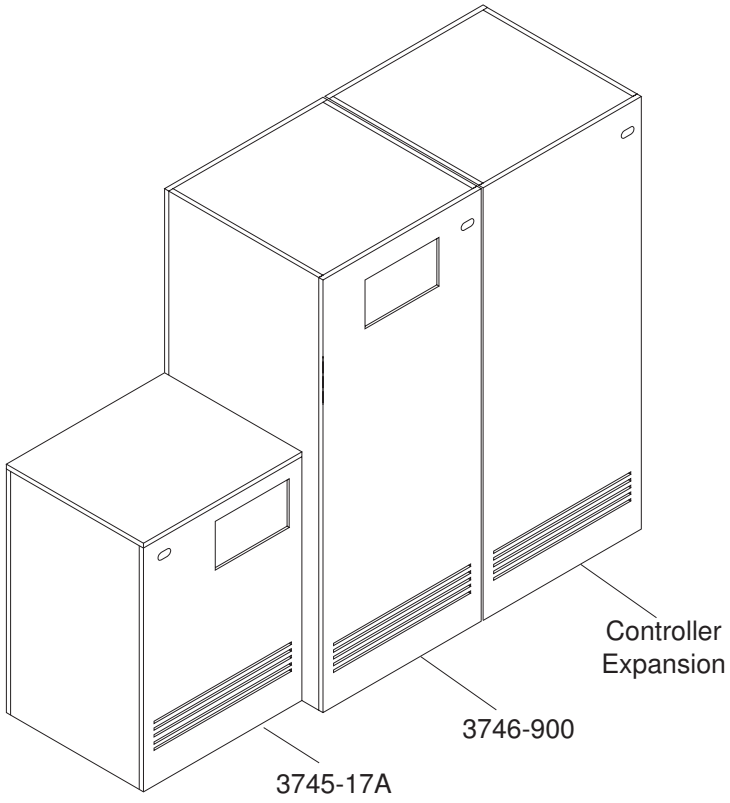
As a general rule, the front-to-rear service clearance is 2250 mm (88.6 in.).

The exception to this rule is when either a 3746-900 (or 3746-950) or Controller Expansion (or both) is installed. These frames have larger doors (750 mm) than the other frames; therefore, adding 50 mm (2.0 in.) in front and 50 mm in the back makes it easier to open and close the doors.

3745 Model 17A with a 3746 Model 900 and Controller Expansion

For the notes in the following diagram, refer to page 7.

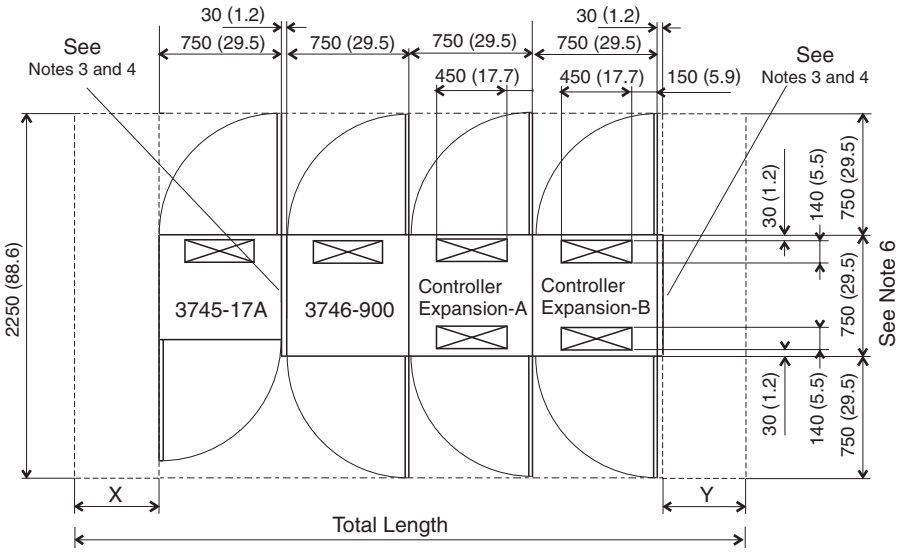


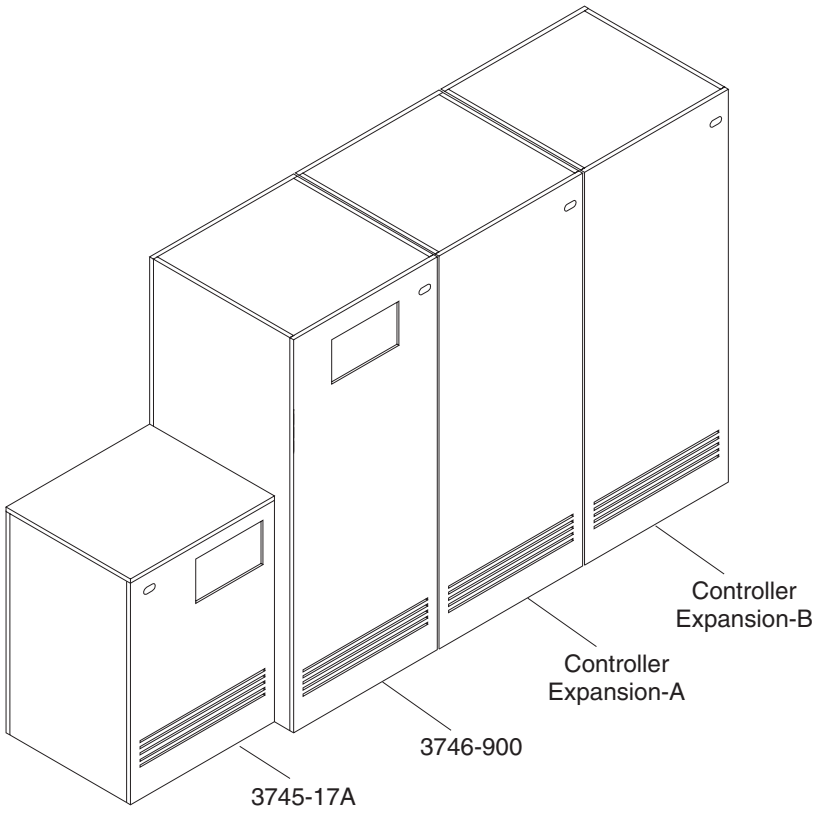


The 3746-900 and the Controller Expansion (FC 5023) can be installed on the right or the left side of the 3745. The Controller Expansion can be installed separately from the 3745-17A (refer to page 11). The X and Y dimensions depend on your configuration (refer to Table 3 on page 13). Total length is explained on page 1.

3745 Model 17A with a 3746 Model 900 and Both Controller Expansions A and B.

For the notes in the following diagram, refer to page 7.

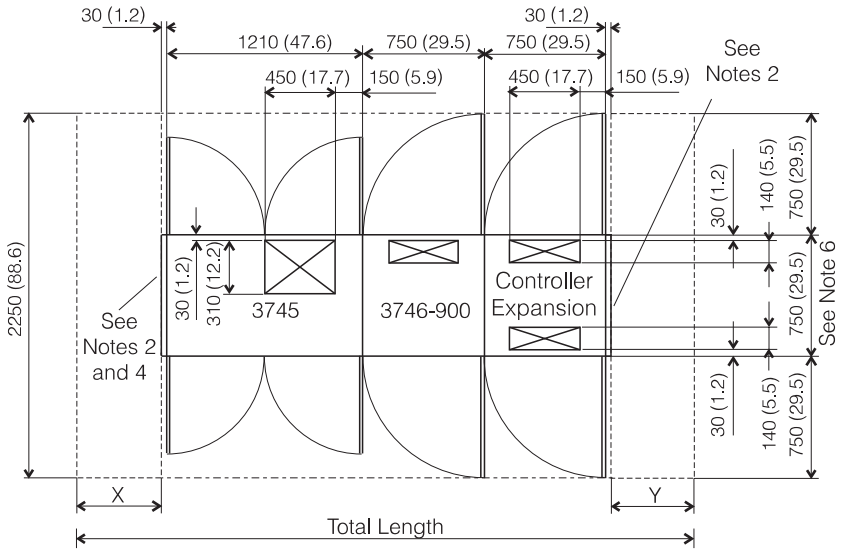


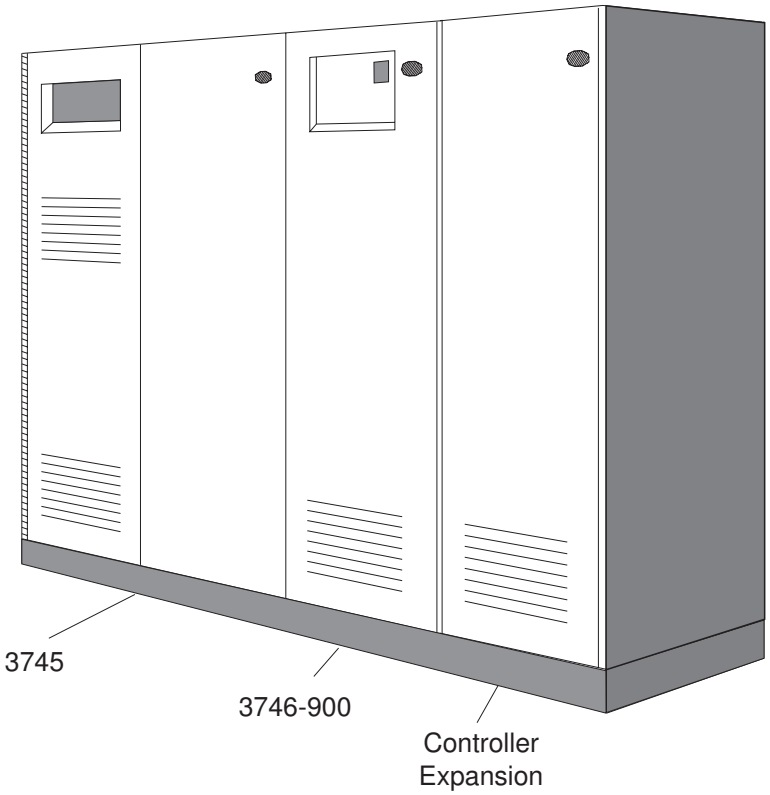


The 3746-900 and the Controller Expansion (FC 5023) can be installed on the right or the left side of the 3745. The Controller Expansion can be installed separately from the 3745-17A (refer to page 11). Both Controller Expansions A and B are optional. The X and Y dimensions depend on your configuration (refer to Table 3 on page 13). Total length is explained on page 1.

3745 Models 21A, 31A, 41A, or 61A with a 3746-900 and One Controller Expansion

For the notes in the following diagram, refer to page 7.

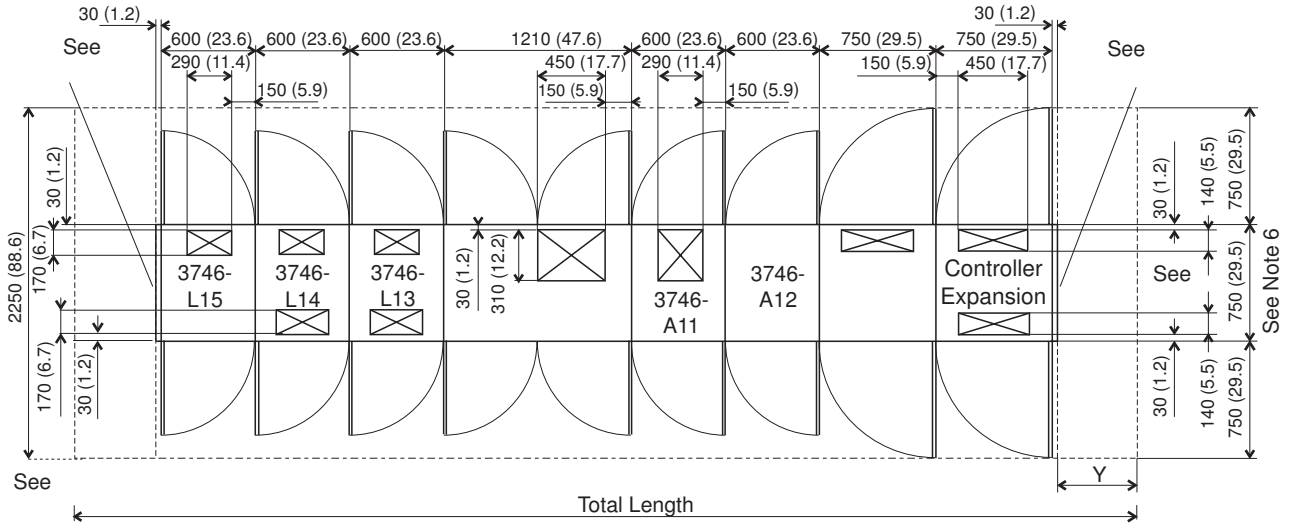


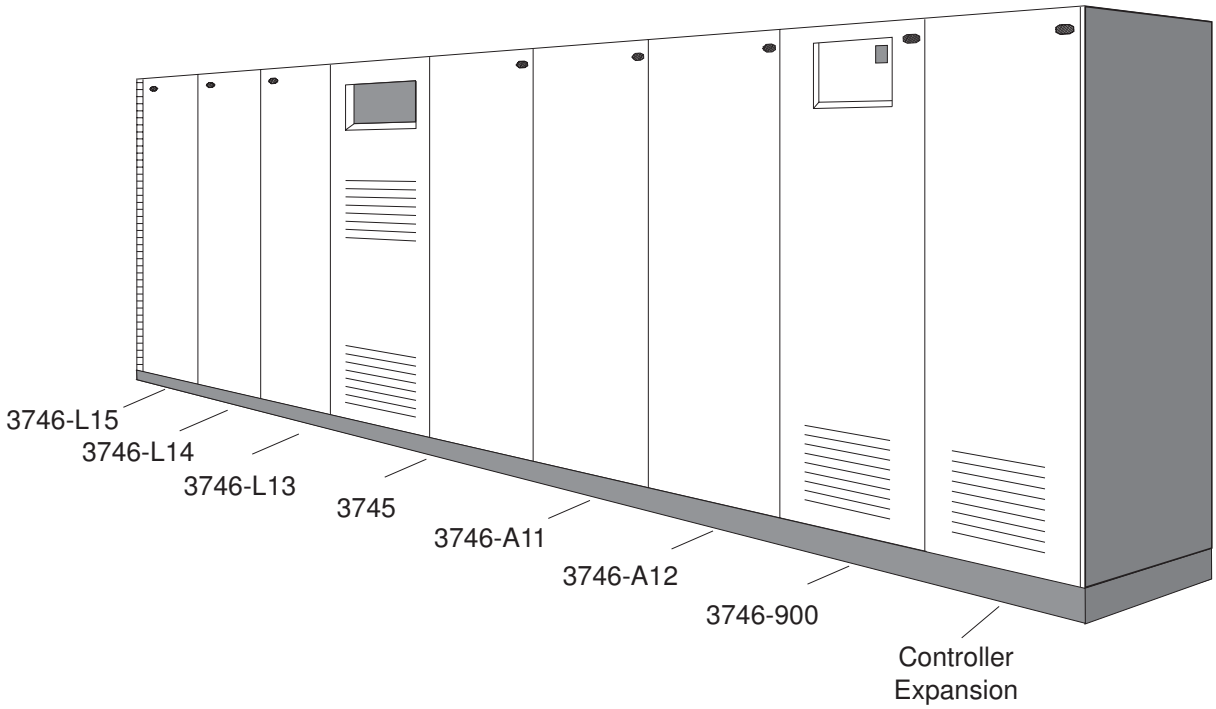


The Controller Expansion (FC 5023) can be installed on the right or the left side of the 3745 or can be installed separately from the 3745 (refer to page 11). The X and Y dimensions depend on the configuration (refer to Table 3 on page 13). Total length is explained on page 1.

3745 Models 21A, 31A, 41A, or 61A Maximum Configuration with a 3746-900 and One Controller Expansion

For the notes in the following diagram, refer to page 7.

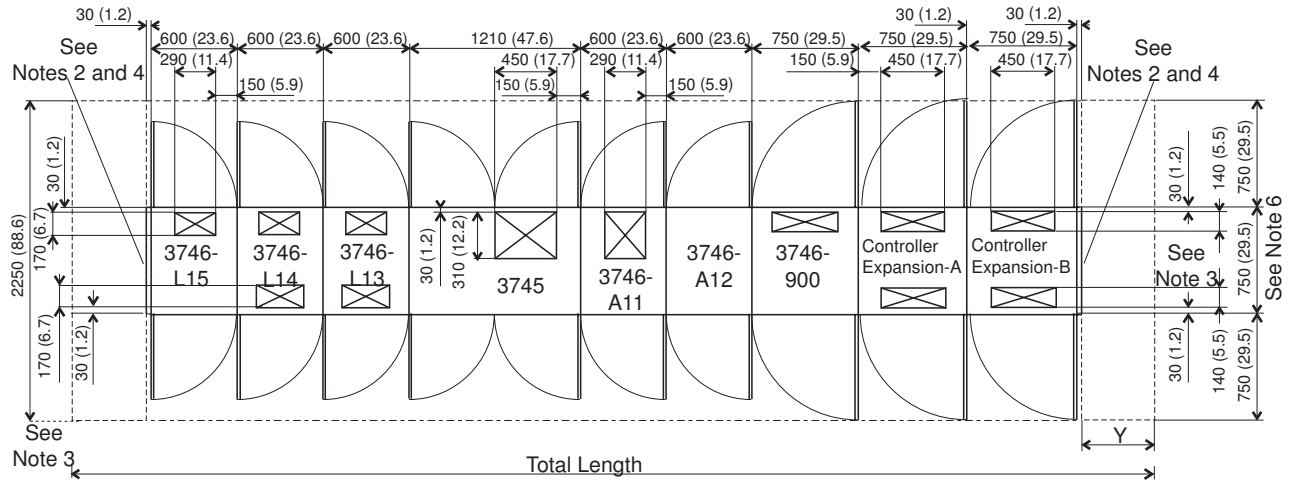


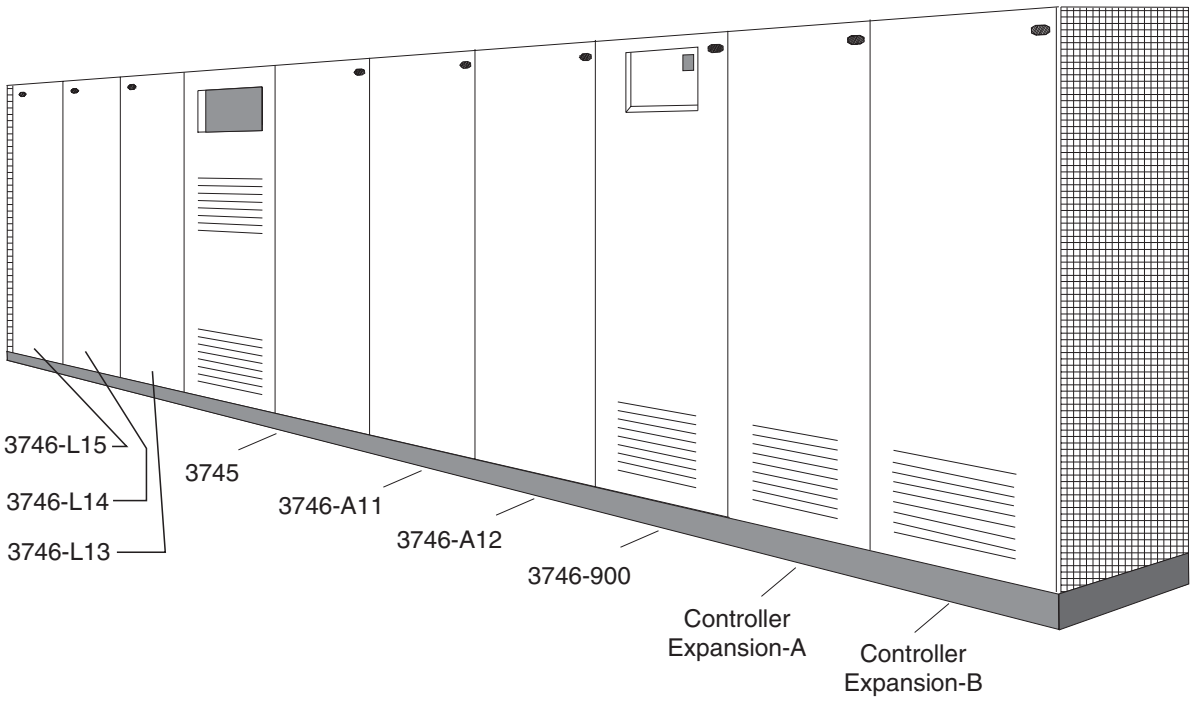


The Controller Expansion (FC 5023) can be installed on the right or the left side of the 3745 or can be installed separately from the 3745 (refer to page 11). The X and Y dimensions depend on the configuration (refer to Table 3 on page 13). Total length is explained on page 1.

3745 Models 21A, 31A, 41A, or 61A Maximum Configuration with a 3746-900 and Both Controller Expansions A and B

For the notes in the following diagram, refer to page 7.





The Controller Expansion (FC 5023) can be installed on the right or the left side of the 3745 or can be installed separately from the 3745 (refer to page 11). Both Controller Expansions A and B are optional. The X and Y dimensions depend on the configuration (refer to Table 3 on page 13). Total length is explained on page 1.

Notes:

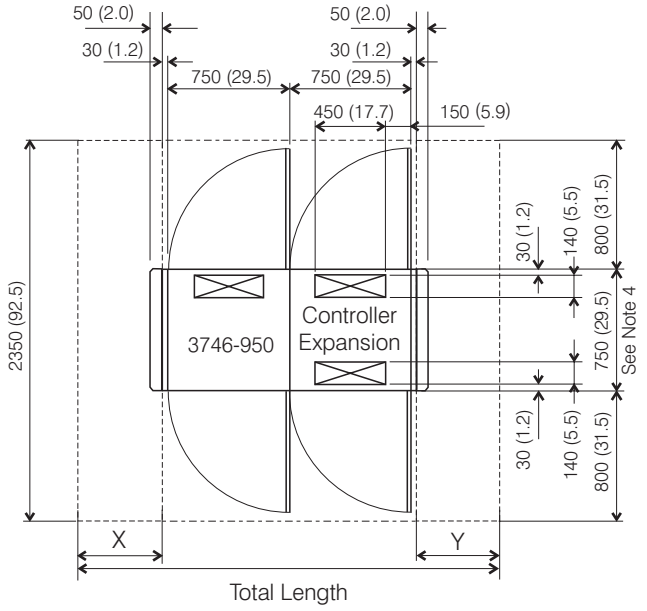
1. 3745 Models 21A and 41A and 3746 Models A11, A12, L13, L14 and L15 are no longer available from IBM.
2. Cable entry and exit area locating dimensions are measured from edge of frame, not covers. The casters must not be less than 75 mm (3 in.) from a hole under a frame.
   - The 3745-x1A, the 3746-9x0, and Controller Expansion have four swiveling castors.
   - The 3745-17A and the 3746-A11 to L15 have:
     – Two swiveling castors on the front side
     – Two fixed castors on the rear side

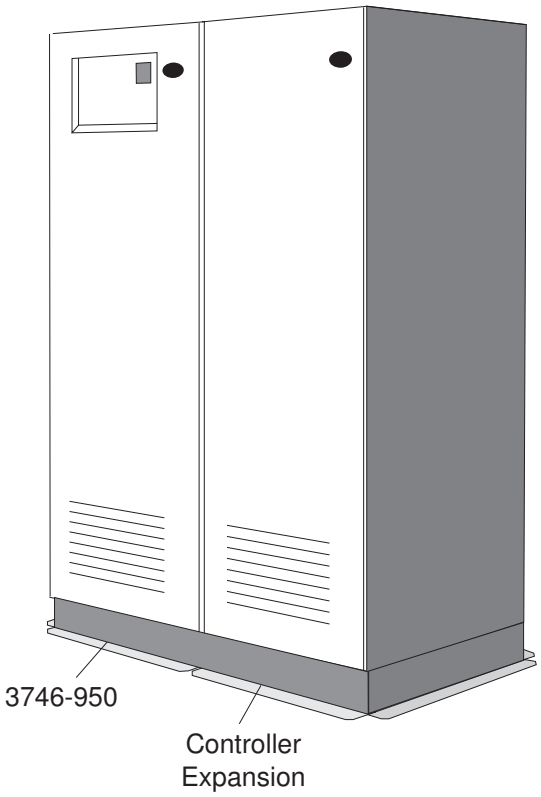
   Leveling pads are delivered with each unit.
3. Side ground plates are delivered with the 3745 Models 21A to 61A. When a 3746-900 or Controller Expansion is installed, these plates are relocated to the end of the configuration by the IBM service representative. Cutaways in the ground plates correspond to the cable entry and exit areas shown in the plan views.
4. Side covers are delivered with the 3746-900 configured for the 3745-17A. When the Controller Expansion feature is installed, one of these covers is relocated to the end of the Controller Expansion by the IBM service representative.
5. The 3745 Models 21A to 61A are shipped with side covers. When a 3746-900 or the Controller Expansion is installed, the 3745 side covers are relocated to the end of the 3746-900 or Controller Expansion by the IBM service representative.
6. A raised floor is recommended.
   - For 3745 Models 21A to 61A, a raised floor is required if one of the following conditions is present:
     – A 3746-900 is connected to the base frame (3745).
     – The base frame (3745) is channel-attached.
     – More than 32 attachments (low-speed lines, high-speed lines, Ethernet lines, and token-ring lines) are connected to the base frame (3745).
   - For 3745 Model 17A, a raised floor is required if one of the following conditions is present:
     – A 3746-900 is connected to the base frame (3745).
     – More than 64 external cables (LIC cables, high-speed line cables, Ethernet cables, token-ring cables).
     – More than two LIC base features.
     – Two parallel channel attachments with blue cables (part number 5460185), or one parallel channel attachment with a gray cable (part number 5353920).

   When no raised floor is installed, the cables should be protected with ramps or trenches.
7. Dimension includes front and rear covers that are 30 mm (1.2 in.) each.

3746-950 with a Controller Expansion (FC 5023)

For the notes in the following diagram, refer to page 12.



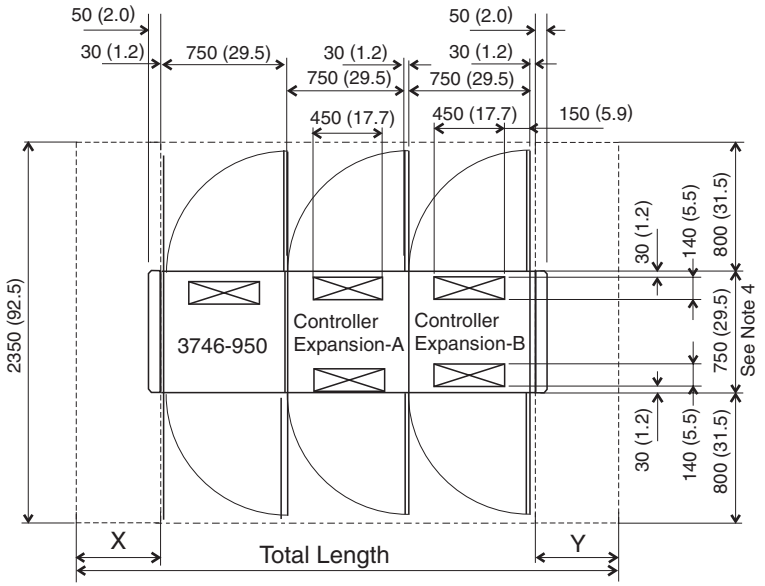


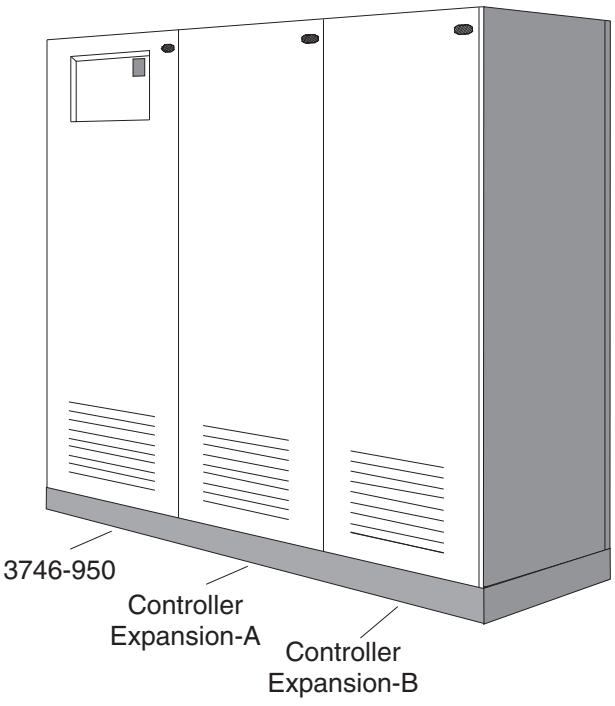
The Controller Expansion can be installed on either the right or the left side of the 3746-950.

Total length is explained on page 1.

3746-950 with Two Controller Expansions (A and B)

For the notes in the following diagram, refer to page 12.

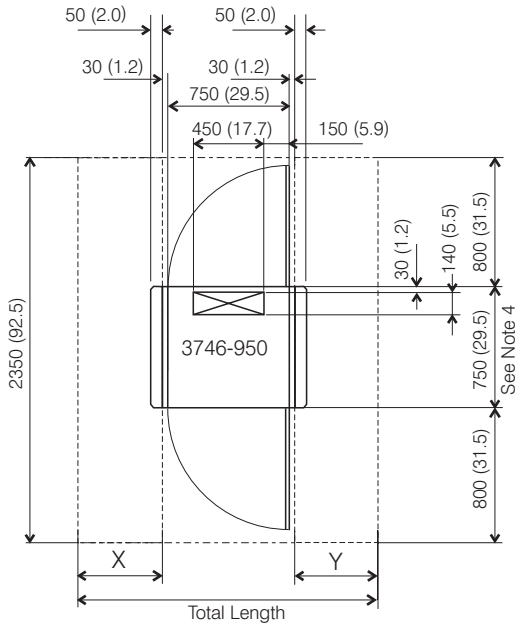


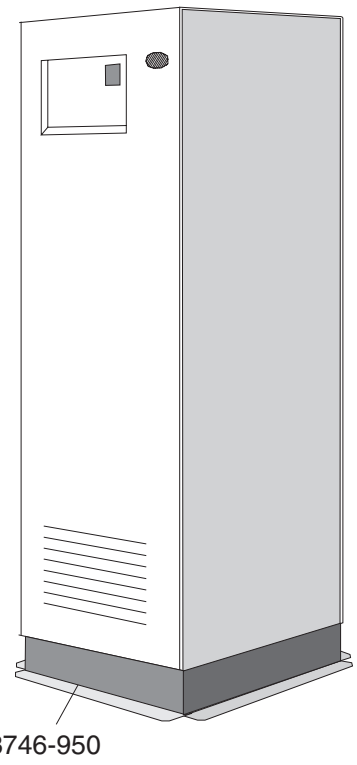


This is an example configuration. Controller Expansion-A and -B can be installed together, but separate from the 3746-950 box. Refer also to notes 5 and 6 on page 12.

3746-950 Standing Alone

For the notes in the following diagram, refer to page 12.

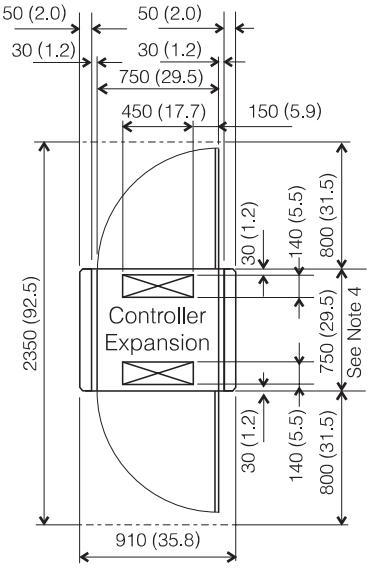


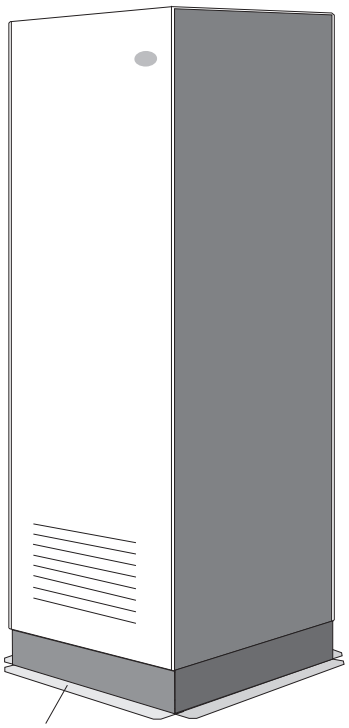


Total length is explained on page 1.

Controller Expansion (FC 5023) Standing Alone

For the notes in the following diagram, refer to page 12.





Controller
Rack

Refer to notes 5 and 6 on page 12.

Notes (3746-950):

1. Cable entry and exit area locating dimensions are measured from edge of frame, not covers.
2. The 3746-950 and Controller Expansion have four swiveling castors. The castors must not be less than 75 mm (3 in.) from a hole under a frame.
3. A raised floor is recommended.

   When no raised floor is installed, the cables should be protected with ramps or trenches.
4. Dimension includes front and rear covers that are 30 mm (1.2 in.) each.
5. For the Controller Expansion standing alone or standing next to a 3745-17A (with no 3746-900), the side cover (FC 5024) must be ordered. It includes the side cover ground plates. The side covers and ground plates are installed by the IBM service representative for radio frequency interference (RFI) and electric static discharge (ESD) protection of the machine.
6. The Controller Expansion can be located about 6 m (20 ft) from the 3746-900 or 3746-950 when using the standard cable shipped with the 3746. For installation more 6 m (20 ft) from the 3746 frame, refer to the information about longer cables on page 74.

   If the Multiaccess Enclosure (MAE FC 3001) is part of the 3746 configuration, the Controller Expansion, which houses the MAE, cannot be more than 6 m (20 ft) from the 3746 frame.

Service Clearances and Floor Loading

Table 3 is based on IBM's method of calculating floor loading. The side clearance is not a service requirement; it ensures that the weight distribution of the 3745 and 3746 units meets IBM standards.

The side service clearances depend on the strength of the raised floor. Your facilities management personnel should be consulted to determine the floor load rating that is installed. Table 3 shows the required side service clearances for different types of raised floor.

Table 3 (Page 1 of 2). Floor Loading an Service Clearances

Configuration (See note 1)	Floor Loading Rating		Total End Clearance (X+Y)	
	kg/m²	lb/ft²	mm	in.
3745-17A	300	61	0	0
3745-17A + Controller Expansion	320	65	0	0
3745-17A + 3746-900	345 365 390	70 74 79	650 400 0	25.6 15.7 0
3745-17A + 3746-900 + Controller Expansion See page 2.	345 372	70 75	550 0	21.6 0
Controller Expansion (FC 5023). See page 11.	345	70	0	0
3745-x1A.	345 365	70 74	1150 850	45.3 33.5
3745-x1A + Controller Expansion	345 365	70 74	1000 700	39.4 27.6
3745-x1A + 3746-900 (1 ac input)	345 365 390	70 74 79	1900 1400 950	74.8 55.1 37.4
3745-x1A + 3746-900 (2 ac inputs or 1 ac + 1 dc input)	345 365 390	70 74 79	1900 1750 1250	74.8 55.1 49.2
3745-x1A + 3746-900 + Controller Expansion (1 ac input) See note 1 and page 4.	345 365 390	70 74 79	1900 1400 950	74.8 55.1 37.4
3745-x1A + 3746-900 + Controller Expansion (2 ac inputs or 1 ac + 1 dc input) See page 4.	345 365 390	70 74 79	1900 1750 1250	74.8 55.1 49.2
3745-x1A + 3746-A11	345 365 390	70 74 79	1800 1300 850	70.9 51.2 33.5
3745-x1A + 3746-A11 + 3746-900	345 365 390	70 74 79	2500 1700 1500	98.4 66.9 59.1
3745-x1A + 3746-A11 + 3746-900 **+ Controller Expansion** See note 2.	345 365 390	70 74 79	2500 1700 1500	98.4 66.9 59.1

Notes:

1. x1A = 21A, 31A, 41A, or 61A.
2. With this configuration, X and Y must be split into two areas: X or Y must be 750 mm minimum and the remaining length on the other side.
3. The maximum configuration includes the 3746-A11 and L-13 plus any combination of 3746-A12, -L14, and L-15 frames.

Table 3 (Page 2 of 2). Floor Loading an Service Clearances

Configuration (See note 1)	Floor Loading Rating		Total End Clearance (X+Y)	
	kg/m²	lb/ft²	mm	in.
3745-x1A + 3746-A11 + 3746-L13	345 365 390	70 74 79	1700 1300 750	66.9 51.2 29.5
3745-x1A + 3746-A11 + 3746-L13 + 3746-900 See note 2.	345 365 390	70 74 79	2750 2000 1500	108.3 78.7 59.1
3745-x1A + 3746-A11 + 3746-L13 + 3746-900 + Controller Expansion See note 2.	345 365 390	70 74 79	2450 1500 1500	96.5 59.1 59.1
3745-x1A Maximum Configuration + 3746-900 See notes 2 and 3.	345 365 390	70 74 79	3000 1600 1500	118.1 63.0 59.1
3745-x1A Maximum Configuration + 3746-900 + Controller Expansion See notes 2 and 3 on page 7.	345 365 390	70 74 79	3000 1600 1500	118.1 63.0 59.1
3746-950 See page 10.	345 365 390	70 74 79	890 690 440	35.0 27.1 17.3
3746-950 + Controller Expansion See page 8.	345 365 390	70 74 79	890 520 190	35.0 20.5 7.5
3746-950 + 2 Controller Expansion See page 9 ***s***.	345 365 390	70 74 79	890 520 190	35.0 20.5 7.5

Notes:

1. x1A = 21A, 31A, 41A, or 61A.
2. With this configuration, X and Y must be split into two areas: X or Y must be 750 mm minimum and the remaining length on the other side.
3. The maximum configuration includes the 3746-A11 and L-13 plus any combination of 3746-A12, -L14, and L-15 frames.

Ground Leakage Current (Power Supplies Only)

The ground leakage current for a 3745-21A, 31A, 41A, or 61A must not exceed 500 mA rms in any configuration.

The ground leakage current for the 3745-17A must not exceed 3.5 mA rms.

The ground leakage current for the 3746-9x0 and Controller Expansion (FC 5023) (or user-supplied rack) must not exceed 3.5 mA rms per power cord.

Physical Specifications

For service processor specifications, refer to page 35.

Dimensions

Frame	Width (See note)	Depth	Height
3745-17A	750 mm (29.5 in.)	650 mm (25.75 in.)	1 000 mm (39.5 in.)
3745-21A, 31A, 41A, 61A	1 210 mm (47.75 in.)	750 mm (29.5 in.)	1 775 mm (70 in.)
3746-900, 950	750 mm (29.5 in.)	750 mm (29.5 in.)	1 775 mm (70 in.)
3746-A11, A12, L13, L14, L15	600 mm (24 in.)	750 mm (29.5 in.)	1 775 mm (70 in.)
Controller Expansion (FC 5023)	750 mm (29.5 in.)	750 mm (29.5 in.)	1 775 mm (70 in.)
Multiaccess Enclosure (FC 3000 and FC 3001)	480 mm (18.9 in.)	358 mm (14.1 in.)	572 mm (22.5 in.)
Note: These dimensions exclude side covers.			

Weight

Frame	Weighs less than:
3745-17A	230 kg (510 lb)
3745-21A, 31A, 41A, 61A	680 kg (1496 lb)
3746-900 (1 ac)	390 kg (858 lb)
3746-900 (2 ac)	446 kg (982 lb)
3746-950 (1 ac)	410 kg (904 lb)
3746-950 (2 ac)	466 kg (1027 lb)
3746-A11	320 kg (704 lb)
3746-A12, L13, L14, L15	240 kg (528 lb)
Controller Expansion (FC 5023) (Populated)	288 kg (633 lb)

Heat Output

Frame	Maximum Heat Output	
	kW	(kBTU/hr)
3745-17A	0.8	(2.6)
3745-21A, 41A	2.6	(8.9)
3745-31A, 61A	2	(6.9)
3746-900, 950	2.2	(7.7)
3746-A11	1.2	(4.1)
3746-A12	0.5	(1.7)
3746-L13	0.6	(2.1)
3746-L14	0.6	(2.1)
3746-L15	0.6	(2.1)
Controller Expansion (FC 5023) (Populated)	1.4	(4.9)

Airflow

A forced air ventilation system is installed inside each 3745/3746 frame.

Frame	Airflow
3745-17A	7.5 m^3/min (260 cfm)
3745-21A, 31A, 41A, 61A	18 m^3/min (635 cfm)
3746-900, 950	18 m^3/min (635 cfm)
3746-A11	24 m^3/min (850 cfm)
3746-A12, L13, L14, L15	12 m^3/min (425 cfm)
3746-L13	5 m^3/min (180 cfm)
3746-L14	5 m^3/min (180 cfm)
3746-L15	5 m^3/min (180 cfm)
Controller Expansion (FC 5023) with Multiaccess Enclosure (FC 3000 or FC 3001)	2 m^3/min (71 cfm)

Acoustical Data

For definitions, see “Acoustics” in Chapter 3 of *IBM General Information Manual: Installation Manual-Physical Planning,* GC22-7072, and *IBM Acoustical Product Specifications*, CS1-1710.

Model		LwAd		I	T
		Operating (bels)	Idling (bels)		
3745-17A Operating at 208 V 60 Hz or at 220 V 50 Hz		7.0	7.0	No	No
3745-21A, 31A, 41A, 61A Operating at 208 V 60 Hz	3745 alone	7.5	7.5	No	No
	3745 and 3746-L13 and 3746-A11	7.8	7.8	No	No
3745-21A, 31A, 41A, 61A Operating at 380 V 50 Hz	3745 alone	7.5	7.5	No	No
	3745 and 3746-L13 and 3746-A11	7.8	7.8	No	No
3746-9x0 Operating at 208 V 60 Hz or at 220 V 50 Hz		7.5	7.5	No	No

Environmental Specifications

Table 4. 3745 and 3746-9x0 Environmental Specifications

	Operating Environment	Non-operating Environment
Temperature	10°C - 38°C (50°F - 100°F)	10°C - 43°C (50°F - 110°F
Relative Humidity	8% - 80%	8% - 80%
Max Wet Bulb	23°C (73°F)	27°C (80°F)

Lightning Protection

The power input of the 3745, 3746-900, 3746-950, and Multiaccess Enclosure (FC 3000 and FC 3001) are protected against lightning.

Contact an electrical contractor to determine if lightning protection is needed for your power distribution system.

The line interface coupler (LIC), Active Remote Connector (ARC), token-ring, high-speed line, and service processor cables are not protected against lightning and must be placed in the same building as the 3745/3746 units.

Electromagnetic Interference (3745, 3746-9x0, and Controller Expansion)

1. The 3745/3746-9x0 and Controller Expansion (physically attached to the 3746-9x0 or not) is always compatible with the following electromagnetic interference standards:
   - CISPR Publication 22 (1993), Class A (International)
   - FCC, Part 15, Class A (U.S.A.)
   - VCCI Class A (Japan)
   - EN 55022 (1994), Class A (Europe).
2. If a 3745-950 (with or without a physically attached controller expansion) or a controller expansion (installed separately from any 3745/3746-9x0) is installed on a raised metallic floor with the cabling underneath this floor, then the following standards apply to the 3746-950 or the Controller Expansion:
   - CISPR Publication 22 Class B (International)
   - EN 55022 Class B (Europe)
   - VCCI Class B (Japan).
3. The Line Connection Boxes (LCBs), whenever configured, must be installed inside the 3746-9x0 or the Controller Expansion frame to comply with Class B.
4. A Controller Expansion (physically attached to the 3746-950 or not) equipped with a Multiaccess Enclosure (FC 3000 or FC 3001) is always compatible with the following electromagnetic interference standards:
   - CISPR Publication 22 Class A
   - FCC, Part 15, Subpart J, Class A (U.S.A.)
   - General Operating Permit (GOP)(Germany)
   - VCCI Class A and IEC 1000-3-2 (Japan).

Power Requirements

3745 Models 21A, 31A, 41A, and 61A, and 3746 Models A11, A12, L13, L14, and L15

The 3745 power system has an external power cord. It distributes power to the attached 3746 Models A11, A12, L13, L14, and L15.

Note: The 3746 Nways Multiprotocol Controller Model 900 and 950 have their own power supply and external power cords. The Controller Expansion (FC 5023) has its own external power cords.

Countries/Regions	Freq.	Voltages (Nominal)	Phase Distribution System	Wiring (Note 1)	Power Factor	Maximum Machine Load (Amperes) (Notes 1 and 2)	Inrush Current (Amperes at first cycle)
U.S.A. and Canada	60 Hz	208/240	Three phases phase–to–phase	Four–wire	0.65	31.6	230
Europe, Middle East and Africa Latin America Asia Pacific (except Japan)	60 Hz	208/220	Three phases phase–to–phase (delta)	Four–wire	0.65	31.6	230
	50 Hz	200/415		Four–wire		33	230
	60 Hz	380/415	Three phases phase–to–neutral (wye)	Five–wire	0.65	17.3	150
	50 Hz	380/415		Five–wire			
Japan	60 Hz	200/240	Three phases phase–to–phase	Four–wire	0.65	33	230
	50 Hz	200/240		Four–wire			

Notes:

1. Four-wire configurations include three phase wires and one ground (earth).

   Five-wire configurations include three phase wires, one ground, and one neutral that are mandatory in the wye system.

2. Maximum load per phase under minimum nominal voltage.

3. A phase load imbalance of 1.2 is included.

3745 Model 17A

The 3746 Model 900 has its own power supply and external power cords. The Controller Expansion (FC 5023) has its own external power cords.

Countries	Freq	Voltages (Nominal) (Note 1)	Phases	Wiring (Note 2)	Power Factor	Maximum Current (Amperes)	Inrush Current (Amperes at first cycle)
U.S.A. and Canada	60 Hz	200–208/220/240	One	Three–wire	0.6	5.5	100
Europe, Middle East, and Africa	50 Hz	200/220–230/240	One	Three–wire	0.6	5.5	100
Latin America	60 Hz	200/220–230/240					
Asia Pacific							

Notes:

1. In some countries, 120 V power is available by ordering RPQ 7L1184.
2. Includes two phase wires and one ground (earth) wire.

3746 Models 900 and 950

The 3746 has a basic ac power supply and power cord and, optionally, a second ac power supply and power cord.

Note: The dc power supply is no longer available from IBM.

Ac Power at Each Inlet

Countries	Freq	Voltages (Nominal) (See Note 1)	Phases	Wiring (See Note 2)	Power Factor	Maximum Current (Amperes)
U.S.A./Canada	60 Hz	200–208/220/240	One	Three–wire	0.75	8
Europe, Middle East, Africa Latin America	50 Hz	200/220–230/240	One	Three–wire	0.75	8
	60 Hz	200/220–230/240				
Asia Pacific	50 Hz	200/220–230/240	One	Three–wire	0.75	8
	60 Hz	200/220–230/240				

Notes:

1. The ac power supplies have three voltage possibilities. For example, 200-208/220/240 means that the first position has a range from 200 to 208 V ac. The second position is for 220 V ac and the third is 240 V ac.
2. Includes two phase wires and one ground (earth) wire.

Maximum Inrush Current

Maximum Inrush Current (A) Verses Duration (ms)					
A	160	192	256	288	400
ms	20	12	10	9	8

Dc Power

Note: The dc power supply is no longer available from IBM.

Input voltage	-44.5 V to -60.0 V
Maximum Continuous Current	26 A
Maximum Inrush Current	400 A during 5 ms
Wiring	2 wires plus one ground (earth) wire. Positive and ground lines connected to DC common and machine frame.

Controller Expansion (FC 5023)

The Controller Expansion has one or two ac power inlets, each powering an ac outlet distribution box. Each box provides eight 220 V ac sockets for components described in 49.

Countries	Freq	Voltages (Nominal)	Phases	Wiring See Note 1	Maximum Current (Amperes) See Note 2
U.S.A. and Canada	60 Hz	200–240	One	Three–wire	12
Europe, Middle East, and Africa	50 Hz	200–240	One	Three–wire	12
Latin America Asia Pacific	60 Hz	200–240			

Notes:

1. Includes two phase wires and one ground (earth) wire.
2. Sockets labeled J1, J2, J3, and J4 can handle a total of 6 A (fuse F1). Sockets labeled J5, J6, J7, and J8 can handle a total of 6 A (fuse F2).
3. You can have up to two Controller Expansions.

Multiaccess Enclosure

The Multiaccess Enclosure has a basic ac power supply and an optional power supply.

The ac power is supplied from an ac socket of the Controller Expansion that houses the Multiaccess Enclosure and uses:

- Nominal voltage of 200 to 240 V ac, single phase.
- Frequency of 50 or 60 Hz. The power supply is a universal auto-sensing type.
- Wiring: three-wire, rated for 0.65 kVA of power.
- Maximum current is 3 A. (70 amps peak inrush current for one quarter cycle per power supply.)

Power Input

The 50- or 60-Hz power input requirements are:

Frame	Maximum kVA
3745-17A	1.1
3745-210, 310, 410, 610, 21A, 31A, 41A, and 61A	4.0
3746-900	1.8
3746-950	1.8
3746-A11	1.8
3746-A12	0.8
3746-L13, -L14, and -L15	0.9
Controller Expansion (FC 5023)	2.9

The minimum branch circuit rating should be calculated by an electrical contractor according to country regulations. For example, in the U.S.A. and in Canada, the minimum branch circuit rating is for:

- 3745 Models 21A, 31A, 41A, or 61A base frame: 15 A per phase
- 3745 Models 21A, 31A, 41A, or 61A maximum configuration: 40 A per phase
- 3745 Model 17A maximum configuration: 10 A
- 3746-900: 15 A
- 3746-950: 15 A
- Controller Expansion (FC 5023): 15 A.

Power Cord Characteristics

3745 Model 17A

Voltages	Cable Outside Diameter mm (in.)	Number of Conductors	AWG Number AWG (mm^2)
200 - 240 single phase (ac)	U.S.A./Japan 9.5 (0.4) Other 8.5 (0.37)	2 plus ground (earth)	14 (2)

3745 Models 21A, 31A, 41A, and 61A

Voltages	Cable Outside Diameter mm (in.)	Number of Conductors	AWG Number AWG (mm^2)
200 - 240 delta configuration	25.9 (1.2)	3 plus ground (earth)	8 (8.4)
380 - 440 wye configuration	21.7 (0.85)	4 plus ground (earth)	10 (5.3)

The power wiring configuration can be changed on-site from wye to delta and from delta to wye. Contact your IBM representative.

3746 Models 900 and 950

Voltages	Cable Outside Diameter mm (in.)	Number of Conductors	AWG Number AWG (mm^2)
200 - 240 single phase (ac)	U.S.A./Japan 9.5 (0.4) Other 8.5 (0.37)	2 plus ground (earth)	14 (2)
-41.3 to -60.0 (dc)	All Countries 22.5 (0.88)	2 plus ground (earth)	8 (8)

Controller Expansion

If you have two Controller Expansions, these requirements refer to both.

Voltages	Cable Outside Diameter mm (in.)	Number of Conductors	AWG Number AWG (mm^2)
200 - 240 single phase (ac)	U.S.A./Japan 9.5 (0.4) Other 8.5 (0.37)	2 plus ground (earth)	14 (2)

Power Cord Length

A 4.3 m (14-ft) power cord is shipped with the 3745. One or two 4.3 m (14-ft) power cords are shipped with each 3746-9x0 and Controller Expansion, depending on how many power inlets are ordered. In Chicago, Illinois, U.S.A., a 1.8 m (6-ft) power cord is shipped instead, provided that the controller configuration includes the specific code 9986.

Power Cord Plug and Receptacle

The ac power cord is supplied with a country-dependent plug. The dc power cord for the 3746-9x0 is supplied with a terminal to fit an M6 or 0.250 - 20 UNC plug. You must provide a receptacle, as shown in the following tables. The branch circuit rating should match the receptacle rating.

The approved plug for the specific location and installation should be installed by an electrical contractor. The green/yellow grounding wire of the power cable ***must*** be attached to the ground leg of the power plug.

U.S.A., Canada, and Mexico

Table 5. Receptacle Types Needed in the U.S.A., Canada, and Mexico

Frame	Plug Type	Plug	Ordering Code	Receptacle Type
3745-17A	Moisture Resistant	Russelstoll 3720-DPU2	9020	Russelstoll 3913U-2 (inline) or 3743U-2 (box type)
	Locking	NEMA L6-15P	9890	NEMA L6-15R
	Nonlocking	NEMA 6-15P	9830*	NEMA 6-15R
3745-21A, -31A, -41A, -61A	Moisture Resistant	Russelstoll 7328-78	None	Russelstoll 7428 (inline) or 7324 (box type)
3746-900/950 (ac input)	Moisture Resistant	Russelstoll 3720-DPU2	9027	Russelstoll 3913U-2 (inline) or 3743U-2 (box type)
	Locking	NEMA L6-15P	9894	NEMA L6-15R
	Nonlocking	NEMA 6-15P	9895	NEMA 6-15R
Controller Expansion (FC 5023)	Moisture Resistant	Russelstoll 3720-DPU2	9028	Russelstoll 3913U-2 (inline) or 3743U-2 (box type)
	Locking	NEMA L6-15P	9898*	NEMA L6-15R
	Nonlocking	NEMA 6-15P	9038	NEMA 6-15R

Note: * No longer available from IBM.

Japan

Table 6. Receptacle Types Needed in Japan

Frame	Plug Type	Plug	Ordering Code	Receptacle Type
3745-17A	Locking	NEMA L6-15P	9890	NEMA L6-15R
	Nonlocking	NEMA 6-15P	9830*	NEMA 6-15R
3745-21A, -31A, -41A, -61A	Moisture Resistant	Hirose Electric CL105-0091	None	Hirose Electric CL105-0092
3746-900/950 (ac input)	Locking	NEMA L6-15P	9892 (50 Hz) 9894 (60 Hz)	NEMA L6-15R
	Nonlocking	NEMA 6-15P	9893 (50 Hz)* 9895 (60 Hz)	NEMA 6-15R
Controller Expansion (FC 5023)	Locking	NEMA L6-15P	9898*	NEMA L6-15R
	Nonlocking	NEMA 6-15P	9838	NEMA 6-15R

Note: * No longer available from IBM.

Other Countries or Regions

Table 7. Receptacle Types Needed in Other Countries or Regions

Frames	Plug Type
3745-21A, -31A,-41A, -61A	No plug shipped
3745-17A 3746-900/950 (ac input) Controller Expansion (FC 5023)	Country standard plug. Refer to pages 26 and 29.

Country Frequency and Power Plug Identification

In Table 8, the second column (3745 Plug) and third column (3746-900/950 and Controller Expansion Plug) refer to the power plugs shown on page 29.

Table 8 (Page 1 of 3). Country Frequency and Power Plug Identification

Country or Region	Freq. (Hz)	Plug Type	
		3745-17A	3746-900/950 and Controller Expansion
Afghanistan	50	18	18
Albania	50	18	18
Algeria	50	18	18
Andorra	50	18	18
Angola	50	18	18
Argentina	50	6	54
Australia	50	6	54
Austria	50	18	18
Bahamas	60	5	5
Bahrain	50	23	46
Bangladesh	50	22	22
Barbados	50	6	54
Belgium	50	18	18
Benin	50	18	18
Bermuda	60	5	5
Bolivia	50	6	54
Bosnia	50	18	18
Brazil	60	5	5
Brunei	50	23	46
Bulgaria	50	18	18
Burma	50	22	22
Cameroon	50	18	18
Canada	60	5/10/34	5/10/34

Table 8 (Page 1 of 3). Country Frequency and Power Plug Identification

Country or Region	Freq. (Hz)	Plug Type	
		3745-17A	3746-900/950 and Controller Expansion
Central African Republic	50	18	18
Chad	50	18	18
Channel Islands	50	23	46
Chile	50	25	25
China	50	6	54
Colombia	60	5	5
Congo Brazzaville	50	18	18
Costa Rica	60	5	5
Croatia	50	18	18
Cyprus	50	23	46
Czech Republic and Slovakia	50	18	18
Denmark	50	19	19
Dominican Republic	60	5	5
Egypt	50	18	18
El Salvador	60	5	5
Ecuador	60	5	5
Ethiopia	50	25	25
Finland	50	18	18
France	50	18	18

Table 8 (Page 2 of 3). Country Frequency and Power Plug Identification

Country or Region	Freq. (Hz)	Plug Type	
		3745-17A	3746-900/950 and Controller Expansion
Germany	50	18	18
Ghana	50	23	46
Greece	50	18	18
Guatemala	60	5	5
Guinea	50	18	18
Haiti	60	5	5
Honduras	60	5	5
Hong Kong	50	23	46
Hungary	50	18	18
Iceland	50	18	18
India	50	23	46
Indonesia	50	18	18
Iran	50	18	18
Iraq	50	23	46
Ireland	50	23	46
Israel	50	32	32
Italy	50	25	25
Ivory Coast	50	18	18
Jamaica	50	6	5
Japan	50/60	5/10	5/10
Jordan	50	23	46
Kenya	50	23	46
Korea	60	5	18
Kuwait	50	23	46
Lebanon	50	18	18
Libya	50	25	25
Liechtenstein	50	24	18
Luxembourg	50	18	18
Macedonia	50	18	18
Malagasy	50	18	18
Malawi	50	23	46
Malaysia	50	23	46
Mali	50	18	18
Malta	50	23	46

Table 8 (Page 2 of 3). Country Frequency and Power Plug Identification

Country or Region	Freq. (Hz)	Plug Type	
		3745-17A	3746-900/950 and Controller Expansion
Martinique	50	18	18
Mauritania	50	18	18
Mauritius	50	18	18
Mexico	60	5/10/34	5/10/34
Monaco	50	18	18
Morocco	50	18	18
Mozambique	50	18	18
Nepal	50	23	46
Netherlands	50	18	18
Netherlands Antil.	60	5	5
New Caledonia	50	18	18
New Zealand	50	6	49
Nicaragua	60	5	5
Niger	50	18	18
Nigeria	50	23	46
Norway	50	18	18
Oman	50	23	46
Pakistan	50	22	22
Panama	60	5	5
Papua New Guinea	50	6	54
Paraguay	50	2	54
Peru	60	5	5
Philippines	60	5	5
Poland	50	18	18
Portugal	50	18	18
Qatar	50	23	46
Romania	50	18	18
Saudi Arabia	50/60	18	18
Senegal	50	18	18
Serbia	50	18	18

Table 8 (Page 3 of 3). Country Frequency and Power Plug Identification

Country or Region	Freq. (Hz)	Plug Type	
		3745-17A	3746-900/950 and Controller Expansion
Sierra Leone	50	23	46
Singapore	50	23	46
Slovenia	50	18	18
Somalia	50	23	46
South Africa	50	22	22
Spain	50	18	18
Sri Lanka	50	22	22
Sudan	50	18	18
Sweden	50	18	18
Switzerland	50	24	46
Syria	50	18	18
Taiwan	60	5	5
Tanzania	50	23	46
Thailand	50	6	5
Togo	50	18	18
Trinidad Tobago	60	5	5

Table 8 (Page 3 of 3). Country Frequency and Power Plug Identification

Country or Region	Freq. (Hz)	Plug Type	
		3745-17A	3746-900/950 and Controller Expansion
Tunisia	50	18	18
Turkey	50	18	18
Uganda	50	23	46
United Arab Emirates	50	23	46
United Kingdom	50	23	46
Upper Volta	50	18	18
Uruguay	50	2	54
U.S.A.	60	5/10/34	5/10/34
USSR	50	18	18
Venezuela	60	5	5
Western Samoa	50	6	5
Yemen	50	23	46
Congo	50	18	18
Zambia	50	23	46
Zimbabwe	50	18	18

Power Plug Types

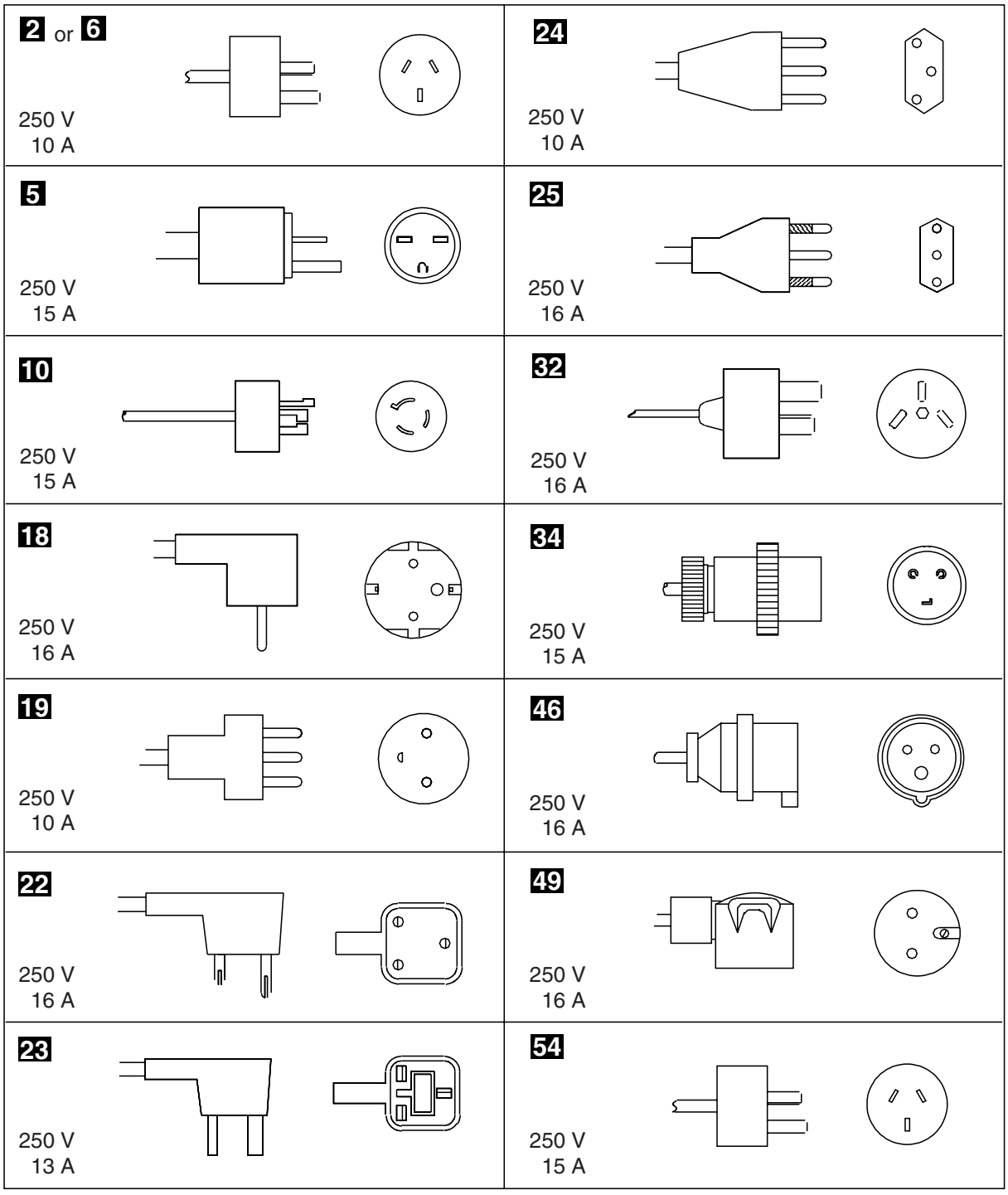


Figure 1. Side and Connector Ends for the Power Plugs

Notes:

1. Plugs 2 and 6 are similar in appearance but have different pin length, thickness, and spacing.
2. The figure shows the side and connector end for each plug.
3. The form of the plug moldings depends on the manufacturer.

Controller Expansion and LCB Grounding (Earthing)

Characteristics

The voltage measured between a frame or stand-alone LCB and the earth (not the ground connection point) must be less than 1 volt as shown in Figure 2.

The Controller Expansion and LCBs outside a grounded frame must be grounded by connecting the ground point located on the Controller Expansion or LCB to a suitable protective grounding/earthing connector that is connected to the building ground pit. The voltage difference between the Controller Expansion or LCB and the ground must be less than one (1) volt.

Controller Expansion

A 9 m (29.5-ft) ground wire comes with the Controller Expansion. It has an M5 terminal at both ends. An M5 screw with two washers is also supplied. See Figure 2.

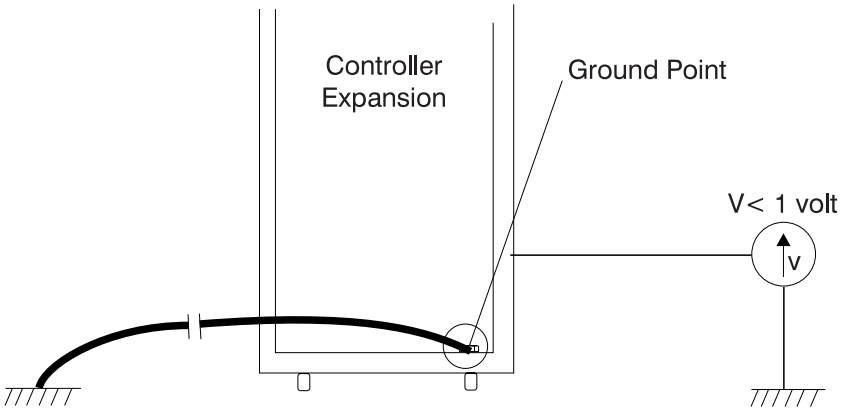


Figure 2. Controller Expansion Ground Requirements

If you have two Controller Expansions, they must both be grounded at the same ground point.

User-Supplied Rack

To meet the less-than-one-volt requirement, use at least 2.5 mm^2 green/yellow wire and an M5 screw (or bolt and nut) and washers that are shown in Figure 3. See also Figure 2.

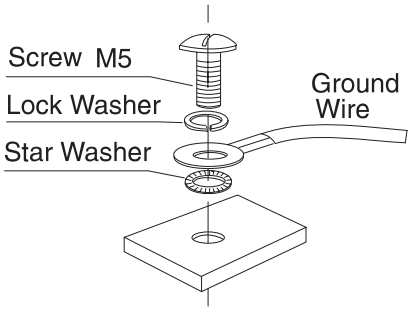


Figure 3. User-Supplied Rack Ground Requirements

Stand-Alone LCB

A single LCB may be used alone on a table or suitable shelf. To meet the less-than-one-volt requirement, use at least 2.5 mm^2 green/yellow wire and an M5 screw and washers that are shown in Figure 4. See also Figure 2 on page 30.

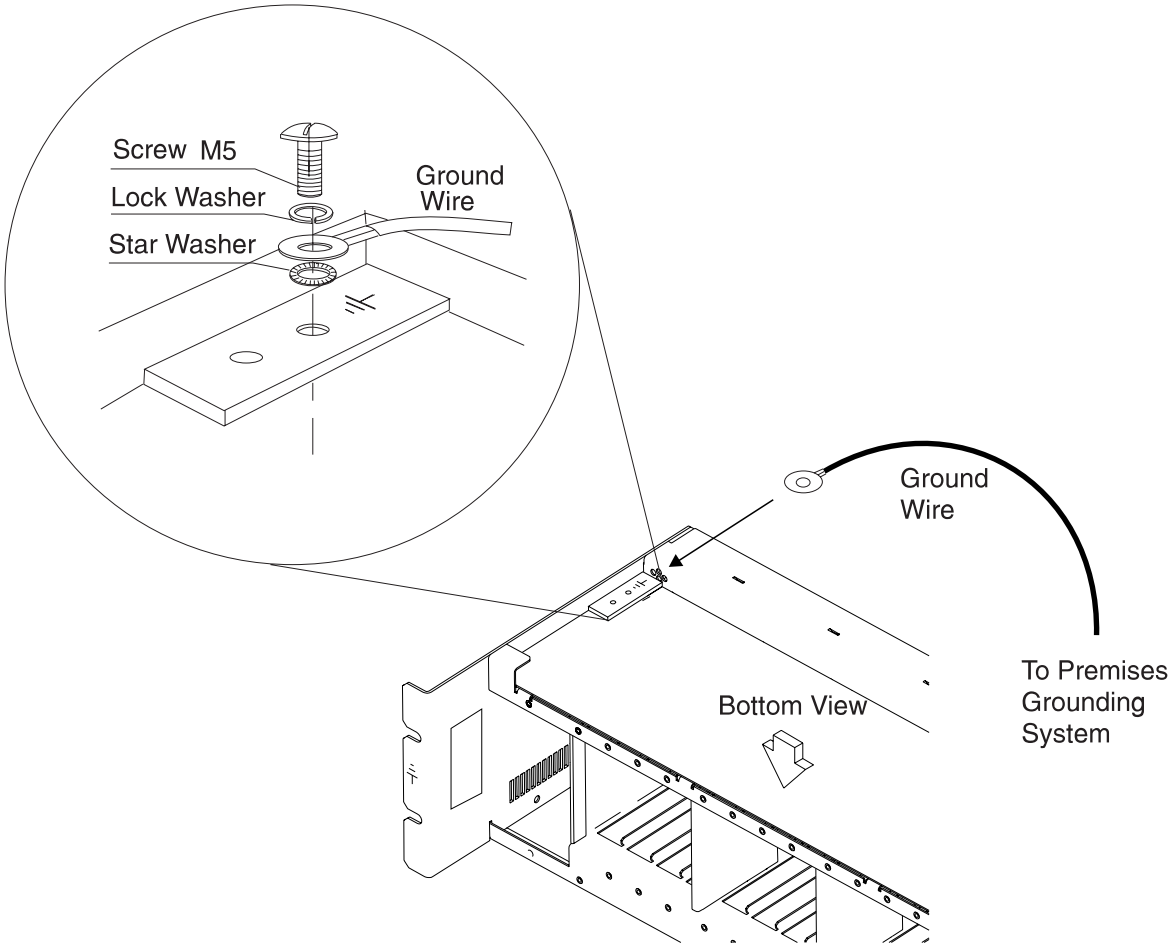


Figure 4. User-Supplied Rack Ground Requirements

Current Grounding

The ground leakage current for the 3746 Model 900 or 950 and Controller Expansion (or user-supplied rack) must not exceed 3.5 mA rms per power cord.

3745 Customer Power Control Relay

The customer power control relay is located in the 3745 console tailgate and can be used to power on or off equipment external to the controller. It includes:

- A normal-closed contact and a normal-open contact when the power is off, and the reverse when the power is on
- An outlet available to you

The voltage and current rating is 30 V ac or 42.4 V dc at 20 - 500 mA.

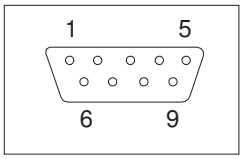
The plug is not provided by IBM. It is a standard 9-pin female D-shell connector including:

- One receptacle (AMP reference 205203-1 or equivalent)
- Four sockets (AMP reference 66504-9 or equivalent)
- One housing (AMP reference 205729-1 or equivalent)
- Two studs (AMP reference 350547-3 or equivalent)

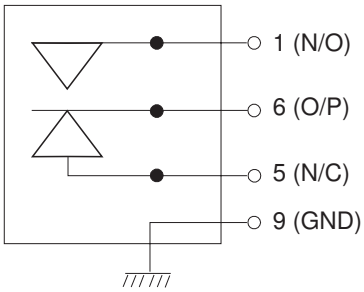
The cable is not provided by IBM. Its characteristics are:

- Bulk cable, with a maximum outside diameter of 6 mm (0.23 in.)
- Four conductors
- AWG no. 22 (0.3 mm²)

Front (Pin Side) View of Customer Power Control Relay Connector on Console Tailgate



Pin-Out of Relay



Line Interface Attachment Cables

There are two types of LIC:

- LIC type 11 (LIC11), which is connected to DCE/DTE through line connection boxes (LCB) and active remote connectors (ARC)
- LIC type 12 (LIC12), which is connected to high-speed lines

In Figure 5, the number above the ARC slot gives the physical position of the ARC in the LCB and represents the address increment with reference to ARC position +0. Address +15 is not used.

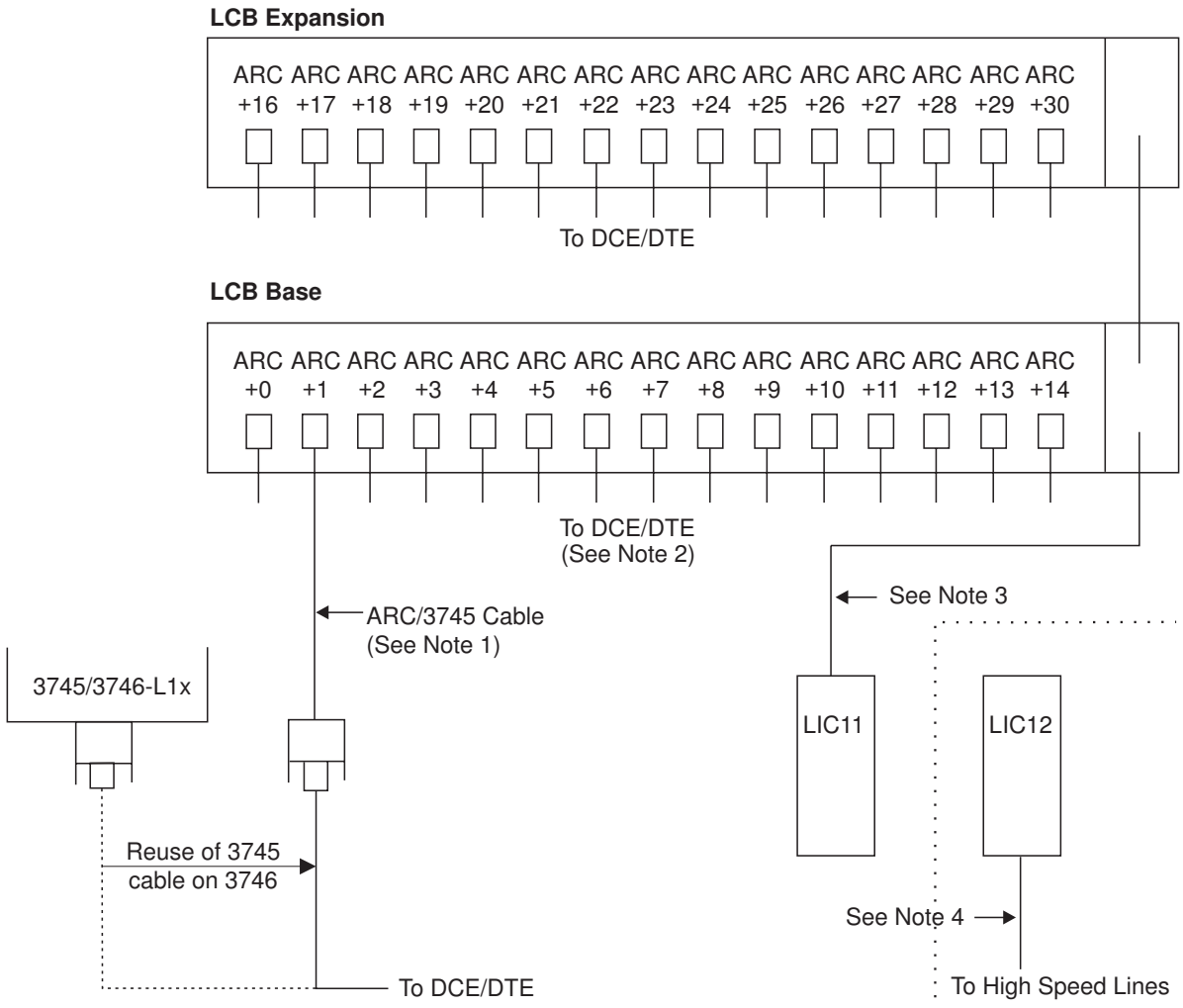


Figure 5. Diagram of LIC11 and LIC12 Cables

Notes:

1. ARC/3745 cables adapt to LIC cables that normally connect to 3745/3746-L1x LIC1s, LIC3s, or LICs 4A/4B installed in a 3745 or 3746 L13, L14, or L15. See the tables on pages 87 and 88. This allows reuse of installed cables when lines are moved from LIC1s, LIC3s, or LICs 4A/4B to LIC11s on the 3746-900/950.
2. See page 87.
3. See page 86.
4. See page 79.

Line Connection Box

There are two types of line connection box (LCB):

- The line connection box base (LCBB).
- The line connection box expansion (LCBE). The LCBE is connected to the LCBB.

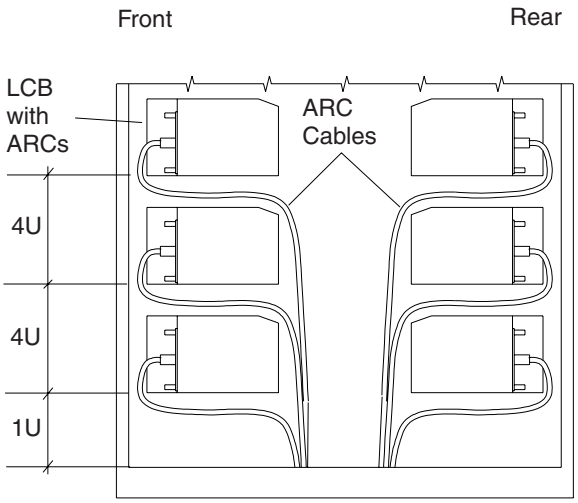
Each LCB contains up to 15 active remote connectors (ARCs). Refer to Figure 5 on page 33.

The LCBs can be installed in any of the following locations:

- In the 3746-900/950 (maximum of two LCBs when the Expansion Enclosure 2 is not present)
- In the Controller Expansion (FC 5023 of the 3745 and 3746-900/950.

  The LCB occupies a height of 4 EIA units (4 U) in the Controller Expansion, where U = 1.75 in. (44.5 mm). Refer to page 49.

  The ARC cards are plugged in on the front of the LCB. The ARCS include the cable for modem attachment or direct attachment. Each side of the controller expansion or a double-sided rack can be equipped with an LCB. This allows the installation of two LCBs per 4 Us.



Note: 1U = 1.75 in. (44.5 mm)

Figure 6. Controller Expansion or 19-inch User-Supplied Rack (Side View)

- In a 19-inch user supplied rack.

  Refer to installation information for the Controller Expansion (FC 5023) above, in addition to the following information.

  To reduce the possibility of radio frequency interference and electrostatic discharge, when installing a 19-inch rack, it is recommended to:

  – Remove one flooring tile (when a raised floor is present) and install the rack where the flooring tile was removed.
  – Have a conductive frame rack connected to the ground of the raised floor.
  – Have metallic side covers on the rack.
  – Install the LCBs starting from the bottom of the rack.

- On the floor.

  This must be in an area where the LCBs and their cables will not be in walkways or work areas.

The maximum length of cable between the LIC11 and the LCBB is 105 m (345 ft). The cable connecting the LCBB to the LCBE is part of the LCBE and it is 35 cm (1.2 in.) long.

Note: When you install the second expansion enclosure, you must move LCBs installed in the 3746-9x0 into the Controller Expansion or user rack. You may need to order longer LIC11-to-LCB cables.

LCB Specifications

Dimensions

Width	45 cm (17.7 in.)
Depth	22 cm (8.7 in.)
Height	13 cm (5.1 in.)

Maximum Weight (with ARCs)

10 kg (22 lb)

Maximum Heat Output

17.6 W (60 BTU/hr)

Service Processor Specifications

The service processor is shipped with a stand-alone RSF modem and a Service Processor Access Unit. The service processor is composed of one rack-mountable system unit, a color display, a keyboard, and a mouse.

The service processor is equipped with an integrated CD-ROM drive, instead of an optical disk drive. Previously installed service processors are to be upgraded to a service processor type 4 (FC 5450), which includes the CD-ROM drive required for the installation of the CD-ROM (containing the Licensed Internal Code) shipped with new machines and features.

For service purposes, it is recommended to install the Controller Expansion (FC 5023) that houses the service processor at a maximum distance of 10 m (33 ft) from the 3746 (maximum of 6 m (20 ft) if the Controller Expansion houses a Multiaccess Enclosure). Refer to page 74 for cable lengths.

If necessary, the display, keyboard, and mouse can be installed outside the Controller Expansion using the 4.6 m (15-ft) cable extenders provided with the service processor, leaving the system unit installed in the rack. If they are installed outside the rack, plan enough table space for display and keyboard use.

The service processor system unit, optical disk drive unit or CD-ROM drive of previously shipped service processors, color displays, and network node processors are powered from the ac outlet distribution box of the Controller Expansion.

Use 200 - 240 V Setting

The Controller Expansion ac outlet distribution box operates at 220 V ac. All components plugged into the ac outlet distribution box must be set for 220 V ac operation. If they have a manual switch setting, set it to 220 V ac.

Notes:

1. To protect 3746 operations against disruptions due to an electrical outage, the Controller Expansion, which houses and powers the NNP, MAE, and service processor should be powered from the same power source as the 3746 controller unit.
2. The 3746 Models 900 and 950 can use an already installed service processor type 3172, 9585 or 9597 (these are no longer available from IBM). However, new 3745s and 3746s and the Licensed Internal Code shipped with machine upgrades require the upgrade to a service processor type 4 (FC 5450). For more information, refer to the information presented in “Controller and Service Processor Integration” in the *3745/3746 Planning Series: Overview, Installation, and Integration*.

System Unit Characteristics

Desktop and Rack-Mountable (Type 6578) Model (FC 5054, FC 5450)

Service Processor Type 4 (FC 5054) or
Service Processor Upgrade to Type 4 (FC 5450)

Size:

- Width: 425 mm (16.7 in.)
- Depth: 425 mm (16.7 in.)
- Height: 140 mm (5.5 in.): 4U when rack-mounted

Weight:: 9.45 kg (20 lb)

Heat Output (maximum): 705 BTUs per hour (207 watts)

Electrical Input:

- Input voltage: single phase, 90 - 265 V ac, 47 or 63 Hz
- Input current: 0.30 kVA maximum.
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Desktop and Rack-Mountable (Type 6563) Model (FC 5054, FC 5450)

Service Processor Type 4 (FC 5054) or
Service Processor Upgrade to Type 4 (FC 5450)

Size:

- Width: 400 mm (15.75 in.)
- Depth: 422.8 mm (16.64 in.)
- Height: 138.8 mm (5.46 in.): 4U when rack-mounted

Weight:: 7.25 kg (16 lb)

Heat Output (maximum): 706 BTUs per hour (207 watts)

Electrical Input:

- Input voltage: single phase, 90 - 265 V ac, 50 or 60 Hz
- Input current: 0.10 kVA maximum.
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Desktop and Rack-Mountable (Type 6275) Model (FC 5053, FC 5050)

Service Processor Type 3 (FC 5053) or
Service Processor Upgrade to Type 3 (FC 5050)

Size:

- Width: 450 mm (17.7 in.)
- Depth: 450 mm (17.7 in.)
- Height: 128 mm (5.0 in.): 4U when rack-mounted

Weight: 11.3 kg (25 lb)

Heat Output (maximum): 700 BTUs per hour (204 watts)

Electrical Input:

- Input voltage: single-phase, 90 - 265 V ac, 50 or 60 Hz
- Input current: 0.52 kVA maximum.
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52

Rack-Mountable (Type 7585) Model (FC 5052)

Service Processor Type 2 (FC 5052)

This service processor is no longer available from IBM.

Size:

- Width: 445 mm (17.5 in.).
- Depth: 444 mm (17.4 in.)
- Height: 171 mm (6.7 in.) 4U when rack-mounted

Weight: 15 kg (33.3 lb)

Heat Output (maximum):

1417 BTUs per hour (415 watts)

Electrical Input:

- Input voltage: single-phase, 180 - 240 V ac, 50 or 60 Hz
- Input current:
  - 6.0 A maximum at 100 to 125V
  - 3.0 A maximum at 200 to 245V
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Rack-Mountable (Type 3172) Model (FC 5021)

This service processor is no longer available from IBM.

Size:

- Depth: 444 mm (17.4 in.)
- Height: 254 mm (10.00 in.): 6U when rack mounted
- Width: 444 mm (17.4 in.)

Weight: 19 kg (47 lb)

Heat Output (maximum):

850 BTUs per hour (250 watts)

Electrical Input:

- Input voltage: single-phase, 180 - 240 V ac, 50 or 60 Hz
- Input current: 2.5 A maximum
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Floor Standing (Type 9585) Tower Model (FC 5021)

This service processor is no longer available from IBM.

Size:

- Depth: 501 mm (19.75 in.)
- Height: 508 mm (20 in.)
- Width: 203 mm (8 in.)

Weight: 22.7 kg (50 lb)

Heat Output (maximum): 1046 BTUs per hour (307 watts)

Electrical Input:

- Input voltage: single-phase, 90 - 240 V ac, 50 or 60 Hz
- Power input: 0.6 kVA maximum

Desktop (Type 9577) Model (FC 5020)

This service processor is no longer available from IBM.

Size:

- Width: 440 mm (17.3 in.)
- Depth: 394 mm (15.5 in.)
- Height: 168 mm (6.6 in.)

Weight: 17.3 kg (38 lb)

Heat Output (maximum): 877 BTUs per hour (257 watts)

Electrical Input:

- Input voltage: single-phase, 90 - 240 V ac, 50 or 60 Hz
- Input current: 2.2 A maximum.

CD-ROM Drive Unit (FC 5051)

This external drive unit is no longer available from IBM.

Size:

- Height: 55 mm (2.16 in.)
- Depth: 315 mm (12.4 in.)
- Width: 160 mm (6.29 in.)

Electrical Input:

- Input voltage: single-phase, 90 - 240 V ac, 50 or 60 Hz
- Input current: 1.8 A
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Optical Disk Drive Unit (FC 5026)

This external drive unit is no longer available from IBM.

Size:

- Height: 117 mm (4.6 in.) With base: 122 mm (4.8 in.)
- Depth: 228 mm (9.0 in.)
- Width: 46 mm (1.8 in.) With base: 77 mm (3.0 in.)

Electrical Input:

- Input voltage: single-phase, 90 - 240 V ac, 50 or 60 Hz
- Input current: 0.7 A maximum.
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Color Display Characteristics

6331-M2N Model E54

Size:

- Width: 371 mm (14.6 in.)
- Depth: 399 mm (15.7 in.)
- Height: 391 mm (15.4 in.) including tilt/swivel stand

Weight: 12.8 kg (28.2 lb)

Electrical Input:

- Input Voltage: single-phase, 90 - 264 V ac, 50 or 60 Hz
- Maximum power comsumption: 70 watts
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

6546-0BN Model G54

Size:

- Width: 370 mm (14.6 in.)
- Depth: 397 mm (15.6 in.)
- Height: 398 mm (15.7 in.) including tilt/swivel stand

Weight: 13.6 kg (30 lb)

Electrical Input:

- Input Voltage: single-phase, 100 - 240 V ac, 50 or 60 Hz
- Maximum current: 1.2 A at 120 V ac
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

6546-01N Model G52

This color display is no longer available from IBM.

Size:

- Width: 368 mm (14.5 in.)
- Depth: 422 mm (16.6 in.)

- Height: 376 mm (14.8 in.) including tilt/swivel stand

Weight: 13.6 kg (30 lb)

Heat Output: 375 BTUs per hour (110 watts)

Electrical Input:

- Input Voltage: single-phase, 90 to 264 V ac, 50 or 60 Hz
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Note: The 3764 Model 900 and 950 can use a service processor with an IBM 6553 Model 503, or with an IBM 8515 Color Display (these types of displays are no longer available from IBM).

RSF Modem

The RSF modem shipped with the service processor is an IBM 7858 Modem unless it is not homologated for the country. If the IBM 7858 modem is not homologated, the IBM 7857 Modem is shipped. They are all desktop units, and installed by IBM, possibly in the Controller Expansion (FC 5023).

Note: In the U.S.A. and Canada, the 3745 and 3746-900/950 can use a service processor (type 9577) with an integrated modem (this type of service processor is no longer available from IBM).

IBM 7858 Modem Characteristics

Size:

- Width: 210 mm (8.27 in.)
- Depth: 150 mm (5.91 in.)
- Height: 44 mm (1.73 in.)

Weight: 1.250 kg (2.75 lb)

Electrical Input:

- Input voltage: single-phase, 100 - 240 V ac (country-dependent), 50 and 60 Hz (country-dependent)
- Power input: 5 W
- Power cord (U.S.A., Canada): non-locking plug (110 V)
- Power cord (elsewhere): country-dependent plug (220 V)
- Power cord (all countries): refer to “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

IBM 7857 Modem Characteristics

Size:

- Width: 220 mm (8.7 in.)
- Depth: 273 mm (10.7 in.)
- Height: 85 mm (3.3 in.)

Weight: 2.6 kg (5.7 lb)

Electrical Input:

- Input voltage: single-phase, 110 - 220 V ac (country-dependent), 50 or 60 Hz (country-dependent)
- Power input: 12.0 W
- Power cord (U.S.A., Canada): non-locking plug (110 V)
- Power cord (elsewhere): country-dependent plug (220 V)

Hayes Modem Characteristics

This modem is no longer available from IBM.

Size:

- Width: 127 mm (5.0 in.)
- Depth: 178 mm (7.0 in.)
- Height: 32 mm (1.25 in.)

Weight: 0.37 kg (0.8 lb)

Electrical Input:

- Input voltage: single-phase, 99 - 253 V ac, 50 or 60 Hz
  - 110V ± 10% 60Hz (ac)
  - 230V ± 10% 50Hz (ac)
- Input current: 0.8 A maximum

IBM 7855 Model 10 Modem Characteristics

This modem is no longer available from IBM.

Size:

- Width: 165 mm (6.5 in.)
- Depth: 280 mm (11 in.)
- Height: 64 mm (2.5 in.)

Weight: 2.5 kg (5.5 lb)

Electrical Input:

- Input voltage: single phase, 90 - 259 V ac, 50 or 60 Hz
- Input current: 0.16 A maximum
- Power cord (Japan): non-locking plug (100 V)
- Power cord (elsewhere): country-dependent plug (220 V)

Service Processor Access Unit (SPAU)

The SPAU is equivalent to the IBM 8228 Multistation Access Unit. It is installed in the Controller Expansion by IBM; refer to “Controller Expansion: Internal Power Distribution” on page 49.

Network Node Processor Specifications

The network node processor must be installed in the Controller Expansion and powered from the ac outlet distribution box of the Controller Expansion (refer to “Controller Expansion: Internal Power Distribution” on page 49).

To protect the 3746 operations against disruptions due to an electrical outage, the Controller Expansion housing the network node processor should be powered from the same power source as the 3746 controller frame.

The Network Node Processor A and Network Node Processor B should be plugged into different blocks of the ac outlet distribution box so that if the fuse should blow on one block, one Network Node Processor will still be powered from the other block and thus continue operation. Referring to Figure 9 on page 50, Network Node Processor-A is plugged into socket J2, and Network Node Processor-B is plugged into J5.

Alternatively, if the configuration includes two ac outlet distribution boxes, either both in the same controller expansion or each in two different controller expansion, the NNP-A and NNP-B should be plugged in different ac outlet distribution boxes.

System Unit Characteristics

Desktop and Rack-Mountable (Type 6578) Model (FC 5425, FC 5427)

Network Node Processor Type 5 (FC 5425) or
Network Node Processor Upgrade to Type 5 (FC 5427)

Size:

- Width: 425 mm (16.7 in.)
- Depth: 425 mm (16.7 in.)
- Height: 140 mm (5.5 in.): 4U when rack-mounted

Weight:: 9.45 kg (20 lb)

Heat Output (maximum): 705 BTUs per hour (207 watts)

Electrical Input:

- Input voltage: single-phase, 90 - 265 V ac, 47 or 63 Hz
- Input current: 0.30 kVA maximum
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Desktop and Rack-Mountable (Type 6563) Model (FC 5424, FC 5448)

Network Node Processor Type 4 (FC 5424) or
Network Node Processor Upgrade to Type 4 (FC 5448)

Size:

- Width: 400 mm (15.75 in.)
- Depth: 422.8 mm (16.64 in.)
- Height: 138.8 mm (5.46 in.): 4U when rack mounted

Weight:: 7.25 kg (16 lb)

Heat Output (maximum): 706 BTUs per hour (207 watts)

Electrical Input:

- Input voltage: single-phase, 90 - 265 V ac, 50 or 60 Hz
- Input current: 0.10 kVA maximum
- Power cord: see “Power Distribution in Controller Expansion” on page 51 and “Service Processor Power Cords” on page 52.

Desktop and Rack-Mountable (Type 6275) Model (FC 5423, FC 5049)

Network Node Processor Type 3 (FC 5423)
Network Node Processor Upgrade to Type 3 (FC 5049)

Size:

- Width: 450 mm (17.7 in.)
- Depth: 450 mm (17.7 in.)
- Height: 128 mm (5.0 in.): 4U when rack-mounted

Weight: 11.3 kg (25 lb)

Heat Output (maximum): 700 BTUs per hour (204 watts)

Electrical Input:

- Input voltage: single-phase, 90 - 265 V ac, 50 or 60 Hz
- Input current: 0.52 kVA maximum
- Power cord: see “Power Distribution in Controller Expansion” on page 51.

Rack-Mountable NNP (Type 7585) Model (FC 5122)

Network Node Processor Type 3 (FC 5122)

This model is no longer available from IBM.

Size:

- Width: 445 mm (17.5 in.)
- Depth: 444 mm (17.4 in.)
- Height: 171 mm (6.7 in.) 4U when rack-mounted

Weight: 15 kg (33.3 lb)

Heat Output (maximum):

1417 BTUs per hour (415 watts)

Electrical Input:

- Input voltage: single phase, 180 - 240 V ac, 50 or 60 Hz
- Input current:
  - 6.0 A maximum at 100 - 125 V
  - 3.0 A maximum at 200 - 245 V
- Power cord: see “Power Distribution in Controller Expansion” on page 51.

Rack-Mountable NNP (Type 3172) Model (FC 5022)

This model is no longer available from IBM.

Size:

- Depth: 444 mm (17.4 in.)
- Height: 254 mm (10.00 in.): 6U when rack-mounted
- Width: 444 mm (17.4 in.)

Weight: 19 kg (47 lb)

Heat Output (maximum):

850 BTUs per hour (250 watts)

Electrical Input

- Input voltage: single-phase, 180 - 240 V ac, 50 or 60 Hz
- Input current: 2.5 A maximum
- Power cord length: 2.5 m (8 ft 2 in.)
- Power plug: IEC (compatible with the ac outlet distribution box of the controller rack).

Ethernet Port Specifications (FC 5631 and FC 5632).

These features are no longer available for IBM.

An Ethernet network can be connected to a 3746-9x0 through an *Ethernet Port* (FC 5631). This feature consists of:

- TIC3
- An Ethernet bridge
- An Ethernet bridge connection box (EBCB)
- Two connecting cables:
  - From the TIC3 to the connection box
  - From the connection box to the Ethernet bridge

The Ethernet-to-Token Ring Bridge (FC 5632) includes the same components as the Ethernet Port (FC 5631), except the TIC3. Both the bridge and its connection box are installed in the Controller Expansion, up to 6 m (20 ft) from the 3746 Network Node, and powered from the ac outlet distribution box.

The components are installed as shown in Table 9.

Table 9. Where Components of the Ethernet Bridge Are Installed

Component	Where Installed
TIC3	3746 Models 900 or 950
Ethernet bridge connection box	Controller Expansion
Ethernet bridge	Controller Expansion

The Ethernet bridge connection box is equivalent to the IBM 8228 Token-Ring Multistation Access Unit. It is installed in the Controller Expansion by IBM, refer to “Controller Expansion: Internal Power Distribution” on page 49.

Ethernet Bridge Specifications

The Ethernet bridge is equivalent to an IBM 8229.

Size:

- Depth: 355.6 mm (14.00 in.)
- Height: 133.4 mm (5.25 in.)
- Width: 444.5 mm (17.50 in.)

Each bridge occupies a height of 4U in the controller expansion.

Weight: 11.4 kg (25.1 lb)

Heat Output (maximum)

850 BTUs per hour (250 watts)

Electrical Input:

- Input voltage: single-phase, 180 - 240 V ac, 50 or 60 Hz
- Input current: 1.5 A (2.5 A maximum)
- Power cord length: 2.5 m (8 ft 2 in.)
- Power plug: IEC (compatible with the ac outlet distribution box of the controller expansion).

Note: To protect operations against disruptions due to an electrical outage, the Controller Expansion housing the Ethernet bridge should be powered from the same power source as the 3746 controller frame.

Cables:

With each Ethernet feature (FC 5631 or 5632), IBM supplies the cables (see Figure 7 and Table 10 on page 47) between:

- TIC3 and the Ethernet bridge connection box: 9 m (30 ft)
- The Ethernet bridge connection box and the Ethernet bridge: 2.4 m (8 ft).

You supply the cable connecting the Ethernet bridge to the Ethernet network.

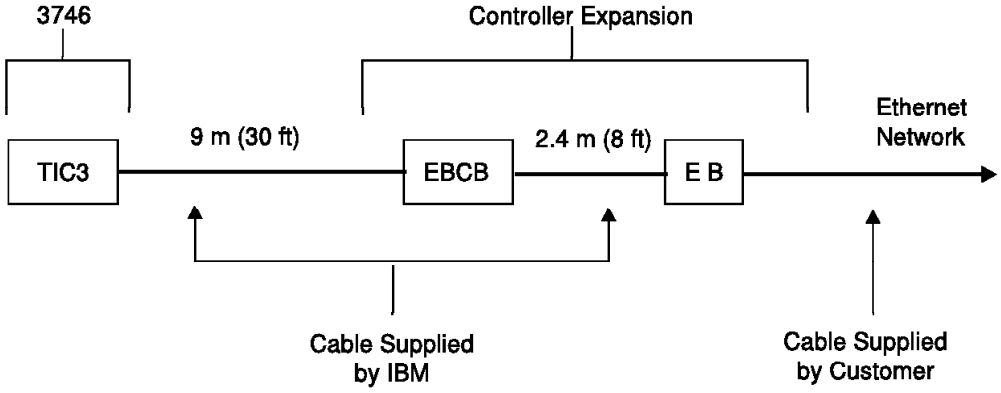


Figure 7. Components of the Ethernet Port

Note: Due to the position of the TIC3 in the 3746-9x0 and of the connection box (EBCB) in the controller expansion, the maximum distance between the 3746 and

the Controller Expansion may not exceed 6 m (20 ft) when using the standard 9 m (30 ft) TIC3 cable supplied with the Ethernet port feature.

Table 10. Part Numbers for Ethernet Bridge Cables

Cable	Country	Part number
TIC3 to Ethernet bridge connection box	All, Except U.S.A. U.S.A.	76F9441 76F9440
Ethernet bridge connection box to Ethernet bridge	All	6339098

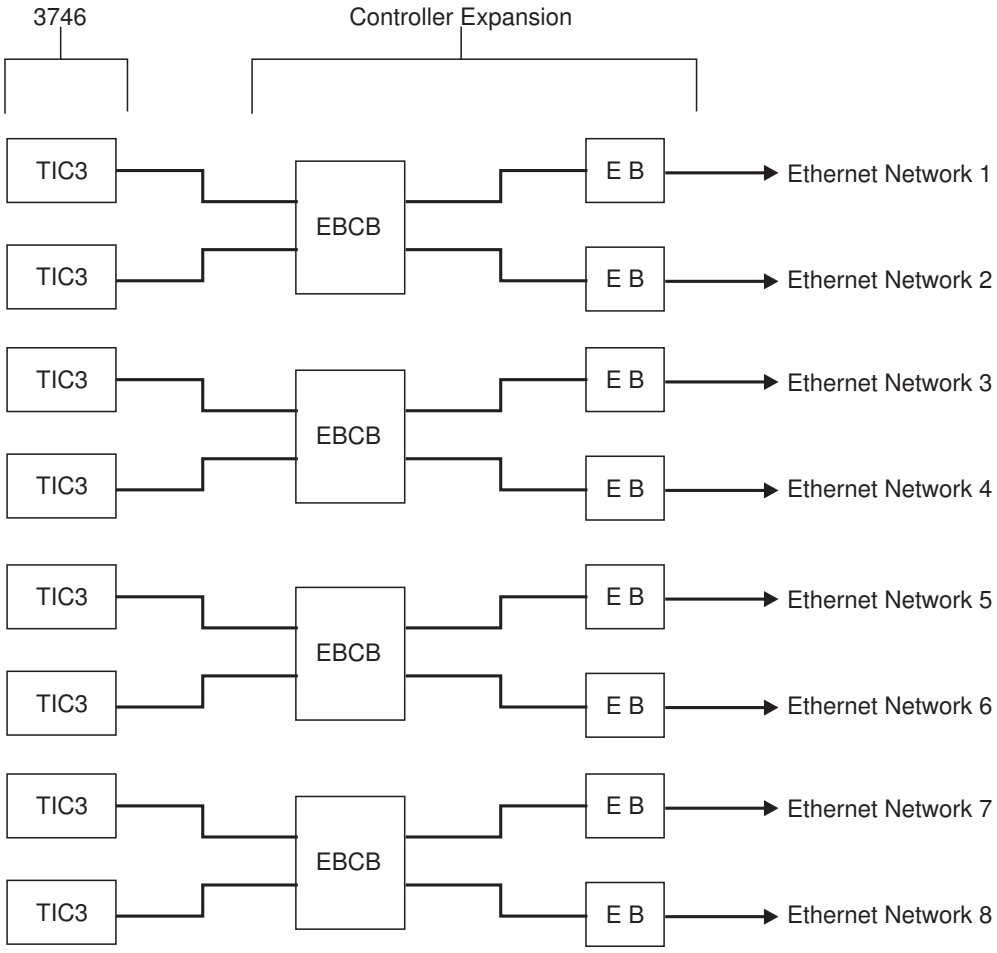
If the distance between the 3746 and the Controller Expansion requires longer TIC3 cables to connect the Ethernet features, or if you need plenum cables (in the U.S.A. and Canada) instead of the standard cables, you need to order the cables described in Table 11.

Table 11. Part Numbers for TIC3 Cables Greater than 9 m (30 ft)

Country	Part number	Maximum Cable Length
U.S.A. and Canada	72F1242	Up to 44 m (144 ft plenum cable)
All others	72F1236	Up to 44 m (144 ft)

Maximum Ethernet Configuration

A 3746 Network Node supports a maximum of eight Ethernet ports, each using a dedicated TIC3. Each Ethernet bridge connection box, however, can connect two bridges and their respective TIC3s. Thus, four connection boxes must be used to connect the eight bridges through to the eight TIC3s in the maximum configuration. This arrangement is shown in Figure 8 on page 48.



Legend:
EBCB = Ethernet Bridge Connection Box
EB = Ethernet Bridge

Figure 8. Maximum Configuration of Ethernet Bridges Allowed for One 3746 Network Node

Controller Expansion: Internal Power Distribution

The Controller Expansion (FC 5023) is required for the installation and the powering of the network node processor and Multiaccess Enclosure, and should also be used to house the service processor components, power them, or both. As an option, it can also be used for the installation of line connection boxes (LCBs), Ethernet bridges, or both. It is equipped with a power cord and one ac outlet distribution box. A second ac outlet distribution box (with its own power cord) can be configured to provide power input. You can have up to two Controller Expansions, each with two ac outlet distribution boxes.

Refer to “Power Cord Characteristics” on page 23 for information about the power cord and plug type of the Controller Expansion.

AC Outlet Distribution Boxes

The ac distribution box operates from 200 to 240 V ac (depending on your country or region and local conditions, the voltage may be outside of this range) and is installed in the lower-right corner on the rear of the controller expansion to power the network node processors, service processor, display, RSF modems (type 7858 only), existing Ethernet bridges, and optical disk drives or CD-ROM drive. It has a total of eight outlets with IEC connectors; the extra outlets allow for possible future upgrades of your controller. Depending on your 3746-9x0 configuration, you may require extra outlets. Also, to reduce the possibility of single power source loss, an optional ac outlet distribution box FC 5002 is available. See “Dual AC Outlet Distribution Box Option (FC 5002)” on page 51 for details of plugging.

Note: The RSF modem (if different from an IBM 7858) requires a customer-provided power receptacle.

The eight outlets are configured in two blocks of four; each block is protected by a fuse. See Table 12 and Figure 9 on page 50.

Table 12. Ac Power Outlets and Fuses

Fuse	Block
F1 (6 Amps)	Lower block J1 to J4
F2 (6 Amps)	Upper block J5 to J8

Single AC Outlet Distribution Box Option

In a Controller Expansion with one ac distribution box installed, units should be plugged into the positions shown (sockets are numbered from the bottom (J1) to the top (J8)):

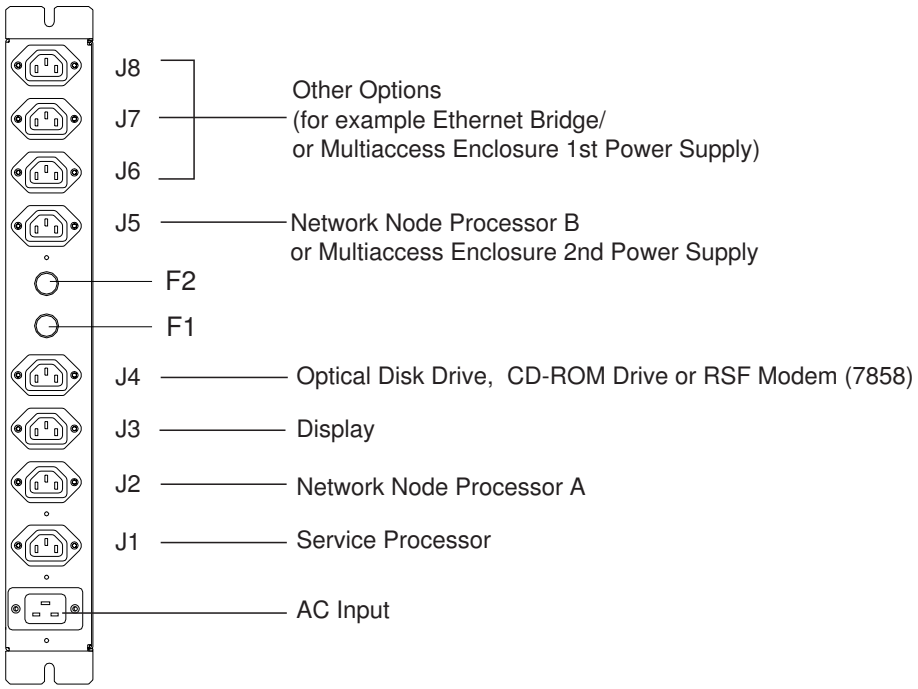


Figure 9. Power Plugging on a Single ac Outlet Distribution Box

Notes:

1. These unit plugging guidelines are calculated not to exceed the F1 or F2 current rating. Therefore units should not be shuffled from the fuse group that is recommended.
2. If the Multiaccess Enclosure second power supply option is installed, it is recommended that the second ac outlet distribution box also be added, see "Dual AC Outlet Distribution Box Option (FC 5002)" on page 51.

Dual AC Outlet Distribution Box Option (FC 5002)

To reduce the risk of outage due to power failure, a Controller Expansion can be equipped with two ac outlet distribution boxes. The Controller Expansion components units should be plugged into the positions shown in Figure 10.

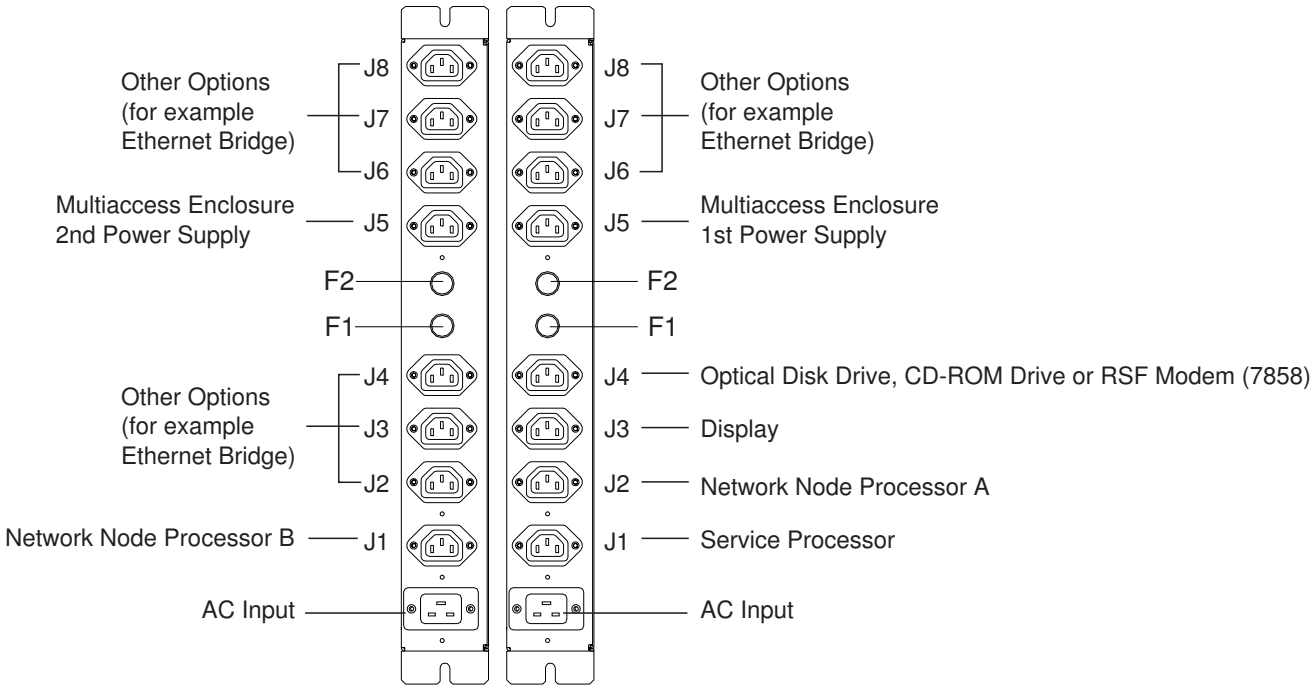


Figure 10. Power Plugging on Dual AC Outlet Distribution Boxes

Power Distribution in Controller Expansion

Three 2.5 m (8 ft 2 in.) power cords with IEC plugs at both ends (part number 58G5783, see Figure 11) are provided with the service processor to power the service processor system unit, color display, and IBM 7858 when used as the RSF modem.

Figure 11. IEC-IEC Power Cord

The network node processor, Ethernet Port[2], and Multiaccess Enclosure features are automatically supplied with an IEC-IEC 2.5 m (8 ft 2 in.) power cord. If the Multiaccess Enclosure is configured with the optional ac power supply, a second IEC-IEC 2.5 m (8.2 ft) power cord is shipped.

2 No longer available.

Service Processor Power Cords

Three IEC power cords are shipped with the service processor to power the system unit, color display, and IBM 7858 when used as the RSF modem from the ac outlet distribution box of the Controller Expansion.

If a Controller Expansion is not included in the order or the installed machine configuration, the following country-dependent power cords are shipped with the service processor (in addition to the three IEC power cords):

- System unit:
  - U.S.A., Canada, and Japan: 200/220 V ac, non-locking plug (NEMA 6-15P)
  - Other countries or regions: 220 V ac, country/region standard plug.
- Color display unit:
  - U.S.A., Canada, and Japan: 100/110 V ac, non-locking plug (NEMA 5-15P)
  - Other countries or regions: 220 V ac, country/region standard plug.

RSF Modem

The RSF modem can be installed in the Controller Expansion, but a separate 110 V or 220 V ac power receptacle (not on the ac outlet distribution box) must be used for RSF modems different from the IBM 7858, refer to “RSF Modem” on page 41

Controller Expansion: Physical Layout

The figures on pages 56 to 60 show the recommended locations for the service processor components, network node processors, Multiaccess Enclosure and LCBs.

The location and number of components in the Controller Expansion can be different depending on the type of service processor and NNP installed.

Each feature, service processor (FC 5053), network node processor (FC 5423), and Multiaccess Enclosure (FC 3001) is shipped with the hardware required for its installation in the controller expansion.

The service processor rack-mount kit (FC 5029) provides all components for reinstallation of an existing service processor in the controller expansion, for example, when upgrading the service processor to type 4 (FC 5450). This kit contains:

- Brackets or plate for the display
- Brackets for control unit
- Drawer for keyboard, mouse, modem, and optical disk or CD-ROM drive
- Three power cords with IEC plug at both ends to power the service processor components from the 220 V internal distribution of Controller Expansion

Moving the Service Processor into the Controller Expansion

Any stand-alone service processor (desktop or tower model) can be reinstalled in the Controller Expansion. This normally occurs when upgrading a 3746-900 to a 3746-950 or to a 3746-900 with a NNP. The existing power cords are removed and replaced by the IEC power cords shipped with the Service Processor Rack-Mount Kit (FC 5029).

If the controller expansion is not equipped with the hardware required for the reinstallation of the service processor components (system unit, display, keyboard and so on), the Service Processor Rack-Mount Kit is required.

However, the keyboard and mouse of the desktop and tower service processors (types 9577 and 9585) cannot be housed in the initial version of the Controller Expansions as they will not fit into the service drawer of the Controller Expansion. The initial version of the Controller Expansion service drawers can only hold a keyboard with the following dimensions:

- 365 mm (14.4 in.) wide
- 45 mm (1.8 in.) height
- 200 mm (7.9 in.) deep

An IBM keyboard (with the trackpoint device), part number 61G2900, or equivalent fits into this type of service drawer.

Display and Keyboard Installation Outside the Controller Expansion

The color display and keyboard for a rack-mountable service processor can be installed outside the Controller Expansion while leaving the service processor system unit in the Controller Expansion. In this case, longer cables are required (which are provided with the service processor):

- The keyboard requires the longer 4 m (13 ft) cable, part number 10K8632.
- The display requires the 4 m (13 ft) cable extender, part number 59G1270.

The length of the IEC power cord, 2.5 m (8.2-ft), allows the color display to be powered from the power distribution strip of the Controller Expansion.

Configuration with Service Processor (Type 6578), NNP (Type 6578) and MAE

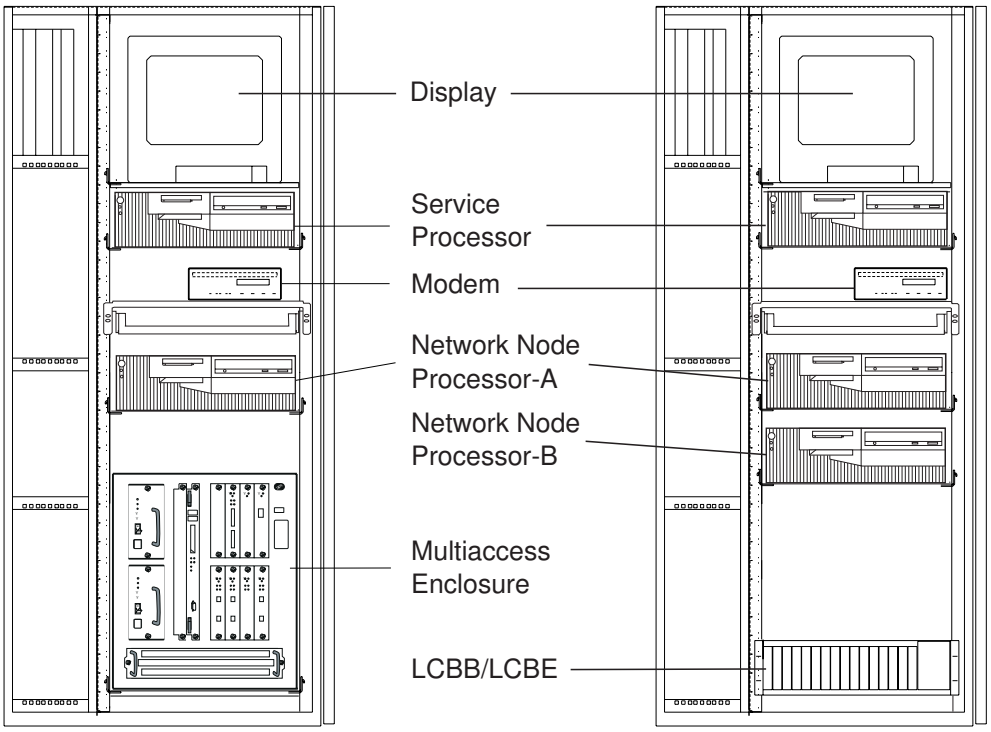


Figure 12. Units Installation in the Controller Expansion (SP and NNP Type 6578 + MAE)

Configuration with Service Processor (Type 6275), NNP (Type 6275) and MAE

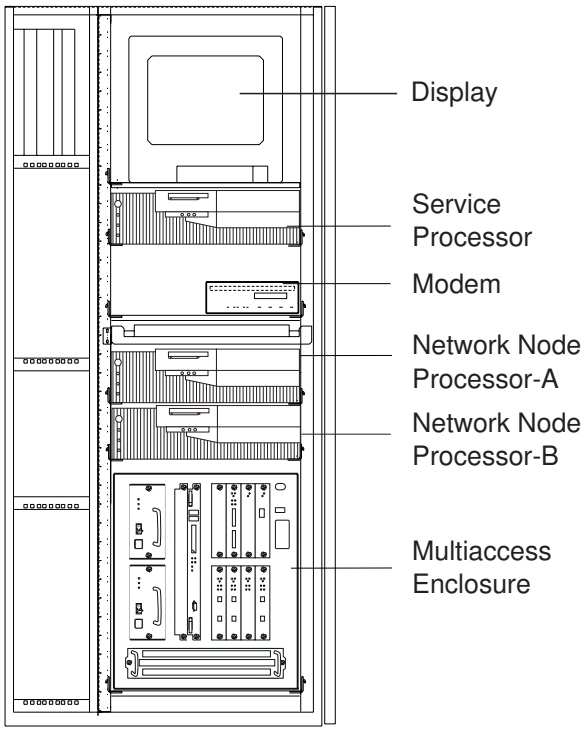


Figure 13. Controller Expansion with a Service Processor (Type 6275), Two NNPs (Type 6275) and a MAE

Configuration with Service Processor and One NNP (Types 3172)

3172[3] is the machine type of service processors part numbers 41H7520 and 55H7630 (FC 5021) and NPP Type 1 (FC 5022).

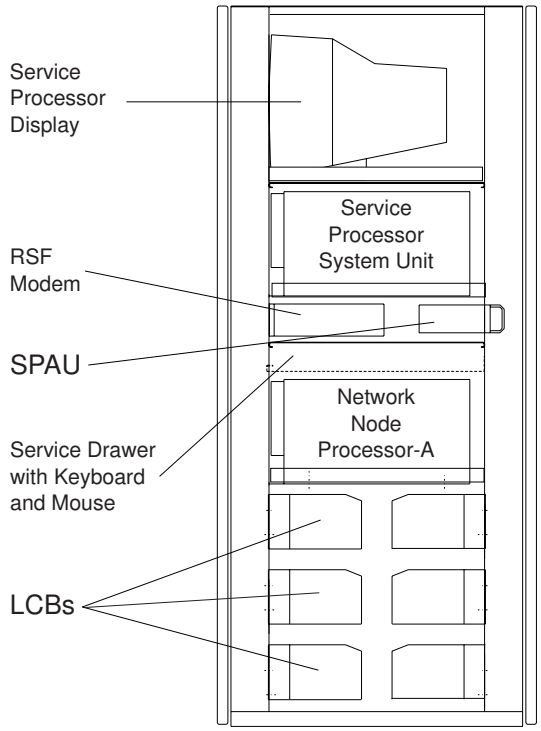


Figure 14. Right Side View of Controller Expansion with a Service Processor and a Network Node Processor (Type 3172)

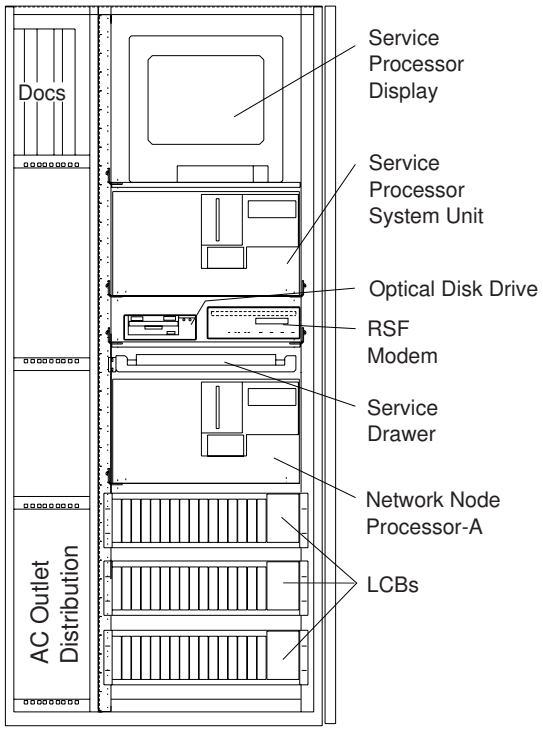


Figure 15. Front View of Controller Expansion with a Service Processor and a Network Node Processor (Type 3172)

Legend:

LCBs	Line connection boxes
RSF	Remote Support Facility
SPAU	Service Processor Access Unit
Docs	Free area for documentation

[3] No longer available.

Configuration with Service Processor (Types 9577 and 9585) and One NNP (Type 3172)

9577[4] is the machine type of service processor (FC 5020).
9585[4] is the machine type of service processor type 1 (FC 5021).
3172[4] is the machine type of the NPP Type 1 (FC 5022).

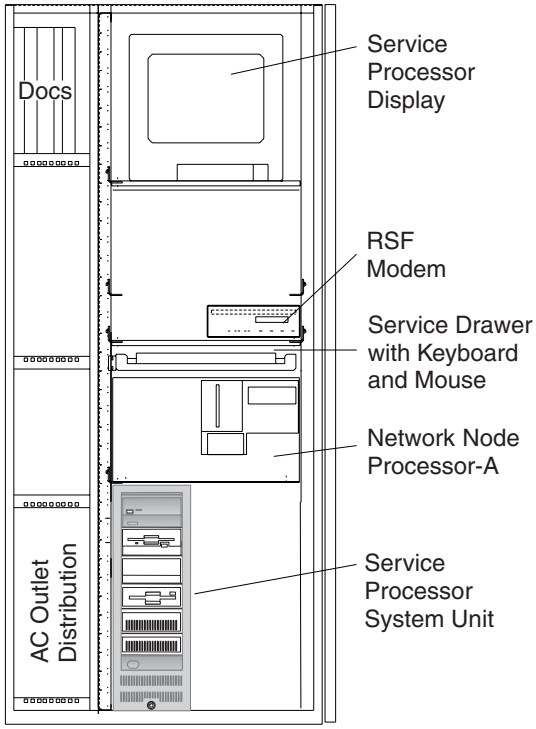


Figure 16. Front View of Controller Expansion with Tower Service Processor (Type 9585)

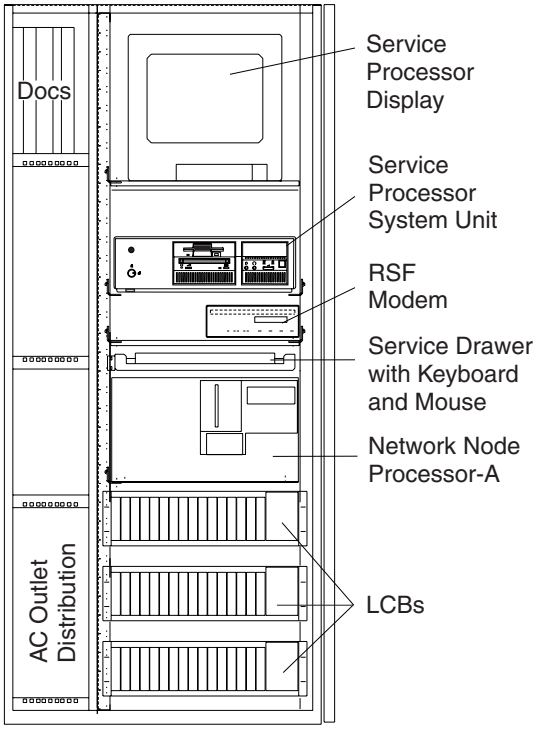


Figure 17. Front View of Controller Expansion with Desktop Service Processor (Type 9577)

[4] No longer available.

Configuration with Service Processor (Types 3172 and 9585) and Two Network Node Processors (Type 3172)

9585 is the machine type of service processor type 1 (FC5021).
3172[5] is the machine type of service processors part numbers 41H7520 and 55H7630 (FC 5021) and NPP Type 1 (FC 5022).

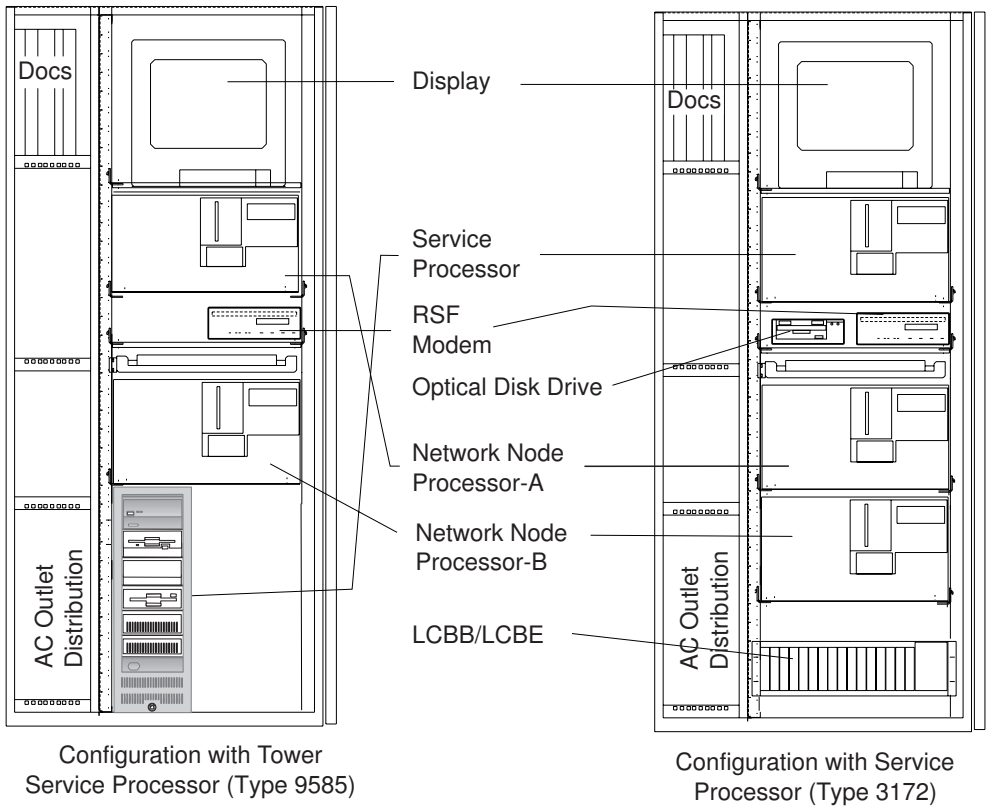


Figure 18. Front View of Controller Expansion with a Service Processor and Two NNPs (Type 3172)

[5] No longer available.

Addition of a Multiaccess Enclosure to a Configuration with One NNP (Type 3172)

The Multiaccess Enclosure feature is shipped with the hardware required for its installation in the Controller Expansion.

Figure 19 shows the recommended location for the Multiaccess Enclosure. Because of the maximum cable length, the MAE with Direct Attachment (FC 3001) must be within 6 m (20 ft) of the 3746 Model 900 or 950 frame.

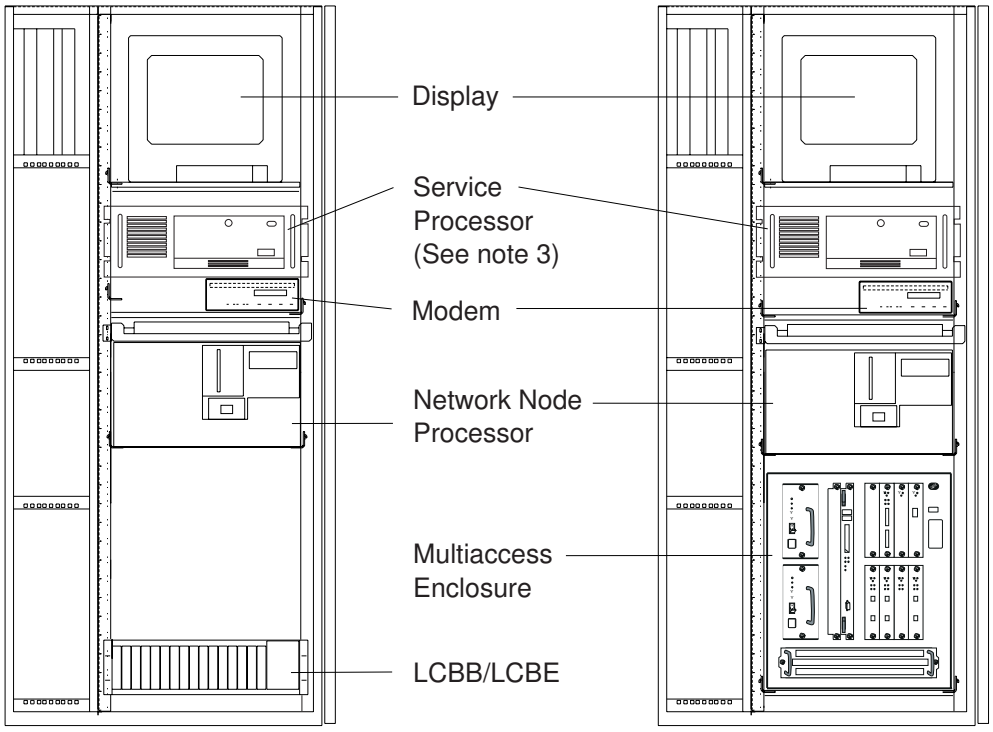


Figure 19. Front View of Controller Expansion with a Service Processor, and One NNP (Type 3172). The Multiaccess Enclosure has been added to the right Controller Expansion

Notes:

1. The Multiaccess Enclosure may need to be installed in a second controller expansion. This depends on the number and type of NNPs (types 3172[6], 7585[6], or 6275). Refer to "Controller Expansion Inventory Charts" on page 62.
2. The location and number of components in the Controller Expansion can be different depending on the number and type of NNPs (types 3172[6], 7585[6], or 6275), refer to "Controller Expansion Inventory Charts" on page 62.
3. A service processor type 2 (type 7585[6]) or type 3 (type 6275) is required in configurations that include the MAE (FC 3001).

6 No longer available.

Configurations with Ethernet Features

These features are no longer manufactured. The service processor and NNPs in Figure 20 are types 3172[7].

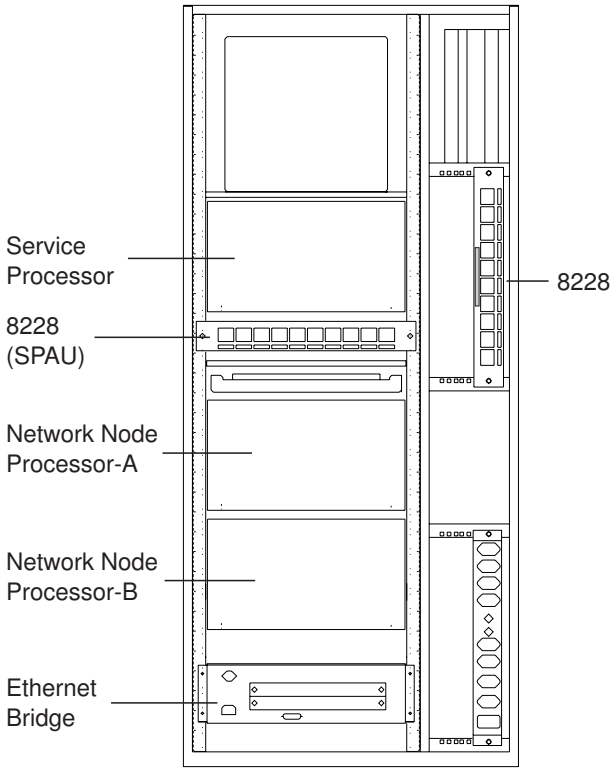


Figure 20. Rear View of Controller Expansion-A with One Ethernet Bridge Installed

[7] No longer available.

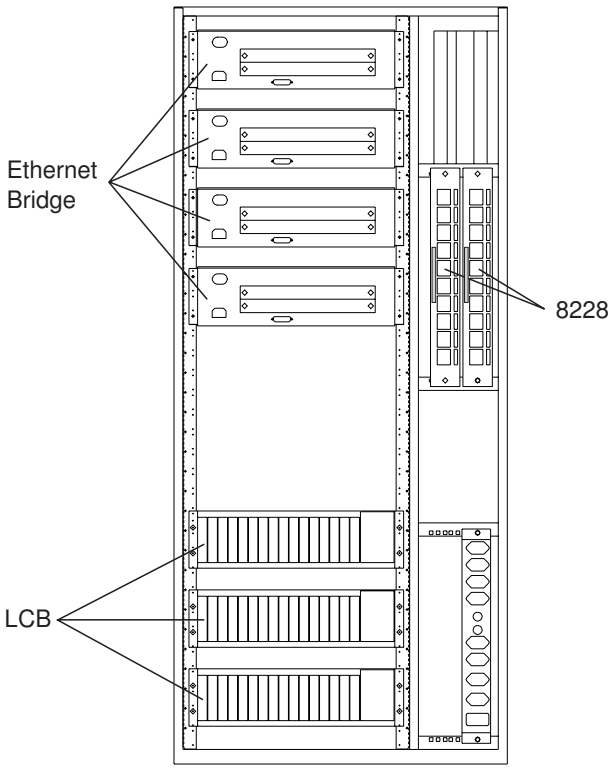


Figure 21. Rear View of Controller Expansion-B with Four Ethernet Bridges Installed

Controller Expansion Inventory Charts

Use these drawing to set up the units on the front side of the controller expansion. For the units that can be installed on the rear, refer to Figure 23 on page 63.

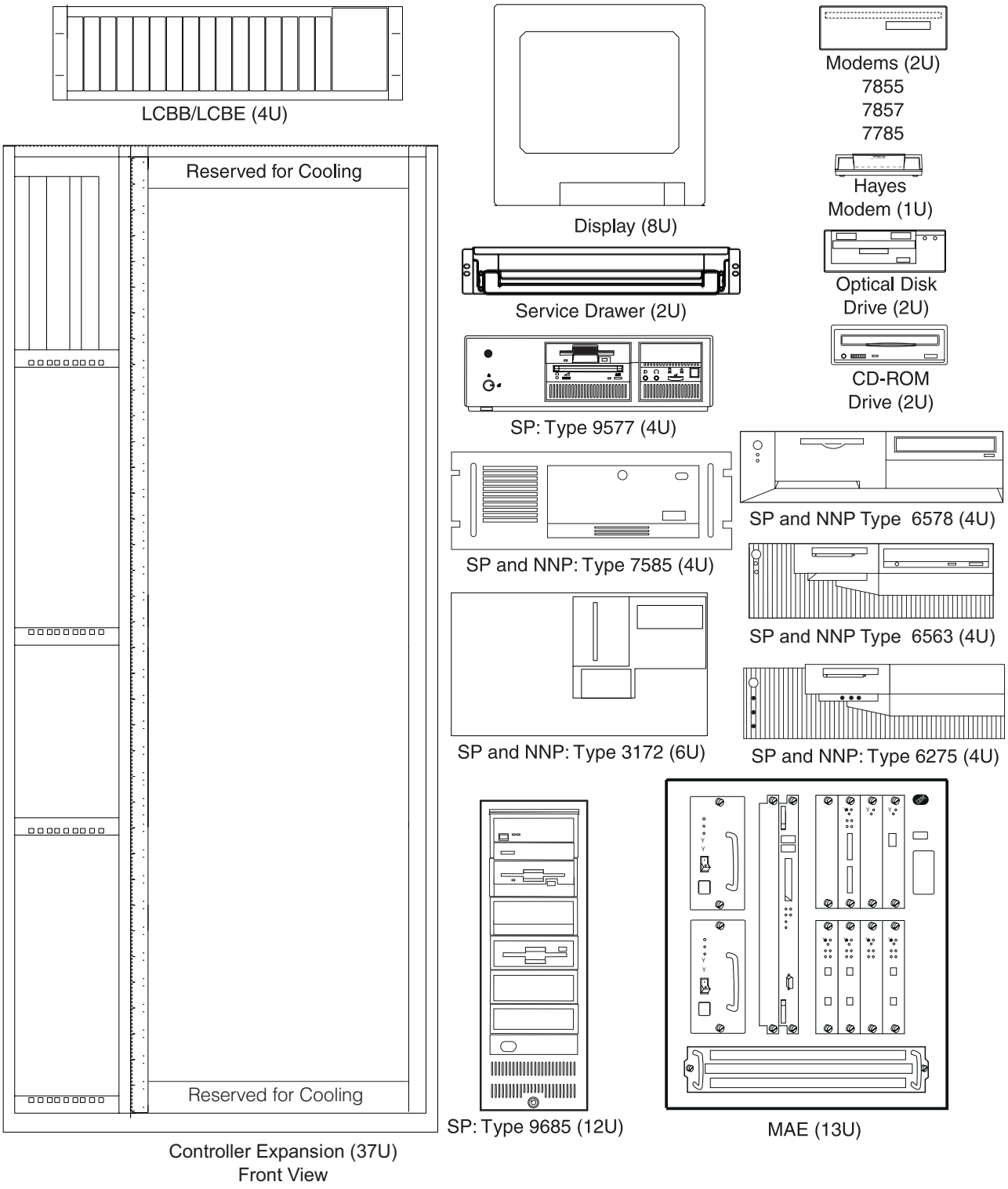


Figure 22. Controller Expansion Inventory Chart (Front View)

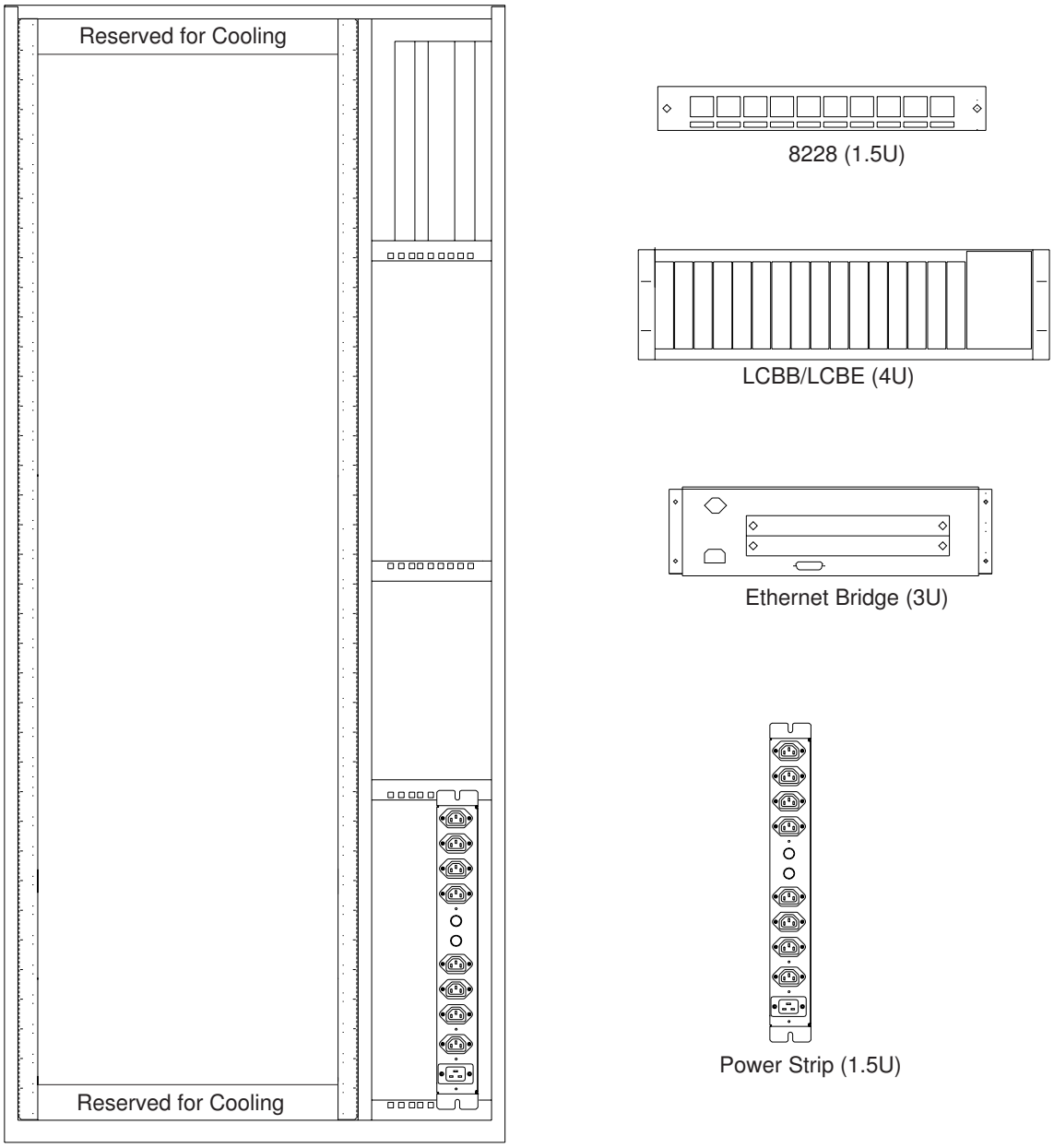


Figure 23. Controller Expansion Inventory Chart (Rear View)

Notes:

1. The units dimensions are scaled to the size of the controller expansion diagram. The values represent the size used to set up the units in the controller expansion; they are not the size of the units themselves.
2. The attachment holes along each side of the controller expansion are divided into units of measure called EIA units. Each EIA unit (U) equals 1.75 in. (44.5 mm).
3. The controller expansion is 37U high but only 35U are usable. One U must be reserved at the top and bottom for proper cooling.

Explanation of Cable Characteristics

The letters in the following sections define the columns in the cable tables that start on page 67.

Cables to be Ordered and Installed <a>

Cables that may have to be ordered and installed with the 3745/3746 features are:

- Channel attachment and emergency power-off (refer to page 67 and 69).
- ESCON jumper and emergency power-off (refer to page 71).
- Service processor attachment (refer to page 74).
- Token-ring and high-speed line attachment (refer to page 79).
- Low- and medium-speed line attachment (refer to page 86).
- Active Remote Connectors (ARCs) (refer to page 87).

FC <b>

The order code of each attachment feature is given if applicable.

LIC Type <c>

The type of LIC corresponding to the line is given if applicable.

Cable Lengths

Three types of cable length are available:

Fixed-Length Cables** <**d**> <**e**>**: Cable lengths are given in column <e>.

In Europe, Middle East, Africa countries, these cables can be automatically delivered with the 3745/3746 or 3746 upgrade, depending on the FC in column <b> and the country. For the 3746-9x0, this applies to the ESCON jumper cables, LIC12 cables, and token-ring cables. This requires the specify code 2999 in the 3745/3746 configuration.

In other countries and regions, order fixed-length cables (for example ESCON jumper, LIC12, or token-ring) by their cable group number in column <d>.

The part numbers of fixed-length cables are not included in these tables. They are the same as those given in column <f> for short cables.

Custom-Length Short Cables** <**f**> <**g**>**: Order these cables by their part number in Europe, Middle East, Africa countries or by their cable group number (CG) in other countries. Specify the required length up to the maximum length given in column <g>.

Custom-Length Long Cables** <**h**> <**i**>**: Order these cables by their part number in column <h> and indicate the required length up to the maximum length given in column <i>.

Country or Region <j> <k>

Features may or may not be available in a particular country or region:

- Column <j> for the U.S.A., Canada, Latin American, Asian, and Pacific countries or regions.
- Column <k> for the Europe, Middle East, Africa countries.

In these two columns:

– Y means that the feature is available.
– N means that the feature is not available.

How to Determine Cable Length

To determine a cable length, add the following distances:

1. From the bottom of the 3745/3746 frame to the bottom of the attached device, including:
   - Cable routing and bends
   - Twice the height of the raised floor, if any
2. From the bottom of the attached device to its connector

Except for the ARCs, the cable is shipped with a length equal to the ordered length, plus 1.5 m (5 ft) to take into consideration the cable length required inside the machine.

See *Selecting and Ordering IBM Machine External Cables,* GA23-0278.

Frame <l>: This column gives the name of the frame or frames to which the cables must be connected. The following abbreviations are used:

- BF is 3745 (base frame).
- 11 is 3746-A11.
- 13 is 3746-L13.
- 14 is 3746-L14.
- 15 is 3746-L15.

Cabling Identification

Use Chapter 3 to prepare the cabling plan. It provides information on how to use the plugging sheets. There is a set of example plugging sheets starting on page 144.

Cable Weight

Communication data line cable weights up to 0.35 kg/m (0.25 lb/ft) for the heaviest cable.

Plenum Cables

For details about plenum cables, refer to the *National Electrical Code*, ZR23-4223. The plenum cables are listed in the following tables.

Modems

Refer to page 75, and also see *Power Supply and Telecommunication Connections for IBM Modems,* GA33-0054 for modem cable information.

For the Hayes modem, the cables are shipped according to the modem part number ordered. Refer to Table 13 on page 75.

Cable Information

Channel Attachment Cables and Emergency Power-Off Cables (3745 Model 17A)

Feature				According to Your Requirements, Order:				Country	
Channel Adapter, TPS, and Emergency Power Off (EPO) (See Note 1) a	FC b	Conn ID b	No. of Cables	Fixed-Length Cable (See Note 2)		Custom-Length Cable (See Note 3 and Note 4)		USA CAN LA AP j	E/ME/A k
				CG d	Length m (ft) e	CG or Part Number h	Maximum Length m i (ft)		
First channel	1563 or 1573	1	2	0185	12 (40)	0185 5460185	122(400)	Y	Y
Second channel	1563 or 1573	3	2	0185	12 (40)	0185 5460185	122(400)		
or first TPS	8320	3	2	0185	12 (40)	0185 5460185	122(400)		
Third channel	1563 or 1573	5	2	0185	12 (40)	0185 5460185	122(400)		
Fourth channel	1563 or 1573	7	2	0185	12 (40)	0185 5460185	122(400)		
or second TPS	8320	7	2	0185	12 (40)	0185 5460185	122(400)		
First EPO	1563 or 1573	41	1	(See Note 5)		1178 5351178	122(400)		
Second EPO	1563 or 1573 or 8320	43	1			1178 5351178	122(400)		
Third EPO	1563 or 1573	45	1			1178 5351178	122(400)		
Fourth EPO	1563 or 1573 or 8320	47	1			1178 5351178	122(400)		

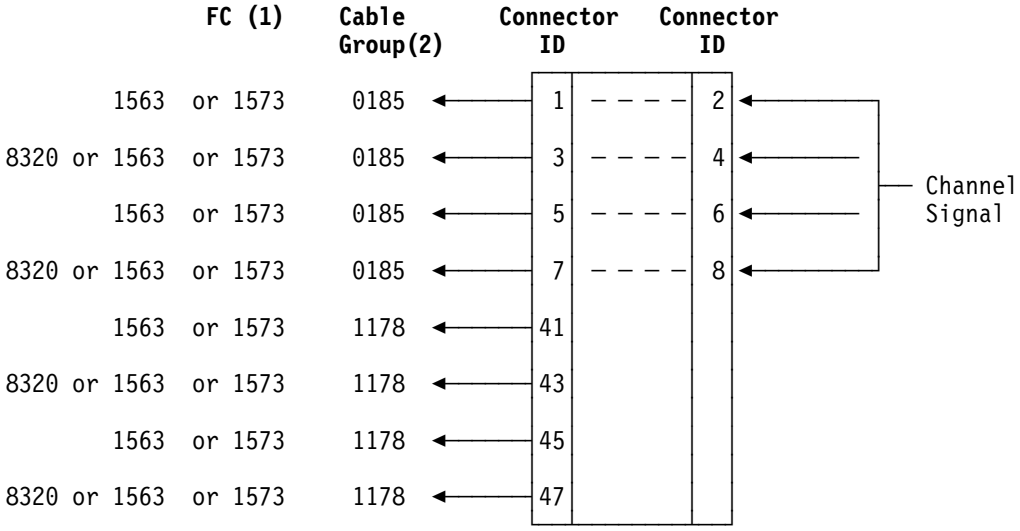
TPS = two-processor switch.

Notes:

1. The emergency power-off (EPO) cable is also called the power control cable.
2. The fixed-length standard cable group 0185 is available in Europe, Middle East, Africa only. It is automatically shipped with each channel adapter and TPS when FC 2999 is specified in the 3745 configuration.
3. For data streaming, the maximum cumulative cable length is 122 m (400 ft) unless modified by system or channel limitation. Maximum cable length must be reduced by 4.5 m (15 ft) for each control unit between the 3745 and the channel.

   For non-data streaming, the maximum length is 61 m (200 ft) unless modified by the general control-to-channel cabling schematic.
4. In the U.S.A., Canada, Latin America, Asia Pacific countries and regions, order cables by group number up to the maximum length specified.
5. The EPO fixed-length standard cable is no longer shipped with the channel adapter or TPS in Europe, Middle East, Africa countries. If an EPO cable is required, order it by P/N up to the maximum length.

3745 Model 17A Channel Cabling Schematic



Notes:

1. Each of the two-processor switches (FC 8320) takes the place of one channel adapter (FC 1563) or one buffer chaining channel adapter (BCCA) (FC 1573).
2. Cable group for signal cables is 0185. Cable group for power control cables is 1178.
3. Each of the four possible power control cables (1178) can be associated with any of the four possible channel attachments. Therefore, a host with a channel attachment to the 3746 Model 900 can power control the 3745 and 3746 Model 900 units through one power control cable.
4. For a 3745 with 3746-900, one of the four possible power control cable connection IDs of the 3745 must be reserved for internal power control.

Channel Attachment Cables and EPO Cables (3745 Models 21A, 31A, 41A 61A, and 3746 Model A11)

Feature				According to Your Requirements, Order:				Country		
Channel adapter, CATPS, and Emergency Power Off (EPO) (See Note 1) a	FC b	Conn ID b	Number of Cables	Fixed-Length Cable (See Note 2) CG d	Length m (ft) e	Custom-Length Cable (See Note 3 and Note 4) CG or Part Number h	Maximum Length m i (ft)	USA CAN LA AP j	E/ME/A k	Frame l
First CATPS or 1st and 2nd Channel Adapters	1562 or 1561 or 1571	1	2	0185	12 (40)	0185 5460185	122(400)	Y	Y	BF
	1581 or 1561 or 1571	3	2	0185	12 (40)	0185 5460185	122(400)			
Second CATPS or 3rd and 4th Channel Adapters	1562 or 1561 or 1571	5	2	0185	12 (40)	0185 5460185	122(400)			
	1581 or 1561 or 1571	7	2	0185	12 (40)	0185 5460185	122(400)			
Third CATPS or 5th and 6th Channel Adapters	1562 or 1561 or 1571	9	2	0185	12 (40)	0185 5460185	122(400)			
	1581 or 1561 or 1571	11	2	0185	12 (40)	0185 5460185	122(400)			
Fourth CATPS or 7th and 8th Channel Adapters	1562 or 1561 or 1571	13	2	0185	12 (40)	0185 5460185	122(400)			
	1581 or 1561 or 1571	15	2	0185	12 (40)	0185 5460185	122(400)			
Fifth CATPS or 9th and 10th Channel Adapters	1562 or 1561 or 1571	17	2	0185	12 (40)	0185 5460185	122(400)			A11
	1581 or 1561 or 1571	19	2	0185	12 (40)	0185 5460185	122(400)			
Sixth CATPS or 10th and 11th Channel Adapters	1562 or 1561 or 1571	21	2	0185	12 (40)	0185 5460185	122(400)			
	1581 or 1561 or 1571	23	2	0185	12 (40)	0185 5460185	122(400)			
Seventh CATPS or 12th and 13th Channel Adapters	1562 or 1561 or 1571	25	2	0185	12 (40)	0185 5460185	122(400)			
	1581 or 1561 or 1571	27	2	0185	12 (40)	0185 5460185	122(400)			
Eighth CATPS or 14th and 15th Channel Adapters	1562 or 1561 or 1571	29	2	0185	12 (40)	0185 5460185	122(400)			
	1581 or 1561 or 1571	31	2	0185	12 (40)	0185 5460185	122(400)			
1st EPO	1561, 1562, 1571, 1581	41	1	(See Note 5)		1178 5351178	122(400)			BF
2nd EPO	1561, 1562, 1571, 1581	43	1			1178 5351178	122(400)			
3rd EPO	1561, 1562, 1571, 1581	45	1			1178 5351178	122(400)			
4th EPO	1561, 1562, 1571, 1581	47	1			1178 5351178	122(400)			
5th EPO	1561, 1562, 1571, 1581	49	1			1178 5351178	122(400)			
6th EPO	1561, 1562, 1571, 1581	51	1			1178 5351178	122(400)			
7th EPO	1561, 1562, 1571, 1581	53	1			1178 5351178	122(400)			
8th EPO	1561, 1562, 1571, 1581	55	1			1178 5351178	122(400)			

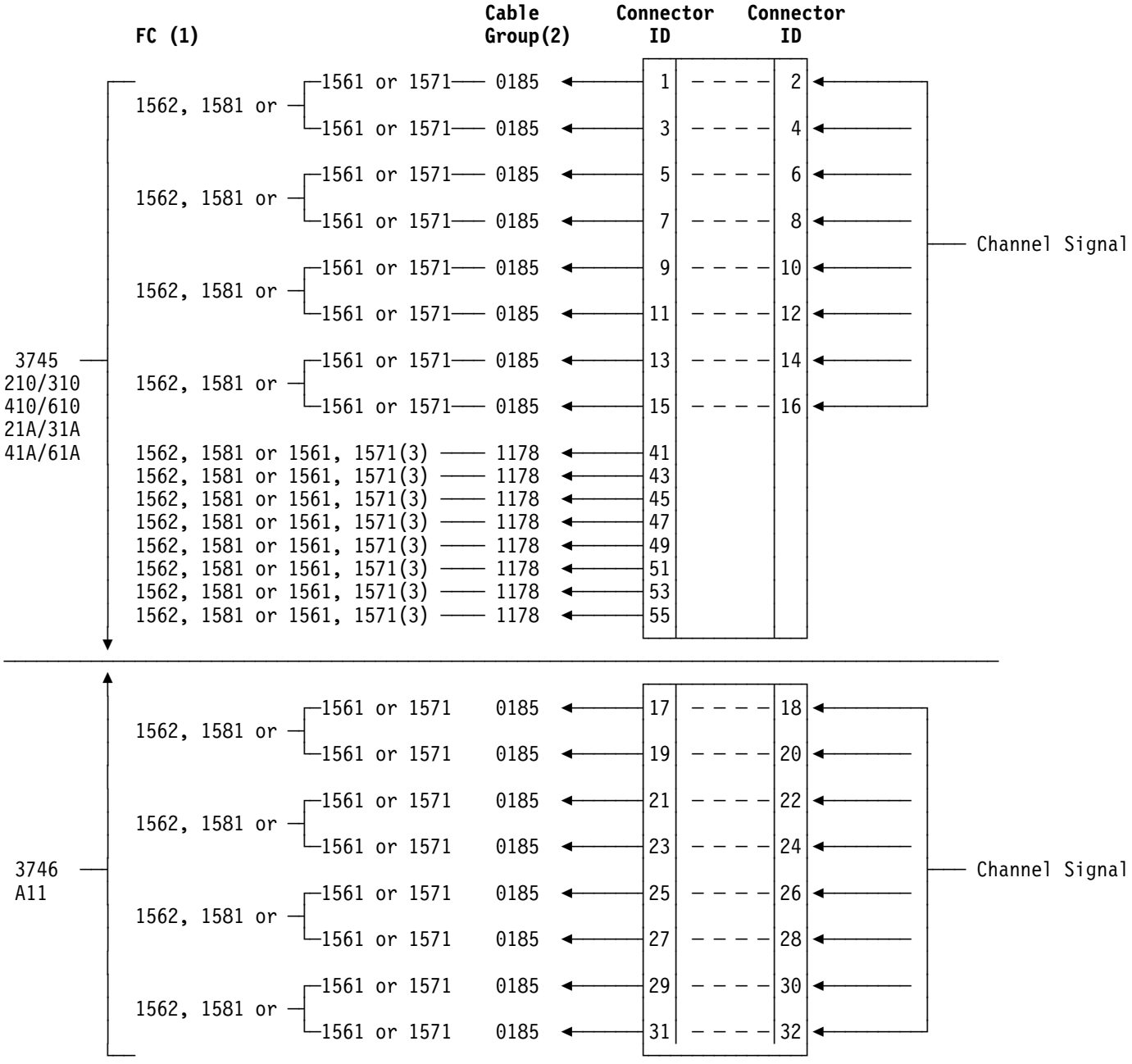
CATPS is channel adapter with two processor switch.

Notes:

1. The emergency power-off (EPO) cable is also called the power control cable.
2. The fixed-length cable (group 0185) is available in Europe, Middle East, Africa countries only. It is automatically shipped with each channel adapter and CATPS, when FC 2999 is specified in the 3745 configuration.
3. For data streaming, the maximum cumulative cable length is 122 m (400 ft) unless modified by system or channel limitation. Maximum cable length must be reduced by 4.5 m (15 ft) for each control unit between the 3745 and the channel.
   For non data streaming, the maximum length is 61 m (200 ft) unless modified by general control-to-channel cabling schematic.

4. In the U.S.A., Canada, Latin America, Asia Pacific countries and regions, order cables by group number up to the maximum length specified.
5. The EPO fixed-length standard cable is no longer shipped with the channel adapter or CATPS in Europe, Middle East, Africa countries. If an EPO cable is required, order it by P/N up to the maximum length.

3745 Models 21A, 31A, 41A, 61A, and 3746 Model A11 Channel Cabling Schematic



Notes:

1. Each channel adapter with two-processor switch (CA FC 1562 or BCCA FC 1581) takes the place of two channel adapters (FC 1561) or of two buffer chaining channel adapters (FC 1571)
2. Cable group for signal cables is 0185. Cable group is 1178 for power control cables.
3. Each of the eight possible power control cables (1178) can be associated with any of the 16 possible channel attachments. Therefore, a host with a channel attachment to the 3746 Model A11 or 900 can power control the 3745 and 3746 Nways Multiprotocol Controllers through one power control cable.
4. For a 3745 with 3746-900, one of the 8 possible power control cable connection IDs of the 3745 must be reserved for internal power control.

ESCON Jumper Cables and Emergency Power-Off Cables (3746-9x0)

For general information about ESCON planning, refer to *Planning for Enterprise Systems Connection Links*, GA23-0367.

The ESCON channel adapters use multimode fibers. Multimode fiber-optic jumper cables with duplex connectors at both ends are required to directly connect the 3746 to ESCON channels, or ESCON Directors. A fixed-length duplex-to-duplex 62.5/125-micron multimode fiber-optic jumper cable is either automatically shipped or must be ordered for each ESCON channel coupler of the 3746, as indicated in Figure 24 on page 72.

Note: IBM recommends using IBM duplex-to-duplex jumper cables between the ESCON-capable device (3746) and distribution panels. In some cases, attaching a jumper cable to a distribution panel could require jumper cables with other connector types for the distribution panel end, (for example, Duplex-to-ST jumper cables or Duplex-to-FC/PC jumper cables), depending upon the type of connectors used by the ESCON trunk cable and the type of couplers/adapters available on the distribution panel.

Notes for Figure 24 on page 72

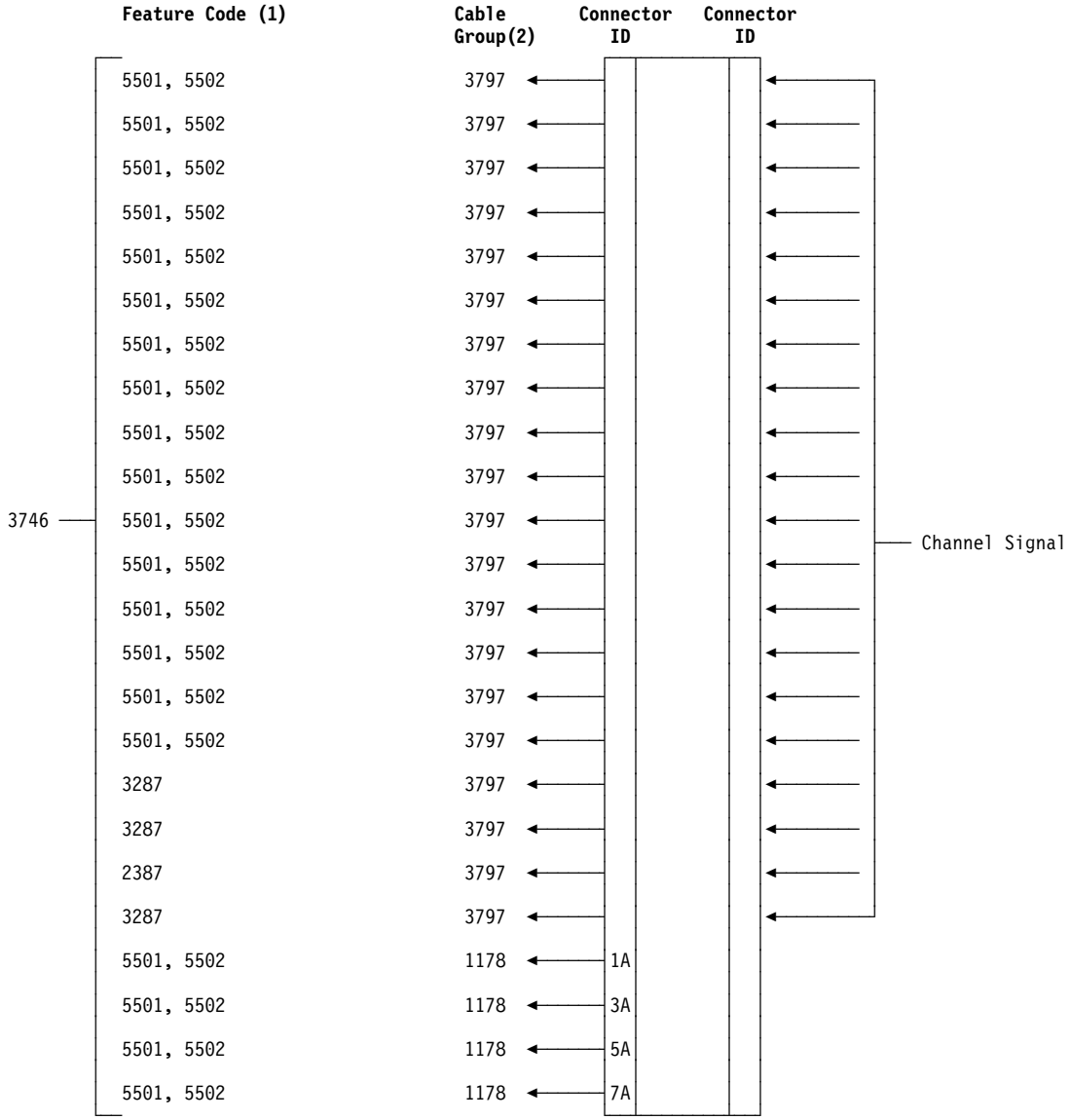
1. The emergency power-off (EPO) cable is also called the power control cable.
2. To order, specify cable group 3797 and one of these lengths, as determined by the IBM Installation Planning Representative.
3. When using the specify code 2999 in your configuration order, the 31 m (100 ft) jumper cable is automatically shipped with the ESCON coupler. If the IBM installation planning representative determines that another length is required, order one of the other fixed-length cables by part number and length.
4. To order, specify cable group 1178, and a length not exceeding the maximum stated.
5. Custom-length duplex-to-duplex jumper cables up to 500 m (1640 ft), jumper cables with a duplex connector at one end (3746) and another type of connector at the other end (distribution panel), and fiber optic adapters and couplers used in distribution panels can be purchased from IBM.
6. The EPO fixed-length standard cable is no longer shipped with the ESCON coupler in the Europe, Middle East, and Africa countries. If an EPO cable is required, order it by P/N up to the maximum length.
7. FC 5501 (ESCON Coupler Type 1) cannot be ordered for the 3746-950. FC 3287 (ESCON Channel Adapter) can be ordered with the Multiaccess Enclosure.

The notes for the figure below are on page 71.

Feature			According to Your Requirements, Order:			
ESCON Coupler & Emergency Power Off (EPO) (See note 1) a	FC b	Cables	Fixed–Length Cable		Custom–Length Cable	
			CG or Part Number d	Length m (ft) e	CG or Part Number f	Maximum Length m g (ft)
ESCON (except Europe, Middle East, and Africa)	5501 5502 3287 (See note 7)	1	3797 (See note 2)	4 (12) 7 (20) 13 (40) 22 (70) 31 (100) 46 (150) 61 (200) 77 (250) 92 (300) 107 (350) 122 (400)	14F3797 (See note 5)	500 (1640)
EPO (except Europe, Middle East, and Africa)	5501 5502 3287 (See note 7)	1			1178 5351178 (See note 4)	122 (400)
ESCON (Europe, Middle East, and Africa)	5501 5502 (See note 7)	1	74F5416 (See note 3) 74F5412 74F5413 74F5414 74F5415 74F9718 74F5417 74F9419 74F9420 74F9421 74F5418	31 (100) 4 (12) 7 (20) 13 (40) 22 (70) 46 (150) 61 (200) 77 (250) 92 (300) 107 (350) 122 (400)	74F5436 (See note 5)	500 (1640)
EPO (Europe, Middle East, and Africa)	5501 5502 (See note 7)	1	(See Note 6)		5351178	122 (400)

Figure 24. ESCON Jumper and EPO Cables

3746 Models 900 and 950 Channel Cabling Schematic



Notes:

1. FC 5501 (ESCON Coupler Type 1) cannot be ordered for the 3746-950. FC 3287 (ESCON Channel Adapter) can be ordered with the Multiaccess Enclosure.
2. Cable group for signal cables is 3797. Cable group for power control cables is 1178.

Service Processor and Network Node Processor Attachment Cables

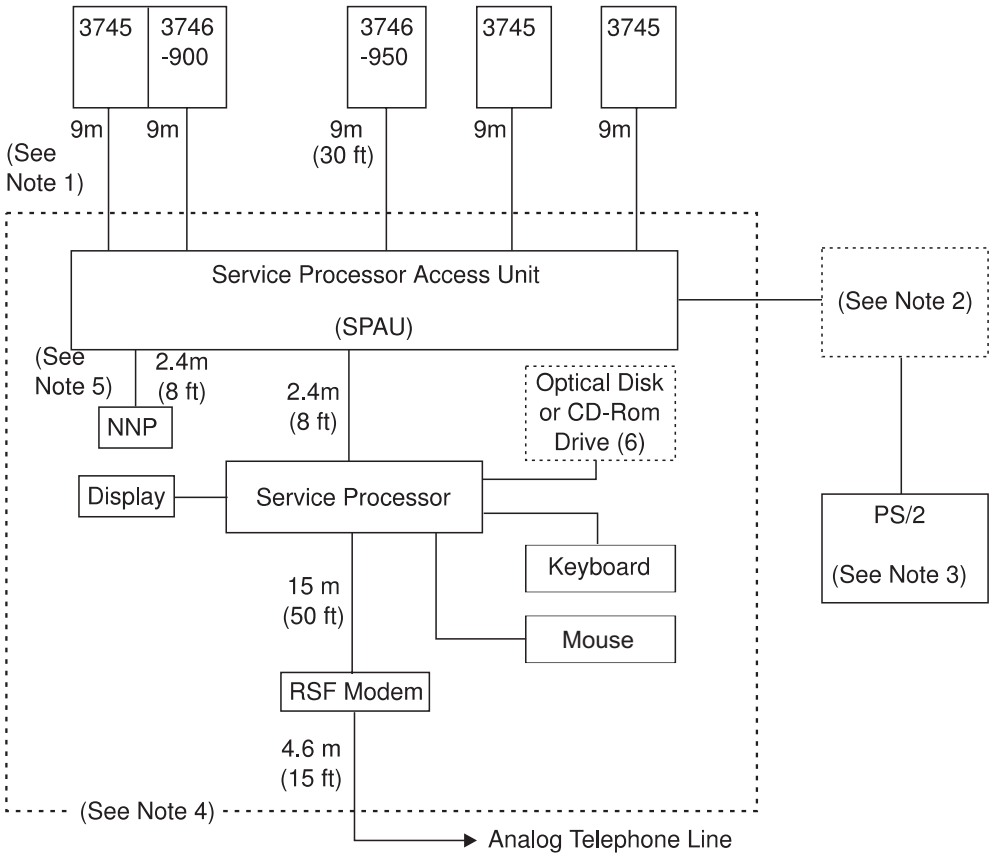


Figure 25. Service Processor Attachment Cables (3745 Models 17A, 21A, 31A, 41A, 61A, and 3746-900/950)

Notes:

In the following notes, the part numbers are supplied for replacement purposes:

1. Token-ring cable shipped automatically with each 3745 and 3746-9x0. The part numbers are:
   - U.S.A. and Canada: 76F9440
   - For all other countries: 76F9441

   If the 9-m cable is not long enough to connect the 3745/3746-9x0 to the SPAU, the Part No 72F1242 for U.S.A. and Canada plenum cable or Part No 72F1236 should be ordered. Refer to page 79 for token-ring cable lengths.
2. Connections to a user's token-ring LAN (16 Mbps), an IBM PS/2 used as an alternate/remote console, or both.
3. LAN-Attached console (through a token-ring).
4. The following signal cables are shipped automatically with the service processor:
   - Service processor to SPAU cable, part number 6339098.
   - Service processor to RSF modem cable, part number 782984 (an adapter 782985).
   - Service processor to display, including a 4 m (13 ft) cable extender, part number 59G1270.
   - Service Processor to keyboard. A 4 m (13 ft) cable is also included, part number 10K8632.
   - Modem telephone cable.
   - Service processor to mouse, part number 10K8633.

In the U.S.A. and Canada, the previously available desktop model of the service processor (type 9577) had an integrated RSF modem with a 15 m (49 ft) modem telephone cable, part number 58G5297.

5. Network node processor-to-SPAU token-ring cable, part number 6339098. This cable is automatically shipped with the network node processor.
6. Separate for older versions of the service processor (no longer available from IBM).

RSF Modem

A modem is required for connection to the IBM Remote Support Facility (RSF). You must provide access to a dedicated analog line of the public switched telephone network, so that the service processor can automatically dial into the IBM Remote Support Facility.

This line can also be used for remote console access from the IBM Support Center to the 3745 and 3746 through the switched telephone network.

The RSF modem is:

- Shipped with the service processor
- Installed by IBM

Refer to “RSF Modem” on page 41 for the RSF modem characteristics.

The part numbers in the following 43-11 to 43-13 tables are provided for information, in case of replacement needs.

Hayes RSF Modem Part Number to Country/Region Reference

Table 13. Hayes Modem P/Ns

Country	Part Number
UK	03K5378
France	03K5371
Germany	03K5372
Netherlands	03K5367
Denmark	03K5369
Sweden	03K5379
Finland	03K5370
Switzerland	03K5380
Norway	03K5377
Iceland	03K5374
Australia	03K5366
China	03K5368

Table 14. Hayes Modem P/Ns

Country	Part Number
Hong Kong	03K5373
Malaysia	03K5373
Singapore	03K5373
Indonesia	03K5375
India	03K5375
Philippines	03K5375
Thailand	03K5375
Sri Lanka	03K5375
Vietnam	03K5375
New Zealand	03K5376
Taiwan	03K5381
U.S.A.	03K5365
Canada	03K5365

Note: Ordering the part number next to a country or region will supply the Hayes modem with all the correct power and line cables for that country.

IBM 7857 RSF Modem Telephone Cables

Table 15. IBM 7857 Modem Cables

Country/Region	Part Number
Albania	89G2554
Argentina	89G2554
Australia	89G2564
Austria	89G2544
Belgium	89G2545
Bolivia	89G2554
Brazil	89G2554
Bulgaria	89G2554
Canada	89G2562
China	89G2554
Colombia	89G2554
Costa Rica	89G2554
Croatia	89G2554
Cyprus	89G2577
Czech Republic	89G2554
Denmark	89G2546
Egypt	89G2554
El Salvador	89G2554
Ecuador	89G2554
Finland	89G2547
France	89G2548

Table 15. IBM 7857 Modem Cables

Country/Region	Part Number
Germany	89G2549
Greece	89G2554
Guatemala	89G2554
Honduras	89G2554
Hong Kong	89G2565
Hungary	89G2554
Iceland	89G3145
Ireland	89G2554
Israel	89G3131
Italy	89G2551
Japan	89G2562
Korea	89G2554
Kuwait	89G2554
Luxemburg	89G3134
Macedonia	89G2554
Mexico	89G2554
Netherlands	89G2552
New Zealand	89G2577
Norway	89G2553
Pakistan	89G2554
Panama	89G2554

Table 15. IBM 7857 Modem Cables

Country/Region	Part Number
Paraguay	89G2554
Peru	89G2554
Poland	89G2554
Portugal	89G2554
Romania	89G2554
Russia	89G2554
Saudi Arabia	89G2554
Slovakia	89G2554
Slovenia	89G2554
South Africa	89G3135
Spain	89G2554
Sweden	89G2555
Switzerland	89G2556
Taiwan	89G2554
Thailand	89G2554
Turkey	89G2554
UK	89G2577
Ukraine	89G2554
Uruguay	89G2554
U.S.A.	89G2562
Venezuela	89G2554

IBM 7855 RSF Modem Telephone Cables

Table 16. IBM 7855 Modem Cables

Country/Region	Part Number
Albania	66X0879
Argentina	53F6095
Austria	74F4485
Belgium	74F4507
Bosnia	See note
Bulgaria	66X0879
Canada	53F6095
Chile	53F6095
China	74F4504
Croatia	See note
Cyprus	03F7852
Czech Republic	66X0879
Denmark	74F4488
Egypt	See note

Table 16. IBM 7855 Modem Cables

Country/Region	Part Number
France	74F4493
Greece	See note
Hong Kong	74F4504
Hungary	66X0879
Iceland	74F4502
Israel	93F1532
Italy	74F4498
Japan	53F6095
Luxemburg	66X0879
Macedonia	See note
Netherlands	74F4500
New Zealand	03F7852
Norway	74F4490

Table 16. IBM 7855 Modem Cables

Country/Region	Part Number
Pakistan	66X0879
Philippines	53F6095
Poland	See note
Portugal	See note
Saudi Arabia	See note
Serbia	See note
Slovenia	See note
South Africa	66X2114
Spain	93F1528
Sweden	74F4502
Thailand	74F4504
UK	74F4504
Uruguay	89G2554
U.S.A.	53F6095
Venezuela	89G2554

Note: The cable with a part number 74F8370 is supplied with spade lugs on one end instead of a plug.

Token-Ring Attachment and High-Speed Line Attachment Cables (3745)

Feature		Maximum Number of Cables per Feature a	According to Your Requirements, Order:						Country		
			Fixed—Length Cable		Custom—Length Cable						
					Short Cable		Long Cable		U.S.A. CANLAAP j	E/ME/A k	Frame l
Token-Ring Attachment and High-Speed Line a	FC b		CG d	Length:em (ft) e	CG or f	Part Number	Maximum Length mg (ft)	Part Number h	Maximum Length mi (ft)		
Token—ring attachment	(See Note 7)	2	1666 (See Note 6)	21.3(70)	1667	61X3229	21.3(70)	61X3229	44.2(145)	Y	N	BF
Token-ring attachment (plenum cable)	(See Note 7)	2	(See Note 6)			76F8641	21.3(70)	76F8641	44.2(145)	U.S.A. Canada	N	
Token—ring attachment	(See Note 7)	2	1666 (See Note 6)	9 (30)	1667	61X3229	21.3(70)	61X3229	44.2(145)	N	Y	
V.35 DCE (See Notes 1 and 2)	(See Note 8)	1	5831	10 (33)	5830	58X9344	10 (33)	58X9344	35 (115) (See Note 5)	Y	Y	
V.35 DCE (See Note 1) (plenum cable)	(See Note 8)	1				76F8633	10 (33)	76F8633	35 (115) (See Note 5)	U.S.A. Canada	N	
X.21 DCE (See Notes 1 and 2)	(See Note 8)	1	5833	10 (33)	5832	58X9345	10 (33)			Y	Y	
X.21 DCE (See Note 1) (plenum cable)	(See Note 8)	1				76F8634	10 (33)			U.S.A. Canada	N	
V.35 direct att. (See Note 1)	(See Note 8)	1	5837 (See Note 9)	10 (33)	5836	58X9347	10 (33)	58X9347	100 (328)	Y	Y	
V.35 direct att. (See Note 1) (plenum cable)	(See Note 8)	1				76F8635	10 (33)	76F8635	100 (328)	U.S.A. Canada	N	
X.21 direct att. (See Note 1)	(See Note 8)	1	5839 (See Note 9)	10 (33)	5838	58X9348	10 (33)			Y	Y	
X.21 direct att. (See Note 1) (plenum cable)	(See Note 8)	1				76F8636	10 (33)			U.S.A. Canada	N	
X.21 Transfix (See Notes 2 and 4)	(See Note 8)	1	5835	10 (33)	5834	58X9346	10 (33)			N	Y	
X.21 EIA—547 DCE	(See Note 8)	1	5844	10 (33)	5842	11F4837	10 (33)	11F4837	35 (115)	Y	N	
X.21 EIA—547 DCE (plenum cable)	(See Note 8)	1				76F8637	10 (33)	76F8637	35 (115)	U.S.A. Canada	N	
X.21 EIA—547 direct attache.	(See Note 8)	1	5845	10 (33)	5843	11F4838	10 (33)	11F4838	100 (328)	Y	N	
X.21 EIA—547 direct attache. (Plenum cable)	(See Note 8)	1				76F8638	10 (33)	76F8638	100 (328)	U.S.A. Canada	N	

Notes: See page 78.

Notes:

1. Direct connections (without any modem):
   a. **3745/3746 to IBM 2210 Multiprotocol Router, IBM 2212 Access Utility, IBM 2216 Multiaccess Connector, or 3746 (Multiaccess Enclosure)** The 3745 and 3746 must use a V.35 DCE cable. The IBM 2210, IBM 2212, IBM 2216, or Multiaccess Enclosure must use a V.35 direct-attachment cable (clocking must be provided by the 2210, 2212, 2216 or Multiaccess Enclosure).
   b. **3745/3746 to 3745/3746, 3720, or 3725 connections**:
      - If the 3745/3746 is defined as main (NCP generation parameters: direct clocking), it must use a V.35 or X.21 direct-attachment cable.
      - If the 3745/3746 is defined as tributary (NCP generation parameters: external clocking), it must use a V.35 or X.21 DCE cable.

   The total length of the two cables must not exceed 100 m (328 ft) for V.35, or 10 m (33 ft) for X.21.
2. In Europe, Middle East, Africa countries, the cable group delivered by default when using specific code 2999 with this feature is:

   5831 (V.35 DCE) in Belgium, Denmark, Finland, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and Turkey.
   5835 (X.21 Transfix) in France.
   5833 (X.21 DCE) in other Europe, Middle East, Africa countries.
3. The cable group numbers 5837 and 5839 are not available in Europe, Middle East, Africa countries. Order by the cable part number in Europe, Middle East, and Africa countries.
4. X.21 Transfix is available in France only. This cable must be used for those Transfix DCEs that do not support the "Control" and "Indicator" signaling over the X.21 interface.
5. This length is authorized with the special clocking option only (transmit clocking loopback to DCE). Without this option, the maximum cable length is 15 m (50 ft).
6. Token-ring cables for the 3745 are not interchangeable with token-ring cables for the 3746-900, due to differing connectors on the machine side.
7. For the 3745 Models 21A, 31A, 41A, and 61A, the FC is 4760 or 4770. For the 3745 Model 17A, the FC is 4771.
8. For the 3745 Models 21A, 31A, 41A, and 61A, the FC is 4740. For the 3745 Model 17A, the FC is 4741. Each 4740 or 4741 FC provides two ports. Only one port can be active at a time.
9. To attach an IBM 6629, a short cable having a maximum length of 5 m (16 ft) must be ordered.

Token-Ring (TIC3) and High-Speed Line (LIC12) Attachment Cables (3746-9x0)

Feature				According to Your Requirements, Order:						Country	
				Fixed-Length Cable		Custom-Length Cable					
						Short Cable		Long Cable			
Token-Ring Attachment a	FC b	LIC Type c	Maximum Number of Cables per Feature a	CG d	Length m (ft) e	CG or Part No. f	Maximum Length m g (ft)	Part Number h	Maximum Length m i (ft)	U.S.A. CANLA AP j	E/ME/A k
Token-ring attachment	5601	NA	1	7003 (See Note 6)	21.3(70)	7004 72F1236	21.3(70)	72F1236	44.2(145)	Y	N
Token-ring attachment (Plenum cable)	5601	NA	1	7005 (See Note 6)	21.3(70)	7006 72F1242	21.3(70)	72F1242	44.2(145)	U.S.A. Canada	N
Token-ring attachment	5601	NA	1	7003 (See Note 6)	9 (30)	7004 72F1236	9.0(30)	72F1236	44.2(145)	N	Y
V.35 DCE (See Notes 1 and 2)	5212	12	1	5831	10 (33)	5830 58X9344	10 (33)	58X9344	35 (115) (See Note 5)	Y	Y
V.35 DCE (See Note 1) (Plenum cable)	5212	12	1	7007	10 (33)	7008 76F8633	10 (33)	76F8633	35 (115) (See Note 5)	U.S.A. Canada	N
X.21 DCE (See Notes 1 and 2)	5212	12	1	5833	10 (33)	5832 58X9345	10 (33)			Y	Y
X.21 DCE (See Note 1) (Plenum cable)	5212	12	1	7009	10 (33)	7010 76F8634	10 (33)			U.S.A. Canada	N
V.35 direct attachment (See Note 1)	5212	12	1	5837 (See Note 3)	10 (33)	5836 58X9347	10 (33)	58X9347	100 (328)	Y	Y
V.35 direct attachment (See Note 1) (Plenum cable)	5212	12	1	7011	10 (33)	7012 76F8635	10 (33)	76F8635	100 (328)	U.S.A. Canada	N
X.21 direct attachment (See Note 1)	5212	12	1	5839 (See Note 3)	10 (33)	5838 58X9348	10 (33)			Y	Y
X.21 direct attachment (See Note 1) (Plenum cable)	5212	12	1	7013	10 (33)	7014 76F8636	10 (33)	76F8636	10 (33)	U.S.A. Canada	N
X.21 Transfix (See Notes 2 and 4)	5212	12	1	5835	10 (33)	5834 58X9346	10 (33)			N	Y
X.21 EIA-547 DCE	5212	12	1	5844	10 (33)	5842 11F4837	10 (33)	11F4837	35 (115)	Y	N
X.21 EIA-547 DCE (Plenum cable)	5212	12	1	7015	10 (33)	7016 76F8637	10 (33)	76F8637	35 (115)	U.S.A. Canada	
X.21 EIA-547 direct attachment	5212	12	1	5845	10 (33)	5843 11F4838	10 (33)	11F4838	100 (328)	Y	
X.21 EIA-547 direct attachment (Plenum cable)	5212	12	1	7017	10 (33)	7018 76F8638	10 (33)	76F8638	100 (328)	U.S.A. Canada	

Notes: See page 80.

Notes:

1. Direct connections (without any modem):
   - **3746 to IBM 2210 Multiprotocol Router, IBM 2212 Access Utility, IBM 2216 Multiaccess Connector, or 3746 (Multiaccess Enclosure)**
     The 3746 must use a V.35 DCE cable and the IBM 2210, IBM 2212, IBM 2216, or Multiaccess Enclosure must use a V.35 direct-attachment cable (the 2210, 2212, 2216, or MAE must provide clocking to the 3746).
   - **3746 to a 3746 Model 900 or 950, or a 3745**
     – The 3745/3746 defined as main (for direct clocking) must use a direct-attachment cable (V.35 or X.21).
     – The 3745/3746 defined as tributary (for external clocking), must use a DCE cable (V.35 or X.21).

   The total length of the two cables must not exceed 100 m (328 ft) for V.35, or 10 m (33 ft) for X.21.
2. In Europe, Middle East, Africa countries, the cable group delivered by default when using specific code 2999 with this feature is:
   - 5831 (V.35 DCE) in Belgium, Denmark, Finland, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, and Turkey.
   - 5835 (X.21 Transfix) in France.
   - 5833 (X.21 DCE) in other Europe, Middle East, Africa countries.

   To attach an IBM 6629, a short cable having a maximum length of 5 m (16 ft) must be ordered
3. The cable group numbers 5837 and 5839 are not available in Europe, Middle East, Africa countries. Order the cable by part number in these countries.
4. X.21 Transfix is available in France only. This cable must be used for those Transfix DCEs that do not support the "Control" and "Indicator" signaling over the X.21 interface.
5. This length is authorized with the special clocking option only (transmit clocking loopback to DCE). Without this option, the maximum cable length is 15 m (50 ft).
6. Token-ring cables for the 3745 are not interchangeable with token-ring cables for the 3746, due to differing connectors on the machine side.

Line Interface Attachment (LIC) Cables (3745, 3746-L13/L15) (Part 1 of 3)

Feature				According to Your Requirements, Order:							Country		
				Fixed-Length Cable		Custom-Length Cable							
						Short Cable			Long Cable				
LIC [a]	FC [b]	LIC Type [c]	Maximum Number of Cables per Feature [a]	CG [d]	Length m (ft) [e]	CG or [f]	Part Number	Maximum Length m [g] (ft)	Part Number [h]	Maximum Length m [i] (ft)	USA CANLA AP [j]	E/ME/A [k]	Frqme [l]
V.24 DCE (Japan NTT) (See Notes 1, and 2)	4911	1	4			1621	6398662	13.5 (45)	6398782	100 (328)	Japan	N	BF 13 14 15
V.24 DCE X.21 bis oper. (Japan NTT) (See Note 2)	4911	1	4			8153	61F4505	13.5 (45)	61F4507	100 (328)			
V.25 auto call (Japan NTT) (See Note 2)	4911	1	4			1634	6398664	13.5 (45)	6398786	35 (115)			
V.25 auto call (Caducee France)	4911	1	4			1622	6398667	13.5 (45)	6398783	35 (115)	N	Y	
V.25 RS-366 auto call (UK)	4911	1	4			1635	6398670	13.5 (45)	6398787	35 (115)			
V.35 DCE (French PTT modem) (See Notes 3 and 5)	4931	3	1	1619	13.5 (45)	1619	6398671	13.5 (45)	6398789	100 (328)			
V.24 DCE (Belgium) (See Notes 1 and 4)	4911	1	4	1620	13.5 (45)	1620	6398672	13.5 (45)	6398780	100 (328)			
X.21 DCE Transfix (France) (See Note 6)	4942	4B	1	1609	13.5 (45)	1609	58X9488	13.5 (45)	6398661	122 (400)			
V.35 direct attachment (France) (See Note 7)	4931	3	1			1623	65X9900	13.5 (45)	65X9900	122 (400)			

Notes: See page 82.

Notes:

1. This cable does not support X.21 bis operation.
2. Cable for:
   - Nippon Telegraph and Telephone (NTT) modem
   - Japanese original equipment manufacturer (OEM) modem
3. Includes the adapter, part number 1749352.
4. This cable can be used in conjunction with an ARC/3745 V.24 DCE assembly, feature number 648x (see pages 87 and 88). However, to be in compliance with the European Telecommunication standard NET2, it is recommended to use the ARC/3745 V.24 DCE in conjunction with a custom-length long cable having a maximum length of 13.5 m (45 ft).
5. This cable can be used in conjunction with an ARC/3745 V.35 DCE assembly feature number 658x (see pages 87 and 88). However, to be in compliance with the European Telecommunication standard NET2, it is recommended to use the ARC/3745 V.35 DCE in conjunction with a custom-length short cable having a maximum length of 13.5 m (45 ft).
6. This cable must be used for those Transfix DCEs that do not support the "Control" and "Indicator" signaling over the X.21 interface. This cable can be used in conjunction with an ARC/3745 X.21 DCE assembly, feature number 662x (see pages 87 and 88). However, to be in compliance with the European Telecommunication standard NET2, it is recommended to use the ARC/3745 X.21 DCE in conjunction with a custom-length short cable having a maximum length of 13.5 m (45 ft).
7. This cable can be used in conjunction with the ARC/3745 V.35 DTE, FC 6580 (see pages 87 and 88).

Line Interface Attachment (LIC) Cables (3745, 3746-L13/L15) (Part 2 of 3)

Feature				According to Your Requirements, Order:						Country		
				Fixed-Length Cable		Custom-Length Cable						
						Short Cable		Long Cable				
LIC a	FC b	LIC Type c	Maximum Number of Cables per Feature a	CG d	Length m (ft) e	CG or Part Number f	Maximum Length m (ft) g	Part Number h	Maximum Length m (ft) i	U.S.A. CANLA AP j	E/ME/A k	Frame l
V.25 RS-366 auto call	4911	1	4	1616	13.5 (45)	1610 6398668	13.5 (45)	6398788	35 (115)	Y	Y	BF 13 14 15
V.25 RS-366 auto call (Plenum cable)	4911	1	4		13.5 (45)	76F8614	13.5 (45)	76F8615	35 (115)	U.S.A. Canada	N	
V.24 RS-232-C direct attachment (See Note 1)	4911	1	4	1607	13.5 (45)	1612 7837397	13.5 (45)	7837398	122 (400)	Y	Y	
V.24 RS-232-C direct attach. (See Note 1) (Plenum cable)	4911	1	4		13.5 (45)	76F8616	13.5 (45)	76F8617	122 (400)	U.S.A. Canada	N	
V.35 DCE (See Notes 2 and 10)	4931	3	1	1613	13.5 (45)	1618 58X9485	13.5 (45)	6398665	100 (328)	Y	Y	
V.35 DCE (Plenum cable) (See Note 10)	4931	3	1		13.5 (45)	76F8618	13.5 (45)	76F8619	100 (328)	U.S.A. Canada	N	
V.35 direct attachment (See Note 11)	4931	3	1	1605	13.5 (45)	1623 58X9484	13.5 (45)	6398657	122 (400)	Y	Y	
V.35 direct attachment (Plenum cable) (See Note 11)	4931	3	1		13.5 (45)	76F8620	13.5 (45)	76F8621	122 (400)	U.S.A. Canada	N	
X.21 DCE (See Notes 3 and 13)	4941 4942	4A* 4B	4 1	1606	13.5 (45)	1624 58X9487	13.5 (45)	6398658	122 (400)	Y	Y	
X.21 DCE (Plenum cable) (See Note 13)	4941 4942	4A* 4B	4 1		13.5 (45)	76F8622	13.5 (45)	76F8623	122 (400)	U.S.A. Canada	N	

* The LIC4A is no longer manufactured.

Notes: See page 85.

Line Interface Attachment (LIC) Cables (3745, 3746-L13/L15) (Part 3 of 3)

Feature				According to Your Requirements, Order:						Country		
				Fixed-Length Cable		Custom-Length Cable						
						Short Cable		Long Cable				
LIC a	FC b	LIC Type c	Maximum Number of Cables per Feature a	CG d	Length m (ft) e	CG or Part Number f	Maximum Length m (ft) g	Part Number h	Maximum Length m (ft) i	U.S.A. CAN LA AP j	E/ME/A k	Frame l
X.21 direct attachment (See Note 14)	4941 4942	4A* 4B	4 1	1608	30 (100)	1625 58X9486	30 (100)	6398660	122 (400)	Y	Y	BF 13 14 15
X.21 direct attachment (Plenum cable) (See Note 14)	4941 4942	4A* 4B	4 1		30 (100)	76F8624	30 (100)	76F8625	122 (400)	U.S.A. Canada	N	
V.24 RS-232-C direct attach. (See Notes 4 and 12)	4911	1	4	1611	13.5 (45)	1627 7837395	13.5 (45)	7837396	122 (400)	Y	Y	
V.24 RS-232-C direct attach. (See Notes 4 and 12) (Plenum cable)	4911	1	4		13.5 (45)	76F8626	13.5 (45)	76F8627	122 (400)	U.S.A. Canada	N	
V.24 RS-232-C DCE (See Notes 5, 6, and 9)	4911	1	4	1604	13.5 (45)	1628 6398643	13.5 (45)	6398785	100 (328)	Y	Y	
V.24 RS-232-C DCE (See Notes 6 and 9) (Plenum cable)	4911	1	4		13.5 (45)	76F8628	13.5 (45)	76F8629	100 (328)	U.S.A. Canada	N	
V.24 RS-232-C DCE X.21 bis operation (See Notes 7 and 9)	4911	1	4	8154	13.5 (45)	8152 61F4504	13.5 (45)	61F4506	100 (328)	Y	Y	
V.24 RS-232-C DCE X.21 bis operation (See Note 9) (Plenum cable)	4911	1	4		13.5 (45)	76F8630	13.5 (45)	76F8631	100 (328)	U.S.A. Canada	N	
Telecommuni-cation cord (See Note 8)	7865 7825	5* 6*	2 1		15 (50)					Y	Y	

* The LIC4A, LIC5, and LIC6 are no longer manufactured.

Notes: See page 85.

Notes:

1. Direct attachment for the IBM 3101 Display Terminal and the asynchronous data terminal equipments (DTE).
2. Cable for LIC3 except for the French Post Telephone and Telegraph (PTT) modem.
3. Cable for LIC4 except for Transfix DCEs requiring "C" to be wrapped on "I" in the cable.
4. Direct attachment for synchronous DTE.
5. Cable for LIC1 except for Belgium and for Nippon Telegraph and Telephone (NTT) modem.
6. This cable does not support X.21 bis operation.
7. Cable for LIC1 except for Nippon Telegraph and Telephone (NTT) modem.
8. LIC types 5 and 6 are no longer manufactured.
9. This cable can be used in conjunction with an ARC/3745 V.24 DCE assembly feature 648x (see pages 87 and 88). However, to be in compliance with the European Telecommunication standard NET2, it is recommended to use the ARC/3745 V.24 DCE in conjunction with a custom-length long cable type having a maximum length of 13.5 m (45 ft).
10. This cable can be used in conjunction with an ARC/3745 V.35 DCE assembly feature 658x (see pages 87 and 88). However, to be in compliance with the European Telecommunication standard NET2, it is recommended to use the ARC/3745 V.35 DCE in conjunction with a custom-length long cable having a maximum length of 13.5 m (45 ft).
11. This cable can be used in conjunction with the ARC/3745 V.35 DTE assembly feature 6580 (see pages 87 and 88).
12. This cable can be used in conjunction with the ARC/3745 V.24 DTE assembly feature 6480 (see pages 87 and 88).
13. This cable must not be used for those Transfix DCEs that do not support the "Control" and "Indicator" signaling over the X.21 interface. This cable can be used in conjunction with an ARC/3745 X.21 DCE assembly feature 662x (see pages 87 and 88). However, to be in compliance with the European Telecommunication standard NET2, it is recommended to use the ARC/3745 X.21 DCE in conjunction with a custom-length long cable having a maximum length of 13.5 m (45 ft).
14. This cable can be used in conjunction with the ARC/3745 X.21 DTE assembly, FC 6620 (see pages 87 and 88).

ISDN Attachment (LIC16) Cables (3746-900)

Note: The LIC16 is no longer available.

Low- and Medium-Speed Line Attachment (LIC11) Cables (3746-9x0)

This cable connects the LIC11 to the line connection box base (LCBB). Refer to the figure on page 33. The LIC11 cable is provided with a predefined fixed length and must be ordered with the LIC11 feature (see column <**d**> below for LIC11 cable ordering codes).

Feature		LIC Type c	Maximum Number of Cables per Feature a	According to Your Requirements, Order:			Country	
				Fixed-Length Cable			U.S.A. CAN LA AP j	E/ME/A k
LIC11 a	FC b			d	Length m (ft) e	Part Number (Note 3)		
	5210	11	1	9913 (Note 1)	1.3 (4)	58G5601	Y	Y
(plenum cable) (Note 6)	5210	11	1	9715 (Note 5)	5.5 (18) (Note 4)	17G5915	U.S.A. Canada	N
(Note 6)	5210	11	1	9714 (Note 5)	5.5 (18) (Note 4)	58G5602	Y	Y
(plenum cable)	5210	11	1	9717 (Note 5)	13.5 (45) (Note 4)	17G5916	U.S.A. Canada	N
	5210	11	1	9716 (Note 5)	13.5 (45) (Note 4)	58G5603	Y	Y
(plenum cable)	5210	11	1	5219 (Note 2)	33.5 (110) (Note 4)	17G5917	U.S.A. Canada	N
	5210	11	1	5218 (Note 2)	33.5 (110) (Note 4)	58G5604	Y	Y
(plenum cable) (Note 6)	5210	11	1	5221 (Note 5)	68.5 (226) (Note 4)	17G5918	U.S.A. Canada	N
(Note 6)	5210	11	1	5220 (Note 2)	68.5 (226) (Note 4)	58G5605	Y	Y
(plenum cable) (Note 6)	5210	11	1	5223 (Note 5)	103.5(341) (Note 4)	17G5919	U.S.A. Canada	N
	5210	11	1	5522 (Note 2)	103.5(341) (Note 4)	58G5606	Y	Y

Notes:

1. This code is a specific code for the 3746 machine or 3746 upgrade order. This cable connects a LIC11 to a LCBB installed in the 3746.
2. This code is a feature code for the 3746 machine or 3746 upgrade order.
3. Part numbers for LIC11 cables are provided for information only. The codes listed in Col <**d**> must be used to order LIC11 cables with the 3746 machine or 3746 upgrade.
4. The actual cable length is the table value plus 1.5 m (5 ft). See "How to Determine Cable Length" on page 65.
5. This code is a specific code for the 3746 machine or 3746 upgrade order.
6. No longer available.

Active Remote Connector (ARC) Assemblies (3746-9x0)

The ARC assembly connects the modem or terminal (direct attachment) to the line connection box (LCB). There are two types of ARC assemblies:

ARC assembly A
The cable is part of the ARC component and cannot be separated from the ARC card. This type of ARC is no longer available from IBM.

ARC assembly B
The cable is separate from the ARC and is included in the ARC assembly. The cable length and connector type are determined by the ordered ARC feature code.

The ARC assemblies are optional features and must be ordered with the 3746 machine or 3746 upgrade.

Note: An ARC cable connects to one of the following:

DCE A modem attachment
DTE A direct attachment

ARC Assemblies A

The information in Table 17 is included for reference only because the ARCs in this category are no longer available from IBM.

Table 17. ARC Assemblies A

ARC Assembly	Connected To	ARC Name (Feature Code)	Length m (ft) (See Note 1)		ARC Assembly	Connected To	ARC Name (Feature Code)	Length m (ft) (See Note 1)
ARC V.24 (See note 2)	DTE	ARC1B (6400)	15 (50)		ARC/3745 V.24 (See note 3)	DTE	ARC1D (6480)	5 (17)
ARC V.24 (See notes 2 and 6)	DCE	ARC1A1 (6405) ARC1A2 (6415)	5 (17) 12 (40)		ARC/3745 V.24 (See note 3)	DCE	ARC1C (6485)	5 (17)
ARC V.35 (See notes 2 and 5)	DTE	ARC3B (6500)	15 (50)		ARC/3745 V.35 (See note 3)	DTE	ARC3D (6580)	5 (17)
ARC V.35 (See notes 2 and 4)	DCE	ARC3A1 (6505) ARC3A2 (6515)	5 (17) 15 (50)		ARC/3745 V.35 (See note 3)	DCE	ARC3C (6585)	5 (17)
ARC X.21 (See note 2)	DCE	ARC4A1 (6605) ARC4A2 (6615)	5 (17) 15 (50)		ARC/3745 X.21 (See note 3)	DCE	ARC4C (6625)	5 (17)
ARC X.21 Transfix (See note 7)	DCE	ARC4A3 (6630) ARC4A4 (6635)	5 (17) 15 (50)		ARC/3745 X.21 (See note 3)	DTE	ARC4D (6620)	5 (17)
ARC X.21 (See note 2)	DTE	ARC4B (6600)	15 (50)					

Note: The notes for this table are on page 92.

ARC Assemblies B

These ARC assemblies consist of an ARC card and a cable that can be separate from the ARC. The possible cable lengths depend on the type of connection. Table 18 shows the feature code for each combination of ARC card type, connection mode, and cable length. The ARC assemblies must be ordered with the 3746 machine or 3746 upgrade.

Each part of Table 18 corresponds to a category of interface and lists all the available lengths up to the maximum allowed for this category.

Table 18 (Page 1 of 2). ARC Assemblies B and Their Cables

ARC Card Type	Connected To	ARC Name (at MOSS-E)	ARC Cable Length m (ft) (See note 1)	Feature Code
V.24	DCE	ARC1A0	0.6 (2)	6406*
V.24	DCE	(See notes 2 and 6)	1.2 (4)	6402
V.24	DCE		2.4 (8)	6404
V.24	DCE		5 (17)	6405
V.24	DCE		10 (33)	6410*
V.24	DCE		12 (40)	6415
V.24	DTE	ARC1B0 (See note 2)	15 (50)	6400
V.24	3745 DCE cable	ARC1C0	0.6 (2)	6486*
V.24	3745 DCE cable	(See notes 2 and 3)	1.2 (4)	6482*
V.24	3745 DCE cable		2.4 (8)	6484*
V.24	3745 DCE cable		5 (17)	6485
V.24	3745 DTE cable	ARC1D0 (See notes 2 and 3)	5 (17)	6480*
V.35	DCE	ARC3A0	0.6 (2)	6506
V.35	DCE	(See notes 2 and 4)	1.2 (4)	6502
V.35	DCE		2.4 (8)	6504*
V.35	DCE		5 (17)	6505
V.35	DCE		10 (33)	6510*
V.35	DCE		15 (50)	6515
V.35	DTE	ARC3B0 (See notes 2 and 5)	15 (50)	6500
V.35 3745 DCE	3745 DCE cable	ARC3C0	0.6 (2)	6586*
V.35 3745 DCE	3745 DCE cable	(See notes 2 and 3)	1.2 (4)	6582*
V.35 3745 DCE	3745 DCE cable		2.4 (8)	6584*
V.35 3745 DCE	3745 DCE cable		5 (17)	6585
V.35 3745 DTE	3745 DTE cable	ARC3D0 (See notes 2 and 3)	5 (17)	6580*

Table 18 (Page 2 of 2). ARC Assemblies B and Their Cables

ARC Card Type	Connected To	ARC Name (at MOSS-E)	ARC Cable Length m (ft) (See note 1)	Feature Code
X.21	DCE	ARC4A0	0.6 (2)	6606*
X.21	DCE	(See note 2)	1.2 (4)	6602
X.21	DCE		2.4 (8)	6604
X.21	DCE		5 (17)	6605
X.21	DCE		10 (33)	6610*
X.21	DCE		15 (50)	6615
X.21	DTE	ARC4B0 (See note 2)	15 (50)	6600
X.21	DCE (Transfix)	ARC4E0	5 (17)	6630*
X.21	DCE (Transfix)	(See note 7)	15 (50)	6635
X.21	3745 DTE cable	ARC4D0 (See notes 2 and 3)	5 (17)	6620*
X.21	3745 DCE cable	ARC4C0	0.6 (2)	6626*
X.21	3745 DCE cable	(See notes 2 and 3)	1.2 (4)	6622*
X.21	3745 DCE cable		2.4 (7)	6624*
X.21	3745 DCE cable		5 (17)	6625

Notes:

1. The notes for this table are on page 92.
2. Items marked with an asterisk (*) are no longer available.

Cables for ARC Assemblies B

Additional cables, with different lengths or with a different connectors, can be ordered separately from the ARC assemblies B when the ARC card type does not need to be changed. These cables can be ordered from IBM by their part numbers.

Table 19 (Page 1 of 2). Cables for ARC Assemblies B

ARC Card Type	Connected To	Cable Length m (ft) (See note 1)	Cable Part Number
V.24	DCE	0.6 (2)	58G5610
V.24	DCE	1.2 (4)	58G5611
V.24	DCE	2.4 (8)	58G5612
V.24	DCE	5 (17)	58G5613
V.24	DCE	10 (33)	58G5614
V.24	DCE	12 (40)	58G5615
V.24	DTE	15 (50)	58G5616
For these DCE cables, see note 3.			
V.24	3745 DCE cable	0.6 (2)	58G5640
V.24	3745 DCE cable	1.2 (4)	58G5641
V.24	3745 DCE cable	2.4 (8)	58G5642
V.24	3745 DCE cable	5 (17)	58G5643
For this DTE cable, see note 3.			
V.24	3745 DTE cable	5 (17)	58G5644

Table 19 (Page 2 of 2). Cables for ARC Assemblies B

ARC Card Type	Connected To	Cable Length m (ft) (See note 1)	Cable Part Number
For these DCE cables, see note 4.			
V.35	DCE	0.6 (2)	58G5620
V.35	DCE	1.2 (4)	58G5621
V.35	DCE	2.4 (8)	58G5622
V.35	DCE	5 (17)	58G5623
V.35	DCE	10 (33)	58G5624
V.35	DCE	15 (50)	58G5625
For this DTE cable, see note 5.			
V.35	DTE	15 (50)	58G5626
For these DCE cables, see note 3.			
V.35 3745 DCE	3745 DCE cable	0.6 (2)	58G5645
V.35 3745 DCE	3745 DCE cable	1.2 (4)	58G5646
V.35 3745 DCE	3745 DCE cable	2.4 (8)	58G5647
V.35 3745 DCE	3745 DCE cable	5 (17)	58G5648
For this DTE cable, see note 3.			
V.35 3745 DTE	3745 DTE cable	5 (17)	58G5649
X.21	DCE	0.6 (2)	58G5630
X.21	DCE	1.2 (4)	58G5631
X.21	DCE	2.4 (8)	58G5632
X.21	DCE	5 (17)	58G5633
X.21	DCE	10 (33)	58G5634
X.21	DCE	15 (50)	58G5635
X.21	DTE	15 (50)	58G5636
For these DCE cables, see note 8.			
X.21	DCE (Transfix)	5 (17)	58G5637
X.21	DCE (Transfix)	15 (50)	58G5638
For these DCE cables, see note 3.			
X.21	3745 DCE cable	0.6 (2)	58G5650
X.21	3745 DCE cable	1.2 (4)	58G5651
X.21	3745 DCE cable	2.4 (8)	58G5652
X.21	3745 DCE cable	5 (17)	58G5653
For this DTE cable, see note 3.			
X.21	3745 DTE cable	5 (17)	58G5654

Note: The notes for this table are on page 92.

Plenum and X.21 bis Cables for ARC Assemblies A and B

For installations requiring plenum cables (U.S.A. and Canada: Table 20) or X.21 bis cables (Table 21), 3745 plenum or X.21 bis cables must be used with:

- ARC assemblies A that have a 3745-type connector
- ARC assembly B cables that have a 3745-type connector.

  Use the shortest ARC assembly B cable (refer to Table 18 on page 88) that will allow the 3745-type connector end to be easily accessible for connection to the 3745-type cable.

Figure 26 shows how a 3745 plenum or X.21 bis cable is used with an ARC assembly that has a 3745-type connector.

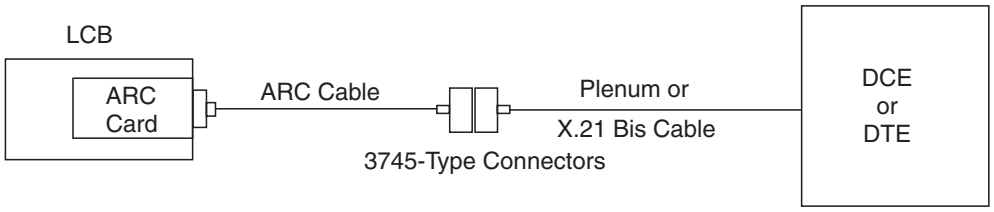


Figure 26. 3745 Plenum or X.21 bis Cable Connected to an ARC Assembly

Maximum Cable Length

The cables listed in Table 20 and Table 21 should not be longer than the maximum length indicated in the third column. This maximum length includes the ARC cable. The lengths are determined by the signal transmission properties of the cables.

Table 20. 3745 Plenum Cables for ARC Assemblies

3745 Plenum Cable Type	Connected To	Maximum Length m (ft)	3745 Part Number
V.24	DCE	15 (49)	76F8628
V.24	DCE	20 (65)	76F8629
V.24 (X.21 bis)	DCE	15 (49)	76F8630
V.24 (X.21 bis)	DCE	20 (65)	76F8631
V.24	DTE	15 (50)	76F8626
V.24	DTE	20 (65)	76F8627
V.35	DCE	15 (49)	76F8618
V.35	DCE	20 (65)	76F8619
V.35	DTE	15 (50)	76F8620
V.35	DTE	20 (65)	76F8621

Table 21. 3745 V.24/X.21 bis Cables for ARC Assemblies

3745 V.24/X.21 bis Cable Type	Connected To	Maximum Length m (ft)	3745 Part Number
Japan	DCE	15 (49)	61F4505
(NTT modem)	DCE	20 (65)	61F4507
All countries	DCE	15 (49)	76F4504
except Japan	DCE	20 (64)	76F4506

Notes:

1. Unlike the other cable tables, these are the actual cable lengths. For cables attached to ARCs inside the 3746 frame, remember to add 1.5 m (5 ft) to the length of the cable measured outside the frame.

   For each category of ARC interface, (V.24 DCE for example,) the longest ARC cable specified in the table (12 m in this example,) is the maximum supported length between the ARC card and the connection to the data communication equipment (DCE, DTE, or equivalent).

   In the case of ARCs connected to the 3745-type cables, this maximum is 20 meters, including the length of the 3745-type cable.

   Non-IBM ARC cables are not supported.

   Other cabling alternatives, such as passive patch panels, should use the shortest ARC cable length possible, because of the intermediate cable being introduced between the patch panel and the DTE or DCE.

2. Plenum cables are not available for the ARCs. If a plenum cable is to be used, order the equivalent ARC/3745 and the plenum cable corresponding to your need. Refer to “Plenum and X.21 bis Cables for ARC Assemblies A and B” on page 91.

   For example, if a plenum cable is to be used in the U.S. or Canada for an ARC V.24 DCE, do not order an ARC1A0. Instead, order the following:

   - An ARC V.24 for 3745 DCE cable (ARC1C0) from page 88
   - One of the 3745 V.24 DCE plenum cables from page 91

3. Connects to 3745 cables listed in “Plenum and X.21 bis Cables for ARC Assemblies A and B” on page 91.
4. When connected to a French DCE, use a French DCE adapter between the cable and the DCE. This adapter is automatically shipped with the ARC.
5. When connected to a French DTE, use a French DTE adapter between the cable and the DTE. This adapter is automatically shipped with the ARC.
6. For Japan, the wrap function on the cable connector is performed by using a wrap plug shipped with the machine.
7. For Transfix (France only). The ARCs named ARC4A3, ARC4A4, and ARC4E0 (X.21 DCE - Transfix) provide internal wrapping of the "Control" (C) and "Indicate" (I) leads. They are primarily designed for those Transfix DCEs (France) that do not support the "I" and "C" signaling of the X.21 interface.
8. For Transfix (France only).
9. No longer available.

Multiaccess Enclosure Cables

The following adapter cables are available for use with the Multiaccess Enclosure.

EIA-232E/V.24 Fanout Cable (FC 3701)

Figure 27 shows a schematic of the EIA-232E/V.24 Fanout Cable (FC 3701).

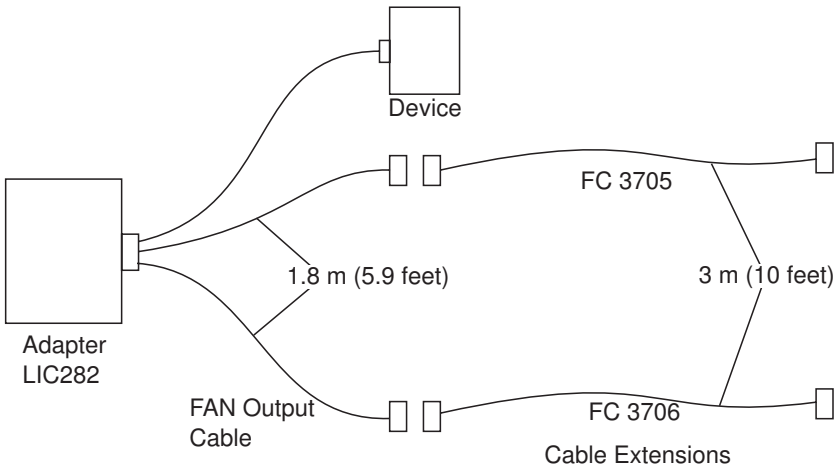


Figure 27. EIA-232 Fanout Schematic

This fanout cable provides eight connections (25-pin D-shell male,) each of which is 1.8 m (5 ft 11 in.) in length. Each connection is suitable for connection to an EIA-232/V.24 modem.

Cables 3705 and 3706 are available to complement this cable. FC 3705 attaches to the FC 3701 and extends the cable length an additional 3 m (10 ft) for attachment to a modem. FC 3706 attaches to FC 3701 and provides clocking to allow devices to be directly attached to the Multiaccess Enclosure without having to use a modem. It is 3 m (10 ft) in length and provides a female 25-pin D-shell connector.

V.35 Fanout Cable (FC 3702)

A 1.2 m (4-ft) fanout cable to a distribution box containing six 25-pin D-shell male connections.

Cables 3707 and 3708 are available to complement this cable. FC 3707 provides a 3 m (10 ft) extension cable with a 34-pin male block connector for attachment to a modem. FC 3708 provides a 2 m (6 ft 7 in.) cable with a 34-pin female block connector for direct-device attachment.

V.36 Fanout Cable (FC 3703)

This fanout cable provides six connections (37-pin D-shell male), each of which is 3 m (10 ft) in length. Each connection is suitable for connection to a V.36 modem.

Cables 3709 and 3710 are available to complement this cable. FC 3709 provides a 3 m (10-ft) extension cable with a 37-pin male D-shell connector for attachment to a modem. FC 3710 provides a 3 m (10-ft) cable with a 37-pin female D-shell connector for direct-device attachment.

X.21 Fanout Cable (FC 3704)

This fanout cable provides eight connections (15-pin D-shell male), each of which is 1.8 m (6 ft) long. Each connection is suitable for connection to an X.21 modem.

Cables 3711 and 3712 are available to complement this cable. FC 3711 provides a 3 m (10-ft) extension cable with a 15-pin D-shell male connector for attachment to a modem. FC 3712 provides a 3 m (10-ft) cable with a 15-pin D-shell female connector for direct-device attachment.

EIA-232E/V.24 Serial Interface Cable (FC 3705)

A 3 m (10-ft) extension cable with a 25-pin D-shell male connector for attachment to a modem.

EIA-232E/V.24 Direct Attach Cable (FC 3706)

A 3 m (10-ft) cable with a 25-pin D-shell female connector for direct-device attachment.

V.35 Serial Interface Cable (FC 3707)

A 3 m (10-ft) extension cable with a 34-pin male block connector for attachment to a modem.

V.35 Serial Interface Cable - France (FC 3799)

This feature provides two cables:

- A 3 m (10-ft) extension cable with a 34-pin male block connector for attachment to a modem, identical to FC 3707.
- A 30 cm (1-ft) cable that adapts the standard V.35 34-pin male block connector to the connector required for attachment to V.35 modems in France.

V.35 Direct Attach Cable (FC 3708)

A 2 m (6 ft 7 in.) cable with a 34-pin female block connector for direct-device attachment.

V.36 Serial Interface Cable (FC 3709)

A 3 m (10-ft) extension cable with a 37-pin male D-shell connector for attachment to a modem.

V.36 Direct Attach Cable (FC 3710)

A 3 m (10-ft) cable with a 37-pin female D-shell connector for direct-device attachment.

X.21 Serial Interface Cable (FC 3711)

A 3 m (10-ft) extension cable with a 15-pin D-shell male connector for attachment to a modem.

X.21 Direct Attach Cable (FC 3712)

A 3 m (10-ft) cable with a 15-pin D-shell female connector for direct-device attachment.

Multipurpose RJ-45 Cable (FC 3713)

A 7.6 m (25-ft) Category 5 cable with an RJ-45 connector for attachment to token-ring hubs or switches or Ethernet 10BASE-T hubs or switches.

RJ-48 T1 ISDN PRI/Channelized T1 Cable (FC 3714)

A 15 m (50-ft) cable with an RJ-48 connector for attachment to T1 ISDN PRI switches, or to a T1 interface.

E1 ISDN PRI/Channelized E1 Cable (FC 3715)

A 30 m (100-ft) cable with “flying leads” suitable for wiring to E1 ISDN PRI switches, or to a E1 interface.

RJ-48 J1 ISDN PRI/Channelized J1 Cable (FC 3716)

A 15 m (50-ft) cable with a RJ-48 connector for attachment to J1 ISDN PRI switches, or to a J1 interface.

RJ-48C ISDN PRI/Channelized T1 Cable (FC 3717)

A 15 m (50-ft) cable with an RJ-48C connector at each end for attachment to T1 ISDN PRI switches, or to T1 interfaces.

RJ-48C ISDN PRI/Channelized E1 Cable (FC 3718)

A 15 m (50-ft) cable with an RJ-48C connector to the adapter and "flying leads" for connecting to E1 ISDN PRI switches, or E1 interfaces.

Keyed RJ-48C ISDN PRI/Channelized J1 Cable (FC 3719)

A 15 m (50-ft) cable with an RJ-48C connection to the adapter and a keyed RJ-48C connection, compliant with ISO 10173, for attachment to J1 ISDN PRI switches, or to J1 interfaces.

Parallel Channel Bus-and-Tag Upstream Cable (FC 3720)

An upstream connection to other devices on a parallel channel bus and tag.

Parallel Channel Bus-and-Tag Downstream Cable (FC 3721)

An downstream connection to other devices on a parallel channel bus and tag.

ATM MMF External Cable (FC 5710)

A 10 m (33-ft) cable for attachment to ATM multimode fiber connections.

ATM MMF External Cable (FC 5715)

A 40 m (131-ft) cable for attachment to ATM multimode fiber connections.

ATM SMF External Cable (FC 5720)

A 10 m (33-ft) cable for attachment to ATM single-mode fiber connections.

ATM SMF External Cable (FC 5725)

A 40 m (131-ft) cable for attachment to ATM single-mode fiber connections.

ESCON Cable (Cable Group 3797)

This cable provides connection to the S/390 server with ESCON Channel.

Note: This cable is not a feature of the Multiaccess Enclosure and must be ordered separately. Refer to “ESCON Jumper Cables and Emergency Power-Off Cables (3746-9x0)” on page 71.

Other Cables

The following cables are not provided as options for the Multiaccess Enclosure and must be obtained by a separate cable order.

- Token-Ring STP Network Adapter cable
- Ethernet 10BASE2 cable
- HSSI DTE/DCE cable
- HSSI “null modem” cable
- RJ-48 cables for T1 (FC 3717), E1 (FC 3718), J1 (FC 3719)

Unshielded Twisted-Pair Cables for Token-Ring LAN Attachment (3746-9x0)

The token-ring multistation access units can be attached to a TIC3 using unshielded twisted-pair cables with 100-ohm impedance.

The American National Standards Institute (ANSI), the Electronic Industries Alliance (EIA), and the Telecommunications Industry Association (TIA) have developed a standard for wiring commercial buildings for telecommunication. This standard provides guidance in the wiring of new commercial buildings and specifies crosstalk and attenuation characteristics up to 16 MHz. (For more information about this standard, see the *EIA/TIA Commercial Building Telecommunication Wiring Standard,* ANSI/EIA/TIA, July 1991.)

The cable and connector used to link a twisted-pair token-ring multistation access unit module to a TIC3 are explained in the following sections:

- “Token-Ring UTP Media Filter”
- “Category 5 UTP Cable”
- “Twisted-Pair Wire Connectors”

Token-Ring UTP Media Filter

The Token-Ring UTP Media Filter links a TIC3 to a 4- or 16-Mbps token-ring network using UTP cabling.

The filter provides the following functions:

- It converts the connector on a TIC3 from DB9 to an 8-pin modular.
- It matches impedance from 150 ohms to 100 ohms connector.
- It reduces radio frequency emissions for FCC Class A compliance.

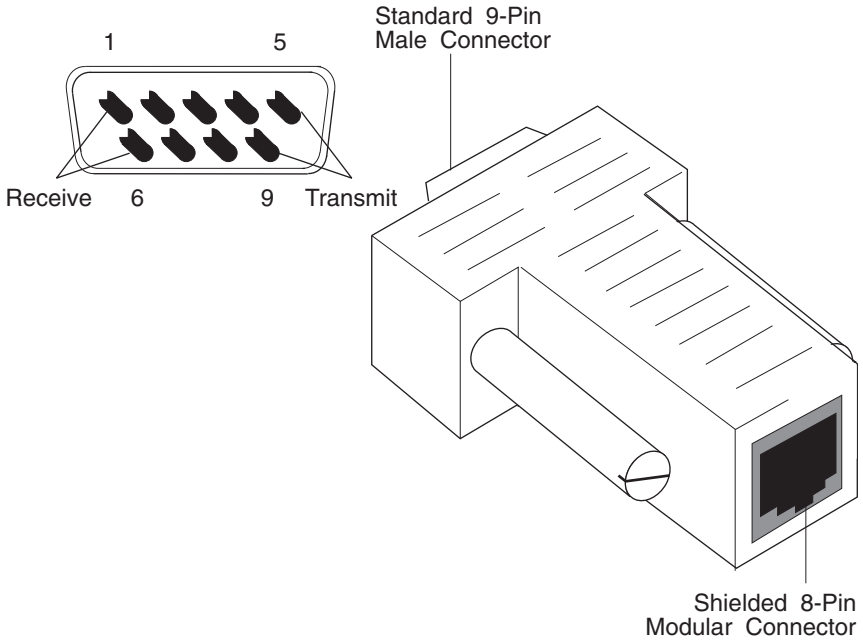


Figure 28. IBM Token-Ring UTP Media Filter (Part Number 43G3875)

Refer to Figure 29 on page 98 for the pin layout of the 8-pin modular connector. Connection of the token-ring UTP media filter to a token-ring multistation access unit is through an attachment cable meeting the following specifications:

- Cable type

  100-ohm UTP meeting or exceeding the specifications for the category 5 cable (the cable can have an optional shield). The cable must contain four twisted pairs.

- Termination

  8-pin modular telephone plugs at each end (optional shielding) meeting or exceeding requirements for category 5 cable connections (refer to Figure 29 on page 98 for pin layout). If the cable and connector are shielded, the cable shield must terminate on the connector shield. Note that the connector pins must not be used to terminate a cable shield.

- Length

  Up to 100 m (330 ft.).

Category 5 UTP Cable

Because cabling manufacturers have developed higher performance UTP cables, EIA/TIA has issued *Additional Cable Specifications for Unshielded Twisted-Pair Cables* (TSB-36) which define category 5 UTP cables. This category is intended for data transmission rates of up to 100 Mbps.

Twisted-Pair Wire Connectors

Attaching cables must use the 802.5 standard pin layout. Cables must be terminated with an 8-pin jack. Figure 29 on page 98 illustrates the proper pin configuration for the cable from the rear.

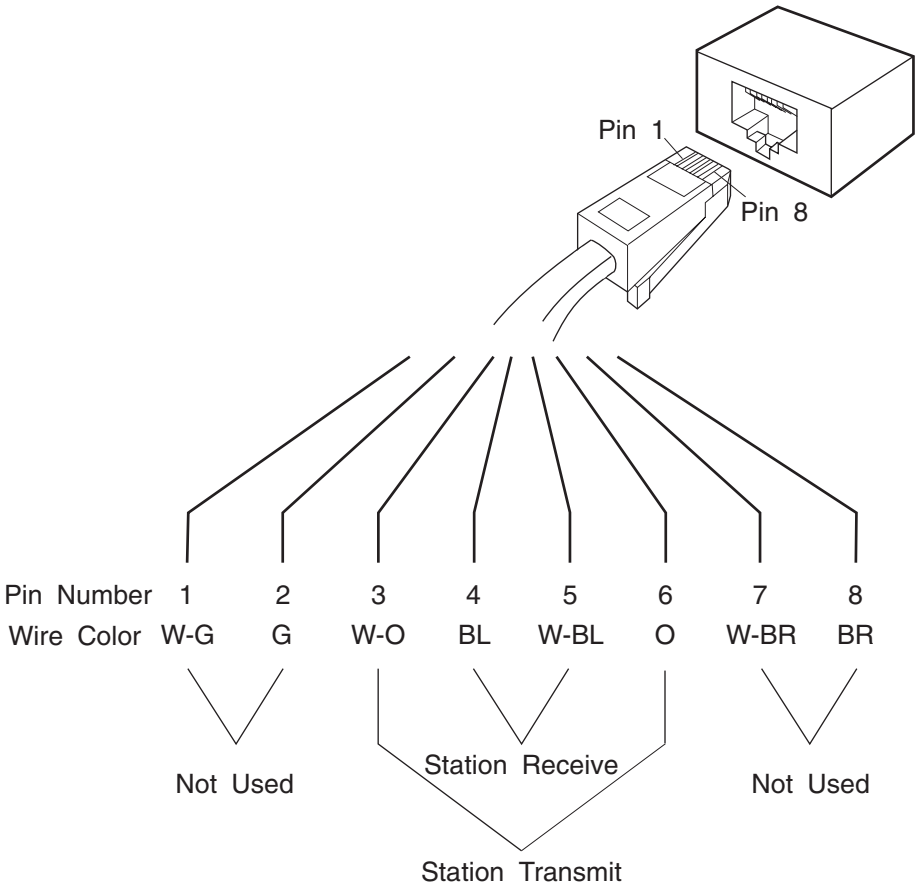


Figure 29. Twisted-Pair 8-Pin Connector

Note: This pin configuration is *not* the same as the pin configuration used for 10BASE-T Ethernet cables. If you attempt to connect stations to the hub using cables terminated with the 10BASE-T pin layout, the connection will not work properly.

Chapter 2. Familiarizing Yourself with the Installation Sheets

This chapter contains examples of the 3745, 3746-900, and 3746-950 installation sheets produced by the 3745 and 3746 Configurator (PC3745). Explanations of terms and abbreviations are provided after the samples. Use your installation sheets to fill out the plugging sheets and cable labels.

Note: The 3745 Models 21A and 41A are no longer available from IBM.

Enclosure Examples

Notes for the 3746-900 and 950 Enclosure Examples

1. For a LIC11, the B number on this line is the LCBB ID number. Refer to page 112.
2. For a LIC12, the number on this line is the line group ID number. Refer to page 111.
3. The number in the lower line (8922, 8223, and so on) corresponds to the specific code that identifies the feature and the position.
4. The 07 number at the top and bottom of the figure is marked on the enclosure to help you identify it.

Legend

The following abbreviations are used in the enclosure examples.

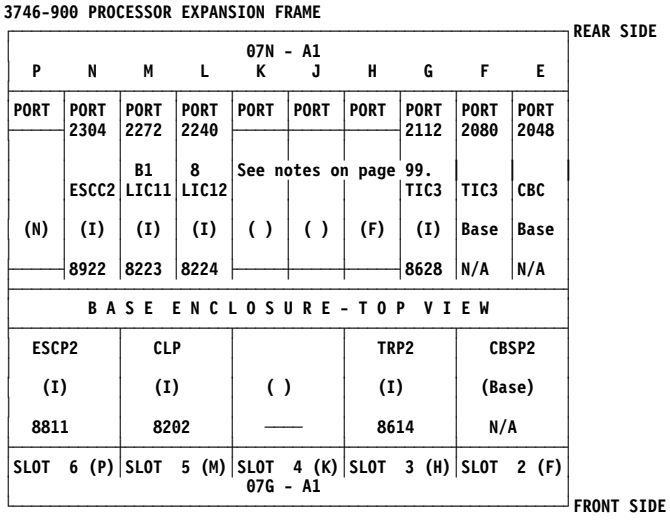
Features:

CBSP	Controller Bus (CCU-A) and Service Processor
CBSP2	Controller Bus (CCU-A) and Service Processor Type 2
CBSP3	Controller Bus (CCU-A) and Service Processor Type 3
CBC	Controller Bus Coupler (CCU-B has TRP/TRP2 with CBC)
TRP	Token-Ring Processor
TRP2	Token-Ring Processor Type 2
TRP3	Token-Ring Processor Type 3
TIC3	Token-Ring Interface Coupler Type 3
ESCP	Enterprise System Connection Processor
ESCP2	Enterprise System Connection Processor Type 2
ESCP3	Enterprise System Connection Processor Type 3
ESCC	Enterprise System Connection Coupler Type 1
ESCC2	Enterprise System Connection Coupler Type 2
CLP	Communication Line Processor
CLP3	Communication Line Processor Type 3
LIC11	Line Interface Coupler Type 11
LIC12	Line Interface Coupler Type 12

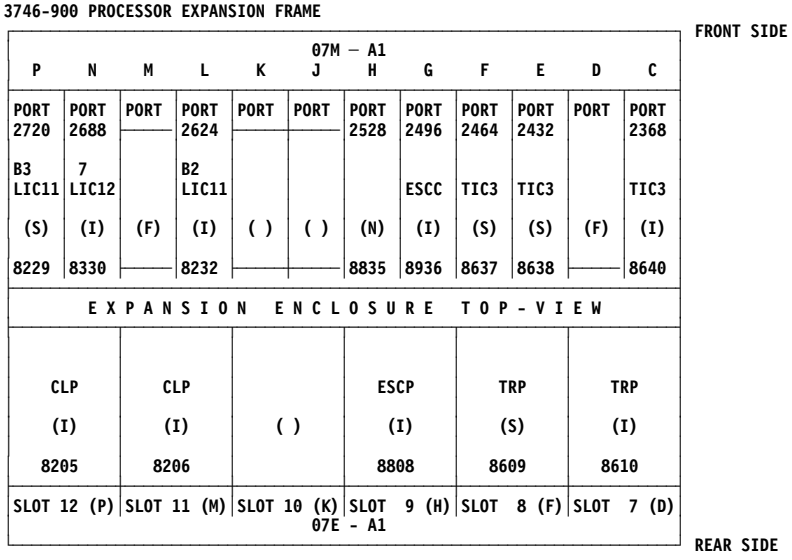
Status()

Base	Basic Feature
I	Installed (Active) Feature
S	Spare (Backup) Feature
F	Coupler slot free on a given processor
N	ESCON coupler slot not available

3746-900 Basic Enclosure Example



3746-900 Expansion Enclosure Example



Note: The figure shows the first expansion enclosure. A second, optional expansion enclosure can be fitted and has the identifier 07L-A1. See note 4 on page 99 above.

3746-950 Basic Enclosure Example

3746-950

REAR SIDE

07N - A1

P	N	M	L	K	J	H	G	F	E
PORT	PORT 2304	PORT 2272	PORT 2240	PORT	PORT	PORT	PORT 2112	PORT 2080	PORT
	ESCC2	B1 LIC11	8 LIC12	See notes on page 99.			TIC3	TIC3	
(N)	(I)	(I)	(I)	( )	( )	(F)	(I)	Base	(N)
	8922	8223	8224				8628	N/A	

B A S E E N C L O S U R E - T O P V I E W

ESCP2	CLP		TRP2	CBSP2
(I)	(I)	( )	(I)	(Base)
8811	8202	——	8614	N/A
SLOT 6 (P)	SLOT 5 (M)	SLOT 4 (K)	SLOT 3 (H)	SLOT 2 (F)

07G - A1

FRONT SIDE

3746-950 Expansion Enclosure Example

3746–950

REAR SIDE

07M – A1

P	N	M	L	K	J	H	G	F	E	D	C
PORT 2720	PORT 2688	PORT	PORT 2624	PORT	PORT	PORT 2528	PORT 2496	PORT 2464	PORT 2432	PORT	PORT 2368
B3 LIC11	7 LIC12		B2 LIC11				ESCC2	TIC3	TIC3		TIC3
(S)	(I)	(F)	(I)	( )	( )	(N)	(I)	(S)	(S)	(F)	(I)
8229	8330		8232			8835	8936	8637	8638		8640

E X P A N S I O N E N C L O U S U R E – T O P V I E W

CLP	CLP		ESCP2	TRP2	TRP2
(I)	(I)	( )	(I)	(S)	(I)
8205	8206		8818	8619	8620
SLOT 12 (P)	SLOT 11 (M)	SLOT 10 (K)	SLOT 9 (H)	SLOT 8 (F)	SLOT 7 (D)

07E – A1

FRONT SIDE

Note: The figure shows the first expansion enclosure. A second, optional expansion enclosure can be fitted and has the identifier 07L-A1. See note 4 on page 99 above.

3746-9X0 with Multiaccess Enclosure

These installation sheets for a 3746-900 configuration include a Multiaccess Enclosure with four adapters: token ring, Fast-Ethernet, ATM, and ESCON.

This configuration corresponds to an environment with:

- Fast-Ethernet-to-ESCON (IP) traffic through the MAE
- TN3270 traffic (WAN) over the ATM adapter

The upstream SNA traffic flows over the dual token-ring connection and, from the base enclosure, is routed by NCP[8] as SNA subarea traffic over the ESCON adapter (ESCP3 and ESCC2).

These sheets have been slightly modified to make them more readable.

Installation Sheets

Base 3746–950

REAR SIDE

07N – A1

P	N	M	L	K	J	H	G	F	E
PORT	PORT 2304	PORT	PORT	PORT	PORT	PORT 2144	PORT 2112	PORT 2080	PORT 2048
	ESCC2					TIC3	TIC3	TIC3	CBC
( )	(I)	( )	( )	( )	( )	(I)	(I)	Base	Base
	8922					8627	8628	N/A	N/A

B A S E E N C L O S U R E – T O P V I E W

ESCB3			TRP3	CBSP3
(I)	( )	( )	(I)	(Base)
8581	———	———	8784	N/A
SLOT 6 (P)	SLOT 5 (M)	SLOT 4 (K)	SLOT 3 (H)	SLOT 2 (F)

07G – A1

FRONT SIDE

Figure 30. Base 3746-900 with Dual Token-Ring Connection to Multiaccess Enclosure

[8] Running in the 3745.

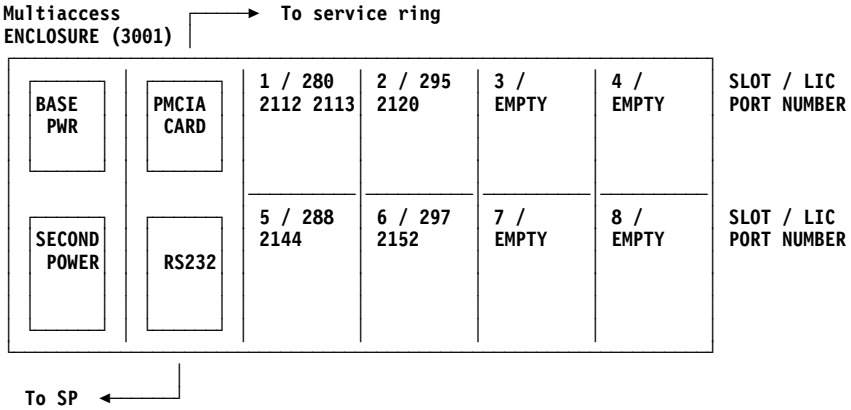


Figure 31. Multiaccess Enclosure with Dual Token-Ring Connections to the 3746-900 Base Frame

```
*** 3746-900/950 CABLE GROUP INFORMATION ***
CABLE
GROUP  QTY  DESCRIPTION
7003     2  TOKEN-RING INTERFACE COUPLER TYPE 3 1

Features:
  CBSP3 = Controller Bus (CCU-A) and Service Processor Type 3
  TRP2  = Token-Ring Processor Type 2
  TIC3  = Token-Ring Interface Coupler Type 3
  ESCP3 = ESCON Processor Type 3
  ESCC3 = ESCON Coupler Type 3

Status():
 Base = Basic Feature
   I  = Installed (Active) Feature
   S  = Spare (Backup) Feature
   F  = Coupler slot free on a given processor
Legend for LIC Lines

                        LIC
Adapter Description     NAME
----------------------- -------
2-Port  Token-Ring      LIC 280
1-Port  Fast-Ethernet   LIC 288
1-Port  ESCON Channel   LIC 287
1-Port  Single-mode ATM LIC 295


POWER PLUG INFORMATION

3746-950 POWER PLUG IS: NON-LOCKING PLUG # NEMA 6-15P
CUSTOMER MUST INSTALL:  RECEPTACLE # NEMA 6-15R
```

Notes:

1. 1 You should ensure that these are ordered with the correct length.
2. These sheets also provide valuable information and it is recommended that you keep them near the service processor.

Hardware Configuration Report

This hardware report corresponds to the installation sheets in Figure 30 on page 102 and Figure 31 on page 103.

```
3746-950 NWAYS MULTIPROTOCOL CTLR              1

     FC                                       QTY

    3001 MULTIACCESS ENCLOSURE (MAE)           1


    3280 2-PORT TOKEN-RING ADAPTER             1 [1]
    3287 1-PORT ESCON CHANNEL ADAPTER          1
    3288 1-PORT FAST-ETHERNET ADAPTER          1
    3295 1-PORT SINGLE MODE ATM ADAPTER        1
    3500 2ND AC POWER SUPPLY (FOR MAE)         1
    3713 MULTI-PURPOSE RJ-45 CABLE             2
    5000 DUAL POWER INPUT AC 200-240           1
    5002 2ND AC DISTRIBUTION                   1
    5023 CONTROLLER RACK                       1
    5033 IP ROUTING                            1
    5053 SERVICE PROCESSOR TYPE 3              1
    5423 NETWORK NODE PROCESSOR TYPE 3         1
    5502 ESCON COUPLER (ESCC3)                 1
    5523 ESCON PROC. TYPE 3 (ESCP3)            1
    5601 TOKEN RING COUPLER (TIC3)             2
    5623 TOKEN RING PROC. TYPE 3 (TRP3)        1 [2]
    5720 SMF ATM EXTERNAL CABLE 10M            1
    8614 TRP2 IN BASE POSITION H               1
    8627 TIC3 IN BASE POS H                    1
    8628 TIC3 IN BASE POS G                    1
    9838 CTLR EXP NON LOCKING PLUG             2
    9895 NON-LOCKING PLUG                      2
    9902 60HZ - 208V                           2
    9023 CBSP TYPE 3                           1
```

Notes:

1 One token-ring adapter is necessary for SNA and APPN/HPR communication with the other enclosures of the 3746 Model 9x0.

2 This token-ring processor and the two TIC3s are required for SNA and APPN/HPR communication with the Multiaccess Enclosure.

Cable List Examples

Example of Cables for the 3745 (HSS and TRA)

Cable Group	Qty	Interface	Port No.
5831	1	HSS NIA Attach thru V.35	1028, 1029
5833	3	HSS NIA Attach thru X.21	1062, 1069, 1070
1666	4	Token-Ring Interface Coupler	1088, 1089, 1092, 1093

The meanings of the column headings are:

Cable Group Cable group number

Qty Quantity of ordered cables in the same cable group

Interface Type of attachment for the cables in the same cable group

Port No. Numbers of the ports to which the cables of each cable group are connected

Example of the Cables for the 3745 (LIC Types 1 to 6)

Note: The LIC4A, LIC5, and LIC6 are no longer available.

Cable Group	Qty	Interface	Port No.
1604	22	LIC type 1 — external modem	0 — 11, 32 — 41
1605	5	LIC type 3 — direct attach	12, 16, 20, 24, 28

Figure 32. 3745 Cable Example Table

The meanings of the column headings are:

Cable Group Cable group number

Qty Quantity of ordered cables in the same cable group

Interface Type of attachment for the cables in the same cable group

Port No. Numbers of the ports to which the cables of each cable group are connected

Example of Cables for 3746-9x0 (LIC11)

FEATURE	QTY	DESCRIPTION	3746/NCP ADDRESSES
9716	4	LIC11 cable — 15m	2272,2240,2720,2624

The meanings of the column headings are:

Feature
Feature or specify code of the LIC cable

QTY
Quantity of ordered LIC11 cables

DESCRIPTION
Type of cable and its length

3746/NCP ADDRESSES
Logical addresses of the ports to which the LIC11 cables are connected

Example of Cables for 3746-9x0 (ARCs)

FEATURE	QTY	DESCRIPTION	DISTRIBUTION ACROSS 3746/NCP ADDRESSES
6415	127	ARC V.24 — DCE attachment 12m	2432,2448,2496,2512,2528,2544,2560, 2576,2592,2608,2624,2640,2656,2672, 2688,2704,2720,2736
6500	30	ARC V.35 — DTE attachment 15m	2432,2448,2496,2512,2528,2544,2560, 2576,2592,2608,2624,2640,2656,2672, 2688,2704,2720,2736

The meanings of the column headings are:

FEATURE
Feature code of the ARC

QTY
Quantity of ordered ARCs

DESCRIPTION
Type of ARC and cable length

DISTRIBUTION ACROSS 3746/NCP ADDRESSES
Port addresses to which the ARCs are connected

Example of 3746 Cable Group Information

These cables, except the system EPO cables, are automatically shipped with the machine or upgrade in European, Middle East and African countries. For all other countries, these cables must be specifically ordered.

For all countries and regions, EPO cables must be ordered if needed.

For available cable types and lengths, refer to “Cable Information” on page 67.

CABLE GROUP	QTY	DESCRIPTION
7003	4	TOKEN RING INTERFACE COUPLER TYPE 3
3797	2	ESCON COUPLER
1178	2	SYSTEM EPO
5833	2	LIC12

The meanings of the column headings are:

CABLE GROUP Cable group number of the cables
QTY Quantity of cables of the same cable group
DESCRIPTION Type of cable

Line Group Examples

Example of High-Speed Scanner Links

ID	Group Name	No. Lines	Line Speed	Line Type	Attach	Back Up	Device
4	High-Speed 1	1	256000	V35	NIA	N	3745
5	High-Speed 2	2	1544000	X21	NIA	N	3745

The meanings of the column headings are:

ID The identification number (from 1 through 99) defined by the person inputting to HONE for a group of lines that are identical in all respects.

Group Name Any name the person inputting to HONE defined for this group.

No. Lines The number of lines in this group.

Line Speed The speed of all lines in this group. It is given in bits per second (bps).

Line Type The type of ITU-T interface used in this group.

Attach NIA means network interface attachment. DA means direct attachment.

Back Up This defines the group as backup (Y for yes) or normally active (N for no) during use of the machine.

Device The device type on the other end of the link.

Example for Token Ring

ID	Group Name	LOGI. CONN.	Line Speed	TRA Type	Line CNTL	DUP	Transmit Set	Ring ID	TIC Number	CCU ID	Back Up
21	CHOLLET	4	1600000	2		HDX	EBCDIC	1	1	A	N

The meanings of the column headings are:

ID The identification number (from 1 through 99) defined by the person inputting to HONE for a group of lines that are identical in all respects.

Group Name The name assigned to this group at configuration time.

LOGI. CONN. The number of logical connections of the 3745 token-ring adapter on a token-ring.

Line Speed The speed is 4 or 16 Mbps.

TRA Type A token-ring adapter (TRA) type 1 provides two attachment ports for token-ring networks operating at 4 Mbps. A TRA type 2 provides two attachment ports for token-ring networks operating at 4 or 16 Mbps.

Line CNTL The type of control used on the token-ring LAN.

DUP Duplex (DX) or half-duplex (HDX).

Transmit Set Transmission character set.

Ring ID The identification number of the token-ring network defined by the person entering data in the CF3745.

TIC Number The token-ring interface coupler identification.

CCU ID The central control unit (CCU).

Back Up **N** means that the line group is not a backup and is normally active when the controller is running.
Y means that the line group is a backup and is normally not active when the controller is running.

Example of Cross-System Links and Line Group Information

ID	Group Name	No Lines	Line Speed	LIC Type	Protocol		Transmit Set	Line Weight	WT 4 LICs	Attach	Back Up
1	Line group 1	16	9600	1	SDLC	HDX	EBCDIC	3.1	2.8	Modem	N
2	Line group 2	5	56000	3	SDLC	FDX	EBCDIC	21.9	21.9	Direct	N
3	Line group 3	6	19200	1	SDLC	FDX	EBCDIC	12.5	10.0	Modem	N

Figure 33. Cross-System Links and Line Group Table Example

The meaning of the column headings are:

ID The identification number (from 1 through 99) defined in the input to the CF3745 for a group of lines that are identical in all respects.

Group Name The name of the group used in the input to the CF3745.

No. Lines The number of lines in this group.

Line Speed The speed of all lines in this group. It is given in bits per second (bps).

LIC Type The type of LIC used in this group. The LIC type can be 1, 3, 4A, 4B, 5, or 6.

Note: The LIC4A, LIC5, and LIC6 are no longer available.

Protocol The line control for this group. It can be S/S, BSC, or SDLC and FDX (duplex) or HDX (half duplex) transmission for this group.

Transmit Set The transmission code for this group. It can be EBCDIC or ASCII.

Line Weight The normal line weight for each individual line in this group.

WT 4 LICs The line weight for each individual line in this group (if the number of LICs being serviced by an individual low- or medium-speed scanner is less than or equal to 4).

Attach Modem or direct attachment of the lines attached to LIC type 1 to 4, or
4 wires for the telephone cable attached to LIC type 5 or 6.

Back Up **N** means that the line group is not a backup and is normally active when the controller is running.
Y means that the line group is a backup and is normally not active when the controller is running.

Example of 3746-900 Low/Medium-Speed Line Group Information (LIC11)

ID	GP NAME	LOCATION	LINE SPEED	TRAFFIC	BACK UP	CLP BACK UP	NO. LINES	ATTACH	INTERFACE	3745 ARC	ARC LENGTH
1	1	1	256000	NCP	N	N	1	DIRECT	V.35	N	15
2	2	1	128000	3746	N	N	1	MODEM	V.35	N	15
3	3	1	56000	NCP	N	N	90	MODEM	V.35	N	15
4	4	1	19200	3746	N	N	12	MODEM	V.24	N	12
5	5	1	9600	NCP	N	N	114	MODEM	V.24	N	12
6	6	1	4800	NCP	N	N	1	MODEM	V.24	N	12

Example of 3746-950 High-Speed Line Group Information (LIC12)

ID	GP NAME	LOCATION	LINE SPEED	TRAFFIC	BACK UP	CLP BACK UP	NO. LINES	ATTACH	INTERFACE
7	2	2	1536000	3746	N	N	1	DIRECT	V–35
8	3	3	2048000	3746	N	N	2	MODEM	V–35

The meanings of the column headings are:

ID The identification number (from 1 through 99) defined by the person inputting to the CF3745 for a group of lines that are identical in all respects.

GP NAME Any name the person inputting to the CF3745 defined for this group.

LOCATION Represents the location where LCBs are installed (for the LIC12). This information has no effect on the 3746 configuration.

LINE SPEED The speed of all lines in this group. It is given in bits per second (bps).

TRAFFIC NCP = traffic controlled by an NCP (3746-900 only)
3746 = traffic controlled by the 3746 (equipped with a NNP)

BACK UP This defines the group as an inactive backup (Y for yes) or as normally active (N for no).

CLP BACK UP This defines the group as being backed up by another CLP (Y for yes) or as not being backed up (N for no).

NO. LINES The number of lines in this group.

ATTACH MODEM attachment (to DCE), MODEM attachment (to Transfix DCE), DIRECT attachment (to DTE).

INTERFACE Interface type. Either V.24, V.35, or X.21.

3745 ARC Specifies whether the lines of a group (DTE or DCE) are connected to the ARCs by LIC1, LIC3, LIC4A, or LIC4B cables.

ARC LENGTH Specifies the cable length of the ARC in meters.

LCB and ARC Example

On this type of installation sheet, the upper row of slot position represents the LCB base (LCBB) and the lower row of slot position represents the LCB expansion (LCBE).

On your installation sheet, in the upper right corner, you will find the low 3746 or NCP address of the LIC11 attaching this LCB base (this not shown on the following example).

```
3746 Frame Installed
Location: 1        LCBB ID: B1
```

	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	
Address	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	
ARC Type	V.35 DCE	V.35 DCE	V.35 DCE	V.35 DCE	V.35 DCE	V.35 DCE	V.24 DCE	V.24 DCE	V.24 DCE		
ARC length	15.0	15.0	15.0	15.0	15.0	15.0	12.0	12.0	12.0		
Speed	56K	56K	56K	56K	56K	56K	19.2K	9600	9600		.....
Line ID	3	3	3	3	3	3	4	5	5		
Status	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)	(I)		

	+16	+17	+18	+19	+20	+21	+22	+23	+24	+25	
Address	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	
ARC Type	V.35 DCE	———	———	———	V.24 DCE	V.24 DCE	V.24 DCE	V.24 DCE	V.24 DCE		
ARC length	15.0	———	———	———	12.0	12.0	12.0	12.0	12.0		
Speed	16.6K	———	———	———	9600	9600	9600	9600	9600		.....
Line ID	2	———	———	———	5	5	5	5	5		
Status	(I)	(F)	(F)	(F)	(I)	(I)	(I)	(I)	(I)		

```
Legend:
(I)=Installed
(S)=Spare
(F)=Free slot
```

The meanings of the column headings are:

ADDRESS The addresses are either NCP addresses (for 3746-900 ports controlled by NCP) or line addresses (for 3746-controlled ports).

ARC Type Gives the interface type (V.24, V.35, or X.21) and type of attachment (DCE: modem attachment or DTE: direct attachment)

ARC Length Specifies the cable length of the ARC in meters.

Speed The speed of the line attached to the ARC.

Line ID The identification number (from 1 through 99) defined by the person inputting to the CF3745 for a group of lines that are identical in all respects.

Enclosure Physical Positions and Logical Addresses

Table 22 gives the relationship between the machine enclosure (physical) addresses and the 3746 or NCP line addresses.

Table 22. Physical Positions and Logical Addresses Relationship

Processor Position (See note 1)	Coupler Position	Logical Line Address (See note 2)
07G-A1-D	Reserved	Reserved
07G-A1-F	07N-A1-E Reserved 07N-A1-F (TIC3)	Reserved 2080
07G-A1-H (See note 3)	07N-A1-G 07N-A1-H	2112 to 2143 2144 to 2175
07G-A1-K	07N-A1-J 07N-A1-K	2176 to 2207 2208 to 2239
07G-A1-M	07N-A1-L 07N-A1-M	2240 to 2271 2272 to 2303
07G-A1-P	07N-A1-N 07N-A1-P	2304 to 2335 2336 to 2367
07E-A1-D	07M-A1-C 07M-A1-D	2368 to 2399 2400 to 2431
07E-A1-F	07M-A1-E 07M-A1-F	2432 to 2463 2464 to 2495
07E-A1-H	07M-A1-G 07M-A1-H	2496 to 2527 2528 to 2559
07E-A1-K	07M-A1-J 07M-A1-K	2560 to 2591 2592 to 2623
07E-A1-M	07M-A1-L 07M-A1-M	2624 to 2655 2656 to 2687
07E-A1-P	07M-A1-N 07M-A1-P	2688 to 2719 2720 to 2751

Notes:

1. Starting with position 07G-A1-K, the processor slots can be assigned to a CLP, CLP3, TRP, TRP2, TRP3, ESCP, ESCP2, or ESCP3 processor.
2. A coupler slot for a LIC12, TIC3, ESCC or ESCC2 uses only the first address in the range of addresses assigned to the slot. The first address of a range is considered as the port address.

   For the LIC11, only 30 addresses out of 32 assigned to a port are used. Refer to page 136.
3. In the 3746-900, when port 07N-A1-G is used for a CBC (to connect to CCU B), there is always a TRP, TRP2, or TRP3 in slot 07G-A1-H.

Table 23. Physical Positions and Logical Addresses Relationship, Second Expansion Enclosure

Processor Position (See note)	Coupler Position	Logical Line Address (See note)
07D-A1-D	07L-A1-C 07L-A1-D	2752 to 2783 2784 to 2815
07D-A1-F	07L-A1-E 07L-A1-F	2816 to 2847 2848 to 2879
07D-A1-H	07L-A1-G 07L-A1-H	2880 to 2911 2912 to 2943
07D-A1-K	07L-A1-J 07L-A1-K	2944 to 2975 2976 to 3007
07D-A1-M	07L-A1-L 07L-A1-M	3008 to 3039 3040 to 3071
07D-A1-P	07L-A1-N 07L-A1-P	3072 to 3103 3104 to 3135

Note: A coupler slot for a LIC12, TIC3, ESCC or ESCC2 uses only the first address in the range of addresses assigned to the slot. The first address of a range is considered as the port address.

For the LIC11, only 30 addresses out of 32 assigned to a port are used. Refer to page 136.

CLP Logical Addresses

START and **END** refer to first and last addresses in the range of logical addresses assigned to a CLP. The CLPs in this example are in slots H, K, and M of the expansion enclosure.

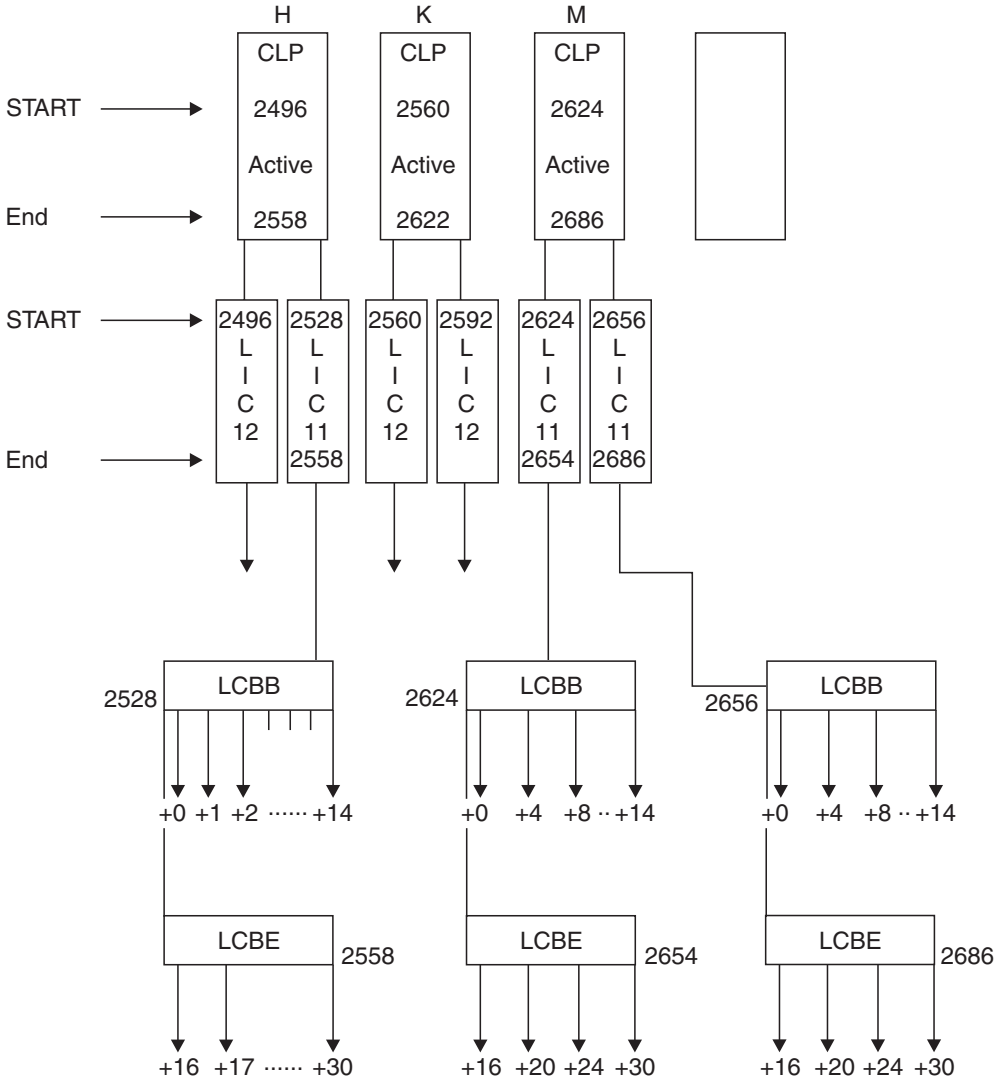


Figure 34. CLP Logical Addresses

Note: 120 addresses are available per CLP and all can be active simultaneously.

Unused addresses within an address range are allowed.

Examples of LIC Installation Sheets

Notes:

1. The LIC4A, LIC5, and LIC6 are no longer available.
2. The 3745 Models 21A and 41A are no longer available.

Figure 35 is an example of an installation sheet for LIC types 1 to 6 in the 3745 Models 21A to 61A. Not all possible LIC types are shown. Refer to page 123 for the legend.

TYPE/MODEL: 3745–21A LINE UNIT (LIU1): 01P LINE RANGE: 0–63

DMUX2	AREA 3			WEIGHT SUM	27.8			AREA 4
B1	D1	E1	F1	G1	H1	J1	K1	L1
CABLE POS W LSS – –	LIC TYPE 1 ID/PORT	LIC TYPE 1 ID/PORT	LIC TYPE 1 ID/PORT	LIC TYPE – – ID/PORT	LIC TYPE – – ID/PORT	LIC TYPE – – ID/PORT	LIC TYPE – – ID/PORT	LIC TYPE – – ID/PORT
POS.Z LSS CABLE #5	1/32 M 1/33 M 1/34 M 1/35 M	1/36 M 1/37 M 1/38 M 1/39 M	1/40 M 1/41 M – – – –	– – – – – – – –	– – – – – – – –	– – – – – – – –	– – – – – – – –	– – – – – – – –
	WEIGHT 11.1	WEIGHT 11.1	WEIGHT 5.6	WEIGHT – –	WEIGHT – –	WEIGHT – –	WEIGHT – –	WEIGHT – –
	STATUS (I)	STATUS (I)	STATUS (I)	STATUS (F)	STATUS (F)	STATUS (F)	STATUS (F)	STATUS (F)
POS.W LSS CABLE #2	LIC TYPE 1 ID/PORT	LIC TYPE 1 ID/PORT	LIC TYPE 1 ID/PORT	LIC TYPE 3 ID/PORT	LIC TYPE 3 ID/PORT	LIC TYPE 3 ID/PORT	LIC TYPE 3 ID/PORT	LIC TYPE 3 ID/PORT
POS.Z LSS CABLE #1	3/0 M 3/1 M 3/2 M 3/3 M	3/4 M 3/5 M 1/6 M 1/7 M	1/8 M 1/9 M 1/10 M 1/11 M	– – – – – – 2/12 D	– – – – – – 2/16 D	– – – – – – 2/20 D	– – – – – – 2/24 D	– – – – – – 2/28 D
	WEIGHT 40.0	WEIGHT 25.6	WEIGHT 11.1	WEIGHT 21.9	WEIGHT 21.9	WEIGHT 21.9	WEIGHT 21.9	WEIGHT 21.9
	STATUS (I)	STATUS (I)	STATUS (I)	STATUS (I)	STATUS (I)	STATUS (I)	STATUS (I)	STATUS (I)
B1	D1	E1	F1	G1	H1	J1	K1	L1
DMUX1	AREA 1	WEIGHT SUM	98.6		WEIGHT SUM	87.6	AREA 2	

Figure 35. Installation Sheet for 3745 LIC Types 1 to 6

Figure 36 is an example of an installation sheet for a LIB type 1 containing LIC types 1 to 4 in the 3745 Model 17A. Not all possible LIC types are shown. Refer to page 123 for the legend.

Type/Model: 3745-17A LIB: M-A1 Line range: 32 - 63

DMUX2	AREA 3		WEIGHT SUM		27.8			AREA 4
B1	C1	D1	E1	F1	G1	H1	J1	K1
POS W LSS CABLE – –	LIC TYPE 1	LIC TYPE 1	LIC TYPE 1	LIC TYPE – –	LIC TYPE – –	LIC TYPE – –	LIC TYPE – –	LIC TYPE – –
	ID/PORT	ID/PORT	ID/PORT	ID/PORT	ID/PORT	ID/PORT	ID/PORT	ID/PORT
POS.Z LSS CABLE #5	1/32 M	1/36 M	1/40 M	– –	– –	– –	– –	– –
	1/33 M	1/37 M	1/41 M	– –	– –	– –	– –	– –
	1/34 M	1/38 M	– –	– –	– –	– –	– –	– –
	1/35 M	1/39 M	– –	– –	– –	– –	– –	– –
	WEIGHT 11.1	WEIGHT 11.1	WEIGHT 5.6	WEIGHT – –	WEIGHT – –	WEIGHT – –	WEIGHT – –	WEIGHT – –
	STATUS (I)	STATUS (I)	STATUS (I)	STATUS (F)	STATUS (F)	STATUS (F)	STATUS (F)	STATUS (F)
	MES No.	MES No.	MES No.	MES No.	MES No.	MES No.	MES No.	MES No.

Figure 36. Installation Sheet for 3745 17A LIC Types 1 to 6

Note: LIB 2 (for LIC types 5 and 6) uses the same legend.

Frame Identification

Note: The 3745 Models 21A and 41A and 3746 Models L13, L14, and L15 are no longer available.

You may want to identify the installation for each 3745 or 3746 to be installed. Check whether an identification is already given at the beginning of your CF3745 report. If yes, add this identification on the top of each installation sheet. Otherwise, it is recommended that you add an identification. It is normally the physical unit name.

Figure 37 locates the LIC units (LIUs) for Models 21A to 61A identified on your installation sheets. There are no LIUs in the 3746-900.

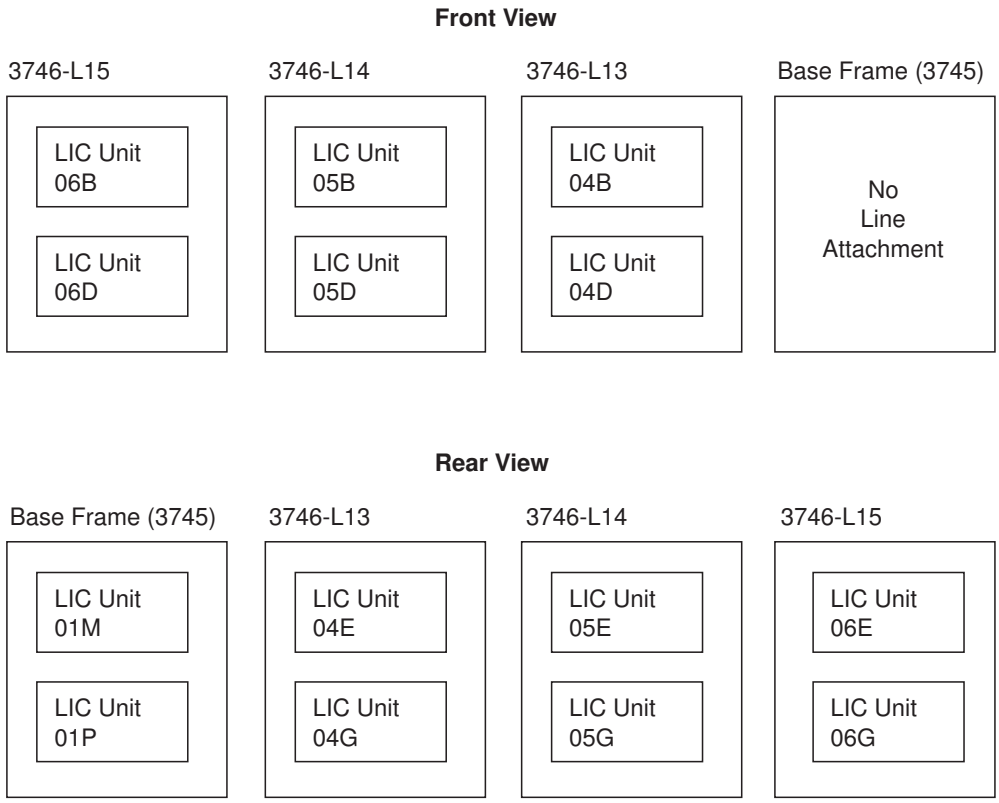


Figure 37. LIC Units (LIUs)

LIB Identification for Model 17A

Figure 38 locates the LIBs identified on your installation sheets. There are no LIBs in the 3745-900.

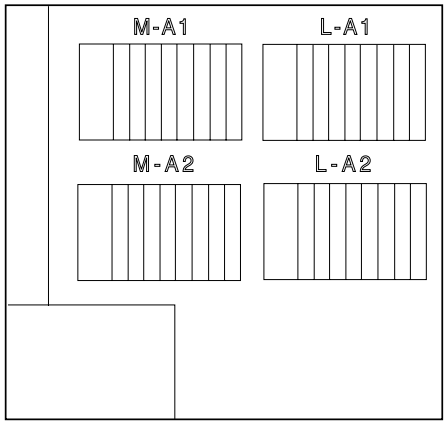


Figure 38. Models 17A LIBs

Notes:

1. Boards M-A1 and M-A2 are type 1 LIBs and are equipped with LIC types 1 to 4.
2. Board L-A1 is a LIB type 2^4 and is equipped with LIC types 5^4 and 6^4.
3. Board L-A2 can be a LIB type 1 or a LIB type 2^4.
4. No longer available.

Example TSST Installation Sheet

Note: The 3745 Models 21A and 41A are no longer available.

Type/Model: 3745 - 21A Line range: 1028 - 1095 (W/TRA)
Controller name: PU 1

T S S T B O A R D								
BUS GROUP	POS. 1 TYPE: TRA 1		POS. 2 TYPE: — —		POS. 3 TYPE: HSS		POS. 4 TYPE: ELA	
1	AD#1088 Port 1 TIC	AD#1089 Port 2 TIC	Reserved		AD#1028 ID/Port 4/1	AD#1029 ID/Port 4/2	AD#1062 PORT 1 LAN	AD#1063 PORT 2 XPT
BUS GROUP	POS. 5 TYPE: TRA 2		POS. 6 TYPE: TRA 2		POS. 7 TYPE: ELA		POS. 8 TYPE: ELA	
2	AD#1092 Port 1 TIC	AD#1093 Port 2 TIC	AD#1094 Port 1 XTC	AD#1095 Port 2 XTC	AD#1068 PORT 1 XPT	AD#1069 PORT 2 LAN	AD#1070 PORT 1 LAN	AD#1071 PORT 2 XPT

Figure 39. TSST Installation Sheet Example

Legend

TSST Board

The TSST board supports token-ring adapters.

TSSB board does not support token-ring adapters.

Pos. *n* **TYPE**

The type of line adapter attached to the bus group in each scanner position.

LSS For a low- or medium-speed scanner. The information consists of the cable number, the frame that it is servicing, and the area within that frame.
HSS For high-speed scanner.
TRA 1 For token-ring adapter type 1.
TRA 2 For token-ring adapter type 2.

AD Port

XTC TIC currently not in use
ELA For Ethernet LAN adapter
LAN For Ethernet LAN attached
XPT For port currently not in use
TIC For token-ring interface coupler
N/A Position not available
- - Position free

- Port addresses for HSSs (configuration without TRAs)

  These are arranged by pairs:

  Ports 1024 and 1025
  Ports 1026 and 1027
  Ports 1028 and 1029
  Ports 1030 and 1031
  Ports 1032 and 1033
  Ports 1034 and 1035
  Ports 1036 and 1037
  Ports 1038 and 1039

  Note: In each pair, two cables can be plugged but only one can be active at a time. Each cable corresponds to a high-speed line. The lines that correspond to both cables of a pair can be of different interface types and protocols.

- Port addresses for HSSs (configuration with TRAs)

  These are arranged by pairs:

  Ports 1028 and 1029
  Ports 1030 and 1031
  Ports 1036 and 1037
  Ports 1038 and 1039

  Note: Same note as above.

- Port addresses for TRAs

  These are arranged by pairs:

  Ports 1088 and 1089
  Ports 1090 and 1091
  Ports 1092 and 1093
  Ports 1094 and 1095

  Note: In each pair, two cables can be active at the same time. Each cable corresponds to a token-ring network.

- Port addresses for Ethernet adapters (configuration without TRA)

  These are arranged by pairs:

  Ports 1056 and 1057
  Ports 1058 and 1059
  Ports 1060 and 1061
  Ports 1062 and 1063
  Ports 1064 and 1065
  Ports 1066 and 1067
  Ports 1068 and 1069
  Ports 1070 and 1071

  Note: In each pair, two cables can be active at the same time. Each cable corresponds to a token-ring network.

- Port addresses for Ethernet adapters (configuration with TRAs)

  These are arranged by pairs:

  Ports 1060 and 1061
  Ports 1062 and 1063
  Ports 1068 and 1069
  Ports 1070 and 1071

  Note: In each pair, two cables can be active at the same time. Each cable corresponds to a token-ring network.

ID/Port

ID The identification number (from 1 through 99) defined in the input to the CF3745 for a group of lines that are identical in all respects.

Port Port number on HSS connector (J1 or J2) or TIC (J1 or J2).

Bus Group

The bus group number is 1 or 2.

Legend for the Example Installation Sheets

Notes:

1. The LIC4A, LIC5, and LIC6 are no longer available.
2. The 3745 Models 21A and 41A are no longer available.

The legend for the figures on pages 116 and 117 starts here and ends on page 127.

Type/Model:
Defines the base frame or line expansion unit.

Line Unit
Number that identifies the LIC unit containing the LICs in the 3745 Models 21A to 61A or 3746-Lx.

LIB
Identifies the 3745-17A line interface board.

Line Range
Defines the range of line addresses for the LIU or LIB.

DMUX Number
Double multiplex circuits (DMUX) are used in LIC units type 1. One DMUX is associated with up to eight LICs type 1 to 4 (up to 32 ports).

SMUX Letter
A single multiplex circuit (SMUX) is used in LIC units type 2. One SMUX is associated with up to eight LIC types 5 or 6 (up to 16 ports).

Area
For Models 21A to 61A:

The LIC area numbers (shown at the top and bottom of the example in Figure 35 on page 116) are subdivisions of the LIC units in the base frame and line expansion units. The following figures show the physical arrangement of LIC areas.

In the 3745 base frame:

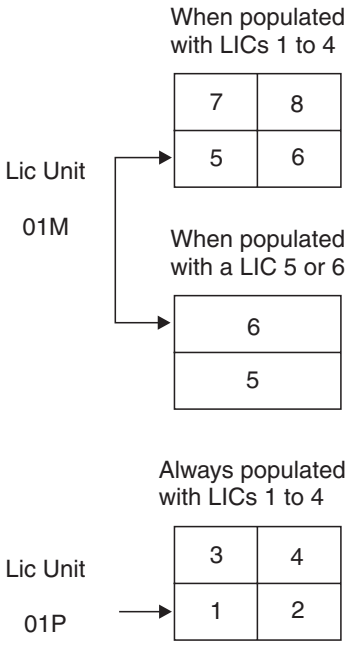


Figure 40. Physical Arrangement of LIC Areas — 3745 Base Frame

In the expansion units 3746-L13, 3746-L14, 3746-L15:

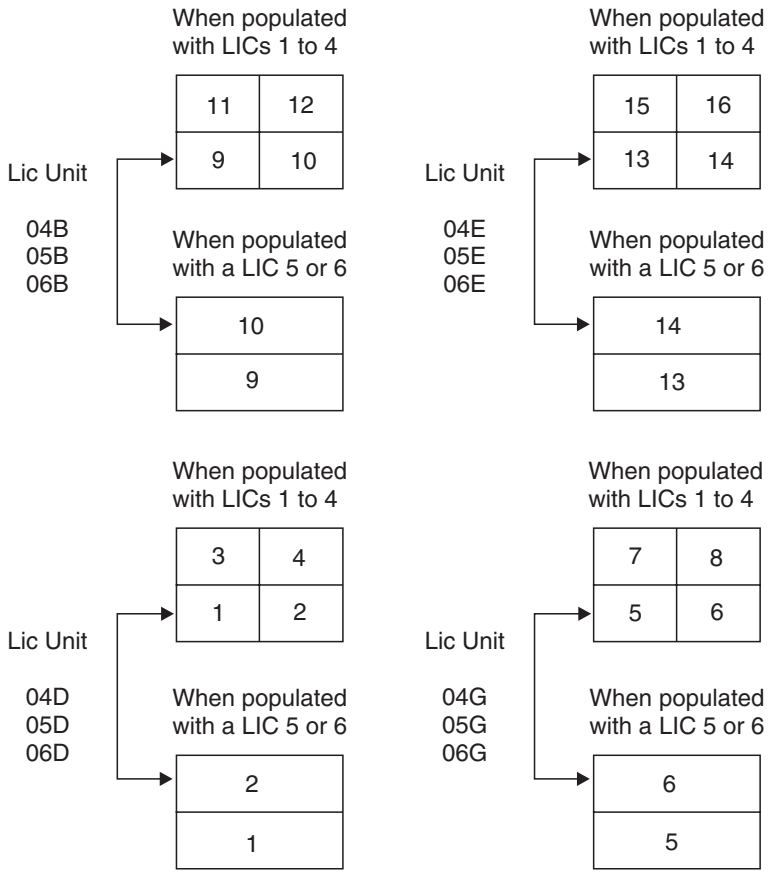


Figure 41. Physical Arrangement of LIC Areas — Expansion Units 3746—L13, —L14, —L15

Area

For the Model 17A:

The LIC area numbers (shown at the top of Figure 36 on page 117) are subdivisions of the LIBs. The following table shows the arrangement of LIC areas:

LIB	LIB Type	
	Area	Area
M–A1	1	
	3	4
M–A2	1	
	1	2
L–A1	2	
	7	7
L–A2	1,2	
	5	6

Figure 42. Arrangement of LIC Areas

Weight Sum
Weight summary (at the top and bottom of the installation sheets) per area. If two areas are serviced by the same scanner, the weight summary will appear overlapping the two areas. If one scanner services only one area, then the weight summary will appear only in the area serviced.

D0 to K0
These column headings are the physical locations of the LIB plugging positions.

D1 to K1
These column headings are physical locations of the LIC plugging positions in the LIC units (LIUs).

ID/Port
There are three types of information for the ID/Port:

1. **ID:** The identification number (from 1 through 99) defined in the input to the CF3745 for a group of lines that are identical in all respects.
2. **Port:** The port number. There are up to four ports per line interface coupler (LIC).

   The port numbers of Models 21A to 61A are arranged in groups of:

   - 64 ports corresponding to the maximum number of ports in a LIU1 for LIC types 1 to 4:

     Ports 0000 through 0063
     Ports 0064 through 0127
     Ports 0128 through 0191
     Ports 0192 through 0255
     Ports 0256 through 0319
     Ports 0320 through 0383
     Ports 0384 through 0447
     Ports 0448 through 0511
     Ports 0512 through 0575
     Ports 0576 through 0639
     Ports 0640 through 0703
     Ports 0704 through 0767
     Ports 0768 through 0831
     Ports 0832 through 0895

- 32 ports corresponding to the maximum number of ports in a LIU2 for LIC types 5 and 6:

  Ports 0064 through 0095
  Ports 0128 through 0159
  Ports 0192 through 0223
  Ports 0256 through 0287
  Ports 0320 through 0351
  Ports 0384 through 0415
  Ports 0448 through 0479
  Ports 0512 through 0543
  Ports 0576 through 0607
  Ports 0640 through 0671
  Ports 0704 through 0735
  Ports 0768 through 0799
  Ports 0832 through 0863

  The port numbers of the Model 17A are arranged as follows:

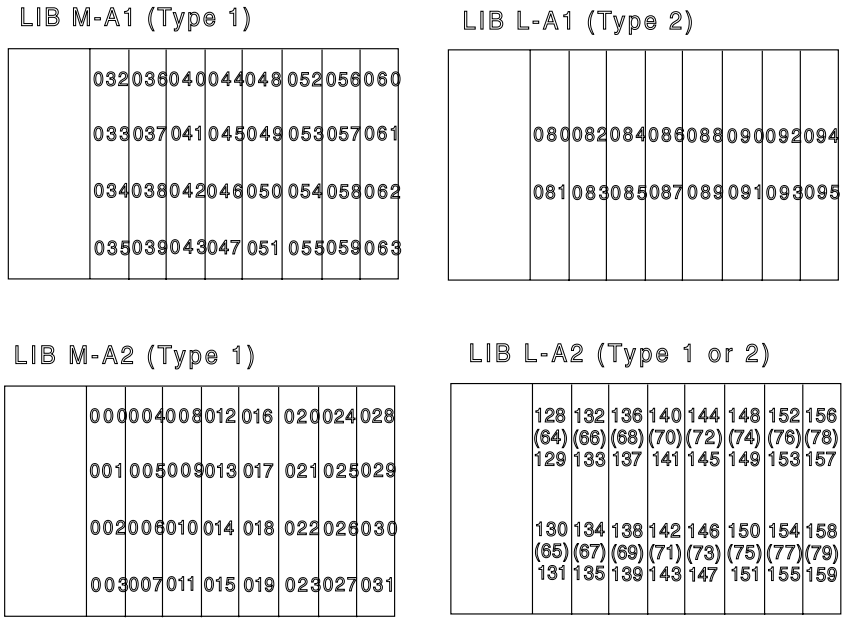


Figure 43. Port Numbers for Model 17A

Note: For LIB L-A2:

- If a LIB type 1 is installed; the address range is 128 to 159
- If a LIB type 2 is installed; the address range is 64 to 79 (in parentheses)

3. **Port status**

   (Blank) Backup line group

   F No cable installed

   D Direct-attached (LIC types 1, 3, 4A, and 4B) or digital data service (LIC6)

   M Modem cable attached (LIC types 1, 3, 4A, and 4B)

   L Limited distance modem (LIC6)

   A Auto-call (LIC1) or analog (LIC5)

Weight
Line weight for each LIC.

Status

F Position free

I Installed (factory-installed if the MES number is blank)

S Spare LIC (installed)

N Position not available for use. The position must be empty. According to LIC plugging rules, there is no LIC in the position on either side of a LIC6 running at a speed above 19 200 bits per second (bps).

Pos W, Pos Z
This is the cable plugging relationship of the scanner with DMUX or SMUX card (see LSS No. following).

LSS No.
One low- or medium-speed scanner (LSS) can be associated with either:

- 4 or 8 LICs in a LIC unit type 1
- 8 or 16 LICs in a LIC unit type 2

If there is only one scanner number, this number applies to positions W and Z.

MES No.
Miscellaneous equipment specification, if there is one.

Chapter 3. Plugging Sheets for 3745 and 3746

Blank plugging sheets for copying are provided starting on page 144.

Why Plugging Sheets and Cable Labels Are Required

In addition to the cables installed by IBM service personnel, you may have to manage up to several hundred cables. These may be for:

- Low-speed lines
- Medium-speed lines
- High-speed lines
- IBM token-ring networks
- Service processor and network node processor cables
- Emergency power-off (EPO) cables.

Other cables (for example, channel adapters and power cables) are not installed by the user and are not included in this chapter.

Even for a small configuration, it is very important to identify these cables. Use the plugging sheet examples included in this manual and cable labels to prepare cable identification:

- **Plugging sheets** summarize the cable situation. These sheets will be used at installation time and must be updated at each cabling change. The plugging sheet set is the map of your cabling situation.

  The plugging sheets must be filled in ***before installation***.

  Update these sheets (and create new cable labels) when changing, removing, or adding cables during later modifications. They are necessary for problem determination, configuration modifications, and controller relocation.

- ***Labels*** identify both ends of each cable (3746 side and destination side).

  The labels are filled out by the service representative ***at installation time*** according to the information that you supply on the plugging sheets.

  Update or replace the labels during later cable or 3746 modifications. Refer to 136 and 135.

Preparing the Plugging Sheets for 3746 Low- and Medium-Speed Lines (LIC11)

Prepare your LIC11 plugging sheets:

1. With your LIC11 and LCB/ARC installation sheets.

   For information about the installation sheets. Refer to Chapter 2, “Familiarizing Yourself with the Installation Sheets.”

2. Using your LCB identifications (LCB number/location) and ARC identifications (Symbolic line name).

3. With the cable characteristics adapted to your installation. There are two types of cables:

   LIC11 Connects the LIC11 to the LCBB. You need a LIC11 cable length and cable part number.

   ARC Up to 30 ARCs connect the LCBB and LCBE to the DCEs/DTEs. You need an ARC type and cable length for each ARC.

   Use the Chapter 1, “Physical Planning Details,” pages 86 and 87.

4. With copies of the blank plugging sheet provided on page 144. See the example in Figure 44 on page 131.

5. If an IBM service representative is not doing the installation or change, prepare the cable labels according to “Preparing the LIC11, LCB, and ARC Cable Labels” on page 136.

3746 Controller Name: CCI					
LIC Port: 2146	LIC Cable Length: 35 m		LIC Cable Part Number: 58G5604		
Address Range: 2146 - 2206					
LCBB Number/Location (Up to 25 Characters): 5/Room 2A					
ARC Position	Port	ARC Type	ARC Cable Length	Symbolic Line Name (Up to 8 Characters)	Comments
+0	2146	V.24 DCE	m 0,6	Print Room	
+1	2147	V.35 DCE	1.2 ft	Spirda	

Legend:

3746 Controller Name
Your identification for the 3746 Network Node.

LIC Port
"3746/NCP" address of the LIC11 as it appears on the LIC11 installation sheet.
Refer to page 105.

LIC Cable Length
The length of the LIC11 cable as it appears on the LIC11 installation sheet.
Refer to page 105.

LIC Cable Part Number
The part number of the LIC11 cable. This information is optional.

Address Range
The 30 addresses available for this LIC port address.
Refer to page 113.

LCBB Number/Location
You can label the LCB with up to 25 characters.
This label is then used to identify the LCB in the MOSS-E.

ARC Position
This is the slot location of the ARC in the LCBB or LCBE.
This information is supplied on the LCB installation sheet.
Refer to page 112.

Port
This is the logical address of the ARC and line.
It is calculated by adding the ARC position to the LIC11 port address.
This information is supplied on the LCB installation sheet.
Refer to page 112.

ARC Type
This information is supplied on the LCB installation sheet.
Refer to page 112 and to Chapter 1, "Physical Planning Details."
It is also on the label of the ARC card in the LCB.

ARC Cable Length
The length of the ARC cable. This information is supplied on the LCB installation sheet.
Refer to page 112.

Symbolic Line Name
You can label the ARC with up to 8 characters identifying the line destination.
This name can identify the ARC in the MOSS-E.

Figure 44. Example LIC11 Plugging Sheet

Preparing the Plugging Sheets for 3746 High-Speed Lines (LIC12)

Prepare your LIC12 plugging sheet:

1. With the port address of each LIC12, as given by your installation sheets.

   For information about the installation sheets. Refer to Chapter 2, “Familiarizing Yourself with the Installation Sheets.”

2. With the names you use to identify the line destination.
3. With the cable characteristics adapted to your installation and chosen using Chapter 1, “Physical Planning Details,” page 79. They are:

   Cable group or cable part number
   Cable length

4. With copies of the blank plugging sheet provided on page 145. See the example plugging sheet in Figure 45.
5. Prepare the cable labels as described on page 135.

3746 Controller Name: CC1

LIC Port	Cable Group or Part Number	Cable Length	Line Destination	Comments
2176	CG 7007	10 m	Atlanta	Plenum cable

Legend:

3746 Controller Name
Your identification for the 3746 Network Node base frame.

LIC Port
Address of the LIC12 as it appears on the 3746 enclosure installation sheets. Refer to pages 99 to 101.

Cable Group or Part Number
This information is available on page 79.

Cable Length
The length of the LIC cable.

Line Destination
Your name for the destination of the LIC cable.

Figure 45. Example LIC12 Plugging Sheet

Preparing the Plugging Sheets for the 3746 Token-Ring Adapters

Prepare your token-ring adapter plugging sheets:

1. With the port address of each token-ring coupler, as given by your installation sheets.

   For information about the installation sheets, refer to Chapter 2, “Familiarizing Yourself with the Installation Sheets.”

2. With the names you use to identify the token-ring LANs (the token-ring network destination).

3. With the cable characteristics adapted to your installation and chosen using Chapter 1, “Physical Planning Details,” page 79. They are:

   Cable group or cable part number
   Cable length

   If you are using unshielded twisted-pair (UTP) cable, refer to Chapter 1, “Physical Planning Details,” page 96 . IBM supplies the necessary token-ring media filter, but not the UTP cable and connectors.

4. With copies of the blank plugging sheet provided on page 146. See the example plugging sheet in Figure 46.

5. Prepare the cable labels as described on page 135.

3746 Controller Name: CC 1				
TIC Port	Cable group or Part number	Cable Length	Token-Ring Network Destination	Comments
2176	CG 7003	21.3 m	BLD. 7-6X	

Legend:

3746 Controller Name
Your identification for the 3746 Network Node frame.

TIC3 Port
Address of the TIC3 as it appears on the 3746 enclosure installation sheets, refer to pages 99 to 101.

Cable Group or Part Number
This information is available starting on page 79.

Cable Length
The length of the TIC3 cable.

Token-Ring Network Destination
Your name for the token-ring LAN connected to the TIC3.

Figure 46. Example TIC3 Plugging Sheet

Preparing the Plugging Sheet for the Service Processor

Prepare your plugging sheet for each service processor using Chapter 1, “Physical Planning Details,” pages 74 and 76.

There is a copy of the blank plugging sheet on page 147.

Preparing the Plugging Sheet for the EPO Cables

The emergency power-off (EPO) cables allow the host to directly control the power state (on or off) of the controller frame.

Prepare your plugging sheet:

1. With the cable characteristics chosen using “ESCON Jumper Cables and Emergency Power-Off Cables (3746-9x0)” on page 71. They are:

   Cable group or cable part number
   Cable length
2. With the blank plugging sheet provided on page 148. See the explanation of the plugging sheet in Figure 47.
3. Prepare the cable labels according to 135.

3746 Controller Name: CC 2

From	To	Cable Group or Part Number	Cable Length	Comments
3746	Host	CG 1178	18 m	

Legend:

3746 Controller Name
Your identification for the 3746 Network Node frame.

Cable Group or Part Number
Information is available on page 71.

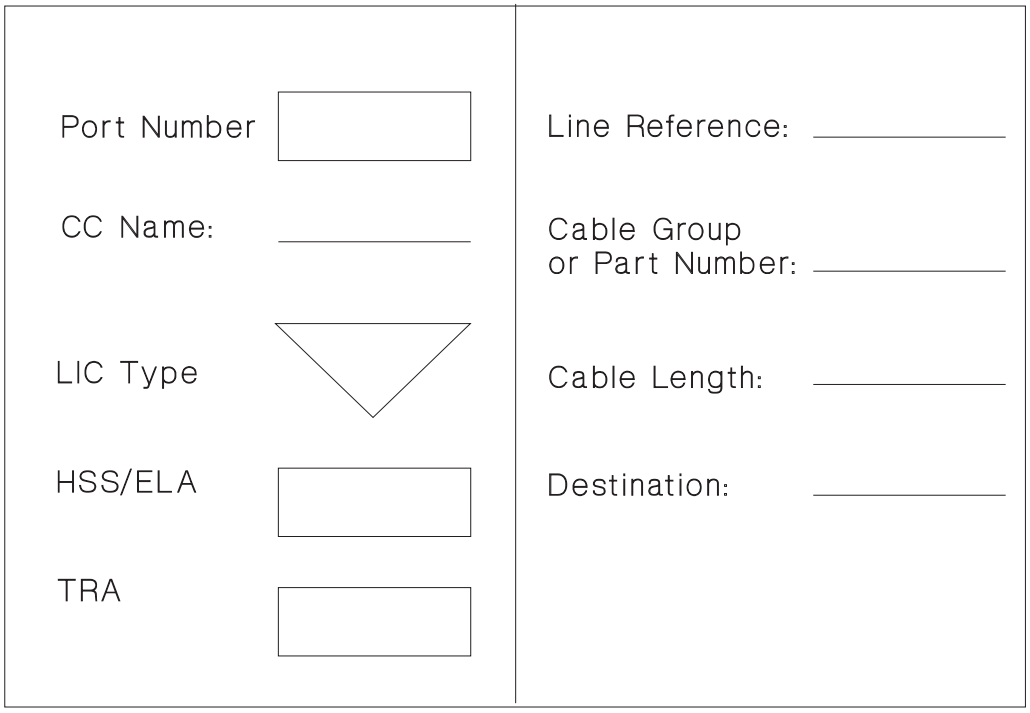
Cable Length
Information is available on page 71.

Figure 47. Example of EPO Cables Plugging Sheet

Preparing LIC12, Token-Ring, and EPO Cable Labels

To prepare the cable labels, proceed as follows:

1. Obtain the necessary number of cable labels required for your installation. Two labels are needed for each cable.
2. Depending on the type of cable:
   a. Enter the line characteristics given in your plugging sheets in the appropriate areas.



   b. Attach an identical label to each end of each cable (3746 side and destination side).

Preparing the LIC11, LCB, and ARC Cable Labels

The line connection boxes (LCBs) are the connectivity interface between the 3746 LIC11 and the your DCEs/DTEs. Two LCBs can be installed in the 3746 itself and more in the Controller Expansion (FC 5023) or independent customer racks.

The LCBB connects to the LIC11, to the LCBE, and houses a maximum of 15 ARCs.

The LCBE connects to the LCBB and houses a maximum of 15 ARCs.

The LCB and cable identification uses the labels referenced A, B, or C in Figure 48 on page 137:

- Label A is used to identify the LCB.
- Label B is on the cable between the LIC11 and the LCBB.
- Label C is on the ARC cables connecting the DCE/DTEs to the LCBs.

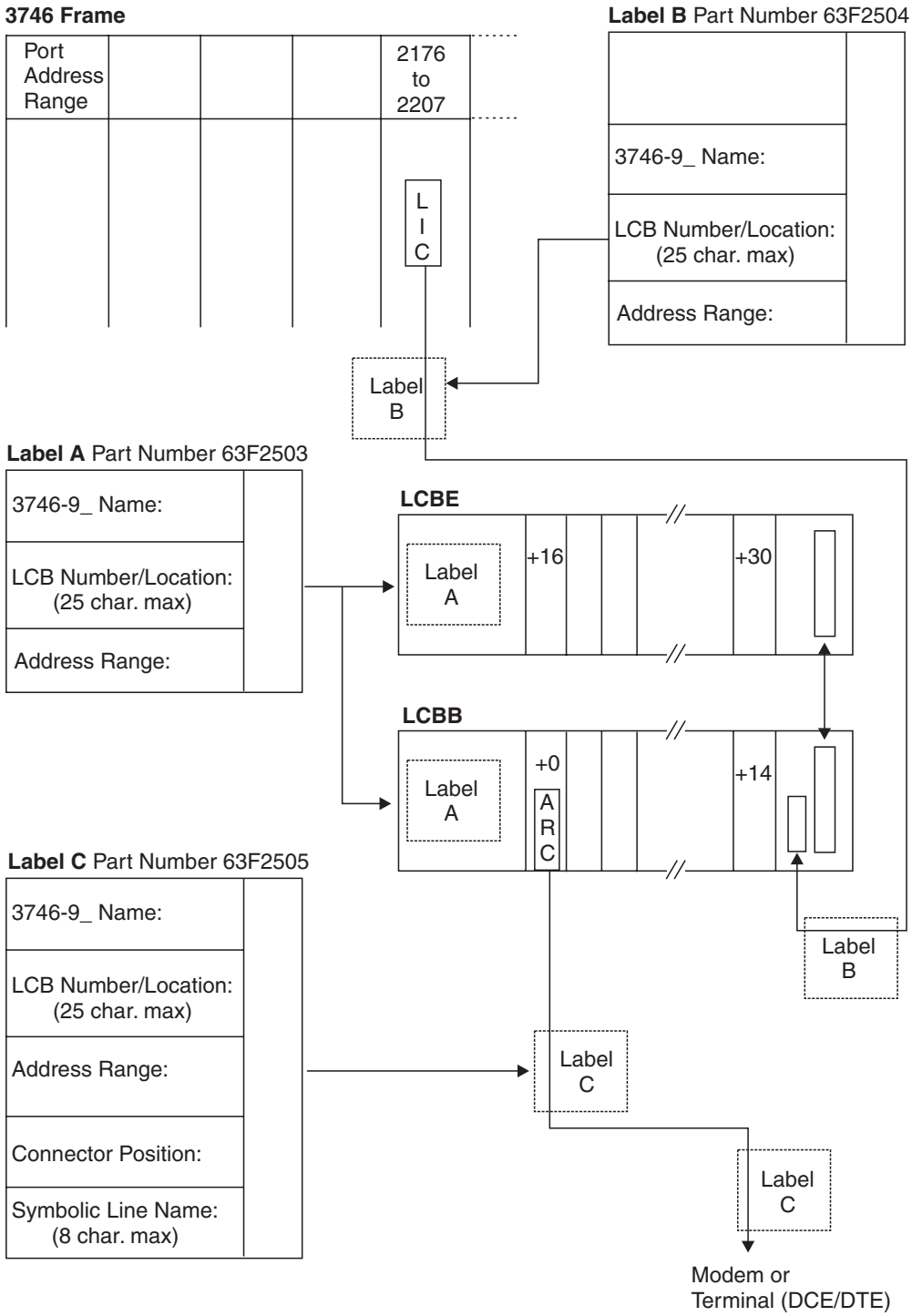


Figure 48. LIC11 Cabling and Labeling

Preparing the Plugging Sheets for 3745 and 3746-L13, -L14, -L15 Low- and Medium-Speed Lines (LIC Types 1 to 6)

Note: The LIC4A, LIC5, and LIC6 are no longer manufactured.

Prepare your plugging sheets for the LIC types 1 to 6:

1. With the line characteristics provided in your installation sheets:
   - For lines attached to a LIC type 1 to 4, they are:

     LIC type
     Port number
     Line protocol
     Line interface
   - For lines attached to a LIC type 5 or 6, they are:

     LIC type
     Port number

   For information about the installation sheets, refer to Chapter 2, “Familiarizing Yourself with the Installation Sheets.”
2. With your network line characteristics:
   - For a LIC type 5 or 6, they are:

     Network type
     Line reference
   - For all LIC types, there is one:

     Destination
3. Use the cable characteristics adapted to your installation and chosen using Chapter 1, “Physical Planning Details,” starting on page 81. They are:
   - Cable group or cable part number
   - Cable length
4. With copies of the blank plugging sheets provided on page 145 or 150.

   There is an example plugging sheet for:
   - LIC types 1 to 4 in Figure 49 on page 139
   - LIC types 5 and 6 in Figure 50 on page 140
5. If an IBM service representative is not doing the installation or change, prepare the cable labels according to “Preparing LIC12, Token-Ring, and EPO Cable Labels” on page 135.

3745 Communication Controller Name: CC 1					Frame: 3746-L15 LIC Unit: 05 D		
LIC Port	LIC Type	Cable Group or Part Number	Cable Length	Line Interface	Line Protocol	Destination	Comments
0384	3	PN 6398665	100 m	V.35 DCE	SDLC	B3 LA GAUDE	
0385							

Legend:

3745 Communication Controller Name
Your identification for the 3745 base frame.

Frame
The frame where the LICs are located.

LIC Unit
The LIC location within the frame.

LIC Port
Address of the LIC as it appears on the HONE installation sheet.

LIC Type
The LIC can be a type 1, 3, 4A, or 4B.

Cable Group or Part Number
This information is available starting on page 81.

Cable Length
The length of the LIC cable.

Line Interface
One of more of the following: Transfix, V.24, V.25, V.25 bis (auto-call), V.35 (DCE or direct attachment), X.20 bis, X.21, and X.21 bis.

Line Protocol
One of the following: BSC, SDLC, or asynchronous.

Destination
The destination of the line using the LIC.

Figure 49. Example Plugging Sheet for LIC Types 1 to 4

3745 Communication Controller Name: CC1				Frame: 3746-L14 LIC Unit: 06D	
LIC Port	LIC Type	Network Type	Line Reference	Destination	Comments
0640	5	LDM	R370L40	Tech Support, Orlando	
0641					

Legend:

3745 Communication Controller Name
Your identification for the 3745 base frame.

Frame
The frame where the LICs are located.

LIC Unit
The LIC location within the frame.

LIC Port
Address of the LIC as it appears on the HONE installation sheet.

LIC Type
The LIC can be a type 5 or 6.

Network Type
One of the following: analog, DSU/CSU, baseband, private, or limited-distance modem (LDM).

Line Reference
Either common carrier or public switched telephone network.

Destination
The destination of the line using the LIC.

Figure 50. Example Plugging Sheet for LIC Types 5 and 6

Preparing the Plugging Sheets for 3745 High-Speed Lines

Prepare your high-speed line plugging sheets:

1. With the port of each line, as given by your installation sheets.

   For information about the installation sheets, refer to Chapter 2, “Familiarizing Yourself with the Installation Sheets.”

2. With the names you use to identify the line destinations
3. With the line characteristics of your installation:

   Line interface
   Line protocol

4. With the cable characteristics adapted to your installation and chosen using Chapter 1, “Physical Planning Details,” starting on page 81. They are:

   Line type
   Cable group or cable part number
   Cable length

5. With copies of the blank plugging sheet provided on page 151. See the example plugging sheet in Figure 51.
6. If an IBM service representative is not doing the installation or change, prepare the cable labels as described on page 135.

3745 Communication Controller Name: CC 2 Model: 3745-41A

Port	Cable Group or Part Number	Cable Length	Line destination	Line Interface and Protocol	Comments
1084	CG 5831	33 ft	Jordan Meeting Room, Bld 100	V.35 DCE Duplex	

Legend:

3745 Communication Controller Name
Your identification for the 3745 base frame.

Frame
These high-speed lines are connected only to the 3745 frame.
Add the 3745 model number.

LIC Port
Address of the LIC12 as it appears on the HONE installation sheet.

Cable Group or Part Number
This information is available on page 79.

Cable Length
The length of the line cable.

Line Destination
Your name for the destination of the line LIC cable.

Line Interface and Protocol
One of the following: V.35 (DCE, direct attachment) or X.21 (DCE, direct attachment, Transfix, EIA-547).

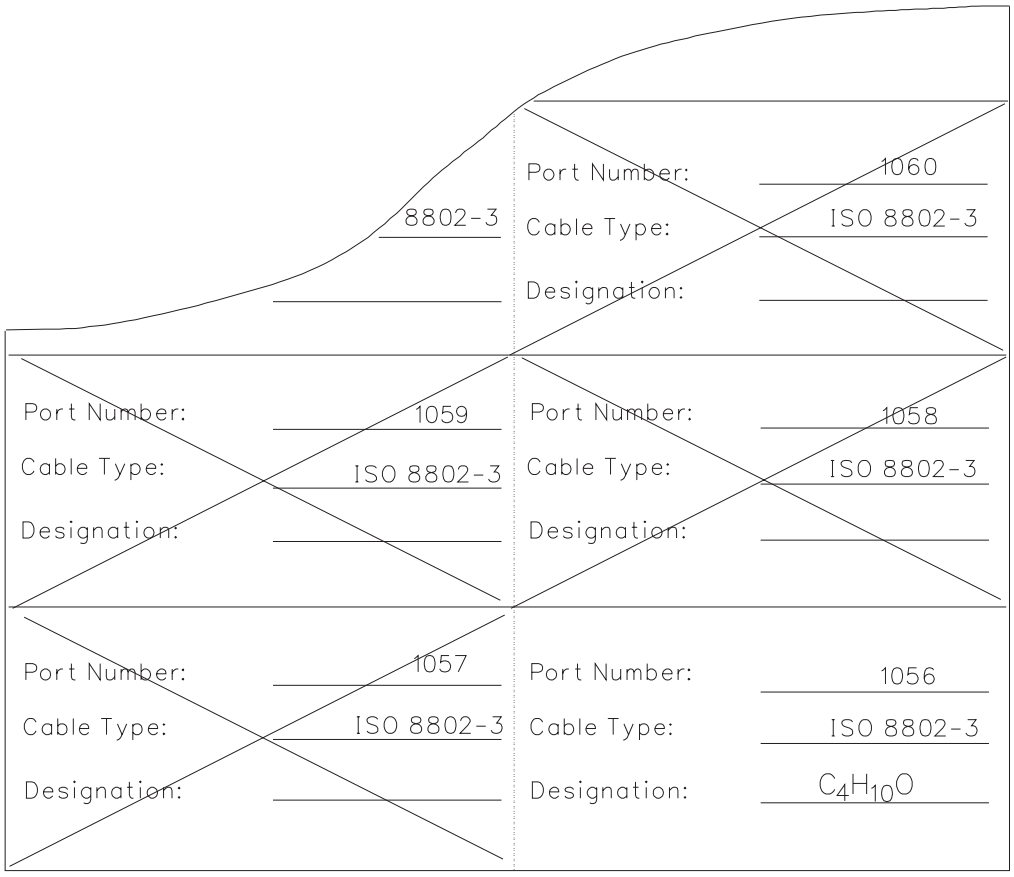
Figure 51. Example 3745 High-Speed Line Plugging Sheet

Preparing the Plugging Sheets for 3745 Ethernet Adapters

Prepare your Ethernet adapter plugging diagram:

1. With the port of each Ethernet adapter, as given by your installation sheets.

   For information about the installation sheets, refer to Chapter 2, “Familiarizing Yourself with the Installation Sheets.”
2. With the names you use to identify the Ethernet LANs (designation).
3. With a copy of the blank plugging diagram provided on page 152. See the example plugging sheet in Figure 52.
4. Enter the Ethernet LAN name on the Designation line that matches its port number.
5. If an IBM service representative is not doing the installation or change, prepare the cable labels as described on page 135.



Legend:

Port Number
Address of the Ethernet adapter as it appears on the HONE installation sheet.

Cable Type
Standard Ethernet LAN cable.

Designation
Your name for the Ethernet LAN connected to the Ethernet port.

Figure 52. Example Plugging Diagram for Ethernet Adapters

Plugging Sheets

This section provides a set of blank plugging sheets. Photocopy as many as you need of each.

Once filled in, these sheets reflect the cabling plan of:

- Low- and medium-speed lines attached to one LIC Unit type 1 for the LIC types 1, 3, 4A, and 4B
- Low- and medium-speed lines attached to one LIC Unit type 2 for the LIC types 5 and 6
- Low- and medium-speed lines (LIC11)
- High-speed lines (LIC12)
- Token-ring connections (TIC3)
- Ethernet networks
- Communication lines attached to the 3746-900 (LIC types 11 and 12)
- Service processor and network node processor
- Service processor RSF link
- Emergency power-off cables
- Customer power connection

Use these sheets at installation time and for any later cable changes. After using these sheets at installation time, store them in this manual for future reference.

Plugging Sheet for 3746 Low- and Medium-Speed Lines (LIC11)

3746 Controller Name					
LIC Port:		LIC Cable Length:		LIC Cable Part Number:	
Address Range:					
LCBB Number/Location (Up to 25 characters)**:**					
ARC Position	**Port**	**ARC Type**	**ARC Cable Length**	**Symbolic Line Name** (Up to 8 characters)	**Comments**
+0					
+1					
+2					
+3					
+4					
+5					
+6					
+7					
+8					
+9					
+10					
+11					
+12					
+13					
+14					
LCBE Number/Location (Up to 25 characters)**:**					
+16					
+17					
+18					
+19					
+20					
+21					
+22					
+23					
+24					
+25					
+26					
+27					
+28					
+29					
+30					

Plugging Sheet for 3746 High-Speed Lines (LIC12)

3746 Controller Name:				
LIC Port	**Cable Group or Part Number**	**Cable Length**	**Line Destination**	**Comments**

Plugging Sheet for 3745 and 3746 Token-Ring Adapters

3746 Controller Name:				
TIC Port	**Cable Group or Part Number**	**Cable Length**	**Token-Ring Network Destination**	**Comments**

Plugging Sheet for 3745/3746 Service Processor

Service Processor Name:			
Cable Type	**Part Number**	**Cable Length**	**Comments**
Service Processor to SPAU	6339098	2.4 m (8 ft)	Shipped with service processor.
3746 CBSP2/TIC3 to SPAU		9 m (30 ft)	Shipped with 3746.
3746 Network Node Processor to SPAU	6339098	2.4 m (8 ft)	Shipped with network node processor.
3745 MOSS to SPAU		9 m (30 ft)	Shipped with 3745.
Service Processor to Modem	57G7528	15 m (49.2 ft)	Shipped with service processor.
Modem to Telephone Line		4.6 m (15 ft)	Shipped with service processor.

Plugging Sheet for 3746 EPO Cables

3746 Controller Name:				
From	**To**	**Cable Group or Part Number**	**Cable Length**	**Comments**

Plugging Sheet for 3745 and 3746 Low- and Medium-Speed Lines (LIC Types 1 to 4)

3745 Communication Controller Name:

Frame:

LIC Unit:

LIC Port	LIC Type	Cable Group or Part Number	Cable Length	Line Interface	Line Protocol	Destination	Comments

Plugging Sheet for 3745 and 3746 Low- and Medium-Speed Lines (LIC Types 5 and 6)

3745 Communication Controller Name:

Frame:
LIC Unit:

LIC Port	LIC Type	Network Type	Line Reference	Destination	Comments

Plugging Sheet for 3745 High-Speed Lines

3745 Communication Controller Name:				Frame: 3745	
Port	Cable Group or Part Number	Cable Length	Line Destination	Line Interface and Protocol	Comments

Plugging Diagram for 3745 Ethernet LAN Adapters

Port Number:	1071	Port Number:	1070
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	
Port Number:	1069	Port Number:	1068
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	
Port Number:	1067	Port Number:	1066
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	
Port Number:	1065	Port Number:	1064
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	
Port Number:	1063	Port Number:	1062
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	
Port Number:	1061	Port Number:	1060
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	
Port Number:	1059	Port Number:	1058
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	
Port Number:	1057	Port Number:	1056
Cable Type:	ISO 8802-3	Cable Type:	ISO 8802-3
Designation:		Designation:	

List of Abbreviations

ac alternating current

ACF Advanced Communications Function

AIS alarm indication signal

AIW APPN Implementers Workshop

AIX Advanced Interactive Executive

AMI alternate mark inversion

ANR automatic network routing

ANR automatic network routing

ANSI American National Standards Institute

APAR authorized program analysis report

APPC advanced program-to-program communication

APPN advanced peer-to-peer networking

APPNTAA APPN Topology and Accounting Agent (NetView)

ARB adaptive rate-based

ARC active remote connector

AS autonomous system

ASM address space manager

ATM asynchronous transfer mode

BACP Bandwidth Allocation Control Protocol

BAN boundary access node

BAP Bandwidth Allocation Protocol

BECN backward explicit congestion notification

BGP Border Gateway Protocol

BNC bayonet Niell-Concelman

BNN boundary network node

bps bits per second

Bps bytes per second

BPV bipolar violation

BRI basic rate interface

BrNN Branch Extender Network Node

BRS bandwidth reservation system

B8ZS bipolar with 8 zero substitution

CAS circuit-associated signaling

CBC (1) cipher block chaining (2) controller bus coupler

CBSP Controller Bus and Service Processor

CCITT Comité Consultatif International Télégraphique et Téléphonique. (The international telegraph and telephone consultative committee, now ITU-T.)

CCM Controller Configuration and Management

CCU central control unit

CD collision detection

CDF-E Configuration Data File - Extended

CDLC channel data link control

CHAP Cryptographic Handshake Authentication Protocol

CIR committed information rate

CLA communication line adapter

CLLM consolidated link layer management

CLP communication line processor

CMC Communication Management Configuration

CMIP Common Management Information Protocol

CNN composite network node

COS class of service

CP control point

CRC cyclic redundancy check

CS configuration services

CSMA carrier sense multiple access

CSU channel service unit

DAS dual attach station

dc direct current

DCAF Distributed Console Access Facility

DCE data circuit-terminating equipment

DCI direct current interlock

DES data encryption standard

DLC data link control

DLCI data link connection identifier

DLSw data link switching

DLU dependent logical unit

DLUR dependent logical unit requester

DLUS dependent logical unit server

DMA direct memory access

DOS disk operating system

DRAM dynamic random access memory

DS directory serviecs

DSX digital system x-connect

DS0 digital system level 0

DTE data terminal equipment

EBN extended border node

ECP Encryption Control Protocol

EGA ESCON Generation Assistant

EGP Exterior Gateway Protocol

EIA Electronic Industries Alliance

EMIF ESCON Multiple Image Facility

EN end node

EP emulation program

EPO emergency power off

ERP error recovery procedures

ES Enterprise Systems

ESA Enterprise Systems Architecture

ESCA ESCON Channel Adapter, also called *ESCON Adapter*

ESCC ESCON Channel Coupler, also called *ESCON Coupler*

ESCD ESCON Director

ESCON Enterprise Systems Connection

ESCP ESCON Channel Processor, also called *ESCON Processor*

ESF extended superframe

ETA Enhanced Tape Attachment

FAS frame-alignment signal

FDDI Fiber Distributed Data Interface

FDL facility data link

FDX full duplex

FECN forward explicit congestion notification

FR frame relay

FRAD frame-relay access device

FRFH frame-relay frame handler

FRSE frame-relay switching equipment

FRTE frame-relay terminating equipment

FTP File Transfer Protocol

HDX half duplex

HPDT high-performance data transfer

HPR High-Performance Routing

HSSI high-speed serial interface

HTTP Hypertext Transfer Protocol

Hz Hertz

I/O input/output

ICMP Internet Control Message Protocol

ICN interchange node

IEC International Electrotechnical Commission

IEEE Institute of Electrical and Electronics Engineers

IETF Internet Engineering Task Force

INN intermediate network node

IOC input/output control

IP Internet Protocol

IPSec Internet Protocol Security

IPX Internetwork Packet eXchange

ISA industry standard architecture

ISDN integrated services digital network

ISO International Organization for Standardization

ISP Internet Service Provider

ISR intermediate session routing

ITU-T International Telecommunication Union - Telecommunication (formerly CCITT)

kbps kilobits per second

km kilometer (0.62 miles)

LAA locally administered address

LAC L2TP Access Concentrator

LAN local area network

LAPB Link Access Protocol - Balanced

LAPS LAN adapter and protocol support

LCB line connection box

LCBB line connection box base

LCBE line connection box expansion

LCS LAN channel station

LEN low-entry networking

LFSID local form session identifier

LIC (1) licensed internal code (2) line interface coupler

LLC logical link control

LNS L2TP network server

LP logical partition

LPAR logically partitioned (mode)

LPDA2 Link Problem Determination Aid-2

LSA Link Services Architecture

LSS low-speed scanner

LU logical unit

L2F Layer 2 Forwarding

L2TP Layer 2 Tunneling Protocol

m meter (39.37 inches)

MAC medium access control

MB megabyte

Mbps megabits per second

MBps megabytes per second

MCL microcode change level

MHz megahertz

MIB Management Information Base

MLTG multilink transmission group

MMF multimode fiber

MNPS multinode persistent session

MOSS-E Maintenance and Operator Subsystem - Extended

MPA multiprotocol adapter

MPC multi-path channel

MS Management Services

MSAU multistation access unit

MSS Multiprotocol Switch Services

MVS Multiple Virtual Storage

NAPT network address and port translation

NAT network address translation

NAU network-addressable unit

NCE network connection endpoint

NCP network control program

NCTE network communication terminal equipment

NFS network file system

NGMF NetView Graphic Monitor Facility

NHRP Next Hop Routing Protocol

NIC network interface card

NLP network layer packet

nm nanometer

NN network node

NNP Network Node Processor

NOF node operator facility

NPI numbering plan identification

NPM NetView Performance Monitor

NPSI NCP packet switching interface

NRF Network Routing Facility

NRZ non-return-to-zero

NRZI non-return-to-zero inverted

NTO Network Terminal Option

NTS network transmission subsystem

NTT Nippon Telegraph and Telephone

NVT Network Virtual Terminal

OSI open systems interconnection

OSPF open shortest path first

PBN peripheral border node

PC path control

PCI Programming Communication Interface

PCMCIA Personal Computer Memory Card International Association

PEP Partitioned Emulation Programming

PLP Packet Layer Protocol

PPP Point-to-Point Protocol

pps packets per second

PPTP Point-to-Point Tunneling Protocol

PRI primary rate interface

PRPQ programming request for price quotation

PTF program temporary fix

PU physical unit

PVC permanent virtual circuit

QLLC qualified logical link control

QoS quality of service

RABM Router and Bridge Manager

RADIUS Remote Authentication Dial-In User Service

RETAIN Remote Technical Assistance Information Network

RFC Request for Comments

RIP Routing Information Protocol

RODM Resource Object Data Manager (NetView)

RSF remote support facility

RSS route selection services

RTP Rapid Transport Protocol

SAP service access point

SAR segmentation and reassembly

SAS single-attach station

SATF shared access transport facility

SC session control

SCM session connection manager

SCSP Server Cache Synchronization Protocol

SDLC Synchronous Data Link Control

SDRAM static DRAM

SF selectable framing

SIE switch interface extension (card)

SLC subscriber loop carrier

SLIP Serial Line Interface Protocol

SMF single-mode fiber

SNA Systems Network Architecture

SNATAM SNA Terminal Access Method

SNI SNA network interconnection

SNMP Simple Network Management Protocol

SONET synchronous optical network

SPAU Service Processor Access Unit

SRC system reference code

SS session services

SSCP system services control point

SSCP system services control point (VTAM)

SSE Session Services Extensions

SSL Secure Sockets Layer

SSP System Support Programs

STP shielded twisted pair

SVC switched virtual circuit

TACACS Terminal Access Control System

TAM Topology and Accounting Management

TCP Transmission Control Protocol

TFTP Trivial File Transfer Protocol

TG transmission group

TIA Telecommunications Industries Association

TIC Token-ring interface coupler

TME Tivoli Management Environment

TOA type of address

TPF Transaction Processing Facility

TRA token-ring adapter

TRP token-ring processor

TRS Topology and Routing Services

UDP User Datagram Protocol

UFC Universal Feature Card

URL Uniform Resource Locator

UTP unshielded twisted pair

VC virtual circuit

VM virtual machine

VPN virtual private network

VRN virtual routing node

VRRP Virtual Router Redundancy Protocol

VSE Virtual Storage Extended

VTAM Virtual Telecommunications Access Method

WAN wide area network

XCA external communications adapter

Glossary

This glossary defines new terms used in this manual.

adaptive rate-based flow and congestion control (ARB). A function of High Performance Routing (HPR) that regulates the flow of data over an RTP connection by adaptively changing the sender's rate based on feedback on the receiver's rate. It allows high link utilization and prevents congestion before it occurs, rather than recovering after congestion has occurred.

advanced communication function (ACF). A group of IBM licensed programs. principally VTAM programs. TCAM, NCP, and SSP, that use the concepts of Systems Network Architecture (SNA), including distribution of function and resource sharing.

advanced communications function for the virtual telecommunications access method (ACF/VTAM). An IBM licensed program that controls communication and the flow of data in an SNA network. It provides single-domain, multiple-domain, and interconnected network capability.

advanced peer-to-peer networking (APPN). Data communications support that routes data in a network between two or more advanced program-to-program communications (APPC) systems that do not need to be adjacent.

automatic network routing. A function of High Performance Routing (HPR) that is provides a low-level routing mechanism that requires no intermediate storage.

channel adapter (CA). A communication controller hardware unit used to attach the controller to a host processor.

communication controller. A device that directs the transmission of data over the data links of a network; its operation may be controlled by a program executed in a processor to which the controller is connected or it may be controlled by a program executed within the device. For example, the IBM 3745 and 3746 Network Nodes.

communications manager. A function of the OS/2 Extended Edition program that lets a workstation connect to a host computer and use the host resources as well as the resources of the other personal computers to which the workstation is attached, either directly or through a host system. The communications manager provides application programming interfaces (APIs) so that users and develop their own applications.

configuration data file - extended (CDF-E). A 3746 Network Node MOSS-E file that contains a description of all the hardware features (presence, type, address, and characteristics).

communications management configuration host node. The type 5 host processor in a communications management configuration that does all network-control functions in the network except for the control of devices channel-attached to a data host nodes. Synonymous with communications management host. See also data host node.

control panel. A panel that contains switches and indicators for the customer's operator and service personnel.

control program. A computer program designed to schedule and to supervise the execution of programs of the controller.

control subsystem. The part of the controller that stores and executes the control program, and monitors the data transfers over the channel and transmission interfaces.

customer engineer. See IBM service representative

data circuit-terminating equipment (DCE). The equipment installed at the user's premises that provides all the functions required to establish, maintain, and terminate a connection, and the signal conversion between the data terminal equipment (DTE) and the line. For example, a modem is a DCE.

Note: The DCE may be a stand-alone equipment or integrated in the 3745.

data terminal equipment (DTE). That part of a data station that serves as a data source, data link, or both, and provides for the data communication control function according to protocols. For example, the 3174 and PS/2s are DTEs.

data host node. In a communication management configuration, a type 5 host node that is dedicated to processing applications and does not control network resources, except for its channel adapter-attached or communication adapter-attached devices. Synonymous with data host. See also communications management configuration host node.

direct attachment. The attachment of a DTE to another DTE without a DCE.

ESCON channel. A channel having an Enterprise System Connection* channel-to-control-unit I/O interface that uses optical cables as a transmission medium.

ESCON channel adapter (ESCA). A communication controller hardware unit used to attach the controller to a host via ESCON fiber optics. An ESCA consists of an ESCON channel processor (ESCP) and an ESCON channel coupler (ESCC).

ESCON channel coupler (ESCC). A communication controller hardware unit which is the interface between the ESCON channel processor and the ESCON fiber optic cable.

ESCON channel processor (ESCP). A communication controller hardware unit which provides the channel data link control for the ESCON channel adapter.

distributed console access facility. (1) This program product provides a remote console function that allows a user at one programmable workstation (PS/2) to remotely control the keyboard input and monitor the display of output of another programmable workstation. The DCAF program does not affect the application programs that are running on the workstation that is being controlled. (2) An icon that represents the Distributed Console Access Facility.

enterprise systems chhnection (ESCON). A set of IBM products and services that provides a dynamically connected environment within an enterprise.

Host. See host processor

host processor. (1) A processor that controls all or part of a user application network. (2) In a network, the processing unit where the access method for the network resides. (3) In an SNA network, the processing unit that contains a system services control point (SSCP). (4) A processing unit that executes the access method for attached communication controllers.

High performance routing (HPR). An extension of APPN that provides faster traffic throughput, lower delays, and lower storage overheads.

IBM service representative. An individual in IBM who does maintenance services for IBM products or systems. Also called the IBM *Customer Engineer*.

initial microcode load (IML). The process of loading the microcode into an adapter, the MOSS, or the service processor.

internet. (1) A wide area network connecting disparate networks using the internetwork protocol (IP) (2) A public domain wide area network connecting thousands of disparate networks in industry, education, government and research. The Internet uses TCP/IP as the standard for transmitting information.

internet address. The numbering system used in IP internetwork communications to specify a particular network, or a particular host on that network with which to communicate.

internet control message protocol (ICMP). A protocol used by a gateway to communicate with a source host, for example, to report an error in a datagram. It is an integral part of the Internetwork Protocol (IP).

internetwork protocol. A protocol that routes data from its source to its destination in an internet environment. It is also called the *Internet Protocol*.

internetwork. Any wide area network connecting more than one network.

initial program load (IPL). The initialization procedure that causes the 3745 control program (NCP) to begin operation.

LAN-attached console. A PS/2 attached to the token-ring LAN that has the service processor attached. It is used to operate remotely the MOSS and MOSS-E functions.

IP router. A device that enables an Internetwork Protocol (IP) host to act as a gateway for routing data between separate networks.

line interface coupler (LIC). A circuit that attaches up to four transmission cables to the controller (from DTEs, DCEs or telecommunication lines).

locally administered address. In a local area network, an adapter address that the user can assign to override the universally administered address.

maintenance and operator subsystem - extended (MOSS-E). The licensed internal code loaded on the service processor hard disk to provide maintenance and operator facilities to the user and IBM service representative.

microcode. A program that is loaded in a processor (for example, the MOSS processor) to replace a hardware function. The microcode is not accessible to the customer.

modem (modulator-demodulator). See DCE.

multiple virtual storage (MVS). Multiple Virtual Storage, consisting of MVS/System Product Version 1 and the MVS/370 Data Facility Product operating on a System/370™ processor.

NetView. An IBM licensed program used to monitor a network, manage it, and diagnose its problems.

nonswitched line. A connection between systems or devices that does not have to be made by dialing. The

connection can be point-to-point or multipoint. The line can be leased or private. Contrast with *switched line.*.

ping. A simple IP application that sends one or more messages to a specified destination host requesting a reply. Usually used to verify that the target host exists, or that its IP address is a valid address.

remote console. A PS/2 attached to the 3746 Network Node either by a switched line (with modems) or by one of the communication lines of the user network.

remote technical assistance information network (RETAIN).

service processor. The processor attached to a 3745, 3746-900, and 3746-950 via a token-ring LAN.

remote support facility (RSF). RSF provides IBM maintenance assistance when requested via the public switched network. It is connected to the IBM RETAIN database system.

service representative. See IBM service representative

services. A set of functions designed to simplify the maintenance of a device or system.

switched line. A transmission line with which the connections are established by dialing, only when data transmission is needed. The connection is point-to-point and uses a different transmission line each time it is established. Contrast with *nonswitched line*.

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 National Standards Institute and High-Level Data Link Control (HDLC) of the International Standards Organization.

synchronous transmission. Data transmission in which the sending and receiving instruments are operating continuously at substantially the same frequency and are maintained, through correction, in a desired phase relationship.

Token-ring adapter (TRA) type 3. 3746-900 and 3746-950 line adapter for IBM Token-Ring Network, composed of one token-ring processor card (TRP2), and two Token-Ring interface couplers type 3 (TIC 3s).

Token-ring interface coupler type 2 (TIC2). A circuit that attaches an IBM Token-Ring network to the 3745.

Token-Ring Interface Coupler type 3 (TIC3). A circuit that attaches an IBM Token-Ring network to the 3746-900 or 3746-950.

user access area. A specific area in the controller where the customer can install, remove, change, or swap couplers and cables without IBM assistance.

universally administered address. In a local area network, the address permanently encoded in an adapter at the time of manufacture. All universally administered addresses are unique.

user application network. A configuration of data processing products, such as processors, controllers, and terminals, for data processing and information exchange. This configuration may use circuit-switched, packet-switched, and leased-circuit services provided by carriers or PTT. Also called a *user network*.

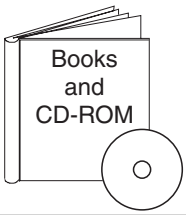
V.24, V.35, and X.21. ITU-T (ex-CCITT) recommendations on transmission interfaces.

Bibliography

Customer Documentation for the 3745 (All Models) and 3746 (Model 900)

Table 24 (Page 1 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

This customer documentation has the following formats:

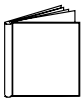


Finding Information

3745 Models A and 3746 Books

All of the books in the 3745 Models A and 3746 library are available on the CD-ROM that contains the Licensed Internal Code (LIC) for the machine.

Evaluating and Configuring



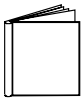
GA33-0092

IBM 3745 Communication Controller
Models 210, 310, 410, and 610

Introduction

Gives an introduction of the IBM Models 210 to 610 capabilities.

For Models A, refer to the *Overview*, GA33-0180.

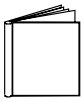


GA33-0180

IBM 3745 Communication Controller Models A and 170[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Overview

Gives an overview of connectivity capabilities within SNA, APPN, and IP networking.



GA27-4234

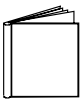
IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Overview, Installation, and Integration

Provides information for:

- Overall 3746 planning
- Installation and upgrade scenarios
- Controller and service processor network integration
- Related MOSS-E and CCM worksheets for these tasks.

Table 24 (Page 2 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900



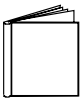
GA27-4235

IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Serial Line Adapters

Provides information for:

- Serial line adapter descriptions
- Serial line adapter line weights and connectivity
- Types of SDLC support
- Configuring X.25 lines
- Performance tuning for frame-relay, PPP, X.25, and NCP lines.
- ISDN adapter description and configuration.



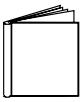
GA27-4236

IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Token Ring and Ethernet

Provides information for:

- Token-ring adapter description and configuration
- Ethernet adapter description and configuration.



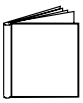
GA27-4237

IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
ESCON Channels

Provides information for:

- ESCON adapter descriptions
- ESCON configuration and tuning information
- ESCON configuration examples.



GA27-4238

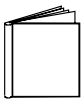
IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Physical Planning

Provides information for:

- 3746 and MAE physical planning details
- 3746 and MAE cable information
- Explanation of installation sheets
- 3746 plugging sheets.

Table 24 (Page 3 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900



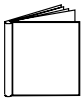
GA27-4239

IBM 3745 Communication Controller Models A²
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Management Planning

Provides information for:

- Overview for 3746
- 3746 APPN/HPR, IP router, and X.25
- NetView Performance Monitor (NPM), remote consoles, and RSF
- MAE APPN/HPR management.



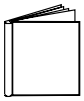
GA27-4240

IBM 3745 Communication Controller Models A²
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Multiaccess Enclosure Planning

Provides information for:

- MAE adapters details
- MAE ESCON planning and configuration
- ATM and ISDN support.



GA27-4241

IBM 3745 Communication Controller Models A²
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Protocol Descriptions

Provides information for:

- Overview and details about APPN/HPR and IP.

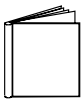
On-line information

IBM 3745 Communication Controller Models A²
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Controller Configuration and Management Worksheets

Provides planning worksheets for ESCON, Multiaccess Enclosure, serial line, and token-ring definitions.

Preparing Your Site



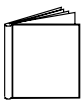
GC22-7064

IBM System/360™, System/370™, 4300 Processor

Input/Output Equipment Installation Manual-Physical Planning
(Including Technical News Letter GN22-5490)

Provides information for physical installation for the 3745 Models 130 to 610.

For 3745 Models A and 3746 Model 900, refer to the *Planning Guide*, GA33-0457.



GA33-0127

IBM 3745 Communication Controller
Models 210, 310, 410, and 610

Preparing for Connection

Helps for preparing the 3745 Models 210 to 610 cable installation.

For 3745 Models A refer to the *Connection and Integration Guide*, SA33-0129.

Table 24 (Page 4 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

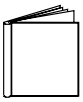
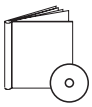
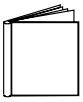
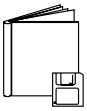
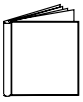
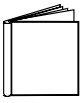
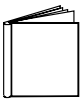
Preparing for Operation		
	GA33-0400	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Safety Information***[1] Provides general safety guidelines.
	SA33-0129	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 Nways Multiprotocol Controller Model 900*** ***Connection and Integration Guide***[1] Contains information for connecting hardware and integrating network of the 3745 and 3746-900 after installation.
	SA33-0416	***Line Interface Coupler Type 5 and Type 6*** ***Portable Keypad Display*** ***Migration and Integration Guide*** Contains information for moving and testing LIC types 5 and 6.
	SA33-0158	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 Nways Multiprotocol Controller Model 900*** ***Console Setup Guide***[1] Provides information for: • Installing local, alternate, or remote consoles for 3745 Models 130 to 610 • Configuring user workstations to remotely control the service processor for 3745 Models A and 3746 Model 900 using: – DCAF program – Telnet Client program – Java Console support.
Customizing Your Control Program		
	SA33-0178	***Guide to Timed IPL and Rename Load Module*** Provides VTAM procedures for: • Scheduling an automatic reload of the 3745 • Getting 3745 load module changes transparent to the operations staff.
Operating and Testing		
	SA33-0098	***IBM 3745 Communication Controller*** ***All Models***[4] ***Basic Operations Guide***[1] Provides instructions for daily routine operations on the 3745 Models 130 to 610.
	SA33-0177	***IBM 3745 Communication Controller Models A***[2] ***IBM 3746 Nways Multiprotocol Controller Model 900*** ***Basic Operations Guide***[1] Provides instructions for daily routine operations on the 3745 Models 17A to 61A, and 3746 Model 900 operating as an SNA node (using NCP), APPN/HPR Network Node, and IP Router.

Table 24 (Page 5 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

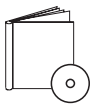
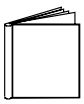
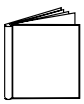
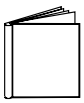
	SA33-0097	***IBM 3745 Communication Controller All Models***[3] ***Advanced Operations Guide***[1] Provides instructions for advanced operations and testing, using the 3745 MOSS console.
	On-line Information	***Controller Configuration and Management Application*** Provides a graphical user interface for configuring and managing a 3746 APPN/HPR Network Node and IP Router, and its resources. It is also available as a stand-alone application, using an OS/2 workstation. Defines and explains all the 3746 Network Node and IP Router configuration parameters through its online help.
	SH11-3081	***IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***Controller Configuration and Management: User's Guide***[5] Explains how to use CCM and gives examples of the configuration process.
	GA33-0479	***IBM 3745 Communication Controller Models A IBM 3746 Nways Multiprotocol Controller Models 900 and 950*** ***NetView Console APPN Command Reference Guide*** Explains how to use the RUN COMMAND from the NetView S/390 Program and gives examples.
Managing Problems		
	SA33-0096	***IBM 3745 Communication Controller All Models***[3] ***Problem Determination Guide***[1] A guide to perform problem determination on the 3745 Models 130 to 61A.
	On-line Information	***Problem Analysis Guide*** An online guide to analyze alarms, events, and control panel codes on: • IBM 3745 Communication Controller Models A[2] • IBM 3746 Nways Multiprotocol Controller Models 900 and 950.
	SA33-0175	***IBM 3745 Communication Controller Models A***[2] ***IBM 3746 Expansion Unit Model 900 IBM 3746 Nways Multiprotocol Controller Model 950*** ***Alert Reference Guide*** Provides information about events or errors reported by alerts for: • IBM 3745 Communication Controller Models A[2] • IBM 3746 Nways Multiprotocol Controller Models 900 and 950.

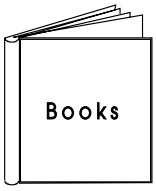
Table 24 (Page 6 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

[1] Documentation shipped with the 3745.
[2] 3745 Models 17A to 61A.
[3] 3745 Models 130 to 61A.
[4] Except 3745 Models A.
[5] Documentation shipped with the 3746-900.

Additional Customer Documentation for the 3745 Models 130, 150, 160, and 170

Table 25. Additional Customer Documentation for the 3745 Models 130 to 170

This customer documentation has the following format:

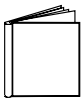


Finding Information

3745 Models A and 3746 Books

All of the books in the 3745 Models A and 3746 library are available on the CD-ROM that contains the Licensed Internal Code (LIC) for the machine.

Evaluating and Configuring



GA33-0138

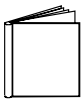
IBM 3745 Communication Controller Models 130, 150, 160, and 170

Introduction

Gives an introduction about the IBM Models 130 to 170 capabilities, including Model 160.

For Model 17A refer to the *Overview*, GA33-0180.

Preparing Your Site



GA33-0140

IBM 3745 Communication Controller Models 130, 150, 160, and 170

Preparing for Connection

Helps for preparing the 3745 Models 130 to 170 cable installation.

For 3745 Model 17A refer to the *Connection and Integration Guide*, SA33-0129.

[1] Documentation shipped with the 3745.

Customer Documentation for the 3746 Model 950

Table 26 (Page 1 of 4). Customer Documentation for the 3746 Model 950

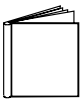
This customer documentation has the following formats:

Finding Information

3745 Models A and 3746 Books

All of the books in the 3745 Models A and 3746 library are available on the CD-ROM that contains the Licensed Internal Code (LIC) for the machine.

Preparing for Operation



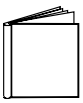
GA33-0400

IBM 3745 Communication Controller All Models[1]
IBM 3746 Expansion Unit Model 900
IBM 3746 Nways Multiprotocol Controller Model 950

Safety Information[2]

Provides general safety guidelines.

Evaluating and Configuring

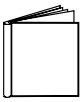


GA33-0180

IBM 3745 Communication Controller Models A and 170[3]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Overview

Gives an overview of connectivity capabilities within SNA, APPN, and IP networking.



GA27-4234

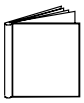
IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Overview, Installation, and Integration

Provides information for:

- Overall 3746 planning
- Installation and upgrade scenarios
- Controller and service processor network integration
- Related MOSS-E and CCM worksheets for these tasks.

Table 26 (Page 2 of 4). Customer Documentation for the 3746 Model 950



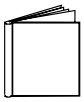
GA27-4235

IBM 3745 Communication Controller Models A2
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Serial Line Adapters

Provides information for:

- Serial line adapter descriptions
- Serial line adapter line weights and connectivity
- Types of SDLC support
- Configuring X.25 lines
- Performance tuning for frame-relay, PPP, X.25, and NCP lines.
- ISDN adapter description and configuration.



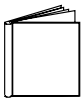
GA27-4236

IBM 3745 Communication Controller Models A2
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Token Ring and Ethernet

Provides information for:

- Token-ring adapter description and configuration
- Ethernet adapter description and configuration.



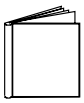
GA27-4237

IBM 3745 Communication Controller Models A2
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
ESCON Channels

Provides information for:

- ESCON adapter descriptions
- ESCON configuration and tuning information
- ESCON configuration examples.



GA27-4238

IBM 3745 Communication Controller Models A2
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Planning Series:
Physical Planning

Provides information for:

- 3746 and MAE physical planning details
- 3746 and MAE cable information
- Explanation of installation sheets
- 3746 plugging sheets.

Table 26 (Page 3 of 4). Customer Documentation for the 3746 Model 950

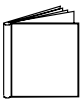
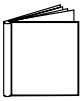
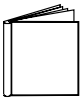
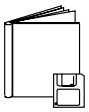
	GA27-4239	***IBM 3745 Communication Controller Models A[2]*** ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Planning Series:*** ***Management Planning*** Provides information for: • Overview for 3746 • 3746 APPN/HPR, IP router, and X.25 • NetView Performance Monitor (NPM), remote consoles, and RSF • MAE APPN/HPR management.
	GA27-4240	***IBM 3745 Communication Controller Models A[2]*** ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Planning Series:*** ***Multiaccess Enclosure Planning*** Provides information for: • MAE adapters details • MAE ESCON planning and configuration • ATM and ISDN support.
	GA27-4241	***IBM 3745 Communication Controller Models A[2]*** ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Planning Series:*** ***Protocol Descriptions*** Provides information for: • Overview and details about APPN/HPR and IP.
	On-line information	***IBM 3745 Communication Controller Models A[2]*** ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Planning Series:*** ***Controller Configuration and Management Worksheets*** Provides planning worksheets for ESCON, Multiaccess Enclosure, serial line, and token-ring definitions.

Table 26 (Page 4 of 4). Customer Documentation for the 3746 Model 950

Operating and Testing



SA33-0356

IBM 3746 Nways Multiprotocol Controller
Model 950

User's Guide[2]

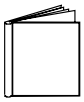
Explains how to:

- Carry out daily routine operations on Nways controller
- Install, test, and customize the Nways controller after installation
- Configure user's workstations to remotely control the service processor using:
  - DCAF program
  - Telnet client program
  - Java Console support.

On-line information

Controller Configuration and Management Application

Provides a graphical user interface for configuring and managing a 3746 APPN/HPR network node and IP Router, and its resources.
It is also available as a stand-alone application, using an OS/2 workstation.
Defines and explains all the 3746 Network Node and IP Router configuration parameters through its on-line help.

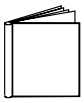


SH11-3081

IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

Controller Configuration and Management: User's Guide[2]

Explains how to use CCM and gives examples of the configuration process.



GA33-0479

IBM 3745 Communication Controller Models A
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

NetView Console
APPN Command Reference Guide

Explains how to use the RUN COMMAND from the NetView S/390 Program and gives examples.

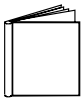
Managing Problems

On-line information

Problem Analysis Guide

An on-line guide to analyze alarms, events, and control panel codes on:

- IBM 3745 Communication Controller Models A[3]
- IBM 3746 Nways Multiprotocol Controller Models 900 and 950.



SA33-0175

IBM 3745 Communication Controller Models A[3]
IBM 3746 Expansion Unit Model 900
IBM 3746 Nways Multiprotocol Controller Model 950

Alert Reference Guide

Provides information about events or errors reported by alerts for:

- IBM 3745 Communication Controller Models A[3]
- IBM 3746 Nways Multiprotocol Controller Models 900 and 950.

[1] Models 130 to 61A.
[2] Documentation shipped with the 3746-950
[3] 3745 Models 17A to 61A.

Required Documentation

The following documents are indispensable for planning for your 3745/3746 controllers:

- *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180
- *3745 Communication Controller All Models, 3746 Nways Multiprotocol Controller Model 900: Console Setup Guide*, SA33-0158.

Be sure to use the latest editions of the above documents.

Related Documentation

The following documents are also helpful for **planning** for your 3745/3746 controllers:

- *Planning for Integrated Networks*, SC31-8062
- *Planning and Reference for NetView, NCP, and VTAM*, SC31-7122.
- *Virtual Telecommunications Access Method V3 R4: Resource Definition Reference*, SC31-6438

The following Enterprise Systems Connection (**ESCON**) documents may be helpful:

- *Introducing the Enterprise Systems Connection*, GA23-0383
- *Enterprise Systems Connection Migration*, GA23-0383
- *Planning for Enterprise Systems Connection Links*, GA23-0367
- *Introducing Enterprise Systems Connection Directors*, GA23-0363.

The following *IBM International Technical Support Centers* "redbooks" are generally very helpful:

- *Frame Relay Guide*, GG24-4463
- *3746-900 and NCP Version 7 Release 2*, GG24-4464.

The following Network Control Program (**NCP**) documents may be helpful:

- For NCP V6 R2:
  - *Network Control Program V6 R2: Migration Guide*, SC31-6216
  - *Network Control Program V6 R2, ACF/SSP V3 R8, EP R11: Resource Definition Guide*, SC31-6209-01
  - *Network Control Program V6 R2, ACF/SSP V3 R8, EP R11: Resource Definition Reference*, SC31-6210-01
  - *Network Control Program V6 R2: Planning and Implementation Guide*, GG24-4012
  - *Network Control Program V6 R2, ACF/SSP V3 R8, EP R11: Library Directory*, SC31-6215.
- For NCP V6 R3:
  - *Network Control Program V6 R3: Migration Guide*, SC31-6217
  - *Network Control Program V6 R3, ACF/SSP V3 R9, EP R11: Resource Definition Guide*, SC31-6209-02
  - *Network Control Program V6 R3, ACF/SSP V3 R9, EP R11: Resource Definition Reference*, SC31-6210-02 Guide,
  - *Network Control Program V6 R3, ACF/SSP V3 R9, EP R11: Library Directory*, SC31-6218.
- For NCP V7 R1:
  - *Network Control Program V7 R1: Migration Guide*, SC31-6219
  - *Network Control Program V7 R1, ACF/SSP V4 R1, EP R12: Resource Definition Guide*, SC31-6223-00
  - *Network Control Program V7 R1, ACF/SSP V4 R1, EP R12: Resource Definition Reference*, SC31-6224-00
  - *Network Control Program V7 R1, ACF/SSP V4 R1, EP R12: Library Directory*, SC31-6220.

- For NCP V7 R2:
  - *Network Control Program V7 R2, ACF/SSP V4 R2, EP R12: Generation and Loading Guide*, SC31-6221.
  - *Network Control Program V7 R2: Migration Guide*, SC31-6258-00
  - *Network Control Program V7 R2, ACF/SSP V4 R2, EP R12: Resource Definition Guide*, SC31-6223-01
  - *Network Control Program V7 R2, ACF/SSP V4 R2, EP R12: Resource Definition Reference*, SC31-6224-01
  - *Network Control Program V7 R2, ACF/SSP V4 R2, EP R12: Library Directory*, SC31-6259.
- For NCP V7 R3:
  - *Network Control Program V7 R3: Migration Guide*, SC31-6258-01
  - *Network Control Program V7 R3, ACF/SSP V4 R3, EP R12: Resource Definition Guide*, SC31-6223-02
  - *Network Control Program V7 R3, ACF/SSP V4 R3, EP R12: Resource Definition Reference*, SC31-6224-02
  - *Network Control Program V7 R3, ACF/SSP V4 R3, EP R12: Library Directory*, SC31-6262.
- For NCP V7 R4:
  - *Network Control Program V7 R4: Migration Guide*, SC30-3786
  - *Network Control Program V7 R4, ACF/SSP V4 R4, EP R12: Resource Definition Guide*, SC31-6223-03
  - *Network Control Program V7 R4, ACF/SSP V4 R4, EP R12: Resource Definition Reference*, SC31-6224-03
  - *Network Control Program V7 R4, ACF/SSP V4 R4, EP R12: Library Directory*, SC30-3785.
- For NCP V7 R5:
  - *Network Control Program V7 R5: Migration Guide*, SC30-3833
  - *Network Control Program V7 R5, ACF/SSP V4 R4, EP R12: Resource Definition Guide*, SC31-6223-04
  - *Network Control Program V7 R5, ACF/SSP V4 R4, EP R12: Resource Definition Reference*, SC31-6224-04
  - *Network Control Program V7 R5, ACF/SSP V4 R4, EP R12: Library Directory*, SC30-3832.
- For NCP V7 R6:
  - *Network Control Program V7 R6: Migration Guide*, SC30-3833-01
  - *Network Control Program V7 R6, ACF/SSP V4 R4, EP R14: Resource Definition Guide*, SC31-6223-06
  - *Network Control Program V7 R6, ACF/SSP V4 R4, EP R14: Resource Definition Reference*, SC31-6224-06
  - *Network Control Program V7 R6, ACF/SSP V4 R4, EP R14: Library Directory*, SC30-3785.
- For NCP V7 R7:
  - *Network Control Program V7 R7: Migration Guide*, SC30-3889
  - *Network Control Program V7 R7, ACF/SSP V4 R4, EP R14: Resource Definition Guide*, SC31-6223-07
  - *Network Control Program V7 R7, ACF/SSP V4 R4, EP R14: Resource Definition Reference*, SC31-6224-07
  - *Network Control Program V7 R7, ACF/SSP V4 R4, EP R14: Library Directory*, SC30-3971.
- For NCP V7 R8:
  - *Network Control Program V7 R8: Migration Guide*, SC30-4024
  - *Network Control Program V7 R8, ACF/SSP V4 R8, EP R14: Resource Definition Guide*, SC31-6223-09

- *Network Control Program V7 R8, ACF/SSP V4 R8, EP R14: Resource Definition Reference*, SC31-6224-09
- *Network Control Program V7 R8, ACF/SSP V4 R8, EP R14: Library Directory*, SC30-4025.

The following **OS/2** document may be of some help:

IBM Extended Services® for OS/2 Programming Services and Advanced Problem Determination for Communications, SO4G-1007.

For the Distributed Console Access Facility (**DCAF**) Version 1.3 the following documents are needed:

- *DCAF: Installation and Configuration Guide*, SH19-4068
- *DCAF: User's Guide*, SH19-4069
- *DCAF: Target User's Guide*, SH19-6839.

To learn more about the **APPN** architecture, including high-performance routing (HPR), adaptive rate based flow and congestion control (ARB), dependent LU requesters/servers (DLURs/DLUSs), and other subjects, refer to:

- *Inside APPN - The Essential Guide to the Next-Generation SNA*, SG24-3669.
- *APPN Architecture and Protocol Implementations Tutorial* SG24-3669.

The following Virtual Telecommunications Access Method (**VTAM**), may be helpful:

- *Virtual Telecommunications Access Method V4R3: Resource Definition Reference*, SC31-6438.

For help with **TCP/IP**, refer to:

- *TCP/IP for MVS: Performance Tuning Guide*, SC31-7188.

To learn about token-ring configurations and the **IEEE 802.2** standard, refer to:

- *Token-Ring Network Architecture Reference*, SC30-3374.

These latest NetView documents may be helpful:

- *TME 10 NetView for OS/390 Version 1: Planning Guide*, GC31-8226
- *TME 10 NetView for OS/390 Version 1: Tuning Guide*, SC31-8240.

The following NetView Performance Monitor (**NPM**) documents are available:

- *NetView Performance Monitor: Concepts and Planning V2R2*, GH19-6961-01
- *NetView Performance Monitor: Concepts and Planning V2R3*, GH19-6961-02
- *NetView Performance Monitor: Concepts and Planning V2R4*, GH19-6961-03
- *NetView Performance Monitor: Concepts and Planning V3R1*, GH19-4221-00.

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3745 Communication Controller Models A
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