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

Planning Series:

Overview, Installation, and Integration

GA27-4234-02

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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 ix.

Third 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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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.

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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) Type 5, 3746 Extended Functions 6, and the related licensed internal code functional support.

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 xix).

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. 3746 Planning Overview

This chapter provides basic planning and migration guidance for using the 3745/3746-900 and 3746-950.

The two models of the 3746 are:

- IBM 3746 Nways Multiprotocol Controller Model 950, also called the 3746 Model 950 or 3746-950. It operates as an APPN/HPR network node providing the dependent LU requester (DLUR) function, and as an IP router.
- IBM 3746 Nways Multiprotocol Controller Model 900, also called the 3746 Model 900 or 3746-900. This is the expansion unit of the 3745 Models A. If equipped with a network node processor it operates as an APPN/HPR network node and provides the dependent LU requester (DLUR) function, IP router function, or both. These functions are independent from the NCP function running in the 3745.

  The 3746 Model 900 is capable of operating with *both NCP-controlled and network node processor-controlled traffic at the same time*.

The remainder of the *Planning Series* guides provide detailed planning information for the 3746 base and expansion enclosures and for the Multiaccess Enclosure.

The 3746-900 basic machine includes the minimum hardware needed to attach it to a single CCU 3745 and to connect the service processor.

The 3746-950 basic machine includes the minimum hardware needed to operate the 3746 IP Router and APPN/HPR control point and to connect the service processor.

For a detailed description of the 3746 Models 900 and 950 minimum machine configurations, including the basic features, refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.

3746 Hardware Optional Features

The 3746-9x0 features provide connectivity for ESCON channels, token-ring and Ethernet LANs, and communication lines (using the SDLC, frame-relay, PPP, and X.25 link protocols).

The 3746-9x0 optional features include:

Controller Expansion
Required for the 3746 IP router and network node and the 3746 Model 950. It houses the network node processor and service processor. The controller expansion and service processor are features of the 3745 Models A or 3746 Models 9x0.

Expansion Enclosures
Besides the ***basic*** enclosure, which can house up to four adapters, two ***expansion enclosures*** can house up to six adapters each.

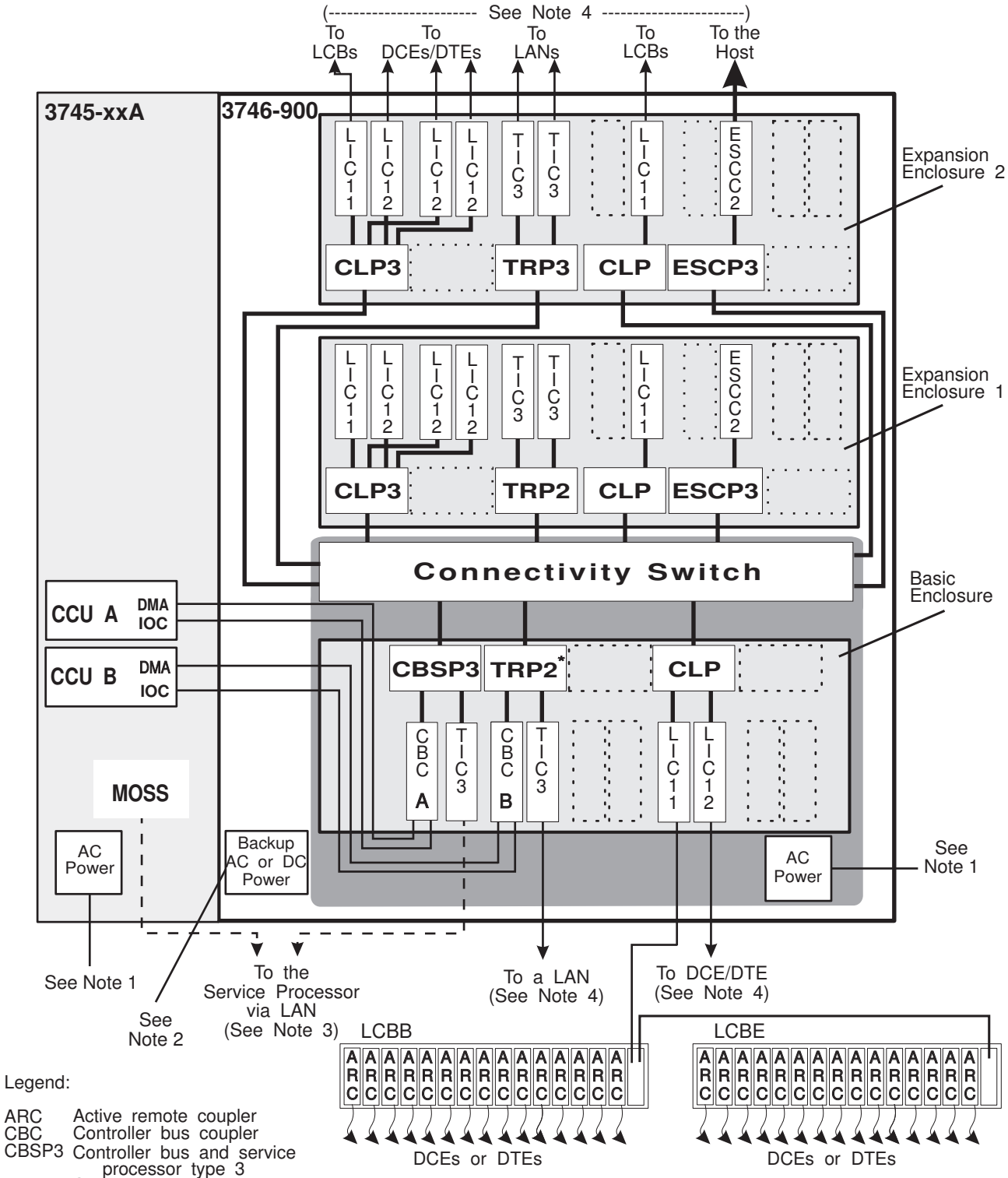
The 3746-9x0 equipped with two expansion enclosures can house up to 16 adapters. The adapter types can be mixed in each enclosure, and adapters can be placed in any position within the enclosures. There are no positions dedicated to

just one type of adapter. This provides flexibility in the initial configuration (use of any combination of adapter types) and flexibility to upgrade the configuration according to the evolution of your communications needs.

Figure 1 on page 3 shows a 3746-900 with two expansion enclosures and a variety of processors and LICs.

Notes for Figure 1 on page 3:

1. The 3746-900 is powered separately from the 3745 base frame, the 3746-9x0 requires a power distribution providing single-phase 200 - 240 V ac. The power plug and receptacle are different from the 3745. Refer to the “Physical Planning Details” chapter in the *3745/3746 Planning Series: Physical Planning*.
2. A second power source for the 3746-9x0 is required if the optional backup power supply feature is installed.
3. All hardware and cables to interconnect the 3745, 3746-900, service processor, and service processor modem are automatically provided with the machines.
4. All hardware and cables to connect the 3746-9x0 to user token-ring LANs, ESCON channels, and 3746-9x0 communication lines to DCEs and DTEs must be ordered according to your needs.



Legend:

ARC	Active remote coupler
CBC	Controller bus coupler
CBSP3	Controller bus and service processor type 3
CCU	Central control unit
CLP	Communication line processor
CLP3	Communication line processor type 3
DMA	Direct memory access
ESCC2	ESCON coupler type 2
ESCP3	ESCON processor type 3
IOC	Input/output control
LCB	Line connection box
LCBB	Line connection box base
LCBE	Line connection box expansion
LIC11	Line interface coupler type 11
LIC12	Line interface coupler type 12
TIC3	Token-ring interface type 3
TRP2	Token-ring processor type 2
TRP3	Token-ring processor type 3
	Basic Machine

*Features necessary for CCU B attachment: TRP, TRP2, or TRP3 and CBC

Figure 1. 3746-900 Physical Connectivity. The notes for this figure are on page 2.

3746 Hardware Components

The 3746 Network Node operates under the control of several processors.[2] These are:

- Network Node Processor (NNP)
- Adapter Processors
- Service Processor

These processors and their function are described in detail in the following sections.

Network Node Processor (NNP)

It runs:

- The APPN/HPR Control Point, which includes the dependent LU Requester (DLUR) function for the dependent PUs attached to the 3746 Network Node.
- IP configuration and the SNMP agent, which requires installation of the optional IP Routing feature (FC 5033).

The network node processor handles the 3746 APPN directory services, APPN network topology services, and APPN route selection. It also activates the ports and link stations, and sets up the Control Point-to-Control Point (CP-CP) and Logical Unit-to-Logical Unit (LU-LU) sessions, allowing data traffic to flow between the 3764 network node and the other attached APPN/HPR nodes.

The adapter processors route user data without involving the network node processor as soon as the sessions have been established.

The Network Performance Analysis LU and the functions that collect performance and accounting data from the 3746 hardware run on the NNP.

Adapter Processors

The 3746 architecture allows up to 16 adapter processors around an 18-port switch. Each processor uses one port of this switch and covers a 64-address range.

For each type of DLC adapter there are up to three types of processors:

- Type 1[3] runs only SNA traffic controlled by NCP (3746-900)
- Type 2[3] offers increased throughput and connectivity for SNA (NCP) and is required to run APPN/HPR and IP traffic with the installed network node processor
- Type 3 offers increased throughput and connectivity for SNA traffic controlled by NCP (3746-900) and for APPN/HPR and IP traffic with the installed network node processor.

Each 3746 adapter is controlled by a processor running licensed internal code loaded from the service processor disk. The processor carries out data link control and path control for the adapter and routes the user data either:

- Adapter-to-adapter through a high-speed, non-blocking switch
- Port-to-port within the same adapter
- Station-to-station over the same port

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2 Running IBM Licensed Internal Code.

3 No longer available.

The 3746 network node processor supports the following four adapters:

Token-Ring Adapter (TRA)
This consists of:

- Token-Ring Processor type 2 (TRP2[3]) or type 3 (TRP3)
- One or two Token-Ring Interface Couplers type 3 (TIC3s).

The TRA can be optionally equipped with token-ring-to-Ethernet bridging[3] to provide Ethernet LAN connectivity.

ESCON Channel Adapter (ESCA)
This consists of:

- ESCON Processor type 2 (ESCP2[3]) or type 3 (ESCP3)
- ESCON Coupler type 1 (ESCC[3]) or type 2 (ESCC2).

It provides native ESCON connectivity to processors adhering to the ESCON architecture (such as the IBM ES/3090® ES/9000® and 9672 processors) through either an ESCON Director (ESCD) or direct attachment.

Communication Line Adapter (CLA)
This consists of:

- A Communication Line Processor type 2 (CLP[3]) or type 3 (CLP3)
- Line interface couplers (LICs)
- Line connection boxes (LCBs)
- Active remote connectors (ARCs).

Controller Bus and Service Processor Adapter
This consists of:

- Controller Bus and Service Processor type 2 (CBSP2[3]) or type 3 (CBSP3)
- Token-Ring Interface Controller type 3 (TIC3)
- For the 3746-900, a controller bus coupler (CBC).

This adapter connects the service processor and network node processor to the service ring. The CBC connects the 3746-900 to the 3745 Central Control Unit (CCU) for SNA subarea traffic routing by NCP.

These adapters allow you to design a high-connectivity and high-performance routing node for IP, APPN/HPR, SNA (DLUR), and SNA subarea (NCP) traffic.

Service Processor
The service processor provides:

- The operator and service console for the maintenance and operator subsystem. The service processor runs the MOSS-E[5] code and communicates with the 3746-950, or the 3745 MOSS and 3746-900, through a 16-Mbps token-ring LAN (the service-ring LAN).

  A token-ring bridge is ***not*** allowed between the service processor and the 3746 or 3745 MOSS.

  To prevent 3746 Network Node or IP router malfunctions resulting from improper use of the service LAN (leading to possible interruption of

[4] No longer available.

[5] Maintenance and Operator Subsystem - Extended, IBM Licensed Internal Code

service), ***never*** connect any user stations to this LAN. See Chapter 3 for important information about proper use of the service LAN.

- Access to the Controller Configuration and Management (CCM) program.[6] The CCM is used to configure and manage the 3746 network node and IP router resources.
- Maintenance capabilities to automatically notify an IBM support center when a 3746 Network Node hardware error is detected. You may also manually report a problem to the same IBM support center.

Although the service LAN is used ***exclusively*** for communication between the network node processor, MOSS-E, and the 3746, it can also be used to:

- Send service processor and 3746 Network Node alerts to NetView (refer to the "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide*).
- Connect a remote console (refer to the "Remote Customer Consoles" chapter in the *3745/3746 Planning Series: Management Planning Guide*).

3746-900 Adapter Sharing

ESCON, token-ring, and communication line adapters (ESCAs, TRAs, and CLAs) can support NCP- and 3746-controlled traffic ***simultaneously***. Higher-layer functions use the lower-layer functions provided by the 3746, that is, the physical and data link control layer functions (see Figure 2). The network node processor (NNP) is available to both 3746 IP and 3746 Network Node functions.

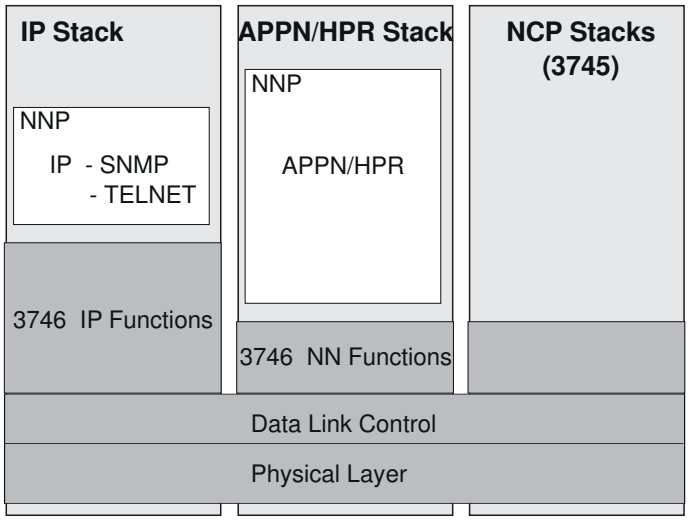

Figure 2. Resource Sharing

Adapter sharing allows physical resources on the 3746-9x0 to be used by the 3746 IP, 3746 Network Node, and 3745 NCP, enabling remote equipment to connect to the 3746 and NCP protocol stacks using a single physical attachment.

Each adapter port can be defined in NCP (one or both NCPs in a 3745-41A or 3745-61A) and the 3746 (APPN/HPR, or IP). Simultaneous activations by the 3746 and NCP can be done for token-ring, frame-relay, X.25, and ESCON ports.

[6] IBM Licensed Internal Code.

ESCON Coupler (ESCC or ESCC2)

The ESCON Coupler has a single port that can carry ***all*** types of traffic, NCP-controlled and 3746-controlled. Two NCPs, the 3746 Network Node and the 3746 IP router can be the owner of an ESCON port at the same time.

Token-Ring Interface Coupler type 3 (TIC3)

The TIC3 has a single port that can be used for NCP-controlled or 3746-controlled traffic.

An adapter with two TIC3s can have each port activated by a different NCP, with both ports carrying IP and APPN/HPR traffic. Connecting the two ports to the same token-ring LAN allows you to share the adapter and the LAN between stations controlled by the active NCPs, stations controlled by the 3746 APPN/HPR network node, and stations controlled by the 3746 IP router.

Line Interface Coupler type 11 (LIC11)

The LIC11 can carry ***all*** types of traffic with some ports controlled by NCP (SDLC, X.25,[7] frame relay[7]), others controlled by the 3746 Control Point (SDLC, X.25,[7] frame relay, [7] PPP).

Line Interface Coupler type 12 (LIC12)

The LIC12 has a single port that can carry all types of traffic and is controlled by either NCP (SDLC, X.25,[7] frame relay[7]) ***or*** 3746 (SDLC, X.25,[7] frame relay,[7] PPP).

3746 Licensed Internal Code Optional Features

3746 functions are provided as optional features of the 3746 Licensed Internal Code. A password is provided for each ordered, chargeable feature. This password is specific to each 3746 and authorizes the user to operate the functions included in the corresponding feature and related no-charge features.

The 3746 base-frame and Multiaccess Enclosure LIC optional features are:

- FC 5030: X.25 support (password required)
- FC 5033: IP Routing (password required)
- FC 5800[8]: 3745 Extended Functions 1 (password required)
- FC 5801[8]: 3746 Extended Functions 3 (same password as for FC 5800 or FC 5804 required)
- FC 5802: 3746 Extended Functions 2 (FC 5800 password required)
- FC 5804[8]: MAE Extended Functions 1 (password required)
- FC 5805[8]: MAE Extended Functions 2 (same password as for FC 5804 required)
- FC 5806: TN3270E Server (password required)
- FC 5807[8]: MAE Extended Functions 3 (same password as for FC 5804 required)
- FC 5810: 3746 and MAE Extended Functions 4 (password required)
- FC 5811: Update from Extended Functions to Extended Functions 4 (password required)
- FC 5812: 3746 Extended Functions 5 (password required)

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7 Frame-relay and X.25 lines can be shared between 3746 traffic (APPN/HPR, IP) and NCP traffic.

8 No longer available (now included in FC 5810 and FC 5811).

- FC 5813: 3746 Extended Functions 6 (password required)

For information about these FCs, refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.

Activating Optional LIC Functions

Figure 3 shows that the optional LIC features and extended functions are activated from the MOSS-E panel using the check-boxes and, if necessary, the machine-specific passwords obtained from IBM.

Note: Extended Functions 4 (FC 5010 and FC 5011) include all the functionality of the previous available extended functions (FCs 5800, 5801, 5804, 5805, and 5807).

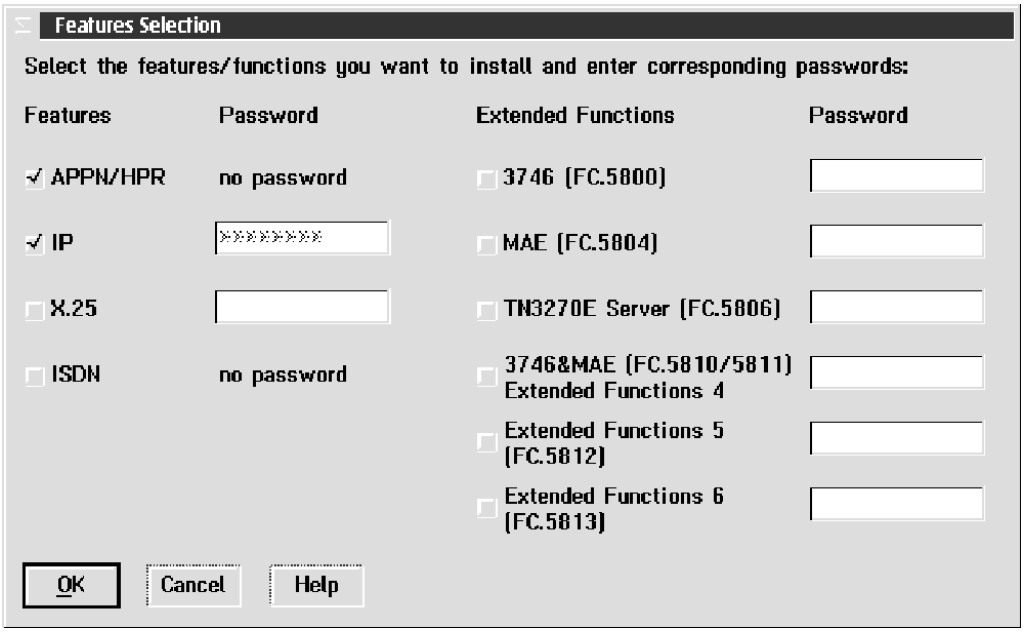


Figure 3. Activating LIC Features and Extended Functions

Hardware Configuration Planning

The 3745 and 3746 Configurator and Performance Model (PC3745) is used by IBM to create a valid hardware configuration based on your communication requirements. It can be used to estimate the utilization % of the 3745 and 3746 resources (processors, media...) based on your expected traffic loads. This tool is available through IBM offerings. One of the outputs is commonly called the *HONE installation sheets* and is used by the IBM service representative installing the 3745 and 3746.

3746 Configuration Planning

On the service processor, you configure and manage the 3746 Network Node and IP router with the Controller Configuration and Management (CCM) application using its graphical user interface. Using the CCM panels, you make all the definitions required by the network node processor (APPN/HPR, IP, ESCON, token-ring, frame relay, X.25, PPP, and others).

You are guided by a graphical representation of the 3746 couplers and, for installed couplers, their line address ranges and Data Link Control (DLC) types.

Refer to the *3746 Nways Multiprotocol Controller Model 900 and 950: Controller Configuration and Management: User's Guide*, SH11-3081.

The CCM configuration functions produce:

- The 3746 Network Node configuration file, including:
  - ESCON resource definitions (refer to the “ESCON Adapters” chapter in the *3745/3746 Planning Series: ESCON Channels*).
  - Token-ring resource definitions (refer to the “Token-Ring Adapters” chapter in the *3745/3746 Planning Series: Token Ring and Ethernet*).
  - SDLC (communication line adapter) resource definitions (refer to the “Serial Line Adapters” chapter in the *3745/3746 Planning Series: Serial Line Adapters*).
  - Frame-relay resource definitions (refer to the “Frame-Relay Port – DLC Parameters” chapter in the *3745/3746 Planning Series: Serial Line Adapters*).
  - PPP resource definitions (refer to the “PPP Port – Parameters” chapter in the *3745/3746 Planning Series: Serial Line Adapters*).
  - X.25 resource definitions (refer to the “Serial Line X.25 Configurations” chapter in the *3745/3746 Planning Series: Serial Line Adapters*).
- Specific ESCON definitions used in:
  - IOCP and HCD generations
  - ACF/NCP channel definitions (for 3746-900s under NCP control)
  - MOSS-E definitions.

CCM management functions include:

- Management of the 3746 resources (APPN/HPR and IP), such as their activation and deactivation, and displaying the status of a resource
- Display of the network topology, the 3746 node directory, and the 3746 node resources

There are two versions of the CCM:

- The one that runs in the service processor and is accessed through the MOSS-E console
- The stand-alone version running on an OS/2 workstation

Note: The CCM does more than just produce the definitions needed to run the 3746. It also cross-checks all the parameters to make sure that their values are consistent throughout the 3746 configuration definitions.

Planning for a 3745 Models A Upgrade and a 3746 Model 900 or 950

Upgrading a 3745 Model xx0 to a Model xxA requires careful planning.

3745 and 3746 Physical Planning

Your local IBM service office has an installation planning representative who is available to assist you with physical planning questions, parallel and fiber optic channel cable planning information, and power requirements.

Note: When adding a 3746-900, there are new and additional power requirements. These power requirements are discussed in more detail on page 2.

Upgrading requires access to standard wall power outlets to power the service processor. Unless you are putting the service processor in a Controller Expansion (FC 5023), permanent table space is required to support the service processor configuration. All cables and hardware required to connect the service processor to the 3745 (and 3746) are provided by IBM.

For connection to the IBM Remote Support Facility (RSF), a dedicated public switched analog telephone line supporting 33.6 kbps must be available for the service processor. It is used during the installation or upgrade and for maintenance. This line should remain available to allow the service processor to support:

- Automatic maintenance functions (refer to the “Connecting to the IBM Remote Support Facility” chapter in the *3745/3746 Planning Series: Management Planning Guide, GA27-4239*)
- Alternate alert path (refer to the “3746 Management Overview” chapter in the *3745/3746 Planning Series: Management Planning Guide, GA27-4239*)
- Backup path for remote console operations (refer to the “Remote Customer Consoles” chapter in the *3745/3746 Planning Series: Management Planning Guide*)

Notes:

1. It is recommended that you install the service processor in the same room, and within 10 m (30 ft) of the 3745s or 3746s. Certain service and maintenance procedures at the communication controller frames require the use of the service processor and may be hindered if the service processor is too far from the communication controller.
2. Service clearances must be checked.

The cable installation and configuration sheets for line interface couplers, token-ring adapters, high-speed lines, and Ethernet adapters are explained in “Familiarizing Yourself with the Installation Sheets” chapter in the *3745/3746 Planning Series: Physical Planning*. Refer also to the “Physical Planning Details” chapter in the same guide.

3745 and 3746 Operator Training

3745 and 3746

The service processor introduces new and advanced functions compared to the MVSS console of the 3745 Models xx0. Local and remote console operations are enhanced. The operator interface guides the user through the existing 3745 MOSS functions and the new MOSS-E functions. Planning should include integration of new functions into existing network operating procedures. Operator training and familiarization with the service processor is required to ease the migration to new operating procedures and to maximize the increased efficiency that they can bring to your operations.

There are tutorials and demonstrations available on the MOSS-E to help with training.

Because the 3746 Network Node and IP router require the use of the CCM functions in addition to MOSS-E functions, planning should include integration of these new functions into existing network operations. Operator training and familiarization with the service processor is required to maximize the efficiency of your network operations.

3745 Model Upgrade

For descriptions of three model upgrade scenarios, see Chapter 2, “3745 and 3746 Installation and Upgrade Scenarios” on page 17. The upgrade replaces the existing MOSS hardware and provides a token-ring connection to the service processor. This MOSS token-ring connection is dedicated to the 3745 MOSS functions and cannot be used to carry user traffic or to send alerts from the MOSS-E to the NetView program. This token-ring operates at 16 Mbps. Any additional devices placed on this ring must operate at 16 Mbps.

Adding any additional 3745 adapters and 3746 Models A1x or L1x units should be completed before the installation of the 3745 upgrade. These new adapters and frames should be operational before beginning this upgrade.

Before installing the 3746-900, your 3745 must be operational as one of the 3745 Models A and be running the ACF/NCP including the 3746-900 Feature. See “Type 5 Scenarios: Migration to 3745 Model As” on page 27.

New ESCON, token-ring, and communication line adapters need to be added to the ACF/NCP software configuration. See “Software Planning” on page 12.

S/390® server and ESCON Director configuration changes should be made at the same time as the migration from the 3745 to the 3746-900. The ESCON Generation Assistant or CCM assists with NCP, IOCP, and MOSS-E definitions.

Note: If you are migrating to the Hardware Configuration Definition (HCD), you can use the IOCP generation provided by the ESCON Generation Assistant or CCM as input for the HCD migration support.

Software Planning

The *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180, lists the minimum requirements for the operating programs necessary before the actual upgrade to a 3745 Model xx0 to a 3745 Model xxA. This will provide time for you to become familiar with its new features, functions, and parameters. It also provides an opportunity to update and verify any changes to existing operating procedures.

If this installation or upgrade will include the 3746-900, a special feature of NCP (the 3746-900 Feature) is required to support the adapters installed in the 3746-900. The existing usage tier requirements and structure for adapters installed in the 3745 and 3746 Models A11 and A12 frames do not change, except for 3745 Models 41A and 61A configured in the twin-dual or twin-backup mode. These configurations require a tier 2 to attach a 3746-900.

Specific NCP usage tiers are applicable to the adapters of the 3746 Model 900, see Table 3, it shows the total number of adapters you can use for 3746 Model 900 usage tiers. Tiers do not include the token-ring processor to which the service processor is attached (CBSP, CBSP2, or CBSP3).

Table 3. Usage Tiers for the 3746 Model 900

Usage Tier	Maximum Number of Adapters
A	Any combination of up to 5 token-ring, ESCON, or communication line adapters
B	Any combination of 6 or more token-ring, ESCON, or communication line adapters
C (see note)	Any combination of token-ring, ESCON, or communication line adapters

Note: Usage tier C (no charge) can be ordered only for NCP Version 7 and when a new Network Node Processor Type 5 (FC 5425) is installed on your 3746 Model 900.

The minimum functional support of the 3745 Models A and 3746-900 is provided by AFC/NCP V6 R2. Certain features offered for the 3746-900 (such as support for SDLC communication lines, frame relay, and X.25) require higher levels of NCP. Refer to the appropriate *NCP Migration Guide* for help in modifying your current NCP definition and migrating to the new, higher program level. It is strongly recommended that you install the most recent release of NCP (V7 R8.1 or later).

ACF/SSP Version 4, Release 8.1 is required to support the generation, load, and dumping of ACF/NCP V7 R8.1. Higher levels of ACF/SSP are required for higher levels of NCP.

Note: IBM provides an ESCON generation tool, the 3745 ESCON Generation Assistant (EGA) or, for 3746s equipped with a NNP, the Controller Configuration and Management (CCM) to create specific definitions used in:

- IOCP/HCD generation
- ACF/NCP channel definitions
- Service processor definitions

To obtain the 3745 ESCON generation tool:

- Contact your IBM representative.
- Refer to the licensed internal code delivered with the 3746-900, which contains the EGA or CCM.

For information on how to use the 3745 ESCON generation tools:

- With no NNP installed, refer to the “ESCON Adapters” chapter in the *3745/3746 Planning Series: ESCON Channels*
- With an NNP installed, refer to the *3746 Nways Multiprotocol Controller Model 900 and 950: Controller Configuration and Management: User's Guide*, SH11-3081.

These documents provide useful information for installing ESCON adapters in the 3746.

Consider creating several NCP load modules before the completion of the hardware upgrade. If problems occur in a new, untested configuration, a reduced or simplified NCP configuration may help you isolate the cause. Fallback and recovery procedures should be developed.

16-MB Storage

If you plan to add the 16-MB storage feature of the 3746 Models 31A and 61A (FC 7200), ensure that the host dump data sets have been increased to accommodate the larger NCP dump sets.

MVS Timer

The missing interrupt handler (MIH) timer must be set to 12 minutes for 3745 channel addresses that will receive NCP load modules greater than 4 MB.

3746 Physical Planning

Adequate planning is required to properly install, configure, and operate a 3746 and 3746. For detailed physical planning information, refer to the “Physical Planning Details” chapter in the *3745/3746 Planning Series: Physical Planning*.

The following list summarizes important physical planning aspects of the 3746:

- Ask the IBM service installation planning representative to assist you with physical planning and cable ordering information.
- The token-ring LAN attachment cables (for the TIC3) are different from the 3745 TIC1 and TIC2 cables.
- The communication line cables for the LIC11 are different from 3745 LIC1, LIC3, and LIC 4A/4B cables.
- ESCON distances up to 3 km (1.86 miles) are supported. Installations requiring longer distances will require the use of ESCON Directors. For additional information:
  - Refer to the “ESCON Overview” chapter in the *3745/3746 Planning Series: ESCON Channels*.
  - Refer to the *Planning for Enterprise Systems Connection Links*, GA23-0367
  - Consult with the IBM service installation planning representative.

3746 Addressing

In the 3746, ESCON, token-ring, and communication line adapters share a single address range.

Each enclosure in the 3746 houses (see Figure 1 on page 3):

- ESCON couplers and processors
- Token-Ring Interface Couplers type 3 (TIC3) and processors
- Communication Line Interface Couplers (types 11 and 12) and processors. Any slot on the front side of the frame can contain any type of processor, and any slot on the rear side can contain any type of coupler. The only limitation is that the corresponding front and rear slots must be part of the same type of adapter.

Each LIC11 uses one or two line connector boxes (LCBs). There is room for a pair of LCBs within the 3746 base frame and more can be housed in the Controller Expansion (FC 5023).

Each coupler slot has a unique, predetermined address or address range. The installation sheets generated by the CF3745 assign slot locations and associated line addresses to the couplers. (Refer to the "Familiarizing Yourself with the Installation Sheets" chapter in the *3745/3746 Planning Series: Physical Planning*.)

3746 Continuity of Operation

Some of the 3746 Network Node options that minimize the effects of equipment malfunction are:

- Dual power input (refer to "Physical Planning Details" chapter in the *3745/3746 Planning Series: Physical Planning*)
- Dual network node processors (refer to "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide*
- Backup communication line adapters (refer to "Serial Line Adapters" chapter in the *3745/3746 Planning Series: Serial Line Adapters*)
- Dual AC outlet distribution box in the controller expansion.

Installation Plan

Be sure to include the following steps in your installation plan:

Note: If your controllers do ***not*** send alerts to NetView, you must reconfigure certain MOSS-E parameters by following the procedure in "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide, GA27-4239*.

1. Schedule operator education on the service processor and remote console operation.

   Check with your IBM marketing representative about classes that IBM offers to help with operator education on the 3746-950 (and 3745/3746-900).

2. Set up remote DCAF software or the Console for Java™. Refer to the "Remote Customer Consoles" chapter in the *3745/3746 Planning Series: Management Planning Guide, GA27-4239*.

3. If required, depending on how you place the service processor components, provide table space and standard, single-phase power outlets to support the service processor configuration: system unit, display, optical disk unit, mouse, keyboard, RSF modem, and service processor access unit.

   These service processor components can be installed in the Controller Expansion that houses the NNP. Refer to the "Physical Planning Details" chapter in the *3745/3746 Planning Series: Physical Planning, GA27-4238*.

4. Ensure that an analog public switched telephone line is available to allow complete testing of the 3746 and service processor. The IBM service representative will use this connection at installation time to retrieve the microcode changes from the RETAIN® databases.

Planning for Backup Operations with the 3745-41A, -61A and 3746-900

This section gives general information about the 3745 CCU/3746-900 controller bus coupler (CBC) connections and explains the backup possibilities when using the 3746-900. See Figure 1 on page 3 while reading this section.

Each 3745 CCU is connected through its input/output controller (IOC) bus and direct memory access (DMA) bus to its own 3746-900 CBC. The 3746-900 traffic flows through the 3745 DMA bus. Each CCU drives its own CBC and never addresses the CBC of the other CCU, even in the twin-standby or twin-backup mode. The 3746-900 ESCON processors (ESCPs), token-ring processors (TRPs), and communication line processors (CLPs) can communicate with any CCU through the corresponding CBC:

- An ESCC can carry traffic to and from both CCUs at the same time.
- Any LIC12 line or LIC11 ARC line can be activated by any CCU. This allows CLP and LIC11 sharing between two active CCUs.
- The two CCUs of the 3745 can share the two TIC3 ports on the same 3746-900 TRP, one port for each CCU. Any TIC3 can be activated by any CCU.

  However, once a LIC12, ARC, or TIC3 is activated, an attempt by the other CCU to activate it is not accepted.

CCU Operating Mode

You must be absolutely sure that the MOSS-E station IPL definitions (in the "Manage ESCON Processors" function) correspond to the MOSS CCU operating mode choice (in the MOSS CDF function):

CCU Operating Mode (MOSS)	IPL Choices (MOSS-E)
Twin-backup	"CCU-A" or "CCU-B" or "NO IPL"
Twin-dual	"CCU-A" or "CCU-B" or "NO IPL"
Twin-standby	"CCU-A + CCU-B" or "NO IPL"

If the 3746-900 cannot communicate with a CCU, the 3746-900 deactivates the resources and active sessions associated with this CCU. Depending on the mode of operation, these resources can be taken over by the other CCU and CBC.

3745 Twin-Dual Mode

Each CCU handles its own buses, 3745 adapters, and CBC.

If there is an interruption of 3746-900 operations with a CCU, the traffic in the 3746-900 corresponding to this CCU is interrupted. In this mode, there is no switching of the 3745 adapters from this CCU to the other CCU.

However, the 3746-900 resources can be reactivated if all of them are defined in both CCUs (as described in "3745 Twin-Backup Mode"). For example, if CCU-A fails, then a command list (CLIST) can reactivate 3746-900 resources through CCU-B. This allows restarting sessions with users connected to 3746-900 adapters.

3745 Twin-Backup Mode

Each CCU handles its own buses, 3745 adapters, and CBC.

If the operations on a CCU are interrupted, an automatic fallback occurs. The remaining valid CCU handles all IOC buses, 3745 adapters, and 3746-900 adapters through its own CBC. If there is an interruption of the 3746-900 communications with a CCU (CBC failure), but the CCU remains operational, then there is no switching of buses.

However, the 3746-900 resources that are normally owned by this CCU can be reactivated through the other CCU. This requires that NCP-A and NCP-B have all the 3746-900 resources defined as follows:

- In CCU-A, the NCP has:
  - All resources of CCU-A defined and active
  - All CCU-B resources defined as backup and inactive.
- In CCU-B, the NCP has:
  - All resources of CCU-B defined and active
  - All CCU-A resources defined as backup and inactive.

This allows restarting sessions with users connected to 3746-900 adapters.

3745 Twin-Standby Mode

The active CCU handles all buses, 3745 adapters, and 3746-900 adapters through its own CBC.

If the operations on a CCU are interrupted, an automatic fallback occurs. The remaining valid CCU handles all IOC buses, 3745 adapters, and 3746-900 adapters through its own CBC. If there is an interruption of the 3746-900 communications with a CCU and the CCU remains operational, then there is no automatic bus switching.

However, the operator can request a manual CCU fallback from the service processor. This allows reactivation of all 3746-900 resources via the other CCU and its CBC, but fallback is disruptive to all the remaining sessions, that is, those sessions that use a 3745-type adapter (HSS, LSS, TRA, or ELA).

Chapter 2. 3745 and 3746 Installation and Upgrade Scenarios

The possible network migration paths for the 3746 Models 900 and 950 are given in the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.

This chapter describes possible hardware and microcode (Licensed Internal Code) installation scenarios that you can use to implement a 3746 Nways Controller. The times given are average times that it takes to do the task. These task times may be shorter or longer at your site, depending on local circumstances. The scenario best suited to your needs depends on your existing hardware and on the configuration to be installed. The scenarios are grouped as follows:

1. Installation of a new 3746-950:
   - APPN/HPR
   - APPN/HPR and IP
2. Upgrade of an existing 3746-900 (subarea or composite network node) to a 3746 Model 900 operating as an APPN/HPR network node and IP router.
3. Installation of a new 3746 Model 900 shared between NCP, the APPN/HPR network node, and the IP router.
4. Upgrade of a 3746-900 with an NNP to a 3746-950.

Note: Scenarios 1, 2, and 3 require the installation of the Controller Expansion (FC 5023). One or two controller expansions can be installed.

Other possible scenarios (for example, going from an NCP-controlled 3746-900 to a 3746-950) can be constructed using the above examples.

The interruption times given in the scenarios:

- Assume that two IBM service representatives are doing the installation, and perform some tasks in parallel to optimize the installation time.
- Do not include the time needed to restart your network. Network restart times vary considerably depending on the size of the installation (number of ports, physical units, and SNA/APPN sessions) and should be taken into consideration when deciding which scenario is best for you.
- Assume that your current service processor is used for the new configuration. If an additional service processor is installed, you need to add about 4 hours to the time for the scenario. The 3745 traffic is not interrupted during this additional time.

The scenario that best fits your needs depends on:

- The type of installation you want (a new machine or an upgrade of an existing one)
- Which machine (the 3745 or 3746) you need to have back in operation first

IBM does not recommend modifying existing network connections during these operations. Changes not related to these operations might increase the duration of the 3745 and/or 3746 interruption and testing. Configuration changes not dependent on the 3746 Network Node and IP router features should be scheduled at a different time.

Type 1 Scenario: Installation of a New 3746-950

Installation of a new 3746-950 takes the IBM service representatives about 10 hours.

Notes:

1. If a service processor is already available at the installation site, it takes about 7 hours.
2. If a second network node processor (B) is installed, this will add about 0.5 hours.
3. If Ethernet bridges[9] are installed (3746 only) this will add about 1 hour for installation and customization ***for each*** Ethernet bridge.

Step	Performed By	Description
1	User	See "How to Use the 3745/3746 Planning Series" on page xxi. 1. Complete the physical planning. 2. Complete the software definitions and tuning. 3. Fill out plugging sheets, if necessary. 4. Complete the NetView definitions for VTAM and the MOSS-E. 5. Complete the controller, service processor, and network node processor definitions (including the second network node processor, if any). 6. Complete the remote console definitions, if necessary.
2	IBM	1. Install the 3746-950. 2. Install the Controller Expansion. 3. Install the second Controller Expansion if two have been ordered.
3	IBM	1. Install the service processor and microcode (licensed internal code). 2. Customize the service processor.
4	IBM	Upgrade the microcode (see note).
5	IBM	1. Install the network node processor A. 2. Customize the network node processor A. If applicable: 3. Install the network node processor B. 4. Customize the network node processor B.
6	IBM	Install Ethernet bridges,[9] if any.
7	IBM	Test the 3746-950.
8	User	Start up the network (3746-950).

Note: If you use the IBM RSF, make sure that an analog telephone line is installed before the controller installation. This will enable the RSF link to be tested at the time of installation, and the latest microcode changes to be loaded over this connection during installation.

[9] No longer available.

Type 2 Scenarios: Installation of the Network Node Processor on your 3746-900

The time required for this procedure depends on the type of service processor system unit installed on the 3745:

1. Stand-alone (tower) or rack-mountable service processor.
2. Desktop service processor, type 9577. This desktop unit requires additional time because it has to be upgraded.

Scenario 2.1: NNP Installation Using the Stand-Alone (Tower) or a Rack-Mountable Service Processor

The steps performed by the IBM service representatives take about 5.5 hours.

Notes:

1. If a second network node processor (B) is installed, this will add about 0.5 hours.
2. If Ethernet bridges[10] are installed (3746 only), this will add about 1 hour for installation and customization ***for each*** Ethernet bridge.

The 3746-900 is not operational during this time.

Step	Performed By	Description	3745 Interruption	3746-900 Interruption
1	User	See "How to Use the 3745/3746 Planning Series" on page xxi. 1. Complete the physical planning. 2. Complete the software definitions and tuning. 3. Fill out plugging sheets, if necessary. 4. Complete the NetView definitions for VTAM and the MOSS-E. 5. Complete the controller, service processor, and network node processor definitions (including the second network node processor, if any). 6. Complete the remote console definitions, if necessary.	No	No
2	IBM	1. Install the Controller Expansion. 2. Install the network node processor.	No (see Note 1)	Yes
3	IBM	1. Exchange type 1 processors for type 3 processors (see Note 2). 2. Customize the service processor.	No	Yes
4	IBM	Upgrade the microcode (licensed internal code).	No	Yes
5	IBM	1. Copy control point microcode onto the network node processor A. 2. Customize the network node processor A. If applicable: 3. Copy control point microcode onto the network node processor B. 4. Customize the network node processor B.	No	Yes

[10] No longer available.

Step	Performed By	Description	3745 Interruption	3746-900 Interruption
6	IBM	Install Ethernet bridges,[10] if any.	—	Yes
7	IBM	Test the 3746-900.	No	Yes
8	User	Start up the network (3746-900).	No	Yes

Notes:

1. Traffic that does not depend on the 3746-900 is not interrupted during the rest of the scenario. Of course, any 3746-900 traffic is halted until the 3746-900 is put back into operation.
2. The time for this scenario assumes that five processors are upgraded to type 3. A processor takes about 15 minutes to upgrade, so changing more or less than five processors might change the total time needed for the installation.

Scenario 2.2: NNP Installation Using the Desktop Service Processor Type 9577

The steps performed by the IBM service representatives take about 7.5 hours. The 3746-900 is not operational during this time.

Notes:

1. If a second network node processor (B) is installed, this will add about 0.5 hours.
2. If Ethernet bridges[11] are installed (3746 only), this will add about 1 hour for installation and customization ***for each*** Ethernet bridge.

Step	Performed By	Description	3745 Interruption	3746-900 Interruption
1	User	See "How to Use the 3745/3746 Planning Series" on page xxi. 1. Complete the physical planning. 2. Complete the software definitions and tuning. 3. Fill out plugging sheets, if necessary. 4. Complete the NetView definitions for VTAM and the MOSS-E. 5. Complete the controller, service processor, and network node processor definitions (including the second network node processor, if any). 6. Complete the remote console definitions, if necessary.	No	No
2	IBM	1. Back up the hard drive. 2. Install a larger hard drive. 3. Restore the hard drive.	No (see Note 1)	Yes
3	IBM	1. Install the Controller Expansion. 2. Install the network node processor.	No	Yes
4	IBM	1. Exchange type 1 processors for type 3 processors (see Note 2). 2. Customize the service processor.	No	Yes
5	IBM	Upgrade the microcode (licensed internal code).	No	Yes
6	IBM	1. Copy control point microcode onto the network node processor A. 2. Customize the network node processor A. If applicable: 3. Copy control point microcode onto the network node processor B. 4. Customize the network node processor B.	No	Yes
7	IBM	Install Ethernet bridges,[11] if any.	—	Yes
8	IBM	Test the 3746-900.	No	Yes

[11] No longer available.

Step	Performed By	Description	3745 Interruption	3746-900 Interruption
9	User	Start up the network (3746-900).	No	Yes

Notes:

1. Traffic that does not depend on the 3746-900 is not interrupted during the rest of the scenario. Of course, any 3746-900 traffic is halted until the 3746-900 is put back into operation.
2. The time for this scenario assumes that five processors are upgraded to type 3. A processor takes about 15 minutes to upgrade, so changing more or less than five processors may change the total time needed for the installation.

Type 3 Scenario: 3745 x10 Migration to a Model x1A with a 3746 Model 900 with a NNP

In this scenario:

1. A 3745 Model 210, 310, 410, or 610 is migrated to a Model 21A, 31A, 41A, or 61A and a 3746 Model 900 is added to the 3745 Model A.
2. There is only one 3745 interruption for hardware installation.
3. The average 3745 down-time is about 4 hours. However, this figure can vary depending on the controller configuration.

Notes:

1. If a second network node processor (B) is installed, this will add about 0.5 hours.
2. If Ethernet bridges[12] are installed (3746 only), this will add about 1 hour for installation and customization ***for each*** Ethernet bridge.

Step	Performed By	Description	3745 Interruption
1	User	For NCP resources: 1. Generate a load module, called “NCP1”, using the latest NCP V7 release with the 3746-900 feature (see Note 1). ***Do not include*** the new 3746-900 resources. 2. Generate a second load module, called “NCP2“, using latest NCP V7 release with the 3746-900 feature (see Note 1). ***Include*** the new 3746-900 resources. 3. Load NCP1 on the 3745. 4. Test the current network configuration (see Note 1)	Yes
2	User	For 3746 Nways Multiprotocol Controller resources (APPN/HPR, IP): 1. Use the Controller Configuration and Management to generate the configuration for the planned 3746 Network Node and IP router resources. 2. Prepare the 3746 configuration diskette for the IBM service representative.	No
3	IBM	1. Install 3746-900 hardware. 2. Install the Controller Expansion. 3. Install the service processor. 4. Perform the preinstallation setup procedures.	No
4	IBM	1. Install network node processor A. 2. Customize network node processor A. If applicable: 3. Install network node processor B. 4. Customize network node processor B.	No
5	IBM	Install Ethernet bridges,[12] if any.	Yes

[12] No longer available.

Step	Performed By	Description	3745 Interruption
6	IBM	1. Install 3745 Model A hardware. 2. Connect 3746-900 to 3745.	Yes (2 hours)
7	IBM	1. Connect the service processor to the 3745 and 3746-900. 2. Test the RSF link to the IBM Support Center (see Note 3). 3. Run diagnostics.	Yes (2 hours)
8	User	1. Load NCP2 on 3745 Model A. 2. Activate and test the 3746 NNP and NCP resources (see Notes 1 and 2)	Yes

Notes:

1. V6 R2 is the minimum NCP level that can be used. The latest release of NCP V7 might be required, depending on the network functions to be implemented and the hardware contained in the 3746-900. For information about programming requirements refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180. The lengths of the testing and stabilization phases are user-defined, but they need to be defined before the installation starts.
2. During this period of testing and stabilization you can perform operator training.
3. If you use the IBM RSF, make sure that an analog telephone line is installed before the controller installation. This will enable the RSF link to be tested at the time of installation, and the latest microcode changes to be loaded over this connection during installation.

Type 4 Scenarios: Upgrade of a 3746 Model 900 to a 3746-950

There are two different ways of doing this migration, depending on your network priority. You can choose one of the following ways to migrate:

1. With the 3745 back into operation as soon as possible.
2. With the 3746-950 operational as soon as possible.

The following procedures assume that there are no changes to the communication processors or couplers.

Scenario 4.1: 3745 Back in Operation as Soon as Possible

This scenario migrates a 3746-900 with the network node processor already installed to a 3746-950.

The 3745 is operational after about 3 hours.

The 3746-950 is operational after about 6 hours.

Step	Performed By	Description	3745 Interruption	3746-900 Interruption
1	User	See "How to Use the 3745/3746 Planning Series" on page xxi and use the *CCM User's Guide*, SH11-3081 as necessary. 1. Complete the physical planning. 2. Complete the software definitions and tuning. 3. Fill out plugging sheets, if necessary. 4. Complete the NetView definitions for VTAM and the MOSS-E. 5. Complete the controller, service processor, and network node processor definitions (including the second network node processor, if any). 6. Complete the remote console definitions, if necessary.	No	No
2	IBM	Physically detach the 3746-900 from the 3745.	Yes	Yes
3	IBM	Return the 3745 to operation: 1. Verify the CDF 2. Run diagnostics.	Yes	Yes
4	User	Start up the network (3745).	Yes	Yes
5	IBM	Convert the 3746-900 frame into a 3746-950.	No	Yes
6	IBM	Upgrade the microcode (see note).	No	Yes
7	IBM	Customize the network node processor.	No	Yes
8	IBM	Test the 3746-950.	No	Yes
9	User	Start up the network (3746-950).	No	Yes

Note: If you use the IBM RSF, make sure that an analog telephone line is installed before the controller installation. This will enable the RSF link to be tested at the time of installation, and the latest microcode changes to be loaded over this connection during installation.

Scenario 4.2: 3746-950 Operational as Soon as Possible

This scenario migrates a 3746-900 with the network node processor already installed to a 3746-950.

The 3746-950 is operational after about 3.5 hours.

The 3745 is operational after about 6 hours.

Step	Performed By	Description	3745 Interruption	3746-900 Interruption
1	User	See "How to Use the 3745/3746 Planning Series" on page xxi. 1. Complete the physical planning. 2. Complete the software definitions and tuning. 3. Fill out plugging sheets, if necessary. 4. Complete the NetView definitions for VTAM and the MOSS-E. 5. Complete the controller, service processor, and network node processor definitions (including the second network node processor, if any). 6. Complete the remote console definitions, if necessary.	No	No
2	IBM	Physically detach the 3746-900 from the 3745.	Yes	Yes
3	IBM	Convert the 3746-900 frame into a 3746-950.	Yes	Yes
4	IBM	Upgrade the microcode (see note).	Yes	Yes
5	IBM	Customize the network node processor.	Yes	Yes
6	IBM	Test the 3746-950.	Yes	Yes
7	User	Start up the network (3746-950).	Yes	Yes
8	IBM	Return the 3745 to operation: 1. Verify the CDF. 2. Run diagnostics.	Yes	No
9	User	Start up the network (3745).	Yes	No

Note: If you use the IBM RSF, make sure that an analog telephone line is installed before the controller installation. This will enable the RSF link to be tested at the time of installation, and the latest microcode changes to be loaded over this connection during installation.

Type 5 Scenarios: Migration to 3745 Model As

Three model upgrade scenarios are proposed by IBM to allow migration from the Models 130, 150, 160, 170, 210, 310, 410, or 610 to the Models A with, optionally, the addition of a 3746-900.

Details of possible migration paths between the different models are given in the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180. The six upgrade scenarios are:

1. Migration to a Model 21A, 31A, 41A, or 61A without the addition a 3746-900.
2. Migration to a Model 21A, 31A, 41A, or 61A with the addition of a 3746-900.
3. Migration to a Model 21A, 31A, 41A, or 61A with addition of a 3746-900, as in scenario 2, but with all tests performed in a single step at the end of the migration.

   Note: The hardware for the conversion from a Model 210 or 21A to a Model 41A is no longer available.
4. Migration to a Model 17A without the addition of a 3746-900.
5. Migration to a Model 17A with 3746-900 that has two interruptions.
6. Migration to a Model 17A with the addition of a 3746-900 as in scenario 5, but with all tests performed in a single step at the end of the migration.

Note: The times given in the scenarios do not include:

1. The time needed to restart your network. Network restart times vary considerably depending on the size of the installation, and should be taken into consideration when deciding which scenario is best for you.
2. The time that the IBM service representative spends at your site performing the installation and migration. Many tasks can be performed while your network is operational.

In scenarios 1, 3, 4, and 6 there is only a single interruption of your network operation. Scenarios 2 and 5 include several interruptions of your network operation but allow testing software and hardware between each migration step. Because of the additional intermediate testing, scenario 2 or 5 is recommended over scenario 3 or 4. You must select the scenario that best meets the availability needs of your communication network.

It is recommended that you perform step 1 in the scenarios very early in the installation phase to stabilize the software before the hardware arrives. This will minimize changing both the hardware and software at the same time.

Also, it is not recommend that you modify existing network connections during this upgrade. Changes that are not related to this upgrade will increase the duration of the 3745 interruption and testing. Configuration changes not dependent on the new 3746-900 features should be scheduled at a different time.

Scenario 5.1: Migration to a Model 21A, 31A, 41A, or 61A without 3746-900

Note: The hardware for the conversion from a Model 210 or 21A to a Model 41A is no longer available.

The following table summarizes the migration steps and indicates when a 3745 interruption is required.

In scenario 1, the average 3745 down-time for hardware installation is at least 3 hours. This figure can vary depending on the communication controller configuration.

Step	Performed by	Description	3745 Interruption
1	User	1. Generate a load module using the latest release of NCP V7 (see Note 1). 2. Load it on the 3745. 3. Test current network configuration (see Note 2).	Yes
2	IBM	1. Install service processor.	No
3	IBM	1. Install Model A hardware. 2. Connect service processor to 3745. 3. Test the RSF link to the IBM Support Center (see Note 4). 4. Run diagnostics.	Yes (3 hours)
4	User	1. Load the step 1 load module on the 3745 Model A. 2. Test the network configuration (see Notes 2 and 3).	Yes

Notes:

1. V6 R2 is the minimum NCP level that can be used. The latest release of NCP V7 might be required, depending on the network functions to be implemented.
2. The lengths of the testing and stabilization phases are user-defined, but they need to be defined before the installation starts.
3. During this period of testing and stabilization you can use the MOSS-E tutorials and demonstrations for operator training.
4. An analog telephone line must be installed before the communication controller installation to ensure that the RSF link can be tested at the time of installation. Updated microcode changes are loaded over this connection during installation.

Scenario 5.2: Migration to a Model 21A, 31A, 41A, or 61A with 3746-900 (Two Interruptions)

Note: The hardware for the conversion from a Model 210 or 21A to a Model 41A is no longer available.

The following table summarizes the migration steps and indicates when 3745 interruptions are required. In scenario 2, the average 3745 down-time for hardware installation is about 6 hours. This figure can vary depending on the communication controller configuration.

Step	Performed by	Description	3745 Interruption
1	User	1. Generate a load module, called “NCP1”, using the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Do not include*** the new 3746-900 resources. 2. Generate a second load module, called “NCP2”, using the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Include*** the new 3746-900 resources. 3. Load NCP1 on the 3745. 4. Test the current network configuration (see Note 2).	Yes
2	IBM	1. Install the service processor.	No
3	IBM	1. Install Model A hardware. 2. Connect service processor to 3745. 3. Test the RSF link to the IBM Support Center (see Note 4). 4. Run diagnostics.	Yes (3 hours)
4	User	1. Load NCP2 on Model A. 2. Test the network configuration (see Note 2).	Yes
5	IBM	1. Install 3746-900 hardware. 2. Connect the service processor to 3746-900 and test.	No
6	IBM	1. Connect the 3746-900 to the 3745. 2. Run diagnostics.	Yes (3 hours)

Step	Performed by	Description	3745 Interruption
7	User	1. Load NCP2 on Model A. 2. Activate and test 3746-900 resources (see Notes 2 and 3).	Yes

Notes:

1. V6 R2 is the minimum NCP level that can be used. The latest release of NCP V7 might be required, depending on the network functions to be implemented and the hardware contained in the 3746-900. For information about programming requirements refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.
2. The lengths of the testing and stabilization phases are user-defined, but they need to be defined before the installation starts.
3. During this period of testing and stabilization you can use the MOSS-E tutorials and demonstrations for operator training.
4. An analog telephone line must be installed before the communication controller installation to ensure that the RSF link can be tested at the time of installation. Updated microcode changes are loaded over this connection during installation.

Scenario 5.3: Migration to a Model 21A, 31A, 41A, or 61A with 3746-900 (One Interruption)

Note: Migration from a Model 210 or 21A to a Model 41A is no longer available from IBM.

The main scenario is as follows:

1. Only one 3745 interruption for hardware installation.
2. The average 3745 down-time is about 4 hours. However, this figure might vary depending on the communication controller configuration.

Step	Performed by	Description	3745 Interruption
1	User	1. Generate a load module, called "NCP1", using the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Do not include*** the new 3746-900 resources. 2. Generate a second load module, called "NCP2", with the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Include*** the new 3746-900 resources. 3. Load NCP1 on the 3745. 4. Test the current network configuration (see Note 2).	Yes
2	IBM	1. Install the service processor. 2. Install and configure the 3746-900 hardware. 3. Perform preinstallation setup procedures. 4. Run diagnostics on the 3746-900.	No
3	IBM	1. Install Model A hardware. 2. Connect the 3746-900 to the 3745.	Yes (2 hours)
4	IBM	1. Connect the service processor to 3745 and 3746-900. 2. Test the RSF link to the IBM Support Center (see Note 4). 3. Run diagnostics on the 3745 - 3746-900 link.	Yes (2 hours)

Step	Performed by	Description	3745 Interruption
5	User	1. Load NCP2 on the Model A. 2. Activate and test 3746-900 resources (see Notes 2 and 3).	Yes

Notes:

1. The latest release of NCP V7 might be required, depending on the network functions to be implemented and the hardware contained in the 3746-900. For information about programming requirements refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.
2. The lengths of the testing and stabilization phases are user-defined, but they need to be defined before the installation starts.
3. During this period of testing and stabilization you can use the MOSS-E tutorials and demonstrations for operator training.
4. An analog telephone line must be installed before the communication controller installation to ensure that the RSF link can be tested at the time of installation. Updated microcode changes are loaded over this connection during installation.

Scenario 5.4: Migration to a Model 17A without 3746-900

The following table summarizes the migration steps and indicates when a 3745 interruption is required.

In scenario 4, the average 3745 down-time for hardware installation is 6.5 hours. This figure varies depending on the communication controller configuration.

Step	Performed by	Description	3745 Interruption
1	User	1. Generate a load module using the latest release of NCP V7 (see Note 1). 2. Load it on the 3745. 3. Test the current network configuration (see Note 2).	Yes
2	IBM	1. Install the service processor.	No
3	IBM	1. Install Model A hardware. 2. Connect the service processor to 3745. 3. Test the RSF link to the IBM Support Center (see Note 4). 4. Run diagnostics.	Yes (6.5 hours)
4	User	1. Load step 1 load module on Model A. 2. Test the network configuration (see Notes 2 and 3).	Yes

Notes:

1. V6 R3 is the minimum NCP level that can be used. The latest release of NCP V7 might be required, depending on the network functions to be implemented.
2. The lengths of the testing and stabilization phases are user-defined, but they need to be defined before the installation starts.
3. During this period of testing and stabilization you can use the MOSS-E tutorials and demonstrations for operator training.
4. An analog telephone line must be installed before the communication controller installation to ensure that the RSF link can be tested at the time of installation. Updated microcode changes are loaded over this connection during installation.

Scenario 5.5: Migration to a Model 17A with 3746-900 (Two Interruptions)

In this scenario, the average 3745 down-time for hardware installation is about 8 hours. This figure can vary depending on the communication controller configuration.

Step	Performed by	Description	3745 Interruption
1	User	1. Generate a load module, called "NCP1", using the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Do not include*** the new 3746-900 resources. 2. Generate a second load module, called "NCP2", using the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Include*** the new 3746-900 resources. 3. Load "NCP1" on the 3745. 4. Test the current network configuration (see Note 2).	Yes
2	IBM	1. Install the service processor.	No
3	IBM	1. Install Model A hardware. 2. Connect the service processor to the 3745. 3. Test the RSF link to the IBM Support Center (see Note 4). 4. Run diagnostics.	Yes (6.5 hours)
4	User	1. Load NCP2 on Model A. 2. Test the network configuration (see Note 2).	Yes
5	IBM	1. Install 3746-900 hardware. 2. Connect the service processor to the 3746-900 and test.	No
6	IBM	1. Connect 3746-900 to 3745. 2. Run diagnostics.	Yes (1.5 hours)
7	User	1. Load NCP2 on the Model A. 2. Activate and test 3746-900 resources (see Notes 2 and 3).	Yes

Notes:

1. V6 R3 is the minimum NCP level that can be used. The latest release of NCP V7 might be required, depending on the network functions to be implemented and the hardware contained in the 3746-900. For information about programming requirements refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.
2. The lengths of the testing and stabilization phases are user-defined, but they need to be defined before the installation starts.
3. During this period of testing and stabilization you can use the MOSS-E tutorials and demonstrations for operator training.
4. An analog telephone line must be installed before the communication controller installation to ensure that the RSF link can be tested at the time of installation. Updated microcode changes are loaded over this connection during installation.

Scenario 5.6: Migration to a Model 17A with 3746-900 (One Interruption

The main changes in this scenario, compared with scenario 5.5, are:

1. There is only one 3745 interruption for hardware installation instead of two.
2. The average 3745 down-time is about 7 hours instead of 8. However, this figure can vary depending on the communication controller configuration.
3. All installation tests are performed at the end of the migration scenario.

Step	Performed by	Description	3745 Interruption
1	User	1. Generate a load module, called “NCP1”, using the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Do not include*** the new 3746-900 resources. 2. Generate a second load module, called “NCP2”, with the latest release of NCP V7 with the 3746-900 feature (see Note 1). ***Include*** the new 3746-900 resources. 3. Load NCP1 on the 3745. 4. Test the current network configuration (see Note 2).	Yes
2	IBM	1. Install the service processor. 2. Install the 3746-900 hardware. 3. Perform preinstallation setup procedures.	No
3	IBM	1. Install Model A hardware. 2. Connect the 3746-900 to the 3745.	Yes (6 hours)
4	IBM	1. Connect the service processor to the 3745 and the3746-900. 2. Test the RSF link to the IBM Support Center (see Note 4). 3. Run diagnostics.	Yes (1 hour)
5	User	1. Load NCP2 on the Model A. 2. Activate and test 3746-900 resources (see Notes 2 and 3).	Yes

Notes:

1. V6 R3 is the minimum NCP level that can be used. The latest release of NCP V7 might be required, depending on the network functions to be implemented and the hardware contained in the 3746-900. For information about programming requirements refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.
2. The lengths of the testing and stabilization phases are user-defined, but they need to be defined before the installation starts.
3. During this period of testing and stabilization you can use the MOSS-E tutorials and demonstrations for operator training.
4. An analog telephone line must be installed before the communication controller installation to ensure that the RSF link can be tested at the time of installation. Updated microcode changes are loaded over this connection during installation.

Chapter 3. Controller and Service Processor Integration

This chapter describes several options and parameters that you need to consider before using the procedures in the *3745 All Models and 3746-900 Connection and Integration Guide* or the *3746-950 User's Guide* at the initial installation or upgrade of your controller.

Controller Time

The MOSS-E time is used in the 3745, 3746-900, 3746-950, and service processor. It is set using a MOSS-E function.

The time of the S/390® server running NetView may be different from the controller time if the S/390 and controller are in different time zones. This could be important when checking box event records (BERs), alerts, and system reference codes (SRCs).

Controller Integration

Use the worksheet starting on page 59 to record the parameter values discussed in this section.

Controller Name

This is the name that you set at installation time to help identify your controllers (3745, 3746-900, or 3746-950) for your own purposes. This name is displayed in the first MOSS-E panel, MOSS-E View. The names can be up to 25 alphanumeric characters long. You should develop a naming convention that will allow an operator to easily distinguish each 3746-9x0 from all the others.

This name is not used for any network or system purpose, nor to contact or identify the controller from elsewhere in the network.

Set Power ON Schedule

This function is available only on the 3735 and 3746-900.

The MOSS Time Services (TIM) function can be used if you want to set the dates and times when your controller is to automatically power on. Be sure to consider a possible time difference between the S/390 server running NetView and the 3745/3746-900, as described in "Controller Time."

MOSS-E Database Optimization

At regular intervals the MOSS-E databases are automatically reorganized to optimize hard disk and program performance. You can specify when and how often this will take place. This optimization should not take place:

- During a scheduled power-on of the machine
- During heavy operator use of the service processor

The parameters are:

Optimize database
This operation can be done daily or weekly. Daily is the default value.

Day
Give the day of the week if you save weekly.

Time
Use the HH:MM 24-hour time format. 00:00 is the default value.

Service Processor Integration

The service processor is preconfigured and preloaded during manufacture with the MOSS-E and Controller Configuration and Management programs.[13] They provide the operator and service support through user interfaces for the:

- 3745, 3746-900, and 3746-950 connected to the service processor
- APPN/HPR, DLUR, and IP functions of the 3746 NNP
- Remote Support Facility (RSF)
- Remote console access

CD-ROM Support

Up to the D46130x microcode level, the MOSS-E microcode and MAE code and configurator are delivered on two dedicated optical disks.

Starting with the F12380 microcode level, the 3746-9x0 microcode, the MAE code, and the CCM configurator are delivered on a single CD-ROM. Service processors type 2, type 3, and type 4 are equipped with a CD-ROM drive and support:

- Dual microcode-level management support
- Online access to 3746 product information

Dual Microcode-Level Support

From the F64810 microcode level, two 3746 microcode levels can be installed and managed on the service processor hard disk. One is active and the other is inactive. Benefits of dual microcode-level support are:

- Online microcode updates
- Backup and testing facilities

Online Microcode Updates: In case of new microcode installation or updates, changes are applied on the inactive version, so that the 3746 operation is not interrupted, until the operator switches from the active version to the inactive one. The switching operation, which lasts about 5 to 15 minutes, depending on the number of processors in the 3746 configuration, can be performed at a time convenient for and compatible with network operations and requirements.

Note: If the service processor is shared between two 3746-9X0s, the same active and inactive versions apply to both 3746-9X0s.

Compared with a microcode upgrade using the optical disk media, online microcode updates minimize the disturbances resulting from the installation of a new

[13] These are IBM Licensed Internal Code.

microcode version. The time during which the 3746 is not operating is reduced from 150 minutes (average duration) to less than 15 minutes.

Backup Facilities: When the new microcode level is activated, the previous production level becomes 'inactive,' but remains available for possible reactivation, if you need to quickly go back to a previous version of microcode in case of problems with the new version. If this happens, the time during which the 3746 operation is interrupted, is limited to the time required for a 3746 IML.

Testing Facilities: By taking advantage of unused machine time, you can test a new level of microcode, maintenance or functional level. You can activate a trial level of microcode and then go back to the production level when required.

Online 3746 Product Information

Using Netscape and Acrobat Reader (available from the CD-ROM), you can consult directly from the service processor panel the publications relating to the 3745 Communication Controller and 3746 Nways Multiprotocol Controllers.

Service Processor Physical Connections

The service processor can have up to three physical connections (refer to “3746 Management Overview” chapter in the *3745/3746 Planning Series: Management Planning Guide*):

1. **Service LAN**

   A token-ring port allows for communication with:

   - Multiple 3745s and 3746s (Refer to “Service Processor Sharing and Use of Service Processor LAN” on page 42.)
   - Network node processor A
   - Network node processor B
   - 3746 multiaccess enclosure
   - NetView, through the mainstream path (Refer to “3746 Management Overview” chapter in the *3745/3746 Planning Series: Management Planning Guide*.)
   - LAN-attached, SNA-attached, APPC-attached, and APPN-attached remote consoles (Refer to “Remote Customer Consoles” chapter in the *3745/3746 Planning Series: Management Planning Guide*.)

2. **Public switched telephone network**

   An SDLC port and modem allows:

   - Connection to the IBM Support Center and the IBM RETAIN databases
   - An alternate path to NetView for the alerts reported by the MOSS-E
   - A backup path from a remote user console

3. **Multiaccess Enclosure (FC 3001 for the 3746)**

   If a Multiaccess Enclosure is installed, an EIA-232 null-modem cable from the service processor COM2 port to the 3746 multiaccess enclosure EIA-232 port allows direct communication to the multiaccess enclosure maintenance mode.

Service Processor Modem

The modem provided by IBM with the service processor attaches the synchronous or asynchronous port of the service processor to the public switched telephone network.

The service processor modem:

- Supports ITU-T V.25 bis (auto-call) and auto-answering
- Supports synchronous, asynchronous, or autosync mode of operation (modem-dependent)
- Automatically sets the modulation scheme compatible with the remote modem (V.22, V.22 bis, V.32, or V.32 bis)
- Operates at speeds up to 33.6 kbps or 28.8 kbps in countries where the 33.6-kbps speed is not homologated
- Automatically adapts the line speed to the remote console and, if possible, line conditions.

You must provide access to a dedicated analog line of the public switched telephone network.

Table 4 through Table 7 on page 41 show the compatibility between the modems and ports used between the remote workstation and the service processor. For details about the remote workstation settings, refer to *3745 and 3746 Model 900 Console Setup Guide*, SA33-0158 if you are working on a 3746-900 or *3746 Nways Multiprotocol Controller Model 950: User's Guide*, SA33-0356 if you are working on a 3746-950.

If you are installing or upgrading a service processor type:

- 6578, 6563 or 6275, see Table 4
- 7585, see Table 5 on page 41
- 3172, see Table 6 on page 41
- 9585 or 9577, see Table 7 on page 41.

The notes for Table 4 through Table 7 appear at the end of Table 7 on page 41.

Table 4. Modems for Remote Workstations and a Target Service Processor IBM 7855-10

Service Processor		**Remote Workstation (DCAF, Java)**						
6578,6563, or 6275 Connection Type and Mode	**Modem Type**	**COM1 Port Connection**						
		7855	**7857**		**7858**		**Hayes**	
		ASY	**ASY**	**AUTO**	**ASY**	**AUTO**	**ASY**	**AUTO**
COM1 ASY	7857 (2)	OK	OK	-	OK	-	OK	-
	7858	OK	OK	-	OK	-	OK	-
	Hayes	OK	OK	-	OK	-	OK	-

Table 5. Modem Connections between a Remote Workstation and a Target Service Processor 7585

Service Processor		Remote Workstation (DCAF, Java)									
7585 Connection Type and Mode	Modem Type	MPA Card Connection			COM1 Port Connection						
		7855	7857	7858	7855	7857		7858		Hayes	
		SYNC			ASY	ASY	AUTO	ASY	AUTO	ASY	AUTO
COM1 ASY	7857(2)	-	-	-	OK	OK	-	OK	-	OK	-
	7858	-	-	-	OK	OK	-	OK	-	OK	-
	Hayes	-	-	-	OK	OK	-	OK	-	OK	-

Table 6. Modem Connections between a Remote Workstation and a Target Service Processor 3172

Service Processor		Remote Workstation (DCAF)									
3172 Connection Type and Mode	Modem Type	MPA Card Connection			COM1 Port Connection						
		7855	7857	7858	7855	7857		7858		Hayes	
		SYNC			ASY	ASY	AUTO	ASY	AUTO	ASY.	AUTO
MPA Card SYNC	7855	OK	OK	OK	-	-	OK	-	OK	-	OK
	7857 (1)	OK	OK	OK	-	-	OK	-	OK	-	OK
	7858	OK	OK	OK	-	-	OK	-	OK	-	OK
COM1 ASY	7857 (2)	-	-	-	OK	OK	-	OK	-	OK	-
	7858	-	-	-	OK	OK	-	OK	-	OK	-
	Hayes	-	-	-	OK	OK	-	OK	-	OK	-
MPA Card COM2	7857	-	-	-	OK	OK	-	OK	-	OK	-
	7858	-	-	-	OK	OK	-	OK	-	OK	-

Table 7. Modem Connections between a Remote Workstation and a Target Service Processor 9585 or 9577

Service Processor		Remote Workstation (DCAF)									
9577 or 9585 Connection Type and Mode	Modem Type	MPA Card Connection			COM1 Port Connection						
		7855	7857	7858	7855	7857		7858		Hayes	
		SYNC			ASY	ASY	AUTO	ASY	AUTO	ASY	AUTO
MPA Card SYNC	7855	OK	OK	OK	-	-	OK	-	OK	-	OK
	7857 (1)	OK	OK	OK	-	-	OK	-	OK	-	OK
	7858	OK	OK	OK	-	-	OK	-	OK	-	OK
	INT	OK	OK	OK	-	-	OK	-	OK	-	OK
COM1 ASY	7857 (2)	-	-	-	OK	OK	-	OK	-	OK	-
	7858	-	-	-	OK	OK	-	OK	-	OK	-
	Hayes	-	-	-	OK	OK	-	OK	-	OK	-

Notes for Tables 1 through 4:

1. 7857 at engineering change level not supporting autosync operation.
2. 7857 at engineering change level supporting autosync operation.

Service Processor Sharing and Use of Service Processor LAN

The service processor LAN must be used exclusively for communication between the Network Node Processors, 3746-9x0s, 3746 Multiaccess Enclosure, 3745 MOSS, and service processor.

Important

Connect user stations to the service processor LAN only in 3745 and 3746-900 configurations operating under the control of NCP. Do not attach any user stations to the service LAN of a 3746 equipped with an NNP. Service LAN problems may disrupt 3746 Network Node and IP router operations.

However, one or more remote consoles (OS/2 workstations running the Distributed Console Access Facility [DCAF]) can be used to reach the service processor through the service LAN (refer to "Remote Customer Consoles" chapter in the *3745/3746 Planning Series: Management Planning Guide*).

When sharing the service processor between several 3745s and 3746s, the following connections are allowed to the service processor LAN:

- Service processor
- Up to four 3745 Models A (their MOSS connections)
- One 3746 and its Network Node Processors and its Multiaccess Enclosure
- One 3746-900 without a NNP

Note: As a minimum requirement, a Service Processor (FC 5021) with a 64-MB Memory Expansion (FC 5027[14]) should be used for the correct operation of a multi-374x configuration.

The service processor access unit (SPAU) included with the service processor provides eight ports for the above connections. If more than eight ports are required, an IBM 8228 Multistation Access Unit can be connected to the SPAU. For example, this might be necessary to connect remote consoles to the service LAN, or implement the above maximum configuration including a back-up network node processor (ten ports are required).

Token-Ring LAN Bridges: If remote consoles are connected to your LAN, the communication with the service LAN must be made through a bridge and comply with the following requirements:

1. The bridge ***must*** be configured with the correct filters to prevent unnecessary traffic, such as "broadcast storms," from entering the service LAN. Such broadcast storms are usually produced by IP traffic.

   The bridge must forward only those frames that are explicitly addressed (no broadcast frames) to the service processors.

2. An incorrectly configured bridge on the service LAN can interfere with the operation of the network node processor and service processor. Among possible effects, such interference could:

   - Prevent the 3746 from completing its IML

[14] No longer available.

- Prevent the 3746 from performing the selective IML of a processor, for example, the IML of ESCON processors for which a host link (not a S/390 server link station) definitions has been modified or deleted
- Degrade the operation of the 3745 (as explained in "Unplugged Cables and Stations")

3. If a hub or LAN switch is used for communication between remote consoles and the service processors, the service processor access unit (SPAU) that forms the service LAN inside the controller expansion must be connected to the hub or LAN switch with the correct filter protection.

   Vital components of the 3746 (the CBSP3/TIC3, service processor, and network node processors) ***must never be directly*** connected to a hub because of the risk of accidental or unplanned disruption of the related cables. See "Unplugged Cables and Stations."

Unplugged Cables and Stations: Beaconing (resulting from removing a station or bridge) or unplugging the network node processor cable from the service LAN for a short time does not interfere with 3746 operations. The communication between the 3746 adapters and the network node processor is automatically reestablished. However, if these conditions last for more than about 2 minutes, the network node processor cannot reestablish contact with the 3746 adapters. Although established user sessions are not disturbed, network node operations degrade (refer to "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide*). To reestablish normal operation of the network node processor, it is necessary to re-IPL the network node processor. During the IPL, all traffic and sessions on the network node are halted.

Service Processor LAN Management Definition

If you want the service processor to report information to a LAN Manager or LAN Network Manager, then you must define the following parameter and record it on the worksheet on page 61:

C&SM LAN ID
Communications and System Management (C&SM) LAN ID is the value of the LAN NAME parameter in your LAN manager that identifies the locally administered service LAN containing the service processor node.

Defining the Service Processor LAN Address

Use the worksheet on page 61 to record the value of the following address:

Network adapter address
This is the locally administered address (LAA) of the service processor token-ring adapter. This address is also required for parameter definitions in the following programs:

- DCAF-controlling workstations (remote consoles) that are attached to the service LAN and operate under CM/2 or CS/2. Refer to the section on network adapter addresses in "Remote Customer Consoles" chapter in the *3745/3746 Planning Series: Management Planning Guide*.
- The ACF/VTAM® switched major node, if a DCAF workstation uses the SNA/subarea network to access the service processor.
- CCM, if the service processor is defined as an end node of the 3746 Network Node.

This address has 12 digits and must be unique among all other network locally administered addresses (LAAs) on the service LAN. Specify this address in the IBM Token-Ring Network format.

Defining the Service Processor in APPN/HPR or SNA/Subarea Network

Definitions are required for:

- MOSS-E to report hardware alerts to NetView and support **RUNCMD** commands from the NetView console (refer to the "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide* for more information).
- Customer consoles to remotely access the service processor using the Distributed Console Access Facility (DCAF) (refer to "Remote Customer Consoles" chapter in the *3745/3746 Planning Series: Management Planning Guide* for more information).

The service processor must be defined either as an end node of the 3746 network node or, if an SNA/subarea physical path exists, as an SNA/subarea physical unit (PU).

MOSS-E Parameters: Use the worksheet on page 61 to record the following parameter values for the definitions in the MOSS-E.

Network ID
Identifies the network to which the service processor node is connected. It has to be defined the same as the:

- VTAM parameter **NETIDX** in the "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide*.
- CCM parameter **Network identifier** on page 49, if the service processor is defined as an APPN network node.

Local node name
This identifies the service processor in the network and must be defined the same as the VTAM parameter **CPNAME** in "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide*.

The **Network ID** and **Local node name** values are 1 to 8 characters long and can include:

- Uppercase letters (A - Z)
- Digits (0 - 9), but it cannot start with a digit
- Dollar sign ($)
- At sign (@)
- Number sign (#)

SNA/Subarea

For an example of the service LAN connection SNA/subarea definitions in a 3745 or 3746-900, refer to the "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide*.

NCP and VTAM parameters

Refer to the NCP and VTAM definitions in the "3746 Management Overview" chapter and the "Remote Customer Consoles" chapter in the *3745/3746 Planning Series: Management Planning Guide*.

For more information about the required NCP and VTAM definitions, refer to the *3746 Nways Multiprotocol Controller Model 950: User's Guide*, SA33-0356.

Loading the Control Program (NCP)

Link IPL Ports: There are three types of links that can be used to initially load the control program (an NCP load module) directly in a 3745 CCU without using the 3745 MOSS disk:

3745 parallel channels
The parallel channels are link IPL ports by default.

3745 communication lines (SDLC)
To enable 3745 LSS and HSS lines as link IPL ports, use the MOSS link IPL ports (LKP) function at the service processor console.

3746-900 ESCON channels
To use ESCON channel adapters as link IPL ports, logical link stations must be defined as link IPL ports in the MOSS-E generation subset produced by the 3745 ESCON Generation Assistant or Controller Configuration and Management. The 3746-900 must be IPLed and running.

Note: The last adapter slot in the second expansion enclosure (address 3272) ***cannot*** be used as a link IPL port. For more information, refer to "ESCON Adapters" chapter in the *3745/3746 Planning Series: ESCON Channels*.

The load module can be saved on the MOSS disk after being loaded in the CCU using the SAVEMOD=YES option in the VTAM command. For this, there is no need to have an NCP load module running in the 3745 CCU.

Table 8 shows the maximum number of link IPL ports available in the single-CCU (Models 21A and 31A) and the twin-CCU (Models 41A and 61A) 3745s.

Table 8. Maximum Number of Link IPL Ports

IPL Port Type	Single-CCU Models	Twin-CCU Models	
		CCU A	CCU B
Parallel channel (3745)	16	8 (See Note 1)	8 (See Note 1)
SDLC communication line (3745)	8	8	8
ESCON stations per adapter	16	16 (See Note 2)	
Total ESCON stations	240	240 (See Note 2)	

Notes:

1. The figures for the twin-CCU models assume that both CCUs are active. Otherwise, use the single-CCU figures.
2. In the twin-CCU models with 3746-900 ESCON channels, the IPL link ports (logical link stations) can be distributed unequally between the two CCUs. Refer to the "ESCON Adapters" chapter in the *3745/3746 Planning Series: ESCON Channels*.

Fill out the table in "Link IPL Ports" on page 60 for the IBM service representatives to use during installation of your machines.

Link Types for Downloading NCP onto MOSS Disk: There are four types of links that can be used to nondisruptively download a new control program (a NCP load module) onto the MOSS disk when an NCP load module is already running the 3745:

1. 3745 communication line: SDLC, X.25 (NPSI), or frame relay
2. 3745 token-ring (TIC2)
3. 3746-900 communication line: SDLC, X.25 (NCP and NPSI) or frame relay
4. 3746-900 token-ring (TIC3).

The following procedure is recommended:

1. Download the NCP load module onto the MOSS disk using the VTAM command:

   MODIFY NET,LOAD,ID=NCPname,LOADMOD=modulename,ACTION=ADD/REPLACE

2. Load the NCP load module from the MOSS disk and activate it using the VTAM command:

   VARY NET,ACT,LOADFROM=EXT,LOAD=YES,ID=NCPname,RNAME=PUname.

If you transfer and activate a load module in a single command on any other line than a 3745 LSS or HSS line running SDLC, you have to wait for the load module to be downloaded onto the MOSS disk of the remote 3745 and then loaded from the disk to the 3745 CCU. Thus, the load takes about twice as long as on a 3745 LSS or HSS line running SDLC. Also, the actual activation of the remote load module occurs some time after the `VTAM IPL COMPLETE` message is displayed. For more information, refer to the *NCP, SSP, and EP Generation and Loading Guide*, SC31-6221.

Loading 3746 and Multiaccess Enclosure Microcode

The 3746 and the MAE do not have a 3745-type load module. However, similar to loading the 3745 microcode from the MOSS disk, the 3746 and MAE microcode is loaded from the service processor MOSS-E disk and MAE hard disk.

Automatic Dump/Load Options

These are the same as the MOSS Disk IPL Information (DII) function. Fill out the table in “Automatic Dump/Load Options” on page 61 for the IBM service representatives to use during installation of your machines.

NCP Dump Transfer

For the 3745 Models A, the NCP dumps are automatically stored on the service processor hard disk.

The VTAM command **F NET,DUMP,ID=...,ACTION=TRANSFER,...** can be used to send an NCP dump from the service processor to the S/390 server. There is also a MOSS-E function to transfer NCP dumps from the service processor hard disk to:

1. The S/390 server, over the SNA backbone. This function can be used instead of the VTAM command to significantly reduce the dump transfer time, especially when you have a large CCU storage.

   This method uses a 3270 terminal emulation on the service processor to transfer the dump file. You must provide a user ID on the S/390 server for the service processor and be logged on to the S/390 server before using this function.

   To use this method from a remote console you must open a DCAF session with the service processor.

2. A rewritable optical disk (optical cartridge) for transfer by hand or mailing to your software support center. When a dump is written to the optical disk it is not formatted. The formatting must be in the S/390 server.

NCP dumps should be processed quickly because:

1. The service processor hard disk can only hold one dump per CCU.
2. When there is already a dump on the hard disk, a new dump cannot be accepted. The information in the second dump will be lost.
3. If a dump remains on the disk for seven days, it will be ***automatically*** purged.

Note: The VTAM command **D NET DISK ...** should not be used on a 3745 disk immediately after a CCU dump. Until the dump is completely stored on the service processor hard disk, this command might give incorrect results.

Dump Transfer Parameters: Use the worksheet on page 61 to record the value of the following parameters in the service processor Communications Manager for the 3270 emulation session:

Destination address
This is the MAC address of the token-ring port (a TIC3 or TIC2) into the SNA network. It is available from your network administrator.

This may be the TIC3 of the CBSP. In this case, it is identical to the token-ring local address (MAC address) in "Definition of the 3746 Controller Address on the Service LAN (MOSS-E)" on page 49.

Long session/LU name
This is the session ID/LU name of the 3270 emulation.

The default is MOSSEEMU.

LU local address
03 or greater.

Note: The value of this parameter must be the same as the VTAM LU LOCADDR definition.

Required S/390 Server Program: The NCP Dump Transfer function uses one of the following programs, depending on the S/390 server operating system:

Operating System	Required Program
MVS with TSO/E	3270 PC File Transfer Program (FTP) Version 1 Release 1.1 (program number 5665-311)
VM/SP with CMS	3270 PC FTP Version 1 Release 1.1 (program number 5664-281)
MVS with CICS®	3270 PC FTP (program number 5798-DQH)
VSE	Either VSE/SP Independent Work Station (IWS) Support Version 3 Release 2.0 (program number 5666-345) or VSE/SP IWS Support Version 4 Release 1 (program number 5750-ABF).

VTAM Switched Major Node for Dump Transfers: The following switched major node definitions are for the PU and LU used to transfer the dumps:

```
MOSSE    PU   ADDR=04,PUTYPE=2,NETID=SYSTST,CPNAME=MOSSNMVT,        X
              MAXPATH=8,MAXDATA=265,MAXOUT=1,                       X
              DISCNT=NO
MOSSEEMU LU   LOCADDR=03,DLOGMOD=SNX32702
```

3746 Integration

Definition of the 3746 Network Node Name (CCM)

The 3746 with its NNP is known to the APPN/HPR network by the following CCM parameters:

Network identifier
Identifies the APPN/HPR network to which the 3746 Network Node is connected. This network identifier has to be defined the same as the:

- MOSS-E parameter **Network ID** on page 44.
- VTAM parameter **NETIDX** in the "3746 Management Overview" chapter in the *3745/3746 Planning Series: Management Planning Guide*.

IBM-registered network identifiers should have an 8-byte name with the structure *cceeeenn*, where:

- *cc* is the country code (according to ISO 3166)
- *eeee* is the enterprise code (unique within a country)
- *nn* is the network suffix code (unique within one enterprise).

Control point name
Identifies the NNP in the network.

Use the worksheet in "Definition of 3746 Network Node Name (CCM)" on page 62 to record these parameters.

Definition of the 3746 Controller Address on the Service LAN (MOSS-E)

The 3746-900 or 3746-950 connection to the service LAN (TIC3 of the CBSP2 or CBSP3) must be defined in the following MOSS-E parameter:

Token-ring local address (MAC address)
During an IML of the 3746, the service processor uses this MAC address to establish the communication with the CBSP2 or CBSP3 and to load the adapter microcode.

During activation of the 3746, the network node processor uses this MAC address to activate the TIC3 on the CBSP2 or CBSP3.

Note: If you find it necessary to change the token-ring local address after your controller is in operation, this will require a re-IML of the CBSP2 or CBSP3 and:

- Interruption of the NCP-controlled traffic between the 3745 CCU A and 3746-900.
- Interruption of all traffic controlled by the 3746 Network Node and IP router.

This could take some time, depending on the number of sessions that have to be restarted.

Use the worksheet “Definition of 3746 Controller Address on Service LAN (MOSS-E)” on page 62 to record these parameters including those of the second, non-network node 3746, if installed.

Service LAN IP Addresses (MOSS-E)

TCP/IP is used for communication between the 3745/3746 components connected to the service LAN. To enable this communication, as well as remote operator access to the service processor (Console for Java, DCAF over TCP/IP) or to the NNP (Telnet), you must define the following *IP addresses* in MOSS-E:

- Service processor
- NNP-A
- NNP-B
- 3746 (CBSP/TIC3)
- Multiaccess Enclosure

For a detailed description of the IP addressing system, refer to the “Internet Protocol (IP) Overview” chapter in the *3745/3746 Planning Series: ProtocolDescriptions*.

If the service LAN has no other TCP/IP connection, use the default values because they do not need to be unique worldwide.

Class C is the default IP address class (refer to “Internet Protocol (IP) Overview” chapter in the *3745/3746 Planning Series: ProtocolDescriptions*).

Use the worksheets “Definition of Service LAN IP Addresses” on page 62 to record the parameters shown in Table 9.

Table 9. Default Service LAN IP Addresses

Unit	**Default IP Address**
Service Processor	192.9.200.1
Network Node Processor-A	192.9.200.2
Network Node Processor-B	192.9.200.3
3746 (CBSP/TIC3)	192.9.200.4
3746 (Multiaccess Enclosure)	192.9.200.5

Configuration of 3746 Control Points

You can use the *3745/3746 Planning Series: CCM Planning Worksheets* located at:

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

to plan the definitions for the following:

- 3745 or 3746 machine identification
- APPN control point:
  - Network Node
  - Focal point
  - DLUR
- IP control point protocols:
  - IP
  - OSPF
  - RIP
  - BGP

– ARP

Telnet to NNP

Specific functions implemented on the 3746 Network Node are:

Direct Telnet access to NNP from any IP station
DCAF is not required on the remote station and there is no need to go through the service processor.

Service processor access to NNP
The MOSS-E function **IP Commands** (in the Network Node Processor (NNP) Management menu). provides Telnet access to the active NNP.

Remote console access to NNP
Using the Console for Java or DCAF console, you can use the MOSS-E to access the active NNP through Telnet.

Telnet Password Configuration: Telnet applications can be secured by a password. The **CCM/Telnet user profiles management** password management function available from the service processor Operations Management menu allows you to define, modify, and delete the Telnet user ID and password.

Note: The Telnet access and CCM passwords can have from 1 to 57 characters and consist of any combination of uppercase and lowercase characters, but it is recommended that you choose a password of 5 to 8 characters.

The default user ID is NNPIP and the default password 3746XOA.

The user ID and password are the same for both Telnet to the NNP and Telnet user access to the CCM. Multiple user IDs and passwords can be defined with different levels of access (view only, and so on).

Note: Deleting the password disables the Telnet function. These changes are dynamic for the 3746 operations, so there is no need to restart the 3746.

NNP Access Control: To enable users to Telnet to the NNP through a bridge or router to the service processor, the bridge or router access controls or filters must be configured to pass IP traffic to the NNP.

If Telnet traffic to the NNP goes through the 3746, the 3746 IP router must be configured to allow IP traffic to pass to the NNP.

If you want to restrict the access to the NNP to one station (or a limited number of stations), define the access as follows:

3746 with IP
The MOSS-E IP Access Control can be used to define the stations allowed to access the Telnet application of the 3746 network node.

Bridge
When using a bridge to access the service ring from a user (LAN), change the filtering to allow messages to the 3746 IP station to pass the bridge (in addition to the service processor messages).

Network Routing Protocol for Each Processor Type

The choice of the specific licensed internal code option (APPN/HPR, APPN/HPR and IP, or only the basic NCP support) is made at installation time. This selection can be changed later, but it requires a re-IML of the processors involved to load the updated licensed internal code configuration.

The options selected require certain features to be ordered:

- APPN/HPR requires the Network Node Processor (FCs 5022, 5122, or 5423)
- IP requires the IP Routing (FC 5033).

Because IP Routing requires APPN/HPR in the same processor, select both features for each category of processors that will be used for IP.[15]

Load only the code that is necessary for your network routing. This saves processor storage and maximizes processor connectivity (number of PUs, LU-LU sessions, and SDLC links) for APPN/HPR/DLUR.

Note: The 3746-950 minimum option is APPN/HPR for all processors. Use the worksheet on page 63 to record the options selected (none, APPN/HPR, or APPN/HPR with IP) for each type of processor. The following rules explain some of the restrictions on the options that you can select for each processors type:

CLP and CLP3

In the 3746-900, do not select any option if you:

- Do not need APPN/HPR or IP support on any CLP or CLP3
- But want to be able to connect up to 3000 active PUs and/or X.25 virtual circuits over a mix of frame-relay, X.25, and ISDN lines (LIC16[16]). With APPN/HPR, the maximum number of PUs is 1000 per CLP type 1.

CBTRP2 or CBTRT3

For a 3746-900 connected to a 3745 Model 41A or 61A, APPN/HPR (and IP) can be selected only if the TRP (CBTRP) connected to the CCU-B is a type 2 or 3.

A CBTRP type 1 can be loaded only with the basic NCP support.

TRP2 and TRP3

For a 3746-900 with TRPs type 1, only the basic NCP support is loaded in the TRP1s.

ESCP2 and ESCP3

For a 3746-900 with ESCPs type 1, only the basic NCP support is loaded in the ESCP1s.

Passwords

The MOSS-E functions are organized in menus for:

- 3745 and 3746 functions for operations (customer functions) and service (maintenance functions)
- Service processor operator and maintenance functions.

All menus are accessed from the first panel displayed by the MOSS-E, the MOSS-E View panel. Examples of customer functions are Display Active Configuration and Manage Disks and Databases. Examples of maintenance functions are Trace Adapters and Display Files.

---

[15] All processors of the same category are loaded with the same options.

[16] No longer available.

A group of six passwords can be used to secure access to customer and maintenance functions on the MOSS-E menus.

Use the worksheet on page 63 to record the new passwords.

Controller customer password: Provides access to the operator functions in the 3735 and 3746 menus. It should be assigned to the first-level operator.

Controller maintenance password: Provides access to the operator and maintenance functions in the 3745 and 3746 menus. It should be assigned to IBM Service.

Service processor customer password: Provides access to all operator functions in both the service processor and in all controllers attached to the service processor. It should be assigned to the operations supervisor and system programmer.

Service processor maintenance password: Provides access to all functions in both the service processor and in all controllers attached to the service processor. Use care in the distribution of this password. IBM requires this password for service.

Management password: Provides access to the password management function in the service processor menu. Use care in the distribution of this password.

The passwords are from 5 to 8 alphanumeric characters long.

Telnet password: Provides Telnet access to 3746 from the service processor or any IP station, see "Telnet to NNP" on page 51.

MOSS-E Password Organization

Table 10 summarizes the password organization and the access they provide to the different types of MOSS-E functions.

Table 10. MOSS-E Password Modes

Password Modes	3745 and 3746 Menus		Service Processor Menu		
	Operator Functions	Maint Functions	Operator Functions	Maint Functions	Password Mgt
Controller customer	X				
Controller maintenance	X	X			
Service processor customer	X		X		
Service processor maintenance	X	X	X	X	
Management password					X
Telnet password			X		X

Legend:

Mgt Management
Maint Maintenance

The controller customer and maintenance passwords provide access to all controllers attached to a service processor (see Figure 4 on page 54).

The service processor customer and maintenance passwords provide access to all controllers and the service processor.

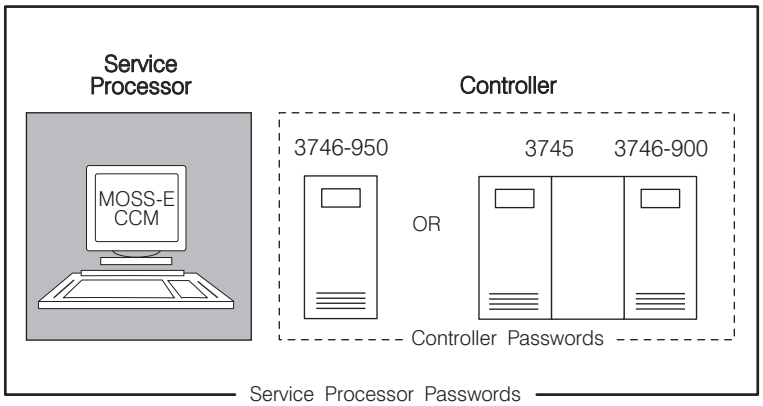


Figure 4. Controller and Service Processor Passwords

Default Passwords

The factory default value (IBM3745 in either uppercase or lowercase letters) is the same for all five passwords. Changing the default passwords is optional. If you decide not to change the default password, you will be able to log on only in the service processor maintenance mode. This means that:

- You will have access to ***all*** functions on ***all*** the MOSS-E menus.
- The logon attempt threshold counter cannot be reset.

IBM recommends that the default passwords always be changed (using the Manage Passwords MOSS-E function.)

When you change the passwords, you can change some and leave others with the default value.

Maintenance Password Status

For the maintenance passwords,you can set the number of times the MOSS-E can be accessed using the password:

Permanent Allows an unlimited number of accesses. This is the default value.
Temporary Allows only one access.
Deactivated Prevents any access.

Logon Attempt Threshold

You can set a threshold defining the number of times that an incorrect password can be tried before access to a menu is blocked.

When access is blocked, use the service processor maintenance password and the management password function to reset the logon attempt counter.

Note: If you are using the default passwords, you cannot reset it.

Restoring Passwords

If the service processor maintenance or management password has been forgotten, then all passwords must be restored to their default values using the Restore Passwords MOSS-E function. During the password restoration procedure, the service processor installation diskette is required.

Service Processor and NNP Configuration Requirements

| Table 11 on page 56 shows the 3745/3746 configurations of all SP types. Table 12 on page 57 shows
| the supported 3745/3746 configurations of all NNP types. The notes for both Table 11 on page 56 and Table 12 appear at the end of Table 12 on page 57.

For an exhaustive validation of the service processor and network node processor configurations, use the PC3745 capacity planning tool.

Table 11. 3745/3746 Service Processor Requirements

Configuration includes:	#5020(15) SP Type 1 (9577) 486-33 MHz	#5021(15) SP Type 1 (9585) 486-66 MHz	#5021(15) SP Type 1 (3172) PN41H7520 486-66 MHz	#5021(15) SP Type 1 (3172) PN55H7630 P-90 MHz	#5052(15) SP Type 2 (7585) P-200 MHz	#5053(15) SP Type 3 #5050(15) SP upgrade to Type 3 (6275) P-350/450 MHz	#5054 SP Type 4 #5450 SP upgrade to Type 4 (6563) P-533 MHz (6578) P-933 MHz
Java Console support (#5801) (3745 with or without a 3746-900)	No	No	No	#5028 (1) #5051 (1) No (2)	Yes	Yes	Yes
3745/6 (14) without any of the options listed in this column	No (2)	No (2)	No (2)	No (2)	Yes	Yes	Yes
Processor Type 3: #5123, #5203, #5523, #5623, processor upgrade to Type 3	No (3, 2)	No (3, 2)	No (3, 2)	No (3, 2)	Yes	Yes	Yes
2nd Expansion Enclosure (#5016)	No (2)	#5028 (1) No (2)	#5028 (1) No (2)	#5028 (1) No (2)	Yes	Yes	Yes
SP sharing between multiple 3745/3746s	No (2)	#5028 (1) No (2)	#5028 (1) No (2)	#5028 (1) No (2)	Yes	Yes	Yes
IP (#5033), X.25 (#5030)	#5026 (1) No (2)	No (2)	No (2)	No (2)	Yes	Yes	Yes
NNP Type 4 (#5424, #5448)	No	No	No	No	Yes	Yes	Yes
NNP Type 5 (#5425, #5427)	No	No	No	No	Yes	Yes	Yes
NNP3 Memory Expansion (#5047)	No	No	No	No	Yes	Yes	Yes
NNP4 Memory Expansion (#5447)	No	No	No	No	Yes	Yes	Yes
APPN/DLUR (4)	#5026 (1) No (2)	No (2)	No (2)	No (2)	Yes	Yes	Yes
APPN/DLUR(5) (6) (part of #5810/#5811)	No	No	No	#5028 (1) #5051 (1) No (2)	Yes	Yes	Yes
APPN/DLUR (7) (5) (part of #5812/#5813)	No	No	No	No	No	Yes	Yes
Extended Function 2 (#5802) Extended Function 4 (#5810/5811)	No	No	No	No	Yes	Yes	Yes
Extended Function 5 (#5812)	No	No	No	No	No	Yes	Yes
Extended Function 6 (#5813)	No	No	No	No	No	Yes	Yes
MAE (#3000) (8)	No	#5026 (9) #5028 (9) #5051 (9)	#5028 (9) #5051 (9)	#5028 (9) #5051 (9)	Yes	No	No
MAE (#3001) (8)	No	No	No	No	Yes	Yes	Yes

Table 12 on page 57 shows the supported 3745/3746 configurations of all NNP types.

Table 12. 3745/3746 Network Node Processor Requirements

Configuration includes:	#5022(15) NNP Type 1 (3172) P-90 MHz	#5122(15) NNP Type 2 (7585) P-200 MHz	#5423(15) NNP Type 3 #5049(15) NNP upgrade to Type 3 (6275) P-350/450 MHz	#5424(15) NNP Type 4 #5448(15) NNP upgrade to Type 4 (6563) P-533 MHz	#5425 NNP Type 5 #5427 NNP upgrade to Type 5 (6578) P-933 MHz
Java Console support (#5801) (3745 with or without a 3746-900)	NNP not required	NNP not required	NNP not required	NNP not required	NNP not required
3745/6(14) without any of the options listed in this column	NNP required only for 3746-950	NNP required only for 3746-950	NNP required only for 3746-950	NNP required only for 3746-950	NNP required only for 3746-950
Processor Type 3: #5123, #5203, #5523, #5623, processor upgrade to Type 3	NNP not required	NNP not required	NNP not required	NNP not required	NNP not required
2nd Expansion Enclosure (#5016)	NNP not required	NNP not required	NNP not required	NNP not required	NNP not required
SP sharing between multiple 3745/3746s	NNP not required	NNP not required	NNP not required	NNP not required	NNP not required
IP (#5033), X.25 (#5030)	Yes	Yes	Yes	Yes	Yes
NNP Type 4 (#5424, #5448)	No	#5037 #5027 (10)	Yes	Yes	No
NNP Type 5 (#5425, #5427)	No	No	#5047	#5447	Yes
NNP3 Memory Expansion (#5047)	No	No	#5047	#5447	
NNP4 Memory Expansion (#5447)	No	No	#5047	#5447	
APPN/DLUR More than 3000 PUs or 9000 LU-LU sessions (Up to 5000/15 000) under NNP control	#5027 (11)	#5037 #5027 (10) (11)	Yes	Yes	Yes
APPN/DLUR (part of #5810/#5811) (5) More than 15,000 (up to 30,000) LU-LU sessions through the NN More than 15,000 (up to 30,000) SSCP-LU sessions controlled by the NNP/DLUR	No	#5037 #5027 (10) (11)	Yes (11)	Yes (11)	Yes
APPN/DLUR (part of #5812) (5) More than 15,000 (up to 20,000) LU-LU sessions controlled by the NNP (total of 35,000 LU-LU sessions through the 3746 NN) More than 30,000 SSCP-LU sessions (up to 60,000) controlled by the NNP/DLUR	No	No	#5047 (11)	#5447 (11)	Yes
APPN/DLUR (part of #5813) (5) More than 20,000 (up to 30,000) LU-LU sessions controlled by the NNP (total of 45,000 LU-LU sessions through the 3746 NN) More than 60,000 SSCP-LU sessions (up to 80,000) controlled by the NNP/DLUR	No	No	#5047 (11)	#5447 (11)	Yes
Extended Function 2 (#5802) Extended Function 4 (#5810/5811)	No (12)	Yes (13)	Yes (13)	Yes (13)	Yes (13)
Extended Function 5 (#5812)	No (12)	No (12)	Yes (13)	Yes (13)	Yes (13)
Extended Function 6 (#5813)	No (12)	No (12)	Yes (13)	Yes (13)	Yes (13)
MAE (#3000) (8)	Yes	Yes	No	No	No
MAE (#3001) (8)	Yes	Yes	Yes	Yes	Yes

Notes for Tables 1 and 2:

1. No longer available. Order SP upgrade to Type 4 (#5450) instead.
2. This SP type/configuration is no longer supported for new installations of the hardware or feature identified in the first column. The SP must be upgraded to Type 4 (#5450).
3. If a TRP3, ESCP3, CLP3 (#5203, #5523, #5623), or a processor upgraded to TRP3, ESP3, CLP3, or CBSP3 is already installed, the service processor upgrade to Type 4 (#5450) is not required for the installation of an additional processor Type 3 or processor upgrade to Type 3.
4. More than 3000 PUs or 9000 LU-LU sessions (up to 5000 PUs/15000 LU-LUs) under NNP/DLUR control.
5. Also requires CBSP3 in base 3746 (#9023) or CBSP3 upgrade (#5123).
6. More than 15 000 (up to 30 000) LU-LU sessions through the 3746 NN. More than 15,000 (up to 30,000) SSCP-LU sessions controlled by the NNP/DLUR.
7. More than 15,000 (up to 30,000) LU-LU sessions controlled by the NNP (out of a total of 45,000 LU-LU sessions through the 3746 NN). More than 30,000 SSCP-LU sessions (up to 80,000) controlled by the NNP/DLUR.
8. MAE #3000 and MAE #3001 are no longer available. If MAE #3000 is installed, it must be upgraded to MAE #3001 to enable the installation of MAE features (adapter features, memory features, TN3270e Server feature) and features that cannot coexist with MAE #3000 (#5047, #5049, #5050, #5053, #5054, #5423, #5424, #5425, #5427, #5448, #5450, #5801, #5802, #5810, #5811, #5812, and #5813).
9. This SP type/configuration must be upgraded to SP Type 4 (#5450) when the MAE #3000 is upgraded to MAE #3001.
10. Memory expansion #5027 is no longer available on #5122. Order memory expansion #5037 instead.
11. For validation of NNP type/storage required to support specific quantities of PUs (depending on PU types: EN/NNs, PU2/LEN), and quantities of LU-LU sessions and SSCP-LU sessions, use the PC3745 capacity planning tool.
12. This NNP is supported **only** for the NNP-independent functions (mainly NCP function) included in Extended Functions 5 and 6.
13. NNP is not required for NNP-independent functions (mainly NCP function). For more than 15,000 LU-LU sessions or 15,000 SSCP-LU sessions, see the corresponding row.
14. This includes the following types and models for the 3745 and 3746:
    - New 3745 (Models 17A, 31A, or 61A)
    - New 3746 (Models 900 or 950)
    - 3745 model conversion to 17A
    - 3745 Model 210 or 310 conversion to 31A
    - 3745 Model 210, 310, 410, or 610 conversion to 61A
15. No longer available

Appendix A. MOSS-E Worksheets for Controller Installation

Complete these sheets and give them to:

- The IBM service representative (the MOSS-E parameters are needed during controller installation)
- The person doing additional controller configuration using the *IBM 3745 Communication Controller All Models, IBM 3746 Nways Multiprotocol Controller Connection and Integration Guide*.

When applicable, default parameter values are included (in parentheses) in the tables of this appendix.

Controller Integration

The following parameters are discussed in “Controller Integration” on page 37.

Controller Names

Controller	Name

Set Power-On Schedule

Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Scheduling active	

MOSS-E Database Optimization

Optimize database	(Daily)
If Weekly: Day of the week	
Time	(00:00)

Link IPL Ports

These parameters are discussed in “Loading the Control Program (NCP)” on page 44.

For detailed information about the link IPL ports, refer to the *3745 Advanced Operations Guide*, SA33-0143.

Make a copy of this page for each 3745 IPL port that you define.

Table 13. Initial Parameters	
Line address	
Direct attach or External clock	

Table 14. For TSS Lines with the External Clock Option		
	External Clock	**Direct Attach**
Duplex or Half-duplex		
Enable timer		
Transmit two flags		
NRZI		---
Switched line		---
Answer tone		---
Transmit flags between frames		
DX facility		
Ring indicator		---
Echo mode		---
Data rate		---
External line speed		---
Direct attach speed	---	

Table 15. For HPTSS Lines	
Enable timer	
Reply timer	
NRZI	
Transmit two flags	
Transmit flags between frames	
Echo mode	

Parameters Common to All Types of IPL Link Ports

Table 16. Common IPL Port Parameters	
SDLC controller address	
Disable timer	
Link activity timer	

Automatic Dump/Load Options

These parameters are the same as in the MOSS Disk IPL Information (DII) function.

CCU A Auto dump/load	
CCU A Active load module	
CCU B Auto dump/load	
CCU B Active load module	

NCP Dump Transfer

The following parameters are discussed in “Dump Transfer Parameters” on page 48.

Destination address	
Long session/LU name	(MOSSEEMU)
LU local address	(03 or greater)

Service Processor Integration

Definition of Service Processor LAN Address

The following parameter is discussed in “Defining the Service Processor LAN Address” on page 43.

Network adapter address	

Service Processor LAN Management Definition

The following parameter is discussed in “Service Processor LAN Management Definition” on page 43.

C&SM LAN ID	(MOSSE)

Definition of the Service Processor

The following parameters are discussed in “Defining the Service Processor in APPN/HPR or SNA/Subarea Network” on page 44.

Network ID	(SYSTSTAP)
Local node name	(MOSSNMVT)

3746 Integration

Definition of 3746 Network Node Name (CCM)

The following parameter is discussed in “Definition of the 3746 Network Node Name (CCM)” on page 49.

Table 17. 3746 Network Node Name	
Network identifier	
Control point name	

Definition of 3746 Controller Address on Service LAN (MOSS-E)

The following parameter is discussed in “Definition of the 3746 Controller Address on the Service LAN (MOSS-E)” on page 49.

Token-ring local address (MAC address)	

Definition of Service LAN IP Addresses

The following parameter is discussed in “Service LAN IP Addresses (MOSS-E)” on page 50.

Table 18. For the Service Processor	
IP address	(192.9.200.1)
Subnet mask	(255.255.255.240)

Table 19. For the Network Node Processor Models A	
IP address	(192.9.200.2)
Subnet mask	(255.255.255.240)

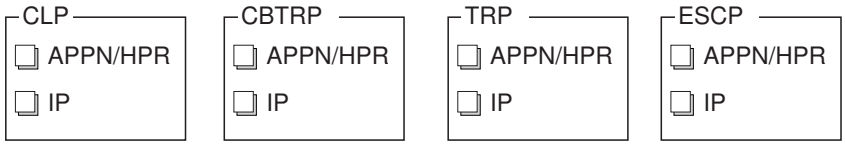
Table 20. For the Network Node Processor Model B	
IP address	(192.9.200.3)
Subnet mask	(255.255.255.240)

Table 21. For the (CBSP/TIC3)	
IP address	(192.9.200.4)
Subnet mask	(255.255.255.240)

Table 22. For the (MAE)	
IP address	(192.9.200.5)
Subnet mask	(255.255.255.240)

Network Routing Protocol for Each Processor Type

The following parameters are discussed starting on page 52. Select a routing protocol for each type of processor that you have.



Password

The following parameters are discussed in “Passwords” on page 52.

Table 23. Service Processor Passwords

Mode	Password	Status	Attempts Threshold
Controller customer	IBM3745	---	
Controller maintenance	IBM3745	(Permanent)	
Service processor customer	IBM3745	---	
Service processor maintenance	IBM3745	(Permanent)	
Management password	IBM3745	---	

Appendix B. Parameter Cross-Reference Table

Table 24 displays the parameters that must be configured with the same values for multiple system definitions. Space is provided in each parameter box to record the actual values that you use.

Table 24 (Page 1 of 2). Identical Parameter List

MOSS-E	NCP	IOCP	VTAM	CCM
Long session ID/LU name	None	None	LU statement label	None
LU local address	None	None	LU LOCADDR	None
Network ID See pages 44 and the "Remote Customer Consoles" chapter in *3745/3746 Planning Series: Management Planning Guide*, GA27-4239.	None	None	PU NETID	Network identifier See pages 49 and the "3746 Management Overview" chapter in *3745/3746 Planning Series: Management Planning Guide*, GA27-4239.
Local node name See pages 44 and the "Remote Customer Consoles" chapter in *3745/3746 Planning Series: Management Planning Guide*, GA27-4239.	None	None	PU CPNAME	None
Token-ring local address (MAC address) See page 49. LAN destination address Refer to "3746 Management Overview" chapter in *3745/3746 Planning Series: Management Planning Guide*, GA27-4239.	LINE LOCADD	None	None	None
Network adapter address See page 43 and "Remote Customer Consoles" chapter in *3745/3746 Planning Series: Management Planning Guide*, GA27-4239.	None	None	None	None

Table 24 (Page 2 of 2). Identical Parameter List

MOSS-E	NCP	IOCP	VTAM	CCM
Unit address	PU ADDR	CNTLUNIT UNITADD IODEVICE UNITADD	None	None
ESCC address	LINE ADDRESS	None	None	None
Partition number	None	RESOURCE PARTITION CHPID PARTITION IODEVICE PART	None	None
Control unit link address	None	CNTLUNIT LINK	None	None
Hostlink Refer to “ESCON Adapters” chapter in *3745/3746 Planning Series: ESCON Channels*, GA27-4237.	LINE HOSTLINK	None	None	None

Appendix C. 3746-9x0 Licensed Internal Code Levels

This appendix lists the engineering change (EC) levels of the 3746 Models 900 and 950 Licensed Internal Code (LIC) and describes the functions supported at each level. If necessary, your IBM representative can obtain an updated list.

Pay particular attention to the prerequisites and corequisites in your planning.

Important: The Licensed Internal Code optional feature codes (FCs) must be ordered to get the necessary installation passwords for the MOSS-E and to operate any of the related functions.

For more detailed information, refer to the *3745 Communication Controller Models A and 170, 3746 Nways Multiprotocol Controller Models 900 and 950: Overview*, GA33-0180.

Table 25. EC Level for Supported LIC Options

Feature Name	Feature Code	EC Level (See note)
X.25 Support	5030	D22560D (NCP)
3746 IP routing	5033	D46100A
3746 Extended Functions 1	5800[17]	D46130I
MAE Extended Functions 1	5804[17]	F12380
3746 Extended Functions 2	5802	F70090[18]
MAE Extended Functions 2	5805[17]	F12380C
TN3270E Server	5806	F12380C
3746 Extended Functions 3	5801[17]	F12720_
MAE Extended Functions 3	5807[17]	F12720_
3746 and MAE Extended Functions 4	5810	F64810_[19]
Update from Extended Functions to 3746 and MAE Extended Functions 4	5811	F64810_[19]
3746 Extended Function 5	5812	H10000[19] and H10010[20]
3746 Extended Functions 6	5813	H10030[19] and H10040[19]

Note: The EC level given is the earliest that supports the FC. In general, later EC levels continue the support.

The following list describe the functional levels of microcode, starting with the most recent. For each level, only the new supported functions are indicated. Unless otherwise stated, each level supports the functions of all the earlier EC levels.

[17] No longer available. Order instead FC 5810 or 5811.

[18] Upper EC level is H10010_.

[19] EC level if configuration does not include FC 5802.

[20] EC level if configuration includes FC 5802.

The EC number indicated for a given ECA number reflects the technical level of the microcode at the availability date of the ECA. The alphabetic index (A, B,...) at the end of the EC number changes (A → B...) when a new technical level starts shipping.

Starting with EC level D46130, the active microcode ECA and EC numbers of the 3746-9x0s connected to the service processor can be displayed at the MOSS-E console.

To upgrade a 3746

To upgrade a 3746 to the latest functional level of code, order FC 5812, FC 5813, and either FC 5810 or, if FC 5800 or 5804 is installed, FC 5811.

Note: All dates in the following EC descriptions are in the format mm/dd/yy.

EC Level H10040 (ECA number 380)

Availability: 10/17/01

Only for 3746s configured with FC 5802 (for 3746s configured without FC 5802, see EC H10030)

Shipped on CD-ROM only and operates with:

- Service Processor Type 2 - 7585 (FC 5052)
- Service Processor Type 3 - 6275 (FC 5053)
- Service Processor upgraded to Service Processor Type 3 - 6275 (FC 5050)
- Service Processor Type 4 - 6563, 6578 (FC 5054)
- Service Processor upgraded to Service Processor Type 4 - 6563, 6578 (FC 5450)

For Service Processors with Optical Disk drive: see ECA 183

For Service Processors (Types 9585 and 3172) with optional CD-ROM drive (FC 5051), and for 3746s with MAE 3000: see ECA 178

The new functional enhancements supported by this EC level are available by ordering FC 5813. FC 5813 is supported only on Service Processors Type 3 and Type 4 and Network Node Processors Type 3, Type 4, and Type 5.

Feature 5813 (3746 Extended Functions 6) contents:

1. Network and systems management
   - NetView - new RUNCMD commands
   - NetView Performance Reporting (NPM)
     - Reporting of the Network Node Processor utilization (processor, memory)
     - Reporting of processor and memory utilization through the NNP for all the adapter processors (CBSP, ESCP, TRP, CLP)
   - VTAM - DeactPU and DeactLU commands support by the NNP
   - Controller Configuration and Management (CCM) - New commands
   - Telnet session awareness
   - Problem reporting enhancements
2. APPN/HPR and Dependent LU Requester (DLUR)

- 30,000 LU-LU data sessions controlled by the NNP Type 4 or Type 5, instead of 20,000. The total number of LU-LU sessions that can be routed through the 3746 is now 45,000 including the intermediate sessions established by other network nodes.
- 80,000 SSCP-LU control sessions established through DLUR running in the NNP Type 4 or Type 5, instead of 60,000
- Branch Extender* - User option to operate the 3746 as a Branch Extender node
- Adaptive Rate-Based Flow and Congestion Control* - (ARB2) also called responsive mode
- APPN/DLUR support of existing NCP functions (migration to 3746/NNP control)
  - Connect multiple LEN nodes having the same CP name
  - Support of LU-LU sessions that do not have pacing
  - Include Link Station name (or PU name) in XID3 frame

3. IP
   - Same subnet option (multiple IP ports to the same subnet [OSPF])
   - NextHop Awareness - NextHop Awareness allows the router to sense whether a neighboring router is active or inactive. NextHop Awareness is supported on Frame Relay and ESCON ports.
   - Not-So-Stubby-Area (NSAA) (OSPF) - Allows for External Route Aggregation and reduced Route Table Size, specifically in OS/390 (TCP/IP)

* Supported only by EC=H10040_, that is configurations including Feature 5802, 3746 Extended Functions 2

EC level H10030 (ECA number 330)

Availability: 10/17/01

Only for 3745s/3746s without FC 5802 (for 3746s configured with FC 5802, see EC H10040).

Shipped on CD-ROM only and operates with:

- Service Processor Type 2 - 7585 (FC 5052)
- Service Processor Type 3 - 6275 (FC 5053)
- Service Processor upgraded to Service Processor Type 3 - 6275 (FC 5050)
- Service Processor Type 4 - 6563, 6578 (FC 5054)
- Service Processor upgraded to Service Processor Type 4 - 6563, 6578 (FC 5450)

For Service Processors with Option Disk drive: see ECA 183

For Service Processors (types 9585 and 3172) with optional CD-ROM drive (FC 5051, and for 3746s with MAE 3000: see ECA 178

The new functional enhancements supported by this EC level are available by ordering FC 5813. FC 5813 is supported only on Service Processors Type 3 and Type 4 and Network Node Processors Type 3, Type 4, and Type 5.

Feature 5813 (3746 Extended Functions 6) contents:

1. Network and systems management
   - NetView - new RUNCMD commands

- NetView Performance Reporting (NPM)
  - Reporting of the Network Node Processor utilization (processor, memory)
  - Reporting of processor and memory utilization through NNP for all the adapter processors (CBSP, ESCP, TRP, and CLP)
- VTAM - DeactPU and DeactLU commands support by the NNP
- Controller Configuration and Management (CCM) - New commands
- Telnet session awareness
- Problem reporting enhancements

2. APPN/HPR and Dependent LU Requester (DLUR)
   - 30,000 LU-LU data sessions controlled by the NNP Type 4 or Type 5, instead of 20,000. The total number of LU-LU sessions that can be routed through the 3746 is now 45,000 including the intermediate sessions established by other network nodes.
   - 80,000 SSCP-LU control sessions established through DLUR running in the NNP Type 4 or Type 5, instead of 60,000
   - Branch Extender* - User option to operate the 3746 as a Branch Extender node
   - Adaptive Rate-Based Flow and Congestion Control* - (ARB2) also called responsive mode
   - APPN/DLUR support of existing NCP functions (migration to 3746/NNP control)
     - Connect multiple LEN nodes having the same CP name
     - Support of LU-LU sessions that do not have pacing
     - Include Link Station name (or PU name) in XID3 frame
3. IP
   - Same subnet option (multiple IP ports to the same subnet [OSPF])
   - NextHop Awareness - NextHop Awareness allows the router to sense whether a neighboring router is active or inactive. NextHop Awareness is supported on Frame Relay and ESCON ports.
   - Not-So-Stubby-Area (NSAA) (OSPF) - Allows for External Route Aggregation and reduced Route Table Size, specifically in OS/390 (TCP/IP)

* Supported only by EC=H10040_, that is configurations including Feature 5802, 3746 Extended Functions 2

EC level H10000B (ECA number 252)*

* ECA number for maintenance of 374x with CD-ROM (FC 5802 not present)

Availability: 07/01 (replaced by EC H10030 - ECA 330 as of 10/17/01)

For details, see ECA 250.

EC level H10010A (ECA number 281)*

* ECA number for maintenance of 374x with CD-ROM (FC 5802 installed)

Availability: 03/01 (replaced by EC H10040 - ECA 380 as of 10/17/01)

For details, see ECA 280.

EC level H10000A (ECA number 251)*

*ECA number for maintenance of 374x with CD-ROM

Availability: 03/01 (replaced by ECA 252 as of July 2001)

For details, see ECA 250.

EC level D46130O (ECA number 183)*

* ECA number for maintenance of 374x with Optical Disk Drive

Availability: 10/00 (replaces ECA 173)

For details, see ECA 171.

EC level H10010 (ECA number 280)

Availability: 09/15/00 (replaced by EC H10010A - ECA 281)

Shipped on CD-ROM only (for 3746s with FC 5802) and operates with:

- Service Processor Type 2 - 7585 (FC 5052)
- Service Processor Type 3 - 6275 (FC 5053)
- Service Processor Type 4 - 6563, 6578 (FC 5054)
- Service Processor upgraded to Service Processor Type 3 - 6275 (FC 5050)
- Service Processor upgraded to Service Processor Type 4 - 6563, 6578 (FC 5450)

For Service Processors with Optical Disk drive: see ECA 173. For Service Processors (types 9585 and 3172) with optional CD-ROM drive (FC 5051), and for 3746s with MAE 3000: see ECA 178.

The new functional enhancements supported by this EC level are available by ordering FC 5812. FC 5812 is supported only on Service Processors Type 3 and Type 4.

Feature 5812 (3746 Extended Functions 5) contents:

- 60 000 SSCP-LU control sessions with Network Node Processor Type 3 (NNP3), Network Node Processor Type 4 (NNP4), or Network Node Processor Type 5 instead of 40 000 (only with EC=H10000_, that is for configurations without Feature 5802, 3746 Extended Functions 2)
- 20 000 LU-LU data sessions controlled by NNP3, NNP4, and NNP5, instead of 15 000, out of a total of 35,000 sessions routed through the 3746 Network Node (only with EC=H10000_, that is for configurations without Feature 5802, 3746 Extended Functions 2)
- 4000 Physical Units (PUs) on Token-Ring Processor Type 3 (TRP3), instead of 3000
- 10 000 IP routes on Controller Bus and Service Processor Type 3 (CBSP3), instead of 7500
- 10 000 OSPF external routes on CBSP3, instead of 7500

- Faster file transfers with increased IP throughput through the ESCON Processor Type 3
- Faster recovery from network problems with dynamic windowing on TRP3
- Easier network definitions (such as discovery of Low Entry Networking (LEN) nodes)
- Ability to use a text editor (such as Windows or OS/2) to complete or update 3746 configuration definitions
- New RUNCMD commands to manage the 3746 from NetView
- Capability to dynamically tune the new dynamic windowing mechanism of NCP and NNP to more efficiently regulate traffic over TRP3 ports

EC Level H10000 (ECA number 250)

Availability: 09/15/00 (replaced by EC H1000A - ECA 251).

Shipped on CD-ROM only (for 3745s/3746s without FC 5802) and operates with:

- Service Processor Type 2 - 7585 (FC 5052)
- Service Processor Type 3 - 6275 (FC 5053)
- Service Processor Type 4 - 6563, 6578 (FC 5054)
- Service Processor upgraded to Service Processor Type 3 - 6275 (FC 5050)
- Service Processor upgraded to Service Processor Type 4 - 6563, 6578 (FC 5450)

For Service Processors with Optical Disk drive: see ECA 173. For Service Processors (types 9585 and 3172) with optional CD-ROM drive (FC 5051), and for 3746s with MAE 3000: see ECA 178.

The new functional enhancements supported by this EC level are available by ordering FC 5812. FC 5812 is supported only on Service Processors Type 3 and Type 4.

Feature 5812 (3746 Extended Functions 5) contents:

- 60 000 SSCP-LU control sessions with Network Node Processor Type 3 (NNP3), Network Node Processor Type 4 (NNP4), or Network Node Processor Type 5 instead of 40 000 (only with EC=H10000_, that is for configurations without Feature 5802, 3746 Extended Functions 2)
- 20 000 LU-LU data sessions controlled by NNP3, NNP4, and NNP4, instead of 15 000, out of a total of 35 000 sessions routed through the 3746 Network Node (only with EC=H10000_, that is for configurations without FC 5802, 3746 Extended Functions 2).
- 4000 Physical Units (PUs) on Token-Ring Processor Type 3 (TRP3), instead of 3000
- 10 000 IP routes on Controller Bus and Service Processor Type 3 (CBSP3), instead of 7,500
- 10 000 OSPF external routes on CBSP3, instead of 7500
- Faster file transfers with increased IP throughput through the ESCON Processor Type 3
- Faster recovery from network problems with dynamic windowing on TRP3

- Easier network definitions (such as discovery of low-entry networking [LEN] nodes)
- Ability to use a text editor (such as Windows or OS/2) to complete or update 3746 configuration definitions
- New RUNCMD commands to manage the 3746 from NetView
- Capability to dynamically tune the new dynamic windowing mechanism of NCP and NNP to more efficiently regulate traffic over TRP3 ports

EC Level F70090

Availability: 10/29/99 (replaced by ECA 280 as of 09/15/00).

Shipped on CD-ROM only and operates with:

- Service Processor Type 2 - 7585 (FC 5052)
- Service Processor Type 3 - 6275 (FC 5053)
- Service Processor upgraded to Service Processor Type 3 - 6275 (FC 5050)

For Service Processors with Optical Disk drive: see ECA 173.

For Service Processors (types 9585 and 3172) with optional CD-ROM drive (FC 5051), and for 3746s with MAE 3000: see ECA 178.

The new functional enhancements supported by this EC level are available by ordering FC 5802.

EC Level F64810 (ECA number 190)

Availability: 07/30/99 (replaced by ECA 250 as of 09/15/00).

Shipped on CD-ROM only and operates with:

- Service Processor Type 2 - 7585 (FC 5052)
- Service Processor Type 3 - 6275 (FC 5053)
- Service Processor upgraded to Service Processor Type 3 - 6275 (FC 5050)

For Service Processors with Optical Disk drive: see ECA 173. For Service Processors (types 9585 and 3172) with optional CD-ROM drive (FC 5051), and for 3746s with MAE 3000: see ECA 178.

The new functional enhancements supported by this EC level are available by ordering FCs: 3521, 3522, 5047, 5810, 5811.

EC Level F12720B (ECA number 186)

Availability: 4/99 (replaced by ECA 190).

ECA number for maintenance of 3745/3746s equipped with a Service Processor type 6275 or 7585 and 3746s equipped with the MAE 3001.

For Service Processors with Optical Disk drive: see ECA 173.

For Service Processors (types 9585 and 3172) with optional CD-ROM drive (FC 5051), and for 3746s with MAE 3000: see ECA 178.

The new functional enhancements supported by this EC level are available by ordering FCs: 5049, 5423. For details, see ECA 185.

EC Level F12380E (ECA number 178)

ECA number for maintenance of 3746s equipped with MAE 3000 and of 374x with a Service Processor (type 9585 or 3172) equipped with optional CD-ROM drive (FC 5051).

Availability: 04/99 (replaces ECA 176). For details, see ECA 176.

EC Level D46130K (ECA number 173) (*)

ECA number for maintenance of 374x with Optical Disk Drive.

Availability: 04/99 (replaced by D46130O - ECA 183) For details, see ECA 171.

EC Level F12720_ (ECA number 185)

Availability: 10/30/98 (replaced by ECA 190).

Shipped on CD-ROM only and operates with:

- Service Processor Type 1 - 3172-P90 / PN 55H7630 (FC5021) + CD-ROM (FC5051)
- Service Processor Type 2 - 7585 (FC 5052)
- Service Processor Type 3 - 6275 (FC 5053)
- Service Processor upgraded to Service Processor Type 3 - 6275 (FC 5050)

For Service Processors with Optical Disk drive: see ECA 173.

For Service Processors (types 9585 and 3172) with optional CD-ROM drive (FC 5051), and for 3746s with MAE 3000: see ECA 178.

The new functional enhancements supported by this EC level are available by ordering FCs: 3001, RPQ 7L1345, 3297, 3298, 3299, 5050, 5053, 5801, 5807.

Feature 5801 (3746 Extended Functions 3) contents:

- 3746-900 and 3746-950 connectivity increase: more than 120 lines controlled by the NNP (up to 240)
- 3746 Network Node connectivity increase: more than 15000 APPN/DLUR sessions (up to 30000) controlled by the NNP (Type 2)
- RIP V2 for MAE 3001 and 3746 base adapters (ESCP_/TRP_/CLP_)
- Network Dispatcher for Servers connected to 3746 base adapt.
- RIP metrics and IP Route Filtering
- NCP V7R7: FR CIR for 3746 NCP-controlled lines, FR over 3746 switched lines, RIF change notification to NTuneMon
- Java Console support

- CCM: Enhancements to Search Command and 3746 Dynamic Change

Feature 5801 (for 3745):

- Java Console support

EC Level F12430_ (ECA = N/A)

Availability: 6/12/98 (replaced by EC F12720).

Shipped on CD-ROM only: operates with Service Processor Type 2.

Shipped only with machines and MES containing either FC 3001 or RPQ 7L1345.

EC Level F12380C (ECA number 176)

Availability: 04/29/98 (replaced by ECA 178).

Shipped on CD-ROM only and operates on:

- Service Processor Type 1 (FC 5021) with CD-ROM (5051) - types 9585 and 3172
- Service Processor Type 2 (FC 5052) - type 7585

For Service Processors with Optical Disk drive: see ECA 173.

ECA 176 supports new FCs for 3746s configured with the MAE 3000: 3286, 3288, 3289, 3520, 5805, 5806.

The new functional enhancements supported by this EC level are available by ordering the above FCs.

EC Level D46130J (ECA number 171)

Availability: 04/29/98 (replaced by ECA 173)

Shipped on optical disk only and operates with:

- Service Processor (no Type) - 9577 (FC 5020)
- Service Processor Type 1 - 9585, 3172 (FC 5021) not equipped with CD-ROM drive

For other Service Processors (with CD-ROM drive), see ECAs 178 and 190.

Reminder: Licensed Internal Code optional FCs must be ordered to get the necessary installation password (MOSS-E) and to operate any of the related functions:

5030 : X.25 support
5033 : IP Routing
5800 : 3745 Extended Functions 1 - details under ECA 170

EC Level F12380 (ECA number 175)

Availability: 12/12/97 (replaced by ECAs 178/190)

Shipped on CD-ROM only: requires a CD-ROM-capable Service Processor. For a service processor with Optical Disk drive, see ECA 173.

ECA 175 supports the new FC 5051 (Service Processor Upgrade to CD-ROM), which includes following enhancements:

- CCM: copy function for Frame-Relay DLCIs
- APING from Service Processor to APPN/HPR PUs

ECA 175 supports also new FCs for a 3746 configured with MAE 3000: 3294, 3295, 5804.

The new functional enhancements supported by this EC level are available by ordering the above FCs.

EC Level D46130I (ECA number 170)

Availability: 30/11/97 (replaced by ECA 173).

Shipped on optical disk only (for Service Processor with Optical Disk Drive). For Service Processors configured for CD-ROM support, see ECA 178.

ECA 170 supports the following new FCs: 3287 (for MAE 3000), 5123, 5203, 5523, 5623, 5800. The new functional enhancements supported by this EC level are available by ordering the above FCs.

Note: FC number 5810 or 5811 (Extended Functions 4) must be ordered to operate any of the functions originally provided by FC 5800 (no longer available as of 7/30/99):

- 3746-NCP internal IP coupling (requires NCP V7R6+)
- Dynamic windowing enhancements for Frame Relay/ISDN (NCP 7.6+)
- X.25 traffic controlled by the NNP (independently of NCP):
  - 3746-controlled traffic: SNA/DLUR, APPN, HPR and IP
  - PVCs and SVCs
  - X.25 port: sharing between 3746 Network Node, 3746 IP and NCP ODLC
  - traffic
  - NPM support (NPM V2R3 + PTFs)
- HPR MLTG support over TR, Ethernet, SDLC, Frame Relay and X25 (ECA 171 is required at minimum for proper MLTG operations)
- Bandwidth Reservation System (BRS): 3746 PPP lines (IP traffic)
- Frame-Relay switching (FRFH): 3746 lines controlled by the NNP
- CIR for 3746 frame-relay lines controlled by the NNP
- Bandwidth Reservation System at DLCI level: IP, APPN, HPR
- PRI Euro-ISDN (LIC16/FC 5216) enhancements (3746-900/NCP V7R5+)

- Automatic backup of frame-relay link over ISDN (non-disruptive for NCP to NCP connections)
- Support of LIC16 for NPM (NPM V2R3 + PTFs)

EC Level D46130B (ECA number 167)

Availability: 06/30/97 (can no longer be ordered).

See ECA 170 for functions available in FC 5800 (3746 Extended Functions 1).

ECA 167 supports the new MAE FC 3000, the related adapter FCs, the new Service Processor Type 2 (FC 5052), and the new NNP Type 2 (FC 5122).

Functional improvements:

- 3746 Network Node connectivity increase: more than 4000 PUs (up to 5000) and more than 12000 APPN/DLUR data sessions (up to 15000)
- CCM: configuration checking versus installed configuration (CDF-E)
- Display of the 3746 microcode level (ECA, EC) at MOSS-E console

EC Level D46120A (ECA number 159)

Availability: 12/20/96 (can no longer be ordered).

- IP over leased lines (PPP) and Frame-Relay lines
- NPM support: ports/stations (APPN/HPR), Processor/Storage/TIC3 utilization (3746-900)
- Frame-Relay line and DLCI sharing: NCP (V7R5), 3746 Network Node and 3746 IP)
- 3746 HPR/RTP over ESCON, TR, Ethernet, SDLC, Frame Relay (ECA 171 is required at minimum for proper HPR/RTP operations.)

EC Level D46120 (ECA number 157)

Availability: 11/29/96 (can no longer be ordered).

- 3746 Network Node connectivity increase: 4000 PUs + 12000 APPN/DLUR data sessions per 3746 Network Node
- Second Expansion Enclosure (FC 5016): 6 processors (total 16)
- Network Node Processor Memory Expansion (FC 5027)
- Service Processor Memory Expansion (FC 5028)
- EMEA only: LIC16 (FC 5216) for Euro.ISDN Primary Support by NCP V7R5 (3746-900)
- FR BAN for INN traffic with remote 372x connected to 2210/2216 (NCP V7R5)
- Back-up Network Node Processor (FC 5022)
- Optimization of processor storage utilization: increased APPN and DLUR connectivity (more PUs/sessions per processor): up to 100% connectivity increase

- Selective load of microcode (APPN/HPR, IP) by category of processors: ESCP2, CLP, TRP2, (CB)TRP2
- NNP no longer required for DCAF TCP/IP consoles on service LAN

EC Level D46100A (ECA number 155)

Availability: 09/20/96 (can no longer be ordered).

- Ethernet interfaces (FC 5631, FC 5632): APPN/DLUR, HPR, IP....
- 3746 IP Routing (FC 5033) over ESCON, token-ring, Ethernet
- 3746 HPR/ANR over ESCON, TR, Ethernet, SDLC, Frame Relay
- 3746 APPN/DLUR over Frame Relay (BNN and BAN)

  Max. connectivity in 3746-950: 500 PUs per CLP
  Max. connectivity in 3746-900: 1000 PUs per CLP, including NCP-controlled Frame-Relay PUs & X.25 PUs
- APPN/DLUR perf improvement by 30-40% in transactions/sec and data throughput
- Port sharing:

  ESCON port: traffic for 3746 Network Node, 3746 IP, NCP-A, and NCP-B
  TIC3 port: traffic for 3746 Network Node, 3746 IP, and one NCP
- NetView Topology Manager (3746 APPN/HPR): 3746 local topology
- Network Management (3746 IP): SNMP (NetView/AIX), Telnet, CCM

  CCM: 3746 online configuration changes, including ESCON, with automatic deactivation/activation of impacted resources Delete/Copy/Search functions

  3746-900 with NNP: ESCON Gen. Assist. replaced by CCM
- Year 2000 support (applicable also to 3745 Models xxA)
- Network Node Processor installation option: no loading of the APPN/HPR microcode in the 3746-900 processors

EC Level D22560D (ECA number 146)

Availability: 03/29/96 (can no longer be ordered).

- 3746 Network Node support: LIC11, DLUR for LIC11/LIC12, 4 LICs per CLP, CLP back-up, 16 versus 4 host link stations per ESCP2, 3000 versus 1500 LU sessions per TRP2, 2000 versus 1000 adjacent nodes per 3746 Network Node, 6000 versus 3000 LU-LU sessions per 3746 Network Node
- X.25 Support - FC 5030 (3746-900/NCP V7R4)
- Non-ERP support over TIC3 for CNN ANR (3746-900/NCP V7R4)
- 3746-900: 3000 versus 1000 station (aggregate number of PUs over Frame Relay + Virtual Circuits over X.25)

EC Level D22560A (ECA number 144)

Availability: 01/26/96 (can no longer be ordered).

- 3746 Network Node support (3746-900, 3746-950): APPN over LIC11, TIC3, and ESCON. DLUR over TIC3. Network Node Processor (FC 5022)
- EGA integrated to MOSS-E (3746-900/NCP)
- 2000 versus 500 PUs on (CB)TRP2 (3746/NCP)

EC Level D22510K (ECA number 142)

Availability: 12/95 — automatically shipped to all the installed 3746-900s (can no longer be ordered).

- V.24 interface (LIC11) support at speeds up to 28.8-kbps (V.35 modems)
- Native IP routing over ESCON channels (3746-900/NCP V7R3)
- Frame-Relay frame switching between 3745 & 3746-900 (NCP V7R4)
- ISDN Terminal Adapter (BRI/PRI) attachment (3746-900/V7R2)
- CLP: 1000 stations (aggregate number of PUs over Frame Relay + Virtual Circuits over X.25), in addition to 1000 SDLC PUs

EC Level D22510J (ECA number 138)

Availability: 08/25/95 (can no longer be ordered).

CLP: Frame-Relay BAN and Frame-Relay SAP multiplexing (3746-900/NCP V7R3).

EC Level D22510I (ECA number 137)

Availability: 06/30/95 (can no longer be ordered.

- CLP: X.25 (3746-900/NCP V7R3/NPSI V3R8)
- NPM 6-900/NCP V7R3)
- ISDN Terminal Adapter (BRI/PRI) attachment (3746-900/V7R2)
- CLP: 1000 stations (aggregate number of PUs over Frame Relay + Virtual Circuits over X.25), in addition to 1000 SDLC PUs

EC Level D22510D (ECA number 134)

Availability: 09/13/94 (can no longer be ordered).

- CLP: Frame Relay (3746-900/NCP V7R2)
- CLP: Up to 120 versus 100 active lines
- CLP: Up to 1000 versus 500 active PUs

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*.

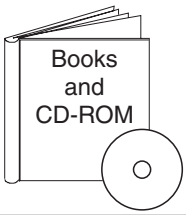
V.24, V.35, and X.21. ITU-T (ex-CCITT) recommendations on transmission interfaces.

Bibliography

Customer Documentation for the 3745 (All Models) and 3746 (Model 900)

Table 26 (Page 1 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

This customer documentation has the following formats:

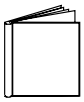


Finding Information

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



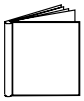
GA33-0092

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.

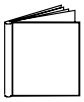


GA33-0180

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

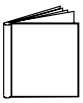
IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

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 26 (Page 2 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900



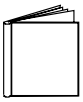
GA27-4235

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.



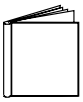
GA27-4236

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.



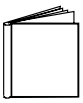
GA27-4237

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

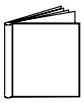
IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

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 26 (Page 3 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900



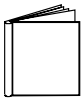
GA27-4239

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.



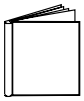
GA27-4240

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.

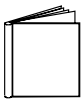
On-line information

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.

Preparing Your Site



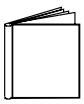
GC22-7064

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 26 (Page 4 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

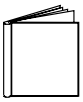
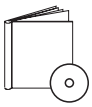
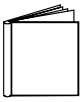
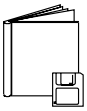
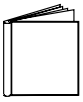
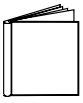
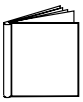
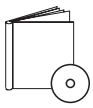
Preparing for Operation		
	GA33-0400	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Safety Information***[1] Provides general safety guidelines.
	SA33-0129	***IBM 3745 Communication Controller All Models***[3] ***IBM 3746 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 26 (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]

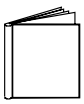
Advanced Operations Guide[1]

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.

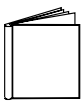


SH11-3081

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.



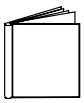
GA33-0479

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.

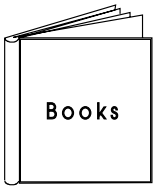
Table 26 (Page 6 of 6). Customer Documentation for the 3745 Models X10 and X1A, and 3746 Model 900

[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 27. Additional Customer Documentation for the 3745 Models 130 to 170

This customer documentation has the following format:

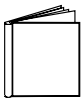


Finding Information

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

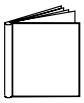
IBM 3745 Communication Controller
Models 130, 150, 160, and 170

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 28 (Page 1 of 4). Customer Documentation for the 3746 Model 950

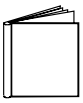
This customer documentation has the following formats:

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



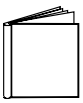
GA33-0400

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

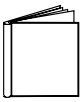


GA33-0180

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

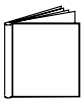
IBM 3745 Communication Controller Models A[2]
IBM 3746 Nways Multiprotocol Controller
Models 900 and 950

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 28 (Page 2 of 4). Customer Documentation for the 3746 Model 950



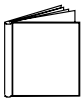
GA27-4235

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.



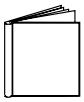
GA27-4236

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.



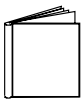
GA27-4237

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 28 (Page 3 of 4). Customer Documentation for the 3746 Model 950

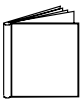
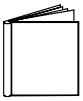
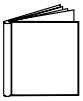
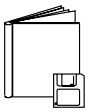
	GA27-4239	***IBM 3745 Communication Controller Models A[2]*** ***IBM 3746 Nways Multiprotocol Controller*** ***Models 900 and 950*** ***Planning Series:*** ***Management Planning*** Provides information for: • Overview for 3746 • 3746 APPN/HPR, IP router, and X.25 • NetView Performance Monitor (NPM), 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 28 (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]

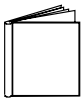
Explains how to:

- 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.

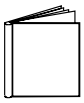


SH11-3081

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.

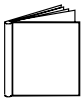
Managing Problems

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 Model A
3746 Nways Multiprotocol Controller
Models 900 and 950
Planning Series:

Overview, Installation, and Integration

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