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IBM 3710
Network Controller

Planning

IBM

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First Edition (September 1984)

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Preface

This manual enables system planners and system programmers to plan for and prepare a site for the installation of one or more IBM 3710 Network Controllers, and plan for a 3710 network.

Before using this manual, you should understand the functions and usage of the Network Controller as described in &iintro., GA27-3430. You must also understand network concepts and be familiar with the requirements and installation of communication equipment and network programs.

Systems Network Architecture (SNA) terms are used in this manual. If you are unfamiliar with SNA, you should refer to *Systems Network Architecture Concepts and Products*, GC30-3072.

Note: Throughout this manual, the IBM 3710 Network Controller is also referred to as the Network Controller and the 3710. The Network Controller and the lines and devices attached to it are called the *3710 network* or the *3710 configuration*; the description of the Network Controller and its lines and devices is called the *3710 configuration definition*.

How This Manual Is Organized

This manual has the following chapters:

- Chapter 1 provides an overview of the steps you must take to plan for the Network Controller.
- Chapter 2 provides information to help you decide where to put Network Controllers in the network, which devices to attach to the Network Controllers, and which Network Controller options you need.
- Chapter 3 provides information to help you plan to define the part of a network attached to a Network Controller.
- Chapter 4 provides information necessary to plan for hardware installation.
- Chapter 5 tells which host programs are needed for the Network Controller.
- Chapter 6 describes how to plan for operation of the Network Controller and how to resolve problems.
- Chapter 7 describes how to plan for relocation or reconfiguration of the Network Controller.
- Chapter 8 describes other considerations in planning for a Network Controller, such as personnel, safety, and orders for accessories and parts.

This manual also has six appendixes:

- Appendix A lists publications that you may need for installing the Network Controller and the host programs.
- Appendix B contains planning forms and worksheets to help you set up the Network Controller and define the 3710 configuration.
- Appendix C contains definitions of the control terminal prompts, to help you fill out the worksheets in Appendix B.

- Appendix D describes the Network Controller performance considerations and contains worksheets to help you evaluate them.
- Appendix E contains FCC regulations governing Integrated Protective Circuitry.
- Appendix F contains a list of devices that can attach to the Network Controller.

A list of abbreviations and glossary of terms precede the index to this manual.

How to Use This Manual

Chapter 1 contains a suggested schedule for installing a Network Controller. Appendix B contains planning forms and worksheets to help with installation. Read through the entire manual before filling in any dates on the schedule and before using any of the planning forms or worksheets.

Related Publications

The following publications are shipped with each Network Controller:

- Unpacking instructions
- Setup and relocation instructions
- A Network Controller operator's guide
- Problem report forms

Additional publications you may need for planning and installation are listed in Appendix A.

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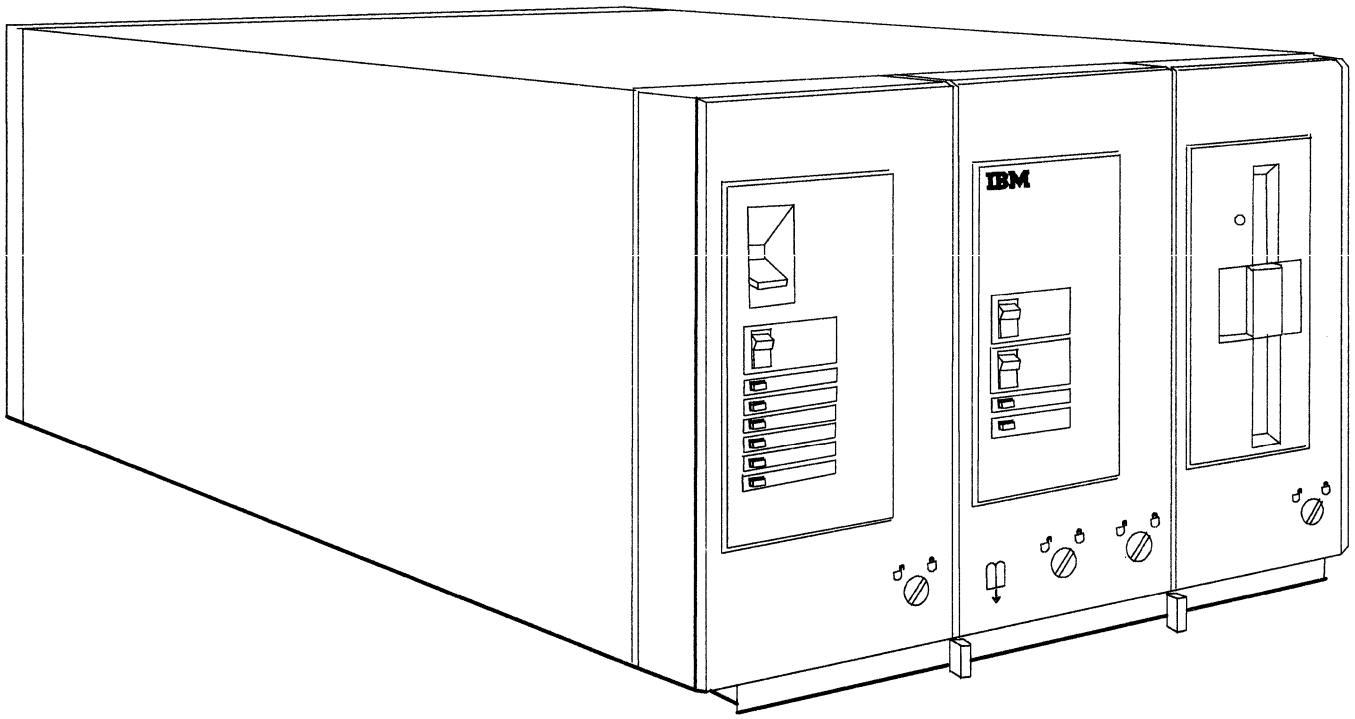


IBM 3710 Network Controller

Chapter 1

Introduction

The IBM 3710 Network Controller concentrates data from multiple lines with different line protocols onto one or more communication links to a host in a SNA network. The schedule in this chapter helps you plan and prepare for the installation and operation of the Network Controller.

Contents

Introduction

The IBM 3710 Network Controller is a machine that allows devices using different kinds of line protocols to connect to a Systems Network Architecture (SNA) network. The Network Controller concentrates the data from multiple lines and sends the data over a communication link through a communication controller to a host. The communication link may use synchronous data link control (SDLC) protocol in an SNA network, or may use X.25 protocol in a packet-switched data network. The communication controller may be an IBM 3705 Communications Controller or an IBM 3725 Communication Controller. The host operating system may be either MVS or MVS/XA. The devices attached to the Network Controller appear to the host to be SNA stations on a multipoint communication link, regardless of their actual configuration or protocol. One or more communication links may attach a Network Controller to one or more 37X5s, which may be attached to one or more hosts.

The following schedule helps you plan for the installation of a Network Controller. The schedule provides an overview of the actions to take in planning and preparing for the Network Controller. Since the schedule contains terms you may not be familiar with, be sure to read the rest of this manual before you fill in any dates.

Your Network Controller may not require all the steps indicated, or it may require additional steps. Change the schedule to meet your requirements, but allow enough time to complete all the steps before the Network Controller arrives. By planning ahead, you can ensure that your location is ready for the Network Controller when it arrives.

The Network Controller is a customer-setup machine. That is, unpacking and setup instructions shipped with each Network Controller enable you to unpack, set up, and check out the Network Controller without tools and without help from IBM personnel. Operating information is also shipped with each Network Controller. As a result, you can use your new Network Controller soon after it arrives.

Planning Schedule for the IBM 3710 Network Controller

6 Months Before the Network Controller Arrives:

Schedule Date	You Do	IBM Does	Action	Refer To
	X		Review this planning schedule.	
	X		Describe your network: determine where each Network Controller goes in the network, and what devices and lines will be attached to it.	Chapter 2
	X		Select the Network Controller optional host enhancements and options you need.	Chapter 2
	X	X	Review your installation plans with your IBM marketing representative.	
	X	X	Determine the schedule dates with your IBM marketing representative. Fill in the dates on this schedule and give a copy to him.	
	X		Determine the method (control terminal or CCP) to be used to define the 3710 configuration. Select and fill out the definition worksheets.	Chapter 3, Appendix B
	X	X	Order each Network Controller.	
	X	X	Order a control terminal, device cable, and modems (if required).	Chapters 4, 8
	X	X	Order device cables (order separately).	Chapter 4
	X	X	Determine which connections you need for the integrated service modem, or order an external modem and cables.	Chapter 2
	X		Fill out the Network Controller Setup form.	Appendix B
	X		Identify any new host or NCP programs required to provide the Network Controller optional enhancements you want.	Chapters 3, 5
	X		Identify any changes required to existing host or NCP programs to support the Network Controller.	Chapters 3, 5
	X		Determine if you want to include information about the Network Controller in your local procedure documentation.	
	X	X	Obtain related manuals.	Preface, Appendix A
	X		Determine where each Network Controller is to be physically located, and make arrangements for site preparation.	Chapter 4
	X		Arrange to install or change power lines and receptacles.	Chapter 4

6 Months Before the Network Controller Arrives (Continued):

Schedule Date	You Do	IBM Does	Action	Refer To
	X		Arrange to install necessary common carrier cables, receptacles, and telephones.	Chapter 4
	X		Arrange to install or change air conditioning, lighting, and so on, at the site.	Chapter 4

3 Months Before the Network Controller Arrives:

Schedule Date	You Do	IBM Does	Action	Refer To
	X	X	Order machine elements, accessories, and cables if you plan to stock spares, and blank diskettes for backup copies of the system diskette.	Chapters 4, 8
	X		Order racks or tables for Network Controllers.	Chapter 4
	X		Start physical site preparation.	
	X		Start the installation of power lines and receptacles, and of common carrier cables, receptacles, and telephones.	
	X		Start the installation of air conditioning, lighting, and so on.	
	X		Select employees who will set up, operate, and maintain the Network Controller.	Chapters 6, 8
	X		Prepare a training program for your employees.	

2 Months Before the Network Controller Arrives:

Schedule Date	You Do	IBM Does	Action	Refer To
	X		Complete the installation of power lines and receptacles, and of common carrier lines, receptacles, and telephones.	
	X		Complete the installation of air conditioning, lighting, and so on.	
	X	X	Ask your IBM marketing representative to check the progress of the site preparation.	
	X	X	Review your installation plan to resolve any weakness in the schedule.	
	X		Make the required changes to existing programs and install any new programs for the host and NCP.	Chapters 3, 5

1 Month Before the Network Controller Arrives:

Schedule Date	You Do	IBM Does	Action	Refer To
	X		Start any employee training you have planned.	
	X		Update your local procedure documentation.	
	X		Complete site preparation.	
	X		Make sure that the Setup form and the definition worksheets have been completed.	Appendix B

Upon Arrival of the Network Controller:

Schedule Date	You Do	IBM Does	Action	Refer To
	X		Make sure that machine elements, accessories, and parts that were ordered have arrived.	
	X		Make sure that the person who is to set up each Network Controller has the appropriate Setup form.	Appendix B
	X		Make sure that the person(s) defining the host link and 3710 configuration has the appropriate worksheets.	Appendix B

Chapter 2

Planning the 3710 Network

This chapter describes how to plan for the 3710 network. It helps you:

- Choose Network Controller optional host enhancements and options
- Decide what is to be attached to the Network Controller
- Plan the use of the service adapter
- Evaluate performance considerations

Contents

Planning the 3710 Network

This chapter describes how to plan for the 3710 network. It helps you:

- Choose Network Controller optional host enhancements and options
- Decide what is to be attached to the Network Controller
- Decide where to place Network Controllers in the network
- Plan the use of the service adapter
- Evaluate performance considerations.

Applications in a Network

The following paragraphs describe applications of the Network Controller. These applications require the following levels of host network program products:

- ACF/VTAM, Version 2, or any later version
- ACF/NCP, Version 3, or any later version.

Refer also to the , GA27-3430, for information about Network Controller applications.

Protocol Management

The Network Controller manages data-transmission protocols to allow SNA networks to handle non-SNA data. This enables some non-SNA devices, as well as SNA devices, to communicate with SNA network program products and host application programs through the Network Controller. Non-SNA devices attached to the Network Controller appear to be SNA devices to the 37X5 NCP receiving data from them through the Network Controller. Thus, you do not need separate protocol management machines and programs for each type of protocol your devices use.

Single-Protocol Networks

The Network Controller manages protocols as follows:

- SNA Device Support. It recognizes and retransmits Synchronous Data Link Control (SDLC) protocol without changing it in any way. SDLC is the protocol used by SNA devices.

- Protocol Enveloping. It surrounds or *envelops* three types of non-SNA protocols so that they appear to be SDLC to the host:

  - Start-stop transmission
  - Binary synchronous communication (BSC) for remote job entry (RJE)
  - BSC for the multi-leaving interface.

- Protocol Conversion. The Network Controller converts BSC 3270 protocol to SDLC protocol for transmission to the host, and converts SDLC to BSC 3270 protocol for transmission to the downstream device.

Mixed-Protocol Networks

A network arrangement that uses more than one type of protocol (for example, start-stop transmission and SDLC) is called a *mixed-protocol network*. Using the methods described in "Single-Protocol Networks" above, the Network Controller can manage protocols for any combination of start-stop, BSC, and SDLC devices.

Line Concentration

A large telecommunication network can require dozens of telecommunication lines and modems. One Network Controller can concentrate device data from as many as 31 lines onto a single line to a communication controller. The lines can be either half-duplex or duplex, using either synchronous or asynchronous protocols, at line speeds from 110 bps to 64 kbps.

By attaching more than one Network Controller to the network (either to the same line, or one Network Controller to another), even more lines can be concentrated to a single line to the communication controller.

Multiple Upstream Attachment

The Network Controller supports attachment to multiple hosts and communication controllers (hosts and communication controllers are said to be *upstream* from the Network Controller). It allows up to 30 lines to be attached to one or more communication controllers (either the IBM 3705 Communications Controller or the IBM 3725 Communication Controller) either remotely by telecommunication line or directly by cable, or both.

The 37X5(s) to which the Network Controller is attached can be attached to one or more hosts. Communication is possible between any host and any Network Controller device, though each device can communicate with (be owned by) only one host at a time. The Network Controller itself should be owned by only one host if the Network Problem Determination Application (NPDA) is being used. But one or more hosts may be reserved for network backup. The 3710 configurations can be defined so that the Network Controller can be switched to a backup host without changing the 3710 configuration definition.

Satellite Attachment

In very large networks, satellites may be used to transmit data. The Network Controller supports satellite services on upstream lines that use the *modulo-128 transmission check*. The Network Controller also supports satellite services on lines to SDLC devices that use modulo-128, and on all lines to start-stop and BSC 3270 devices.

Remote Assistance

IBM provides problem analysis and resolution procedures for the Network Controller. If you have not been able to resolve a Network Controller problem using these procedures, and you have a maintenance agreement with IBM for your Network Controller, IBM can help through *remote assistance*. Remote assistance may include consultation with an IBM service representative and/or problem diagnosis by IBM through a remote connection to your Network Controller over a telecommunication link. Refer to "Service Adapter" on page 2-13 and "Remote Assistance" on page 6-4 for more information about remote assistance.

Optional Host Enhancements

As you add Network Controllers to your network, you may want to enhance and expand some Network Controller applications. A number of optional host enhancements are available for the Network Controller when certain host network program products are installed. The host program requirements for optional host enhancements are described in Chapter 5, "Planning for Installation of Host Programs."

The following paragraphs describe briefly the optional host enhancements. Refer also to the for information about them.

Communication Network Management

Communication network management (CNM) is the process of designing, installing, operating, and managing the distribution of information and control in a network. The Network Controller and an attached control terminal provide a basic level of CNM. IBM host network program products provide additional levels of CNM. CNM functions that are unique to the Network Controller are provided by the following program products:

- Advanced Communications Function for the Virtual Telecommunications Access Method (ACF/VTAM) is required for the Network Controller Trace function.
- System Support Programs for ACF/NCP/VS (SSP) generate a Network Control Program (NCP) that runs in a 37X5 communication controller. It provides a number of utilities and programs, including the Configuration Control Program (CCP) and the Trace Analysis Program (TAP).
- Network Communications Control Facility (NCCF) provides a network operator interface to the Network Controller from the host console. NCCF also provides online diagnostic tests, a CCP interface and data transport facility, and some additional operator commands.
- Network Problem Determination Application (NPDA) provides Link Problem Determination Aids (LPDA), and automatic display of Network Controller alerts at the host in addition to the Network Controller's requested display at the control terminal.

X.25 Packet-Switched Data Network Attachment

A packet-switched data network carries data that has been divided into segments called *packets* over lines that are shared by many users. X.25 has been defined by the International Telegraph and Telephone Consultative Committee (CCITT) as the standard interface to packet-switched data networks.

The X.25 NCP Packet Switching Interface is an IBM network program product that enables the Network Controller to connect to a packet-switched data network that supports the X.25 interface and line protocol. Connection is through a 3725 Communication Controller, over leased and switched virtual circuits.

Refer to Appendix A, "Publications", for documentation on CCITT Recommendation X.25 and packet-switched data networks.

Enhanced Definition Capability

IBM offers enhanced configuration definition with the Configuration Control Program (CCP), which is part of SSP. CCP uses terminal panels to guide operators through the processes of defining, displaying, and changing all or part of a 3710 configuration. The definitions can be stored to be used or changed at a later time.

CCP also creates files containing macro generation instructions and Dynamic Reconfiguration Definition Statements (DRDS) used to define or change a 3710 configuration in ACF/NCP and ACF/VTAM.

Remote Job Entry (RJE)

The Network Controller supports remote job entry (RJE), which enables jobs to be submitted for processing by non-SNA program products in a remote host. Network Controller support for RJE requires the Non-SNA Interconnection (NSI), an IBM program product that operates in a 3725 Communication Controller, to provide terminal functions for devices that use BSC RJE and BSC for the multi-leaving interface.

Network Controller Trace

The Network Controller can trace the data and control information it sends or receives. At the same time, trace data may be collected for one or two devices, both on the line connecting the Network Controller to the communication controller and on the lines connecting the devices to the Network Controller. (Data for two devices may be collected at the same time if they are not on the same line.)

Trace data is passed through ACF/VTAM to the Generalized Trace Facility (GTF). The Trace Analysis Program (ACF/TAP) is used to format and print a trace report.

Link Problem Determination Aids (LPDA)

LPDA is used to run tests over lines attached with IBM 386X modems. NPDA provides the programming support for LPDA, and includes the LPDA test results in alerts displayed at the host console.

LPDA on lines to devices may be run on SDLC and BSC lines only. If a line connecting a Network Controller to a 3725 Communication Controller is a multidrop line (other control units or Network Controllers are on the same line), LPDA by Station is required.

Lines and devices attached to a Network Controller are referred to as either upstream or downstream. The following paragraphs define upstream and downstream lines and devices, list the devices, and tell which protocols can be used with them.

A line connecting a Network Controller and a 37X5 communications controller is referred to as an *upstream line.* The 37X5 that the Network Controller is attached to is referred to as an *upstream device.*

A line connecting a Network Controller and a device is referred to as a *downstream line.* A device attached to a Network Controller by a downstream line is referred to as a *downstream device.* Devices attached to downstream devices are also referred to as downstream devices.

The total number of upstream and downstream lines attached to a Network Controller may not be greater than 32.

A Network Controller together with its upstream lines, downstream lines, and downstream devices is referred to as a *3710 network* or a *3710 configuration.* The description of the Network Controller lines and devices is called a *3710 configuration definition.*

The following figure shows the relationships of a Network Controller to its upstream and downstream lines and devices.

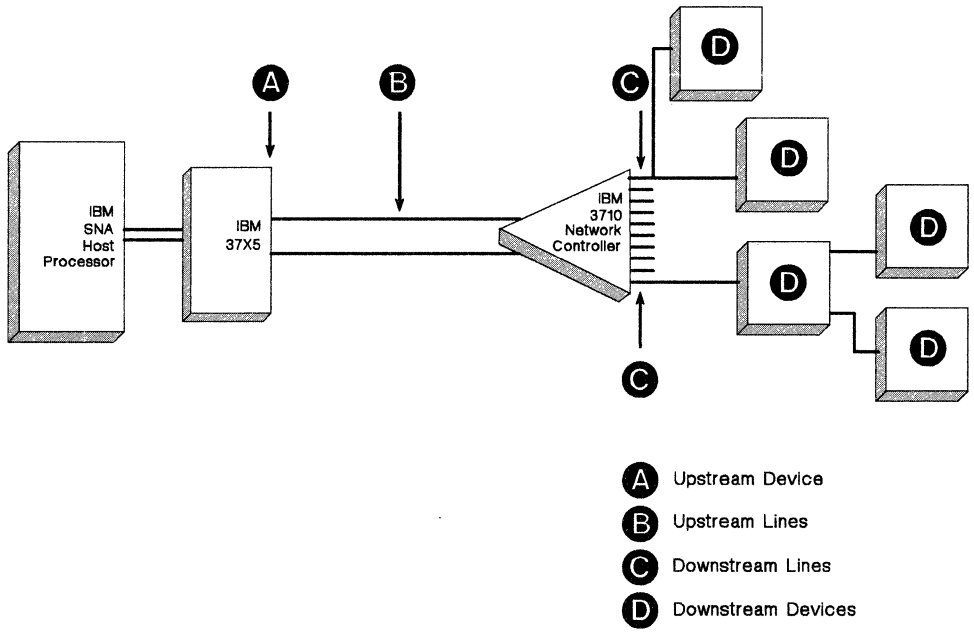


Figure 2-1. Network Controller with Upstream and Downstream Lines and Devices

Upstream Lines and Devices

Each Network Controller must have at least one upstream line. A Network Controller can be attached to the following devices:

- 3705 Communications Controller
- 3725 Communication Controller
- Another Network Controller.

A Network Controller can be attached to a 3705 Communications Controller, either directly or remotely, by a telecommunication line using SDLC protocol.

A Network Controller can also be attached to a 3725 Communication Controller. When the connection to a 3725 is through a packet-switched data network, X.25 protocol is used on the upstream line. Otherwise, SDLC is used on an upstream line to a 3725.

SDLC is used on a line connecting two Network Controllers.

Downstream Lines and Devices

Up to 31 downstream lines can be attached to a Network Controller. A downstream device can establish sessions with multiple hosts, but only one session at a time. SDLC, BSC, and start-stop protocols can be used on downstream lines.

Any device that is an SNA physical unit (PU) type 2 and uses the SDLC protocol on a multipoint or nonswitched point-to-point link can be attached to the Network Controller.

BSC 3270 devices can be directly attached on downstream lines to the Network Controller, or attached on a multipoint or point-to-point nonswitched link with multipoint line control.

BSC RJE and MLI devices can be directly attached, or attached on a point-to-point nonswitched or switched link.

Devices using start-stop transmission can be directly attached to the Network Controller, or attached on a switched or nonswitched point-to-point link.

See Appendix F for a list of devices and systems that can attach to the Network Controller.

Placement in the Network

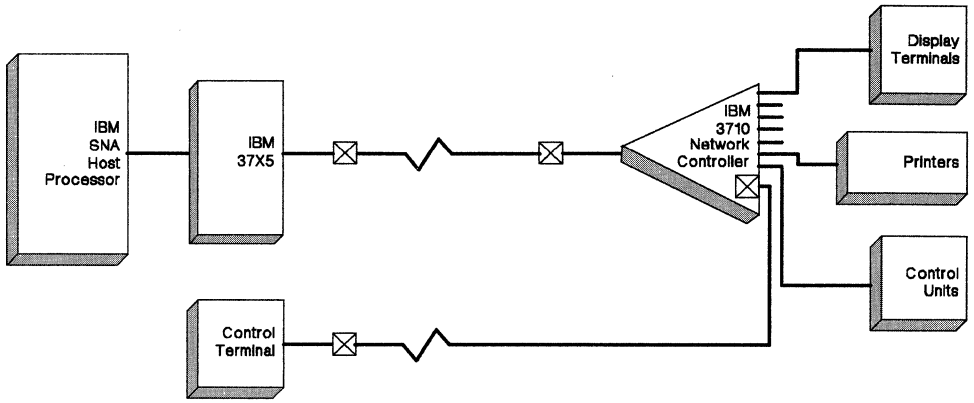
Network Controllers can be used in networks with:

- One host processor and one communication controller
- One host processor and multiple communication controllers
- Multiple host processors and multiple communication controllers.

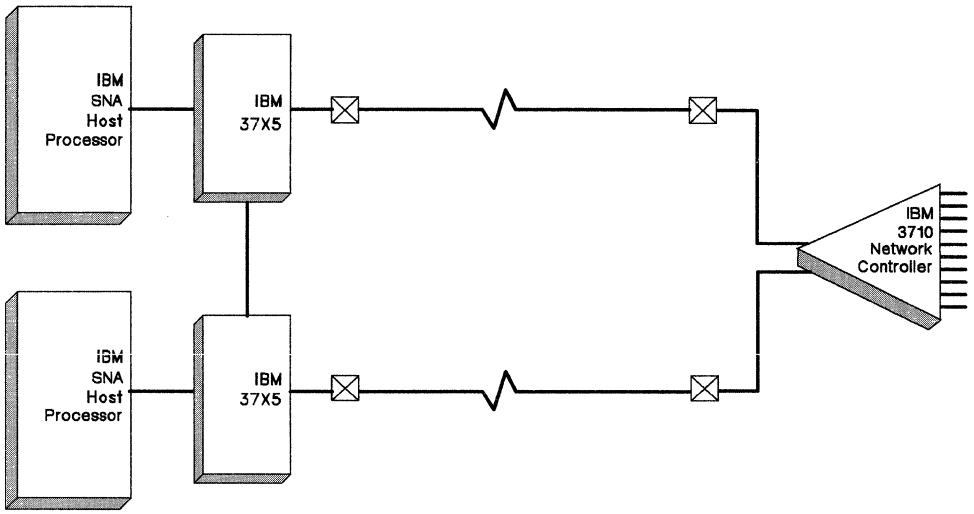
You might consider installing a Network Controller:

- Where you want to concentrate data from multiple lines to a single remote link, for reducing communication line cost.
- Where you want to concentrate data from multiple lines with mixed protocols to a single SDLC line.
- Where you want to provide a central point for nondisruptive reconfiguration of lines and both SNA and non-SNA devices.
- Where you want to provide a remote focal point for Communication Network Management (CNM) capabilities.

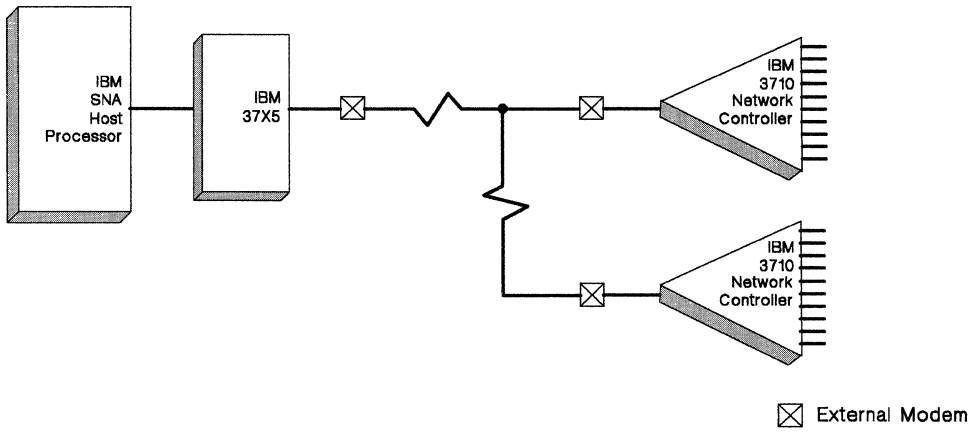
Some ways that the Network Controller may be placed in the network are shown in Figure 2-2 on page 2-8.



The Minimum Network Using The Network Controller



Multiple Communication Controllers And Hosts



Multidrop Network Controllers

Figure 2-2. The Network Controller in the Network

Options

Options for the Network Controller are a storage expansion unit and three types of communication adapters. The following paragraphs describe the Network Controller options and help you decide which ones you need.

Storage Expansion Unit

The Network Controller comes with 384K bytes of storage. The number and type of lines and devices attached to the Network Controller determine the amount of storage required in the Network Controller for work areas, tables, microcode, and data buffers. These storage requirements may exceed the 384K bytes of Network Controller storage.

The *storage expansion unit* offers an additional 128K bytes of storage. To determine whether you need to order a storage expansion unit with your Network Controller, refer to the performance considerations in Appendix D. The worksheets in the appendix help you calculate your Network Controller storage requirements.

Communication Adapters

Communication adapters provide the ports for attaching lines and devices to the Network Controller. The line protocols, line speeds, and electrical interfaces used in your 3710 network determine which types of communication adapters you need.

Types

The three types of communication adapters are EIA, V.35, and X.21. They are shown in Figure 2-4 on page 2-12, and are described below:

- The *EIA communication adapter* has the following characteristics:
  - It provides two ports that use the EIA RS-232-C (CCITT V.24) interface.
  - The line speed of each line attached to the EIA adapter should not exceed 19.2 kbps (kilobits per second). (It is rated to support 19.2 kbps maximum.)
  - It provides auto-answer support in unattended mode for the Network Controller.
  - It allows attachment of both leased and switched lines.
  - When BSC or start-stop protocols are used on two lines attached to the same EIA adapter, both lines must use the same protocol.
  - A line using SDLC protocol and a line using X.25 protocol can be attached to the same EIA adapter.
  - Public data networks and packet-switched data networks using X.25 and X.21 bis interfaces on leased lines with line speeds not exceeding 19.2 kbps can use the EIA adapter to attach to the Network Controller.
- The *V.35 communication adapter* has the following characteristics:
  - It provides one port that uses the CCITT V.35 interface.
  - It is rated to support line speeds less than or equal to 56 kbps.
  - It allows attachment of leased lines only.
  - Public data networks and packet-switched data networks using X.25 and X.21 bis interfaces on leased lines with line speeds greater than 19.2 kbps can use the V.35 adapter to attach to the Network Controller.

- The *X.21 communication adapter* has the following characteristics:
  - It provides one port that uses the X.21 interface.
  - It is rated to support line speeds greater than 19.2 kbps and less than or equal to 64 kbps.
  - It allows attachment of leased lines only.
  - Public data networks and packet-switched data networks using X.25 and true X.21 interfaces on leased lines with line speeds greater than 19.2 kbps can use the X.21 adapter to attach to the Network Controller.

The line speed of a line attached to a communication adapter is determined by the following four factors:

- Common-carrier or public switched network facilities (for leased or switched lines)
- Communication adapter type
- The speeds at which the attached devices send and receive data
- Method of attaching the line to the Network Controller (directly, nonswitched, or switched).

Arrangement

The Network Controller has positions for up to 16 communication adapters, allowing for attachment of a maximum of 32 lines. Each adapter is inserted into the back of the Network Controller into one of the 16 positions, which are labeled 01 through 16. The EIA communication adapters have two ports; the top port is labeled AA and the bottom port is labeled BB. The other adapters have one port; the port is labeled AA. Each port is referred to, or addressed, by its adapter position and label, as shown in Figure 2-3 on page 2-11. (05AA, for example, is the top or only port on the communication adapter in position 5).

At least one port must be used for an upstream line to the host (the *host link*). The host link must be defined in the configuration definition. But, to help you get started, several default host link definitions are supplied with the Network Controller (on the system diskette). Each default definition assigns the upstream line to a specific port. If you use a default definition, you must attach the line for the host link to the port assigned in that definition. For more information about the default host link definitions, see "Default Host Link Definitions" on page 3-2.

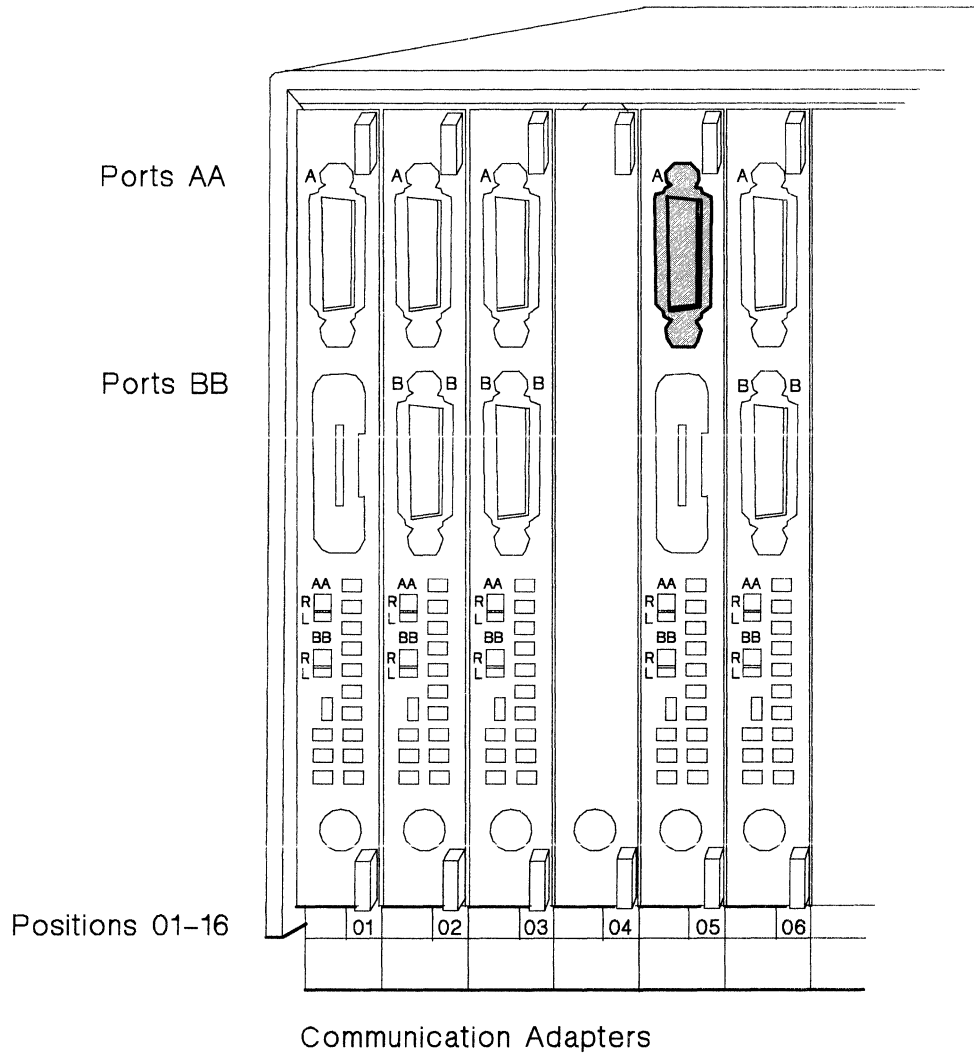


Figure 2-3. Communication Adapter Positions and Ports

An EIA communication adapter must be used in position 16 for remote assistance and for use with a control terminal. That adapter is known as the *service adapter*. For more information about the service adapter, see "Service Adapter" on page 2-13.

Except for the service adapter in position 16, the adapters may be arranged in any order in the Network Controller. Once they are installed, communication adapters can be removed and inserted without turning the Network Controller power off. Polling and servicing of the lines do not depend on the position of the adapters in the Network Controller. They are determined by the order in which the lines are defined to the NCP and the Network Controller (in the service order table).

Adapter Blanks

If you do not plan to install 16 communication adapters, an *adapter blank* must be placed in each unused adapter position to maintain proper airflow through the Network Controller.

Ordering Communication Adapters and Adapter Blanks

Your Network Controller order will include the number and types of communication adapters you need to connect the devices in your network to the Network Controller. These communication adapters are shipped with your Network Controller, along with enough adapter blanks to fill the positions you will not be using. One extra adapter blank is also shipped with the Network Controller, to allow for a change in your network. Additional communication adapters and adapter blanks may be ordered as needed. (See Chapter 8, "Additional Planning Considerations" on page 8-1 for information on ordering communication adapters and adapter blanks.) The adapter blank is shown in Figure 2-4.

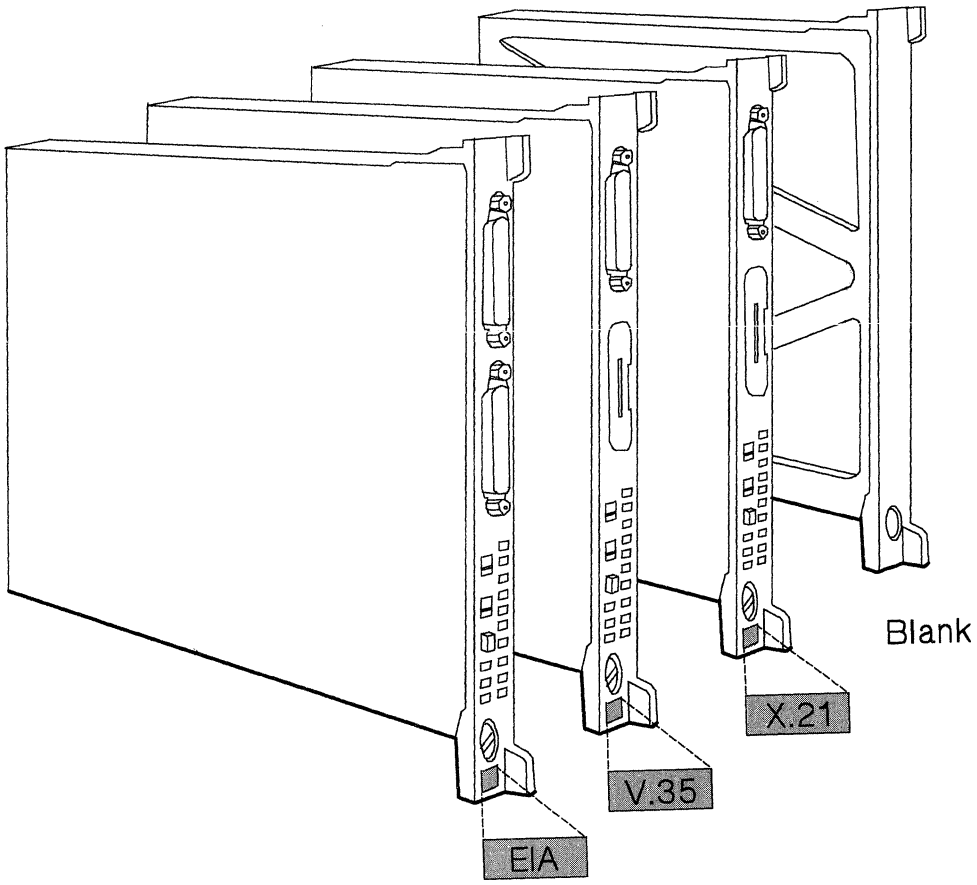


Figure 2-4. Communication Adapters and Adapter Blank

Service Adapter

The service adapter is an EIA communication adapter installed in position 16. It is required for attachment of a control terminal; and it may be used for a remote connection to your Network Controller if you have remote assistance as part of a maintenance agreement with IBM. It can also be used as a communication adapter. The following paragraphs describe the uses and operating modes of the service adapter.

Service Adapter Modes

The service adapter operates in one of two modes: service mode and communication mode.

For remote assistance or for use with the control terminal, the service adapter must be in service mode, and the devices and cables must be connected as shown in Figure 2-7 on page 2-17 and Figure 2-6 on page 2-15.

The service adapter begins operating in service mode whenever:

- The network operator deactivates all devices using the service adapter in communication mode
- The control terminal operator sends a "Reset" command to the Network Controller
- The Network Controller operator presses the Start Control Terminal switch on the Network Controller.

When the service adapter is not being used for remote assistance or for the control terminal, it may be used as a communication adapter for downstream lines and devices (upstream lines cannot be attached to the service adapter). In this case, the service adapter operates in communication mode.

The service adapter begins operation in communication mode when the network operator sends an "Activate" command from the host to a downstream device attached to the service adapter.

Using the Service Adapter for Remote Assistance

The service adapter can be used for remote service when it is connected through a modem to a public switched network.

If you have a problem with the Network Controller that you have not been able to solve using the procedures provided with the Network Controller, host program diagnostic tools, and local problem analysis procedures, IBM can assist you if you have remote assistance as part of a Network Controller maintenance agreement with IBM. Remote assistance can include remote connection by IBM to your Network Controller through the service adapter and service modem over a public switched network telecommunication link.

Connections for remote assistance are shown in Figure 2-7 on page 2-17.

In the USA

In the USA, an *integrated service modem*, a *common-carrier cable*, and a *service modem cable* are shipped with your Network Controller.

The integrated service modem is registered with the Federal Communications Commission (FCC) for attachment to the public switched network (See Appendix E). The modem operates in half-duplex mode at a speed of 1200 bits per second (bps).

Notify the telephone company that you need a switched network line for data communication. Supply the following information to the telephone company when you place your order for the line:

1. Request a switched data line for FCC-registered equipment, with the local loop conditioned for data transmission at 1200 bps or greater.
2. Provide the following information about the Network Controller and the integrated service modem:
   - Model number of your Network Controller
   - Registration Number: AK 396F-70594-DM-N
   - Ringer Equivalence Number: 0.2 B
3. Specify that the line be terminated in a programmable data jack, Universal Service Order Code (USOC) RJ45S.

The Network Controller common-carrier cable (shown in Figure 2-5) is 7.6 meters (25 feet) long, and connects the integrated service modem to the public switched network. One end of the common-carrier cable terminates in an 8-position keyed plug that is compatible with and plugs into the RJ45S data jack.

The Network Controller service modem cable connects the integrated service modem to port 16AA of the service adapter.

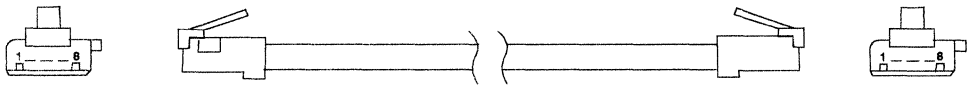


Figure 2-5. Common-carrier Cable

In Other Countries

Outside the USA, IBM does not ship a service modem with the Network Controller. Instead, you must provide a 1200-bps, auto answer, half-duplex, standalone modem to use for remote assistance. This modem is sometimes referred to in this manual as the *external modem*.

In Europe, the Middle East, and Africa, this modem (either OEM, or PTT mandatory) must conform to the CCITT V.23/V.24/V.28 interface. Modems from other manufacturers will be attached under the provisions of the "Multiple Supplier System Bulletin."

In South America, and the Far East, this modem must be 202C compatible.

A Network Controller EIA-DCE device cable, shown in Figure 4-10 on page 4-12, is required to attach the external modem to port 16BB of the service adapter.

Use a common-carrier cable appropriate to your modem and the public switched network in your country to attach the modem to the public switched network.

For more information about remote assistance, see "Remote Assistance" on page 6-4.

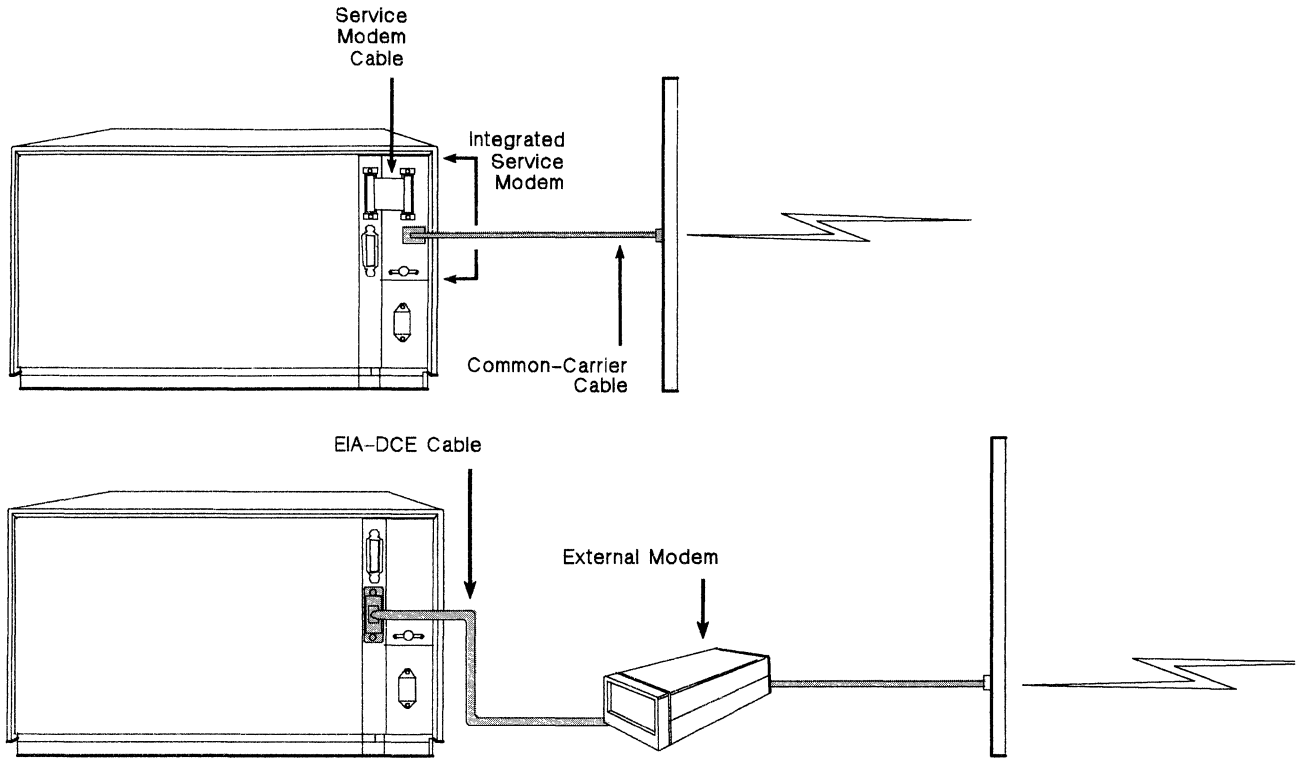


Figure 2-6. Methods of Attaching the Service Modem to the Service Adapter

Using the Service Adapter with the Control Terminal

For the control terminal, the Network Controller can use an ASCII, asynchronous display terminal operating in TTY 33/35 mode, such as or equivalent to the IBM 3101 Display Terminal.

The control terminal allows you to:

- Define the 3710 configuration to the Network Controller, or change an existing definition
- Run offline tests, online tests, and cable tests; and run setup tests after relocation.
- Display the 3710 configuration definition, Network Controller status, and Network Controller alerts
- Copy the contents of Network Controller storage to a diskette for backup or analysis.
- Copy the system diskette to a backup diskette.
- Execute some network operations (set SNBU mode off or on, set a line to half-speed or full-speed, or restart an upstream line).

Attaching the Control Terminal to the Service Adapter

The control terminal is attached to the service adapter in the following ways, which are shown in Figure 2-6 on page 2-15:

- Directly.

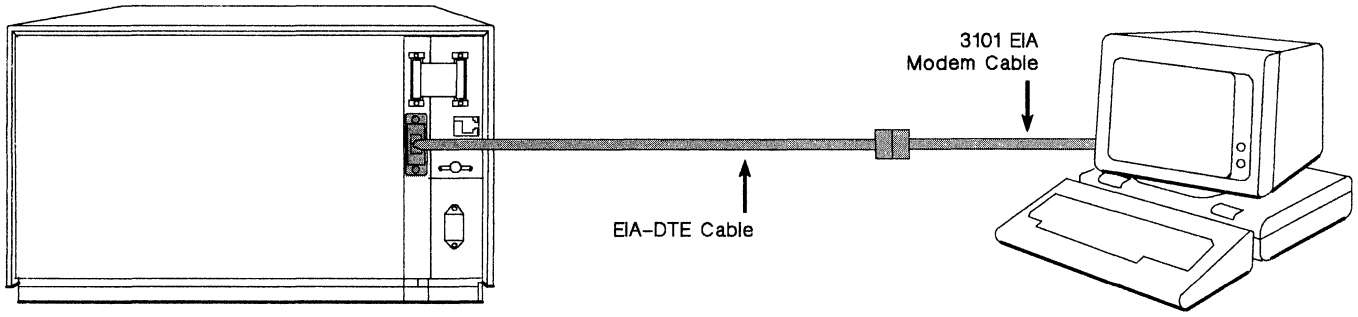
  Attach the control terminal EIA modem cable to a Network Controller EIA-DTE device cable. Then attach the EIA-DTE device cable to port 16BB of the service adapter.

- By a nonswitched link.

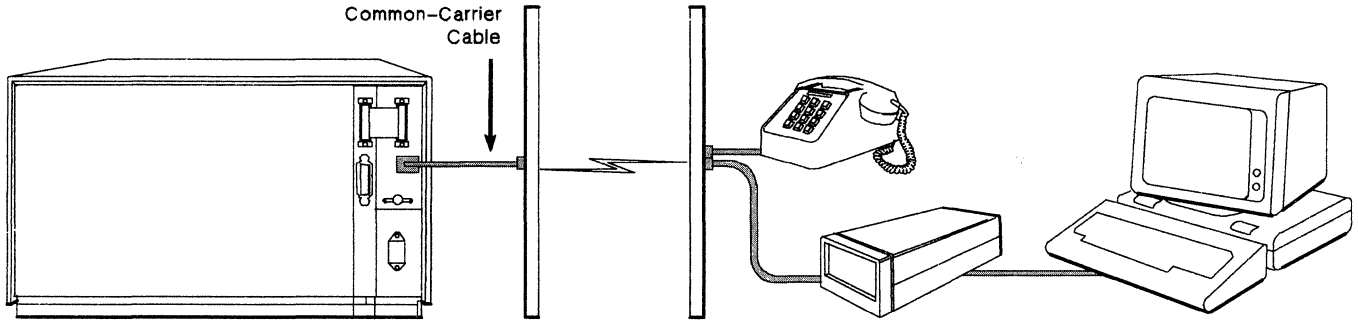
  Attach the control terminal through a modem to the nonswitched link. Then, if the integrated service modem is used at the Network Controller (USA only), attach the service modem to port 16AA of the service adapter with the service modem cable. Attach the service modem to the nonswitched link using the common-carrier cable. If an external modem is used at the Network Controller, use an EIA-DCE device cable to attach the external modem to port 16BB of the service adapter; attach the external modem to the nonswitched link with an appropriate common-carrier cable.

- By a switched link.

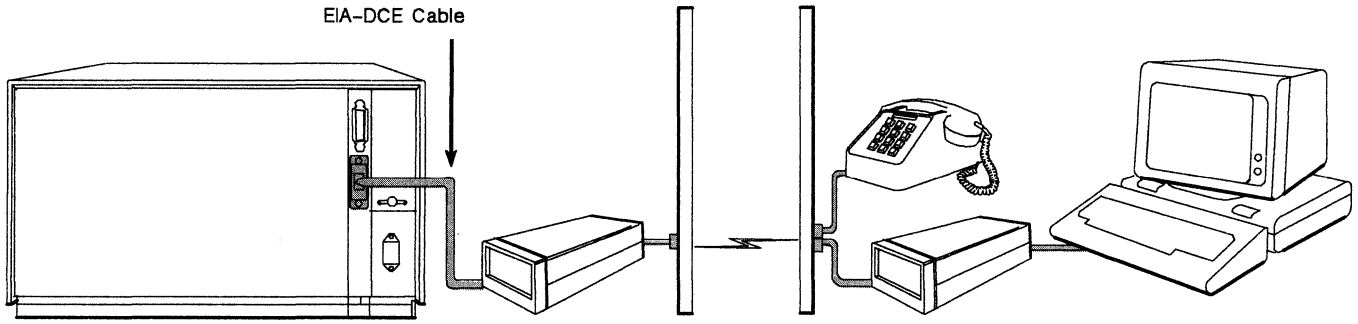
  Attach the control terminal through a modem to the switched link. Then, if the integrated service modem is used at the Network Controller (USA only), attach the service modem to port 16AA of the service adapter with the service modem cable. Attach the service modem to the switched link using the common-carrier cable. If an external modem is used at the Network Controller, use an EIA-DCE device cable to attach the external modem to port 16BB of the service adapter; attach the external modem to the switched link with an appropriate common-carrier cable.



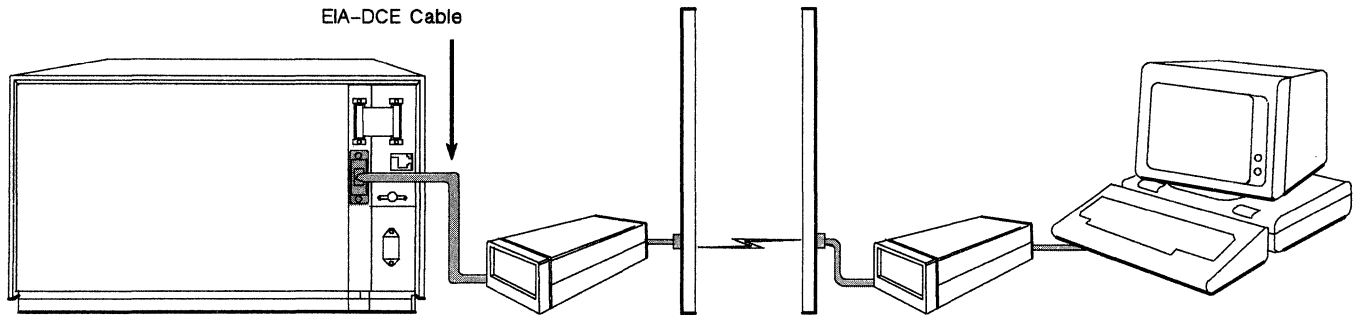
Directly Attached



(USA) Switched Line Connection with Integrated Service Modem



Switched Line Connection with External Modem



Leased Line Connection with External Modem

Figure 2-7. Methods of Attaching the Control Terminal to the Service Adapter

Control Terminal Characteristics

The following characteristics must be set as indicated in the tables, on an IBM 3101 terminal used as the Network Controller control terminal. If a 3101-equivalent terminal is used, the corresponding characteristics must be also be set as indicated in these tables.

For a terminal run in half duplex mode, and attached to port 16AA of the service adapter, use the following chart. For a terminal run in full duplex mode, see page 2-19.

Characteristic	Set to
Speed	One of the following: 1200, 900, 600, 300, 200, 150, 134.5, or 110 bps
FDX/HDX	HDX
PRTS/CRTS	CRTS
Turnaround Character	Carriage return
Parity	Odd
Stop Bits	Two
Auto New Line	On
Scrolling	On
Auto Line Feed	Not On
CR/CR-LF	CR-LF
Reverse Channel	Not on

Where:

- FDX/HDX = Full duplex or Half duplex
- PRTS/CRTS = Permanent-Request-to-Send or Controlled-Request-to-Send
- CR/CR-LF = Carriage return or Carriage return-Line feed

For a terminal run in full duplex mode, and attached to port 16BB of the service adapter:

Characteristic	Set to
Speed	One of the following: 9600, 7200, 4800, 3600, 2400, 1800, 1200, 900, 600, 300, 200, 150, 134.5, or 110 bps
FDX/HDX	FDX
PRTS/CRTS	PRTS
Turnaround Character	Carriage return
Parity	Odd
Stop Bits	Two
Auto New Line	Not On
Scrolling	On
Auto Line Feed	Not On
CR/CR-LF	Set to either
Reverse Channel	Not on

Where:

- FDX/HDX = Full duplex or Half duplex
- PRTS/CRTS = Permanent-Request-to-Send or Controlled-Request-to-Send
- CR/CR-LF = Carriage return or Carriage return-Line feed

Using the Service Adapter as a Communication Adapter

The service adapter can be used as a communication adapter if downstream lines and devices are attached to the service adapter, and are defined to the Network Controller and to ACF/NCP and ACF/VTAM. The service adapter functions as a communication adapter whenever the network operator activates one or more of the attached devices.

Performance

Performance considerations for the Network Controller include:

- Storage and other miscellaneous requirements
- Line utilization
- Response times
- Network Controller processor capacity.

Appendix D, "Performance Considerations", contains worksheets to help you decide, for each Network Controller:

- Whether you need to order the storage expansion unit with the Network Controller
- What line speeds to use
- How many devices and lines should be attached to the Network Controller
- How many Network Controllers to use in the network.

Use the worksheets to evaluate the performance of your Network Controller. If you desire more detailed information, ask your IBM marketing representative to obtain them for you by using the Hands On Network Environment (HONE) computer system.

See "NCP Performance Considerations for the Network Controller" on page 3-7 for some performance items to consider when you define the 3710 configuration to ACF/NCP and ACF/VTAM.

Chapter 3

Planning for 3710 Configuration Definition

This chapter describes how to plan to define the 3710 configuration:

- To the Network Controller
- To ACF/NCP and ACF/VTAM

Contents

Planning for 3710 Configuration Definition

This chapter describes how to plan to define the 3710 configuration:

- To the Network Controller
- To ACF/NCP and ACF/VTAM.

Defining the 3710 Configuration to the Network Controller

The 3710 configuration is defined to the Network Controller by means of a *configuration table*, which resides in Network Controller storage and on the Network Controller system diskette.

A default configuration table is supplied on the system diskette shipped with the Network Controller. The default table consists of:

- Nine upstream line definitions (default host link definitions)
- Configuration Name: 'DEFAULT '
- Configuration Version: '0000000000000000' hex
- Service Adapter Password: '99999999'
- 3710 Name: '3710 '

The default table may be used to test the host link after setup, to log on the control terminal the first time, and to pass a new configuration table from the host to the Network Controller.

When you define your 3710 configuration to the Network Controller, a new configuration table is created. The new table describes each line and device attached to your Network Controller, describes the Network Controller itself, gives the name of the configuration definition, and shows the date on which the configuration was defined.

The configuration is defined using either:

- The 3710 control terminal

- The Configuration Control Program in SSP (CCP), Version 3, Release 2.

The control terminal's definition is passed directly to the Network Controller from the control terminal, without going through the host. CCP's definition is passed to the Network Controller from the host. The Network Controller uses the definition information to create the new configuration table in Network Controller storage, and writes the new table on the system diskette.

Note: The previous configuration table in storage and on the system diskette is erased or overlayed when the new table is created. If you want to save the previous configuration table, you must copy the system diskette to a blank diskette before you define the new configuration and create the new table. See the for information on how to copy the system diskette.

The following sections describe considerations and procedures for defining the 3710 configuration to the Network Controller.

Considerations

- The control terminal defines the 3710 configuration to the Network Controller only. You must separately create the macro generation instructions to define the configuration to ACF/NCP and ACF/VTAM.
- CCP both defines the 3710 configuration to the Network Controller, and automatically creates some of the macro generation instructions needed to define the configuration to ACF/NCP and ACF/VTAM.
- The number of devices and lines that can be attached to the Network Controller is limited by the amount of Network Controller storage assigned to the configuration table, other tables, and work areas. The performance worksheets in Appendix D will help you to determine whether the configuration for each Network Controller in your network will exceed these limits.
- The control terminal and the lines used to connect the control terminal and the service modem to the Network Controller are not defined to the Network Controller or to ACF/NCP and ACF/VTAM. You must, however, define any downstream lines and devices attached to the service adapter in communication mode.

Defining the Host Link

Before the Network Controller can communicate with a host processor, an upstream line from the Network Controller through a communication controller to the host must be defined. This line is often referred to as the *host link*. The host link is the line over which the host passes the configuration table created by CCP, and over which Network Controller-related data is passed to and from the host that currently owns the Network Controller.

You can use one of the default host link definitions supplied on the system diskette, or you can define your own host link.

Default Host Link Definitions

Nine default host link definitions, as shown in Figure 3-1 on page 3-3, are included in the default configuration table on the system diskette supplied with each Network Controller. You can use one of the default host link definitions to test the host link after setup, or to pass CCP's configuration definition information from the host to the Network Controller.

Each default host link definition specifies a different Network Controller communication adapter port to be used or the upstream line. To use one of the default host links, connect the upstream line to the specified adapter port and activate the line from the host.

Note: All of the default host link definitions are for SDLC lines. If your host link is a line using X.25 protocol, you must use the control terminal ADD function to add an X.25 upstream line to the default configuration table before you can pass a CCP configuration to the Network Controller from the host. See "Nondefault Host Link Definition" on page 3-3 for more information on how to define a host link.

Figure 3-1 on page 3-3 shows the default host link definitions. In each definition, the host link is a nonswitched, full-duplex, SDLC line, and the upstream SDLC address of the Network Controller is hex C1.

The columns in the table indicate:

- What Network Controller communication adapter port the host link must be attached to
- Whether the line is always ready to send data (permanent request-to-send condition)
- Whether internal (Network Controller) or external clocking is used
- Whether non-return-to-zero (inverted) recording (NRZI) used
- Whether the Network Controller is attached to the 37X5 directly or through a modem
- What the host link line speed is.

Port No.	Permanent-Request-to-Send	Clock	NRZI	Attached to	Line Speed
01AA	Yes	External	Yes	Modem	≤19.2 kbps
02AA	No	External	Yes	Modem	≤19.2 kbps
03AA	Yes	External	No	Modem	≤19.2 kbps
04AA	No	External	No	Modem	≤19.2 kbps
05AA	Yes	Internal	Yes	386X modem, local line set without clock	1200 bps
06AA	Yes	Internal	Yes	386X modem, local line set without clock	2400 bps
07AA	Yes	Internal	Yes	Direct local line set without clock	4800 bps
08AA	Yes	External	Yes	Direct local line set with clock	≤19.2 kbps
09AA	Yes	External	Yes	Direct local line set with clock	>19.2 kbps

Figure 3-1. Default Host Link Definitions

Nondefault Host Link Definition

Though you may use a default host link definition to get started using your Network Controller, you may want to define a host link that better fits the normal operation of your Network Controller. (More than one upstream line can be defined for a Network Controller.) Either the control terminal or CCP can be used to define the host link. The host link may be defined as part of an entire new configuration definition; or an upstream line used as the host link may be added to or redefined in an existing definition.

Using the Control Terminal

To define the host link at the control terminal as part of a new configuration definition, use the control terminal INITIAL function. The INITIAL function allows you to define the host link, define the Network Controller itself, name and date the configuration, and define the service adapter password. The information collected by the INITIAL function is used by the Network Controller to create the first part of a new configuration table. The new table will overlay or erase the table currently in Network Controller storage and on the system diskette. (The ADD function is used to complete the rest of the 3710 configuration definition.)

Fill out the Host Link and 3710 Definition worksheet in Appendix B, to provide the required information for the INITIAL function to the control terminal operator. Instructions with the worksheet explain what information is required.

Note: The Host Link and 3710 Definition worksheet is used only to define or redefine the entire 3710 configuration. Some of the information defined by the INITIAL Function can be changed through other functions of the control terminal or through CCP Dynamic Reconfiguration.

Use the control terminal ADD function to insert an upstream line in an existing configuration table. (To redefine a line, delete the existing line; then add a new one.) The line can then be used as the host link. The configuration table is updated, but not overlayed or erased.

Fill out either the SDLC or the X.25 Upstream Line Definition worksheet in Appendix B to provide the required information to the control terminal operator. Instructions with the worksheets explain what information is required to add the upstream line.

Using CCP

To use CCP to define the host link as part of a new configuration definition or to add an upstream line to an existing definition, refer to the instructions and worksheets in the user's guide for CCP. The definition information is passed to the Network Controller from the host over the host link.

For a complete definition, the resulting configuration table will overlay and erase the table currently in Network Controller storage and on the system diskette. Adding a line definition will update the existing configuration table.

Note: A default SDLC host link or an X.25 upstream line defined at the control terminal must be used to pass the new configuration information to the Network Controller. The default host link upstream line (or the added X.25 line) **must** be included in your configuration definition. And the new NCP and VTAM definitions must be loaded before you activate the default or X.25 host link to send the configuration table information to the Network Controller. To use the new configuration definition, deactivate the host link, and activate the new configuration.

Defining the Rest of the 3710 Configuration to the Network Controller

After the host link is defined, either the control terminal or CCP is used to define the rest of the 3710 configuration to the Network Controller.

Using the Control Terminal

The rest of the 3710 configuration is defined at the control terminal using the control terminal ADD function. Descriptions of the lines and devices attached to the Network Controller are collected and verified, and then used by the Network Controller to create the new configuration table. The table then resides in Network Controller storage and is written on the system diskette. (Remember, if you want to save an old configuration table, you must copy the system diskette to a blank diskette before the new table is created and written on the diskette.)

Use the Configuration Definition worksheets in Appendix B to provide the line and device descriptions to the control terminal operator. There are worksheets for upstream lines, downstream lines, and various types of devices. Instructions provided with the worksheets explain what information is required.

On the worksheets, you may have defined some start-stop devices that send and receive data that is neither EBCDIC nor ASCII, or that use simulated system request strings to communicate with the host SSCP. If so, use the control terminal CHANGE function to define for those devices:

- User Transmit and Receive Translate Tables for devices that send and receive data in formats other than EBCDIC and ASCII
- One or two simulated system request strings.

Using CCP

CCP is a function of SSP that can be used to define, display, or change the configuration of an SNA network.

CCP uses descriptions of the Network Controller lines and devices to create two data files at the host:

- An NCCF command list containing the information to define lines and devices to the Network Controller, and NCCF commands for sending the definition information to the Network Controller
- A set of PU and LU macro generation instructions that are used to define the Network Controller downstream line and devices to ACF/VTAM and ACF/NCP.

To pass the configuration definition information to the Network Controller, the network operator executes the NCCF command list at the host. The Network Controller then uses the information to create a new configuration table in Network Controller storage, and writes the table onto the system diskette.

Summary of Procedures to Define the 3710 Configuration

In summary:

Briefly, the steps for defining the 3710 configuration using the control terminal are:

1. Set up the Network Controller and attach the control terminal to it.
2. Use the control terminal and worksheets to define the 3710 configuration to the Network Controller.
3. Prepare the macro generation instructions needed to define the the configuration to ACF/NCP and ACF/VTAM.
4. Execute the ACF/NCP generation process to create the NCP and VTAM definitions.
5. Load the new NCP modules containing the configuration definition into the 37X5.
6. Activate the host link and the rest of the network.

Briefly, the steps for defining the 3710 configuration with CCP are:

1. Install CCP at the host.
2. Set up the Network Controller.
3. Use CCP to create a NCCF command list for the Network Controller and the macro generation instructions for ACF/VTAM and ACF/NCP.
4. Distribute the NCCF command list file to the appropriate host(s).
5. Insert the ACF/NCP macro generation instructions into the appropriate ACF/NCP generation deck.
6. Execute the NCP generation process to create the new configuration definition for ACF/NCP and ACF/VTAM.
7. Load the new NCP into the 37X5 to which the Network Controller is attached.
8. Load the appropriate modules from the generation process into VTAM.
9. Re-IPL the host system, or restart the affected major nodes.
10. Activate the default host link.
11. Execute the NCCF command list to send the new configuration definition information to the Network Controller.
12. Deactivate the host link, and activate the Network Controller network.

Notes:

1. *CCP restricts the number of cascaded Network Controllers (that is, one Network Controller attached downstream to another Network Controller) to two, and the number of upstream lines to five.*
2. *The CCP configuration definition host data files can be generated for several Network Controllers, NCPs, and hosts at the same time, and saved for backup or reconfiguration. Repeat some or all of the steps above for each NCP, host, and Network Controller, as required.*

Refer to "Defining the 3710 Configuration to ACF/NCP and ACF/VTAM" on page 3-7 for more information on how to define the Network Controller configuration to ACF/VTAM and ACF/NCP.

Defining the 3710 Configuration to ACF/NCP and ACF/VTAM

The Network Controller and the lines and devices attached to it must be defined to ACF/NCP and ACF/VTAM, so that polling, error reporting, data exchange with host application programs, and other network activities may take place. If you use the control terminal to define the 3710 configuration to the Network Controller, you must separately code the macro generation instructions needed to define the 3710 to ACF/NCP and ACF/VTAM (GROUP, LINE, SERVICE, PU, and LU macros).

CCP, however, will create the PU and LU macro generation instructions while it is processing the Network Controller line and device descriptions in the 3710 configuration definition. You must insert the GROUP, LINE, and SERVICE macro generation instructions to complete the ACF/NCP and ACF/VTAM definition. See "Nondefault Host Link Definition" on page 3-3 for information on defining the host link using CCP.

Device Definition

The Network Controller and its downstream devices are defined to ACF/NCP as being on a multidrop line attached to the 37X5, regardless of the actual physical configuration.

The ACF/NCP macro generation instructions GROUP, LINE, SERVICE, PU, and LU are used to generate the appropriate definitions for ACF/NCP, and include parameters and operands that provide definition information to ACF/VTAM.

Devices are Defined to ACF/NCP as follows:

Device Type	Defined As
Network Controller	physical unit type 2
SDLC	physical unit type 2
BSC	physical unit type 2, logical unit type 0
Start-Stop	physical unit type 2, logical unit type 1

Note: The control terminal and the lines used for remote assistance and for the control terminal are not defined to ACF/VTAM and ACF/NCP.

NCP Performance Considerations for the Network Controller

When you are coding the ACF/NCP macro generation instructions to define the 3710 configuration, setting macro parameters and operands as suggested below will help to optimize Network Controller performance:

- Do not run the Network Controller in Definite Response Mode; use Exception Response Mode.
- For X.25, set packet and window so that
  - Packet size is 256. (This is recommended because of Network Controller buffer size and utilization.)
  - RU size is less than or equal to packet size.
    (The RU size is the size of the data portion of the transmission.)
- Set PASSLIM and MAXOUT equal to Modulus - 1 (That is, 7 for modulo-8; 127 for modulo-128.)
- NCP Poll Delay (time allotted to one cycle of the search order table) should be set equal to the default of 0.2 seconds. A higher value may be needed if:
  - The number of PUs routed over this line is high (20 or more)
  - The number of upstream lines is high (3 or more).
- Set PACING and/or VPACING off.

NCP Generation

Once the appropriate NCP macro generation instructions have been created and inserted into the NCP generation deck, the NCP generation process is executed. The new NCP is loaded into the 37X5 communication controller to which the Network Controller is attached, and the appropriate information is passed to ACF/VTAM.

Multiple Upstream Attachment

Multiple upstream lines can be defined from a Network Controller to one or more hosts. In a network using NPDA, the Network Controller and all its downstream devices should be owned by the same host, so that errors and status are reported correctly.

Downstream devices may send and receive data over more than one upstream line. However, each device can communicate with only one host at a time.

Network Backup

In planning for backup in the network, you may want to create ACF/NCP macro generation instructions and 3710 configuration definitions for each NCP and/or host to which the Network Controller can attach. The network item names of the Network Controller devices and upstream lines in the ACF/NCP Network Controller definition must correspond to the names used in the 3710 configuration table in order for the Network Controller to operate properly, and send correct status and error information to NPDA.

Care in defining the 3710 configuration to the Network Controller and to the host can make it possible to change the Network Controller to another NCP or host without loading a different NCP, Network Controller configuration table, and VTAM definition. It is, however, recommended that the NCP, the VTAM definition, and the Network Controller configuration table be loaded each time the Network Controller is changed to a backup NCP or host in the network.

In networks using NPDA, if you change the configuration definition, you must also make the corresponding changes in the ACF/NCP and ACF/VTAM definitions. Likewise, if you change the ACF/NCP and ACF/VTAM definitions, you must make the corresponding changes in the 3710 configuration definition. This will ensure that the information passed to NPDA in alerts from the Network Controller and from the host is accurate and usable in problem determination.

Chapter 4

Planning for 3710 Installation

This chapter describes how to plan for hardware installation. It helps you:

- Select and prepare the location for each Network Controller
- Plan the Electrical power for the Network Controller
- Select and order cables
- Decide how to label the cables and devices

Contents

Planning for 3710 Installation

This chapter describes how to plan for hardware installation. It helps you:

- Select and prepare the location for each Network Controller
- Plan the electrical power for the Network Controller
- Select and order cables
- Decide how to label the cables and devices.

Specifications and Views

Dimensions

Width: 444 mm (17.5 in.)
Depth: 742 mm (29.2 in.)
Height: 259 mm (10.2 in.)

Weight

Minimum configuration:	35.1 kg (77.4 lb)
Maximum configuration:	50.8 kg (112.0 lb)
Frame:	18.5 kg (41.0 lb)
Power unit:	6.8 kg (15.0 lb)
Control unit:	4.8 kg (10.5 lb)
Diskette unit:	4.5 kg (10.0 lb)
Communication adapter:	1.0 kg (2.0 lb)
Storage expansion unit:	0.7 kg (1.5 lb)
Service modem:	0.5 kg (1.0 lb)
Adapter blank:	Less than 0.25 kg (.5 lb)
Storage expansion blank:	Less than 0.25 kg (.5 lb)

Power Requirements

Voltage: See "Electrical Power" on page 4-7.
kVA: 0.8
Phase: Single

Setup and Service Clearances

Front: 760 mm (30 in.)
Rear: 760 mm (30 in.)
Left: 0 mm (0 in.)
Right: 0 mm (0 in.)
Above: 25 mm (1 in.)

Heat Output: 524 watts/hr (1788 Btu/hour)

Airflow: 57 liters/second (120 cfm)

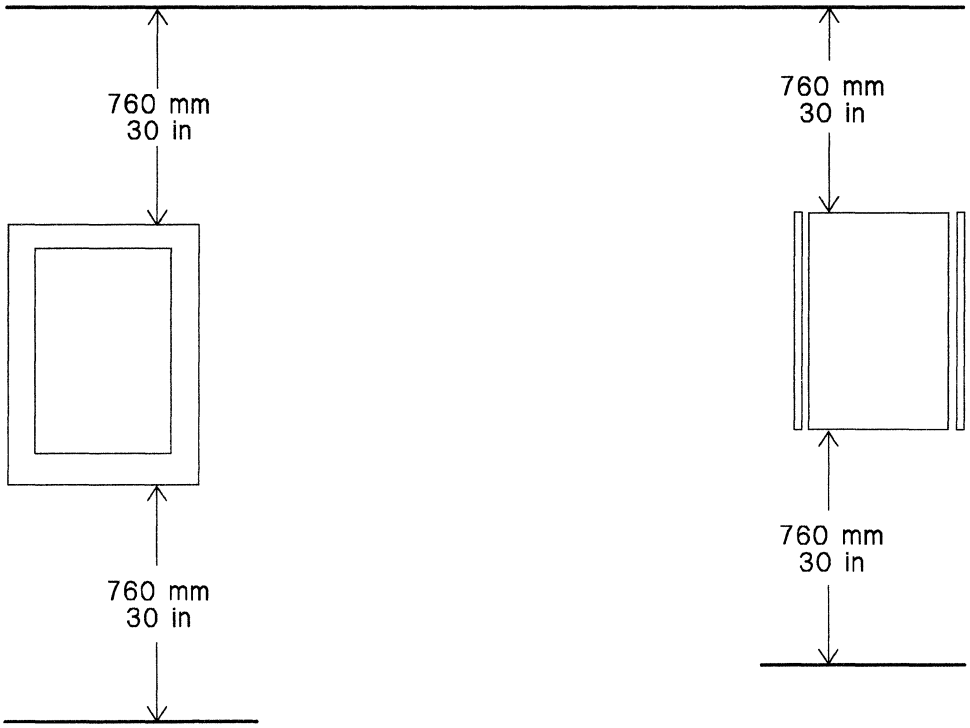


Figure 4-1. Plan View

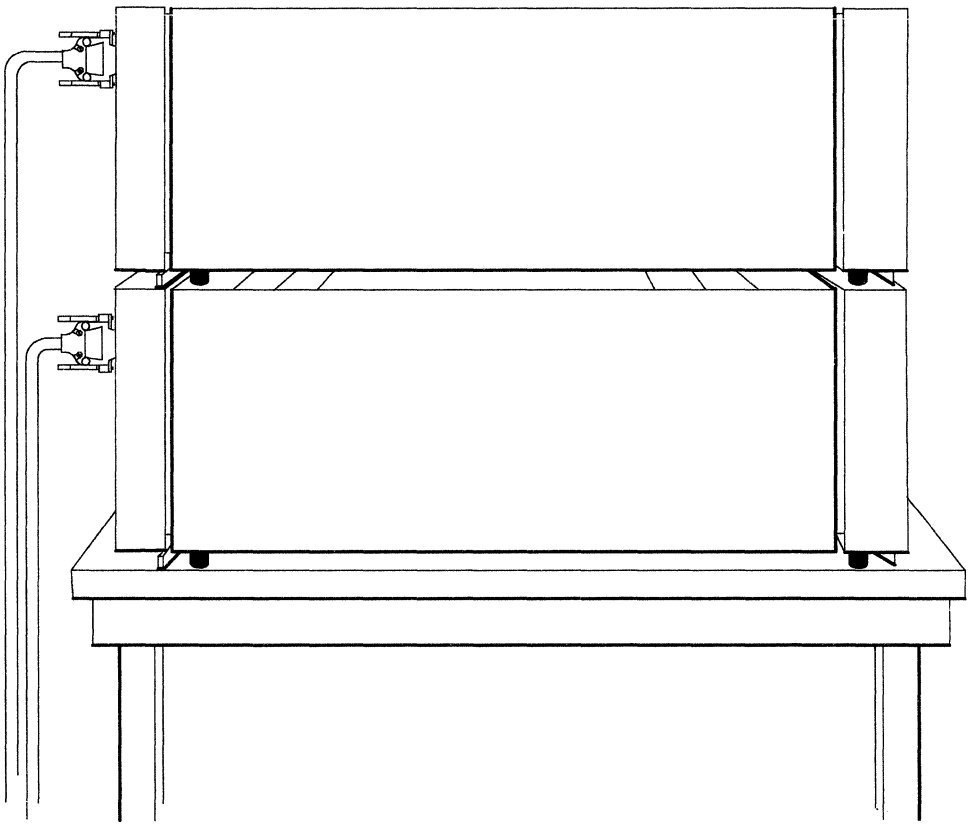


Figure 4-2. Side View of Network Controllers on a Table or Stand

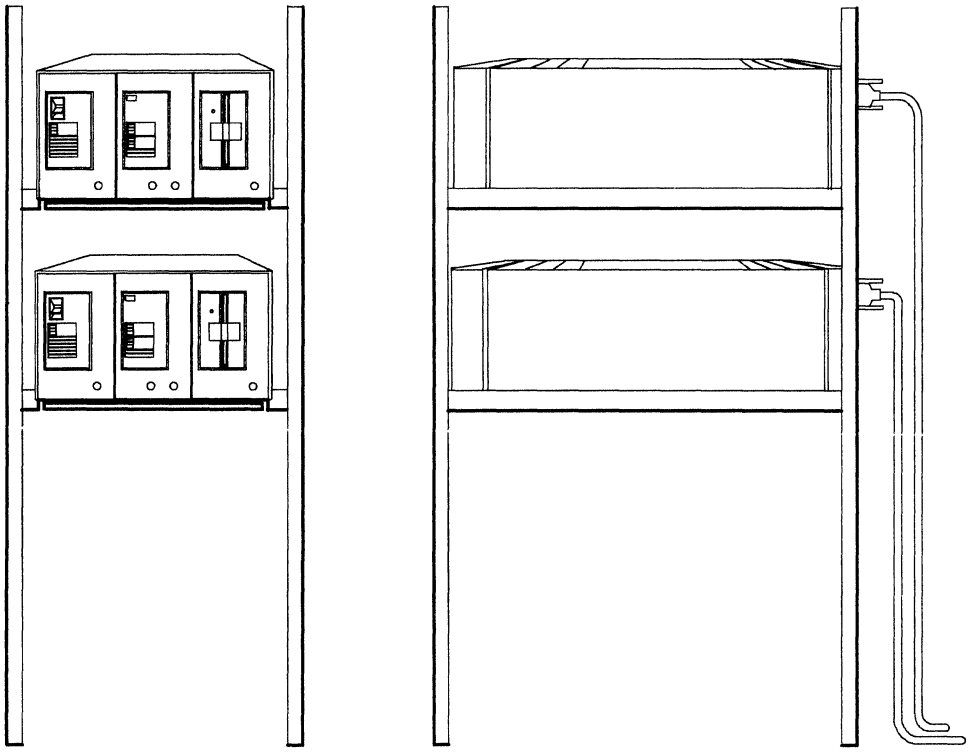


Figure 4-3. Front and Side Views of Network Controllers in an Open Rack

Location Considerations

When you are deciding where to put the Network Controller, you should consider weight, clearance, the control terminal, facilities, power cord, cable layout, heat output, environment, and airflow.

Weight

An assembled Network Controller with 16 communication adapters, service modem, and storage expansion unit weighs about 51 kilograms (112 pounds). Attaching the device cables to the Network Controller will add some additional weight. Plan to locate one or more Network Controllers on a level surface, such as on table or in a rack, that can support the total weight of the Network Controllers and cables.

Do not stack more than two Network Controllers on a table. The table may not be able to hold their combined weight, and there is the danger of the top one falling when cables, machine elements, or adapters are being changed or moved. Figure 4-2 on page 4-2 shows the Network Controller on a table or a stand.

If you plan to use two or more Network Controllers in one location, you may want to place them in an open rack. Two L-shaped brackets must be attached to the rack, one on each side, to support each Network Controller. The rack must be 485 mm (19 in) wide. The Network Controllers are installed from the back of the rack. Figure 4-3 shows the Network Controller in a rack.

If a Network Controller does not have 16 communication adapters (some positions contain adapter blanks) or if it does not have the storage expansion unit or the integrated service modem, calculate the weight of the Network Controller using the weights shown in "Specifications and Views" on page 4-1.

Clearance

The Network Controller operator and anyone doing problem determination need space to move quickly and easily around the machine. Front and back clearances for the Network Controller are given in "Specifications and Views" on page 4-1 and are shown in Figure 4-1 on page 4-2.

Control Terminal

Plan to install at least one control terminal on a table or stand either at the host location or near the Network Controller. Installing it at the host location is recommended, because there it may be easily used with other host programs and procedures to monitor network status and do problem determination. The control terminal may be directly attached to the Network Controller, or may be remotely attached by a switched or nonswitched link.

Facilities

A telephone should be located near the Network Controller. The network operator and control terminal operator will need to communicate with the Network Controller operator for such tasks as resolving problems, switching to a backup host, and running Network Controller utilities.

Power Cord

A power cord is provided with each Network Controller. The length of the power cord varies according to country. In the USA and Canada, the power cord is 1.8 meters (6 feet) long. For countries other than the USA and Canada, contact your local IBM representative for information on power cord lengths.

Make sure that you have a proper power receptacle at the place you plan to put your Network Controller. For more information about electrical power, see "Electrical Power" on page 4-7.

Cable Layout

In planning the location for the Network Controller, decide whether to place the cables under a raised floor or on the floor.

Also consider cable lengths. Cables must be able to reach devices that are directly attached to the Network Controller, or must reach common-carrier receptacles for those that are remotely attached.

Heat Output

The Network Controller dissipates about 524 watts/hr (1788 Btu/hr). If you plan to locate several Network Controllers in one room, the air conditioning, heating, and ventilation may require adjustment.

Environment

The Network Controller operates satisfactorily in normal business environments. Your IBM marketing representative can help you determine whether the location you want to use is suitable. Environmental requirements are shown in the following table.

Environment	Temperature Range	Relative Humidity Range	Maximum Wet Bulb
Operating	15.6° to 40.6° C (60° to 105° F)	8% to 80%	26.7° C (80° F)
Non-operating	10° to 51.7° C (50° to 125° F)	8% to 80%	26.7° C (80° F)
Storage	0.6° to 60° C (33° to 140° F)	5% to 80%	0.6° C to 29.4° C (33° F to 85° F)
Shipment	-40° to 60° C (-40° to 140° F)	5% to 100%	0.6° C to 29.4° C (33° F to 85° F)

Figure 4-4. Environmental Requirements

Airflow

The Network Controller is cooled by built-in fans that draw clean air into and exhaust air from the Network Controller at a minimum rate of 57 liters/second (120 cfm). The air intake vents are located on the front and along the top front edge of the Network Controller. The air exhaust vents are located on the back and along the top back edge of the Network Controller. **Do not obstruct the air vents.**

To ensure proper airflow, adapter blanks must be installed in any positions without communication adapters.

Electrical Power

In planning for the Network Controller, you must consider power requirements, branch circuits and grounding, and power plugs and receptacles.

Power Requirements

The power required for the Network Controller is 0.8 kVA. The maximum continuous load (Amperes) can be determined by using the following formula:

$$\text{Amperes} = \frac{\text{kVA} \times 1000}{\text{voltage}}$$

You can order the Network Controller for low voltages (100-127 volts) or for high voltages (200-240 volts), and for frequencies of either 50 Hz (Hertz) or 60 Hz. (High voltages are not available in the USA and Canada.) Ensure that your site has the electrical power to match your order.

The tolerance for the 50-Hz or 60-Hz frequencies is ± 0.5 Hz. Permissible voltage variances are shown in the following table:

Voltage	Minimum Voltage	Maximum Voltage
100-127 V	90 V	137 V
200-240 V	180 V	259 V

Figure 4-6. Permissible Variances for Available Voltages

Branch Circuits and Grounding

A dedicated branch circuit is recommended for each Network Controller. For safety and proper machine operation, each branch circuit must be grounded. The power cord of each Network Controller is equipped with a grounding conductor. The conductor must be electrically connected to a ground that complies with the electrical codes for proper grounding in your location. Wiring conduit should not be used as the only means of grounding. If, however, you do use conduit for one means of grounding, the conduit joints must be bonded to ensure electrical continuity.

Power Plugs and Receptacles

The following chart shows, by country, which power plugs are shipped with the Network Controller. The alphabetic references in this chart indicate the power plugs shown in Figure 4-7 on page 4-9.

Country	Low-Voltage	High-Voltage
Argentina		B
Australia		F
Austria		H
Belgium		J
Brazil		B
Bulgaria		H
Canada	A	
Chile		M
Czechoslovakia		H
Denmark		K
Finland		H
France		J
Germany DR		H
Germany FR		H
Greece		H
Hungary		J
Ireland		C
Israel		E
Italy		M

Country	Low-Voltage	High-Voltage
Japan	A	G
Korea		B
Netherlands		H
New Zealand		F
Norway		H
Peru		B
Poland		H
Portugal		H
Rumania		H
South Africa		D
Spain		H
Sweden		H
Switzerland		L
Taiwan		B
United Kingdom		C
United States	A	
Venezuela		B
Yugoslavia		H

Figure 4-6. Power Plugs by Country

The following chart shows the power plugs used with the Network Controller and their corresponding receptacles.

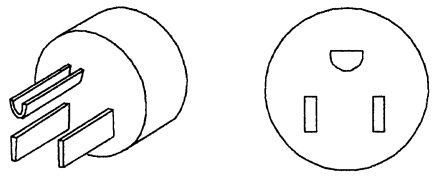
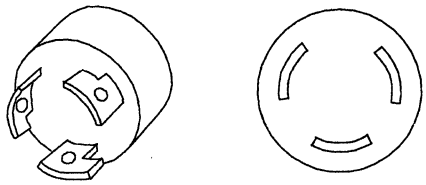
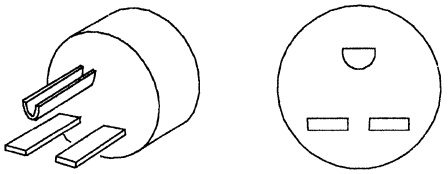
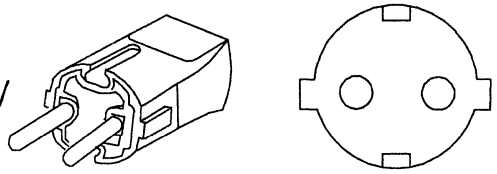
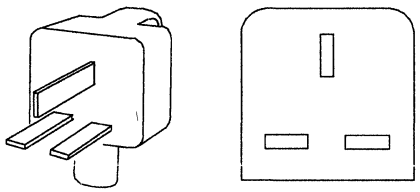
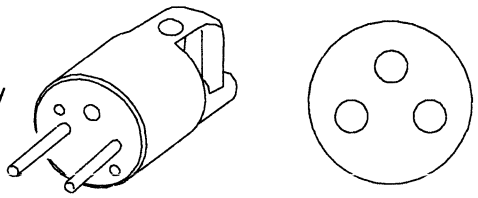
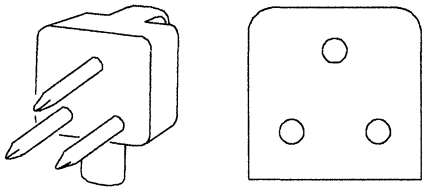
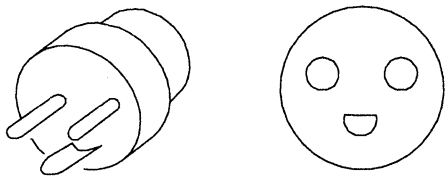
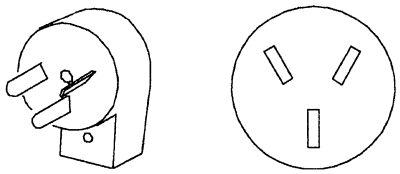
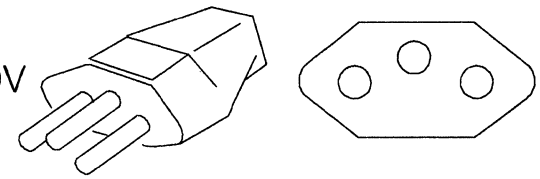
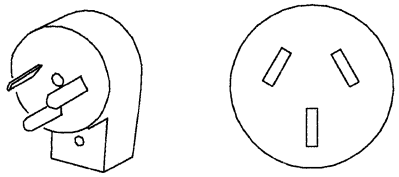
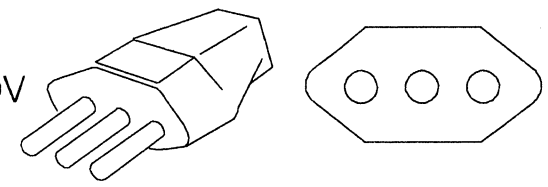
Plug (3-D View)	Receptacle	Plug (3-D View)	Receptacle
A 125v 15A		G 250V 10A Locking	
B 250V 15A		H 250V 16A	
C 250V 13A		J 250V 16A	
D 250V 16A		K 250V 10A	
E 250V 10A		L 250V 10A	
F 250V 10A		M 250V 16A	

Figure 4-8. Power Plugs and Receptacles

Device Cables

The following paragraphs describe the types of cables used to attach devices to the Network Controller (known as *device cables*). Also included is information to help you order the correct cables.

Types of Device Cables

The cables attaching devices to the Network Controller use three types of electrical interfaces: EIA RS-232-C (CCITT V.24), V.35, and X.21. See Appendix A, "Publications," for references containing more information about these interfaces. The connectors used on the cables for each interface are shown in Figure 4-11 on page 4-12.

An *EIA device cable* attaches a device using the EIA RS-232-C (CCITT V.24) interface to a Network Controller EIA communication adapter. Two types of EIA cable are available: EIA-DCE and EIA-DTE. An EIA-DCE cable is used to attach data circuit-terminating equipment (DCE), such as a modem. An EIA-DTE cable is used to attach data terminal equipment (DTE), such as a control unit or display terminal.

A *V.35 device cable* attaches a device using the V.35 interface to a Network Controller V.35 communication adapter. Two types of V.35 cable are available: V.35-DCE and V.35-DTE. A V.35-DCE cable is used to attach a DCE. A V.35-DTE cable is used to attach a DTE.

An *X.21 device cable* attaches a DCE using the X.21 interface to a Network Controller X.21 communication adapter.

Attaching one Network Controller to another requires a 3710-to-3710 cable, which consists of an EIA-DTE cable and an EIA-DCE cable with the "to DTE" and "to DCE" ends attached together.

The types of connectors on each cable are described in the following

Cable Type	Connector Type	Connector Description
EIA-DTE	To DTE To 3710	25-pin EIA RS-232-C/CCITT V.24 (female) 25-pin EIA RS-232-C/CCITT V.24 (male)
EIA-DCE	To DCE To 3710	25-pin EIA RS-232-C/CCITT V.24 (male) 25-pin EIA RS-232-C/CCITT V.24 (male)
V.35-DTE	To DTE To 3710	34-pin Winchester/CCITT V.35 (female) 25-pin EIA RS-232-C/CCITT V.24 (male)
V.35-DCE	To DCE To 3710	34-pin Winchester/CCITT V.35 (male) 25-pin EIA RS-232-C/CCITT V.24 (male)
X.25-DCE	To DCE To 3710	15-pin CCITT X.21 (male) 25-pin EIA RS-232-C/CCITT V.24 (male)
3710-3710		See note.

Figure 4-9. Device Cable Connector Types

Note: The 3710-3710 cable consists of the EIA-DTE and EIA-DCE cables attached together. The connectors are ones described above for those two cables.

The cables are shown in Figure 4-11 on page 4-12. See "Ordering Cables" on page 4-13 for information on how to order device cables.

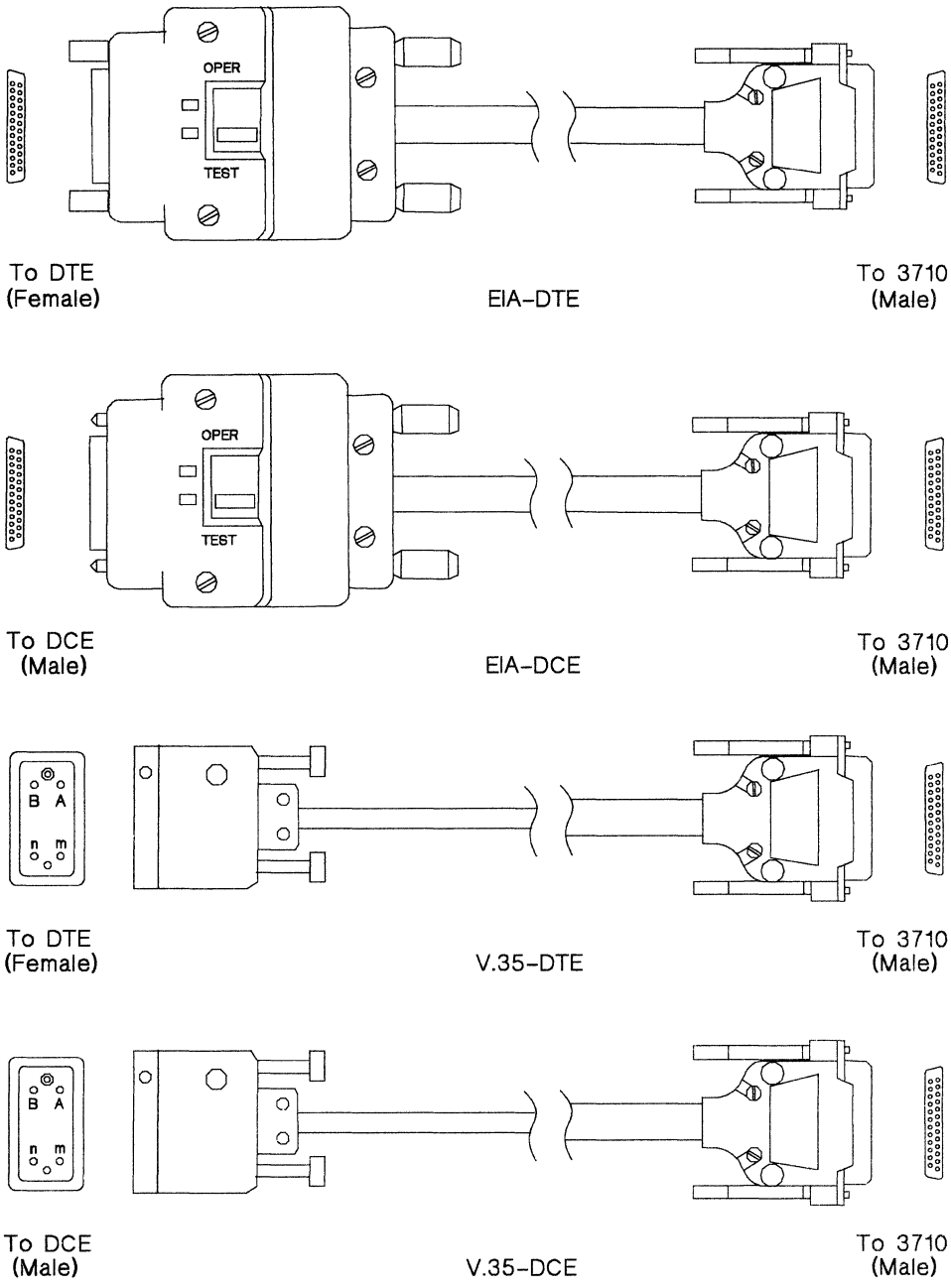


Figure 4-10. Device Cables (Part 1)

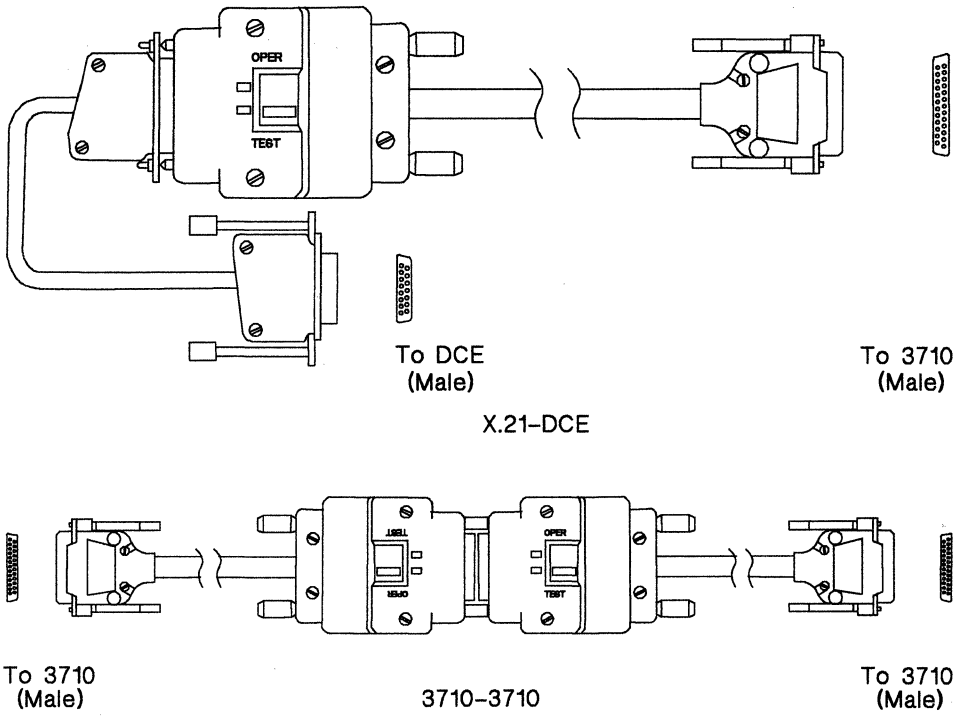


Figure 4-10. Device Cables (Part 2)

Cable Lengths

In the USA, South America, and the Far East, device cables are available variable lengths up to the maximum lengths shown in the cabling schematic on page 4-14.

In Europe, the Middle East, and Africa, contact your local IBM representative for information on cable lengths. In determining the length of cable you need, consider the distance from the Network Controller to the floor (including the length from the raised floor to the subfloor underneath if you have a raised floor), the distance across the subfloor, and the distance from the floor(s) to the device.

For information on how to order cables, see "Ordering Cables" on page 4-13.

Ordering Cables

You must order the device cables separately; they are not shipped with the Network Controller. They will probably arrive before the Network Controller arrives. You may plan to install the cables under a raised floor, or otherwise locate them so that they may be immediately connected to the Network Controller when it arrives.

In Europe, the Middel East, and Africa, contact your local IBM representative for information and assistance when ordering cables.

In the USA, South America, and the Far East, the rest of the information in this section and your local IBM representative will assist you in ordering cables.

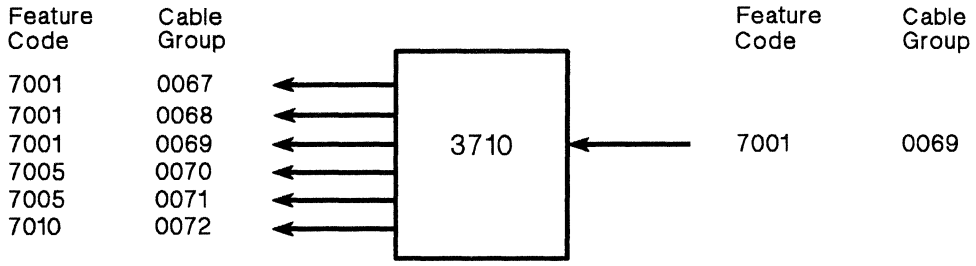
Cables are ordered by cable group number. The notes following the cable schematic on page 4-14 indicate the number of cables (or cable group numbers) to order for each communication adapter (or feature code) in your Network Controller. Each feature code corresponds to the type of cable used with one of the Network Controller communication adapters.

For example, the EIA adapter provides two ports. Therefore, you would order two cables that have feature code 7001, for the two devices that you will attach to that EIA adapter. The V.35 adapter has one port; order one cable from feature code 7005.

Note: Order a cable for every communication adapter port that will be on your Network Controller. Even if you are going to use one or neither of the two ports on an EIA adapter, order two device cables; order two cables for the service adapter whether or not you will use it for a control terminal and/or remote service. At initial setup and after relocation, **every** EIA adapter port must have a cable with a test switch attached for the setup tests to complete successfully. The Network Controller setup instructions have further instructions on attaching cables before and after the setup tests are run.

Use the following cable schematic to help you order device cables for your Network Controller.

Your IBM marketing representative will help you use the following cabling schematic to order your cables.



Cables from the Network Controller:

Feature Code	Group Number	No. of Cables	Maximum Length	Description	Notes
7001	0067	1	15.2 m (50 ft)	EIA-DCE	1
7001	0068	1	15.2 m (50 ft)	EIA-DTE	1, 3
7001	0069	1	15.2 m (50 ft)	3710-3710	1
7005	0070	1	15.2 m (50 ft)	V.35-DCE	2
7005	0071	1	15.2 m (50 ft)	V.35-DTE	2
7010	0072	1	150 m (492 ft)	X.21	2

Notes:

1. *Order any two cables for each feature code 7001.*
2. *Order one cable for each feature code 7005 or 7010.*
3. *A directly attached 3101 used as the control terminal requires cable group number 0068 and the 3101 EIA modem cable. The 3101 EIA modem cable is ordered as part of your 3101 order, or separately through your IBM marketing representative.*

Cables to the Network Controller:

Feature Code	No. of Cables	Description
7001	1	3710-3710

Cable Tests

Before diagnostic tests are run on device cables, a switch must be set, or a test plug must be attached to the connector at the device end of the cable or to the adapter port.

Each EIA device cable has an Operate/Test switch on the connector at the device end. When the cable is to be tested, the switch must be set to Test. The cable operates normally when the switch is set to Operate.

Each V.35 device cable has a test plug. Attach the test plug to the connector on the device end of the cable before running tests on the cable. The cable operates normally when the test plug is removed.

Each X.21 communication adapter has a test plug that must be inserted in the adapter port when setup tests are run. Refer to the setup instructions and the Network Controller operator's guide for more information on running cable tests with the X.21 adapter.

Note: It is recommended that the test plug be tied to the cable so that it will be readily available when needed for testing.

The EIA test switches and V.35 test plug are shown in Figure 4-12 (the X.21 test plug is not shown).

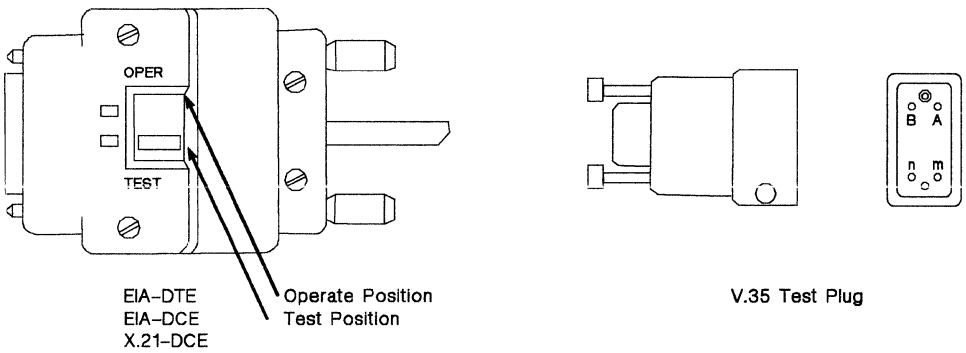


Figure 4-12. Test Switches and Test Plug for Device Cables

Labels

During setup, labels should be attached to device cables, to the Network Controller, and to the devices attached to the Network Controller. These labels help to identify parts of the network during problem determination, reconfiguration, and relocation.

As you define your Network Controller's physical configuration, plan to obtain appropriate labels and provide them to the person who will set up the Network Controller. Either fill them out before setup, and give the setup person instructions on which label to attach to what. Or give the setup person labels and instructions on how to fill them out and to attach them during setup.

It is recommended that you use the same names for Network Controller lines and devices on the labels that you assigned to them in your 3710 configuration definition. This will help communication between the network operator and the Network Controller operator during problem resolution.

Every device cable should have a label at each end. The label at the end connected to the Network Controller should include the Network Controller name, the number of the Network Controller adapter port to which the device is attached, and the device or line name, like this:

```
3710 Name: 371001
3710 Port No.: 16BB
Device Name: SS0010A
```

If only one device is to use a line, such as for a nonswitched point-to-point line, use the device name on the label. If several devices use a line, such as for a multidrop or switched line, use the line name.

The label at the other end of the cable, the end away from the Network Controller, should include the 3710 name and the device or line name, like this:

```
3710 Name: 371001
Device Name: SS0010A
```

You should also plan to label the front and back of each Network Controller with the same name used on the cable labels. If several Network Controllers are located in the same room, having a label on the front and back of each Network Controller helps the Network Controller operator find the right one.

You should also label each downstream device with the device name and/or the line name used on the device cable labels.

Figure 4-13 on page 4-17 shows an example of how to label devices and device cables.

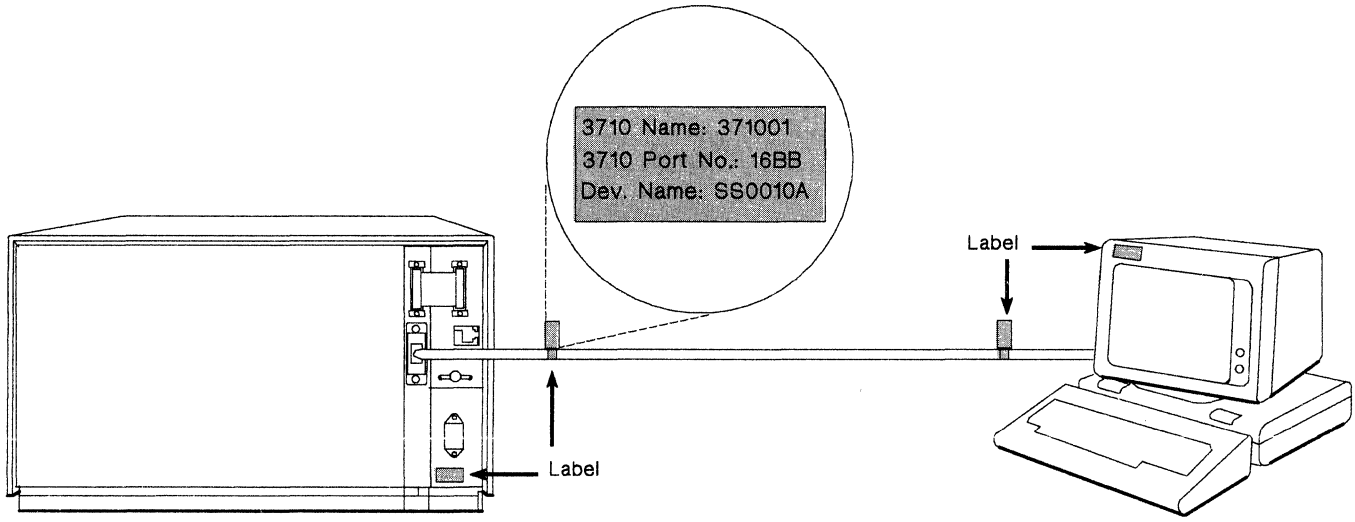


Figure 4-13. Labels for Device Cables and Devices

Setting up the Network Controller

Setting up the Network Controller is described in the setup instructions and the operator's guide shipped with the Network Controller. The person setting up the Network Controller also uses the Setup form in Appendix B in this manual.

The person setting up a Network Controller:

1. Unpacks and assembles the Network Controller
2. Connects cables to the Network Controller, the downstream devices, and the 37X5
3. Runs Network Controller setup tests
4. Notifies the appropriate persons when setup is complete
5. Follows any additional instructions checked or written on the Setup form
6. Puts the Setup form and manuals away for future reference.

In planning for Network Controller setup, fill out a Setup form for each Network Controller according to the instructions with the form in Appendix B. Give a copy of the form to the person who is setting up the Network Controller.

Also plan to provide to the setup person:

- Labels for the Network Controller, lines, and devices, and instructions on how to fill them out and/or attach them during setup
- Blank diskettes, if a copy of the system diskette is to be made at the end of setup.

Chapter 5

Planning for Installation of Host Programs

To help you plan for the installation of the host network program products needed for optional host enhancements for the Network Controller, this chapter describes:

- Which programs are required
- Which versions and releases of programs are required for each enhancement

Contents

Planning for Installation of Host Programs

To help you plan for the installation of the host network program products needed for optional host enhancements for the Network Controller, this chapter describes:

- Which programs are required
- Which versions and releases of programs are required for each enhancement.

Host Programs for Applications in the Network

The Network Controller can be used in various applications in your network, when the following levels of host network program products are installed:

- ACF/VTAM, any release of Version 2, or any later version, with appropriate PTFs
- ACF/NCP, any release of Version 3, or any later version, with appropriate PTFs.

To use the Network Controller, a new NCP must be generated to define the Network Controller configuration to ACF/NCP and to ACF/VTAM. No other changes are required to existing host network program products.

Host Programs for Optional Host Enhancements

Optional host enhancements for the Network Controller require certain levels of ACF/VTAM and ACF/NCP, as well as some additional host network program products. The following paragraphs describe the requirements for Network Controller optional host enhancements.

Communication Network Management

Communication network management (CNM) is the process of designing, installing, operating, and managing the distribution of information and control in a network. The Network Controller and an attached control terminal provide a basic level of CNM. When the following network program products are installed, additional levels of CNM are provided:

- Advanced Communications Function for the Virtual Telecommunications Access Method (ACF/VTAM), Version 3, or any later version, is required for the Network Controller Trace function.

- Network Communications Control Facility (NCCF), Version 2, Release 2, or any later version, provides a network operator interface to the Network Controller from the host console, online diagnostic tests, and commands to pass the CCP 3710 configuration definition information to the Network Controller.
- Network Problem Determination Application (NPDA), Version 3, Release 2, or any later version, provides LPDA support and Network Controller alert processing and display at the host console.
- System Support Programs for ACF/NCP/VS (SSP), Version 3, Release 2, or any later version, provides the Configuration Control Program (CCP) and the Trace Analysis Program (ACF/TAP).

X.25 Packet-Switched Data Network Attachment

The X.25 NCP Packet Switching Interface is an IBM network program product that enables SNA users to connect, through the 3725 Communication Controller, to packet-switched data networks using the CCITT X.25 interface and line protocol.

This Network Controller enhancement requires:

- The X.25 NCP Packet Switching Interface, Release 4.2, or any later release. (Release 4.2 operates in a 3725 Communication Controller only.)
- ACF/NCP, Version 4, or any later version.

Enhanced Definition Capability

IBM offers enhanced configuration definition with the Configuration Control Program (CCP), a function of SSP. CCP uses terminal panels to guide operators through the processes of defining, displaying, and changing all or part of a 3710 configuration. The definitions can be stored for later use or changes. CCP also creates some of the macro generation statements and the VTAM DRDS statements needed to define or redefine the 3710 configuration to ACF/NCP and ACF/VTAM.

CCP requires the following network program products:

- Interactive System Product Facility, Release 1.1, operating in either MVS or MVS/XA with the Time Sharing Option (TSO)
- NCCF, Version 2, Release 2, or later, to process the DRDS file and to send the configuration definition information to the Network Controller.
- ACF/SSP, Version 3, which contains CCP support.

Note: ACF/SSP, Version 3, will generate an NCP at ACF/NCP Version 3 level for 3705 support; or an NCP at Version 4 level for 3275 support. CCP can be used to assist in the Network Controller definition for both levels.

Remote Job Entry (RJE)

The Network Controller supports BSC RJE and BSC for the multi-leaving interface, which enable jobs to be submitted for processing by non-SNA program products in a remote host. RJE requires the Non-SNA Interconnection (NSI), Release 1.3. NSI is an IBM program product that operates in a 3725 Communication Controller, and provides terminal functions for devices that use BSC RJE and BSC for the multi-leaving interface. NSI operates with JES2 and JES3.

Network Controller Trace

The Network Controller can trace the data and control information it sends or receives. Trace data may be collected for two devices at once, if they are not on the same line. Data may be collected for a device, both on its downstream line and on the upstream line over which it sends data to the host.

The trace data is passed through ACF/VTAM to the Generalized Trace Facility (GTF). The Trace Analysis Program (ACF/TAP) uses the data to format and print a trace report.

To produce a trace, the Network Controller requires:

- ACF/VTAM, Version 3, for Trace Analysis Program ACF/TAP support
- ACF/SSP, Version 3, which includes the Trace Analysis Program (ACF/TAP).

Link Problem Determination Aids (LPDA)

LPDA can be used to run tests on Network Controller upstream lines, and on downstream lines that use BSC and SDLC protocols. The lines must be attached through IBM 386X modems.

When multiple Network Controllers and other control units are attached to the upstream line, LPDA by Station is required. The following host program products provide host program support for LPDA and LPDA by Station:

- ACF/NCP, Version 4 (which runs only in the 3725), or any later version
- NPDA, Version 3, Release 2, or any later version.

When only one Network Controller is attached on point-to-point upstream link, earlier levels of ACF/NCP and NPDA may be used--with caution. The earlier levels do not provide LPDA by Station. And they do not allow solicitation of LPDA by the Network Controller for downstream lines; solicitation is only by NCP on the Network Controller upstream link. The earlier level of NPDA displays LPDA alert information "generically," or in an unformatted form. The earlier levels that may be used are:

- NPDA, Version 3, Release 1
- ACF/NCP, Version 3, Release 1 (for 3705)
- ACF/NCP, Version 3, Release 2 (for 3725).

The following items must be coded for ACF/NCP:

- The LPDATS operand of the LINE macro for LPDA by Station
- The LPDA operand of the PU macro.

The Network Controller host guide contains more information about NPDA alert processing for the Network Controller.

Chapter 6

Planning for Operation and Problem Resolution

To help you plan for Network Controller operation and problem resolution, this chapter describes:

- The Network Controller operator's tasks
- The control terminal operator's tasks
- Documentation for operators
- Considerations for problem determination and remote assistance

Contents

Planning for Operation and Problem Resolution

To help you plan for Network Controller operation and problem resolution, this chapter describes:

- The Network Controller operator's tasks
- The control terminal operator's tasks
- The network operator's tasks
- Documentation for operators
- Considerations for problem determination and remote assistance.

The following paragraphs assume that the control terminal is at the host location. The network operator and the control terminal operator may be the same person or different persons.

The Network Controller Operator's Tasks

The Network Controller operator can:

- Turn the Network Controller on and off
- Help the network operator determine if a problem involves the Network Controller
- Copy the Network Controller system diskette onto a blank diskette for backup
- Remove and replace machine elements and cables
- Replace fuses or LEDs
- Assist the control terminal operator in running tests and utilities (by putting diskettes in the diskette unit and setting cable test switches and plugs).

The Control Terminal Operator's Tasks

The control terminal operator can:

- Define the 3710 configuration to the Network Controller, or change an existing definition
- Display the 3710 configuration
- Change the service adapter password and threshold counters
- Display Network Controller status and alerts
- Run online and offline diagnostic tests on the Network Controller
- Run Network Controller utilities
- Assist the network operator in Network Controller problem determination.

The Network Operator's Tasks

The network operator can:

- Activate and deactivate lines and devices attached to the Network Controller
- Request and display Network Controller line and device status
- Display Network Controller alerts and change alert thresholds (if NPDA is installed)
- Run LPDA tests on lines attached to the Network Controller
- Use the Network Controller trace to collect Network Controller line trace data
- Do problem determination for the Network Controller.

If CCP is used to create the 3710 configuration definition, the network operator also executes the NCCF command list to send the configuration data to the Network Controller.

Documentation for Operators

The appropriate documentation helps operators accomplish their tasks more easily and efficiently. Network Controller documentation for operators should include the following manuals, control terminal documentation, and local procedure documentation.

Manuals

Network Controller manuals used by the operators include the Network Controller operator's guide, the control terminal guide and the host guide.

The network operator works closely with the Network Controller operator when tasks are performed at the Network Controller. To facilitate communication between the network and Network Controller operators, the network operator should have a copy of the Network Controller operator's guide. One copy of the Network Controller operator's guide is shipped with the Network Controller; the person setting up the Network Controller should place the operator's guide in the *document drawer* under the Network Controller. Another copy should be ordered for the network operator.

The host guide contains information for the network operator; it is not shipped with the Network Controller and must be ordered separately.

The control terminal guide contains information about the functions available at the control terminal. A copy must be ordered for the control terminal operator; it is not shipped with the Network Controller.

Your IBM marketing representative can help you obtain the manuals you need.

Control Terminal Documentation

Be sure that the control terminal operator has documentation about the control terminal itself and is familiar with using the terminal.

Procedure Documentation

If the network operator uses documentation about local network procedures, you may want to include in that documentation instructions pertaining to your new Network Controller.

Plan to provide the network operator with a list of the Network Controllers in the network. The list should include the following information for each Network Controller:

- Network Controller name and location
- Name and phone number of the Network Controller operator
- Network names of the lines and devices that use each port, including any devices that use the service adapter (ports 16AA and 16BB) in communication mode
- Service adapter password, control terminal dial-in number, and remote assistance dial-in number.

Also plan to provides the Network Controller operator with:

- The phone number of the network operator
- Procedures for normal Network Controller operation (such as when to turn power on and off, or when to load a different configuration)
- Procedures to follow to report and resolve problems with the Network Controller.

Problem Determination

Problem analysis and resolution procedures are provided with the Network Controller. The network operator uses them, along with host program diagnostic tools and your local problem determination procedures, to to try to find the cause of a Network Controller problem.

He may also ask the control terminal operator and the Network Controller operator to run online and offline tests on the Network Controller. The other operators also may assist the network operator in the problem resolution, by replacing malfunctioning machine elements or by performing the activities needed to implement network backup procedures.

The operators work closely together and with system support persons to resolve Network Controller problems. You should plan to ensure that each one knows who to call and what procedures to follow if a problem occurs.

Remote Assistance

If you choose to obtain a *maintenance agreement* from IBM for your Network Controller, a part of that agreement can be remote assistance (at the mutual consent of you and IBM). You can then request remote assistance from IBM, when the operators and system support persons have not been able to resolve a problem with the Network Controller.

Remote assistance can include consultation with an IBM service representative and/or a remote connection from IBM to your Network Controller over a telecommunication link. The connection is made through the Network Controller service modem and service adapter.

Before IBM makes the remote connection to your Network Controller, you will need to tell IBM the physical location, the service adapter password, and the dial-in phone number for your Network Controller. The network operator must also deactivate any devices using the service adapter in communication mode. The Network Controller operator must make sure that the service modem is connected as shown in Figure 2-7 on page 2-17.

See your IBM marketing representative for more information about remote assistance.

Note: You must have at least one control terminal that can access the Network Controller in order to obtain a maintenance agreement for a Network Controller.

Chapter 7

Planning for Reconfiguration or Relocation

This chapter helps you to plan for:

- Redefining a 3710 configuration
- Relocating a Network Controller

Contents

Planning for Reconfiguration or Relocation

This chapter helps you plan for:

- Redefining a 3710 configuration
- Relocating a Network Controller.

For all relocations and reconfigurations, the suggested Planning Schedule in Chapter 1 should be modified and used to plan the changes. The Host Link form and the Configuration Definition worksheets in Appendix B (or CCP worksheets in the user's guide for CCP) and the appropriate publications listed in Appendix A should also be used to plan the 3710 configuration definition changes.

Reconfiguration Considerations

Because all devices attached to the Network Controller appear to ACF/NCP to be SDLC devices on the same multidrop line with the Network Controller, the 3710 configuration can be changed without disrupting the rest of the network.

If the changes require moving cables or communication adapters, fill out a new Setup form (see Appendix B). Give a copy to the person who is to move the cables and adapters, along with new labels for the cables and devices. Also, give the network operator a new list of line and device names for the Network Controller (see "Procedure Documentation" on page 6-3). If you want to save the previous configuration table, arrange to copy the system diskette to a blank diskette before the configuration is redefined.

The control terminal can be used to change the 3710 configuration in the Network Controller. Use the Configuration Definition worksheets in Appendix B to plan the changes. Then create the necessary macro generation instructions to redefine the configuration to ACF/NCP and ACF/VTAM, and execute the NCP generation process. The Dynamic Reconfiguration function of ACF/NCP and ACF/VTAM can be used to redefine the configuration to ACF/NCP and ACF/VTAM.

CCP can also be used to redefine the 3710 configuration. For reconfiguration, CCP creates two files:

- An NCCF command list containing commands to add and delete Network Controller line and device definitions in the existing configuration table
- A set of Dynamic Reconfiguration statements that are used to define to ACF/NCP and ACF/VTAM the changes to PUs and LUs in the 3710 configuration.

Relocation Considerations

To ensure proper handling or shipping of the Network Controller during relocation, the Network Controller should be taken apart and packed, as described in the setup and relocation instructions shipped with the Network Controller. Leaving the machine elements in the frame may result in damage to the connectors that hold the machine elements in place. The person relocating the Network Controller should also remove the diskette from the diskette unit before moving the Network Controller.

If you do not have the original Network Controller packing material, you can order packing material from IBM. For the IBM part number for the packing material, see "Packing Material" on page 8-3.

The Network Controller is reassembled at the new location as though it were being set up for the first time. Fill out a new Setup form for the Network Controller that is being relocated, showing any changes to be made during relocation (such as moving cables or adapters). Give the person setting up the Network Controller in its new location a copy of the new Setup form. And provide the setup person with new labels for any changed cables and devices. Also, give the network operator a new list of line and device names for the Network Controller.

If the relocation also includes redefining the 3710 configuration, use the Configuration Definition worksheets in Appendix B (and/or the CCP worksheets) to plan the changes for the definition to the Network Controller. Give a copy of the worksheets to the person who is to change the configuration definition. Also make the appropriate changes to the ACF/NCP and ACF/VTAM definitions.

Chapter 8

Additional Planning Considerations

Some other considerations in planning for the Network Controller are described in this chapter:

- Personnel
- Safety
- Ordering accessories and parts

Contents

Additional Planning Considerations

Some other considerations in planning for the Network Controller are described in this chapter:

- Personnel
- Safety
- Ordering accessories and parts.

Personnel

Selecting and training setup persons, operators, and system support persons before your Network Controller arrives allows you to begin using your Network Controller without delay. Information for the setup person and the Network Controller operator is shipped with each Network Controller. Host information for the network operator and information on using the control terminal must be ordered separately.

You may want programmers or other technical persons to be familiar with the information relating to the 3710 configuration definition and any host program installation. Plan to provide the appropriate manuals for them:

- For 3710 configuration definition, this Planning manual and the manuals listed in Appendix B for CCP and NCP
- For host program installation, those manuals listed in Appendix B for the optional host enhancements you choose to use (see Chapter 5, "Planning for Installation of Host Programs" on page 5-1).

Setup forms (see Appendix B) are required for setup of the Network Controller. They are also required whenever a Network Controller is changed, such as for relocation or reconfiguration. Configuration Definition worksheets (in Appendix B) are used when defining or redefining the 3710 configuration. Be sure to provide the appropriate forms to persons who are setting up the Network Controller or who are defining or redefining the 3710 configuration.

Safety

Safety is a major consideration in the design and manufacture of IBM products. In the USA, the Network Controller is listed by the Underwriters' Laboratory (UL).

Electrical grounding of the Network Controller is essential for safety and proper operation. Be sure that the power receptacle is properly grounded. If you have any questions about the grounding of the receptacle, contact your electrician.

A Network Controller with the maximum number of communication adapters weighs about 51 kilograms (112 pounds), unpacked and assembled. You should plan to have enough persons available to move the Network Controller safely, when it arrives and when you relocate it.

If the Network Controller cables are not installed under a raised floor, precautions should be taken to make sure that persons can move around the Network Controller safely, without tripping over the cables.

Accessories, Parts, and Machine Elements

You may order Network Controller accessories (diskettes and packing material), spare parts (fuses and LEDs), and machine elements from IBM, with the assistance of your IBM marketing representative. Plan to provide storage space for the items you order.

The following paragraphs provide information about ordering and storing accessories, parts, and machine elements.

Diskette

If you want to make a backup copy of the Network Controller system diskette, or if you want to copy Network Controller storage to a diskette for problem analysis, you will need to order blank diskettes.

Be sure to store your diskettes away from motors, magnets, and excessive heat.

Fuse

The Network Controller requires a medium- or normal-blow fuse that is 6.4 mm (1/4 in.) in diameter and 31.8 mm (1-1/4 in.) long. A low-voltage Network Controller (100-130 volts) requires a 10-amp fuse. A high-voltage Network Controller (200-240 volts) requires a 6-amp fuse. To determine which fuse you need, check the voltage label on the front of the Network Controller frame under the power unit (you will need to remove the power unit to see the label). Some spare fuses are shipped with the Network Controller.

LEDs

Indicator lights on the Network Controller are red and green light-emitting diodes (LEDs). All LEDs except the LED on the diskette unit are replaceable. Some spare LEDs are shipped with the Network Controller.

IBM part numbers for these and other accessories are:

Part Description	IBM Part Number
Blank diskettes	P/N 6023450
Common-carrier cable	P/N 6340768 ***
Communication adapter blank	P/N 4765589
Red LED	P/N 6340847
Green LED	P/N 6340848
10-amp/250-volt fuse	P/N 511063 *
6-amp/250-volt fuse	P/N 5214456 **
Key	P/N 4765546
Power cord	P/N 8952304 *
Storage expansion blank	P/N 4765515
V.35-to-DCE test plug	P/N 6835348
V.35-to-DTE test plug	P/N 6835349
X.21 wrap plug	P/N 4765597

* Available in the USA and Canada only.
** Not available in the USA and Canada.
*** Available in the USA only.

Machine Elements

You may wish to stock backup machine elements. Several diagnostic procedures described in the Network Controller operator's guide assume that you have spare parts and machine elements on hand. IBM part numbers for the machine elements are:

Machine Element Description	IBM Part Number
Power unit, low-voltage	P/N 4718250
Power unit, high-voltage	P/N 4718277 *
Control unit, low-voltage	P/N 4718252
Control unit, high-voltage	P/N 4718251 *
Diskette unit, low-voltage	P/N 4718240
Diskette unit, high-voltage	P/N 4718239 *
Integrated service modem	P/N 6340825 **
Storage expansion unit	P/N 4718247

* Not available in USA and Canada.
** Available in USA only.

Packing Material

If you relocate a Network Controller or send a machine element to the IBM Service Center, you should have the proper packing material. You can use the original packing material if you saved it, or you can order packing material from IBM. The IBM part number for the packing material is P/N 6405133.

Features

The communication adapters and the 128K storage expansion unit are ordered by feature number. Your IBM representative will assist you in ordering these features.

A total of ninety-nine communication adapters may be ordered for each Network Controller.

The feature numbers are:

Feature	Feature Number
EIA communication adapter	7001
V.35 communication adapter	7005
X.21 communication adapter	7010
128K storage expansion unit	7020

Appendixes
Abbreviations
Glossary
Index

The appendixes list additional publications you may need for planning and for installation. The list includes other Network Controller manuals and related host program manuals. They are followed by a list of abbreviations, a glossary, and an index.

Contents

Appendix A. Publications

This appendix lists additional publications you may need for planning and for installation. The list includes other Network Controller manuals and related host program manuals.

IBM 3710 Network Controller Publications

Other publications for the Network Controller include:

- GA27-3430
- Setup and relocation instructions
- Control terminal guide
- Network Controller operator's guide
- Host guide
- Problem report.

Network Program Products Publications

The following publications include information for ACF/NCP, ACF/VTAM, CCP, NCCF NPDA, and SSP:

- *IBM Network Program Products General Information*, GC23-0108
- *IBM Network Program Products Planning*, SC23-0110.

Other publications for ACF/NCP and ACF/SSP include:

- *ACF/NCP, ACF/SSP Customization*, LY30-5556 (3705) and LY30-5559 (3725)
- *ACF/NCP, ACF/SSP Installation and Resource Definition Guide*, SC30-3224 (3705) and SC30-3226 (3725)
- *ACF/NCP, ACF/SSP Resource Definition Reference*, SC30-3199 (3705) and SC30-3277 (3725).

Other publications for ACF/VTAM include:

- *ACF/VTAM Customization*, SC27-0613
- *ACF/VTAM Installation and Resource Definition*, SC27-0610.

Other publications for CCP include:

- *CCP Diagnosis and Installation*
- *CCP User's Guide*.

Other publications for NCCF include:

- *NCCF Customization: Command Lists*, SC27-0661.
- *NCCF Installation and Resource Definition*, SC27-0660

Another publication for NPDA that you may need is:

NPDA Installation, SC34-2011.

Electrical Interface Publications

The following publications include information about the X.25 electrical interface:

- *The X.25 Interface for Attaching SNA Nodes to Packet-Switched Data Networks*, GA27-3345.

Information about the X.21 electrical interface is available in:

- *IBM Implementation of X.21 Interface-General Information Manual*, GA27-3287.

Information about the EIA RS-232-C electrical interface can be obtained at the following address:

Electronics Industries Association
2001 "I" Street, NW
Washington, DC 20006

Information about CCITT V.24, V.35, X.21 bis, X.21, and X.25 electrical interfaces and line protocols can be obtained in CCITT Recommendations, published every four years (the Yellow Book was published in 1980, and the next revision, the Red Book, is to be available in October, 1984). CCITT Volumes can be obtained at the following addresses:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

or

U.I.T. Place des Nations
1211 Geneve 20
Switzerland

Modems

Information about IBM 386X modems is available in the following publications:

- *IBM 3863, 3864, and 3865 Modems Introduction and Site Preparation Guide*, GA27-3200
- *IBM 3868 Modem User's Guide*, GA33-0025
- *IBM 3868 Modem Planning and Site Preparation Guide*, GA33-0023.

NSI Publications

The following publications contain information for NSI:

- *Non-SNA Interconnection General Information Manual*, GC33-2023
- *Non-SNA Interconnection Installation and Operation*, SC33-2024.

X.25 NCP Packet Switching Interface Publication

Information about the X.25 NCP Packet Switching Interface is available in:

- *X.25 NCP Packet Switching Interface-General Information*, GC30-3080.

Systems Network Architecture Publication

Information about systems network architecture (SNA) is available in:

- *Systems Network Architecture Concepts and Products*, GC30-3072.

IBM 3101 Display Terminal

Information about the IBM 3101 Display Terminal is available in:

- *IBM 3101 Display Terminal Description*, GA18-2033.

Appendix B. Planning Forms

This appendix contains the following items to help you plan for and install a Network Controller:

- IBM 3710 Network Controller Setup form
- Host Link and 3710 Definition worksheet
- Configuration Definition worksheets.

IBM 3710 Network Controller Setup Form

The Setup form on page B-5 is used when the Network Controller is being set up after arrival, and for reconfiguration and relocation of the Network Controller. It shows how the communication adapters are arranged, and how the cables are attached to the adapters. The form also lists the number of cables and parts you should have at setup, relocation, or reconfiguration.

For the initial setup of a Network Controller, fill in the indicated information, skipping the columns on the back that are for changing ports.

For reconfiguration only (not relocation), fill in the indicated information, including the columns on the back that are for moving devices and lines from one port to another (changing ports).

For relocation, it is recommended that you use this form as though the Network Controller were being set up for the first time. Do not indicate that devices and lines are being moved from one port to another (if they are). Just indicate the number of cables and elements that should be present when the Network Controller is reassembled at its new location, and fill in the columns on the back for attachment of the cables (skipping the columns on the back that are for changing ports).

Refer to Chapter 7, "Planning for Reconfiguration or Relocation" on page 7-1 for more information on planning for reconfiguration and relocation.

Persons Who Use the Form

Fill out a copy of the Setup form for each Network Controller you plan to install, change, or relocate. After you have filled out the form, give a copy to the person who is to set up, change, or relocate the Network Controller. You may also want to give a copy to the network operator and/or the person responsible for maintaining the network.

Filling Out the Front

The front of the form has three sections.

1. Setup Information

   Before setup, fill in all blanks in this section, except the serial number. This section contains the following information:

   - 3710 information. Fill in the 3710 name, description, location, and model number before setup time. The location is the street address, building, floor, room, and so forth, where the Network Controller is located. Do not fill in the serial number. The person doing the setup fills in the serial number, which is on a plate on the Network Controller frame.
   - The date.
   - Host link Network Controller port number.
   - A space to check indicating whether this is an initial setup, a reconfiguration, or a relocation.
   - Dial-in numbers. The Network Controller service modem number is the number to dial to access the Network Controller for remote assistance or to use a remotely attached control terminal. The IBM number is the telephone number to dial to ask IBM for remote assistance.

2. Checklist

   Fill in all blanks in this section before setting up or changing the Network Controller. This section contains a checklist to indicate which elements, cables, and parts should be available to set up or change this Network Controller. The list tells the person setting up or changing the Network Controller what he should have; he can compare what he actually has to what he should have.

3. Other Instructions

   This section provides space for additional instructions to the person setting up or changing the Network Controller. Some instructions are already printed in that section. Check those that apply to your Network Controller. Write in any additional instructions that apply to your network. Such instructions might include where to store spare parts and machine elements, where to put manuals and the Network Controller Problem Report forms, and whether to keep and store the original packing material.

Filling Out the Back

The following list describes the information that goes in each column on the back of the setup form:

1. Adapter

   - Adapter Type. If an adapter is to be inserted in this position, write *EIA*, *V.35*, or *X.21*. If an adapter blank is to be inserted in this position, write *BLANK*.
   - Adapter Changed. Use only for reconfiguration, if communication adapters are being moved to different positions or changed to a different type. Put a check mark to indicate that the adapter that now goes in this position is not the adapter that was previously in this position.

2. Cable

   - Cable Type. Write *EIA-DCE*, *EIA-DTE*, *V.35-DCE*, *V.35-DTE*, *X.21*, or 3710-to-3710, to indicate the type of device cable attached to this Network Controller port.
   - Cable Length. Write the length ordered for this cable.
   - Previous Port. Use only for reconfiguration. Write the port number to which this cable was previously attached, if the cable is being moved from one port to another. Write *NEW* if the cable to be attached is new (was not attached to this Network Controller before reconfiguration).

3. Device Name or Line Name.

   Write the configuration definition name of the device attached to this line (if it is the only device on the line), or of the line (if there are several devices on the line). These names should be the same ones written on the labels to be attached to the line or device during setup.

4. Previous Device Name or Line Name.

   Use only for reconfiguration, for devices or lines that are being moved from one port to another. Write the configuration definition name of the device (if there is only one device on this line) or of the line that was previously attached to this Network Controller port.

IBM 3710 Network Controller Setup

Setup information:

3710 Information

3710 name: _____

Description: _____

Location: _____

Serial number: _____

Model number: _____

Host link port number: _____

Date _____

Check one:

_____ Initial Setup

_____ Reconfiguration

_____ Relocation

Dial-in numbers:

3710 Service modem: _____

IBM (for remote assistance): _____

Checklist

Communication adapters (how many):

_____ EIA

_____ X.21

_____ V.35

_____ Blank

Service modem parts:

_____ Service modem

_____ Common-carrier cable

Device cables (how many):

_____ EIA-DCE

_____ EIA-DTE

_____ V.35-DCE

_____ V.35-DTE

_____ X.21

_____ 3710-to-3710

_____ **Storage expansion unit**

Other Instructions:

[ ] If a backup copy of the system diskette is to be made at this time, call _____ at _____ and ask for the backup to be made.

[ ] Call _____ at _____ and tell him that this Network Controller is ready for host link definition and a configuration table.

Return to the Customer Setup Instructions to complete setup.

SU-2

3710 Name: _____ Date: _____

Position Number	Adapter Type	Adapter Changed * (√)	Port	Cable Type	Cable Length	Cable Previous Port*	Device Name or Line Name	Previous Device Name or Line Name*
01			01AA					
			01BB					
02			02AA					
			02BB					
03			03AA					
			03BB					
04			04AA					
			04BB					
05			05AA					
			05BB					
06			06AA					
			06BB					
07			07AA					
			07BB					
08			08AA					
			08BB					
09			09AA					
			09BB					
10			10AA					
			10BB					
11			11AA					
			11BB					
12			12AA					
			12BB					
13			13AA					
			13BB					
14			14AA					
			14BB					
15			15AA					
			15BB					
16			16AA					
			16BB					

* Use only for changes

Host Link and 3710 Definition Worksheet

The Host Link and 3710 Definition worksheet (also called the Host Link form) contains the information needed to define the first upstream line connecting the Network Controller to a 37X5, the Network Controller itself, and the service adapter password. Use it to define the host link and the Network Controller from the control terminal.

Note: Before you begin to fill in the values, make a blank copy of the worksheet pages for each host link to be defined in the network. Save the original blank worksheet pages for later use.

This worksheet is used for the first definition of the 3710 configuration, or for a complete reconfiguration. Some items listed on the form may be changed individually at the control terminal.

Any other upstream lines connecting the Network Controller to a 37X5 are defined separately using either the SDLC or X.25 Upstream Line Definition worksheets.

You will not use all of the steps on the form for the definition. For the steps that are not used for this definition, write a dash in the space on the form under Values. This will help you to make sure that no required values have been left blank.

Use the list of prompts in Appendix C to help you fill out the form (the prompts are listed in numerical order).

After you have filled out the form, make several copies. Give one copy to the person who is to enter the host link and Network Controller definition at the control terminal. Give a second copy to the network operator. You may also want to give a copy to the person responsible for maintaining your network.

Host Link and 3710 Definition Worksheet

3710 Name———————— Date————————

Configuration Name———————— Version Name————————

Step	Control Terminal Prompts	Values
1.	C001: UPSTREAM LINK PROTOCOL	
2.	C004: PORT NUMBER	
3.	C005: LINE NAME	
4.	C006: MODEM TYPE	
5.	If UPSTREAM LINK PROTOCOL = X.25, go to step 7. If UPSTREAM LINK PROTOCOL = SDLC, continue.	
6.	C008: INTERNAL (3710 PROVIDES) CLOCK	
7.	C009: LINE SPEED	
8.	C010: UPSTREAM SDLC ADDRESS FOR THE 3710	
9.	If UPSTREAM LINK PROTOCOL = SDLC, go to step 11. If UPSTREAM LINK PROTOCOL = X.25, continue.	
10.	C014: MODULO-8 OR MODULO-128	
11.	If UPSTREAM LINK PROTOCOL = X.25, go to step 16. If UPSTREAM LINK PROTOCOL = SDLC, continue.	
12.	C011: DUPLEX	
13.	C013: NRZI	
14.	C012: PERMANENT REQUEST TO SEND	
15.	Go to step 40.	
16.	C016: NUMBER OF SWITCHED VIRTUAL CIRCUITS FOR INCOMING CALLS (VSCI)	
17.	C017: NUMBER OF SWITCHED VIRTUAL CIRCUITS FOR TWOWAY CALLS (VSCT)	
18.	C018: NUMBER OF PERMANENT VIRTUAL CIRCUITS (PVC)	
19.	If VSCI = 0, go to step 21. If VSCI > 0, continue.	
20.	C020: LOGICAL CHANNEL NUMBER OF THE FIRST SWITCHED INCOMING CIRCUIT	
21.	If VSCT = 0, go to step 23. If VSCT > 0, continue.	
22.	C021: LOGICAL CHANNEL NUMBER OF THE FIRST SWITCHED TWOWAY CIRCUIT	
23.	If PVC > 0, go to the X.25 Permanent Virtual Circuit Definition Worksheet. If PVC = 0, go to step 27.	
24.	C037: PVC ASSIGNED TO THE 3710 PHYSICAL UNIT	

(Please turn the page over.)

Step	Control Terminal Prompts	Values
25.	If PVC ASSIGNED... = NO, go to step 27. If PVC ASSIGNED... = YES, continue.	
26.	C024: LOGICAL CHANNEL NUMBER FOR THE PVC	
27.	If VSCI + VSCT = 0, go to step 32. If VSCI + VSCT > 0, continue.	
28.	C025: DEFAULT PACKET SIZE FOR SWITCHED CIRCUITS	
29.	C026: MINIMUM PACKET SIZE FOR SWITCHED CIRCUITS (NEGOTIATION)	
30.	C027: MAXIMUM PACKET SIZE FOR SWITCHED CIRCUITS (NEGOTIATION)	
31.	C028: DEFAULT WINDOW SIZE FOR SWITCHED CIRCUITS	
32.	C029: MAXIMUM NUMBER OF OUTSTANDING I-FRAMES VALUE FOR THE LINK LEVEL OF X.25	
33.	C030: ERROR RECOVERY NUMBER OF RETRIES FOR LINK LEVEL OF X.25	
34.	C031: PAUSE BETWEEN ERROR RETRIES FOR LINK LEVEL OF X.25 (IN HALF SECONDS)	
35.	C032: NETWORK TYPE	
36.	If VSCI + VSCT = 0, go to step 40. If VSCI + VSCT > 0, continue.	
37.	C033: NUMBER OF HOSTS ALLOWED TO CALL IN (0 MEANS ANY HOST ALLOWED)	
38.	If NUMBER OF HOSTS... = 0, go to step 40. If NUMBER OF HOSTS... > 0, continue.	
39a.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39b.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39c.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39d.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39e.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39f.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39g.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39h.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39i.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
39j.	C034: ADDRESS FIRST/NEXT CALLING DTE ADDRESS	
40.	C051: NCP NAME	
41.	C052: NCP LINE NAME	

(Please go to the next page.)

Host Link and 3710 Definition Worksheet (continued)

Step	Control Terminal Prompts	Values
42.	C035: 3710 NAME	
43.	C036: NEW PASSWORD FOR COMMUNICATION SERVICE ADAPTER	
44.	C038: NEW PASSWORD AGAIN FOR VERIFICATION	
45.	C039: CUSTOMER GEOGRAPHICAL DATA	
46.	C053: CONFIGURATION NAME	
47.	C054: CONFIGURATION VERSION	
48.	C055: CONFIGURATION DATE	
49.	C056: CONFIGURATION TIME	

X.25 Permanent Virtual Circuit Definition Worksheet

3710 Name———————— Date————————

Configuration Name———————— Version Name————————

PVC #	C022: LCN	C023: PACKET SIZE	C015: WINDOW SIZE
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

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X.25 Permanent Virtual Circuit Definition Worksheet (continued)

PVC #	C022: LCN	C023: PACKET SIZE	C015: WINDOW SIZE
31.			
32.			
33.			
34.			
35.			
36.			
37.			
38.			
39.			
40.			

When all permanent virtual circuits have been defined, return to step 24 of the Host Link and 3710 Definition Worksheet.

Configuration Definition Worksheets

The Configuration Definition worksheets help you plan to define the 3710 configuration at the control terminal.

Note: Before you begin to fill in the values, make as many blank copies of the worksheet pages as you need to define the devices and line attached to each Network Controller. Save the blank original worksheets for later use.

Use the list of control terminal prompt explanations in Appendix C to help you fill out the worksheets (the prompts are listed in numerical order). You may not use all of the steps on each worksheet for the definition. For the steps that are not used, write a dash in the space on the worksheet under Values. This will help you to make sure that no required values have been left blank.

After you fill out the worksheets, make at least one copy of each sheet. Give one set of worksheets to the control terminal operator to use in defining the 3710 configuration at setup, relocation, or reconfiguration. Save a set of worksheets to refer to during reconfiguration or relocation.

SDLC Upstream Line Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C005: LINE NAME	
4.	C006: MODEM TYPE	
5.	C008: INTERNAL (3710 PROVIDES) CLOCK	
6.	C009: LINE SPEED	
7.	C201: CAN 3710 REPORT UPSTREAM OVER THIS LINE	
8.	If 3710 CAN REPORT... = NO, go to step 10. If 3710 CAN REPORT... = YES, continue.	
9.	C010: UPSTREAM SDLC ADDRESS FOR THE 3710	
10.	C011: DUPLEX	
11.	C013: NRZI	
12.	C012: PERMANENT REQUEST TO SEND	
13.	C051: NCP NAME	
14.	C052: NCP LINE NAME	

X.25 Upstream Line Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C005: LINE NAME	
4.	C006: MODEM TYPE	
5.	C009: LINE SPEED	
6.	C201: CAN 3710 REPORT UPSTREAM OVER THIS LINE	
7.	If 3710 CAN REPORT... = NO, go to step 9. If 3710 CAN REPORT... = YES, continue.	
8.	C010: UPSTREAM SDLC ADDRESS FOR THE 3710	
9.	C014: MODULO-8 OR MODULO-128 (PACKET LEVEL X.25)	
10.	C016: NUMBER OF SWITCHED VIRTUAL CIRCUITS FOR INCOMING CALLS (VSCI)	
11.	C017: NUMBER OF SWITCHED VIRTUAL CIRCUITS FOR TWOWAY CALLS (VSCT)	
12.	C018: NUMBER OF PERMANENT VIRTUAL CIRCUITS (PVC)	
13.	If VSCI = 0, go to step 15. If VSCI > 0, continue.	
14.	C020: LOGICAL CHANNEL NUMBER OF THE FIRST SWITCHED INCOMING CIRCUIT	
15.	If VSCT = 0, go to step 17. If VSCT > 0, continue.	
16.	C021: LOGICAL CHANNEL NUMBER OF THE FIRST SWITCHED TWOWAY CIRCUIT	
17.	If PVC > 0, go to the X.25 Permanent Virtual Circuit Definition Worksheet If PVC = 0, go to step 21.	
18.	C037: PVC ASSIGNED TO THE 3710 PHYSICAL UNIT	
19.	If PVC ASSIGNED = NO, go to step 21. If PVC ASSIGNED = YES, continue.	
20.	C024: LOGICAL CHANNEL NUMBER FOR THE PVC	
21.	If VSCI + VSCT = 0, go to step 26. If VSCI + VSCT > 0, continue.	
22.	C025: DEFAULT PACKET SIZE FOR SWITCHED CIRCUITS	
23.	C026: MINIMUM PACKET SIZE FOR SWITCHED CIRCUITS (NEGOTIATION)	

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X.25 Upstream Line Definition Worksheet (continued)

Step	Control Terminal Prompts	Values
24.	C027: MAXIMUM PACKET SIZE FOR SWITCHED CIRCUITS (NEGOTIATION)	
25.	C028: DEFAULT WINDOW SIZE FOR SWITCHED CIRCUITS	
26.	C029: MAXIMUM NUMBER OF OUTSTANDING I-FRAMES VALUE FOR THE LINK LEVEL OF X.25	
27.	C030: ERROR RECOVERY NUMBER OF RETRIES FOR LINK LEVEL OF X.25	
28.	C031: PAUSE BETWEEN ERROR RETRIES FOR LINK LEVEL OF X.25 (IN HALF SECONDS)	
29.	C032: NETWORK TYPE	
30.	If VSCI + VSCT = 0, go to step 33. If VSCI + VSCT > 0, continue.	
31.	C033: NUMBER OF HOSTS ALLOWED TO CALL IN (0 MEANS ANY HOST ALLOWED)	
32a.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32b.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32c.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32d.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32e.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32f.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32g.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32h.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32i.	C034: ADDRESS FIRST/NEXT CALLING DTE	
32j.	C034: ADDRESS FIRST/NEXT CALLING DTE	
33.	C051: NCP NAME	
34.	C052: NCP LINE NAME	

X.25 Permanent Virtual Circuit Definition Worksheet

3710 Name ———————— Date————————

Configuration Name———————— Version Name————————

PVC #	C022: LCN	C023: PACKET SIZE	C015: WINDOW SIZE
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
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16.			
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18.			
19.			
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21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

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X.25 Permanent Virtual Circuit Definition Worksheet (continued)

PVC #	C022: LCN	C023: PACKET SIZE	C015: WINDOW SIZE
31.			
32.			
33.			
34.			
35.			
36.			
37.			
38.			
39.			
40.			

Return to step 18 of the X.25 Upstream Line Definition Worksheet.

(You are hereby given permission to copy this page only.)

SDLC Downstream Line Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C005: LINE NAME	
4.	C006: MODEM TYPE	
5.	C008: INTERNAL (3710 PROVIDES) CLOCK	
6.	C009: LINE SPEED	
7.	C011: DUPLEX	
8.	C013: NRZI	
9.	C012: PERMANENT REQUEST TO SEND	
10.	C206: REPLY TIMEOUT (IN HALF SECONDS)	
11.	C208: NUMBER OF CONTIGUOUS RETRIES	
12.	C209: SEND NEW SYNC	
13.	C212: ANSWERTONE IN SWITCHED MODE	

BSC Downstream Line Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C005: LINE NAME	
4.	C006: MODEM TYPE	
5.	C008: INTERNAL (3710 PROVIDES) CLOCK	
6.	C009: LINE SPEED	
7.	C011: DUPLEX	
8.	C012: PERMANENT REQUEST TO SEND	
9.	C202: SWITCHED LINE	
10.	C206: REPLY TIMEOUT (IN HALF SECONDS)	
11.	C207: MAXIMUM WACK COUNT	
12.	C208: NUMBER OF CONTIGUOUS RETRIES	
13.	C209: SEND NEW SYNC	
14.	If SWITCHED LINE = NO, go to step 17. If SWITCHED LINE = YES, continue.	
15.	C210: HANG UP IF CARRIER LOST	
16.	C211: CONNECT DATA SET TO LINE	
17.	C212: ANSWERTONE IN SWITCHED MODE	

Start-Stop Downstream Line Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C005: LINE NAME	
4.	C006: MODEM TYPE	
5.	C008: INTERNAL (3710 PROVIDES) CLOCK	
6.	C009: LINE SPEED	
7.	C011: DUPLEX	
8.	C012: PERMANENT REQUEST TO SEND	
9.	C202: SWITCHED LINE	
10.	C204: TRANSLATION OF DATA TO THE TERMINAL	
11.	C205: TRANSLATION OF DATA FROM THE TERMINAL	
12.	If SWITCHED LINE = NO, go to step 15. If SWITCHED LINE = YES, continue.	
13.	C210: HANG UP IF CARRIER LOST	
14.	C211: CONNECT DATA SET TO LINE	
15.	C212: ANSWERTONE IN SWITCHED MODE	

SNA Control Unit Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name———————— Version Name————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C227: CONTROL UNIT NAME	
4.	C228: MODULO-8 OR MODULO-128	
5.	C011: DUPLEX	
6.	C229: CAN LPDA EXECUTE TO THIS STATION	
7.	C230: TRANSMIT DATA THRESHOLD	
8.	C231: POLL THRESHOLD	
9.	C232: TRANSMIT ERROR THRESHOLD	
10.	C233: RECEIVE DATA THRESHOLD	
11.	C234: RECEIVE ERROR THRESHOLD	
12.	C235: MAXIMUM FRAME SIZE (FROM HOST TO 3710 FOR THIS STATION)	
13.	C236: WILL STATION REPORT UPSTREAM THROUGH AN X.25 NETWORK	
14.	If WILL STATION REPORT... = NO, go to step 18. If WILL STATION REPORT... = YES, continue.	
15.	C237: IS A PVC ASSIGNED FOR THIS CONTROL UNIT	
16.	If A PVC ASSIGNED... = NO, go to step 18. IF A PVC ASSIGNED... = YES, continue.	
17.	C024: LOGICAL CHANNEL NUMBER FOR THE PVC	
18.	C238: MAXIMUM OUTSTANDING REQUESTS 3710 CAN HAVE FOR THIS PU	
19.	C239: POLL DELAY (IN HALF SECONDS)	
20.	C240: NUMBER OF REPEATS OF THE RETRY SEQUENCE	
21.	If NUMBER OF REPEATS... = 0, go to step 23. If NUMBER OF REPEATS... > 0, continue.	
22.	C241: PAUSE BETWEEN REPEATS OF THE RETRY SEQUENCE (IN HALF SECONDS)	
23.	C242: STATION DOWNSTREAM POLL ADDRESS	
24.	C249: NUMBER OF UPSTREAM LINES OVER WHICH THIS STATION CAN REPORT	
25a.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
25b.	C251: CORRESPONDING UPSTREAM STATION ADDRESS	

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SNA Control Unit Definition Worksheet (continued)

Step	Control Terminal Prompts	Values
25c.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
25d.	C251: CORRESPONDING UPSTREAM STATION ADDRESS	
25e.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
25f.	C251: CORRESPONDING UPSTREAM STATION ADDRESS	
25g.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
25h.	C251: CORRESPONDING UPSTREAM STATION ADDRESS	

BSC 3270 Control Unit Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C227: CONTROL UNIT NAME	
4.	C011: DUPLEX	
5.	C229: CAN LPDA EXECUTE TO THIS STATION	
6.	C230: TRANSMIT DATA THRESHOLD	
7.	C232: TRANSMIT ERROR THRESHOLD	
8.	C233: RECEIVE DATA THRESHOLD	
9.	C234: RECEIVE ERROR THRESHOLD	
10.	C235: MAXIMUM FRAME SIZE (FROM HOST TO 3710 FOR THIS STATION)	
11.	C236: WILL STATION REPORT UPSTREAM THROUGH AN X.25 NETWORK	
12.	If WILL STATION REPORT... = NO, go to step 16. If WILL STATION REPORT... = YES, continue.	
13.	C237: IS A PVC ASSIGNED FOR THIS CONTROL UNIT	
14.	If A PVC ASSIGNED... = NO, go to step 16. If A PVC ASSIGNED... = YES, continue.	
15.	C024: LOGICAL CHANNEL NUMBER FOR THE PVC	
16.	C239: POLL DELAY (IN HALF SECONDS)	
17.	C240: NUMBER OF REPEATS OF THE RETRY SEQUENCE	
18.	If NUMBER OF REPEATS... = 0, go to step 20. If NUMBER OF REPEATS... > 0, continue.	
19.	C241: PAUSE BETWEEN REPEATS OF THE RETRY SEQUENCE (IN HALF SECONDS)	
20.	C243: TRANSMISSION IN TRANSPARENT MODE	
21.	C244: TRANSMISSION IN DELAY COMPENSATION MODE	
22.	C245: BSC CONTROL UNIT POLL ADDRESS	
23.	C246: NUMBER OF DISPLAYS AND PRINTERS FOR THE CONTROL UNIT	
24.	Go to the BSC 3270 Printer/Display Definition Worksheet.	
25.	C249: NUMBER OF UPSTREAM LINES OVER WHICH THIS STATION CAN REPORT	

(Please turn the page over.)

BSC 3270 Control Unit Definition Worksheet (continued)

Step	Control Terminal Prompts	Values
26a.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
26b.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
26c.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
26d.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
26e.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
26f.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
26g.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
26h.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
26i.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
26j.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	

BSC 3270 Printer/Display Definition Worksheet

3710 Name ———————— Date————————

Configuration Name———————— Version Name————————

STEP	C247: DEVICE NAME	C248: DEVICE NUMBER
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
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24.		
25.		
26.		
27.		
28.		

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BSC 3270 Printer/Display Definition Worksheet (continued)

STEP	C247: DEVICE NAME	C248: DEVICE NUMBER
29.		
30.		
31.		
32.		

When all devices have been defined, return to step 25 of the BSC 3270 Control Unit Definition worksheet.

BSC RJE and MLI Station Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C227: CONTROL UNIT NAME	
4.	C011: DUPLEX	
5.	C229: CAN LPDA EXECUTE TO THIS STATION	
6.	C230: TRANSMIT DATA THRESHOLD	
7.	C232: TRANSMIT ERROR THRESHOLD	
8.	C233: RECEIVE DATA THRESHOLD	
9.	C234: RECEIVE ERROR THRESHOLD	
10.	C235: MAXIMUM FRAME SIZE (FORM HOST TO 3710 FOR THIS STATION)	
11.	C236: WILL STATION REPORT UPSTREAM THROUGH AN X.25 NETWORK	
12.	If WILL STATION REPORT... = NO, go to step 16. If WILL STATION REPORT... = YES, continue.	
13.	C237: IS A PVC ASSIGNED FOR THIS CONTROL UNIT	
14.	If A PVC ASSIGNED... = NO, go to step 16. If A PVC ASSIGNED... = YES, continue.	
15.	C024: LOGICAL CHANNEL NUMBER FOR THE PVC	
16.	C243: TRANSMISSION IN TRANSPARENT MODE	
17.	C244: TRANSMISSION IN DELAY COMPENSATION MODE	
18.	C279: EOT HANDSHAKING	
18.	C249: NUMBER OF UPSTREAM LINES OVER WHICH THIS STATION CAN REPORT	
19a.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
19b.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
19c.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
19d.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
19e.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
19f.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
19g.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
19h.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
19i.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
19j.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	

Start-Stop CRT Terminal Definition Worksheet

3710 Name ———————— Date ————————

Configuration Name ———————— Version Name ————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C227: CONTROL UNIT NAME	
4.	C011: DUPLEX	
5.	C230: TRANSMIT DATA THRESHOLD	
6.	C232: TRANSMIT ERROR THRESHOLD	
7.	C233: RECEIVE DATA THRESHOLD	
8.	C234: RECEIVE ERROR THRESHOLD	
9.	C235: MAXIMUM FRAME SIZE (FORM HOST TO 3710 FOR THIS PU)	
10.	C236: WILL STATION REPORT UPSTREAM THROUGH AN X.25 NETWORK	
11.	If WILL STATION REPORT... = NO, go to step 15. If WILL STATION REPORT... = YES, continue.	
12.	C237: IS A PVC ASSIGNED FOR THIS CONTROL UNIT	
13.	If A PVC ASSIGNED... = NO, go to step 15. If A PVC ASSIGNED... = YES, continue.	
14.	C024: LOGICAL CHANNEL NUMBER FOR THE PVC	
15.	C252: AUTOBAUD	
16.	C253: AUTO PROTOCOL RECOGNITION	
17.	C254: CHARACTER TO SUBSTITUTE FOR PARITY AND FRAMING ERRORS	
18.	C255: CHARACTER TO SUBSTITUTE FOR ATTENTION KEY	
19.	C260: CHARACTER TIMES TO DELAY AFTER RECEIPT OF A LINE TURNAROUND CHARACTER BEFORE TRANSMITTING	
20.	C257: RUN ECHO MODE	
21.	C258: RECOGNIZE TERMINAL ATTENTION	
22.	C259: ALLOW TERMINAL BREAK	
23.	If AUTO PROTOCOL RECOGNITION = YES, go to step 27. If AUTO PROTOCOL RECOGNITION = NO, continue.	
24.	C262: NUMBER OF DATA BITS	
25.	C263: NUMBER OF STOP BITS	

(Please turn the page over.)

Start-Stop CRT Terminal Definition Worksheet (continued)

Step	Control Terminal Prompts	Values
26.	If AUTO PROTOCOL RECOGNITION = NO and NUMBER OF DATA BITS = 8, go to step 29. Otherwise, continue.	
27.	C265: PARITY	
28.	C266: IGNORE PARITY ON RECEIVE	
29.	C267: SEND READ PROMPT	
30.	If SEND READ PROMPT = NO, go to step 32. If SEND READ PROMPT = YES , continue.	
31.	C268: READ PROMPT IMAGE IN HEX	
32.	C276: SHOULD ANY CHARACTER BE RECOGNIZED AS END OF MESSAGE WHEN RECEIVING	
33.	If SHOULD ANY CHARACTER... = NO, go to step 35. If SHOULD ANY CHARACTER... = YES , continue.	
34.	C269: 1 TO 5 END OF MESSAGE CHARACTERS IN HEX	
35.	C270: TEXT TIMEOUT (IN HALF SECONDS)	
36.	C273: WHICH SIMULATED SYSTEM REQUEST STRING TO RECOGNIZE	
37.	C249: NUMBER OF UPSTREAM LINES OVER WHICH THIS STATION CAN REPORT	
38a.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
38b.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
38c.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
38d.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
38e.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
38f.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
38g.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
38h.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	

Start-Stop Terminal Definition Worksheet

3710 Name ———————— Date————————

Configuration Name———————— Version Name————————

Step	Control Terminal Prompts	Values
1.	C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED	
2.	C004: PORT NUMBER	
3.	C227: CONTROL UNIT NAME	
4.	C011: DUPLEX	
5.	C230: TRANSMIT DATA THRESHOLD	
6.	C232: TRANSMIT ERROR THRESHOLD	
7.	C233: RECEIVE DATA THRESHOLD	
8.	C234: RECEIVE ERROR THRESHOLD	
9.	C235: MAXIMUM FRAME SIZE (FROM HOST TO 3710 FOR THIS STATION)	
10.	C236: WILL STATION REPORT UPSTREAM THROUGH AN X.25 NETWORK	
11.	If WILL STATION REPORT... = NO, go to step 15. If WILL STATION REPORT... = YES, continue.	
12.	C237: IS A PVC ASSIGNED FOR THIS CONTROL UNIT	
13.	If A PVC ASSIGNED... = NO, go to step 15. If A PVC ASSIGNED... = YES, continue.	
14.	C024: LOGICAL CHANNEL NUMBER FOR THE PVC	
15.	C252: AUTOBAUD	
16.	C253: AUTO PROTOCOL RECOGNITION	
17.	C254: CHARACTER TO SUBSTITUTE FOR PARITY AND FRAMING ERRORS	
18.	C255: CHARACTER TO SUBSTITUTE FOR ATTENTION KEY	
19.	C256: DELAY BEFORE RESPONDING TO CARRIAGE RETURN OR NEW LINE	
20.	C261: CHARACTER TIMES TO DELAY AFTER TRANSMITTING A CARRIAGE RETURN OR HORIZONTAL TAB OR LINE FEED	
21.	C277: DELETE RUB OUT	
22.	C260: CHARACTER TIMES TO DELAY AFTER RECEIPT OF A LINE TURNAROUND CHARACTER BEFORE TRANSMITTING	

(Please turn the page over.)

Start-Stop Terminal Definition Worksheet (continued)

Step	Control Terminal Prompts	Values
23.	C257: RUN ECHO MODE	
24.	C258: RECOGNIZE TERMINAL ATTENTION	
25.	C259: ALLOW TERMINAL BREAK	
26.	If AUTO PROTOCOL RECOGNITION = YES, go to step 29. If AUTO PROTOCOL RECOGNITION = NO, continue.	
27.	C262: NUMBER OF DATA BITS	
28.	C263: NUMBER OF STOP BITS	
29.	If AUTO PROTOCOL RECOGNITION = NO and NUMBER OF DATA BITS = 8, go to step 32. Otherwise, continue.	
30.	C265: PARITY	
31.	C266: IGNORE PARITY ON RECEIVE	
32.	C267: SEND READ PROMPT	
33.	If SEND READ PROMPT = NO, go to step 35. If SEND READ PROMPT = YES , continue.	
34.	C268: READ PROMPT IMAGE IN HEX	
35.	C276: SHOULD ANY CHARACTER BE RECOGNIZED AS END OF MESSAGE WHEN RECEIVING	
36.	If SHOULD ANY CHARACTER... = NO, go to step 37. If SHOULD ANY CHARACTER... = YES. continue.	
37.	C269: 1 TO 5 END OF MESSAGE CHARACTERS IN HEX	
38.	C270: TEXT TIMEOUT (IN HALF SECONDS)	
39.	C273: WHICH SIMULATED SYSTEM REQUEST STRING TO RECOGNIZE	
40.	C249: NUMBER OF UPSTREAM LINES OVER WHICH THIS STATION CAN REPORT	
41a.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
41b.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
41c.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
41d.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
41e.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
41f.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
41g.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
41h.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
41i.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
41j.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	
41k.	C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK	
41l.	C251: CORRESPONDING UPSTREAM SDLC ADDRESS	

Appendix C. Control Terminal Prompts

Use the following explanations of the control terminal prompts to help you fill out the Host Link and 3710 Definition Worksheet and the Configuration Definition Worksheets.

The standard system-supplied default value (if there is one) is given for each prompt. To use the default value, press carriage return (CR) on the control terminal. You may want to write the default value on the worksheet anyway, to keep a complete record of your configuration definition.

Note: When the prompt requests the name of a line or device, instructions are given for the format of the name (up to 8 characters EBCDIC, and so on). The control terminal does not validate the names, other than length; names that do not follow the given format will be accepted by the control terminal. But if you use the same names in your ACF/NCP definition, they will not process correctly in NCP unless they are the format given in these prompt explanations.

C001: UPSTREAM LINK PROTOCOL

Valid Values: SDLC X.25

Default Value: (None.)

Write SDLC if the host link uses SDLC protocol in an SNA network.

Write X.25 if the host link uses X.25 protocol in a packet-switched data network.

C004: PORT NUMBER

Valid Values: 01AA - 16BB

Default Value: 01AA

Write the number of the Network Controller communication adapter port used to attach this line or device to the Network Controller.

- Ports 16AA and 16BB cannot be used for upstream lines.

C005: LINE NAME

Valid Values: 1 - 8 EBCDIC characters.

Default Value: LINENAME

Write the unique name by which the 3710 knows this line.

- This name must be a valid assembler language name, consisting of 1 to 8 alphanumeric characters. The first character must be alphabetic (including @, #, and $); but the name cannot begin with = or ?. The name cannot include blanks, and cannot end with an asterisk (*).

C006: MODEM TYPE

Valid Values: NONE 386X OTHER

Default Value: OTHER

Write NONE if modems are not used to attach this line to the Network Controller or the 37X5.

Write 386X if IBM 386X modems are used on this line.

- This line must be attached with IBM 386X modems if LPDA is used on this line.

Write OTHER if non-IBM modems are used on this line.

C008: INTERNAL (3710 PROVIDES) CLOCK

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller is to provide the clocking to maintain data synchronization.

Write NO if the modems are to provide the clocking to maintain data synchronization.

C009: LINE SPEED

Valid Values: 110 150 200 300 600 1200 1800 2400 3600
4800 7200 9600 14400 19000 48K 56K 64K AUTO

Default Values: 1200 for start-stop downstream lines
19000 for all other lines

Write the rate in bits per second (bps) at which data is transmitted over this line (K = 1024 bps).

- AUTO is valid *only* for Start-Stop lines.
- "19000" is the same as 19.2K bps.

C010: UPSTREAM SDLC ADDRESS FOR THE 3710

Valid Values: 2 hexadecimal digits (except 00, FD, and FF)

Default Value: C1

Write the unique 2-digit hexadecimal SDLC address by which the 37X5 knows the 3710 for polling (the SDLC type 2 PU address).

C011: DUPLEX

Valid Values: FULL HALF

Default Values:
HALF for: BSC 3270 Control Unit
BSC (RJE) Station
BSC (MLI) Station
FULL for all other lines and devices.

Write FULL if this line or device transmits data in full duplex mode

Write HALF if this line or device transmits data in half duplex mode.

C012: PERMANENT REQUEST TO SEND

Valid Values: YES NO

Default Value: YES

Write YES if the request-to-send and clear-to-send signals are always up on this line; the line is always ready to send and receive data.

Write NO if the line is not always ready to send and receive data.

C013: NRZI

Valid Values: YES NO

Default Value: YES

Write YES if communication on this line is maintained between transmissions of data by sending strings of binary bits in the pattern "10101010...".

Write NO if this method of maintaining communication is not used on this line.

- If INTERNAL CLOCKING is used, write YES.
- If EXTERNAL CLOCKING is used, write YES, except when the modems are sensitive to "101010..." bit patterns. (They can cause loss of synchronization.) If the modems are sensitive to this bit pattern, write NO.

C014: MODULO-8 OR MODULO-128 (PACKET LEVEL X.25)

Valid Values: 8 128

Default Value: 8

Write 8 if 7 or fewer packets may be sent over this X.25 line before waiting for a response.

Write 128 if more than 7 packets may be sent over this line before waiting for a response, or if satellite transmission is is used in this packet-switched data network.

C015: WINDOW SIZE FOR THE PVC

Valid Values: 1 - 7 for modulo-8 1 - 15 for modulo-128

Default Value: (None.)

Write the window size (number of packets that can be sent at one time before waiting for a response) for this permanent virtual circuit on this X.25 line.

C016: NUMBER OF SWITCHED VIRTUAL CIRCUITS FOR INCOMING CALLS (VSCI)

Valid Values: 0 - 253

Default Value: 0

Write the number of switched virtual circuits available for incoming calls on this X.25 line.

C017: NUMBER OF SWITCHED VIRTUAL CIRCUITS FOR TWOWAY CALLS (VSCT)

Valid Values: 0 - 253

Default Value: 1

Write the number of switched virtual circuits available for two-way calls on this X.25 line.

C018: NUMBER OF PERMANENT VIRTUAL CIRCUITS (PVC)

Valid Values: 0 - 40

Default Value: 0

Write the number of permanent virtual circuits available on this X.25 line.

Note: PVC + VSCI + VSCT must be greater than zero, and less than or equal to 253.

C020: LOGICAL CHANNEL NUMBER OF THE FIRST SWITCHED INCOMING CIRCUITS

Valid Values: 3 hexadecimal digits (000 - FFF)

Default Value: 000

Write the logical channel number of the first switched virtual circuit for incoming calls on this X.25 line.

C021: LOGICAL CHANNEL NUMBER OF THE FIRST SWITCHED TWOWAY CIRCUIT

Valid Values: 3 hexadecimal digits (000 - FFF)

Default Value: 001

Write the logical channel number of the first switched virtual circuit for two-way calls on this X.25 line.

C022: LOGICAL CHANNEL NUMBER FIRST/NEXT PERMANENT VIRTUAL CIRCUIT

Valid Values: 3 hexadecimal digits (000 - FFF)

Default Value: (None.)

Write the logical channel number of the first permanent virtual circuit on this X.25 line.

C023: PACKET SIZE FOR THE PVC

Valid Values: 64 128 256 512 1024

Default Value: (None.)

Write the packet size in bytes to be used for the first permanent virtual circuit on this X.25 line.

C024: LOGICAL CHANNEL NUMBER FOR THE PVC

Valid Values: 3 hexadecimal digits (000 - FFF)

Default Value: 000

Write the logical channel number for the permanent virtual circuit assigned to the 3710 PU.

C025: DEFAULT PACKET SIZE FOR SWITCHED CIRCUITS

Valid Values: 64 128 256 512 1024

Default Value: 128

Write the default packet size in bytes used for switched virtual circuits on this X.25 line.

C026: MINIMUM PACKET SIZE FOR SWITCHED CIRCUITS (NEGOTIATION)

Valid Values: 64 128

Default Value: 64

Write the minimum packet size in bytes to be accepted in packet size negotiations on this X.25 line.

C027: MAXIMUM PACKET SIZE FOR SWITCHED CIRCUITS (NEGOTIATION)

Valid Values: 128 256 512 1024

Default Value: 1024

Write the maximum packet size in bytes to be accepted in packet size negotiations on this X.25 line.

C028: DEFAULT WINDOW SIZE FOR SWITCHED CIRCUITS

Valid Values: 1 - 7 for modulo-8 1 - 15 for modulo-128

Default Value: 1

Write the window size (number of packets that can be sent at one time before waiting for a response) for this permanent virtual circuit on this X.25 line.

C029: MAXIMUM NUMBER OF OUTSTANDING I-FRAMES VALUE FOR THE LINK LEVEL OF X.25

Valid Values: 0 - 7

Default Value: 1

Write the number of information frames that can be waiting to be sent over this X.25 line at any one time.

C030: ERROR RECOVERY NUMBER OF RETRIES FOR LINK LEVEL OF X.25

Valid Values: 0 - 255

Default Value: 5

Write the number of error recovery retries to be attempted in one sequence for the link level of this X.25 line.

C031: PAUSE BETWEEN ERROR RETRIES FOR LINK LEVEL OF X.25 (IN HALF SECONDS)

Valid Values: 0 - 255

Default Value: 6

Write the number of half seconds that the NCP is to pause between error retries for the link level of this X.25 line.

C032: NETWORK TYPE

Valid Values: TELENET UKPSS DDX OTHER

Default Value: OTHER

Write the type of packet-switched data network to which this X.25 line is attached.

C033: NUMBER OF HOSTS ALLOWED TO CALL IN (0 MEANS ANY HOST ALLOWED)

Valid Values: 0 - 10

Default Value: 0

Write the number of hosts allowed to call in to the Network Controller over the switched circuits on this X.25 line.

- A value of 0 means that any host is allowed to call in.

C034: ADDRESS FIRST/NEXT CALLING DTE

Valid Values: Up to 15 hexadecimal digits

Default Value: (None.)

Write the address (host calling identification) of the first or next host allowed to call in to the Network Controller over the switched circuits on this X.25 line.

C035: 3710 NAME

Valid Values: 1 - 8 EBCDIC characters

Default Value: (None.)

Write the unique name by which the 3710 will be known in the network.

- This name must be a valid assembler language name, consisting of 1 to 8 alphanumeric characters. The first character must be alphabetic (including @, #, and $); but the name cannot begin with = or ?. The name cannot include blanks, and cannot end with an asterisk (*).
- Write this name at the top of each of the Configuration Definition worksheets for this Network Controller.

C036: NEW PASSWORD FOR COMMUNICATION SERVICE ADAPTER

Valid Values: 8 EBCDIC characters

Default Value: (None.)

Write the new service adapter password you have defined to use for access to the 3710 during remote assistance and for logon to the control terminal.

- This password must conform to the rules for a a valid assembler language name, consisting of 1 to 8 alphanumeric characters. The first character must be alphabetic (including @, #, and $); but the name cannot begin with = or ?. The name cannot include blanks, and cannot end with an asterisk (*).

C037: PVC ASSIGNED TO THE 3710 PHYSICAL UNIT

Valid Values: YES NO

Default Value: NO

Write YES if a permanent virtual circuit is assigned to the 3710 physical unit (PU).

Write NO if a permanent virtual circuit is not assigned to the 3710 physical unit (PU).

C038: NEW PASSWORD AGAIN FOR VERIFICATION

Valid Values: 8 EBCDIC characters

Default Value: (None.)

Write the new service adapter password again; it must be entered again to verify that the first entry was correct. (See prompt C036.)

C039: CUSTOMER GEOGRAPHICAL DATA

Valid Values: Up to 80 characters

Default Value: (None.)

On the worksheet line under the prompt text, write up to 80 characters of information. It is recommended that this information include the street address, building, floor, and room or office number where this Network Controller is located.

C050: NAME OF EXISTING ITEM AFTER WHICH NEW ITEM SHOULD BE MODELED

Valid Values: press CR or 1 - 8 EBCDIC characters

Default Value: (None.)

Write "press CR" for the value, if you want to see the standard system supplied default value for each prompt on the control terminal when you define this line or device.

Write the network item name of an existing line or device (already defined through the control terminal) in this configuration, if you want to make this line or device a copy of the existing one except for a few changes in characteristics. The defaults shown in the control terminal prompts will be the values specified when the existing line or device was defined. To use the default value as the value for the new line or device, press the carriage return. Type only the values that are different from those of the existing line or device.

C051: NCP NAME

Valid Values: 1 - 8 EBCDIC characters

Default Value: NCPNAME

Write the unique name by which the network knows the NCP running in the 37X5 to which this line is attached.

- This name must be a valid assembler language name, consisting of 1 to 8 alphanumeric characters. The first character must be alphabetic (including @, #, and $); but the name cannot begin with = or ?. The name cannot include blanks, and cannot end with an asterisk (*).

C052: NCP LINE NAME

Valid Values: 1 - 8 EBCDIC characters

Default Value: NCPLINE

Write the unique name by which the NCP knows this line in the network (the NCP item name), if this is a line connecting the Network Controller to the 37X5.

Write the unique name of a line connecting the Network Controller to the 37X5, if this line being defined connects one cascaded Network Controller to the one above it.

- This name must be a valid assembler language name, consisting of 1 to 8 alphanumeric characters. The first character must be alphabetic (including @, #, and $); but the name cannot begin with = or ?. The name cannot include blanks, and cannot end with an asterisk (*).

C053: CONFIGURATION NAME

Valid Values: 1 - 8 EBCDIC characters

Default Value: (None.)

Write the unique name by which the 3710 knows this configuration definition.

- This name must be a valid assembler language name, consisting of 1 to 8 alphanumeric characters. The first character must be alphabetic (including @, #, and $); but the name cannot begin with = or ?. The name cannot include blanks, and cannot end with an asterisk (*).
- Write this name at the top of each of the Configuration Definition worksheets for this Network Controller.
- Write this name on the top of each Configuration Definition worksheet used for this 3710 configuration.
- This name appears on several of the panels used to display status and configuration summary information on the control terminal.

C054: CONFIGURATION VERSION

Valid Values: 1 - 8 EBCDIC characters

Default Value: (None.)

Write the unique version name of this 3710 configuration definition.

- Write this name on the top of each Configuration Definition worksheet used for this 3710 configuration.

- This name appears on several of the panels used to display status and configuration summary information on the control terminal.

C055: CONFIGURATION DATE

Valid Values: 1 - 8 EBCDIC characters

Default Value: (None.)

Write the date on which this 3710 configuration was defined.

- This should be the date at the top of each Configuration Definition worksheet used for this configuration.

C056: CONFIGURATION TIME

Valid Values: 1 - 8 EBCDIC characters

Default Value: (None.)

Write the time at which this 3710 configuration was defined.

- This step is optional.

C201: CAN 3710 REPORT UPSTREAM OVER THIS LINE

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller can send status and receive polls over this upstream line.

Write NO if the Network Controller cannot send status and receive polls over this line.

- The Network Controller should be defined to and owned by only one host at a time, to avoid having two hosts polling the Network Controller at once, and to prevent the Network Controller from sending NPDA data to the wrong host.

C202: SWITCHED LINE

Valid Values: YES NO

Default Value: NO

Write YES if this line is a switched link.

Write NO if this line is a nonswitched (leased) line.

C204: TRANSLATION OF DATA TO THE TERMINAL

Valid Values: NONE USER ASCII

Default Value: USER

Write NONE if the type of data sent to the terminal from the host and the type of data used by the terminal are the same.

Write USER if the type of data sent to the terminal from the host is not ASCII and is not the same as the type of data used by the terminal.

Write ASCII if the type of data sent to the terminal from the host is not in ASCII format, and the terminal uses ASCII data.

- The ASCII Transmit Translate Table is supplied with the line adapter, and does not have to be defined in this configuration.
- If USER is specified, a Transmit Translate Table must be defined at the control terminal as part of this configuration definition. It is used in translating data from the host to the type of data used by the terminal.

C205: TRANSLATION OF DATA FROM THE TERMINAL

Valid Values: NONE USER ASCII

Default Value: USER

Write NONE if the type of data sent from the terminal to the host and the type of data used by the host are the same.

Write USER if the type of data sent from the terminal to the host is not ASCII and is not the same as the type of data used by the host.

Write ASCII if the type of data sent from the terminal to the host is ASCII, and the host does not use ASCII data.

- The ASCII Receive Translate Table is supplied with the line adapter, and does not have to be defined in this configuration.
- If USER is specified, a Receive Translate Table must be defined at the control terminal as part of this configuration definition. It is used in translating data from the terminal to the type of data used by the host.

C206: REPLY TIMEOUT (IN HALF SECONDS)

Valid Values: 0 - 255

Default Value: 2

Write the number of half seconds that the Network Controller should wait for a response after polling device on this line, before indicating a polling error.

C207: MAXIMUM WACK COUNT

Valid Values: 1 - 255

Default Value: 15

Write the maximum number of times the BSC wait-before-transmit positive acknowledgment (WACK) may be accepted from a non-buffered BSC station (in text mode only) before the operation is terminated. The WACK sequence notifies the Network Controller that the station is temporarily not ready to receive.

C208: NUMBER OF CONTIGUOUS RETRIES

Valid Values: 0 - 255

Default Value: 7

Write the number of error retries that should be attempted in one error recovery sequence for this line.

C209: SEND NEW SYNC

Valid Values: YES NO

Default Value: YES

Write YES if the Network Controller is to supply the new sync signal to the modem on this line to maintain or reestabiish synchronization, **only if** all are true:

1. The modem at the Network Controller has the new sync feature
2. The Network Controller is the multipoint primary station for a duplex line
3. The modem at the remote device does not continuously send carrier signal to the modem at the Network Controller.

Write NO if all of the above are not true.

C210: HANG UP IF CARRIER LOST

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller is to break the line connection ("hang up") if the switched line drops or line errors are detected.

Write NO if the Network Controller is not to break the connection if the switched line drops or line errors are detected.

C211: CONNECT DATA SET TO LINE

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller should connect the data set to the line after receiving a Ring Indicate.

Write NO if the Network Controller should not connect the data set to the line after receiving a Ring Indicate.

C212: ANSWERTONE IN SWITCHED MODE

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller should send an answertone after line connection, on a switched line.

Write NO if the Network Controller should not send an answertone after line connection, on a switched line.

C227: CONTROL UNIT NAME

Valid Values: 1 - 8 EBCDIC characters.

Default Value: (None.)

Write the unique name by which this station will be known to the Network Controller.

- This name must be a valid assembler language name, consisting of 1 to 8 alphanumeric characters. The first character must be alphabetic (including @, #, and $); but the name cannot begin with = or ?. The name cannot include blanks, and cannot end with an asterisk (*).

C228: MODULO-8 OR MODULO-128

Valid Values: 8 128

Default Value: 8

Write the number of path information units (PIUs) that can be sent to this station before the Network Controller stops and waits for a reply.

- Write 128 if satellite transmission is supported in the network, or if more than 8 PIUs can be sent before waiting for a reply.
- Write 8 if no more than 8 PIUs can be sent at once to this station before waiting for a reply.

C229: CAN LPDA EXECUTE TO THIS STATION

Valid Values: YES NO

Default Values: YES for SNA Control Unit
NO for BSC 3270 Control Unit
NO for BSC (RJE) Station
NO for BSC (MLI) Station

Write YES if LPDA can be used to run tests on the downstream line to which this station is attached.

- LPDA requires IBM 386X modems on the downstream line to which this station is attached.

Write NO if LPDA cannot be used to run tests on the downstream line to which this station is attached.

C230: TRANSMIT DATA THRESHOLD

Valid Values: 0 - 65535

Default Value: 0

Write the number of data transmissions from this station that the Network Controller should count before sending a Statistical Data Record (SDR) to NPDA.

- When the SDR record is sent, the counter is reset to zero and a new count is begun.
- Write 0 if no count should be kept, or if NPDA is not used in the network.
- Threshold counts can be used to calculate line quality statistics, such as traffic to error ratios. The thresholds may be changed individually at the control terminal.

C231: POLL THRESHOLD

Valid Values: 0 - 65535

Default Value: 0

Write the number of polls to this station that the Network Controller should count before sending a Statistical Data Record (SDR) to NPDA.

- When the SDR record is sent, the counter is reset to zero and a new count is begun.
- Write 0 if no count should be kept, or if NPDA is not used in the network.
- Threshold counts can be used to calculate line quality statistics, such as traffic to error ratios. The thresholds may be changed individually at the control terminal.

C232: TRANSMIT ERROR THRESHOLD

Valid Values: 0 - 65535

Default Value: 0

Write the number of transmission errors from this station that the Network Controller should count before sending a Statistical Data Record (SDR) to NPDA.

- When the SDR record is sent, the counter is reset to zero and a new count is begun.
- Write 0 if no count should be kept, or if NPDA is not used in the network.
- Threshold counts can be used to calculate line quality statistics, such as traffic to error ratios. The thresholds may be changed individually at the control terminal.

C233: RECEIVE DATA THRESHOLD

Valid Values: 0 - 65535

Default Value: 0

Write the number of data transmissions to this station that the Network Controller should count before sending a Statistical Data Record (SDR) to NPDA.

- When the SDR record is sent, the counter is reset to zero and a new count is begun.
- Write 0 if no count should be kept, or if NPDA is not used in the network.
- Threshold counts can be used to calculate line quality statistics, such as traffic to error ratios. The thresholds may be changed individually at the control terminal.

C234: RECEIVE ERROR THRESHOLD

Valid Values: 0 - 65535

Default Value: 0

Write the number of transmission errors to this station that the Network Controller should count before sending a Statistical Data Record (SDR) to NPDA.

- When the SDR record is sent, the counter is reset to zero and a new count is begun.
- Write 0 if no count should be kept, or if NPDA is not used in the network.
- Threshold counts can be used to calculate line quality statistics, such as traffic to error ratios. The thresholds may be changed individually at the control terminal.

C235: MAXIMUM FRAME SIZE (FROM HOST TO 3710 FOR THIS STATION)

Valid Values: 256 - 4096

Default Value: 256

Write the maximum size in bytes of the data portion of one frame transmitted from the host to the Network Controller for this station.

- For the Network Controller, this number is divided by 256 to determine how many Network Controller storage buffers are needed to receive the transmission. This number may not, therefore, be the same as the maximum frame size given to NCP for this station.

C236: WILL STATION REPORT UPSTREAM THROUGH AN X.25 NETWORK

Valid Values: YES NO

Default Value: NO

Write YES if this station sends and receives data on an X.25 upstream line through a packet-switched data network.

Write NO if this station does not send and receive data on an X.25 upstream line through a packet-switched data network.

C237: IS A PVC ASSIGNED FOR THIS CONTROL UNIT

Valid Values: YES NO

Default Value: NO

Write YES if a permanent virtual circuit is assigned for this station.

Write NO if a permanent virtual circuit is not assigned for this station.

C238: MAXIMUM OUTSTANDING REQUESTS 3710 CAN HAVE FOR THIS PU

Valid Values: 1 - 7 (Modulo-8) 1 - 127 (Modulo-128)

Default Value: 1

Write the maximum number of outstanding requests that the Network Controller can have at one time for this station (PU).

- Write a number from 1 through 7 if modulo-8 was specified for this station.
- Write a number from 1 through 127 if modulo-128 was specified for this station.

C239: POLL DELAY (IN HALF SECONDS)

Valid Values: 0 - 255

Default Value: 0

Write the number of half seconds that elapse between polls of this station.

- This is the number of half seconds in which one polling cycle (one pass through the service order table) should be completed.

C240: NUMBER OF REPEATS OF THE RETRY SEQUENCE

Valid Values: 0 - 65535

Default Value: 0

Write the total number of times the error recovery retry sequence is to be repeated before the operation to the station is ended and an error is indicated.

C241: PAUSE BETWEEN REPEATS FOR THE RETRY SEQUENCE (IN HALF SECONDS)

Valid Values: 0 - 255

Default Value: 0

Write the number of half seconds that the Network Controller is to pause between repeats of the error recovery retry sequence for this station.

C242: STATION DOWNSTREAM POLL ADDRESS

Valid Values: 2 hexadecimal digits (except 00, FD, and FF)

Default Value: C1

Write the unique 2-digit hexadecimal address by which the Network Controller knows this station for polling.

C243: TRANSMISSION IN TRANSPARENT MODE

Valid Values: YES NO

Default Value: YES

Write YES if this station can transmit arbitrary bit patterns as text.

Write NO if this station cannot transmit arbitrary bit patterns as text.

C244: TRANSMISSION IN DELAY COMPENSATION MODE

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller acknowledges to the 37X5 the receipt of data for this control unit, and then sends the data to the control unit.

- Writing YES for this value can give better response time for this control unit, but can allow loss of data if the control unit cannot receive the data (the host has already received acknowledgment and no longer has the data to retransmit).

Write NO if the Network Controller passes the data to the control unit and does not acknowledge to the 37X5 until the control unit confirms receipt.

C245: BSC CONTROL UNIT POLL ADDRESS

Valid Values: 40 4A-4F 50 5A-5F C1-C9 D1-D9

Default Value: 40

Write the 2-digit hexadecimal address by which the Network Controller knows this control unit when polling.

C246: NUMBER OF DISPLAYS AND PRINTERS FOR THIS CONTROL UNIT

Valid Values: 1 - 32

Default Value: 1

Write the total number of displays and printers attached to this BSC 3270 control unit.

C247: NAME OF FIRST/NEXT DISPLAY OR PRINTER

Valid Values: 1 - 8 characters EBCDIC

Default Value: (None.)

Write the unique name by which the Network Controller knows this BSC 3270 display or printer.

C248: CORRESPONDING DEVICE NUMBER FOR THE DISPLAY OR PRINTER

Valid Values: 0 - 31

Default Value: (None.)

Write the sequential device number of this BSC 3270 display or printer for this control unit.

C249: NUMBER OF UPSTREAM LINES OVER WHICH THIS STATION CAN REPORT

Valid Values: 1 - 30

Default Value: (None.)

Write the number of upstream lines (lines connecting the Network Controller to the 37X5) over which this station can send and receive data.

C250: PORT NUMBER OF FIRST/NEXT UPSTREAM LINK

Valid Values: 01AA - 15BB

Default Value: (None.)

Write the number of the Network Controller communication adapter port used to connect the first or next upstream line to the Network Controller, over which this station can send and receive data.

- Ports 16AA and 16BB are not valid for upstream lines.

C251: CORRESPONDING UPSTREAM SDLC ADDRESS

Valid Values: 2 hexadecimal digits (except 00, FD, and FF)

Default Value: (None.)

Write the unique 2-digit hexadecimal SDLC address by which the 37X5 knows this station for polling over this upstream link.

C252: AUTOBAUD

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller determines the line speed of the start-stop line to which this terminal is attached.

- If YES is specified, the line speed in the definition for that Start-Stop line must be specified as AUTO.

Write NO if the Network Controller is not to determine the line speed of this start-stop line, and the line speed is not specified as AUTO.

C253: AUTO PROTOCOL RECOGNITION

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller is to determine the number of data and stop bits in data transmissions to and from this terminal.

Write NO if the number of stop and data bits is specified in this definition.

- If you write YES, or if you write NO and the number of data bits is 7, your must also specify the type of parity and whether to ignore parity on receive for this terminal.

C254: CHARACTER TO SUBSTITUTE FOR PARITY AND FRAMING ERRORS

Valid Values: 2 hexadecimal digits (default is FF)

Default Value: 6F

Write the 2-digit hexadecimal character that the Network Controller is to use to overlay data when incorrect parity or framing is detected.

- Valid only if parity is defined as EVEN or ODD.
- A framing error is detected when the wrong sequence of bits is received; normal sequence is: 1 start bit, 7 data bits, 1 parity bit, and 1 or 2 stop bits; or 1 start bit, 8 data bits, and 1 or 2 stop bits.

C255: CHARACTER TO SUBSTITUTE FOR ATTENTION KEY

Valid Values: 2 hexadecimal digits

Default Value: 21

Write the 2-digit hexadecimal character that the Network Controller is to substitute for the terminal attention key in data sent from this terminal.

C256: DELAY BEFORE RESPONDING TO CARRIAGE RETURN OR NEW LINE

Valid Values: YES NO

Default Value: YES

Write YES if this terminal is to delay before responding to a carriage return or new line.

Write NO if this terminal is not to delay before responding to a carriage return or new line.

C257: RUN ECHO MODE

Valid Values: YES NO

Default Value: YES

Write YES if data characters from this terminal are sent to the host and then sent back to be displayed at the terminal (echoed), as a simple means of data validity checking.

- A full duplex line is required for running echo mode.
- Permanent request to send is also required on the line in order to run echo mode.

Write NO if this terminal is not to run echo mode.

C258: RECOGNIZE TERMINAL ATTENTION

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller is to substitute a character (see step 17) for the terminal attention key when the key is identified in data sent from the terminal.

Write NO if the Network Controller is not to substitute a character for the terminal attention key in the data.

C259: ALLOW TERMINAL BREAK

Valid Values: YES NO

Default Value: YES

Write YES when the Network Controller is in receiving mode and the host sends a break to this terminal, and the Network Controller is to forward the break to the terminal.

Write NO if the Network Controller is not to forward the break, but is to discard it.

C260: CHARACTER TIMES TO DELAY AFTER RECEIPT OF A LINE TURNAROUND CHARACTER BEFORE TRANSMITTING

Valid Values: 0 - 255

Default Value: 0

Write the number of character times that this terminal is to delay between the end of a receive and the beginning of a transmit, to allow the line to electrically "quiesce" (or become electrically inactive).

- This number is usually 0.
- Write 5 for this value for line speeds greater than or equal to 1200 bps.

C261: CHARACTER TIMES TO DELAY AFTER TRANSMITTING A CARRIAGE RETURN OR HORIZONTAL TAB OR LINE FEED

Valid Values: 0 - 255

Default Value: 0

Write the number of character times that this terminal is to delay after transmitting data before it begins receiving data.

- This delay allows time for the print mechanism to return to the left margin, so that the first few characters of the incoming data are not printed randomly during the mechanism's return motion.

C262: NUMBER OF DATA BITS

Valid Values: 7 8

Default Value: 7

Write the number of data bits that this terminal will send in a data transmission.

C263: NUMBER OF STOP BITS

Valid Values: 1 2

Default Value: 2

Write a 1 if there is 1 stop bit in data transmissions from this terminal.

Write a 2 if there are 2 stop bits in data transmissions from this terminal.

C265: PARITY

Valid Values: ODD EVEN MARK SPACE

Default Value: ODD

Write ODD if this terminal uses data in which the number of one-bits is always odd.

Write EVEN if this terminal uses data in which the number of one-bits is always even.

Write MARK if this terminal uses data in which the data parity bit is always set to 0.

Write SPACE if this terminal uses data in which the data parity bit is always set to 1.

C266: IGNORE PARITY ON RECEIVE

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller is to substitute a character for parity errors in data received from this terminal.

Write NO if the Network Controller is not to substitute a character for parity errors in data received from this terminal; substitution is to be for framing errors only.

C267: SEND READ PROMPT

Valid Values: YES NO

Default Value: YES

Write YES if the Network Controller is to display a prompt to this terminal whenever the terminal is ready for the user to begin typing.

Write NO if the Network Controller is not to display a prompt and may continue typing.

C268: READ PROMPT IMAGE IN HEX

Valid Values: Up to 40 (at least 2) hexadecimal digits

Default Value: 0D256F0D2537

Write at least 2 and up to 40 hexadecimal digits to define the read prompt image to be sent by the Network Controller to this terminal when the user may begin typing.

- The last 2 digits must be the turnaround character.

C269: 1 TO 5 END OF MESSAGE CHARACTERS

Valid Values: Up to 10 hexadecimal digits

Default Value: 37

Write 2 to 10 hexadecimal digits to define the character(s) that the Network Controller should recognize as End-of-Message in data transmissions from this terminal.

C270: TEXT TIMEOUT (IN HALF SECONDS)

Valid Values: 0 - 255

Default Value: 0

Write the number of half seconds that the Network Controller may wait between receipt of successive message characters from this terminal after transmission has begun.

- If the next character is not received before this time elapses, the read operation for the terminal is ended. This may be an error, or may be used as a default End-of Message indication.

C273: WHICH SIMULATED SYSTEM REQUEST STRING TO RESPOND TO

Valid Values: 99999 1USER 2USER NONE

Default Value: NONE

Write 99999 if the Network Controller is to break the session between this terminal and the host application program, and pass this default data string to the host SSCP for processing.

Write 1USER if the Network Controller is to break the session between this terminal and the host application program, and pass the first user-defined string (defined at the control terminal as part of this configuration definition) to the host SSCP for processing.

Write 2USER if the Network Controller is to break the session between this terminal and the host application program, and pass the second user-defined string (defined as part of this configuration definition) to the host SSCP for processing.

Write NONE if no simulated system request strings are to be used.

- The simulated system request string may be used like a TEST REQ or SYS REQ key on a 3270 terminal, to request services from the SSCP such as test and logoff.

C276: SHOULD ANY CHARACTER BE RECOGNIZED AS END OF MESSAGE WHEN RECEIVING

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller should recognize a character as End-of-Message when receiving data from this terminal.

Write NO if the Network Controller is not to recognize an End-of-Message character from this terminal.

C277: DELETE RUB OUT

Valid Values: YES NO

Default Value: NO

Write YES if the Network Controller is to delete the paper tape "rub out" characters (punch errors that are to be ignored in the data) for paper tape data transmissions from this terminal.

Write NO if the Network Controller is not to delete paper tape rub out characters from data transmissions from this terminal.

C279: EOT HANDSHAKING

Valid Values: YES NO

Default Value: NO

Write YES if End-of-Transmission handshaking is used for this station to reverse line direction.

Write NO if End-of-Transmission handshaking is not used for this station.

Appendix D. Performance Considerations

Use the worksheets on the following pages to evaluate performance for your Network Controller. If you desire more detailed information, ask your IBM marketing representative to get it for you on the IBM Hands On Network Environment (HONE) computer system.

The performance estimates presented are approximations which are believed to be sound. The degree of success that you may achieve in the use of IBM equipment and programs is dependent on a number of factors, many of which are not under IBM's control. Thus, IBM does not guarantee that you can or will achieve similiar results. It is your responsibility to validate the estimates furnished and to determine their relevance to your operation.

The performance worksheets will help you determine the following information about your Network Controller:

- Storage and other miscellaneous requirements
- Line utilization
- Response times
- Network Controller processor capacity.

Before you begin filling out the worksheets, make blank copies of the pages to use for your network. Save the blank originals to copy again later.

For these worksheets, the following definitions apply:

- **Inbound** refers to messages traveling toward the host.
- **Outbound** refers to messages traveling away from the host.
- **Upstream lines** are lines from the Network Controller going toward the host.
- **Downstream lines** are lines from control units, terminals, or a cascaded Network Controller to the Network Controller nearest the host.
- A **message** is considered to be a group of characters transferred as one entity.
- **Message rates** should be for inbound messages only, as the worksheets assume a corresponding outbound message in reply to every inbound message.
- **Response time** is defined as the time from the user's submission of an inbound message to the complete return of the corresponding outbound message.

Downstream Line Performance Worksheet (Part **1**)

Make a blank copy for each downstream line.

Write the requested information in the blanks.

General information about this downstream line:

A. Line speed in bits per second ..... _____

B. Line speed in bytes per second
A/8 ..... _____

C. Number of control units on this line ..... _____

D. Number of devices (terminals, printers) on this line ..... _____

E. Average inbound message size in bytes ..... _____

F. Average outbound message size in bytes ..... _____

G. Average message rate per minute per terminal or printer ..... _____

H. Message rate per second for this line
(D x G)/60 ..... _____

I. Bytes per second inbound on this line
E x H ..... _____

J. Bytes per second outbound on this line
F x H ..... _____

Line utilization:

K. Line utilization inbound
I/B ..... _____

L. Line utilization outbound
J/B ..... _____

M. Line utilization for this line ..... _____

If data transmission on this line is full duplex,
write the greater of K and L.
If data transmission on this line is half duplex,
write: K + L.

Note: If the line utilization is above 70%, a faster line speed is recommended.

Storage and processor capacity requirements for this line:

N. Buffers required for inbound messages
E/256 (round up to the next integer) ..... _____

P. Buffers required for outbound messages
F/256 (round up to the next integer) ..... _____

Q. Buffers per second required
(N + P) x H (do not round up to the next integer) ..... _____

R. In Figure D-1 on page D-5, look up the value for R ..... _____

Find the row in the table for the line protocols used on both
this downstream line and the upstream line it sends data to.
Use the value of N above to select the value of R from that row.

(Please turn the page over.)

S. In Figure D-2 on page D-5, look up the value for S..... _____

Find the row in the table for the line protocols used on both this downstream line and the upstream line it sends data to. Use the value of P above to select the value of S from that row.

T. Processor capacity factor for this line
H x (R + S + (3.75 x E) + (3.75 x F))..... _____

U. Fixed storage for this line..... _____

If the line is:
SDLC: 2304 + the maximum RU size on this line in bytes
BSC 3270: 2016 + (1152 x C) + (576 x D)
BSC RJE-MLI: 576 + block size for this line in bytes
Start-stop 2880

Finish items A-U on this worksheet for each downstream line. Then complete an Upstream Line Performance worksheet for each upstream line before proceeding with Part 2 of the Downstream Line Performance worksheet.

UPSTREAM PROTOCOL	DOWNSTREAM PROTOCOL	R if N=1	R if N=2	R if N>2
SDLC	SDLC	5556	5610	5610 + (N - 2) x 123
SDLC	BSC 3270	9099	10160	10160 + (N - 2) x 556
SDLC	BSC RJE/MLI	8640	9042	9042 + (N - 2) x 1223
SDLC	Start-stop	10189	12292	12292 + (N - 2) x 268
X.25	SDLC	8516	14538	14538 + (N - 2) x 5878
X.25	BSC 3270	12059	19098	19098 + (N - 2) x 6293
X.25	BSC RJE/MLI	11600	17970	17970 + (N - 2) x 6790
X.25	Start-stop	14149	21220	21220 + (N - 2) x 6015

Figure D-1. Table for Downstream Line 3710 Processor Capacity, Item R

UPSTREAM PROTOCOL	DOWNSTREAM PROTOCOL	S if P=1	S if P=2	S if P>2
SDLC	SDLC	4957	5834	5834 + (P - 2) x 228
SDLC	BSC 3270	10501	10368	10368 + (P - 2) x 650
SDLC	BSC RJE/MLI	8859	10761	10761 + (P - 2) x 928
SDLC	Start-stop	13064	13326	13326 + (P - 2) x 573
X.25	SDLC	7849	13183	13183 + (P - 2) x 5150
X.25	BSC 3270	13402	17717	17717 + (P - 2) x 5573
X.25	BSC RJE/MLI	11760	18110	18110 + (P - 2) x 5850
X.25	Start-stop	15965	20675	20675 + (P - 2) x 8495

Figure D-2. Table for Downstream Line 3710 Processor Capacity, Item S

Upstream Line Performance Worksheet

Make one blank copy for each upstream line.

Write the requested information in the blanks.

General information about this upstream line:

A'. Line speed in bits per second ..... _____

B'. Line speed in bytes per second
A'/8 ..... _____

C'. Add all items H (Message rate per second)
from the Downstream Line worksheets
for all downstream lines that send
data over this upstream line ..... _____

D'. Add all items I (Bytes per second inbound on the line)
from the Downstream Line worksheets
for all downstream lines that send
data over this upstream line ..... _____

E'. Add all items J (Bytes per second outbound)
from the Downstream Line worksheets
for all downstream lines that send data over this
data over this upstream line ..... _____

Line utilization:

F'. Line utilization inbound
D'/B' ..... _____

G'. Line utilization outbound
E'/B' ..... _____

H'. Line utilization for this upstream line ..... _____

If this line is full duplex, write the greater of F' and G'.
If this line is half duplex, write: F' + G'.

Note: If the utilization is above 70—, a faster line is recommended.

Storage and other miscellaneous requirements for this upstream line:

I'. Average message size inbound on this line
D'/C' ..... _____

J'. Average message size outbound on this line
E'/C' ..... _____

K'. Contention time in seconds
((I' + J') x H')/(B' x (1 - H')) ..... _____

L'. Fixed storage for this upstream line ..... _____

If the line is:
SDLC: 4640 + the maximum RU size for this line in bytes.
X.25: 3456 + the maximum packet size for this line in bytes.

(Please turn the page over.)

M′. Work areas needed for this line..... _____

If this line is:
SDLC: 1
X.25: 9

N′. Configuration table bytes needed for this line..... _____

If this line is:
SDLC: 46
X.25: 174

(You are hereby given permission to copy this page only)

Downstream Line Performance Worksheet (Part **2**)

Write the requested information in the blanks.

Use this worksheet after you have completed Part 1 of the Downstream Line Performance worksheet for all downstream lines *and* the Upstream Line Performance worksheet for all upstream lines for this Network Controller.

Response time:

V. Seconds spent on the line
(E + F)/B ..... _____

W. Multiplication factor for contention
1/(1 - M) ..... _____

X. Host application delay in seconds for this line ..... _____

Y. Upstream delays
(B′ and K′ are from the worksheet
for the upstream line that
this downstream line will send data to).
(E + F)/B′ + K′ + X ..... _____

Z. Response time in seconds
(V x W) + Y ..... _____

Miscellaneous requirements for this downstream line:

AA. If this line ..... _____
sends data to an X.25 upstream line, write 1
sends data to an SDLC upstream line, write 0

BB. Number of Task IDs needed for this line ..... _____
If the line is:
SDLC: 2
BSC 3270: 2 + C + D
BSC RJE-MLI: 4
Start-Stop: 4

CC. Number of work areas needed for this line ..... _____
If the line is:
SDLC: C x (2 + AA) + 1
BSC 3270: C
BSC RJE-MLI: C
Start-Stop: C

DD. Configuration table bytes needed for this line ..... _____
If the line is:
SDLC: 42 + (48 + (6 x AA)) x C
BSC 3270: 42 + (22 x D) + (60 + (6 x AA)) x C)
BSC RJE-MLI: 98 + (6 x AA)
Start-Stop: 138 + (6 x AA)

Network Controller Performance Worksheet

Make one blank copy for each Network Controller in the network.

Write the requested information for this Network Controller in the blanks.

Processor capacity used to transmit data:

A. Add all items T (Processor capacity factor) from the Downstream Line worksheets for all downstream lines attached to this Network Controller..... _____

B. Fraction of the processor capacity of this Network Controller used to transmit data (does not include polling) 0.07 + (A/1,000,000)..... _____

Total storage requirements for this Network Controller:

C. Add all items U (Fixed storage) from the Downstream Line worksheets for all downstream lines attached to this Network Controller..... _____

D. Add all items Q (Buffers per second) from the Downstream Line worksheets for all downstream lines attached to this Network Controller..... _____

E. Add all items L′ (Fixed storage) from the Upstream Line worksheets for all upstream lines attached to this Network Controller ..... _____

F. Storage for buffers
17280 + 576 x D + C + E..... _____

G. Base Network Controller storage..... _____

If there are no X.25 lines, write 247,000
If there is at least 1 X.25 line, write 272,000

H. Total storage required
F + G bytes..... _____

Notes:

1. *If H is less than 393,216 bytes, you do not need to order a storage expansion unit with this Network Controller.*

2. *If H is greater than 393,216 bytes and less than 524,288 bytes, order a storage expansion unit with this Network Controller.*

3. *If H is greater than 524,288 bytes, you need to attach fewer lines or devices to this Network Controller, or use two Network Controllers.*

(Please turn the page over.)

Miscellaneous Network Controller requirements

1. Task IDs.

   I. Add all items BB (Task IDs needed)
   from the Downstream Line worksheets for all
   the downstream lines attached to this Network Controller..... _____

   Note: There are 973 task IDs available for use in the Network Controller.
   If I is greater than 973, it is recommended that you attach
   fewer lines or devices to this Network Controller.

2. Work areas.

   J. Add all items CC (Work areas needed)
   from the Downstream Line worksheets for all
   the downstream lines attached to this Network Controller..... _____

   K. Add all items M′ (Work areas needed)
   from the Upstream Line worksheets for all
   the upstream lines attached to this Network Controller..... _____

   L. Work Areas used:
   J + K ..... _____

   Note: There are 222 work areas available for use in this Network Controller. If L is greater than 222, it is recommended that you attach fewer lines or devices to this Network Controller.

3. Configuration table bytes.

   M. Add all items DD (Configuration table bytes)
   from the Downstream Line worksheets for all
   the downstream lines attached to this Network Controller..... _____

   N. Add all items N′ (Configuration table bytes)
   from the Upstream Line worksheets for all
   the upstream lines attached to this Network Controller..... _____

   P. Configuration table bytes used
   M + N..... _____

   Note: There are 12,208 bytes of configuration table space available in the Network Controller. If P is greater than 12,208, it is recommended that fewer lines or device be attached to this Network Controller.

Appendix E. FCC Regulations Governing Integrated Protective Circuitry

Components of the IBM Network Controller's integrated protective circuitry are registered with the Federal Communications Commission (FCC).

The following statements concerning the operation and maintenance of these registered components are required by the FCC and must be adhered to in the USA.

1. To ensure compliance with regulations regarding the repair of the registered components, field repair is limited to replacement of field-replaceable units only. No other field repair or adjustments to the registered components are permitted. A field repair will be performed by authorized service personnel.

2. When a problem is determined to be in or caused by the device, it must be immediately disconnected from the public switched network.

3. Connecting this devices to party lines or coin telephones is prohibited.

4. Part 68 of FCC regulation states that, under certain circumstances, the telephone company may temporarily discontinue service and make changes in the facilities and services, which may affect the operation of the user's equipment; however, the user shall be given adequate notice in writing to allow the user to maintain uninterrupted service.

5. The user is responsible for contacting the telephone company before the device is initially connected to and/or permanently disconnected from the public switched network. The following information must be provided to the telephone company:

   - Device make and model number: IBM 3710 Model 1
   - FCC registration number: AK 396F-70594-DM-N
   - Ringer equivalence number: 0.2 B
   - Type of communication line jack needed: RJ45S

   The user should also inform the telephone company of all registration numbers of other registered devices that are connected to the network.

Appendix F. List of Compatible Devices

The following systems and devices are compatible with the Network Controller.

Note: The following lists of devices are not exhaustive and may change. Consult your local IBM representative for a complete description of the devices currently supported, and for the specific requirements for the support of each of these devices.

Host Processors

- IBM System/370
- IBM 30XX Processor
- IBM 43XX Processor.

Communication Controllers

- IBM 3705 Communications Controller
- IBM 3725 Communication Controller.

Binary Synchronous Communication (BSC) Devices

- **BSC RJE:**
  - IBM 3776-1 Communication Terminal (BSC)
  - IBM 3776-2 Communication Terminal(BSC)
  - IBM 3777-1 Communication Terminal (BSC)
  - IBM 3780 Data Communication Terminal (BSC).
- **BSC for the Multi-leaving Interface**
  - IBM 3777-2 Communication Terminal (BSC)
- **BSC 3270:**
  - IBM 3271 Control Unit (BSC)
  - IBM 3274 Control Unit (BSC)
  - IBM 3276 Control Unit Display Station (BSC).

Start-Stop Devices

- Non-IBM teletypewriter equipment (TTY Model 33/35)
- IBM 3101 Display Terminal operating as a TTY Model 33/35
- IBM Personal Computer operating as a TTY Model 33/35.

Synchronous Data Link Control (SDLC) Devices

- IBM 3274 Control Unit
- IBM 3276 Control Unit Display Station
- IBM 3600 Finance Communication System
- IBM 3630 Plant Communication System
- IBM 3650 Retail Store System
- IBM 3660 Supermarket System
- IBM 3680 Programmed Store System
- IBM 3730 Distributed Office Communication System
- IBM 3770 Data Communication System
- IBM 3790 Communication System
- IBM 4700 Finance Communication System
- IBM 5280 Distributed Data System
- IBM 5520 Administrative System
- IBM 8100 Information System (DPCX)
- IBM 8100 Information System (DPPX)
- IBM 8775 Display Terminal
- IBM Series/1
- IBM System/32
- IBM System/34
- IBM System/36
- IBM System/38
- Another IBM 3710 Network Controller

List of Abbreviations

ac	alternating current
ACF	Advanced Communication Function
ACF/NCP	Advanced Communication Function for the Network Control Program
ACF/VTAM	Advanced Communication Function for the Virtual Telecommunications Access Method
ASCII	American National Standard Code for Information Interchange
bps	bits per second
BSC	binary synchronous communication
CCITT	The International Telegraph and Telephone Consultative Committee
CCP	Configuration Control Program
cfm	cubic feet per minute
CNM	communication network management
dc	direct current
DCE	data circuit-terminating equipment
DTE	data terminal equipment
EBCDIC	extended binary-coded decimal interchange code
EIA	Electronic Industries Association
K bytes	1024 bytes
kbps	kilobits per second (1000 bits per second)
LED	light-emitting diode
LPDA	Link Problem Determination Aids
LU	logical unit
MVS	multiple virtual storage
MVS/XA	multiple virtual storage/extended addressing
NCCF	Network Communications Control Facility
NPDA	Network Problem Determination Application
NRZI	non-return-to-zero (inverted) recording
NSI	Non-SNA Interconnection
NTO	Network Terminal Option
PU	physical unit
RJE	remote job entry
SDLC	Synchronous Data Link Control
SNA	Systems Network Architecture
SSCP	system services control point
SSP	System Support Programs for ACF/NCP/VS
TAP	Trace Analysis Program
TTY	teletypewriter equipment
TWX	teletypewriter exchange service

Glossary

This glossary defines Network Controller terms and abbreviations used in this manual. This glossary includes terms and definitions from the *IBM Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699. It also includes definitions developed by the American National Standards Institute (ANSI), by the International Organization for Standardization (ISO), and by the International Telegraph and Telephone Consultative Committee (CCITT).

Entries from the *American National Dictionary for Information Systems*, published by the Computer and Business Equipment Manufacturers Association, are identified by an asterisk (*).

Entries from the *ISO Vocabulary of Data Processing*, developed by the International Standards Organization, Technical Committee 97, Subcommittee 1, are identified by the symbol "(ISO)" for published sections of this vocabulary, or "(TC97)" for definitions on which agreement has not yet been reached.

Entries from the *CCITT Sixth Plenary Assembly Orange Book, Terms and Definitions*, published by the International Telecommunication Union, Geneva, 1978, are identified by the symbol "(CCITT/ITU)."

If you do not find the term you are looking for, refer to the index or to the *IBM Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699.

A

access method. A technique for moving data between main storage and devices.

ACF. See *Advanced Communication Function (ACF)*.

ACF/NCP. See *Advanced Communication Function for the Network Control Program (ACF/NCP)*.

ACF/VTAM. See *Advanced Communication Function for the Virtual Telecommunications Access Method (ACF/VTAM)*.

adapter. See *communication adapter*.

adapter blank. A nonfunctional machine element of the Network Controller that maintains proper airflow at an empty communication adapter position.

Advanced Communication Function (ACF). A group of IBM program products (including ACF/NCP and ACF/VTAM) that use the concepts of Systems Network Architecture (SNA), including distributed functions and shared resources.

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

Advanced Communication Function for the Virtual Telecommunications Access Method (ACF/VTAM). An IBM program product that provides single-domain network capability and optional multiple-domain capability. ACF/VTAM runs under MVS and supports direct-control application programs and subsystems, such as VM/VCNA and VM/VSPC. Synonymous with *VTAM*.

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

application program. A program used to connect and communicate with devices in a network, enabling users to perform application-oriented activities.

ASCII. See *American National Standard Code for Information Interchange (ASCII)*.

asynchronous. Pertaining to a device or line in which the sending or receiving of data is not governed by a timing signal. Contrast with *synchronous*.

auto-answer. A feature that allows a device to respond automatically to a call that it receives over a switched line.

B

backup diskette. A diskette that contains information copied from another diskette. It is used in case the original information is unintentionally altered or destroyed. See *spare diskette, system diskette.*

binary synchronous communication (BSC). A uniform procedure, using a standardized set of control characters and control character sequences, for synchronous transmission of binary-coded data between devices.

BSC. See *binary synchronous communication (BSC).*

C

cable test. A Network Controller test that verifies that data can be sent and received over the length of all attached cables.

cascading. Connecting Network Controllers to each other in a succession of levels, to concentrate many more lines than a single level permits. See also *line concentration.*

CCP. See *Configuration Control Program (CCP).*

circuit switching. (TC97) A process that, on demand, connects two or more data terminal equipments (DTEs) and permits the exclusive use of a data circuit between them until the connection is released. See *packet switching.*

CNM. See *communication network management (CNM).*

common-carrier cable. A Network Controller customer-replaceable cable that connects the service modem to a standard modular telephone jack.

communication adapter. A machine element of the Network Controller that enables one or more telecommunication lines to be connected to the machine. See *EIA communication adapter, V.35 communication adapter, X.21 communication adapter.*

communication common carrier. In the USA and Canada, a public data transmission service that provides the general public with transmission service facilities; for example, a telephone or telegraph company.

communication controller. A type of communication control unit whose operations are controlled by one or more programs stored and executed in the unit; for example, the IBM 3705 Communications Controller and 3725 Communication Controller. They manage the details of line control and the routing of data through a network.

communication network management (CNM). The process of designing, installing, operating, and managing the distribution of both information and control among end users of communication systems.

concentration. See *line concentration.*

configuration. A collective set of definitions that describe the physical and logical arrangement of telecommunication lines and devices in a 3710 network. See also *define, definition statement, 3710 configuration.*

Configuration Control Program (CCP). An IBM program product that is used interactively to define, display, and alter configurations that contain Network Controllers.

configuration table. Storage containing the definition of a 3710 configuration.

control terminal. A display terminal, equivalent to the IBM 3101 Display Terminal, that enables an operator to communicate with the Network Controller for purposes of controlling, monitoring, and diagnosing problems in a 3710 configuration. The control terminal may be either directly attached or remotely attached to the Network Controller. See also *3101 Display Terminal.*

control terminal operator. The network operator or system programmer that uses a Network Controller control terminal. See also *control terminal.*

control unit. A machine element of the Network Controller that controls the handling of data and provides network interfaces.

copy. See *write.*

customer-replaceable. Designed to be removed and replaced by the customer, according to instructions provided by IBM, without the use of tools or the assistance of IBM personnel.

customer setup. The unpacking, setup, and checkout of IBM machines designated for setup by customer personnel, according to instructions provided by IBM, without the use of tools or the assistance of IBM personnel.

D

data circuit-terminating equipment (DCE). (TC97) 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 and coding between the data terminal equipment (DTE) and the line.

Note: The DCE may be separate equipment or an integral part of other equipment.

data switching exchange (DSE). (TC97) The equipment installed at a single location to provide circuit switching, packet switching, or both.

data terminal equipment (DTE). (TC97) That part of a device that serves as a data source, data sink, or both, and provides for the data communication control function, according to protocols.

DCE. See *data circuit-terminating equipment (DCE)*.

define. To describe to a network the arrangement of telecommunication lines and devices in the network; to create a configuration. See also *configuration*.

definition statement. In ACF/VTAM, a description of the arrangement of telecommunication lines and devices in a network. See also *configuration*.

device. For the Network Controller, any terminal, printer, or other piece of data communication equipment that sends data to a host, or receives data from a host.

device cable. For the Network Controller, a customer-replaceable cable that is used to directly attach a device to a communication adapter.

diagnosis. See *problem diagnosis*.

diagnostic routine. A specified series of steps or programs that recognize, locate, and explain a fault in equipment, a mistake in a computer program, or a user error.

dial. To use a dial or pushbutton telephone to initiate a telephone call. In telecommunication, this action is taken to attempt to establish a connection between a terminal and a telecommunication device over a switched line.

direct-access storage. (TC97) A storage device that provides direct access to data.

diskette. A thin, flexible magnetic disk permanently enclosed in a semi-rigid protective jacket. See *backup diskette*, *spare diskette*, *system diskette*.

diskette unit. A machine element of the Network Controller that reads information from and writes information onto the system diskette.

display terminal. A terminal that gives a visual representation of data, such as the IBM 3101 Display Terminal.

document drawer. A shallow drawer underneath the Network Controller for storing the operator's guide, the key that locks and unlocks machine elements, and spare lights and fuses.

downstream. In the direction of data flow from the host to the end user. Contrast with *upstream*.

downstream device. For the Network Controller, a device located in a network, such that the Network Controller is positioned between the device and a host. A display terminal downstream from the Network Controller is an example of a downstream device. Contrast with *upstream device*.

downstream line. For the Network Controller, a telecommunication line attaching a downstream device to a Network Controller. Contrast with *upstream line*.

DSE. See *data switching exchange (DSE)*.

DTE. See *data terminal equipment (DTE)*.

*** duplex.** In data communication, pertaining to a simultaneous two-way, independent transmission in both directions. Contrast with *half duplex*.

dynamic reconfiguration. The process of changing an ACF/NCP configuration without interrupting the operation of the network and without loading an ACF/NCP generated for the new configuration. The dynamic reconfiguration remains in effect as long as either ACF/VTAM or ACF/NCP are active.

E

EBCDIC. See *extended binary-coded decimal interchange code (EBCDIC)*.

EIA communication adapter. A Network Controller communication adapter that can combine and send information on two lines at speeds up to 19.2 kbps, and conforms to EIA RS-232-C (CCITT V.24) standards.

end user. In SNA, the ultimate source or destination of application data flowing through an SNA network. An end user may be an application program or a terminal operator.

extended binary-coded decimal interchange code (EBCDIC). A set of 256 characters, each represented by 8 bits.

F

frame. A machine element of the Network Controller that houses the other machine elements.

front panel. One of three panels on the front of the Network Controller that contains switches or indicator lights or both.

H

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

host. See *host processor*.

host processor. (TC97) A processor that controls all or part of a user-application network. Synonymous with *host*. See also *processor*.

I

indicator light. A light that signals a change in status or the presence of a certain predefined condition. See also *light-emitting diode (LED)*.

interactive. Pertaining to an application in which each entry calls forth a response from a system or program. An interactive system may also be conversational, implying a continuous dialog between the user and the system.

*** interface.** A shared boundary. An interface might be a hardware component to link two devices or it might be a portion of storage or registers accessed by two or more computer programs.

J

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

L

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

LED. See *light-emitting diode (LED)*.

licensed program. Any separately priced program that bears an IBM copyright and is offered to customers under the terms and conditions of the Agreement for IBM Licensed Programs.

light-emitting diode (LED). A semi-conductor chip that gives off visible or infrared light when activated. See also *indicator light*.

line. See *telecommunication line*.

line concentration. Combining data from many lines or devices onto fewer lines. See also *cascading*.

line speed. The number of binary digits that can be sent over a telecommunication line in one second, expressed in bits per second (bps).

link. In SNA, the combination of the physical medium of data transmission (such as a telephone wire or a microwave beam), the protocol, and associated devices and programming. A link is both logical and physical.

Link Problem Determination Aids (LPDA). A set of test commands executed by an IBM 3863, 3864, or 3865 Modem or an IBM 3867 Link Diagnostic Unit to determine which of various network components may be causing an error in the network.

link protocol. (CCITT/ITU) The set of rules by which a logical data link is established, maintained, and terminated, and by which data is transferred across the link. It includes the format by which control information is passed, and the rules by which it is interpreted, in order to transmit data across the link. See *protocol*.

load lever. A lever on the front of the Network Controller diskette unit that holds the system diskette in place.

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

LPDA. See *Link Problem Determination Aids (LPDA)*.

LU. See *logical unit (LU)*.

M

machine element. Any of those elements of the Network Controller that have been designed to be removed and replaced by the customer, without tools or the assistance of IBM personnel.

microcode. A code that represents instructions used as an alternative to "hard-wired" circuitry in a product to implement certain functions of a processor or other system component.

mixed-protocol network. A network arrangement that uses more than one type of protocol for data

transmission (for example, start-stop transmission and SDLC together).

modem. (TC97) A functional unit that modulates and demodulates signals. One of the functions of a modem is to enable digital data to be transmitted over analog transmission facilities.

modulo-N check. (TC97) A check in which an operand is divided by a number N to generate a remainder that is retained and later used for checking. For example, in a modulo-7 check, the remainder will be either 0, 1, 2, 3, 4, 5, or 6; if the remainder obtained when the operand is divided by 7 does not equal the retained value, an error is indicated.

modulo-128 transmission check. In SDLC, a data transmission check used with satellite services.

modulus. In a modulo check, the number by which the summed digits are divided. See *modulo-N check*.

multidrop line. A telecommunication line interconnecting several devices. Contrast with *point-to-point link*.

multidrop network. A network arrangement in which more than one device is connected to a single telecommunication line.

N

NCCF. See *Network Communications Control Facility (NCCF)*.

NCP. See *Advanced Communication Function for the Network Control Program (ACF/NCP)*.

network. In data processing, a user-application network. See *user-application network*.

Network Communications Control Facility (NCCF). An IBM program product consisting of command processors that can monitor, control, and improve the operation of a network.

network operator. A person responsible for controlling the operation of all or part of a network.

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

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

node. In SNA, an endpoint of a link or a junction common to two or more links in a network.

non-return-to-zero (inverted) recording (NRZI). (TC97) Non-return-to-reference recording of binary digits, such that the ones are represented by a change in the condition of magnetization, and the zeros are represented by the absence of a change. This method is called (mark) recording because only the one or mark signals are explicitly recorded.

Non-SNA Interconnection (NSI). An IBM program product that extends the capabilities of ACF/NCP to provide SNA transport support for BSC RJE data from selected non-SNA facilities.

nonswitched line. See *leased line*.

NPDA. See *Network Problem Determination Application (NPDA)*.

NRZI. See *non-return-to-zero (inverted) recording (NRZI)*.

NSI. See *Non-SNA Interconnection (NSI)*.

NTO. See *Network Terminal Option (NTO)*.

O

offline. (TC97) Pertaining to the operation of a functional unit without the continual control of a computer. Contrast with *online*.

online. (TC97) Pertaining to the operation of a functional unit that is under the continual control of a computer. Contrast with *offline*.

*** operator.** A person who operates a machine. See *network operator*.

P

packet switching. (TC97) The process of routing and transferring data by means of addressed packets so that a channel is occupied only during the transmission of a packet; upon completion of the transmission, the channel is made available for the transfer of other packets. See *circuit switching*.

panel. A predefined display image that defines the locations and characteristics of display fields on a screen.

physical unit (PU). In SNA, the component that manages and monitors the resources (such as attached links and adjacent link devices) of a node, as requested by a system services control point through an

SSCP-SSCP session. Note that an SSCP activates a session with the physical unit in order to indirectly manage, through the PU, resources of the node, such as attached links and adjacent link devices. See also *system services control point (SSCP)*.

point-to-point link. A link that connects a single remote link device to a node; the link may be switched or leased. Contrast with *multidrop line*.

point-to-point network. A network arrangement made up of point-to-point links. Contrast with *multidrop network*.

*** polling.** Interrogation of devices for such purposes as avoiding contention, determining operational status, and determining readiness to send or receive data.

port. An access point for data entry or exit.

power cord. A customer-replaceable cord supplied with the Network Controller that connects the machine to an electrical outlet, and provides electrical power.

power unit. A machine element of the Network Controller that controls the electrical power used by the machine.

problem diagnosis. Analysis that results in identifying the precise cause of a hardware, software, or system failure.

problem resolution. A process of diagnosing and correcting a problem.

processor. (ISO) In a computer, a functional unit that interprets and executes instructions.

program. A set of actions or instructions that a machine is capable of interpreting and executing.

program product. A licensed program that performs a function for the user and usually interacts with and relies upon system control programming or some other IBM-provided control program.

protocol. (CCITT/ITU) A specification for the format and relative timing of information exchanged between communicating parties. See *link protocol*.

protocol conversion. Changing a protocol so that it appears to be a different protocol. For example, the Network Controller changes BSC 3270 protocol to appear as SDLC.

protocol envelopment. Surrounding a protocol with appropriate information so that it appears to be a different protocol. For example, the Network Controller envelopes start-stop transmission to make it appear as SDLC.

PU. See *physical unit*.

R

Recommendation X.25 (Geneva 1980). A CCITT recommendation for the interface between data terminal equipment and packet-switched data networks. See *packet switching*.

*** remote job entry (RJE).** (ISO) Submission of jobs through an input unit that has access to a computer through a data link.

remotely attached. Pertaining to devices that are connected to another device by a telecommunication line and modems.

remote assistance. Problem diagnosis and recovery, maintenance, and program help offered by IBM by telephone or over a telecommunication line.

RJE. See *remote job entry (RJE)*.

S

screen. The illuminated display surface of a display terminal.

SDLC. See *Synchronous Data Link Control (SDLC)*.

service adapter. An EIA communication adapter that permits the use of a control terminal with the Network Controller and can be set to receive remote assistance. The service adapter connects to the service modem.

service modem. A machine element of the Network Controller that attaches to the service adapter and enables communication with the Network Controller over a telecommunication line.

service modem cable. A short ribbon cable that connects the Network Controller service modem to the service adapter.

setup tests. Tests performed by the customer during and after customer setup to verify that a machine is ready for operation.

SNA. See *Systems Network Architecture (SNA)*.

SNA device. A device that supports SNA protocols. See also *System Network Architecture (SNA)*.

SNA network. The part of a user-application network that conforms to the formats and protocols of SNA. See also *Systems Network Architecture (SNA)*.

SNBU. See *switched network backup*.

source diskette. In a diskette-copying procedure, the diskette from which information is being read. Contrast with *target diskette*.

spare diskette. A diskette that has not been formatted as a Network Controller system diskette or backup diskette. It may or may not be a blank diskette. See *backup diskette*, *system diskette*.

SSCP. See *system services control point (SSCP)*.

SSP. See *System Support Programs for ACF/NCP/VS (SSP)*.

start-stop transmission. (TC97) Asynchronous transmission such that a group of signals representing a character is preceded by a start element and is followed by a stop element.

*** storage.** A storage device.

storage device. (ISO) A functional unit into which data can be entered, in which it can be retained, and from which it can be retrieved.

storage expansion blank. A nonfunctional machine element of the Network Controller that maintains proper airflow in the Network Controller's control unit in the absence of the storage expansion unit.

storage expansion unit. A machine element of the Network Controller that fits into the Network Controller's control unit and provides additional storage.

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

switched network backup (SNBU). An optional facility that allows a user to specify, for certain types of physical units, a switched line to be used as an alternate path if the primary line becomes unavailable or unusable.

synchronous. Pertaining to a device or line in which the sending or receiving of data is governed by a timing signal. Contrast with *asynchronous*.

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.

*** system.** In data processing, a collection of personnel, machines, and methods organized to accomplish a set of specific functions.

system diskette. On the Network Controller, a 5-1/4 inch diskette that contains operational microcode, diagnostic microcode, the configuration table, the serial number, the password, error logs, and other information. The diskette is inserted into the front of the Network Controller's diskette unit. See *backup diskette*, *spare diskette*.

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

System Support Programs for ACF/NCP/VS (SSP). An IBM program product, consisting of utilities and small programs, that supports and is required for the operation of ACF/NCP.

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

T

TAP. See *Trace Analysis Program*

Trace Analysis Program (TAP). An IBM program product, provided by SSP, that merges and formats SNA and SDLC trace data into formatted trace reports.

target diskette. In a diskette or storage copying procedure, the diskette onto which information is being written. Contrast with *source diskette*.

telecommunication. (TC97) Communication over a distance, as by telegraph or telephone.

telecommunication line. Any physical medium, such as a wire or microwave beam, that is used to transmit data. Synonymous with *line*.

teletypewriter equipment (TTY). A generic term referring to the basic equipment made by Teletype Corporation, and to teleprinter equipment.

teletypewriter exchange service (TWX). Teletypewriter service in which suitably arranged teletypewriter devices are provided with lines to a central office for

access to other such devices throughout the USA and Canada.

trace. A function that enables the Network Controller to copy the data and control information it sends or receives. ACF/VTAM collects the trace data, which can then be formatted and printed using the Trace Analysis Program.

TTY. See *teletypewriter equipment (TTY)*.

TWX. See *teletypewriter exchange service (TWX)*.

U

upstream. In the direction of data flow from the end user to the host. Contrast with *downstream*.

upstream device. For the Network Controller, a device located in a network such that the device is positioned between the Network Controller and a host. A communication controller upstream from the Network Controller is an example of an upstream device. Contrast with *downstream device*.

upstream line. For the Network Controller, a telecommunication line attaching a Network Controller to an upstream device. Contrast with *downstream line*.

user-application network. (TC97) A configuration of data processing products such as processors, controllers, and terminals, established and operated by users for the purpose of data processing or information exchange, which may use services provided by communication common carriers.

V

VTAM. See *Advanced Communication Function for the Virtual Telecommunications Access Method (ACF/VTAM)*.

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

W

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

X

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

X.25. See *Recommendation X.25 (Geneva 1980)*.

X.25 NCP Packet Switching Interface. An IBM program product that allows SNA users to communicate over packet-switched data networks that have interfaces complying with Recommendation X.25 (Geneva 1980) of the International Telegraph and Telephone Consultative Committee (CCITT). It allows SNA programs to communicate with SNA equipment or with non-SNA equipment over such networks.

3101 Display Terminal. A tabletop IBM keyboard display terminal that uses the asynchronous line protocol and the USA ASCII or ISO code character set. The 3101 Display Terminal is suitable for use as a Network Controller control terminal.

3710 configuration. The definitions that describe a 3710 network.

3710 network. A Network Controller and its attached lines and devices.

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