TOPS–10
DECnet and PSI
Installation Guide

AA–P379B–TB

April 1986

This manual describes the procedures for generating and installing DECnet and TOPS–10 PSI software on the DECsystem–10.

This manual supersedes the *DECnet–10 Network Generation and Installation Procedures*, order number AA–P379A–TB, and the *TOPS–10 PSI Installation Guide*, order number AA–CK82A–TB.

OPERATING SYSTEM:	TOPS–10 V7.03
SOFTWARE:	DECnet V4.0 GALAXY V5.1 TOPS–10 PSI V1.0

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CONTENTS

FIGURES

TABLES

PREFACE

This manual describes the procedures for configuring TOPS-1Ø DECnet and PSI (Packetnet Switching Interface) nodes in a network. The procedure for installing network software includes instructions for generating a TOPS-1Ø monitor that supports the network configuration. The tools that are provided for configuring the host node, front-end software, and for generating network links are described, as well as verification tools for testing network communication. This manual also contains software configuration procedures to verify DECnet network links over Ethernet (NIA2Ø) circuits.

The installation procedures include information for configuring front-end software for DN2Ø devices. You can run DECnet software on the front end, or on PSI (X.25) software. This manual contains instructions for installing both types of network front ends, because you must install DECnet in order to run PSI software. To install a DECnet MCB front end, follow all the procedures EXCEPT those in gray shading. To install PSI software, follow all the procedures INCLUDING those in gray shaded areas.

Intended Audience

This manual is intended to be used by the experienced TOPS-1Ø operator or software specialist. It explains all the information needed to install DECnet or PSI on the TOPS-1Ø KL or KS system and on the DN2Ø front end (KL systems only). To perform the installation procedures documented in this manual, you must also be familiar with the procedure for installing the TOPS-1Ø monitor and the GALAXY system.

Before attempting to install TOPS-1Ø networks, see the TOPS-1Ø Software Installation Guide, which contains worksheets for recording information that you must supply during the installation procedure. Some of that information will be necessary during the DECnet and PSI installation procedure as well.

This manual contains all the commands you need to restore files from distribution tapes using the BACKUP program. This manual assumes that you are experienced with the tape mounting and dismounting procedures and the BACKUP program. For more information about these procedures, see the TOPS-1Ø Operator's Guide.

The DECnet network is controlled by the NCP command level within the OPR program. To verify the network connections and correct problems, you must know how to run OPR and use NCP commands to control network parameters and devices. The OPR program is described in the TOPS-1Ø Operator's Command Language Reference Manual. To learn more about DECnet network management and PSI network management commands, see the TOPS-1Ø DECnet and PSI System Manager's and Operator's Guide.

For PSI installations, you should refer to the following reference cards for PSI network-specific information:

- PSI NSI PSS Card
- PSI NSI DATANET-1 Card
- PSI NSI TRANSPAC Card
- PSI NSI TELENET Card
- PSI NSI DATEXP Card
- PSI NSI TYMNET Card

You may need the X.25 and X.3 parameters supplied by your Public Packet Switching Network (PPSN).

The following lists CCITT (Consultative Committee for International Telegraph and Telephone) recommendations relevant to users of the TOPS-10 PSI software and the CCITT publications in which those recommendations are discussed. The information in this manual is subject to change. For more information contact the CCITT.

Recommendation	Document
X.3	Document AP VII-No. 6-E
X.25	Document AP VII-No. 7
X.28,X.29	Document AP VII-No. 8

The following document contains a complete and unabridged form of the key CCITT recommendations as they appear in Fascile VIII.2 of the Yellow Book of the Consultative Committee for International Telegraph and Telephone, 1981 edition.

The X.25 Protocol and Seven Other Key CCITT Recommendations:
X.1, X.2, X.3, X.21 bis, X.28, and X.29,
Lifetime Learning Publications, Belmont, California, 1981.

Conventions in this Manual

The following conventions are used in this manual in command descriptions and examples:

Convention/Symbol	Meaning
UPPERCASE PRINT	indicates what you type in a command string.
Lowercase letters	indicate a type of variable (name, number, for example)) in a command string for which you must supply the actual text or number.
Shading	**Information highlighted with gray shading applies to configuration and installation of PSI nodes only. All non-shaded areas apply to both DECnet and PSI installation, unless otherwise noted in the text.**
<ESC>	means press the ESCape or ALTmode key.
<CTRL/x>	means hold the CTRL key and press the character "x." For example, <CTRL/C> means hold the CTRL key while you press the letter "c."

Unless the instructions in the manual indicate otherwise, you must end every command by pressing RETURN.

This manual contains installation procedures for both DECnet and PSI software for TOPS-10 systems. To install PSI software, you also must install DECnet software on the host node.

Organization of this Manual

Chapter 1, **NETWORK CONFIGURATIONS**, contains descriptions of the various hardware configurations that are required to support DECnet and PSI gateway software. This chapter also contains an overview of the entire installation procedure, instructions for preparing to install network software, and worksheets you can use to record the values of the numerous parameters required in the procedures. The files required for installing DECnet and for installing PSI gateway are also listed in this chapter.

If you have never installed DECnet and PSI, Chapter 1 will help you get started. If you have installed network software before, you should read this chapter to review changes to the software and the installation procedure.

Chapter 2, **GENERATING TOPS-10**, describes the procedures you must follow to configure the host system software to prepare it to support DECnet communications. These instructions are based on those described in the TOPS-10 Software Installation Guide.

Chapter 3, **INSTALLING DN2Ø NODES**, contains a description of the procedures for configuring and generating DN2Ø software. If your installation does not include a DN2Ø, you can skip Chapter 3.

The DN2Ø front end (supported by KL systems only) can run DECnet front-end software (called the MCB) or PSI gateway software. Using the NETGEN program, you configure the front end software by answering questions in a dialog and including the values of parameters for the network configuration files. NETGEN produces these configuration files, which are processed by a batch control file that is also described in this chapter.

Chapter 4, **CONFIGURING NETWORK NODES**, describes the procedure for creating network support files and verification batch files for the network software. You run the NIPGEN program to create the NCP.CMD file used by OPR and the batch control files you can use to test network connections. This chapter also contains descriptions of the changes you must make to system initialization files (such as SYSJOB.INI and SYSTEM.CMD) to start up network software automatically at system startup.

To install PSI, you must also run the COMGEN program to create the PSI initialization file for OPR, X25NM.CMD. COMGEN allows you to create files that are used by the batch jobs that verify PSI network connections.

Chapter 5, GENERATING PSI INITIALIZATION FILES, describes the methods for testing network functions, and ways to correct errors or problems you might find. This chapter also contains procedures for installing PSI software on other TOPS-1Ø systems in the PSI network.

After you have followed the procedures in Chapters 2 through 5, the network should be installed and running. The appendixes contain additional information about tools used during the installation procedures.

Appendix A, **NETGEN**, lists the NETGEN commands, parameters, and error messages in detail.

Appendix B, PSITST, describes the PSITST program in detail.

Appendix C, **GLOSSARY**, contains a glossary of the DECnet and PSI terms that are used in this manual.

CHAPTER 1

NETWORK CONFIGURATIONS

TOPS-1Ø DECnet extends the capabilities of the DECsystem-1Ø by supplying protocols that TOPS-1Ø programs use to communicate with programs on other systems. The DECnet protocols that govern message communication allow any task running under the TOPS-1Ø operating system to communicate with any other task in the network. DECnet-1Ø allows communications with other systems running DECnet and DN2Ø communications front ends.

The TOPS-1Ø Packetnet System Interface (PSI) Gateway provides access to Public Packet Switching Networks (PPSNs). The PSI Gateway is the interface between a PPSN and a DECnet network. The Gateway software resides with DECnet-1Ø software in a DN2Ø as several Multifunction Communications Base (MCB) processes. In the network, each processor is a node with a name and a unique identifying address. The systems in the network that support interactive command execution are the host nodes. All processors dedicated to input and/or output are called front ends, or servers, because these types of nodes depend on a host node for loading software into memory and performing software recovery functions. The DECnet front end is based on the DN2Ø communications device.

To install the network software, you must be familiar with the type of hardware that your system includes, and you must know the names and address numbers of nodes that will communicate with the system. You configure your network node by identifying the nodes in the network and describing the hardware and software characteristics of the nodes.

The TOPS-1Ø system runs on two different types of processors, the KS (DECSYSTEM-2Ø2Ø), or the KL (DECsystem-1Ø9Ø/1Ø91/1Ø95). These processors have different network configuration possibilities, which are described separately below.

1.1 KS NETWORK CONFIGURATION

The KS system running TOPS-1Ø has more limited capabilities than the larger KL processor: the KS does not support DN2Ø hardware. Therefore, to install network software on a KS system, it is not necessary to build MCB or X.25 gateway software. To use this manual to install KS network software, follow all the instructions except those in Chapter 3 or those that are gray-shaded. Ignore all procedures related to the NETGEN program, the DN2Ø front end, and PSI.

1.2 KL NETWORK CONFIGURATIONS

TOPS-10 on a KL processor supports DECnet and PSI communications. DECnet configurations include the DN20 running MCB software, or the KL can communicate in the DECnet network over the Ethernet. The KL processor supports DN20 front ends running PSI software as well. **The PSI network configuration is described in Section 1.2.2.**

The DN20 processes data transferred over synchronous communications lines. The DN20 is a PDP-11 processor that runs the MCB (Multifunction Communications Base) operating system. You must configure the MCB software using the NETGEN program before you can load the DN20.

DECnet also supports the NIA20 device, which provides communication between nodes on the same Ethernet network. Although DECnet is not required for Ethernet communications, it provides methods of ensuring data integrity, such as automatic retransmission of lost messages.

The Ethernet allows DECnet to communicate with the local area of the network, including up to 1024 nodes. DECnet allows up to 63 such areas, each consisting of up to 1024 nodes. This configuration requires that nodes with addresses outside of the local network area be specified using the area number as well as local node address, in the form: area.address.

1.2.1 DECnet Network Configurations

The KL and KS network configurations are illustrated in Table 1-1.

Table 1-1: Network Configuration Matrix

CPU Type:	KL	KS
Circuits:	ETH-0 DTE-0-(1-3) DTE-1-(1-3) DTE-2-(1-3)	KDP-0-0 KDP-0-1
Node Types:	Host Target Adjacent Remote File Transfer MCB-Adjacent	Host Adjacent Remote File Transfer
Front end Nodes:	DN20/MCB	None

Before you can generate and install network communications software, your system manager must determine the baud rate for communications based on the type of network controller and the number of lines. Table 1-2 lists the maximum line configurations allowed for each type of network device and the maximum line speeds allowed for each configuration.

Table 1-2: Maximum Line Configurations

	Supported Devices	Lines Allowed At Baud Rates
On KL systems:		
	NIA2Ø	1 per CPU
On the DN2Ø:		
	DMC11	2 lines at 1ØØØkb, or 4 lines at 56kb
	DMR11	2 lines over 56kb, or 4 lines at 56kb
	DUP11	8 lines requiring 1 KMC-11 per 4 DUP11s. This KMC/DUP combination is referred to as a KDP.
On KS systems:		
	KDP	2 lines allowed

1.2.2 PSI Network Configurations

This section describes PSI hardware configurations. If you are not installing PSI software, continue at Section 1.3.

You must run TOPS-1Ø PSI on a DECsystem-1Ø9Ø/1Ø91/1Ø95. Follow the same procedure for all of these machines. To run TOPS-1Ø PSI, the TOPS-1Ø monitor, GALAXY software, and DECnet-1Ø software must be installed. You may be running in either timesharing or stand-alone mode while you configure the software, but you must reload the system to install the software and verify the network connections.

Network configuration files are provided on two distribution tapes:

- DECnet-1Ø Distribution Tape
- TOPS-1Ø PSI Distribution Tape

The distribution tapes are BACKUP-formatted tapes.

You must create a directory on disk for storage of the generation and installation files. You will need to allocate 15,ØØØ blocks for DECnet/PSI storage. Consult with your system manager to be sure you have enough space before you begin the generation procedures.

You must know your hardware configuration to perform this installation. The maximum number of each type of supported communications device in the DN2Ø X.25 gateway front end is shown in Table 1-1. For more information, see the TOPS-1Ø PSI V1.Ø SPD (Software Product Description).

Table 1-3: Supported Devices (PSI)

Device	Maximum Number
DMC11s	1
DMR11s	1
KMC-11	1
DUP11s for KDP	3

TOPS-10 PSI, in a DN20 X.25 gateway front end, supports 2 connections to the PPSN and 1 DECnet-10 connection.

If your system supports more than 1 (one) DN20 front end, see the DECnet-10, Version 3.0 SPD for a list of devices supported on the DN20 DECnet front end. The following diagram illustrates the configuration of a typical PSI front-end node.

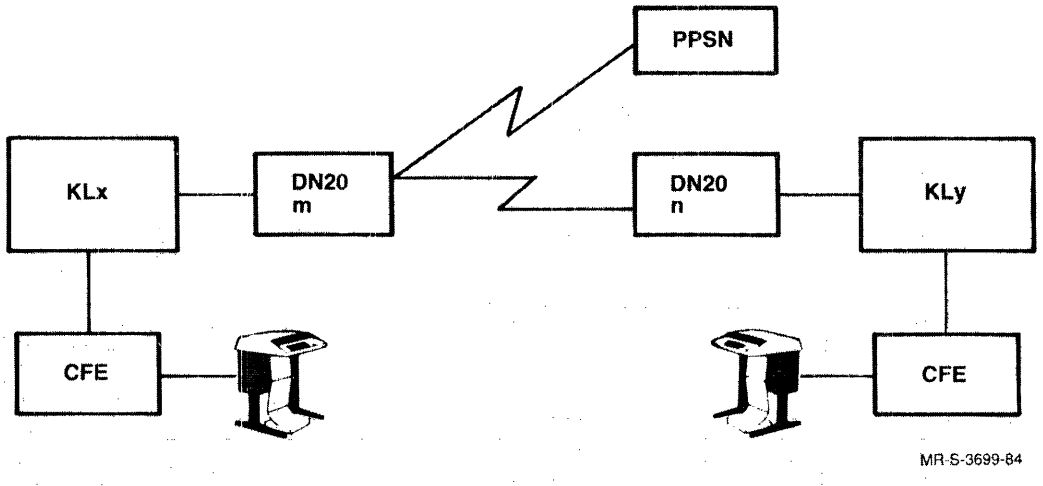


Figure 1-1: Configuration of a DN20/TOPS-10 PSI Node

1.3 OVERVIEW OF INSTALLATION PROCEDURES

To install DECnet, you must follow all the steps described in this manual except those that are in gray shaded boxes. If you are installing PSI, you must follow all the steps in this manual, including those in gray shaded boxes.

The procedure for generating and installing DECnet is summarized here for your convenience. This is only an overview of the installation procedure. The actual installation instructions begin with Chapter 2.

➡ **Step 1: Initial Preparation**

- Before you install network software, you must become familiar with the procedure and the tools you will use in the procedure. Read this manual from start to finish, and fill out the worksheets provided at the end of this chapter. The time you spend preparing to install the network software may prevent confusion and errors during the installation process.
- Log into a directory that has access to all necessary files for a monitor generation. In this manual, we call this your "build directory."
- If this system has no previous version of DECnet, create a unique directory for DECnet files. If you are installing PSI, and there is no previous version of PSI, create a special area for PSI files.
- Restore files from the DECnet distribution tapes to your build directory.
- Read the beware files. Check the distribution package for a hard copy of the beware file. The hard-copy beware file supersedes the on-line beware file.
- If you are installing PSI, restore the files from the PSI distribution tape to your build directory.
- Before installing PSI software, read the PSI.BWR file. If there is a hard copy of the beware file in the distribution package, the hard-copy supersedes the on-line beware file.
- Prepare your information using the worksheets provided at the end of this chapter.

➡ **Step 2: Modify MONGEN and GALGEN Procedures**

Generate your TOPS-10 monitor using the instructions in the TOPS-10 Software Installation Guide. Modify the MONGEN and GALGEN procedures to include network information. Instructions for modifying the monitor and GALAXY generation procedures are described in Chapter 2.

- Generate the TOPS-10 monitor with network support.
- Generate the GALAXY software with network support.
- You can install the monitor and GALAXY now, or you can generate the network software first, and install the entire system later.

Step 3: Configure Front-end Software

For DN20 nodes, you must configure software that will be loaded into the node. For DECnet, you must generate and install MCB software for the front end. For PSI, you must generate and install X.25 gateway software for the front end.

The following steps are applicable only to systems that include front ends. KS systems do not support DN20 front ends for network communications. Therefore, if you are installing DECnet on KS, you can skip these steps.

The following procedure is documented in Chapter 3.

- Run the NETGEN program and initiate the dialog to describe the hardware and software characteristics of your DN20. To generate MCB software, you choose the DN20 option when NETGEN starts. To generate PSI software, you choose the X.25 option.

- After you run NETGEN, check the configuration information and make any corrections that are required. When you are satisfied with the configuration information, save the configuration files.

- For PSI installations at European sites (that is, sites with 50Hz power), delete the default 60Hz file, RSX11S.TSK, and rename RSX50H.TSK to RSX11S.TSK.

- Submit the batch control file that builds the front-end software. For MCB software, this batch job is called MCBSYS.CTL. For PSI software, it is called MCBX25.CTL.

  Check the log file from the batch job for any errors in the build process. If you must change any configuration information, run NETGEN again, and use the RESTORE command to restore the configuration file. Modify the necessary parameters, and use the SAVE and FINISHED commands to save the changes. Then submit the batch control file once again.

  The batch control file creates a system image for the front end as a file named nodename.SYS, where nodename is the name of the front-end node, as you specified in the NETGEN dialog.

- Copy nodename.SYS to the SYS: area.

- Copy any other necessary files to SYS:.

Step 4: Create Network Configuration Files

Next you must create files to load network software and verify the network connections. The NIPGEN program, described in Chapter 4, allows you to enter the appropriate information and creates the file you need to load and verify network software.

- Run the NIPGEN program to create the command and control files used to verify and load your network software.

- Copy the NCP.CMD command file, created by NIPGEN, from your directory to the SYS: area.

To install PSI, you must also use COMGEN to generate PSI installation and verification control files by performing the following procedures:

1. Edit the file X25CNF.BNF and substitute your site-specific parameters.

2. Submit the COMGEN.CTL batch job, which produces the following files: X25NM.CMD, PSITST.INI, and X29SRV.INI.

3. Check the log file produced by the batch job for any errors in the building process. If there are errors in COMGEN.LOG, correct the errors in X25CNF.BNF and run COMGEN again.

When the configuration procedure is finished, edit the system files SYSJOB.INI, SYSTEM.CMD, and NCP.CMD to include commands that automatically start up the network software.

➡ Step 5: Load and Verify Network Software

Load the monitor and front-end software. Verify that the loading process is complete, and verify that network connections are activated. Procedures for accomplishing this are described in Chapter 5; a summary follows:

- Halt the front end, then shut down and reload the TOPS-10 system.

- If the TOPS-10 monitor does not come up, load the monitor that was running previously, and examine your procedures to find the error.

- If TOPS-10 V7.03 and the front end come up correctly, submit the batch file NIPTST.CTL from NIPGEN to verify connections to the adjacent nodes. Check NIPTST.LOG for errors before proceeding. If there are errors in the log file, you must run NIPGEN to correct the errors, then resubmit NIPTST until it runs without errors.

- If the network does not come up, try to start it manually with the following procedures:

  1. Use the OPR command TAKE to take SYS:NCP.CMD.

  2. For PSI installation procedures, you can also use the TAKE command to execute the commands in SYS:X25NM.CMD, to define X.25 network management parameters.

  3. Use the NCP command LOAD NODE to load the DN20. If the DN20 comes on line, resubmit the NIPTST control file.

- If there are other DECnet nodes in the network, test network file transfer capabilities, by submitting the NIPNFT control file. Check the log file and correct any errors before proceeding.

- To verify the PSI X.25 network connections, perform the following procedure:

  1. Use NCP SET and LOOP LINE commands to perform a hardware loop test.

  2. Run PSITST, using the PSITST.INI script file to test X.25 capabilities.

  3. Check the PSITST log for errors. Correct errors and repeat PSITST until it runs without errors.

  In addition, you can verify X.29 functions using the following procedure:

  1. Call up your local PAD.

  2. Connect to the (X.25) gateway.

  3. Log in on a system through the PPSN.

  4. Log out from the host system.

  5. Return to the local PAD.

- After you have verified the connections and the software using these procedures, set up the node database for all the nodes in your network, by editing NCP.CMD to include node definitions for each node in the network.

- When you are satisfied with TOPS-10 Version 7.03 and the network, copy the new monitor to the system bootstrap tape.

- For PSI installation, you can install PSI access software on other TOPS-10 nodes, as described in the following procedure:

  1. Install the necessary gateway access files on other TOPS-10 nodes.

  2. Modify the system startup files.

  3. Restart NML on the remote system.

  4. Run CPR and TAKE the X25NM command file.

If you have corrected all errors you found during the configuration procedure, the network software will be fully installed.

1.4 PREPARATION

If you prepare your information before performing the configuration procedure described in this manual, the procedure will run more smoothly. Observe the guidelines summarized below before you begin to configure network software.

- If you have never installed this version of DECnet or PSI before, read this entire manual. It explains the tools and parameters you must define to configure the network. Hardware and software terms are defined in Appendix C. PSI-specific hardware and software terms are indicated by gray shading.

To install DECnet software without PSI gateway software, perform all the procedures applicable to your configuration, ignoring the gray-shaded areas of this manual.

To install PSI software, follow all the instructions in this manual that apply to your configuration, including areas marked by gray shading.

- Fill out the worksheets provided in this chapter, using parameters that reflect the actual hardware at the installation. In many cases, you can accept default values for hardware and software parameters, but you must make sure that these defaults are appropriate to the installation configuration. Some of this information may be available only from a DIGITAL service representative.

  Also, make sure that each software parameter is within the accepted range. You may choose to accept the default parameters supplied by the installation tools: a safe procedure, but the default values do not necessarily produce optimal performance.

  Software parameters entered in the MONGEN monitor-generation dialog must be consistent with those supplied in the NETGEN dialog. Those parameters and the tradeoffs involved in selecting different values are discussed in Appendix A.

- Secure a terminal and location where you will not be interrupted during the on-site configuration, and set aside at least two hours for the configuration procedure. The amount of time you will need depends on your own rate of progress, the characteristics of your configuration, and the response time of the system you are using. To install the final version of your network software, you will have to shut down the system and the front ends, then reload the system.

You begin the DECnet generation procedure by generating your monitor and GALAXY system with network facilities enabled. Chapter 2 contains descriptions of the specific MONGEN and GALGEN questions that pertain to DECnet and PSI. See the TOPS-10 Software Installation Guide for a complete description of the monitor generation and installation procedures.

1.5 INSTALLATION WORKSHEETS

To install DECnet and PSI software, you must provide information about the hardware and software that will be supported by the configuration. You can use the following worksheets to record information that you can obtain from your Field Service representative and the system manager.

DN2Ø Hardware Worksheet for DECnet (KL only)

For each DN2Ø, record the following information:

DTE number (DTE-Ø-1, -2, or -3): _____

Number of DMC11s (Ø to 5): _____

DMC-Ø cost: _____
DMC-1 cost: _____
DMC-2 cost: _____
DMC-3 cost: _____
DMC-4 cost: _____

Number of DMR11s (Ø to 5): _____

DMR-Ø half___ or full___ duplex, cost:_____
DMR-1 half___ or full___ duplex, cost:_____
DMR-2 half___ or full___ duplex, cost:_____
DMR-3 half___ or full___ duplex, cost:_____
DMR-4 half___ or full___ duplex, cost:_____

Number of KDPs (Ø to 2): _____

For KDP-Ø, number of DUP11s (Ø to 4) _____

KDP-Ø-Ø maximum baud rate: _____ cost: _____
KDP-Ø-1 maximum baud rate: _____ cost: _____
KDP-Ø-2 maximum baud rate: _____ cost: _____
KDP-Ø-3 maximum baud rate: _____ cost: _____

For KDP-1, number of DUP11s (Ø to 4): _____

KDP-1-Ø maximum baud rate: _____ cost: _____
KDP-1-1 maximum baud rate: _____ cost: _____
KDP-1-2 maximum baud rate: _____ cost: _____
KDP-1-3 maximum baud rate: _____ cost: _____

For KDP-2, number of DUP11s (Ø to 4): _____

KDP-2-Ø maximum baud rate: _____ cost: _____
KDP-2-1 maximum baud rate: _____ cost: _____
KDP-2-2 maximum baud rate: _____ cost: _____
KDP-2-3 maximum baud rate: _____ cost: _____

Figure 1-2: DECnet Hardware Worksheet

DN20 Hardware Worksheet for PSI (KL only)

For each DN20, specify:

DTE number (DTE-0-1, -2, or -3): _____

Cost: _____

If there is a DMC11, specify the cost: _____

If there is a DMR11, specify half____ or full_____ duplex.
Cost: _____

Number of KDP devices on the DN20 (0 to 1):_____

For KDP-0, specify the number of DPU circuits (0 to 3):_____

For each KDP circuit, supply the following information:

KDP-0-0 datalink protocol type (DDCMP-DMC or LAPB):_____
Maximum baud rate:_____
Cost (DDCMP-DMC only):_____
DTE address (LAPB only):_____
Channel range for this DTE (LAPB only):_____

KDP-0-1 datalink protocol type (DDCMP-DMC,LAPB):_____
Maximum baud rate:_____
Cost (DDCMP-DMC only):_____
DTE address (LAPB only):_____
Channel range for this DTE (LAPB only):_____

KDP-0-2 datalink protocol type (DDCMP-DMC,LAPB):_____
Maximum baud rate:_____
Cost (DDCMP-DMC only):_____
DTE address (LAPB only):_____
Channel range for this DTE (LAPB only):_____

Figure 1-3: PSI Hardware Worksheet

Network Software Worksheet (KS and KL)

Tapes:	Disk Space Needed:
DECnet V4.Ø	For NIA2Ø only: 2ØØØ blocks
TOPS-1Ø V7.Ø3	For DN2Ø/DECnet: 1Ø,ØØØ blocks
CUSP	For PSI/DECnet: 17,5ØØ blocks
TOPS-1Ø PSI V1.Ø	

The following parameters apply to DN2Ø nodes for both MCB and PSI generation procedures. Refer to Appendix A for information about these parameters:

DN2Ø node name: _____ address: _____

Parameter	Range	Default
Buffer size	(29Ø to 576)	576
Identification	(1 to 32 char's)	DECNET Version 3.Ø Release
Inactivity timer	(1 to 65535 sec's)	3Ø
Maximum address	(2 to 255)	255
Maximum cost	(1 to 1Ø22)	1ØØ
Maximum hops	(1 to 3Ø)	16
Maximum links	(3 to 23)	11
Maximum visits	(16 to 255)	32
Outgoing timer	(1 to 65535 sec's)	6Ø
Retransmit factor	(1 to 15)	5
Routing timer	(1 to 65535 sec's)	6Ø
Transmit password	(1 to 8 char's)	DECNET2Ø
Management user		
Management account		
Management password		

Figure 1-4: Software Worksheet

Network Configuration Worksheet

This worksheet lists the parameters you must supply to the NIPGEN program, to configure the network software for your host system. These parameters apply to both DECnet and PSI installation procedures. NIPGEN is described in Chapter 4.

Host Node Definition:
Host name:_____

Host node address:_____

For the NIA2Ø, specify circuit names as ETH-Ø:_____

DN2Ø Node Definition
(Supply the following for each DN2Ø node that must be down-line loaded from the host system.)
Target node name:_____

Target node address:_____

Host's service circuit for target node:_____

Target node type:_____

Target node's service password:_____

Target node's Ethernet address:_____

Adjacent Node Definition
(Supply the following for each node directly adjacent to the host.)
Adjacent node name:_____

Adjacent node address:_____

Host node circuit to adjacent node:_____

DN2Ø Adjacent Node Definition
(Supply the following for each node directly adjacent to the DN2Ø.)

Adjacent node name:_____

Adjacent node address:_____

DN2Ø circuit to adjacent node:_____

Figure 1-5: Network Configuration Worksheet

DN20 Network Management Information
(Supply the following for each DN20.)

Network management user-id:_____

Network management account:_____

Network management password:_____

(Supply the following for each remote node in the network.)

Remote node name:_____

Remote node address:_____

File Transfer Test Information
(Supply the following for each node with which you will perform file transfer tests.)

Test file transfer to node name: _____

File transfer node address: _____

User-id for file transfer test: _____

Account for file transfer test: _____

Password for file transfer test: _____

Figure 1-5: Network Configuration Worksheet (Cont'd)

PSI Software Worksheet

To install PSI software, you must edit the distributed copy of the X25CNF.BNF file, providing the following information:

DN20-node-name:_____
DTE-address:_____
Name-of-PPSN:_____
PPSN-access-password:_____

The following information defines the PSI frame-level characteristics. If your PPSN subscription requires non-default values for any of the following parameters, you can use the NETGEN program to change the values. Otherwise, you should not change these parameters.

NETGEN Parameters	CCITT Parameter	Default Value	PPSN Value
Maximum Window	K	7	_____
Maximum Retransmits	N2	20	_____
Retransmit Timer	T1	3000	_____
Maximum Data	Max. packet size	128	_____
Maximum Window	Max. window size	2	_____
Restart Timer(sec)	T20	180	_____
Call Timer (sec)	T21	200	_____
Reset Timer(sec)	T22	180	_____
Clear Timer(sec)	T23	180	_____
Maximum Clears	Maximum	6	_____
Maximum Resets	Maximum	6	_____
Maximum Restarts	Maximum	6	_____

Figure 1-6: PSI Software Worksheet

1.6 FILES REQUIRED FOR INSTALLING NETWORK SOFTWARE

This manual assumes that TOPS-1Ø Version 7.Ø3 is being installed, or has been installed. Instructions for installing the monitor are included in the TOPS-1Ø Software Installation Guide. You can generate the monitor and the network software, then install them on the same system reload. Or you can install TOPS-1Ø and GALAXY, then install the network software. For the network generation procedure, the system need not be brought up for standalone operation, but you will have to reload the system to install the network software.

The DECnet installation procedure and the PSI installation procedure are very similar. To install PSI software, you must also include DECnet files. Therefore, the files described in this section are important for BOTH DECnet and PSI installation procedures. Section 1.7 describes files required ONLY for PSI installation. If you are not installing PSI, you can skip Section 1.7. If you are installing PSI, you must read this section as well as Section 1.7.

All the DECnet-specific network configuration files are supplied on the DECnet-1Ø Version 4.Ø Distribution Tape. The monitor distribution tape contains the BACKUP program, which you use to copy files from the distribution tapes to the disk area. You may also use BACKUP to save the network software after you have generated and installed the network.

The DECnet distribution tape contains the following files to help you generate and install DECnet and PSI network software:

- The documentation files associated with DECnet. These include:
  - The DECNET.BWR file contains important information about the software and changes since the previous version. The beware file may also be distributed in hard-copy form with the distribution package. The hard-copy beware file supersedes the on-line beware file.
  - The .HLP files are text files that describe the network commands.
  - The .DOC files describe the edits made to the software modules.
- Files needed to support the task-to-task, file transfer, and network command terminal capabilities for your configuration.
- Software tools, including programs and batch control files that allow you to configure your network software, generate front end software, and verify network connections. These tools are described below.
- NIPGEN.EXE, a program that enables you to generate files for verifying and loading your network software. You must run NIPGEN for both DECnet and PSI installation procedures.

You must install front-end software if you have a DN2Ø communications front end. The DN2Ø can run either MCB software (for DECnet) or X.25 gateway software (for PSI). The following files allow you to generate and install front-end software for KL systems:

- NETGEN.EXE, a program that allows you to enter parameters for either DECnet or PSI front-end network software. You run NETGEN to configure DN2Ø MCB software for DECnet communications, or X.25 software for PSI communications.

NETGEN creates the configuration files NETPAR.MAC and CETAB.MAC, which contain the system parameters and database for the DN20, and NMLACC.MAC, which defines access information that remote sites must furnish before they can issue certain commands.

NETGEN also creates the configuration file that you describe in the NETGEN dialog. The dialog creates the file nodename.CNF.

- DNMAC.EXE, a cross-assembler for PDP-11 macro source files.
- PDP-11 files for all modules needed for any configuration, including object modules, symbol tables, and memory maps.
- TKB36.EXE, a program that constructs PDP-11 formatted task images from object files.
- VNP36.EXE, a program that creates the front-end system image.
- MCBSYS.CTL, a control file for building the MCB software for DECnet.

1.7 FILES REQUIRED FOR INSTALLING PSI

In addition to the files listed in Section 1.6, you must also have the following files if you are installing PSI software:

- Documentation files about the installation tools.
- TOPS-10 binary files needed for installation.
- PDP-11 files for configuring PSI software; these include task modules, symbol tables, and memory maps.
- TOPS-10 source files needed for PSI installation.
- Tools used for installing and verifying PSI.

MCBX25.CTL is a control file for building a DN20 X.25 gateway front end for TOPS-10 PSI systems. When the commands in this file have been executed, your build directory will contain the necessary PSI system image file for the DN20.

Among the binary files are PSITST.EXE, a program that allows you to verify your host's connection to the X.25 gateway. PSITST is comprised of PSITSB.EXE, a background process that handles communications with the X.25 PPSN, and PSITST.EXE, a foreground process, which provides a user command interface to control the activity of the background process.

To make X.29 connections, you use another binary file, X29SRV.EXE. This program provides X.29 network functions, and is described in the TOPS-10 PSI User's Guide. Many of these files are provided in the DECnet and PSI distribution packages. Others are created during the installation procedure.

The instructions for installing a monitor to support DECnet and PSI networks are described in Chapter 2.

CHAPTER 2

GENERATING TOPS-10

Before you can perform the DECnet and PSI generation procedures, you must generate a TOPS-10 monitor and GALAXY subsystem to support network functions. Use the TOPS-10 Software Installation Guide to install TOPS-10 and GALAXY. This chapter describes only those steps you must modify to support DECnet and PSI.

Log in, using the PPN where you wish to perform the generation. The disk area used for generating and installing software is called the "build area." If this is the first version of DECnet to be installed on the system, use the CREDIR program to create such a directory, to contain the DECnet-related files. In the following procedures, the [100,200] directory is used. (See the TOPS-10 User Utilities Manual for more information on the CREDIR program.)

2.1 RESTORING DECNET FILES

Use the BACKUP program to restore the files from the DECnet distribution tape to disk. (See the TOPS-10 User Utilities Manual for more information on the BACKUP program.)

(If you are installing PSI software and you are already running DECnet, you can skip this step.)

To restore the DECnet files, mount the DECnet distribution tape and type the commands in the following procedure. (Use the actual magnetic tape drive unit identifier in place of MTxn:.)

```
.RUN BACKUP
/TAPE MTxn:
/REWIND
/SSNAME ALL
/SUPERSEDE ALWAYS
/PROTECTION 155
/RESTORE *.*
/UNLOAD
/EXIT
.
```

Dismount the DECnet distribution tape and verify that the DECnet files exist in the proper directory, using the DIRECT command.

Before proceeding, read the DECnet beware file, DECNET.BWR. Note that any hard-copy beware file supersedes the copy on the DECnet tape.

The DECnet distribution tape contains files that you must copy to SYS:. Use the COPY command to transfer the following files from the build area to SYS:.

```
.COPY SYS:=NFT.EXE
.COPY SYS:=NML.EXE
.COPY SYS:=FAL.EXE
.COPY SYS:=CTHNRT.EXE
.COPY SYS:=NETWOR.EXE
```

You must also copy the NFT.HLP and CTHNRT.HLP files to the HLP: area:

```
.COPY HLP:=NFT.HLP
.COPY HLP:=CTHNRT.HLP
```

If the configuration includes a DN20 front end (KL systems only), you must also copy the following files to SYS:.

```
DTEMPT.SYS
DTEMPS.SYS
DTEDMP.SYS
```

If you are not installing PSI, you can skip Section 2.2 and proceed with the instructions in Section 2.3.

2.2 RESTORING PSI FILES

This section applies to PSI installations only. To install PSI software, you must restore the DECnet distribution files as well as the PSI distribution files. To restore the PSI files, mount the PSI distribution tape and run BACKUP. Use the following commands to restore the files with BACKUP:

```
.R BACKUP
/TAPE MTxn:
/REWIND
/SSNAME ALL
/SUPERSEDE ALWAYS
/PROTECTION 155
/RESTORE *.*
/UNLOAD
/EXIT
.
```

When you are satisfied with the files you have restored, dismount the PSI tape. Read the PSI.BWR file using the TYPE command, as shown in the following example:

```
.TYPE PSI.BWR
```

When you have read both the DECNET.BWR and PSI.BWR files, use the following commands to copy the required files to SYS:.

```
.COPY SYS:=PSITST.EXE
.COPY SYS:=PSITSB.EXE
.COPY SYS:=X29SRV.EXE
.COPY SYS:=B361LB.REL
```

Copy the X25SYM.UNV file to the UNV: area:

```
.COPY UNV:=X25SYM.UNV
```

Use the following commands to copy the required files to the REL: area:

```
.COPY REL:=X25GAF.REL
.COPY REL:=X25GAM.REL
```

2.3 GENERATING THE MONITOR

The following sections describe the MONGEN program, with procedures for supporting DECnet and PSI network software.

Follow the directions in the TOPS-10 Software Installation Guide to generate the TOPS-10 monitor with MONGEN, and answer the questions that are listed here with the appropriate network information.

2.3.1 Hardware Definition for KL Systems

For KL systems, MONGEN's HDW dialog asks the following questions:

```
# of DTEs on CPU0(1,1-4):
```

If you are generating a monitor for a multiple processor system, this request is repeated for each processor.

Respond with the number of DTEs you will use. The range is 1 to 4. Since the first DTE supports the console front end (RSX20F), specify at least 1 DTE port.

For each DTE you specify, you will be asked:

```
Type of front end on DTEn (RSX20F,ANF10,IBM,DECnet):
```

Type DECnet in response to this question for any DTE that is to support communications with the DECnet or PSI front end.

In monitor generation for all TOPS-10 systems, MONGEN asks:

```
Decimal "symbol,value"
```

At this point, you may want to specify values for DECnet-related parameters. Consult your system manager before changing the values of any of these parameters. The symbol names and the default values for the DECnet-related parameters are listed below. See the TOPS-10 DECnet and PSI System Manager's and Operator's Guide for more information about these parameters.

Table 2-1: Monitor Symbols for DECnet

Symbol	Default Value	Parameter
Session Control parameters:		
%SCINT	30*1000	Incoming timer value
%SCOTT	1*60*1000	Outgoing timer value
Data link parameter		
%DLBSZ	576	Maximum data links buffer size
Router parameters:		
%RTB3M	3	Hello timer multiplier for broadcast adjacencies
%RTBEA	64	Maximum number of end node adjacencies
%RTBRA	32	Maximum number of broadcast router adjacencies
%RTBSZ	576	Buffer size (bytes)
%RTBT1	40*1000	Default maximum routing message interval (Ethernet)
%RTCST	1	Default cost for circuit
%RTCTO	60*1000	Endnode cache timeout
%RTITM	1*60*1000	Initialization timer
%RTMX3	255	Default maximum node address for router
%RTMXC	100	Maximum line cost
%RTMXH	16	Maximum hops
%RTMXN	1023	Maximum node address
%RTMXR	16	Default maximum number of routers on an Ethernet
%RTMXV	20	Maximum visits
%RTPRI	5	Node's priority to be the designated router
%RTT3M	2	Hello timer multiplier for non-broadcast
%RTTM1	10*60*1000	Routing timer (milliseconds)
%RTTM3	15*1000	Hello frequency timer (milliseconds)
%RTTM4	30*1000	Node listener timer (milliseconds)
LLINKS parameters:		
%NSDLY	3*16	Delay factor
%NSWGT	10	Delay weight
%NSINA	120	Inactivity timer
%NSRTH	10	Retransmission threshold
%NSFLR	1000	Delay floor (ms)
%NSRUF	10000	Delay roof (ms)
%NSADL	2	ACK delay in seconds

NOTE

The buffer size parameter (%RTBSZ) is critical to smooth operation of network communications. The value associated with this symbol should be the same as that assigned to MCB nodes in the NETGEN program (see Chapter 3). The buffer size parameter is discussed in Appendix A.

2.3.2 Hardware Definition for KS Systems

For KS systems, the HDWGEN dialog asks the following questions that pertain to DECnet. Answer all the questions in the HDWGEN dialog as described in the TOPS-10 Software Installation Guide, until you come to this question:

```
#KMC/DUP Lines (0,0-2):
```

Type the number of KDP circuits on the KS system.

```
Type of line for KDPx(ANF10,DECNET,USER):
```

This question is repeated for each KDP (KDP0,KDP1,KDP2). You type the word DECNET for the KDP circuit that will support DECnet communications.

2.3.3 Specifying Network Configurations

At the end of the HDWGEN section, select the NETGEN option to configure network support for your TOPS-10 monitor. This section is identical for KL and KS systems.

The MONGEN section that defines your system network configuration is called NET. Be sure to use the same node names and addresses to define your host system in the following dialog and in the NIPGEN dialog, described in Chapter 4.

After you specify the file for storing the network-related configuration file, MONGEN asks:

```
Network software (Y,N)
```

Respond to this question with "Y."

Then MONGEN asks:

```
Name of central site [Six characters or less.]:
```

Respond with the name of the host node, in six characters or less. There must be at least one alphabetic character in the name.

After the network definition questions for ANF-10, MONGEN asks:

```
DECnet software?(Y,N):
```

Respond to this question with "Y."

Immediately following this, MONGEN asks:

```
DECnet area number of central site (1,1-63):
```

If you have multiple areas, type the area number for the TOPS-10 system. Otherwise, your area number is assumed to be 1.

```
DECnet node number of central site(1,1-1023):
```

Respond with the node number by which the TOPS-10 system will be identified in the DECnet network. This must be a decimal number between 1 and 1023.

MONGEN then asks:

Ethernet software(Y,N)

If the system has a NIA20 driver with an Ethernet port, answer this question with "Y."

The rest of the monitor generation process is identical to the directions in the TOPS-10 Software Installation Guide.

You MUST run the FGEN dialog, to generate the feature test conditionals for the system. These feature test settings are stored in F.MAC. FGEN allows you to choose between the KL feature test set (KLFULL) and the KS feature test set (KSFULL). It is not necessary to change the standard settings for any feature test switches to support DECnet or PSI network communications.

After MONGEN generates F.MAC, exit from the MONGEN program by pressing <CTRL/Z>.

2.4 GENERATING GALAXY

If your site has modified GALAXY, you must run the GALGEN program to generate GALAXY with DECnet. The directions for running GALGEN are given in the TOPS-10 Software Installation Guide.

The GALGEN dialog consists of questions and prompts to help you record GALAXY-related parameters. The possible answers follow the question and are enclosed in parentheses. The default answer is shown in brackets, following the possible answers. To select the default answer, press RETURN in response to the question.

NOTE

The following procedure need only be performed on systems where one or more modules in the GALAXY system have been modified. The distributed versions of the GALAXY programs have DECnet facilities enabled. Note, however, that if you make one change to any GALGEN parameter, you must supply the answers to the entire GALGEN dialog, and you must follow the GALAXY generation procedures to produce the GALAXY system you desire.

In the following procedure, you must include the answers shown here, as well as any additional answers required by the installation:

GALGEN asks the following question:

Will you be running applications:(YES,NO) [NO] YES

GALGEN prompts:

Application name or carriage return to exit (1-20 characters):NCP

GALGEN then asks the following question:

Table name for NCP (1-6 characters): NCPTAB

GALGEN asks:

```
Internal ORION application (YES,NO) [NO]
```

Simply press RETURN in response to this question. NCP is not an internal application.

```
Application name or carriage return to exit (1-20 characters):
```

Include all applications required for the system, as listed in the TOPS-10 Software Installation Guide. Press RETURN when you have no other applications to enter, then proceed with the dialog until you see the following question:

```
Default network-type for FAL streams (ANF-10,DECnet) [ANF-10]
DECNET
```

Type DECNET in response to this question, if you want FAL (File Access Listener) streams to assume NFT transfers are from DECnet nodes, unless the FAL stream has been defined as an ANF-10 FAL stream. You can define each FAL stream using the OPR program.

Complete the monitor and GALAXY generation procedures as documented in the TOPS-10 Software Installation Guide. After the monitor is compiled and loaded, you can start the new monitor and GALAXY subsystem; or you can continue with the network generation procedures described in Chapters 2 through 5, and start the monitor, GALAXY, and network software at the same time.

CHAPTER 3

INSTALLING DN20 NODES

This chapter describes a procedure for creating software configuration files for the DN20 front end. This front end is not supported on KS processors. If your configuration does not include a DN20 front end for network communications, skip this chapter and continue with Chapter 4.

If your system includes any DN20 processors you must configure the software to run on those processors. The software can support DECnet-10 communications or DECnet and PSI communications. When you configure the DN20 software, you must specify the type of communications software to support. Before you begin the configuration procedure described below, review the information you must provide during the procedure using the Hardware Worksheets provided in Chapter 1. Figure 1-2 is provided for DECnet front end configuration information. Figure 1-3 is provided for PSI front end configuration information.

To configure communications software for the DN20, run the NETGEN program and specify the type of networking software (DN20/DECnet or PSI). Using NETGEN's START dialog, you can configure the files that are used by a supplied batch job to create image software for the DN20. The files created by NETGEN for both types of DN20 configurations are:

- NMLACC.MAC
- CETAB.MAC
- NETPAR.MAC
- node-name.CNF

3.1 STARTING NETGEN

To start the NETGEN program, type:

```
.RUN NETGEN
```

NETGEN responds with an identifying message and then prompts for the type of software to configure:

```
TOPS-10 Network Configurator for DN20 or X25 Version 4A(50)
Node type:
```

You must first specify the type of software to configure. To configure DN20/DECnet software, type "DN20." Procedures for configuring the DECnet front-end software continue in Section 3.2.

To configure PSI software, type "X25." Procedures for configuring PSI/X.25 software continue in Section 3.3. You can skip the procedures in Section 3.2.

Initially, you describe the networking parameters by responding to the START dialog. If there are existing configuration files and you want to modify the configuration information, you can RESTORE the files as described in Section 3.5.

If are not familiar with the parameters you must change, or the commands you use to change them, please see Appendix A. This appendix contains complete descriptions of all the NETGEN commands, parameters, and error messages, and describes methods for correcting the errors.

3.2 CONFIGURING MCB SOFTWARE

The following procedure allows you to specify characteristics of the DN20/DECnet software. For the procedure to specify characteristics of a PSI node, refer to Section 3.3.

The values used in these examples represent common values that allow the software to run efficiently. However, you might find that an adjustment of some parameters (for example, table sizes) can provide more efficient network operation. For complete information about the NETGEN parameters, commands, and error messages, refer to Appendix A.

The following steps assume that you are logged into the directory where you will build your MCB software and have restored the DECnet distribution tape into your disk area. The following examples use [100,200] as the PPN. Replace this PPN with your actual PPN when performing the procedures.

In the following examples, the START command activates the configuration dialog. The answers given in these examples are representative of typical parameter values, but your answers must reflect the actual hardware on your system.

The following examples illustrate the creation of an MCB node called NEWER. During your procedure, replace NEWER with your actual MCB node name.

```
.RUN NETGEN
```

NETGEN responds with an identifying message:

```
TOPS-10 Network Configurator for DN20 or X25 Version 4A(50)

Node type:  DN20

NETGEN>START

Node name:  NEWER
Node address:  12

Transmit password:
```

(The text you enter for transmit password IS echoed.)

```
What DTE port number is used for this DN20:  1
```

```
The total number of DMC11s and DMR11s must not exceed 6
How many DMC11 lines are on this DN20:  1
DMC-0 Cost:  3

How many DMR11 lines are on this DN20:  1

DMR-0 Duplex:  Full
DMR-0 Cost:  3

How many KDPs are on this DN20:  1

Number of DUP11 lines on this KDP:  2

KDP-0-0 Maximum Baud Rate:  19200
KDP-0-0 Cost:  3

KDP-0-1 Maximum Baud Rate:  2400
KDP-0-1 Cost:  4

[Configuration Saved On:  DSKB:NEWER.CNF[100,200]]
[Generating DSKB:NMLACC.MAC[100,200]] [OK]
[Generating DSKB:CETAB.MAC[100,200]] [OK]
[Generating DSKB:NETPAR.MAC[100,200]] [OK]

[Configuration complete]
 Type SAVE and FINISH after any additional changes
 Type EXIT to terminate NETGEN

NETGEN>
```

Check the current parameters for the MCB to be sure that the information is correct. If you make no changes to the information, you can EXIT from NETGEN, because the output files have already been saved.

You may optionally assign management account parameters to the DN20, thereby controlling access to the MCB software. These management parameters are not set automatically, and there are no defaults supplied with the configuration. If you build the MCB software without defining these parameters, any user will be allowed to access the MCB network management information, thus placing confidential network information in danger of being discovered by unauthorized users.

The network management parameters are not included when you RESTORE an existing MCB configuration file to modify its characteristics. If you RESTORE an existing MCB, you must define the management parameters again.

To define MCB network management parameters, type the following commands to NETGEN before you SAVE the configuration:

```
NETGEN>DEFINE EXECUTOR MANAGEMENT ACCOUNT acct-string
NETGEN>DEFINE EXECUTOR MANAGEMENT USER user-id
NETGEN>DEFINE EXECUTOR MANAGEMENT PASSWORD password
```

After you define these parameters, you use SAVE to save the configuration, and FINISHED to save the output files.

3.3 CONFIGURING PSI FRONT-END SOFTWARE

To configure PSI software, answer the 'Node Type:' prompt with X25. You can either use the dialog triggered by the START command, or you may enter your own list of commands. If you choose to combine the START dialogue and explicit commands, such as DEFINE or INCLUDE, use individual commands only after you have concluded the START dialog.

To accurately describe your configuration, you will need to enter parameters summarized in the PSI Hardware Worksheet (Figure 1-3). You can obtain defaults for some parameters by pressing RETURN. after you type the command.

The following example uses the START command to activate the configuration dialog.

```
.RUN NETGEN

TOPS-10 Network Configurator for DN20 or X25 Version 4A(50)
Node type:X25

NETGEN>START

Node name: DNX25
Node address: 120

Transmit Password:
```

(The text you enter for transmit password IS echoed.)

```
What DTE port number is used for this node:  1

The total number of DMC11s and DMR11s must not exceed 6
How many DMC11 lines are on this node:  0

How many DMR11 lines are on this node:  0

How many KDPs are on this node:  1

Number of DUP11 lines on this KDP:  2

KDP-0-0 Data link protocol type:  DDCMP-DMC
KDP-0-0 Maximum Baud Rate: 9600
KDP-0-0 Cost: 10

KDP-0-1 Data link protocol type:  LAPB
KDP-0-1 Maximum Baud Rate: 9600
KDP-0-1 DTE address:  311030300171
KDP-0-1 Channel range for this DTE:  20-1

X.25 Network name: TELENET

X.25 Destination name: X29SRV
Destination node: 6
Destination object: 34
Priority: 1
Call Mask: FF
Call Value: 01
Subaddresses:
```

```
X.25 Destination name: PSITST
Destination node: 6
Destination object: X25TST
Priority: Ø
Call Mask:
Subaddresses:

X.25 Destination name:

[Configuration Saved On:  DSK:DNX25.CNF[1ØØ,2ØØ]]
[Generating DSK:NMLACC.MAC[1ØØ,2ØØ]] [OK]
[Generating DSK:CETAB.MAC[1ØØ,2ØØ]] [OK]
[Generating DSK:NETPAR.MAC[1ØØ,2ØØ]] [OK]

[Configuration complete]
 Type SAVE and FINISH after any additional changes
 Type EXIT to terminate NETGEN

NETGEN>
```

If you respond that there are KDPs on your DN20, NETGEN immediately asks for information regarding the lines on the first KDP. To include a DECnet-10 line, specify DDCMP-DMC to the 'Data link protocol type:' prompt. LAPB, used for PSI/X25, is the default for that prompt.

To permit PSITST to run and to allow X.29 terminal access, you must specify the DESTINATION parameters, with the exception of the Destination Node parameter, which requires you to specify your own KL node number.

LCNs (Logical Channel Numbers) are used for outgoing calls in the order in which they are specified. Most PPSNs assign channels for incoming calls starting with the lowest value assigned to you and proceeding to higher values. To reduce the chance of an incoming and and outgoing call from simultaneously attempting to use the same channel, you should define your channel range in descending order.

3.3.1 Defining the X25-Server Access Password

You can define the access password for the X.25 server module using the NETGEN program. If you have previously created a PSI gateway image, including the access password, then RESTORE the image using the RESTORE command to NETGEN, the access password is not included in the restored image. Therefore, if you are reconfiguring an existing PSI node, you must use the DEFINE MODULE X25-SERVER ACCESS PASSWORD command to redefine the access password, then use SAVE and FINISHED to retain the changes.

To define the password that the users will be required to supply to access the X.25 gateway node, type DEFINE MODULE X25-SERVER ACCESS PASSWORD followed by the password itself.

NOTE

Remember that all parameters, including your password, must be typed in uppercase letters.

```
NETGEN>DEFINE MODULE X25-SERVER ACCESS PASSWORD password
```

Remember to use SAVE and FINISHED to save the configuration information.

3.3.2 Adjusting Executor Parameters

If your configuration contains a DMC/DMR with the DN20 processor, you must define the EXECUTOR MAXIMUM ADDRESS to 140 or less, and the EXECUTOR BUFFER SIZE to 290. Type the following commands:

```
NETGEN>DEFINE EXECUTOR MAXIMUM ADDRESS 140
NETGEN>DEFINE EXECUTOR BUFFER SIZE 290
```

If you have a network with less than 140 nodes, and your installation does not use a DMC/DMR device for a DECnet line, it is still recommended to define the EXECUTOR MAXIMUM ADDRESS to 140 and EXECUTOR BUFFER SIZE to 290 to achieve better performance. These parameters must have the same value on every node in the network (see Table A-1).

Remember to use SAVE and FINISHED to save the configuration information.

3.4 CHECKING NETGEN PARAMETER VALUES

Before saving the NETGEN parameters, you can check them using the LIST command. The following example shows the information displayed by LIST EXECUTOR CHARACTERISTICS for a DN20 node named NEWER (node number 12).

```
NETGEN>LIST EXECUTOR CHARACTERISTICS

          Executor Node = 12 (NEWER)
            Identification = DECnet-10 V3.0 Release
            Management Version = 3.0.0
            Loop Count = 1
            Loop Length = 127
            Loop With = Mixed
            Incoming Timer = 10
            Outgoing Timer = 60
            NSP Version = 3.2.0
            Maximum Links = 11
            Delay Factor = 2
            Delay Weight = 3
            Inactivity Timer = 30
            Retransmit Factor = 5
            Routing Version = 1.3.0
            Type = Routing
            Routing Timer = 60
            Maximum Address = 255
            Maximum Cost = 100
            Maximum Hops = 16
            Maximum Visits = 32
            Buffer Size = 576
            Transmit Password = DECNET20

NETGEN>
```

If you find any errors in the configuration described by the LIST command, you can modify the NETGEN parameters until you are satisfied that your own configuration has been accurately described. After making changes to the parameters, be sure to use both the SAVE and FINISHED commands to preserve the changes before you exit from NETGEN.

3.5 RECONFIGURING SOFTWARE

If the system already has DECnet and/or PSI software, there may be an existing configuration file for the DN2Ø. The configuration file is named node-name.CNF, where node-name is the name of the DN2Ø node. If you need to change any parameter values for the DN2Ø, you can restore the .CNF file with NETGEN to adjust parameter values.

NETGEN provides a RESTORE facility to simplify reconfiguration of an existing network node. The RESTORE command allows you to specify a .CNF file that you created earlier. (See Appendix A for information about the RESTORE command.)

You modify the configuration using INCLUDE, EXCLUDE, and DEFINE commands. Use INCLUDE and EXCLUDE to change hardware parameters and DEFINE to change software parameters. Then type SAVE to save the modified configuration file, and use the FINISHED command to generate the other NETGEN output files.

If you have set any Management Parameters (User, Account, Password), they are not restored when you use the RESTORE command. Whenever you restore a configuration, you must use the DEFINE command to set the management parameters, and the SAVE and FINISHED commands to retain them.

For PSI nodes, if you have set the X25-SERVER ACCESS PASSWORD, this parameter is not restored with the .CNF file. Therefore, if you restore a PSI configuration file, you must use the DEFINE command to define the X25-SERVER ACCESS PASSWORD, then use the SAVE and FINISHED commands to retain the password.

The following sequence adds a third DUP11 to the previous configuration, defines the network management parameters, and saves all the output files.

```
.R NETGEN
NETGEN>RESTORE NEWER.CNF
[Configuration Restored From: DSKB:NEWER.CNF[100,200]]
NETGEN>INCLUDE KDP Ø
Number of DUP11 lines on this KDP: 3
KDP-Ø-Ø Maximum Baud Rate: 19200
KDP-Ø-Ø Cost: 3
KDP-Ø-1 Maximum Baud Rate: 2400
KDP-Ø-1 Cost: 4
KDP-Ø-2 Maximum Baud Rate: 9600
KDP-Ø-2 Cost: 5

NETGEN>DEFINE EXECUTOR MANAGEMENT USER MAROTTA
NETGEN>DEFINE EXECUTOR MANAGEMENT ACCOUNT INSTALL
NETGEN>DEFINE EXECUTOR MANAGEMENT PASSWORD SECRET

NETGEN>SAVE
[Configuration Saved On:  DSKB:NEWER.CNF[100,200]
NETGEN>FINISHED
[Generating DSKB:NMLACC.MAC[100,200]
[Generating DSKB:CETAB.MAC[100,200]
[Generating DSKB:NETPAR.MAC[100,200]
NETGEN>EXIT

.
```

3.6 CREATING DN20 SOFTWARE

Before you create the front-end software, make sure the following procedures have been accomplished:

- Log in to the directory you created for storing MCB front-end software.
- Run NETGEN to create the files necessary for completing the procedure. You must have the following files:
  1. node-name.CNF, where node-name is the name of the DN20
  2. NMLACC.MAC
  3. CETAB.MAC
  4. NETPAR.MAC
- If the files created by NETGEN are stored in a sub-file directory (SFD), you must run the SETSRC program (described in the TOPS-10 User Utilities Manual). With SETSRC, enter the SFD followed by /SCAN, which allows the following procedures to access files in the SFD.
- For PSI installations at European sites, rename your RSX11S task file. The RSX11S.TSK file supplied on the DECnet-10 distribution tape is for a 60 Hertz timer and is equivalent to the RSX60H.TSK file on the TOPS-10 PSI distribution tape.

  To allow the timer in your DN20 to run at 50 Hertz, type:

  ```
  .COPY RSX11S.TSK=RSX50H.TSK
  ```

Submit the batch control file that is supplied on your distribution tape to the batch system. For DECnet installations, the batch control file is named MCBSYS.CTL. For PSI installations, the batch file is named MCBX25.CTL.

When you submit the batch job, remember to specify a time limit of at least 1/2 hour. The SUBMIT command for a DECnet DN20 is shown below:

```
.SUBMIT MCBSYS.CTL/TIME:30:00/NOTIFY:YES
```

For PSI installations, using the following command to submit the batch control file:

```
.SUBMIT MCBX25.CTL/TIME:30:00/NOTIFY:YES
```

The system displays a message like the following, where job-name is either MCBSYS or MCBX25:

[Batch job job-name queued, request #60, limit 00:30:00]

When the job has completed, the system displays the following type of message:

[From SYSTEM: Job job-name request #60 finished executing at hh:mm:ss]

The batch job does the following:

- Takes a checksum directory of all required files
- Assembles MACRO-11 source modules
- Creates TSKs and STBs (tasks and symbol tables)
- Builds the DN2Ø system image, nodename.SYS
- Deletes OBJ files

The PSI batch job, MCBX25, also deletes the file NMLACC.MAC. Examine the log file produced by the batch job for errors. You should first check the log to see if the batch job ended successfully. If there were errors in the .CTL file, you must go back and correct those errors.

A successful job produces the DN2Ø system image; an unsuccessful job creates no system image. If your log file contains error messages, assembly errors, or undefined global symbols, determine the cause of the error, correct it, and resubmit the batch control file.

You must check the batch log file for the size of the generated system image. If the system image is greater than 124K words, the configuration is too large to load into the DN2Ø. To determine the size of the system image, find the following lines in the batch log file:

> "The conjured system image is xxxK words. Considering buffers, yyyK words of memory will be required during execution."

If the value of yyy is greater than 124, your system image is too large.

You can adjust the size of the configuration. To change the system image size, you run NETGEN, restore the .CNF file, and reduce the complexity of your DN2Ø configuration. The procedure for restoring a configuration file is described in Section 3.5. You must change the parameters to omit a device or adjust the size of the buffers. (Refer to Section A.3 for more information on DN2Ø buffer sizes.)

After changing parameters, you must use the DEFINE command to define any management access parameters. These parameters are not restored with the RESTORE command. After you have made all parameter changes needed, use the SAVE and FINISHED commands to save the new configuration file.

If the DN2Ø is configured for PSI networking, the X25-SERVER ACCESS PASSWORD is not restored with the .CNF file. Like the MCB management account parameters, if you restore a PSI configuration you must DEFINE the X25-SERVER ACCESS PASSWORD and use SAVE and FINISHED to retain the definition.

After adjusting parameters, submit the batch control file once again. You must repeat this procedure until the batch job finishes successfully and the value of the yyy in the message above is less than 124K words.

After the control file is successfully processed, your directory contains a file named node-name.SYS, where node-name is the name of the DN2Ø. Put the node-name.SYS file on SYS: using the COPY command. If the DN2Ø node is named NEWER, the following command is used to copy the file to SYS:.

```
.COPY SYS:=NEWER.SYS
```

You must repeat Sections 3.1 through 3.4 for each DN2Ø in your configuration, and you must repeat the procedure whenever you add a DN2Ø to the network configuration or change a DN2Ø configuration.

CHAPTER 4

CONFIGURING NETWORK NODES

Now you can configure the network for your host system. If your system includes any DN2Ø nodes for DECnet or PSI front-ends, you must configure these nodes according to the procedures in Chapter 3.

Before you can load the nodes and test their connectivity, you must create the command and control files used in the loading and testing procedures. The NIPGEN program creates these files.

The NIPGEN program is described in the following sections. Remember, the PPN used in these examples is [1ØØ,2ØØ], and the node name is NEWER. Replace these with your own PPN and node name.

4.1 RUNNING NIPGEN

The NIPGEN program allows you to describe network configuration information for the following types of nodes:

- Host nodes
- Adjacent nodes
- Remote nodes
- File transfer test nodes

The NIPGEN program provides a list of the valid answers to each question in the dialog when you type "?" in response to the question. Use the worksheets in Chapter 2 to record the exact hardware characteristics of your site before starting the program.

You can exit from NIPGEN by pressing RETURN when NIPGEN asks for a node name to configure. You can halt NIPGEN without creating output files by pressing <CTRL/C> at any time during the dialog.

If you encounter any errors in running NIPGEN, refer to Section 4.3 for error descriptions and recovery procedures.

4.1.1 Describing the Host Node

When you run NIPGEN, it first asks you to enter information about the host system. For example, to specify the KL system NEWER, with node address 12, use the following commands:

```
.RUN NIPGEN
NIPGEN for DECNET Version 4.Ø

Host node definition section.

Host name: NEWER
NEWER's node address: 12
NEWER's CPU type(KL1Ø): KL
```

The host node name and address must be identical to the node name you specified in the NETGEN portion of the MONGEN dialog. If you press RETURN to the request for CPU type, NIPGEN assumes you are configuring the network for a KL system.

The NIPGEN dialog requires node addresses for each node. The node address you specify must be unique, and cannot conflict with any previously assigned node address.

4.1.2 Describing Adjacent Nodes

Next, you must describe the nodes that are adjacent to the host system in the network configuration. This must include any MCBs in the KL configuration. The following example describes the adjacent nodes for NEWER, which are:

- MCBØ, a DN2Ø running MCB
- NEXUS, a KL on the Ethernet

The NIPGEN dialog requires a circuit name for each adjacent node. You can choose any of the circuit names listed by "?" that are appropriate to your hardware configuration. The following is a list of the valid circuit types for adjacent nodes:

For KL systems,

- DTE-n-m for MCB nodes

  where n = the CPU number and m = the DTE number on the CPU.

- ETH-Ø for Ethernet nodes

For KS systems,

- KDP-Ø-Ø
- KDP-Ø-1

```
For node NEWER
Adjacent node definition section.
(Type an extra CR when through)

Adjacent node name: MCBØ
   MCBØ's node address: 2Ø
   NEWER's circuit to MCBØ: DTE-Ø-1
```

You can specify the network management user-id, account, and password for the DN2Ø. If you included these parameters in the NETGEN dialog (described in Chapter 3), you must also include the same parameters in the NIPGEN dialog.

If you omit the network management parameters, there are no default settings and any user will be allowed access to the network management information on that DN2Ø. It is recommended that you specify the network management information to prevent unauthorized access to the DN2Ø node, for example:

```
Network management's user-id: MAROTTA
Network management's account: DEC1Ø
Network management's password: SECRET
```

After allowing you to specify network management parameters, NIPGEN repeats the "Adjacent node name" question. The node NEXUS is specified on an Ethernet network connection in the following example:

```
Adjacent node name: NEXUS
   NEXUS's node address: 25
   NEWER's circuit to NEXUS: ETH-Ø
```

When you have finished listing the nodes adjacent to the host node, press RETURN to the "Adjacent node name" question. NIPGEN continues by asking questions about nodes connected to the DN2Ø node.

4.1.3 Describing MCB Configurations (KL/DN2Ø only)

If you have included any MCB node types in the Adjacent Nodes section, NIPGEN now asks for MCB configuration information. If you did not include an MCB in the Nodes section, NIPGEN proceeds to the Remote Node definition section, described in Section 4.1.4.

You can describe the network environment for each DN2Ø that you included in the DN2Ø Nodes section, as illustrated in the following example. NIPGEN allows you to describe nodes immediately adjacent to the DN2Ø.

For each node adjacent to the DN2Ø, you must specify the name of the circuit on the DN2Ø that is connected to the adjacent node. You can see all the possible circuit names by typing "?" to the circuit question. The following types of circuit names are allowed:

- DMC-n (where n is in the range of Ø-3)
- DMR-n (where n is in the range Ø-3)
- KDP-n-m (where n is Ø or 1, and m is in the range Ø-3)

The following questions are asked for each DN2Ø that you have configured. This example illustrates the procedure for including two nodes (FLORA and FAUNA) adjacent to the DN2Ø:

```
For MCB MCBØ:
Adjacent node definition section.
(Type an extra CR when through)

Adjacent node name: FLORA
   FLORA's node address: 7
   MCBØ's circuit to FLORA: DMC-Ø

Adjacent node name: FAUNA
   FAUNA's node address: 8
   MCBØ's circuit to FAUNA: KDP-Ø-Ø

Adjacent node name:
```

To end the list of nodes adjacent to the DN2Ø, press RETURN to the "Adjacent node name" question.

If there are any more DN2Ø/MCBs, NIPGEN repeats the Adjacent Nodes questions for each DN2Ø/MCB. When there are no more DN2Ø/MCBs, NIPGEN proceeds to the Remote Node definition section.

4.1.4 Describing Remote Nodes

After you describe adjacent nodes, you must describe the remote nodes in the network configuration. List each remote node and its unique address in this section, and press RETURN to the Remote node name question when you are finished.

This example describes three remote nodes, LARRY, CURLY, and MOE.

```
Remote node definition section.
(Type an extra CR when through)
Remote node name: LARRY
   LARRY's node address: 3Ø

Remote node name: CURLY
   CURLY's node address: 31

Remote node name: MOE
   MOE's node address: 32

Remote node name:
```

When you press RETURN to the node name question, NIPGEN proceeds to the File Transfer Test section.

4.1.5 Describing Nodes for File Transfer Tests

The installation and verification process may include tests of the file transfer software. For these tests, NIPGEN requires the user-id, account, and password of a valid account on each system. NIPGEN repeats the following question for each adjacent and remote node that you specified (except MCBs):

```
File Transfer test section.

Test file transfers to NEXUS? YES
   File transfer user-id: MMAROTTA
   File transfer account:
   File transfer password:  (does not echo)

Test file transfers to FLORA? NO
Test file transfers to FAUNA? NO

Test file transfers to LARRY? YES
   File transfer user-id: MMAROTTA
   File transfer account:
   File transfer password:  (does not echo)

Test file transfers to CURLY? NO

Test file transfers to MOE? NO

[Generating DSKC:NCP.CMD[100,200]]
[Generating DSKC:NIPTST.CTL[100,200]]
[Generating DSKC:NIPNFT.CTL[100,200]]

.
```

NIPGEN returns your job to the monitor automatically, and creates the listed files in your directory. These files are used in the installation and verification procedures that are described in Chapter 6.

If you encounter any errors in the process of using NIPGEN, refer to Section 4.3 for a description of the problem and how to recover from the error.

4.2 NIPGEN COMMAND AND CONTROL FILES

NIPGEN creates the following command and control files, which are used to verify and load the configured nodes and to test connectivity to specified remote nodes:

```
NCP.CMD
NIPTST.CTL
NIPNFT.CTL
```

Each file is described in the following subsections.

4.2.1 NCP.CMD

NCP.CMD is a command file that is read by the OPR program to:

- Define the node names and addresses of all of the nodes.
- Define the databases for DN2Ø nodes.

The NCP.CMD file must be stored in SYS: for the commands in the file to function properly.

4.2.2 NIPTST.CTL

NIPTST.CTL is a control file created to:

- Examine the host node.
- Verify the connectivity between the host and adjacent nodes, including MCBs, if applicable.
- Verify the connectivity between MCBs and adjacent nodes, if any.

4.2.3 NIPNFT.CTL

NIPNFT.CTL is a control file that contains commands to NFT to transfer files between adjacent nodes.

4.3 NIPGEN ERROR MESSAGES

In the process of running NIPGEN, you may receive the error messages listed below. The messages are listed here in alphabetical order, with suggestions for ways to correct the error. The following are warning messages that indicate a possible error condition and allow you to correct the error.

? NIPGEN Ambiguous switch or keyword: "x"

You did not type enough of the command to distinguish it from other similar commands. You must type more letters to uniquely identify the command. To display a list of valid commands or arguments, type a question mark (?).

? NIPGEN File "filename" close error - Error description

An error was encountered closing your file. A description of the error is displayed after the error message.

? NIPGEN File "filename" open error - Error description

An error was encountered opening your file. A description of the error is displayed after the error message.

? NIPGEN File "filename" output error - Error description

An error was encountered while information was being written to a file. A description of the specific error is displayed after the error message.

? NIPGEN Invalid character in number: "c"

You have used special characters that NIPGEN does not accept. Node numbers must be 1 to 1023.

? NIPGEN Invalid node address: "node number"

The node address you have specified is incorrect. The address must be a unique number in the network ranging from 1 to 1023.

? NIPGEN Invalid node area: "node area"

The node area you have specified is incorrect. The area must be in the range 1 to 63.

? NIPGEN Invalid node name: "node name"

A node name can contain 1 to 6 alphabetic and numeric characters only. Special characters are not allowed. The node name must be a unique name in the network.

? NIPGEN Invalid number of KDPs: "n"

The number of the KDP controller you have specified on a DECSYSTEM-2020 is outside the valid range of 0 to 2.

? NIPGEN Invalid number of MCBs: "n"

The number of MCBs you have specified for your DECsystem-1090/1091/1095 is outside the valid range of 0 to 9.

? NIPGEN Invalid number of synchronous lines: "n"

The number of synchronous lines you have specified for your MCB is outside the range of 0 to 16.

? NIPGEN Node name may not exceed 6 characters: "x"

The node name you specify must contain 1 to 6 alphanumeric characters. Special characters are not permitted.

? NIPGEN Not confirmed: "x"

A carriage return was expected instead of "x".

? NIPGEN unrecognized switch or keyword: "x"

You have not specified a unique keyword. Use NIPGEN's recognition feature or the question mark (?) to display valid command arguments.

CHAPTER 5

GENERATING PSI INITIALIZATION FILES

If you are not installing PSI software, skip this chapter and start the verification procedures described in Chapter 6.

However, if you are installing PSI (X.25) network software, you must use the COMGEN program to create the command files required to load and start network software and test packages. Procedures for running the COMGEN program are described in this chapter.

For PSI installations, the COMGEN program creates command files to initiate network activity. The COMGEN program requires the following files:

1. X25CNF.BNF, a template file that you must edit to include parameters for the specific installation. This file is described in Section 5.1.

2. X25NM.BNF

3. PSITST.BNF

4. X29SRV.BNF

These files are distributed with the PSI software and restored to disk as described in Chapter 2.

To create the initialization files, you must first edit the X25CNF.BNF file to contain information about the PSI gateway, then run the COMGEN program.

5.1 EDITING THE X25CNF.BNF FILE

To set up your system to bring TOPS-10 PSI up automatically, you must edit the X25CNF.BNF file provided on your TOPS-10 PSI tape. X25CNF.BNF contains parameters required to build the command and control files listed above.

The X25CNF.BNF file is in the following format:

```
<DN20 NODE NAME> ::= DN20-node-name |
<DTE ADDRESS> ::= DTE-address |
<NETWORK NAME> ::= name-of-PPSN |
<GATEWAY PASSWORD> ::= PPSN-access-password |
```

You must supply values for the items to the right of the sign ::=. Each line is terminated by the sequence:

```
<Space><Vertical Bar><RETURN>
```

The values to supply are described in the following table:

Item	Meaning
DN20-node-name	DECnet node name of the DN20 supporting X.25; for example, DNX25.
DTE-address	X.25 DTE address of the line to the PPSN; for example, 311030300171.
name-of-PPSN	Name of PPSN to which you connect; for example, TELENET.
PPSN-access-password	Default password used to access the gateway; for example, SECRET.

CAUTION

The PPSN-access-password must be identical to the password you supplied to the NETGEN program in Chapter 4 (refer to the DEFINE X25-SERVER ACCESS information in Section A.5). If the NETGEN and COMGEN programs do not have the same password, PSI verification will fail. After the software is installed successully, you may remove references to the access password in the X25CNF.BNF file.

Remember that all installation parameters, including your password, must be typed in UPPERCASE LETTERS.

When you submit the COMGEN control file, the COMGEN program executes three times to produce the files listed below.

- X25NM.CMD is an OPR command file to set up X.25 network management. You can append this file to NCP.CMD to simplify network startup and file maintenance.
- PSITST.INI is a command script to test X.25 network functions.
- X29SRV.INI is a command script to test X.29 network implementations.

5.2 RUNNING COMGEN

Submit the COMGEN.CTL file using the following command. The COMGEN batch job processes the .BNF files to build the necessary files for testing your X.25 node.

```
.SUBMIT COMGEN.CTL/TIME:30:00/NOTIFY/OUTPUT:LOG

[Batch job COMGEN queued, request #66, limit 00:30:00]
```

When the job has completed, the system displays a message in the form:

[From SYSTEM: Job COMGEN request #66 finished executing at hh:mm:ss]

Examine the COMGEN.LOG file produced by the batch job for fatal errors.

A successful job produces the necessary PSI files described earlier. If your log file contains assembly errors, determine the cause of the error, correct it, and submit the COMGEN.CTL file again.

CHAPTER 6

STARTING AND VERIFYING NETWORK SOFTWARE

This chapter describes the procedures for creating system initialization files to automatically load network software. The procedure for starting the system and verifying network connections is followed by instructions for troubleshooting network software.

6.1 PREPARING SYSTEM FILES

To start network software automatically, the new network initialization files must be placed in the appropriate system areas and certain changes must be made to system startup files. The following procedure assumes that the OPR program is used to start GALAXY and network activity by executing the SYSTEM.CMD file. Check the startup procedures on the TOPS-10 system and make the appropriate changes to the system startup files.

First, copy the NCP.CMD command file created by NIPGEN from your directory to SYS:. If a previous version of NCP.CMD exists in SYS:, you must append your changes to the previous file.

For PSI installations, you may append the file X25NM.CMD to the NCP.CMD file to simplify the initialization procedure. Use the following command to append X25NM.CMD to NCP.CMD:

```
.COPY NCP.CMD=NCP.CMD,X25NM.CMD
```

If there is no existing NCP.CMD file in SYS:, use the following command to copy the new NCP.CMD to SYS:.

```
.COPY SYS:=NCP.CMD
```

To bring the network up automatically when the system starts up, you must edit the system files SYSJOB.INI and SYSTEM.CMD.

SYSJOB.INI is read by the INITIA program at system startup, so it is often used to start detached system processes. To start DECnet processes, SYSJOB.INI must include the following commands to start the DECnet management process:

```
LOG
NML
```

To start the FAL program, the OPR.ATO file must include the following commands:

```
:SLOG
:DEF FAL=
FAL-R FAL
```

To start PSI processes, the SYSJOB.INI file must also contain the following commands:

```
LOG
X29SRV
LOG
PSITSB
```

The SYSTEM.CMD file is automatically read and executed by the OPR program at system startup. The following commands must be in the SYSTEM.CMD file to include DECnet:

```
TAKE SYS:NCP.CMD
SET FAL-STREAM n NETWORK-TYPE DECNET
START FAL-STREAM n
```

You must include one START command line for each FAL stream that will run. The value of n is the number of the FAL stream, where you may run FAL streams for each File Access Listener to run on the system simultaneously.

For the PSI initialization procedure, if the file X25NM.CMD was not appended to NCP.CMD, the SYSTEM.CMD file must also include the following command line:

```
TAKE SYS:X25NM.CMD
```

For PSI installation, use the PIP utility and the indirect command file GENCPY.CCL to move files created in previous steps to SYS:. Type the following commands to execute GENCPY:

```
.R PIP
*GENCPY@
*<CTRL/Z>
.
```

Verify that the following files have been copied to SYS: using the DIRECT command:

```
.DIRECT SYS:

SYSTEM.CMD
NCP.CMD
X29SRV.INI
SYSJOB.INI
```

See the TOPS-10 DECnet and PSI System Manager's and Operator's Guide for downline-loading procedures and the commands to place in the SYSJOB.INI and SYSTEM.CMD files to accomplish this operation automatically.

6.2 STARTING NETWORK SOFTWARE

To load network software, you must shut down the system and reload it with the latest versions of the monitor, GALAXY, and DECnet software. See the TOPS-10 Software Installation Guide for complete information about this procedure.

To reboot the system in an orderly fashion, do the following:

- Inform system users that timesharing will end in a specified time.
- Halt the DN2Ø.
- Shut down the system.
- Reboot from disk.
- Log in.

6.3 VERIFYING NETWORK SOFTWARE

Once the TOPS-1Ø monitor is up and running, and you have been able to log in as usual, verify that the network has been started by using the NETWORK command. It may take several minutes to load DN2Ø nodes and for the network to initialize. If your new monitor does not come up, you can try to reboot a second time. If it still fails to come up, revert to the previous monitor, using the procedures described in the TOPS-1Ø Software Installation Guide. Then check your TOPS-1Ø installation procedure to be sure your new monitor has been installed correctly.

Check to see if DN2Ø nodes were downline loaded. You can check a node data base using the following NCP command:

```
NCP>SHOW NODE node-name CHARACTERISTICS
```

If the NCP command displays information about the DN2Ø, the node database is set up. If the node is not running and the node data base is set up, you can initiate the operation using the following commands to OPR:

```
.R OPR
OPR>ENTER NCP
NCP>LOAD NODE nodename
```

If the SHOW NODE command to NCP fails, then you have to initialize the network database. To set up the database, type the following NCP command:

```
OPR>TAKE SYS:NCP.CMD
```

If no errors occurred and the loading process is successful, you can begin the verification procedures.

6.4 TROUBLESHOOTING NETWORK SOFTWARE

If the TOPS-1Ø 7.Ø3 monitor is up and running, but your network has failed to come up, you can try to start the network manually. To do this, use OPR to define your network nodes and load the DN2Ø nodes.

Run the OPR program and then issue the TAKE SYS:NCP command. This causes the commands in the NCP.CMD command file to be executed, defining the network topology and describing all information required to load DN2Ø nodes.

After you issue this command to NCP, ensure that the load is successful. Use the NCP SHOW command to display information for the node you just loaded. If the load is not successful, determine the cause of the failure, correct it, and perform this procedure again.

CHK11 is a module that resides in the DN2Ø. It starts when the DN2Ø is loaded and displays messages concerning available memory, the number and status of devices, and any detected errors. If you have difficulty bringing up the front end, use CHK11 output to determine your errors. Immediately before typing the NCP LOAD NODE command, type the following at another terminal:

```
.R DTELDR
*/TALK:nn
```

where nn are the two digits used to identify the DTE number. For example, for DTE-Ø-1, you would use "Ø1" for "nn".

You can also use SPEAR to look at CHK11 output from a previous load. NML logs the CHK11 output to SYS:ERROR.SYS.

If the DN2Ø fails to come up, you must revert to the previous versions of the monitor and network software. Refer to Chapter 2 to review your installation procedure for an error. Check the log file from the generation procedure in Section 3.4 for possible errors, and to make sure the system-image size is less than 124K words. For DECnet installation, this batch log file is MCBSYS.LOG. For PSI installation, the batch log file is called MCBX25.LOG.

6.5 VERIFYING THE NETWORK

Log into your account and set your path to the build directory. Type the NETWORK command to see if the new DN2Ø nodes are reported in the display. For example:

```
.NETWORK

[ANF1Ø network: connected to KL1Ø26(26), located at NOVA(31), 1Ø nodes]
Node            CHERRY     (1)     TAPE12 Load/Sirus System     Ø9-12-85
Node            JUBLEE     (2)     DN87S V23(21Ø)               9-JAN-84
Node            KL1Ø26     (26)    RL24ØA DEC1Ø Development     1Ø-22-85
Node            NOVA       (31)    DN87S V24(226)               12-Mar-85
Node            DWARF      (33)    DN2Ø V24(227)                3-SEP-85
Node            JINX       (34)    DN2Ø V24(225)                12-FEB-85
Node            COMET      (7Ø)    DN2ØØ V24(226)               12-Mar-85
Node            MREAST     (71)    Mister East  KS7Ø2/46F       Ø7-31-85
Node            TWINKY     (77)    Hostess Twinky KL7Ø3/54A     1Ø-Ø2-85
Node            BACALL     (121)   DN2Ø V22E/7ØB
[DECnet network: local node KL1Ø26, 48 reachable nodes in area 7]
BRONCO          BRUNO      CAEWK2  CAEWK3  CAEWK4  CAEWK5  CAEWK6  CAEWK7
CURIE           CURIUM     DAR     DARTS   DCHPS   DCSVAX  DEMILO  DESADE
EINSTN          ELI        ELIGUS  EMILY   EPOCH   ESGPRT  FASTER  FERMI
IONIAN          IRAO       IROBOT  ISAVAX  ISHTAR  JACKSO  JAWS    JBOAT
MASTER          MATE       MATISE  MAX     MCAD    MDR228  MDR268  MDR292
MRSVAX          MRTEIS     MURRAY  MUSEUM  NIMBUS  NOBEL   NU      NYHPS
```

Note that you can use the /DECNET switch with the NETWORK command to display only DECnet nodes.

Verify the success of the loading procedures by running OPR and issuing the NCP command SHOW NODE. For example, display the network information for the node named DEMILO:

```
.R OPR
OPR>ENTER NCP
NCP>SHOW NODE DEMILO CHARACTERISTICS

12:30:29 NCP
Request   45; Show Node Summary Completed
Remote Node = 6.131 (DEMILO)
Circuit = ETH-0
Next Node = 7.93 (MONTY)
NCP>
```

If the DN20 nodes are listed by NETWORK and in the SHOW NODE output, the automatic system startup procedures are correct. If the DN20 is not listed in these displays, review the system files described in Section 6.1 and correct the errors.

6.6 TESTING NETWORK CONNECTIONS

The batch job NIPTST is supplied to display network characteristics and to test network connections through the DN20. This batch job is useful for both DECnet and PSI installations.

Use the NIPTST.CTL batch control file created by NIPGEN to perform the following operations:

- Display the node characteristics of the host system.
- Display the node characteristics of adjacent nodes.
- Perform LOOP tests to adjacent nodes.

To submit the NIPTST.CTL file to the batch system, type the following command:

```
.SUBMIT NIPTST.CTL/NOTIFY:YES/OUTPUT:LOG/TIME:30:00
[Batch job NIPTST queued, request #98, limit 00:30:00]
```

You will receive notification when the job is done. When the job is finished, the log file is printed automatically. Check the log file for fatal errors and correct the cause of any errors.

If an error indicates a timeout condition, you can adjust the time interval allowed for testing each circuit. The normal time limit for this job is 10 minutes per circuit tested. You can adjust the time interval for the WAIT command in the batch control file, to modify installation test timing.

Carefully check the batch job log file for errors. If you find no errors, continue with your installation; otherwise, find the cause of the errors, correct them, and resubmit the batch job.

6.7 TESTING FILE TRANSFER

If you included file transfer testing in the NIPGEN program (described in Chapter 4), use the NIPNFT.CTL batch control file created by NIPGEN to test file transfer between the host processor and nodes in the network that support NFT (Network File Transfer). NIPNFT.CTL copies an ASCII file from one DECnet host node to another and back again, and compares the output file with the input file.

Submit the NIPNFT.CTL file to the batch system by typing the following command:

```
.SUBMIT NIPNFT.CTL/NOTIFY:YES/OUTPUT:LOG/TIME:20:00
[Batch job NIPNFT queued, request #99, limit 0:20:00]
```

You will be notified when the batch job has completed. Check the log file generated by the batch job, examine the file for errors, and verify that file transfers have completed successfully. The output of the batch job will be in NIPNFT.LOG.

6.8 VERIFYING PSI CONNECTIONS

If you are installing PSI, verify the PSI connections after you make sure the DECnet part of your installation is working. If you are not installing PSI, you can skip this section and proceed to Section 6.10 to complete the installation procedures.

To test and verify PSI connections, you can:

- Perform a hardware loop test.
- Test X.25 capabilities.
- Call up your local PAD.
- Connect to the (X.25) gateway.
- Log in on the system through the PPSN (X.29 implementation).

6.8.1 Performing the X.25 Loop Test

To perform a loop test, use the NCP commands SET LINE and LOOP LINE. Use the following commands to start the LOOP test. This example tests KDP-0-0.

```
.R OPR
OPR>ENT NCP
NCP>SET EXECUTOR NODE nodename
NCP>SET LINE KDP-0-0 STATE OFF
```

After you type these commands, disconnect the modem and attach a loopback connector to the KDP line. Then type the following commands:

```
NCP>SET LINE KDP-0-0 CLOCK INTERNAL
NCP>SET LINE KDP-0-0 SERVICE ENABLED
NCP>SET LINE KDP-0-0 STATE ON
NCP>LOOP LINE KDP-0-0 COUNT m WITH MIXED LENGTH n
NCP>SET LINE KDP-0-0 STATE OFF
```

The LOOP LINE command contains three variables: the line-id (KDP-Ø-Ø) is the same line-id used in previous commands. The COUNT value (m) specifies the number of times the test data is to be returned; the value of LENGTH (n) specifies the length of the test data, in bytes.

When performing the LOOP LINE command, do not use a COUNT greater than 1ØØØ or a LENGTH greater than 127. Failure to observe this restriction can cause the loop test to take longer than the 3 minute timeout period.

If in response to the LOOP command you receive one of the following messages, you must reload the DN2Ø before the DN2Ø will respond to network management commands:

```
Loop Line Failed, Operation failure

Timed out waiting for response
```

You will receive these messages if the loop line test takes longer than 3 minutes, or if the line is not functioning properly.

When the test is successfully completed, remove the loopback connector and reconnect the line to the modem. Type the following commands to turn the line on:

```
NCP>SET LINE KDP-Ø-Ø CLOCK EXTERNAL
NCP>SET LINE KDP-Ø-Ø SERVICE DISABLED
NCP>SET LINE KDP-Ø-Ø STATE ON
```

The KDP line will not start if the modem has not been connected to the line. If the KDP line does not start, connect the modem, turn the line off, then turn it back on, using the following commands to NCP:

```
NCP>SET LINE KDP-Ø-Ø STATE OFF
NCP>SET LINE KDP-Ø-Ø STATE ON
```

6.8.2 Testing X.25 Connectivity

Run the PSITST program to test the connection from your host to the X.25 PPSN you have chosen. For a complete description of the PSITST program, see Appendix B. PSITST tests the commands in PSITST.INI, and exits automatically when the test is completed.

To activate PSITST, type:

```
.R PSITST
```

The following is an example of a successful PSITST execution. After you run PSITST, it is important to check the log file for errors. The log file entries are described in Appendix B.

Example:

```
.R PSITST
KL1Ø1Ø, RC7Ø3 7.Ø3  System, TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(7)  (Normal Environment)
Monday, October 15, 1985  Ø9:21:Ø9AM


  Port # Ø;  Status

    Network = TELENET
    Object Identification = X25TST
    Port State = Running
    Error State Detail = None

    Last Port Request = Accept Incoming Call
    Last Request Error = None
    Network Data = None
    Network Interrupt = None

  Port # 1;  Status

    Network = TELENET
    Port State = Running
    Error State Detail = None
    Last Port Request = Read Accept Data
    Last Request Error = No Data To Read
    Network Data = None
    Network Interrupt = None


  Port # Ø;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal
    Received Normal Data Packet = 38 bytes
      1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 12Ø 121 122 123 124     |KLMNOPQRST|
      125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63     |UVWXYZØ123|
      Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12              |456789..  |
    Last Data Reception Error = No Data To Read

  Port # 1;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal
    Transmitted Normal Data = 38 bytes
      1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 12Ø 121 122 123 124     |KLMNOPQRST|
      125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63     |UVWXYZØ123|
      Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12              |456789..  |


  Port # Ø;  Counters

    Wait For Incoming Calls = 1
    Incoming Calls Accepted = 1
    Received Normal Data Packets = 25
    Received Normal Data Bytes = 95Ø
```

```
  Port # 1;  Counters

    Call Requests = 1
    Transmitted Normal Data Packets = 25
    Transmitted Normal Data Bytes = 950

  Port # 1;  Status

    Network = TELENET
    Port State = Running
    Error State Detail = None
    Last Port Request = Read Port Status
    Last Request Error = None
    Network Data = None
    Network Interrupt = None


  Port # 1;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Transmitted Reset Diagnostic = 377 (255)
    Data Transmission = Normal
    Transmitted Interrupt Byte = 377 (255)
    Transmitted Normal Data = 38 bytes
      101 102 103 104 105 106 107 110 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124     |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063     |UVWXYZ0123|
      064 065 066 067 070 071 015 012             |456789..  |

Initialization Completed
EXIT

.
```

PSITST collects status information in the log file PSITST.LOG[1,2] for your inspection. Use the TYPE command to display the contents of this file.

```
.TYPE PSITST.LOG[1,2]
```

If no errors occurred as you ran the loopback test and PSITST, your node is connected to the PPSN.

If you encounter errors connecting to the PPSN, check the status of the X.25 line by running OPR and typing the following commands. (See the TOPS-10 DECnet and PSI System Manager's and Operator's Guide for additional information.)

```
OPR>ENTER NCP
NCP>TELL nodename SHOW KNOWN LINE STATUS
```

If the state of your X.25 line is on, but the substate is synchronizing or starting, the line to the PPSN is not functioning properly. Return to Section 6.8.1 and perform the loop test again. If the loop test completes successfully, there may be a problem with the leased line to your PPSN. Consult your PPSN representative for further assistance. If the loop test fails, you may have a faulty KDP; therefore, you should consult your field service representative.

If the X.25 line is on, but no substate is displayed, check the values for DTE address, default data size, default window size, and channel range. If you are unsure of the correct values, consult your PPSN representative to determine the correct values.

6.9 VERIFYING X.29 CONNECTIONS

The TOPS-10 X.29 software, X29SRV, enables you to connect your terminal, through a PPSN, to a TOPS-10 host. To make this connection, you must:

- Make a physical connection between your facility and the PPSN PAD.
- Create a virtual circuit that connects your terminal to X29SRV through the X.25 gateway node.
- Connect your terminal to the TOPS-10 host.

6.9.1 Calling the Local Pad (TELENET)

You need telephone access to a local PAD (Packet Assembler/Disassembler). Go to a dial-in terminal and call the PAD (get the number from your System or Network Manager).

If you are using an acoustic coupler, when you hear a high-pitched tone, place the telephone handset in the acoustic coupler. If you are using a dataset, change the DATA/TALK switch to DATA and place the handset in the telephone cradle.

Examples in the following steps use TELENET as the local pad.

Press the RETURN key twice to see the PPSN herald. TELENET responds with a message, such as:

```
TELENET
000 18C
```

TELENET then prompts you to identify your terminal model:

```
TERMINAL=
```

If your terminal is type VTxxx, enter:

```
D1
```

Otherwise, enter:

```
A8
```

Or, press the RETURN key.

6.9.2 Signing on to the Network Gateway

Enter the appropriate information to sign on to your gateway (see your System or Network Manager for specifics):

```
.C 311171D

311 171D CONNECTED

Digital Equipment Corporation, TOPS-10 PSI Gateway X.29 Server
Friday, July 15, 1985 03:39:03 V1.0(0) #110 (00)

X29SRV>
```

If you do not receive the connect message from the PPSN, the connection has failed. The connection could fail for one of the following reasons:

- The X.25 module database is incorrect. Use the following commands to verify that the destination node is specified correctly:

  ```
  NCP>SET EXEC NODE node-name
  NCP>SHOW MODULE X25-SERVER CHARACTERISTIC KNOWN DESTINATION
  ```

  If necessary, run NETGEN again, as described in Chapter 3, to adjust the faulty parameters.

- X29SRV is not running properly. Check your CTY listing for errors. (See the TOPS-10 DECnet and PSI System Manager's and Operator's Guide for a complete description of X29SRV configuration commands, and for a list of X29SRV error messages).

6.9.3 Connecting to the TOPS-10 Host System

In response to the X29SRV prompt, type the CONNECT command, followed by the node name of the TOPS-10 system. (See the TOPS-10 PSI User's Guide for a complete description of X29SRV user commands.) When you see the TOPS-10 monitor prompt, type the command TTY NO ECHO. Then log in as usual.

```
X29SRV>CONN KL1010

RL222B   DEC10 System   15:40:34 TTY 66 System 1010/1020
Connected to Node KL1010 Line  #66
Please LOGIN or ATTACH

.TTY NO ECHO
.LOGIN
```

After you type the node name, the system banner appears. If you do not see the banner, verify that the requested node is in operation and DECnet-10 is installed properly. If the node and DECnet are running, the node may have depleted DECnet or system resources. Try again later.

6.9.4 Disconnecting from the TOPS-10 System

To disconnect from the TOPS-10 system, type the following command:

```
.KJOB
Job 36 User MRT [100,200]
Logged-off TTY44 at 15:17:18 pm 15-Jul-85
Runtime: 0:00:01. KCS:23, connect time:0:03:24
```

Press the BREAK key to return to the gateway. The TOPS-10 X.29 software responds with BREAK and returns the X29SRV prompt.

```
<BREAK>
BREAK
X29SRV>
```

Type the CLEAR command to disconnect from X29SRV.

```
X29SRV>CLEAR

DISCONNECTING.........
B17 22 DISCONNECTED   00 00 00:00:01:17 30 25
```

After you receive the disconnect message, hang up your telephone.

6.10 COMPLETING THE INSTALLATION PROCEDURE

For both DECnet and PSI installations, there are a few steps that must be accomplished to conclude the network installation procedure.

In NCP.CMD, you must include SET NODE commands to establish the correspondence between the node name and node address for all nodes in your network. In the NIPGEN procedure described in Chapter 4, the node associations were provided for nodes included in the testing procedures. If there are any other nodes in the network, edit the NCP.CMD file and add a line for each node in the network that is not already in NCP.CMD. For each node, add a command similar to the following, where node-address is the node number and node-name is the name of the node:

```
SET NODE node-address NAME node-name
```

For example, to add node JAKE (node number 25), place the following line in NCP.CMD:

```
SET NODE 25 NAME JAKE
```

After you edit NCP.CMD, copy the file to SYS:. To activate the node database while your system is running under timesharing, use the following command:

```
.R OPR
OPR>TAKE SYS:NCP.CMD
```

This activates the node database immediately.

As long as NCP.CMD is in SYS:, and the SYSTEM.CMD file contains the line TAKE NCP.CMD, the network database will be activated automatically whenever OPR is started on the system console terminal.

When you are satisfied with the functioning of the monitor and network software, copy the new monitor, DECnet, and GALAXY files to the appropriate system areas. This completes the DECnet installation and verification procedures.

For PSI installations, if you want to access the PSI gateway node from other TOPS-10 host systems, you must install the PSI access software on those systems. The procedure to accomplish this is documented in the next section.

6.11 INSTALLING PSI ACCESS SOFTWARE ON OTHER NODES

To allow users of other TOPS-10 systems in your network to access the PSI gateway node that you have installed, you must also install the files listed in Section 6.11.1 on those TOPS-10 nodes. If you are not installing the gateway access software on any other TOPS-10 system, the installation procedure is complete.

You can use NFT to copy files to other nodes, or perform the installation procedures described below to manually install the software.

Repeat the following steps for each TOPS-10 node that will allow access to the PSI gateway node.

6.11.1 Installing Access Software

To install the gateway access software on another TOPS-10 node, perform the following steps:

1. Install DECnet-10 on that node.

2. Install the TOPS-10 PSI files that were restored from tape, or generated during the installation procedures, on the system areas. The files you must copy to the TOPS-10 systems are:

```
SYS:OPR.EXE
SYS:X25NM.CMD
SYS:B361LB.REL
REL:X25GAM.REL
REL:X25GAF.REL
UNV:X25SYM.UNV
HLP:NCP.HLP
```

6.11.2 Restarting NML

Start NML by restarting the system or by following the NML startup procedures described in the TOPS-10 DECnet and PSI System Manager's and Operator's Guide.

6.11.3 Activating Network Management

Use OPR to take the X25NM.CMD command file to activate network management capabilities. (If you merged X25NM.CMD with NCP.CMD, you only have to execute the NCP.CMD file.)

```
.R OPR

OPR>TAKE SYS:X25NM.CMD
```

If your connection to the PPSN and your system startup files work correctly, and your log files contain no errors, you are finished. If some parts of your network are still not operational, you must resolve the errors and repeat the appropriate installation procedures to correct the software.

APPENDIX A

NETGEN

This appendix describes the NETGEN program in detail. It lists the software and hardware parameters that you use to configure DECnet and PSI front-end software. The NETGEN commands are listed in alphabetical order, then the error messages that NETGEN can display are described, also in alphabetical order.

A.1 NETGEN INPUT FEATURES

NETGEN provides several features that help you to enter necessary commands and arguments. You can:

- Type a question mark in response to the NETGEN prompt to display a list of NETGEN commands.
- Type a question mark after the command to list the valid arguments.
- Press the ESCape key after the command to display guidewords for the argument. Or press ESCape while typing a command or argument, to complete the command or argument name.
- Abbreviate commands, keywords, and arguments.

A.2 NETGEN PARAMETERS

This section describes the parameters you need for the operation of network software in your DN20. These parameters apply to both DECnet and PSI installations.

Parameter	Meaning
Node type	The first parameter you must specify is the type of front-end node you want to configure. You can specify DN20 for a DECnet front end or X25 for a PSI front end. Default: None
Node name	The name for the node you are generating. The name must begin with an alphabetic character and cannot exceed six characters. Default: None

Parameter	Meaning
Node address	A number that identifies the address of the node being generated. This address must be unique within the network. Any decimal number in the range 1 through 255 can be specified, provided it does not duplicate an address assigned to another node in the network. Generally, you should use low numbers for addresses of nodes in a small network. You cannot use a node address larger than the Maximum Address you specify. If you enter an address incompatible with your Maximum Address or Buffer Size, NETGEN warns you. Default: None
Identification	A string you can use to identify the software you are generating. The string can be seen with the NCP SHOW EXECUTOR CHARACTERISTICS command. You can specify any text string of 1 to 32 characters. Default: DECNET V3.Ø Release
Outgoing Timer	The number of seconds to wait for acknowledgement from a remote node to a connect request issued locally. The range is 1 to 65535 seconds. Default: 6Ø
Maximum Links	The maximum number of supported logical links to the DN2Ø/MCB. Each virtual circuit requires a logical link. This parameter applies to the number of links to tasks residing in the MCB (such as NML). It does not affect links to nodes other than the MCB. This parameter does affect the number of PSI links, which resides in the MCB. The maximum number of links should be at least equal to the maximum number of virtual circuits you want to support, plus 3. (A logical link is a software connection allowing programs on different nodes to transmit data to each other.) The range is 3 to 16. Default: 11
Inactivity Timer	Number of seconds to wait before exercising a logical link when there is no received traffic on the link. A condition of No Receive Traffic can occur, for example, because the network is disconnected, or because the physical line went down. When the number of seconds specified have elapsed, NSP sends a data request message over the logical link. If, after a certain amount of time (see Retransmit Factor), there has been no acknowledgement of the message, NSP decides that the physical network supporting the logical link has failed. The range for the inactivity timer is 1 to 65535 seconds. Default: 3Ø

Parameter	Meaning
Retransmit Factor	The number of times the node retransmits a message without receiving acknowledgement before the DN20/MCB software supporting a logical link has failed. The range is 1 to 15. Default: 5
Routing Timer	Maximum amount time to wait before transmitting a routing message. The range is 1 to 65535 seconds. Default: 60
Maximum Address:	The highest node number in the same network as the node you are configuring, plus 2, to allow for future expansion. The specified value must be at least equal to the node address of the node you are configuring. This parameter determines the highest node address in the network. For example, a network with node numbers 1, 2, and 5 must have a maximum address of at least 5. Nodes numbered greater than the maximum address are not visible to the MCB, and thus cannot be accessed. The range is 1 to 255. The Maximum Address, Buffer Size, and Node Address you use must be compatible. NETGEN computes Buffer Size depending on the Maximum Address you enter, and warns you if they are incompatible. See Section A.2 for more information about the Buffer Size parameter. Default: 255
Maximum Cost	Highest allowable cost associated with a particular logical path. This parameter depends on the individual line cost (the cost of transferring a message over a line), and path costs. This value is calculated as the sum of the line costs of all lines over which the data is routed. The range is 1 to 1022. Default: 100
Maximum Hops	The maximum number of hops allowed between any pair of nodes in the network. The range is 1 to 30. Default: 16
Maximum Visits	The maximum number of visits to network nodes that any individual message can make in the attempt to find the correct destination node. When a node receives a message with a visit count greater than the value of the Maximum Visits, the node discards the message. The Maximum Visit value must be greater than or equal to Maximum Hops. The range is 16 to 255. Default: 32

Parameter	Meaning
Buffer Size	The size of buffers the system uses to transmit and receive data over any physical link in the network. The size you specify must be the same on every node in the network because a DECnet node cannot communicate with any node whose buffer size differs from its own. The range is 515 to 576. NETGEN computes the minimum buffer size depending on the Maximum Address you enter. If you enter a buffer size that is less than the computed minimum, NETGEN warns you. See Section A.2 for more information about the buffer size parameter. Default: 576
Transmit Password Receive Password	Optional parameters identifying the password sent to a remote node during an initialization sequence. The password must be an alphanumeric string from 1-8 characters long. In a DECnet network, passwords are required to initialize MCB nodes. In a Phase IV network, passwords are only used in initializing nodes with dialup lines used by the network. Passwords are not checked on incoming requests to DECnet, but a Transmit Password may be required by other nodes in the network. Default: DECNET2Ø

Management Parameters

You can set these three parameters to restrict users at remote terminals from giving NCP commands that affect your local node. The parameters are:

Account	Up to 16 characters
User I.D.	Up to 16 characters
Password	Up to 8 characters

No default is set for these parameters. If you do not include these access control parameters, any user at any remote terminal has unrestricted access to local network management commands.

If you set these parameters, a user must supply this information before performing NCP commands that affect your node. Any remote users can display local network information using the NCP SHOW and LIST commands, but the management parameters are not displayed.

The network management parameters must also be supplied in the NIPGEN program, as described in Chapter 4.

Parameter	Meaning
Logging File Event Classes	
	DECnet provides a facility for logging information that has potential significance in the operation or maintenance of the network. Logged information includes the location of information about the event as well as number of events lost, initialization failures, and circuit losses. Significant events are recorded by SPEAR in ERROR.SYS. See the TOPS-10 DECnet and PSI System Manager's and Operator's Guide for more information about the event classes and event types.
Hardware	
DMC11	Number of DMC11s on your DN20. You may have no DMC11s, or from 1 to 6 DMC11s on a DN20. The DMC11 is a single-line microprocessor-based interface to the network. The DMC11 is a synchronous DMA device. Default: 0
DMR11	Number of DMR11s on your DN20. You may have no DMR11s, or from 1 to 6 DMR11s on a single DN20. The DMR11 is a single-line, microprocessor-based interface to the network. The DMR11 is a synchronous DMA device. Default: 0
DUP11	Number of DUP11 devices on the KDP (0-3). Default: 2 (0 if no KDP)
DTE20	Number of the DTE with which the DN20 interfaces to the processors (not the number of DTEs). Normally, the DN20 used for DECnet uses DTE number 1, 2, or 3. You cannot use DTE number 0 because DTE-0-0 is always dedicated to the console front end. Note that DECnet identifies the DTE as DTE-CPU-n, as opposed to DN20s, which always interpret the DTE as DTE-0-n. Default: DTE-0-1
KDP	Number of KDPs on your DN20 (0 to 2). A KDP is a combination of a KMC11 controller and one to four DUP11s (the default is two DUP11s). With the KMC11, the DUP11 functions as a direct memory access device (DMA). The interface is synchronous. Default: 0

A.3 PSI PARAMETERS

This section describes the parameters that must be defined for the operation of PSI in your DN2Ø. You can display the values for these parameters using the LIST command.

A.3.1 Known Circuits Characteristics

The parameters in this section apply to Permanent Virtual Circuits (PVCs).

Parameter	Meaning
Circuit-id	is the name that the system manager assigns to the PVC (Permanent Virtual Circuit). The circuit-id is an ASCII string of up to 16 characters. Default: None
DTE address	is an ASCII string that represents the DTE address to which your PVC is defined. Default: None
Node type	is the type of front-end software, either DN2Ø or X25. Default: X25
Channel	is the logical channel number associated with the PVC, as defined by your PPSN. Default: None
Maximum data	is the packet size for the PVC, as defined by your PPSN. The range is from 1 to 65535. Default: 128
Maximum window	is the window size for the PVC, as defined by your PPSN. The range is 1 to 255. Default: 2

A.3.2 Known Lines Characteristics

PSI line parameters define the hardware and data link protocol (frame level protocol) parameters necessary to communicate with the PPSN. For proper operation of your PPSN link, it is important to set these parameters with the values recommended by your PPSN.

Parameter	Meaning
Line	is the line that connects your DN20 to the PPSN. The line can only be a KDP11.
Protocol	is the data link protocol type used on the line. LAPB is the protocol for an X.25 connection. Default: LAPB
Retransmit Timer (ms)	is the data link timer used to determine the interval after which an unacknowledged data frame is retransmitted. The timer interval is given in milliseconds (ms). You must supply the value defined by your PPSN. (The CCITT frame level parameter is "T1".) The range is 1 to 65535. Default: 4000
Maximum Window	is the maximum frame level window size for the LAPB line. You must supply the value defined by your PPSN. (The CCITT frame level parameter is "K".) The range is 1 to 255. Default: 7
Maximum Retransmits	is the maximum number of times a data frame is retransmitted at the expiration of the Retransmit Timer. You must supply the value defined by your PPSN. (The CCITT frame level parameter is "N2".) The range is 0 to 255. Default: 20
Baud Rate	is the rate of speed of the LAPB lines, which cannot exceed 9600. The baud rate can be one of the following values, 1200, 1800, 2400, 3600, 4800, 7200, or 9600. Default: 9600

A.3.3 X25-Protocol Parameters

X25-Protocol parameters define the parameters required to maintain the X.25 packet level protocol. The packet level protocol is necessary to establish a connection between two users over a virtual circuit.

There are two types of X25-Protocol parameters:

- Parameters that apply to all connections between the DN20 and PPSN (DTE independent).
- Parameters that apply to a specific connection (DTE dependent). These parameters are described in the next section.

A.3.3.1 Module X25-Protocol Characteristics -

Parameter	Meaning
Default data	is the default packet size, in bytes, for switched virtual circuits. You must supply the value defined by your PPSN. The default data size is the value of the packet size used for an SVC when the flow control parameter negotiation facility is not used. (See the TOPS-10 PSI User's Guide for additional information on the flow control parameter negotiation facility.) The range is 1 to 1021. Default: 128
Default window	is the default packet-level window size for switched virtual circuits. You must supply the value defined by your PPSN. The Default Window size is the value of the window size used for an SVC when the flow control parameter negotiation facility is not used. The range is 1 to 7. Default: 2
Maximum data	is the maximum packet size that can be used when the flow control parameter negotiation facility is used. The range is 1 to 1021. Default: 128
Maximum window	is the maximum window size that can be used when the flow control parameter negotiation facility is used. The range is 1 to 255. Default: 2
Maximum clears	is the maximum number of times the software will retransmit an unconfirmed clear request when the Clear Timer wait interval is reached. If your PPSN does not recommend a value, use the default. The range is 1 to 255. Default: 6
Maximum resets	is the maximum number of times the software will retransmit an unconfirmed reset request when the Reset Timer wait interval is reached. If your PPSN does not recommend a value, use the default. The range is 1 to 255. Default: 6
Maximum restarts	is the maximum number of times to retransmit an unconfirmed restart request when the Restart Timer wait interval is reached. If your PPSN does not recommend a value, use the default. The range is 1 to 255. Default: 6

Parameter	Meaning
Call timer	is the number of seconds the software will wait before clearing an outgoing call request for which there has been no response. If the value of the Call Timer is zero, outgoing calls are not cleared. If your PPSN does not recommend a value, use the default. The range is 1 to 255. Default: 200
Clear timer	is the number of seconds the software will wait before retransmitting a clear request for which there has been no response from the PPSN. If the value of Clear Timer is zero, clear requests are not retransmitted. If your PPSN does not recommend a value, use the default. The range is Ø to 255. Default: 180
Reset timer	is the number of seconds the software will wait before retransmitting an unacknowledged reset request. If your PPSN does not recommend a value, use the default. The range is Ø to 255. Default: 180
Restart timer	is the number of seconds the software will wait before retransmitting an unacknowledged restart request. If your PPSN does not recommend a value, use the default. The range is Ø to 255. Default: 180
Maximum groups	is the maximum number of closed user groups supported by the X25-PROTOCOL module. The range is Ø to 20. Default: Ø

A.3.3.2 Module X25-Protocol Characteristics Known DTEs -

Parameters	Meaning
DTE address	is the DTE address of the physical connection to the PPSN (ASCII string, 1-15 digits). Default: None
Line-id	is the device identification for the physical connection to the PPSN. Default: None
Channels	are a range of logical channel numbers used for outgoing SVCs (Switched Virtual Circuits). Default: None
Maximum channels	are the maximum number of logical channel numbers that can be assigned to incoming and outgoing SVCs for a DTE. The maximum channel range is Ø to 2Ø. Default: 2Ø

A.3.3.3 List Module X25-Protocol Characteristics Known Groups -

If your PPSN subscription specifies that you are a member of a closed user group or a bilateral closed user group, you need to specify the parameters in this section. User groups are described in the TOPS-1Ø DECnet and PSI System Manager's and Operator's Guide.

Parameters	Meaning
Group name	is the name for the user group, assigned by the system manager. Default: None
DTE address	is the address of the DTE for which the user group is defined (ASCII string of 1-15 digits). Default: None
Group number	is the number assigned by your PPSN for the closed user group on the DTE defined above. The range is Ø to 9999. Default: None
Group type	is Bilateral if this is a bilateral closed user group; otherwise, omit this parameter. Default: None

A.3.4 X25-SERVER Parameters

The X25-Server module's primary function is to determine which user receives the incoming virtual circuit connection (virtual calls). Each user job that is eligible to receive incoming calls must be defined in the destination database, which is maintained by the X25-Server module. The following sections describe X25-Server parameters.

A.3.4.1 Module X25-SERVER Characteristics -

Parameters	Meaning
Maximum circuits	is the maximum number of virtual circuits (SVCs and PVCs) the Server Module can have open. The range is Ø to 2Ø. Default: 8
Maximum Destinations	Maximum number of DECnet objects that can receive incoming calls. The range is 1 to 2Ø. Default: 4

A.3.4.2 Module X25-SERVER Characteristics Known Destinations - The following parameters, which are found in the destination data base, are necessary to route an incoming virtual call to a DECnet object. For a description of how the X25-SERVER module uses these parameters, See the TOPS-1Ø DECnet and PSI System Manager's and Operator's Guide.

Parameters	Meaning
Account	is the DECnet access control account string to be used when the X25-Server module connects to the destination of an incoming call. For detailed information, See the TOPS-1Ø DECnet and PSI System Manager's and Operator's Guide. Default: Null string
Call mask	is a hexadecimal string, of up to 16 characters, used to determine the destination of an incoming call based on the content of the user call data field of the incoming call packet. It is added byte-by-byte to the user call data field of the incoming call packet. The resulting string is compared with the Call Value. Default: Null string
Call value	is a hexadecimal string, of up to 16 characters, used to determine the destination of an incoming call based on the content of the user call data field of the incoming call packet. It is compared byte-by-byte with the string resulting from the call mask operation to determine the destination of an incoming call. Default: Null string

Parameters	Meaning
Group name	is the name used to determine the destination of an incoming call based on user group membership. If given, only incoming calls with this user group name will be routed to this destination. Default: Null string
Node number	is used when the X25-Server module connects to the destination of an incoming call. The range of this parameter is 1 to 255. Default: None
Number	is the full remote DTE address used to determine the destination of an incoming call based on the calling DTE address in the incoming packet. If given, only incoming calls from the designated DTE address are routed to this destination. The address is up to 15 digits in length. Default: Null string
Object	is the DECnet object identification to be used when the X25-Server module connects to the destination of an incoming call. This parameter is required. Default: None
Password	is the access control password to be used when the X25-Server module connects to the destination of an incoming call. Default: Null string
Priority	is the level of priority associated with a given entry in the destination data base. The highest priority is 255 and the lowest is Ø. If an incoming call maps to more than one destination, the one with the higher priority is chosen. If there is more than one match with equal priority, the first is chosen. Default: Ø
Subaddresses	are the range of the local DTE subaddresses used to determine the destination of an incoming call. If given, only those calls with the called DTE subaddress in the specified range are routed to this destination. A subaddress is a decimal number from Ø-99. Default: Ø
User-id	is the DECnet access control user identification to be used when the X25-Server module connects to the destination of an incoming call. Default: Null string

A.4 BUFFER SIZE GUIDELINES

The buffer size of the DN2Ø MCB software determines the largest size for a message that the DN2Ø can send or receive. NETGEN allows a buffer size from 29Ø to 576 bytes. The default is 576, which is appropriate for most configurations. However, if the batch job MCBSYS.CTL reports a system image size that is larger than 124K, and if you have no devices you can omit from the configuration, you must reduce the buffer size.

The buffer size you set with NETGEN must be compatible with the Maximum Address entered in MONGEN's network configuration dialog. Ideally, the two values should be identical. However, systems that contain NI hardware, without DN2Ø or CI hardware, may set the Maximum Address to a much higher value than the maximum supported by the DN2Ø.

The buffer size MONGEN symbol (%RTBSZ) should be the same value as that assigned to MCB nodes in NETGEN. You can adjust the Ethernet buffer size by defining the appropriate monitor symbol in the HDWGEN portion of MONGEN. The symbols are listed in Table 2-1.

To adjust the DN2Ø buffer size in NETGEN, use the following command:

```
NETGEN>DEFINE EXECUTOR BUFFER SIZE nnn
```

The size of the buffer must be a decimal number between 515 and 576. Refer to Table A-1 for suggested buffer sizes in relation to network size.

If you wish to use a DMC/DMR for the DECnet line in the TOPS-1Ø PSI Gateway node, you must restrict the maximum node address in your network to 14Ø or less and the buffer size on every node in the network to 29Ø.

Even though your installation does not use the DMC/DMR device for the DECnet line in the TOPS-1Ø PSI Gateway, the default values of 255 for maximum node address and 576 for buffer size can be too large if you have a small network. If your network has less than 14Ø nodes, you will obtain better performance if you set the maximum node address to 14Ø and the buffer size to 29Ø.

Maximum Address	Buffer Size
(2 - 14Ø)	(29Ø)

If your network has more than 14Ø nodes, you must use a KMC/DUP for the DECnet line in the TOPS-1Ø PSI Gateway node.

Table A-1 provides the parameter values as they are required by the MONGEN procedure and the NETGEN program. To determine the parameter values for a maximum address that is not in the table, calculate as follows: for each increment of the maximum node address, add 2 bytes to the corresponding minimum buffer size. For example, if your maximum node address is 146, the buffer size must range from 297 to 576 bytes.

Table A-1: Parameter Values For MONGEN and NETGEN

Maximum Address	Buffer Size
145	295 - 576
155	315 - 576
165	335 - 576
175	355 - 576
185	375 - 576
195	395 - 576
205	415 - 576
215	435 - 576
225	455 - 576
235	475 - 576
245	495 - 576
255	515 - 576

A.5 NETGEN COMMANDS

To define the initial MCB configuration, see Chapter 3. The syntax for the individual NETGEN commands is described on the following pages.

DEFINE CIRCUIT Command (X.25 only)

Syntax:

```
                                  ⎧CHANNEL nnn          ⎫
                                  ⎪DTE nnn              ⎪
DEFINE CIRCUIT     circuit-id     ⎨MAXIMUM ⎧DATA nnn   ⎬⎪
                                  ⎪        ⎩WINDOW nnn ⎭⎪
                                  ⎩TYPE X25             ⎭
```

Description:

Define the characteristics of the allowed circuits that are PVCs.

Arguments:

Circuit-id: circuit number; default, none
Channel: numeric value, 0 to 4095; default, 0
DTE: decimal DTE address, 1 to 15 digits; default, none
Maximum Data: numeric value, 1 to 65535, default, 128
Maximum Window: numeric value, 1 to 255, default, 2
Type: X25; default, X25

Example:

```
NETGEN>DEFINE CIRCUIT DTE-0-1 MAXIMUM DATA 100
NETGEN>
```

DEFINE EXECUTOR

Syntax:

```
                    ⎧ADDRESS nnn                                  ⎫
                    ⎪BUFFER SIZE nnn                              ⎪
                    ⎪IDENTIFICATION txt                           ⎪
                    ⎪INACTIVITY TIMER nnn                         ⎪
                    ⎪                 ⎧ACCOUNT txt  ⎫             ⎪
                    ⎪MANAGEMENT       ⎨PASSWORD txt ⎬             ⎪
                    ⎪                 ⎩USER txt     ⎭             ⎪
DEFINE EXECUTOR     ⎪                                             ⎪
                    ⎪                 ⎧ADDRESS nnn  ⎫             ⎪
                    ⎪                 ⎪COST nnn     ⎪             ⎪
                    ⎪MAXIMUM          ⎨HOPS nnn     ⎬             ⎪
                    ⎪                 ⎪LINKS nnn    ⎪             ⎪
                    ⎪                 ⎩VISITS nnn   ⎭             ⎪
                    ⎪NAME txt                                     ⎪
                    ⎪OUTGOING TIMER nnn                           ⎪
                    ⎪PHASE II LINKS n                             ⎪
                    ⎪RECEIVE PASSWORD txt                         ⎪
                    ⎪RETRANSMIT FACTOR nnn                        ⎪
                    ⎪ROUTING TIMER nnn                            ⎪
                    ⎩TRANSMIT PASSWORD txt                        ⎭
```

Description:

Defines the characteristics of the host node, and sets network management parameters. The management ACCOUNT, USER, and PASSWORD control access to NCP from remote nodes.

Arguments:

Address: numeric value, 1 to 255; default, none
Buffer Size: numeric value, 515 to 576; default, 576
Identification: text, 1 to 32 characters;
default, DECnet-10 V3.0 Release
Inactivity Timer: numeric value, 1 to 65535 seconds; default, 30
Management Account: string, 1 to 16 characters; default, none
Management Password: string, 1 to 8 characters; default, none
Management User-Id: string, 1 to 16 characters; default, none
Maximum Address: node address, numeric value, 10 to 255;
default, 255
Maximum Cost: numeric value, 1 to 1022; default, 100
Maximum Hops: numeric value, 1 to 30; default, 16
Maximum Links: numeric value, 3 to 23; default, 11
Maximum Phase II Links: numeric value, 0 to 40; default, none
Maximum Visits: numeric value, 16 to 255; default, 32
Name: node name, 1 to 6 characters; default, none
Outgoing Timer: numeric value, 1 to 65535 seconds; default, 60
Receive Password: string, 1 to 8 characters; default, none
Retransmit Factor: numeric value, 1 to 15; default, 5
Routing Timer: numeric value, 1 to 65535; default, 60
Transmit Password: string, 1 to 8 characters; default, DECNET20

DEFINE KNOWN LINES Command (X.25 only)

Syntax:

```
                          {RETRANSMISSION TIMER nnn}
DEFINE KNOWN LINES        {MAXIMUM {RETRANSMITS nnn}}
                          {        {WINDOW nnn      }}
```

Description:

Defines parameters for the LAPB X.25 line.

Arguments:

Retransmission Timer: numeric value, 1 to 65535 milliseconds; default, 3000
Maximum Retransmits: numeric value, 0 to 255; default, 20
Maximum Window: numeric value, 1 to 255; default, 7

Example:

```
NETGEN>DEFINE KNOWN LINES MAXIMUM WINDOW 5
NETGEN>
```

DEFINE LOGGING FILE EVENT Command

Syntax:

DEFINE LOGGING FILE EVENT event-class

Description:

Specifies the types of network events to be logged in the logging file. The supported event classes and types are listed in the example for the LIST LOGGING command.

Arguments:

Event class: numeric form, n.m, where n is the event class and m is the event type(s) within the class.

Example:

```
NETGEN>DEFINE LOGGING FILE EVENT 3.1
NETGEN>
```

DEFINE MODULE X25-PROTOCOL Command (X.25 only)

Syntax:

```
                                  ⎧CALL TIMER nnn                                  ⎫
                                  ⎪CLEAR TIMER nnn                                 ⎪
                                  ⎪                                                ⎪
                                  ⎪DEFAULT     {DATA nnn  }                        ⎪
                                  ⎪            {WINDOW nnn}                        ⎪
                                  ⎪                                                ⎪
                                  ⎪                        {CHANNELS nnn}          ⎪
                                  ⎪                        {CLEARS nnn  }          ⎪
DEFINE MODULE X25-PROTOCOL        ⎪                        {DATA nnn    }          ⎪
                                  ⎪MAXIMUM     {GROUPS nnn  }                      ⎪
                                  ⎪                        {RESETS nnn  }          ⎪
                                  ⎪                        {RESTARTS nnn}          ⎪
                                  ⎪                        {WINDOW nnn  }          ⎪
                                  ⎪                                                ⎪
                                  ⎪NETWORK txt                                     ⎪
                                  ⎪RESET TIMER nnn                                 ⎪
                                  ⎪RESTART TIMER nnn                               ⎪
                                  ⎪GROUP txt DTE nnn NUMBER nnn                    ⎪
                                  ⎪      TYPE [BILATERAL]                          ⎪
                                  ⎩                                                ⎭
```

Description:

Defines parameters describing the virtual circuit to the PPSN.

Arguments:

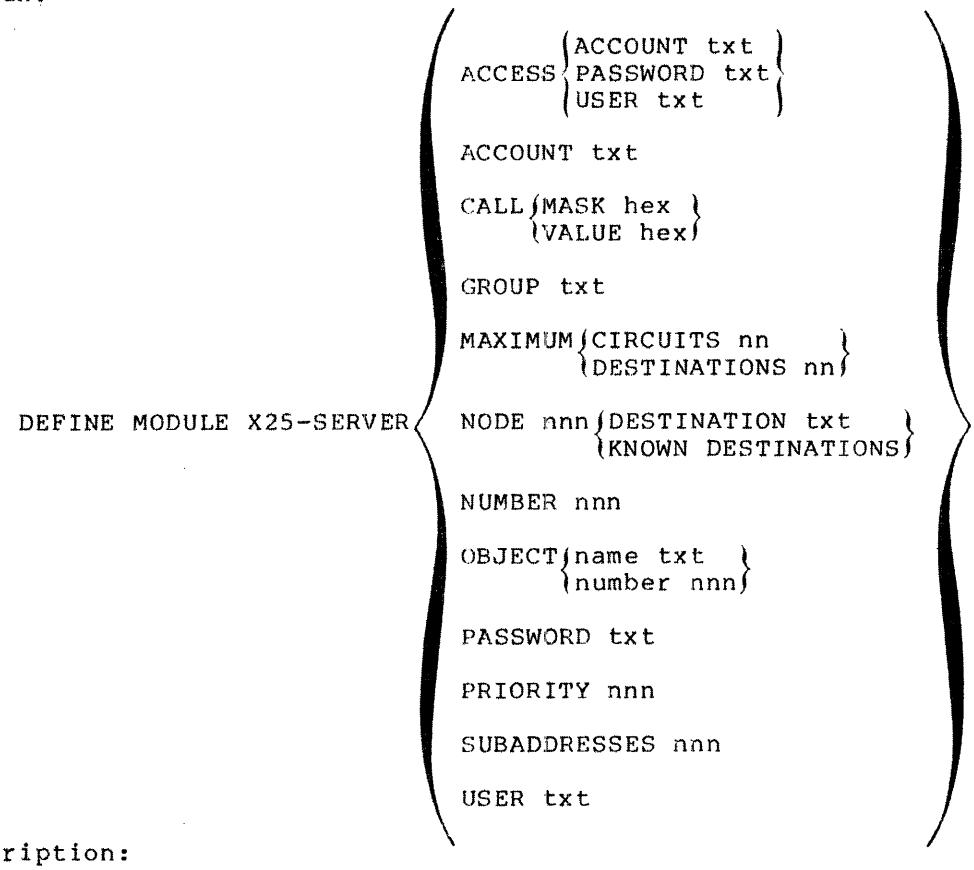
Call timer: numeric value, 1 to 255; default, 200 seconds
Clear timer: numeric value, 1 to 255; default, 180 seconds
Default Data: numeric value, 1 to 1021; default, 128
Default Window: numeric value, 1 to 255; default, 2
DTE: decimal DTE address, 1 to 15 digits; default, none
Group: alphanumeric, 1 to 16; default, none
Maximum Channels: numeric value, 1 to 20; default, 20
Maximum Clears: numeric value, 0 to 255; default, 6
Maximum Data: numeric value, 1 to 1021; default, 128
Maximum Groups: numeric value, 0 to 20; default, 0
Maximum Resets: numeric value, 0 to 255; default, 6
Maximum Restarts: numeric value, 0 to 255; default, 6
Maximum Window: numeric value, 1 to 255; default, 2
Network: text, alphanumeric; default, none
Number: numeric value, 0 to 9999; default, none
Restart Timer: numeric value, 1 to 255; default, 180 seconds
Reset Timer: numeric value, 1 to 255; default, 180 seconds
Type: BILATERAL (optional parameter); default, none

Example:

```
NETGEN>DEFINE MODULE X25-PROTOCOL MAXIMUM CHANNELS 20
NETGEN>
```

DEFINE MODULE X25-SERVER Command (X.25 only)

Syntax:



Description:

Defines parameters for the X.25 Server. The Server maintains the interface between a DECnet logical link to the Gateway user and the X.25 virtual circuit to the remote packetnet user. When a virtual call comes in, these parameters are provided by the PSI software to set up a logical link to the Gateway user.

Arguments:

Access Account: text, 1 to 16; default, none
Access Password: text, 1 to 16; default, none
Access User: text, 1 to 16; default, none
Account: text, 1 to 16; default, none
Call Mask: hexadecimal mask, 1 to 16; default, none
Call Value: hexadecimal value, 1 to 16; default, none
Destination: node name, 1 to 16; default, none
Group: group name, 1 to 16; default, none
Maximum Circuits: numeric value, 1 to 20; default, 8
Maximum Destinations: numeric value, 0 to 20; default, 4
Node number: numeric, 1 to 255; default, none
Number: full remote DTE address, 1 to 15; default, none
Object name: alphanumeric, 1 to 16; default, none
Object number: numeric, 1 to 255; default, none
Password: text, 1 to 16; default, none
Priority: numeric, 0 to 255; default, 0
Subaddresses: numeric range, 0 to 99; default, none
User: alphanumeric, 1 to 16; default, none

DEFINE MODULE X25-SERVER Command (X.25 only) (Cont.)

Example:

```
NETGEN>DEFINE MODULE X25-SERVER MAXIMUM CIRCUITS 12
```

EXCLUDE Command

Syntax:

```
          ⎧DMC11 nnn⎫
EXCLUDE   ⎪DMR11 nnn⎪
          ⎪DTE20 nnn⎪
          ⎩KDP nnn  ⎭
```

Description:

Removes a device from the configuration.

In certain cases, NETGEN provides a default for the EXCLUDE command. If you type:

```
NETGEN>EXCLUDE DMR11 <ESC>
```

NETGEN automatically fills in the most recently included device number for each device.

Arguments:

DMC11: number of DMC11, 0 to 5
DMR11: number of DMR11, 0 to 5
DTE20: number of DTE, 1 to 3
KDP: number of KDP, 0 to 2

EXIT Command

Syntax:

EXIT

Description:

Exits from NETGEN procedure. Saves no files unless you have begun with the START command. To save your configuration files, use SAVE and FINISHED before typing EXIT.

FINISHED Command

Syntax:

FINISHED

Description:

Indicates that you have finished your configuration. When you give this command, NETGEN writes its output files, NMLACC.MAC, CETAB.MAC and NETPAR.MAC, to your directory. If you have generated a system that is incomplete or not a supported configuration, NETGEN warns you. See Chapter 3 for examples using this command.

HELP Command

Syntax:

HELP

Description:

Displays a short description of the function of NETGEN.

INCLUDE Command

Syntax:

```
          ⎧DMC11 nnn⎫
INCLUDE   ⎨DMR11 nnn⎬
          ⎧DTE20 nnn⎫
          ⎩KDP nnn  ⎭
```

Description:

Adds a device to the configuration. In certain cases, an automatic default is provided for the INCLUDE command. NETGEN provides Ø as a default or the next available number for all the devices; however, the default for DTE2Ø is always 1.

For each DMR11 you include, NETGEN asks you to specify the type of transmission as either HALF or FULL duplex and prompts you for the cost of the line (a number from 1 to 25). The default cost is 1.

For each DMC11 and DTE2Ø you include, NETGEN prompts you for the cost of the line. The default cost for the DMC11 and the DTE2Ø is 1.

NOTE

NETGEN default values for circuit cost may be different from default values provided in the MONGEN procedure. Verify your values before continuing with the installation.

If you include a KDP, NETGEN prompts you to specify the number of lines on the KDP (KDPs numbered 1 to 4), the maximum baud rate (line speed) for each, and the cost of the line as shown in the example below. The default cost for the KDP is Ø.

Arguments are described under the EXCLUDE command.

INFORMATION Command

Syntax:

```
INFORMATION   {NODE      }
              {NODE-TYPE }
```

Description:

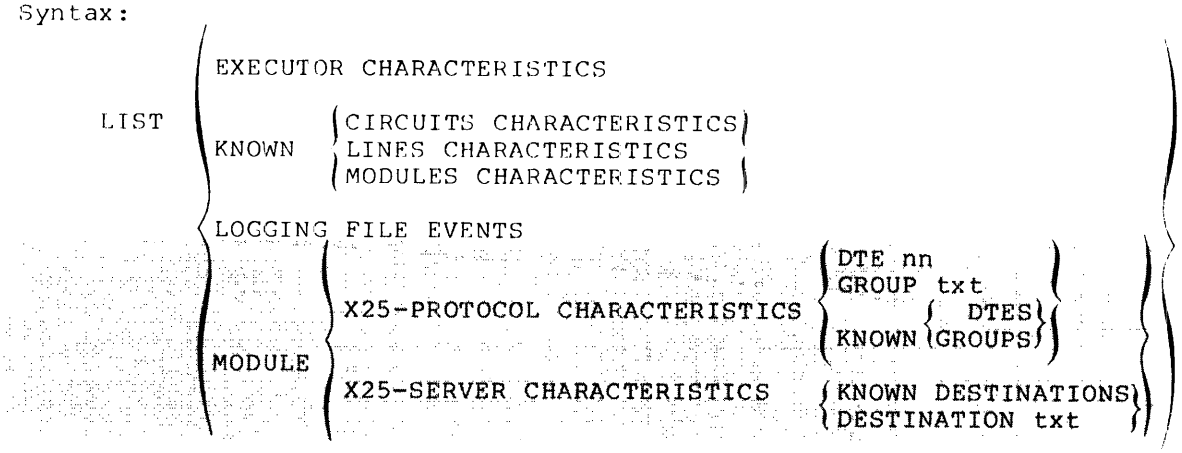
The NODE argument displays the node name and node address. The NODE-TYPE argument displays either DN2Ø or X25.

Example:

```
NETGEN>INFORMATION NODE
   Node name is:      NEWER
   Node address is:   12

NETGEN>INFORMATION NODE-TYPE

   Node type is:      DN2Ø
NETGEN>
```

LIST Command

Syntax:



Description:

Displays the characteristics you have set for executor and known circuits and lines. Also lists the supported event class types, for the DEFINE LOGGING FILE EVENT command. See the TOPS-10 DECnet and PSI System Manager's and Operator's Guide for more information about logged events.

Examples:

```
NETGEN>LIST LOGGING FILE EVENTS

        LOGGING = FILE
          SINK = (host)
          EVENTS = 0.0-3,6-9
          EVENTS = 1.2
          EVENTS = 2.0-1
          EVENTS = 3.0-2
          EVENTS = 4.0-10,12-13
          EVENTS = 5.6-12
          EVENTS = 6.3-4
```

LOG Command

Syntax:

LOG filespec

Description:

Logs all of your NETGEN commands in a disk file. If you make a mistake in your NETGEN procedure, you can TAKE this log file instead of reentering all of the commands.

The default filename for the LOG file is the node name specified in your NETGEN dialog. For example, if your current node name is MARL, your default LOG file is MARL.LOG.

Argument:

output file specification

Example:

```
NETGEN>LOG ? name of output file to record TTY input
NETGEN>LOG MARL.LOG

NETGEN>
```

PURGE EXECUTOR Command

Syntax:

```
                    { IDENTIFICATION                    }
                    {                 { ACCOUNT  }      }
PURGE EXECUTOR      { MANAGEMENT      { PASSWORD }      }
                    {                 { USER     }      }
                    { OUTGOING TIMER                    }
```

Description:

Removes a parameter you have previously set. Arguments:

event-class: logging file event class and type, refer to LIST command

PURGE CIRCUIT Command (X.25 only)

Syntax:

PURGE CIRCUIT circuit-id { CHANNEL | DTE | MAXIMUM { DATA | WINDOW } | TYPE X25 }

Description:

Removes an X.25 parameters that has been previously set.

Arguments:

Circuit-id: circuit-number; default, none

Example:

```
NETGEN>PURGE CIRCUIT DTE-1-1 TYPE X25
```

PURGE KNOWN LINES Command (X.25 only)

Syntax:

```
PURGE KNOWN LINES    { MAXIMIMUM { RETRANSMITS } }
                     {           { WINDOW      } }
                     { RETRANSMISSION TIMER      }
```

Description:

Clears the values for the KNOWN LINES parameters that you have set.

Example:

```
NETGEN>PURGE KNOWN LINES RETRANSMISSION TIMER
```

PURGE LOGGING FILE EVENT Command

Syntax:

PURGE LOGGING FILE EVENT event-class

Description:

Clears any logging file event classes that are currently enabled. Refer to the LIST LOGGING FILE EVENT command.

Argument:

event-class: n.m, where n is the class type and m is the event type(s) to be purged from the database.

Example:

```
NETGEN>PURGE LOGGING FILE EVENT 3.1
NETGEN>
```

PURGE MODULE X25-PROTOCOL Command (X.25 only)

Syntax:

PURGE MODULE X25-PROTOCOL

```
{ CALL TIMER
  CLEAR TIMER

  MAXIMUM CLEARS
  RESETS
  RESTARTS

  RESET TIMER
  RESTART TIMER
  ALL GROUP name
  ALL KNOWN GROUPS
  GROUP name TYPE }
```

Description:

Purges the X25-PROTOCOL characteristics set by the DEFINE MODULE X25-PROTOCOL command.

Example:

```
NETGEN>PURGE MODULE X25-PROTOCOL RESET TIMER
NETGEN>
```

PURGE MODULE X25-SERVER Command (X.25 only)

Syntax:

```
PURGE MODULE X25-SERVER  ALL
                         ALL DESTINATION node-name
                         ALL KNOWN DESTINATIONS

                         ACCESS      {ACCOUNT }
                                     {PASSWORD}
                                     {USER    }

                         ACCOUNT     {DESTINATION node-name}
                                     {KNOWN DESTINATIONS   }

                         CALL MASK
                         CALL VALUE

                         GROUP
                         NUMBER
                         PASSWORD
                         PRIORITY
                         SUBADDRESSES
                         USER
```

Description:

Clears values set by the DEFINE MODULE X25-SERVER command.

Example:

```
NETGEN>PURGE MODULE X25-SERVER PASSWORD DESTINATION NEWNOD
NETGEN>
```

RESTORE Command

Syntax:

RESTORE filespec

Description:

Restores an existing DN2Ø configuration file from disk. When you restore a configuration file, the appropriate .MAC files are initialized by NETGEN.

If you have set any Management Parameters (User, Account, Password), they are not restored when you use the RESTORE command. Whenever you change your configuration, use the DEFINE command to set the management parameters and the SAVE and FINISHED commands to retain them.

For PSI installations, the X25-SERVER ACCESS PASSWORD is not restored with the configuration file. If you restore an X.25 configuration file, you must use the DEFINE X25-SERVER command to set the password, and use the SAVE and FINISHED commands to retain the password.

Refer to Section 3.2 for procedures for modifying MCB configuration files.

Argument:

input filespec

Example:

```
NETGEN>RESTORE MARL.CNF
[ Configuration Restored From: MARL.CNF[1ØØ,2ØØ]]
NETGEN>
```

SAVE Command

Syntax:

SAVE filespec

Description:

Saves the current DN2Ø configuration parameters. The output file is named node.CNF, where node is the node name of the MCB node.

Argument:

output file specification

Example:

```
NETGEN>SAVE MARL.CNF
[ Configuration Saved On: MARL.CNF[1ØØ,2ØØ]]
NETGEN>
```

START Command

Syntax:

START

Description:

Engages the user in an interactive dialog to enter node configuration parameters for DN2Øs to configure either MCB software for the DECnet network, or PSI gateway software for the X.25 network.

NETGEN gives warning and fatal error messages as necessary and, if there are no fatal error messages, writes output files to the user's directory. The user may need to give additional configuration commands and end the task with a FINISHED command. NETGEN provides defaults for some parameters when you use the START dialog. Display the defaults by pressing the ESCAPE key.

Refer to Chapter 3 for procedures for defining a DN2Ø node.

TAKE Command

Syntax:

TAKE filespec

Description:

Tells NETGEN to read commands from the specified disk file rather than expecting these commands to be entered from the terminal.

The default file specification is node.CMD, where node is the node name of the MCB to be configured.

Argument:

input filespec

Example:

```
NETGEN>TAKE MARL.CMD
NETGEN>
```

A.6 NETGEN ERROR MESSAGES

This appendix contains error messages that NETGEN displays. These messages can occur when you enter information to NETGEN, or when you try to SAVE the NETGEN files and EXIT from NETGEN.

The first character of each message indicates the severity of the error. The characters and their meanings are:

? = Fatal error

% = Warning message

[= Information message

Some warning messages are not preceded with a flag.

The messages are listed in alphabetical order.

Address Must Be In Range 1 to 255

The specified node address must be in the range 1 to 255.

?Cannot open log file

?Cannot read file after open ok

[Configuration Restored From: filename]

[Configuration Saved On: filename]

?DMC11 is already included, exclude it first

You cannot include a DMC11 more than once.

?DMC11 not in configuration

You have not included a DMC11 in your configuration, so you cannot exclude it.

?DMR11 is already included, exclude it first

You cannot include a DMR11 more than once.

?DMR11 not in configuration

You have not included a DMR11 in your configuration, so you cannot exclude it.

?Error opening restore file

?Error opening save file

?Error Reading Restore File - Data Area Corrupted

?Error writing save file

%Have you issued a SAVE command for this configuration?

The SAVE command saves all your configuration parameters. If you exit from NETGEN without saving the configuration, and discover errors that require you to rerun NETGEN, you will have to configure the node from the initial settings again.

?Illegal character in node name

A node name can contain alphabetic characters and numeric characters only. Special characters are not allowed.

?Illegal to Exclude DMC11 Other Than The Last One Included

To determine the correct number, use the INFORMATION or LIST command.

?Illegal to Exclude DMR11 Other Than The Last One Included

To determine the correct number, use the INFORMATION or LIST command.

?Illegal to Include DMC11s except in Numeric Order

Use the INFORMATION or LIST command to find the last number you included.

?Illegal to Include DMR11s except in Numeric Order

Use the INFORMATION or LIST command to find the last number you included.

?Illegal to Exclude KDP Controller other than last one Included

Use the INFORMATION or LIST command to find the number of the last KDP included.

?Illegal to Include KDP Controllers except in numeric order

Use the INFORMATION or LIST command to find the number of the last KDP included.

?Incorrect DTE20 number

The number you specified is outside the valid range (1 to 3).

?Invalid KDP Controller Number

The number you gave for the KDP controller is outside the valid range (0 to 2).

?Invalid KDP number

The number you gave for the KDP controller is outside the valid range (0 to 2).

?Invalid number of DUP11 lines, must be in range 1-4

The number you gave for the number of DUP11 lines is outside the valid range. Use a value from 1 to 4.

?KDP Controller is already included, exclude it first

You cannot include a KDP controller more than twice.

?KDP not in configuration

You have not included a KDP in your configuration, so you cannot exclude it.

?KDP11 Number Must Be In Range Ø To 2

The number you gave for the KDP controller is outside the valid range (Ø to 2).

?Length Of Save File Differs From Expected Length - Cannot Restore This File

The file specified in a RESTORE command is the wrong length. Check your file specification.

?Logging error

%More than 8 communications lines on a DN2Ø is unsupported.

You have included too many synchronous lines on your DN2Ø.

?Name Must Contain At Least One Alphabetic Character

A node name must contain at least one alphabetic character.

?Name Must Start with Alphabetic Character: "nnn"

A node name cannot begin with a number or special character.

?No such DUP11 in this KDP11

?Number of DMx11 (DMC/DMR) Devices Exceeded - Cannot Add this DMC11

The maximum number of combined DMC11 and DMR11 devices you can include is 6.

?Number of DMx11 (DMC/DMR) Devices Exceeded - Cannot Add this DMR11

The maximum number of combined DMC11 and DMR11 devices you can include is 6.

%Physical address already in use

?Physical Address Must Be In Range 1 To 255

?The Node Address has not been set

Warning message. Runnable software is created if you see this message, but you should set this parameter for each node.

?The node address must be less than or equal to the number of nodes in the net.

The output files are not written. Check your node address. If the address is larger than the number of nodes in the network, your node will be unable to talk to its host, and all loads will fail.

The node address requires a MAXIMUM ADDRESS of at least xxxx

The node address you use and the maximum address you give must be compatible. Correct either one.

?The Node Name has not been set

Runnable software is created if you see this message, but you should set this parameter for each node.

The number of nodes in the net requires a BUFFER SIZE of at least xxxx

The number of nodes in the network and the buffer size you use must be compatible. Change either one or the other.

This system is not supported by DEC

You have created software with parameters outside the allowed ranges. See the documentation describing configuration for the valid ranges.

%Version Mis-Match - File Might Not Be Compatible

Warning message. You have specified a file in a RESTORE command that may be the correct length, but the data in the file may not be compatible with the current software. Check your file specification, or rerun NETGEN.

?You have not configured any communications lines.

This is a fatal error message. If you receive this message, the output files are not written. You have not included any synchronous lines (DMC, DMR, KDP) for your DN2Ø node. The DN2Ø configuration must include at least one synchronous line for communication with the network.

?You have not specified any communications lines.

You must include at least one communications line for any node you are configuring.

?Your DN2Ø has no DTE.

The output files are not written. A DTE-2Ø link between your host and your DN2Ø is required.

APPENDIX B

PSITST

This appendix describes the PSITST program, which is used as a test package and software development tool. You can use PSITST to isolate faults during the installation, or to verify the installation hardware and software components.

PSITST provides a way for users to test communication software during software development. Logging features of PSITST can be used to debug the software being developed, trace data traffic to or from user software, or detect events on a virtual circuit between the user software and PSITST.

PSITST consists of two processes: PSITSB and PSITST. PSITSB is a background process that handles communication with the PPSN. It creates a switched virtual circuit and causes data to be transmitted over that circuit. PSITST is a foreground process that provides you with command interfaces to control activities of the PSITSB background process.

These processes are used to verify installation by testing the following functions:

- Successful completion of outgoing X.25 requests
- Successful processing of incoming X.25 calls
- Data transmission over a virtual circuit
- Virtual call clearing

The two processes communicate through the Interprocess Communication Facility (IPCF) mechanism. A copy of the PSITSB can communicate with only one foreground process PSITST at any one time.

In a normal environment, PSITSB is started by the system and continues in the background as a detached job. You need only to run the foreground process PSITST in order to communicate with your PPSN.

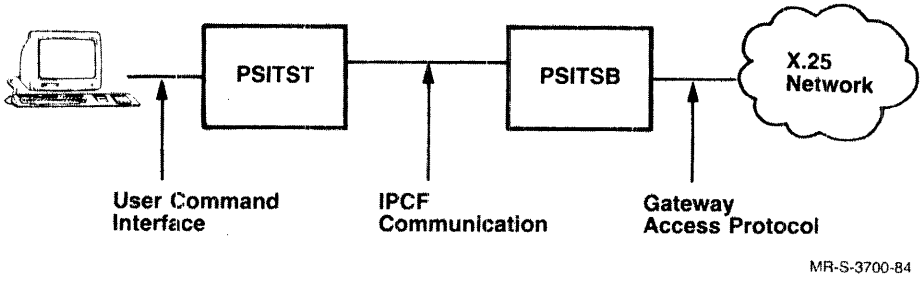


Figure B-1: PSITST Software Components

B.1 RUNNING PSITST

PSITST can run in both a normal and a private environment. In a normal environment, PSITSB is accessible to all users on the system; however, PSITSB cannot be accessed simultaneously by more than one user. You can set up both processes to create a private foreground process in which PSITST communicates with the private background process, PSITSB, only.

B.1.1 Normal Environment

In this environment, assume that PSITSB has been started by the system file, SYSJOB.INI, at startup time and is running as a detached job. To run PSITST, type:

```
.RUN PSITST
```

PSITST responds by displaying a message similar to the following:

```
KL10Ø RN176D Triple System, TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(Ø)  (Normal Environment)
Monday, March 7, 1985 Ø2:19:ØØPM
```

PSITST displays the prompt, PSITST>, when it is ready to receive your commands.

B.1.2 Private Environment

In this environment, it is assumed that you will start both processes beginning with PSITSB. To run PSITSB, type:

```
.GET SYS:PSITSB
Job setup

.D Ø 1 135

.CSTART

.DETACH
From job 29
```

You can now proceed to log into the system as a different job by typing:

```
.LOGIN 100,200
JOB 36 RN176D Triple System TTY126
Password:
Other jobs detached with the same PPN:
   Job 29 PSITSB running
Do you want to ATTACH to this job?  [Y] NO
[LGNJSP Other jobs same PPN:29]

.
```

To run PSITST, type:

```
.GET SYS:PSITST
Job setup

.D 0 1 135

.START
```

PSITST responds by displaying a message similar to the following:

```
KL1010, RN176D Triple System, TOPS-10 Monitor 7.03(00)
TOPS-10 PSI PSITST Version 1.0(0)  (Private Environment)
Monday, March 7, 1985 02:19:00PM
```

PSITST displays the prompt, PSITST>, when it is ready to receive your commands.

B.1.3 Duplicating PSITST Processes

If another user is running PSITST in the normal environment, your copy of PSITST will fail and a message similar to the following will be displayed:

```
KL1010, RN176D Triple System, TOPS-10 Monitor 7.03(00)
TOPS-10 PSI PSITST Version 1.0(0)  (Normal Environment)
Monday, March 7, 1985 02:19:00PM


? PSITST Process Already Exist
? Encountered IPCF Error
```

If this message is displayed in the private environment, it indicates that another copy of PSITST has been initiated by one of your other login jobs.

B.1.4 Missing PSITSB Process

If the PSITSB process is not running when you run the PSITST program, a message similar to the following will be displayed on your screen:

```
KL1Ø1Ø, RN176D Triple System, TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(Ø)  (Normal Environment)
Monday, March 7, 1985 Ø2:19:ØØPM


? PSITST Partner Process Does Not Exist
? Encountered IPCF Error
.
```

B.1.5 GALAXY Compatibility

If your system supports a version of GALAXY that is not compatible with the field image GALAXY, PSITST may fail. If PSITST fails due to incompatible GALAXY software, it displays a message similar to the following and halts:

```
KL1Ø1Ø, RN176D Triple System, TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(Ø)  (Normal Environment)
Monday, March 7, 1985 Ø2:19:ØØPM


Failed to initialize GALAXY
.
```

B.2 ACCESS PORTS

PSITST maintains ten ports for access to the TOPS-1Ø PSI Gateway node. Each port is associated with a virtual circuit. A PSITST port maps to a port in the TOPS-1Ø PSI Gateway as a switched or permanent port. A switched port is associated with a switched virtual circuit. A permanent port is associated with a permanent virtual circuit. The association is defined by the PSITST LISTEN, CALL, and OPEN commands. The CLOSE command ends the association.

A port may be specified by its numeric identification, which ranges from Ø to 9. A collection of ports may also be identified by their characteristics. PSITST maintains three types of ports: known, active, and inactive. A port is considered to be one of the following:

known — when it has been referenced, at least once, by any of the PSITST commands that affect its characteristics and status.

active — when a virtual circuit is currently associated with that port.

inactive — when a virtual circuit is no longer associated with that port.

B.3 INITIALIZATION

You may prepare a set of PSITST commands and save them in the initialization file PSITST.INI in your directory. PSITST executes the commands in this indirect command file every time you run the program. For initial PSI checkout, a copy of PSITST.INI is provided on the distribution tape.

Using the initialization feature is discouraged in the normal environment, as you may unintentionally interfere with another user's PSITSB communication setup.

If all initalizations commands are executed successfully, PSITST displays a message similar to:

```
KL1Ø1Ø, RN176D Triple System, TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(Ø)  (Private Environment)

Monday, March 7, 1985  Ø2:19:ØØPM


Initialization Completed
PSITST>
```

If PSITST fails to execute any of the commands in the initialization file, it notifies you by displaying appropriate messages on the terminal similar to:

```
KL1Ø1Ø, RN176D Triple System, TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(Ø)  (Private Environment)

Monday, March 7, 198  Ø2:19:ØØPM


? Command "LISTEN Ø OBJECT USER" failed

PSITST>
```

B.4 LOGGING

PSITST software keeps track of events, transmitted and received data, and counters for each port. This information can be recorded selectively in a log file for any specific interval.

B.4.1 Log File Contents

The software records the information in the log file DSK:PSITST.LOG. If the log file already exists, the software appends the new information to the current log file. The following information types can be recorded in the log file:

- User commands
- The following events:
  - TOPS-10 priority system interrupt
  - Receipt of call request packet
  - Automatic accept of incoming call
  - Call request being accepted
  - Call request being rejected
  - Permanent virtual circuit being allocated successfully
  - Failure to obtain a permanent virtual circuit
  - Automatic no-communication confirmation on permanent virtual circuit
  - Receipt of reset indication packet
  - Automatic reset confirmation
  - Receipt of reset confirmation packet
  - Switched virtual circuit being cleared due to failure to confirm a reset indication promptly
  - Receipt of interrupt message packet
  - Automatic interrupt confirmation
  - Receipt of interrupt confirmation packet
  - Receipt of clear indication packet
  - Receipt of clear confirmation packet
  - Receipt of corrupted normal data packets
  - Receipt of corrupted qualified data packets
  - Port fatal error, due to loss of communication with the TOPS-10 PSI Gateway node and port state becomes ERROR
- Zeroed counters
- Received accept data
- Received accept facilities
- Received call data
- Received call facilities
- Received reset cause and diagnostic
- Received interrupt data packets
- Received normal data packets
- Received qualified data packets
- Received clear cause and diagnostic
- Received clear data
- Received clear facilities

In the normal environment, the log file is written to the PPN [1,2]. In the private environment, the log file is written to the PPN from which the user starts the background process, PSITSB.

B.4.2 User Command Log Entry

The format of recorded user command is:

```
hh:mm:ss  PSITST> <command>
[PSITST response or error message]
```

where <command> is the user command as typed.

For example:

```
16:19:50  PSITST> CALL 1 REMOTE DTE 311030300012
? Command "CALL 1 REMOTE DTE 311030300012 " failed

16:20:01  PSITST> CALL 1 REMOTE DTE 311080100170

16:29:16  PSITST> SEND 1 NORMAL DATA FILE CRIGHT.TXT.4

16:29:21  PSITST> SHOW * COUNTERS

  Port # 0;  Counters

    Wait For Incoming Calls = 1
    Incoming Calls Accepted = 1
    Received Normal Data Packets = 2
    Received Normal Data Bytes = 177

  Port # 1;  Counters

    Call Requests = 1
    Transmitted Normal Data Packets = 2
    Transmitted Normal Data Bytes = 177
```

B.4.3 Event Log Entry

The format of recorded event is:

```
hh:mm:ss Port   <n>; <event message>
```

where:

<n> is the port number
<event message> is one of the following:

- Accepted Incoming Call
- Confirmed Interrupt Request
- Confirmed Reset Indication
- Switched Circuit Is Denied
- Received Clear Confirmation Packet
- Received Clear Indication Packet
- Fatal Error Condition
- Received Call Connected Packet
- Received Call Request Packet

- o Received Interrupt Confirmation Packet
- o Received Interrupt Packet
- o Permanent Circuit Is Reserved
- o Permanent Circuit Is Denied
- o TOPS-10 Priority System Interrupt Indication
- o Received Reset Confirmation Packet
- o Too Much Delay After Virtual Circuit Reset
- o Received Reset Indication Packet
- o Received Corrupted Normal Data
- o Received Corrupted Qualified Data

For example:

```
11:19:49  Port   0;  Received Incoming Call Packet
11:19:49  Port   0;  Accepted Incoming Call
11:19:49  Port   1;  Received Call Connected Packet
```

B.4.4 Received Data and Facilities Log Entry

```
hh:mm:ss Port   <n>; <data type>, <count> (data)
```

where:

<n> is the port number
<count> is the length of the data in octets
<data type> is one of the following:

- o Received Accept Data
- o Received Accept Facilities
- o Received Call Data
- o Received Call Facilities
- o Received Clear Data
- o Received Clear Facilities
- o Received Interrupt Data Packet
- o Received Normal Data Packet
- o Received Qualified Data Packet

For example:

```
16:29:04  Port # 0;  Received Call Facilities, 8 bytes

      001 000 000 041 005 002 006 010            |...!....  |

16:29:18  Port # 0;  Received Normal Data Packet (More bit), 128
bytes

      124 150 151 163 040 163 157 146 164 167    |This softw|
      141 162 145 040 151 163 040 146 165 162    |are is fur|
      156 151 163 150 145 144 040 165 156 144    |nished und|
      145 162 040 141 040 154 151 143 145 156    |er a licen|
      163 145 040 141 156 144 040 155 141 171    |se and may|
      040 142 145 040 165 163 145 144 040 141    | be used a|
      156 144 040 143 157 160 151 145 144 015    |nd copied.|
      012 157 156 154 171 040 151 156 040 141    |.only in a|
      143 143 157 162 144 141 156 143 145 040    |ccordance |
      167 151 164 150 040 164 150 145 040 164    |with the t|
      145 162 155 163 040 157 146 040 163 165    |erms of su|
      143 150 040 154 151 143 145 156 163 145    |ch license|
      040 141 156 144 040 167 151 164            | and wit  |


16:29:18  Port # 0;  Received Normal Data Packet, 49 bytes

      150 040 164 150 145 040 151 156 143 154    |h the incl|
      165 163 151 157 156 015 012 157 146 040    |usion..of |
      164 150 145 040 141 142 157 166 145 040    |the above |
      143 157 160 171 162 151 147 150 164 040    |copyright |
      156 157 164 151 143 145 056 015 012        |notice... |
```

B.4.5 Clear and Reset Diagnostic Log Entry

The format of the clear and reset diagnostic entry is:

hh:mm:ss Port <n>; <type> Cause <cause>, Diagnostic <diagnostic>

where:

<n> is the port number
<type> is the diagnostic type (Clear or Reset)
<cause> is the value of the cause byte in octal and decimal
<diagnostic> is the value of the diagnostic byte in octal and decimal

Example:

```
16:30:11  Port # 0;  Reset Cause 000 (0), Diagnostic 377 (255)

16:30:35  Port # 0;  Clear Cause 000 (0), Diagnostic 177 (127)
```

B.4.6 Examples

The following three examples show the type of entries you might see for successful and unsuccessful transmissions.

Example 1:

The following example shows the type of entries you might see with a successful connection on Port Ø, a call on Port 1, and a successful transmission of data.

```
Node KL1Ø1Ø - KL1Ø1Ø, RC7Ø3 7.Ø3, TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(5)  (Normal Environment)
Monday, October 15, 1985  Ø9:21:ØØAM


Ø9:21:Ø9  PSITST> ENABLE Ø LOGGING ALL

Ø9:21:1Ø  PSITST> DISABLE Ø LOGGING PRIORITY SYSTEM INTERRUPT

Ø9:21:12  PSITST> ENABLE 1 LOGGING ALL

Ø9:21:13  PSITST> DISABLE 1 LOGGING PRIORITY SYSTEM INTERRUPT

Ø9:21:14  PSITST> SET Ø OBJECT X25TST

Ø9:21:15  PSITST> ENABLE Ø AUTOMATIC ACCEPT INTERRUPT
CONFIRMATION
RESET CONFIRMATION

Ø9:21:16  PSITST> SET 1 NETWORK TELENET

Ø9:21:17  PSITST> SET 1 REMOTE DTE 311Ø6Ø7Ø1234

Ø9:21:18  PSITST> LISTEN Ø

Ø9:21:24  PSITST> CALL 1

Ø9:21:25  Port # Ø;  Received Call Request Packet

Ø9:21:25  Port # Ø;  Received Call Facilities, 8 bytes

      ØØ1 ØØØ ØØØ Ø41 Ø05 Ø02 Ø06 Ø1Ø           |...!....  |

Ø9:21:25  Port # Ø;  Accepted Incoming Call

Ø9:21:25  Port # 1;  Received Call Connected Packet

Ø9:21:25  Port # 1;  Received Accept Facilities, 6 bytes

      ØØØ Ø41 Ø05 Ø02 Ø06 Ø1Ø                   |.!....    |
```

```
09:21:29   PSITST> SHOW * STATUS

  Port # 0;  Status

    Network = TELENET
    Object Identification = X25TST
    Port State = Running
    Error State Detail = None
    Last Port Request = Accept Incoming Call
    Last Request Error = None
    Network Data = None
    Network Interrupt = None

  Port # 1;  Status

    Network = TELENET

    Port State = Running
    Error State Detail = None
    Last Port Request = Read Accept Data
    Last Request Error = No Data To Read
    Network Data = None
    Network Interrupt = None

09:21:31   PSITST> SEND 1 NORMAL DATA STRING "ABCDEFGHIJKLMNOP
QRSTUVWXYZ012345678 9",15,12 COUNT 25

09:21:31   Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124     |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063     |UVWXYZ0123|
      064 065 066 067 070 071 015 012             |456789..  |


09:21:32   Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124     |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063     |UVWXYZ0123|
      064 065 066 067 070 071 015 012             |456789..  |


09:21:32   Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124     |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063     |UVWXYZ0123|
      064 065 066 067 070 071 015 012             |456789..  |


09:21:32   Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124     |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063     |UVWXYZ0123|
      064 065 066 067 070 071 015 012             |456789..  |


09:21:33   Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124     |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063     |UVWXYZ0123|
      064 065 066 067 070 071 015 012             |456789..  |
```

```
Ø9:21:33  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:33  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:33  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:34  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:34  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:34  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:34  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:35  Port # Ø;  Received Normal Data Packet, 38 bytes

     1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
     113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
     125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
     Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |
```

```
Ø9:21:35  Port # Ø;  Received Normal Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:35  Port # Ø;  Received Normal Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:35  Port # Ø;  Received Normal Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:36  Port # Ø;  Received Normal Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:36  Port # Ø;  Received Normal Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFG IJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:36  Port # Ø;  Received Normal Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:37  Port # Ø;  Received Norma Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |

Ø9:21:37  Port # Ø;  Received Normal Data Packet, 38 bytes

        1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112    |ABCDEFGHIJ|
        113 114 115 116 117 12Ø 121 122 123 124    |KLMNOPQRST|
        125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63    |UVWXYZØ123|
        Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12            |456789..  |
```

```
09:21:37  Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112    |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124    |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063    |UVWXYZ0123|
      064 065 066 067 070 071 015 012            |456789..  |


09:21:37  Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112    |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124    |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063    |UVWXYZ0123|
      064 065 066 067 070 071 015 012            |456789..  |


09:21:38  Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112    |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124    |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063    |UVWXYZ0123|
      064 065 066 067 070 071 015 012            |456789..  |


09:21:38  Port # 0;  Received Normal Data Packet, 38 bytes

      101 102 103 104 105 106 107 110 111 112    |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124    |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063    |UVWXYZ0123|
      064 065 066 067 070 071 015 012            |456789..  |


09:21:46  PSITST> SHOW * DATA

  Port # 0;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal
    Received Normal Data Packet = 38 bytes
      101 102 103 104 105 106 107 110 111 112    |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124    |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063    |UVWXYZ0123|
      064 065 066 067 070 071 015 012            |456789..  |
    Last Data Reception Error = No Data To Read

  Port # 1;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal
    Transmitted Normal Data = 38 bytes
      101 102 103 104 105 106 107 110 111 112    |ABCDEFGHIJ|
      113 114 115 116 117 120 121 122 123 124    |KLMNOPQRST|
      125 126 127 130 131 132 060 061 062 063    |UVWXYZ0123|
      064 065 066 067 070 071 015 012            |456789..  |
```

```
Ø9:21:47  PSITST> SHOW * COUNTERS

  Port # Ø;  Counters

    Wait For Incoming Calls = 1
    Incoming Calls Accepted = 1
    Received Normal Data Packets = 25
    Received Normal Data Bytes = 95Ø

  Port # 1;  Counters

    Call Requests = 1
    Transmitted Normal Data Packets = 25
    Transmitted Normal Data Bytes = 95Ø

Ø9:21:48  PSITST> RESET 1 DIAGNOSTIC 377

Ø9:21:49  Port # Ø;  Received Reset Indication Packet

Ø9:21:49  Port # Ø;  Reset Cause ØØØ (Ø), Diagnostic 377 (255)

Ø9:21:49  Port # Ø;  Confirmed Reset Indication

Ø9:21:49  Port # 1;  Received Reset Confirmation Packet

Ø9:21:53  PSITST> SHOW 1 STATUS

  Port # 1;  Status

    Network = TELENET
    Port State = Running
    Error State Detail = None
    Last Port Request = Read Port Status
    Last Request Error = None
    Network Data = None
    Network Interrupt = None


Ø9:21:54  PSITST> SEND 1 INTERRUPT REQUEST 377

Ø9:21:55  Port # Ø;  Received Interrupt Packet

Ø9:21:55  Port # Ø;  Received Interrupt Data Packet, 1 byte

      377                                          |.          |


Ø9:21:55  Port # Ø;  Confirmed Interrupt Request

Ø9:21:55  Port # 1;  Received Interrupt Confirmation Packet
```

```
Ø9:22:ØØ  PSITST> SHOW 1 DATA

  Port # 1;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Transmitted Reset Diagnostic = 377 (255)
    Data Transmission = Normal
    Transmitted Interrupt Byte = 377 (255)
    Transmitted Normal Data = 38 bytes
      1Ø1 1Ø2 1Ø3 1Ø4 1Ø5 1Ø6 1Ø7 11Ø 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 12Ø 121 122 123 124     |KLMNOPQRST|
      125 126 127 13Ø 131 132 Ø6Ø Ø61 Ø62 Ø63     |UVWXYZØ123|
      Ø64 Ø65 Ø66 Ø67 Ø7Ø Ø71 Ø15 Ø12              |456789..  |

Ø9:22:ØØ  PSITST> CLEAR 1 DIAGNOSTIC 377

Ø9:22:Ø1  Port # Ø;  Received Clear Indication Packet

Ø9:22:Ø1  Port # Ø;  Clear Cause ØØØ (Ø), Diagnostic 377 (255)

Ø9:22:Ø1  Port # 1;  Received Clear Confirmation Packet

Ø9:22:11  PSITST> CLOSE Ø, 1

Ø9:22:12  PSITST> DISABLE Ø LOGGING ALL

Ø9:22:13  PSITST> DISABLE 1 LOGGING ALL
```

Example 2:

The following example shows an unsuccessful connection due to an incorrect password. If this happens, you should check your server access password, defined in the X25CNF.BNF file, to make sure the password is correct.

```
Node KL1Ø1Ø - KL1Ø1Ø, RC7Ø3 7.Ø3  TOPS-1Ø Monitor 7.Ø3(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(5)  (Normal Environment)
Monday, October 15, 1985  Ø9:36:36AM


Ø9:36:36  PSITST> ENABLE Ø LOGGING ALL

Ø9:36:37  PSITST> DISABLE Ø LOGGING PRIORITY SYSTEM INTERRUPT

Ø9:36:39  PSITST> ENABLE 1 LOGGING ALL

Ø9:36:4Ø  PSITST> DISABLE 1 LOGGING PRIORITY SYSTEM INTERRUPT

Ø9:36:41  PSITST> SET Ø OBJECT X25TST

Ø9:36:41  PSITST> ENABLE Ø AUTOMATIC ACCEPT INTERRUPT
CONFIRMATION
RESET CONFIRMATION

Ø9:36:43  PSITST> SET 1 NETWORK TELENET

Ø9:36:44  PSITST> SET 1 REMOTE DTE 311Ø6Ø7Ø1234

Ø9:36:45  PSITST> LISTEN Ø
```

```
Ø9:36:51  PSITST> CALL 1
? Command "CALL 1" failed

Ø9:36:56  PSITST> SHOW * STATUS

  Port # Ø;  Status

    Object Identification = X25TST
    Port State = Listening
    Error State Detail = None
    Last Port Request = Read Port Status
    Last Request Error = None
    Network Data = None
    Network Interrupt = None

  Port # 1;  Status

    Network = TELENET
    Port State = Undefined
    Last Port Request = Initiate Switched Circuit
    Last Request Error = Illegal Network Access Code


Ø9:36:57  PSITST> SEND 1 NORMAL DATA STRING "ABCDEFGHIJKLMNOPQRST
UVWXYZØ123456789",15,12 COUNT 25
? Illegal port state for requested function
? Command "SEND 1 NORMAL DATA STRING "ABCDEFGHIJKLMNOPQRSTUVWXYZØ
123456789",15,12 COUNT 25" failed


Ø9:37:12  PSITST> SHOW * DATA

  Port # Ø;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal

  Port # 1;  Data

    More Bit Setting = Enabled
    Data Transmission = Normal


Ø9:37:14  PSITST> SHOW * COUNTERS

  Port # Ø;  Counters

    Wait For Incoming Calls = 1

  Port # 1;  Counters

    No Information
```

```
Ø9:37:15  PSITST> RESET 1 DIAGNOSTIC 377
? Illegal port state for requested function
? Command "RESET 1 DIAGNOSTIC 377" failed

Ø9:37:2Ø  PSITST> SHOW 1 STATUS

  Port # 1;  Status


    Network = TELENET
    Port State = Undefined
    Last Port Request = Initiate Switched Circuit
    Last Request Error = Illegal Network Access Code


Ø9:37:21  PSITST> SEND 1 INTERRUPT REQUEST 377
? Illegal port state for requested function
? Command "SEND 1 INTERRUPT REQUEST 377" failed

Ø9:37:26  PSITST> SHOW 1 DATA

  Port # 1;  Data

    More Bit Setting = Enabled
    Data Transmission = Normal


Ø9:37:27  PSITST> CLEAR 1 DIAGNOSTIC 377
? Illegal port state for requested function
? Command "CLEAR 1 DIAGNOSTIC 377" failed

Ø9:37:37  PSITST> CLOSE Ø, 1

Ø9:37:38  PSITST> DISABLE Ø LOGGING ALL

Ø9:37:39  PSITST> DISABLE 1 LOGGING ALL
```

Example 3:

The following example shows an unsuccessful connection because the network is down.

```
Node KL1Ø1Ø - K11Ø1Ø, RC7Ø2 7.Ø2, TOPS-1Ø Monitor 7.Ø2(ØØ)
TOPS-1Ø PSI PSITST Version 1.Ø(5)  (Normal Environment)
Monday, October 15, 1984  Ø9:41:17AM


Ø9:41:17  PSITST> ENABLE Ø LOGGING ALL

Ø9:41:18  PSITST> DISABLE Ø LOGGING PRIORITY SYSTEM INTERRUPT

Ø9:41:19  PSITST> ENABLE 1 LOGGING ALL

Ø9:41:2Ø  PSITST> DISABLE 1 LOGGING PRIORITY SYSTEM INTERRUPT

Ø9:41:21  PSITST> SET Ø OBJECT X25TST

Ø9:41:22  PSITST> ENABLE Ø AUTOMATIC ACCEPT INTERRUPT
CONFIRMATION
RESET CONFIRMATION
```

```
Ø9:41:24  PSITST> SET 1 NETWORK TELENET

Ø9:41:25  PSITST> SET 1 REMOTE DTE 311Ø60701234

Ø9:41:26  PSITST> LISTEN Ø

Ø9:41:32  PSITST> CALL 1

Ø9:41:32  Port # 1;  Switched Circuit Is Denied

Ø9:41:37  PSITST> SHOW * STATUS

  Port # Ø;  Status

    Object Identification = X25TST
    Port State = Listening
    Error State Detail = None
    Last Port Request = Read Port Status
    Last Request Error = None
    Network Data = None
    Network Interrupt = None

  Port # 1;  Status

    Network = TELENET
    Port State = Error
    Error State Detail = No Communication With The Public Network
    Last Port Request = Read Port Status
    Last Request Error = None
    Network Data = None
    Network Interrupt = None


Ø9:41:38  PSITST> SEND 1 NORMAL DATA STRING"ABCDEFGHIJKLMNOPQRSTU
VWXYZØ1234567 89",15,12 COUNT 25
? Illegal port state for requested function
? Command "SEND 1 NORMAL DATA STRING"ABCDEFGHIJKLMNOPQRSTUVWXYZØ1
23456789",15,12 COUNT 25" failed


Ø9:41:53  PSITST> SHOW * DATA

  Port # Ø;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal

  Port # 1;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal
```

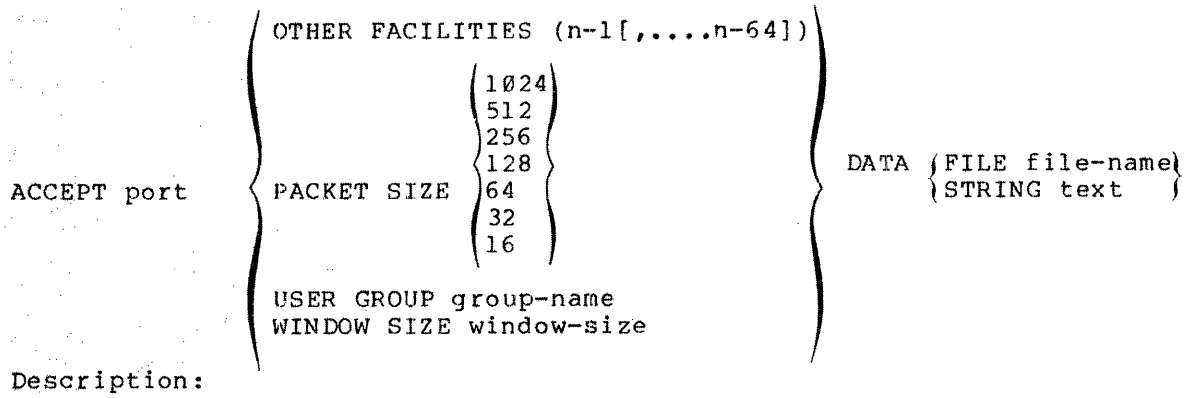
```
09:41:54  PSITST> SHOW * COUNTERS

  Port # 0;  Counters

    Wait For Incoming Calls = 1

  Port # 1;  Counters

    Call Requests = 1
    Port Errors = 1

09:41:55  PSITST> RESET 1 DIAGNOSTIC 377
? Illegal port state for requested function
? Command "RESET 1 DIAGNOSTIC 377" failed

09:42:01  PSITST> SHOW 1 STATUS

  Port # 1;  Status

    Network = TELENET
    Port State = Error
    Error State Detail = No Communication With The Public Network
    Last Port Request = Read Port Status
    Last Request Error = None
    Network Data = None
    Network Interrupt = None

09:42:02  PSITST> SEND 1 INTERRUPT REQUEST 377
? Illegal port state for requested function
? Command "SEND 1 INTERRUPT REQUEST 377" failed

09:42:07  PSITST> SHOW 1 DATA

  Port # 1;  Data

    More Bit Setting = Enabled
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Data Transmission = Normal

09:42:08  PSITST> CLEAR 1 DIAGNOSTIC 377
? Illegal port state for requested function
? Command "CLEAR 1 DIAGNOSTIC 377" failed

09:42:18  PSITST> CLOSE 0, 1

09:42:19  PSITST> DISABLE 0 LOGGING ALL

09:42:20  PSITST> DISABLE 1 LOGGING ALL
```

B.5 PSITST COMMANDS

The syntax for the individual PSITST commands is described on the following pages in this chapter. Commands are presented in alphabetical order.

ACCEPT Command

Syntax:



Description:

Accepts incoming virtual calls.

If you do not specify the facilities parameters, PSITST uses the current definitions of those defined by the SET command to build the call accept packet. Use the SHOW FACILITIES command to determine the defined facilities parameters.

If you do not specify the user data, PSITST uses the current definition of the accept data defined by the SET command to build the call accept packet. Use the SHOW DATA command to determine the defined user data.

Arguments:

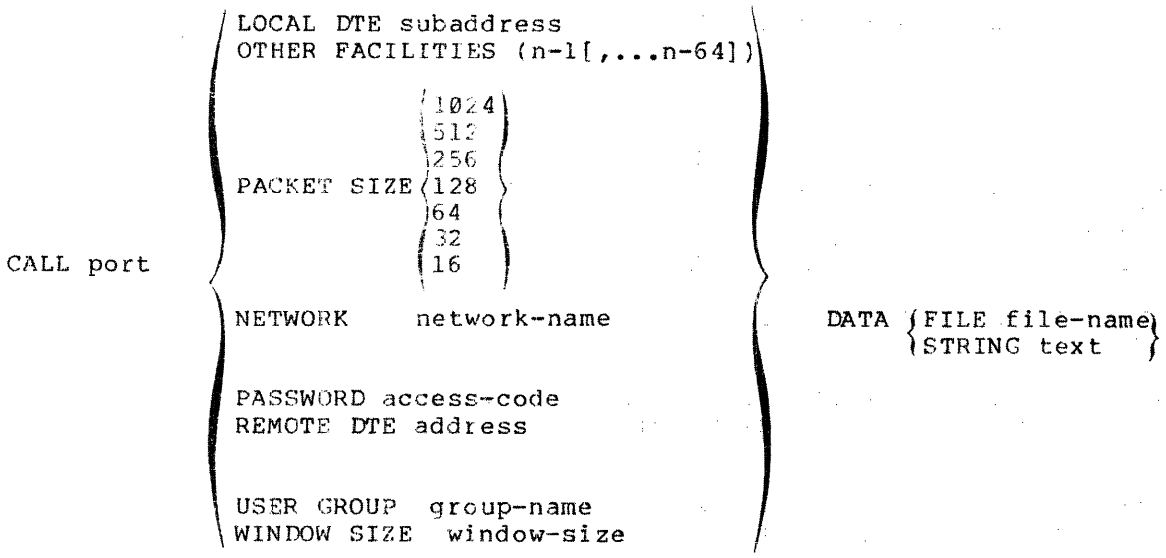
File-name	ASCII file name from which PSITST gets the accept data. PSITST reads from the file either the first 128 characters or to the end of the file, whichever is shorter, and uses the text as the accept data.
Group-name	Name of the Bilateral Closed User Group or Closed User Group.
(n-1[,...n-64])	Optional facilities permissible on your PPSN. PSITST does not attempt to check the validity of the facilities. You must enter this value as octal represention of an 8-bit byte.
Port	Port number, Ø to 9.
Text	Octal representation of 8-bit byte, quoted and unquoted string of up to 128 characters. An unquoted string is allowed only as the last element in a list and must be terminated with a carriage return.
Window-size	Window size of the virtual circuit, 2 to 127.

Examples

```
PSITST> ACCEPT Ø PACKET SIZE 256 WINDOW SIZE 7
PSITST> ACCEPT 2 DATA STRING 12,"Testing",15,12,Ø
PSITST>
```

CALL Command

Syntax:



Description:

Initiates a switched virtual circuit.

If you do not specify the network related parameters, PSITST uses the current definitions of those defined by the SET command to build the call request packet. To initiate a switched virtual circuit successfully, you must supply at least the NETWORK and REMOTE DTE parameters. Use the SHOW CHARACTERISTICS command to determine the defined network related parameters.

If you do not specify the facilities parameters, PSITST uses the current definitions of those defined by the SET command to build the call request packet. Use the SHOW FACILITIES command to determine the defined facilities parameters.

If you do not specify the user data, PSITST uses the current definition of the call data defined by the SET command to build the call request packet. Use the SHOW DATA command to determine the defined user data.

Arguments:

Access-code	Password for accessing the TOPS-10 PSI Gateway node. The access-code must be an alphanumeric string, 1 to 39 characters.
Address	Destination's full DTE address. The address must be a numeric string, 1 to 15 digits.
File-name	ASCII file from which PSITST receives the CALL data. PSITST reads either the first 128 characters from the file or to the end of the file, whichever is shorter, and uses the text as the call data.

CALL Command (Cont.)

Group-name	Name of the Bilateral Closed User Group or Closed User Group.
Network-name	PPSN with which you wish to communicate. The network-name must be an alphanumeric string of 1 to 39 characters.
(n-1[,...n-64])	Optional facilities permissible on your PPSN. PSITST does not attempt to check for the validity of all facilities. The value must be entered as an octal representation of an 8-bit byte.
Port	Port number, Ø to 9.
Subaddress	Local DTE subaddress. Numeric string, 1 to 15 digits.
Text	Octal representation of 8-bit byte, quoted and unquoted strings, 1 to 128 characters. An unquoted string is allowed only as the last element of a list, and must be terminated by a carriage return.
Window-size	Window size of the virtual circuit, 2 to 127.

Example:

```
PSITST> CALL 1 NETWORK TELENET REMOTE DTE 3110617000480Ø2
PSITST>
```

CLEAR Command

Syntax:

```
CLEAR port {[DIAGNOSTIC c-diagnostic]                    } DATA {FILE file  }
           {OTHER FACILITIES (n-1[,...n-64])}                   {STRING text}
           {USER GROUP group-name           }
```

Description:

Clears a switched virtual circuit.

If you do not specify the diagnostic code, PSITST uses the current value defined by the SET command to build the clear request packet. Use the SHOW DATA command to determine the value of the clear diagnostic code. If a diagnostic code is not set, the clear diagnostic byte is zero.

If you do not specify the facilities parameters, PSITST uses the current definitions of those defined by the SET command to build the clear request packet. Use the SHOW FACILITIES command to determine the defined facilites parameters.

If you do not specify the user data, PSITST uses the current definition of the clear data defined by the SET command to build the clear request packet. Use the SHOW DATA command to determine the defined user data.

Arguments:

C-diagnostics	Octal representation of the user clear diagnostic code, Ø to 377.
File	ASCII file from which PSITST receives the clear data. PSITST reads either the first 128 characters or to the end of the file, whichever is shorter, and uses the text as the clear data.
Group-name	Name of the Bilateral Closed User Group or Closed User Group.
(n-1[,...n-64])	Optional facilities permissible on your PPSN. PSITST does not attempt to check the validity of all facilities. You must enter the value as octal representation of an 8-bit byte.
Port	Port number, Ø to 9.
Text	Octal representation of 8-bit bytes, quoted or unquoted string, 1 to 128 characters. An unquoted string can be the last element in a list and must be terminated with a carriage return.

Example:

```
PSITST> CLEAR 1 DIAGNOSTIC 377 DATA STRING 7,Testing
PSITST>
```

CLOSE Command

Syntax:

CLOSE port

Description:

The CLOSE command is used to terminate port access.

The accumulated information of the port activities, events, and counters, remains unchanged regardless of the number of times the port becomes active or inactive.

The data and information that the port received while it was active (for example, call facilities, call user data, normal and qualified data, etc.) and volatile data (those that change from one circuit to another, for example, packet size and user group) are cleared from the port data base when the port is closed. Others remain unchanged.

Argument:

Port	List of one or more port numbers, separated by commas, or an asterisk (*) to indicate known and inactive ports. The port number ranges from Ø to 9. A port is considered to be inactive if the port state is CLEARED or ERROR.

Examples:

```
PSITST> CLOSE Ø,3,9
PSITST> CLOSE *
PSITST>
```

CONTINUE Command

Syntax:

CONTINUE port DATA TRANSMISSION

Description:

Resumes current data transmission of a virtual circuit.

Argument:

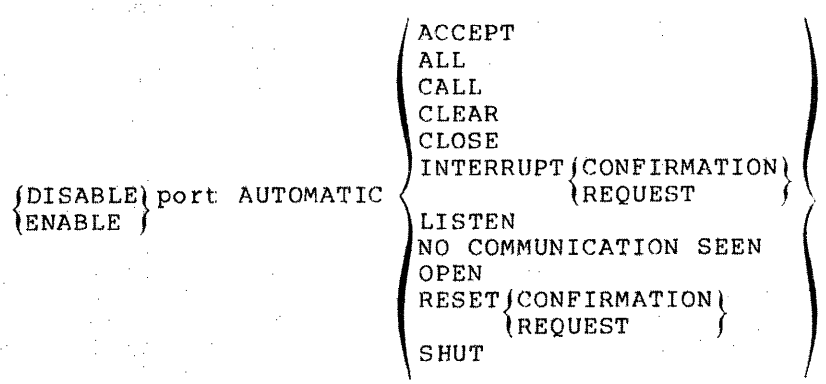
Port	Port number, Ø to 9.

Example:

```
PSITST> CONTINUE Ø DATA TRANSMISSION
PSITST>
```

ENABLE/DISABLE AUTOMATIC Command

Syntax:



Description:

Allows you to control the activities of the virtual circuit automatically. The automatic activities can be enabled or disabled at any time.

The following automatic commands can be enabled simultaneously.

- Automatic ACCEPT allows a listening port (see LISTEN command) to accept an incoming call unconditionally at the earliest convenience. PSITST uses the parameters defined by the SET command to build the call accept packet (see ACCEPT command).

- Automatic CLEAR allows a clear request of a switched virtual circuit to be initiated as soon as the circuit is established successfully (port state changes from CALLING or CALLED to RUNNING). PSITST uses the parameters defined by the SET command to build the clear request packet (see CLEAR command).

  If you enable automatic CLEAR while the port is active, the request may not take effect until access to the port is terminated and another switched virtual circuit is initiated for that port.

  See the description of multiple automatic requests following this list.

- Automatic INTERRUPT CONFIRMATION allows the port to confirm the receipt of each interrupt request packet at the earliest convenience (see SEND INTERRUPT CONFIRMATION command).

- Automatic INTERRUPT REQUEST allows an interrupt request packet to be sent to the remote destination as soon as the virtual circuit is established successfully (port state changes from CALLING, CALLED, or OPEN to RUNNING). PSITST uses the parameters defined by the SET command to build the interrupt request packet (see SEND INTERRUPT REQUEST command).

  If you enable automatic INTERRUPT REQUEST while the port is active, the request may not take effect until access to the port is terminated and another virtual circuit is initiated for that port. See below for description of multiple automatic requests.

ENABLE/DISABLE AUTOMATIC Command (Cont.)

- Automatic NO COMMUNICATION SEEN allows a port to confirm the NO COMMUNICATION state on a permanent virtual circuit (see NO COMMUNICATION SEEN command).

- Automatic RESET CONFIRMATION allows a port to confirm the reset of the virtual circuit at the earliest convenience (see RESET command).

- Automatic RESET REQUEST allows a reset request packet to be initiated as soon as the virtual circuit is established successfully (port state changes from CALLING, CALLED, or OPEN to RUNNING). PSITST uses the parameters defined by the SET command to build the reset request packet (see RESET command).

  If you enable automatic RESET REQUEST while the port is active, the request may not take effect until access to the port is terminated and another virtual circuit is initiated for that port.

- Automatic SHUT allows a permanent port to be closed as soon as the circuit is established successfully (port state changes from OPEN to RUNNING).

  If you enable automatic SHUT while the port is active, the request may not take effect until access to the port is terminated and another permanent virtual circuit is initiated for that port.

Multiple Automatic Requests

If automatic INTERRUPT REQUEST, RESET REQUEST, and CLEAR or SHUT, or any combinations of those are enabled simultaneously for a port, when the port state becomes RUNNING the following events will take place in the following order:

1. If automatic RESET REQUEST is enabled, PSITST transmits a reset request packet on the specified port and waits for the confirmation. PSITST only proceeds to the next steps after the receipt of the reset confirmation packet.

   If the remote system initiates a reset on the permanent virtual circuit before PSITST does, and automatic RESET REQUEST and CONFIRMATION are enabled simultaneously, RESET CONFIRMATION overrides RESET REQUEST. If automatic RESET CONFIRMATION is not enabled, the automatic RESET REQUEST will then be analogous to the RESET CONFIRMATION command.

   For a switched virtual circuit, if the RESET REQUEST is not confirmed in time and consequently the circuit is cleared, the remaining steps are invalidated.

2. If automatic INTERRUPT REQUEST is enabled, PSITST transmits an interrupt request packet on the specified port and wait for the confirmation. PSITST only proceeds to the next step after the receipt of the interrupt confirmation packet.

3. If automatic CLEAR is enabled, PSITST transmits a clear request packet on the specified switched port. If automatic SHUT is enabled, PSITST terminates access to a permanent port.

ENABLE/DISABLE AUTOMATIC Command (Cont.)

While the above automatic activities are being carried out by PSITST, you may choose to disable any of the remaining requests that PSITST has not executed. Similarly, while PSITST is executing the above automatic activities in the specified order, you may choose to enable any of the requests that PSITST has not evaluated. For example, if PSITST executed the RESET REQUEST and is waiting for the reset confirmation before proceeding to the automatic INTERRUPT REQUEST, you may enable or disable the automatic INTERRUPT REQUEST at that moment. However, if PSITST is executing the automatic INTERRUPT REQUEST, enabling or disabling the automatic RESET REQUEST will not take effect since PSITST already evaluated the setting of that automatic command (and may have carried out the request, if it was enabled).

The following commands may be enabled only one at a time. When you enable any one of the commands, it will supersede the one currently enabled.

- Automatic LISTEN allows an inactive switched port to be set up to receive an incoming call. A switched port is considered to be inactive when the port state is CLEARED or ERROR. PSITST uses the parameters defined by the SET command to initialize the port (see LISTEN command).

- Automatic CALL allows a switched virtual circuit to be initiated on an inactive switched port. A switched port is considered to be inactive when the port state is CLEARED or ERROR. PSITST uses the parameters defined by the SET command to build the call request packet (see CALL command).

- Automatic OPEN allows a permanent virtual circuit to be initiated on an inactive permanent port. A permanent port is considered to be inactive when the port state is ERROR. PSITST uses the parameters defined by the SET command to initiate the permanent circuit (see OPEN command).

- Automatic CLOSE allows access to an inactive port to be terminated. A port is considered to be inactive when the port state is CLEARED or ERROR (see CLOSE command).

The ALL keyword, when used with the DISABLE command, will disable all of the above automatic activities.

The ALL keyword, when used with the ENABLE command, will enable all of the above automatic activities except the LISTEN, CALL, OPEN, and CLOSE commands. You have to enable those commands individually.

Argument:

Port is a port number, Ø to 9.

Examples:

```
PSITST> ENABLE Ø AUTOMATIC ACCEPT INTERRUPT CONFIRMATION
PSITST> DISABLE 1 AUTOMATIC ALL
PSITST>
```

ENABLE/DISABLE ECHOING Command

Syntax:

```
{DISABLE}                {ALL      }
{ENABLE } port  ECHOING  {DATA     }
                         {INTERRUPT}
```

Description:

ENABLE echoes the data and interrupt packets, as PSITST receives them, back to the sender on the same circuit. DISABLE prevents this echoing.

When you are transmitting data on a circuit, PSITST will not allow you to enable the echoing of data packets you received.

When the echoing of interrupt packets is enabled and you have transmitted an interrupt message to a remote system that did not confirme that interrupt, PSITST will not echo the next received interrupt packets until the outstanding interrupt is confirmed.

Argument:

Port	Port number, Ø to 9.

Examples:

```
PSITST> ENABLE Ø ECHOING DATA
PSITST> DISABLE 1 ECHOING ALL
PSITST>
```

ENABLE/DISABLE LOGGING Command

Syntax:

```
{DISABLE}  port  LOGGING  ⟨ ACCEPT {DATA       }                          ⟩
{ENABLE }                 ⟨       {FACILITIES}                          ⟩
                          ⟨ ALL                                         ⟩
                          ⟨ CALL {DATA       }                          ⟩
                          ⟨      {FACILITIES}                          ⟩
                          ⟨       {CAUSE AND DIAGNOSTIC}               ⟩
                          ⟨ CLEAR {DATA                 }              ⟩
                          ⟨       {FACILITIES           }              ⟩
                          ⟨ COUNTERS                                    ⟩
                          ⟨ EVENTS                                      ⟩
                          ⟨ INTERRUPT DATA                              ⟩
                          ⟨ NORMAL DATA                                 ⟩
                          ⟨ PRIORITY SYSTEM INTERRUPT                   ⟩
                          ⟨ QUALIFIED DATA                              ⟩
                          ⟨ RESET CAUSE AND DIAGNOSTIC                  ⟩
```

Description:

Records the events, data, and counters of the ports you select to be recorded in the log file DSK:PSITST.LOG. You can select the port, the type of information, and when to record.

While logging is enabled for one or more ports, all user commands and PSITST responses to those commands are also recorded.

When you first enable logging of interrupt data, PSITST will start logging the last interrupt data byte, if it has received one, and subsequent interrupt data bytes on the virtual circuit. If logging of interrupt data has been enabled, repeated enabling will not cause PSITST to log the last received interrupt byte.

Note that if you specify ALL information to be recorded for any port, the performance of PSITST will be considerably less desirable due to the overhead of output activities to the log file.

Argument:

Port	Port number, Ø to 9.

Examples:

```
PSITST> ENABLE Ø LOGGING EVENTS
PSITST> DISABLE 1 LOGGING ALL
```

ENABLE/DISABLE MORE BIT Command

Syntax:

```
{DISABLE} port  MORE BIT SET
{ENABLE }
```

Description:

Forces the More Bit in each full data packet to be set. The enforcement of the setting (or not setting) of the More Bit is applicable only when the SEND command causes a sequence of data packets to be transmitted on the virtual circuit. In such a sequence, each data packet, except the last one, is a full packet. The last data packet can be a full or partial packet (the X.25 recommendation prohibits a partial data packet from having its More Bit set).

The SEND command may cause more than one sequence of data packets to be transmitted (for example, if the text data is longer than the current packet size (128) and 2 copies of the data are to be transmitted on the virtual circuit). PSITST divides the text into smaller segments before transmission. If the last segment is shorter than 128, the 2 copies of the data are transmitted as 2 sequences of data packets. However, if the last segment is exactly 128 octets long, the 2 copies of the data are transmitted as one contiguous sequence of data packets.

If the setting of the More Bit is enabled, each full data packet, except the last one of the sequence, has the More Bit set. This is done to indicate that all data packets in such a sequence are logically related. The relationship is left to be interpreted by the communicating parties.

If the setting of the More Bit is disabled, all data packets are transmitted with the More Bit not set.

By default, the setting of the More Bit is enabled.

Argument:

Port	Port number, Ø to 9.

Example:

```
PSITST> DISABLE Ø MORE BIT SET
PSITST>
```

EXIT Command

Syntax:

EXIT [CHECKPOINT]

Description:

Terminates PSITST. This command does not terminate the activities of the background process PSITSB. The background process continues running independently.

The CHECKPOINT parameter is applicable only if logging has been enabled for one or more ports. The current status, characteristics, data, and counters of the ports are recorded in the log file.

Example:

```
PSITST> EXIT
```

LISTEN Command

Syntax:

LISTEN port OBJECT {object-name | object-number}

Description:

Initiates a port to wait for an incoming call.

If you do not specify an object identification, PSITST uses the current value defined by the SET command. Use the SHOW CHARACTERISTICS command to determine the value of the object identification.

Arguments:

Object-number	The object-numbers 1 to 127 are reserved for DECnet system tasks and require system privileges. Object numbers 128 to 255 are available to all tasks.
Object-name	Alphanumeric string of 1 to 16 characters that must begin with an alphabetic character. Hyphens (-), dollar signs ($), and underscores (_) are allowed.
Port	Port number, Ø to 9.

Example:

```
PSITST> LISTEN Ø OBJECT USER
PSITST>
```

NO COMMUNICATION SEEN Command

Syntax:

NO COMMUNICATION SEEN port

Description:

Confirms the NO COMMUNICATION state of a permanent virtual circuit.

Argument:

Port	Port number, Ø to 9.

Example:

```
PSITST> NO COMMUNICATION SEEN Ø
PSITST>
```

OPEN Command

Syntax:

```
OPEN   port  {CIRCUIT  circuit-name }
             {NETWORK  network-name }
             {PASSWORD access-code  }
```

Description:

Initiates a permanent virtual circuit.

Arguments:

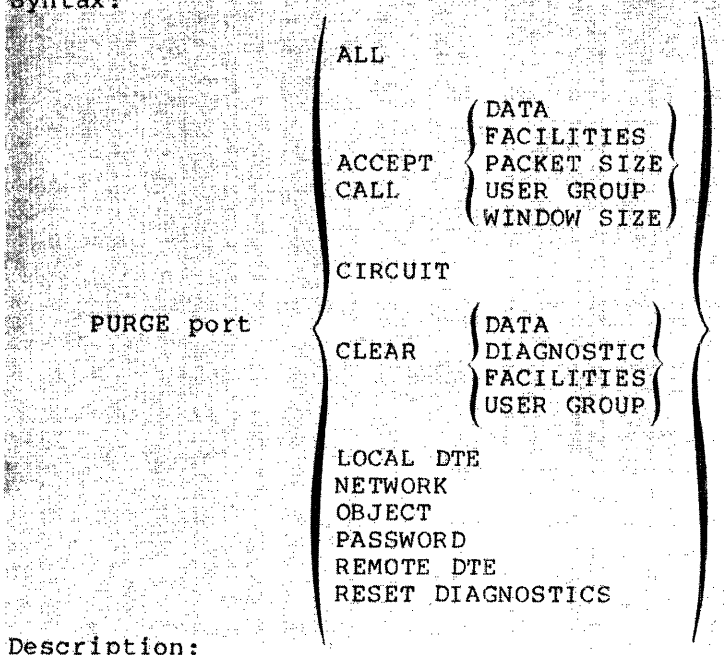
Access-code	Password for accessing the TOPS-10 PSI Gateway node. The value must be an alphanumeric string, 1 to 39 characters.
Circuit-name	Name of the permanent virtual circuit you wish to use exclusively. The value must be an alphanumeric string, 1 to 16 characters.
Network-name	Name of the PPSN you wish to communicate over. The value must be an alphanumeric string, 1 to 39 characters.
Port	Port number, 0 to 9.

Example:

```
PSITST> OPEN 0 CIRCUIT EUROPE NETWORK TELENET
PSITST>
```

PURGE Command

Syntax:



Description:

Removes the parameter definitions associated with a port. When you specify ALL, PSITST removes the definitions of all parameters listed above.

Argument:

Port	Port number, Ø to 9.

Examples:

```
PSITST> PURGE Ø NETWORK CALL DATA CLEAR FACILITIES CLEAR DATA
PSITST> PURGE 1 ALL
PSITST>
```

RECEIVE Command

Syntax:

```
RECEIVE port {NORMAL DATA    } {DISCARD          }
             {QUALIFIED DATA } {WRITE file-name }
```

Description:

Records data packets (normal and qualified data only) received from the virtual circuit. Use the logging facilities to record the interrupt data packets (see LOGGING commands).

By default, all received data packets are discarded.

Arguments:

File-name	Output file name, where the data is to be written.
Port	Port number, 0 to 9.

Examples:

```
PSITST> RECEIVE 0 QUALIFIED DATA (and) DISCARD
PSITST> RECEIVE 0 NORMAL DATA (and) WRITE (to) PSITST.TXT
PSITST>
```

RESET Command

Syntax:

RESET port [DIAGNOSTIC r-diagnostic]

Description:

The RESET command is used to request or confirm a reset on a virtual circuit. The RESET command terminates current data transmission on the virtual circuit.

If you use the RESET command to confirm a reset request, the diagnostic byte is ignored.

If you do not specify the diagnostic code, PSITST uses the current value defined by the SET command to build the reset request packet. Use the SHOW DATA command to determine the value of the clear diagnostic code. If a diagnostic code is not set, the reset diagnostic byte is Ø.

Arguments:

Port	Port number, Ø to 9.
R-diagnostic	Octal representation fo the user reset diagnostic code, Ø to 377 octal.

Example:

```
PSITST> RESET Ø DIAGNOSTIC 377
PSITST>
```

SEND Command

Syntax:

```
                  ⎧ INTERRUPT {REQUEST octal}                  ⎫
                  ⎪           {CONFIRMATION }                  ⎪
SEND port         ⎨ NORMAL DATA {FILE file-name}               ⎬ [COUNT number]
                  ⎪             {STRING text   }               ⎪
                  ⎩ QUALIFIED {DATA FILE file-name}            ⎭
                              {STRING text      }
```

Description:

Transmits interrupt requests and confirmations, and normal and qualified data on a virtual circuit.

If the echoing of data packets is enabled on the port, you have to disable it before PSITST allows you to transmit data over the virtual circuit (see ECHOING commands).

If the transmitted text data is shorter than or equal to the current packet size, the text is transmitted on the virtual circuit as a single packet. The value of COUNT determines the number of copies of text to be transmitted. If the length of the data is equal to the current packet size and the value of COUNT is greater than 1, the setting of the More Bit of each packet in the transmitted packet sequence is dependent on your specification (see the ENABLE/DISABLE MORE BITS command).

If the transmitted text data is longer than the current packet size, PSITST divides the text into smaller segments and transmits them as a sequence of data packets. The value of COUNT determines the number of copies of text to be transmitted. The setting of the More Bit of each packet depends on your specification.

Arguments:

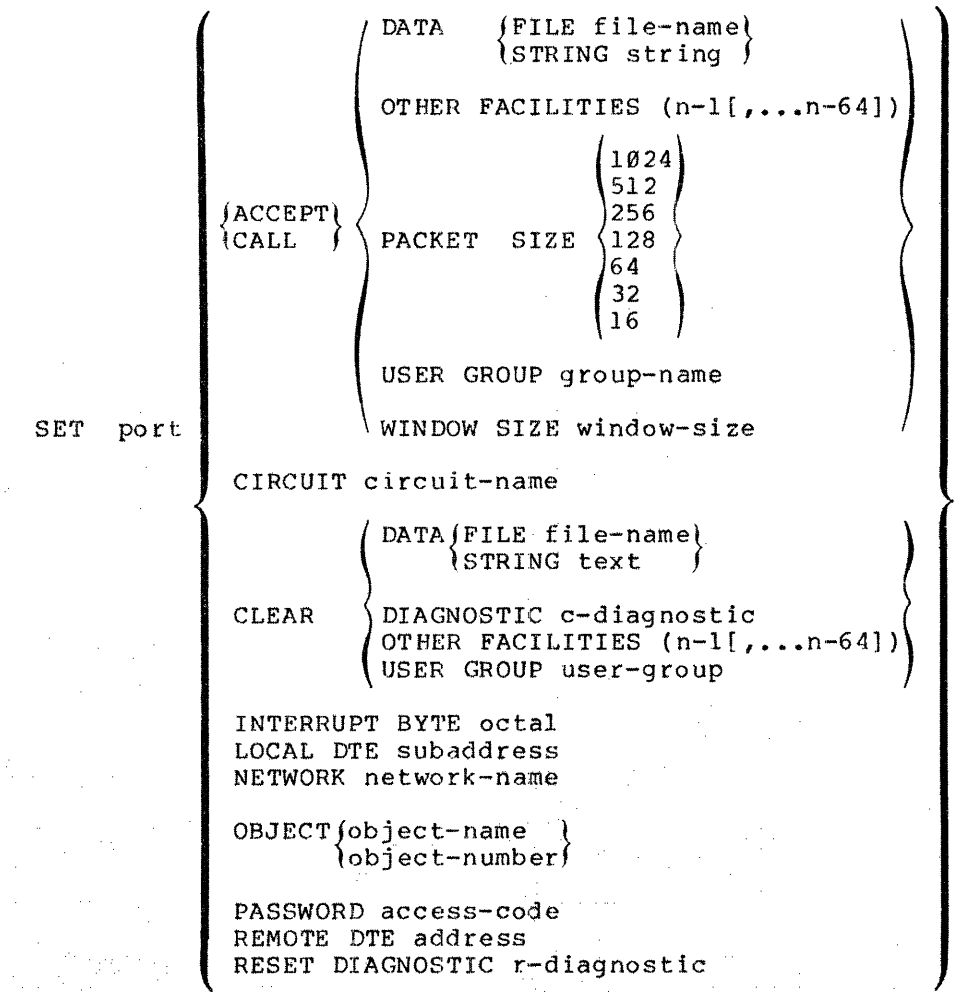
File-name	ASCII file from which PSITST transmits the data.
Number	Optional number of times PSITST transmits the specified data. The maximum value is 511. The default is 1.
Octal	Octal representation of an 8-bit byte.
Port	Port number, 0 to 9.
Text	Octal representation of 8-bit bytes, quoted and unquoted strings. An unquoted string is allowed as the last element in a list and must be terminated by a carriage return.

Examples:

```
PSITST> SEND 0 INTERRUPT REQUEST 377
PSITST> SEND 1 NORMAL DATA STRING "This is a test",15,12 COUNT 2
PSITST> SEND 2 QUALIFIED DATA STRING This is a test
PSITST> SEND 3 NORMAL DATA FILE PSITST.TXT
PSITST>
```

SET Command

Syntax:



Description:

Defines the parameters associated with a port.

Arguments:

Access-code	Password for accessing the TOPS-10 PSI Gateway. The value must be an alphanumeric string, 1 to 39 characters.
Address	Full DTE destination address. The value must be a numeric string, 1 to 15 digits.
C-diagnostics	Octal representation of the user clear diagnostic code, 0 to 377 octal.
Circuit-name	Permanent virtual circuit you wish to use exclusively. The value must be an alphanumeric string, 1 to 16 characters.

SET Command (Cont.)

File-name	ASCII file from which PSITST receives the accept, call, or clear data. PSITST reads either the first 128 characters or to the end of the file, whichever is shorter, and uses the text as the user data in the accept, call, or clear packet.
Group-name	Name of the Bilateral User Group or the Closed User Group.
Network-name	Name of the PPSN you wish to communicate with. The value must be an alphanumeric string, 1 to 39 characters.
Object-number	Object numbers 1 to 127 are reserved for DECnet system tasks and require system privileges. The object numbers 128 to 255 are available to all tasks.
Object-name	Alphanumeric string, 1 to 16 characters. The object name must begin with an alphabetic character. Hyphens (-), dollar signs ($), and underscores (_) are allowed.
Octal	Octal representation of an 8-bit byte.
(n-1[,..n-64)]	Optional facilities permissible on your PPSN. PSITST does not attempt to check the validity of facilities. This value must be entered as octal representation of an 8-bit byte.
Port	Port number, Ø to 9.
R-diagnostic	Octal representation of the user reset diagnostic code, Ø to 377 octal.
Subaddress	Local DTE address. The value must be a numeric string, 1 to 15 digits.
Text	Octal representation of 8-bit byte. Quoted and unquoted string are allowed. An unquoted string must be the last element of the list and is terminated by a carriage return.
Window-size	Window size of the virtual circuit, 2 to 127.

Example:

```
PSITST> SET Ø CLEAR DIAGNOSTIC 377 ACCEPT DATA STRING Testing
PSITST>
```

SHOW Command

Syntax:

```
                  ⎧CHARACTERISTIC⎫
                  ⎪COUNTERS      ⎪
                  ⎪DATA          ⎪
SHOW   port       ⎨FACILITIES    ⎬
                  ⎪LOGGING       ⎪
                  ⎪STATUS        ⎪
                  ⎩SUMMARY       ⎭
```

Description:

Displays information you have set for a port.

If you type

```
PSITST> SHOW
```

it is equivalent to

```
PSITST> SHOW * SUMMARY
```

If you do not specify the information type in the SHOW command, SUMMARY is the default type.

The SHOW command is used to display the following types of information:

CHARACTERISTICS	Parameters that remain constant until changed or purged (for example, the network name or the remote DTE address).
COUNTERS	Error and performance statistics. For example, transmitted data packets.
DATA	Contents of the last data packets being transmitted and received.
FACILITIES	Contents of the last facilities buffers being transmitted and received.
LOGGING	Log file and type of information being recorded.
STATUS	Dynamic values associated with a port (for example, port state).
SUMMARY	Most useful information from the characteristics and status type.

Argument:

Port	Port number, Ø to 9, an asterisk (*) to indicate known ports, or the pound sign (#) to indicate active ports only.

SHOW Command (Cont.)

Examples:

```
PSITST> SHOW Ø SUMMARY

  Port # Ø;  Summary

    Network = TELENET
    Virtual Circuit Type = Switched
    Object Identification = USER
    Port State = Running

PSITST> SHOW * CHARACTERISTICS

  Port # Ø;  Characteristics

    Network = TELENET
    Remote DTE Address = 311Ø3Ø3ØØ171

    Object Identification = USER
    Packet Size = 128

  Port # 1;  Characteristics

    Network = TELENET
    Access Password = SECRET
    Remote DTE Address = 311Ø3Ø3ØØ171

    Local DTE Subaddress = ØØ
    Packet Size = 128

  Port # 2;  Characteristics

   Access Password = SECRET

PSITST> SHOW # COUNTERS

  Port # Ø;  Counters

    Wait For Incoming Calls = 1
    Incoming Calls Accepted = 1
    Received Normal Data Packets = 4Ø61
    Received Normal Data Bytes = 64978
    Received Qualified Data Packets = 7
    Received Qualified Data Bytes = 119

  Port # 1;  Counters

    Call Requests = 1
    Transmitted Normal Data Packets = 4Ø9Ø
    Transmitted Normal Data Bytes = 65440
```

SHOW Command (Cont.)

```
PSITST> SHOW 1 DATA

  Port # 1;  Data

    Network Data = None
    Network Interrupt = None
    Transmitted Interrupt = None Outstanding
    Received Interrupt = None Outstanding
    Transmitted Normal Data = 16 bytes
      101 102 103 104 105 106 107 110 111 112     |ABCDEFGHIJ|
      113 114 115 116 117 120                     |JKLMNOP   |
    Last Data Reception Error = No Data To Read

PSITST> SHOW 0 FACILITIES

  Port # 0;  Facilities

    Received Call Facilities = 8 bytes
      001 000 000 041 005 002 006 010             |...!....  |

PSITST> SHOW * LOGGING

  Port # 0;  Logging

    Log File = PSITST.LOG
      Open, Read, Write, 17802 bytes, 6 pages, 17802(7)
    Logged Information = Including
      Virtual Circuit Events
      Zeroed Counters
      Call Data
      Call Facilities
      Accept Data
      Accept Facilities
      Reset Cause And Diagnostic
      Interrupt Data
      Normal Data
      Qualified Data
      Clear Cause And Diagnostic
      Clear Data
      Clear Facilities
      TOPS-10 Priority System Interrupts

  Port # 1;  Logging

    Log File = PSITST.LOG
      Open, Read, Write, 17802 bytes, 6 pages, 17802(7)
    Logged Information = Virtual Circuit Events
```

SUSPEND Command

Syntax:

SUSPEND port DATA TRANSMISSION

Description:

Freezes data transmission on a virtual circuit when data is being transmitted. The command does not affect the transmission of interrupt data.

While data transmission is being suspended on a port and the virtual circuit is reset, data transmission is terminated and the suspension is removed.

The suspension of data transmission is also removed when the port becomes inactive. A port is considered inactive when the port state is CLEARED or ERROR.

Use the CONTINUE command to resume data transmission.

Argument:

Port	Port number, Ø to 9.

Example:

```
PSITST> SUSPEND Ø DATA TRANSMISSION
PSITST>
```

TAKE Command

Syntax:

```
TAKE  file-name {DISPLAY   }
                {NODISPLAY}
```

Description:

Allows PSITST to process user commands from direct command file. The DISPLAY parameter allows you to view the processed commands on your terminal.

The default is NODISPLAY.

Argument:

file-name	Name of the direct command file.

Example:

```
PSITST> TAKE DSK:PSITST.CMD
PSITST>
```

WAIT Command

Syntax:

WAIT seconds

Description:

Suspends PSITST for a specified period. During this period, PSITST delays processing of user commands from the control terminal. Input and output activities are not affected by the command.

Argument:

seconds	Number of seconds.

Example:

```
PSITST> WAIT 60
PSITST>
```

ZERO Command

Syntax:

ZERO port COUNTERS

Description:

Resets the counters of a port. If logging is enabled for the port, the values of the counters are recorded before being reset.

Argument:

Port	Port number, Ø to 9.

Example:

```
PSITST> ZERO Ø COUNTERS
PSITST>
```

B.6 PSITST ERROR MESSAGES

This section of the manual describes PSITST error messages.

?Cannot accept input from terminal using this command

?Cannot initialize logging

PSITST failed to start the logging facilities. The usual cause is lack of disk space for the log file to be created.

If you are running the PSITST program in the normal environment, contact the system manager. Otherwise, clean up your disk area before proceeding.

?Cannot send null string

You have attempted to send a null text string to the network.

?Echoing received data packets

Echoing of received data is being enabled for the requested port and data transmission by the user is prohibited. Use DISABLE ECHOING command to turn off echoing and re-enter the SEND command.

?Failed to open file for input

The file you specified in the SEND or TAKE command does not exist.

?Port is not active

The port that you specified in a command is not active.

?PSITST Process Already Exists

You are attempting to run the PSITST program in the normal environment and another user is already running the same program. Follow instructions in Section B.1.2 to run the software in your "private" environment.

?Encountered IPCF Error

The PSITST or PSITSB process encountered an error while communicating with each other through the IPCF mechanism. Contact DEC support personnel if error persists.

?PSITST Partner Process Does Not Exist

If you are running the PSITST program in the normal environment, this message means that the system copy of PSITSB which is supposed to run in the background is not there. Contact the system manager for assistance.

If you are running the PSITST program in the "private" environment, it means that you have not started up the PSITSB program or your private copy of PSITSB has stopped. Refer to Section B.1.2 for instructions how to run the software in a "private" environment.

?Illegal port number

You have specified an illegal port number outside the range of Ø to 9.

?Illegal port state for requested function

You have requested a command that is illegal for the current port state.

?Transmission busy on circuit

PSITST is still sending data requested by the previous SEND command. Use the SHOW DATA command to check the status of data transmission before you re-enter the SEND command.

APPENDIX C

GLOSSARY

Adjacent node

A node connected to another node by a single physical line.

CCITT

Comite Consultatif International de Telegraphique et Telephonique. An international consultative committee that sets international communications usage standards.

Closed User Group (CUG)

An optional PPSN facility that restricts two or more DTEs in the same group to communicating with each other. The basic CUG also prevents these DTEs from accessing or being accessed by other DTEs outside the group. For more information, see the TOPS-10 PSI User's Guide.

COMGEN

A grammar-producing program that creates other NCP command files used during installation and system startup.

Computer network

An interconnection of computer systems, I/O devices, and communications fronts ends.

Configuration

The process of customizing the host system and the front ends. Using the configuration tools, the DECnet user establishes the network parameters specific to the communications devices and software being configured.

Cost

See data link cost.

Connectivity

See physical connectivity.

Data link

A physical connection between two nodes (line), or a logical connection (circuit).

Data link cost

An arbitrary positive integer assigned to a physical path. Because the routing algorithm selects the least-cost path to a destination, an operator can dynamically affect the path to be taken by changing line costs

DCE

Data Communications Equipment (DCE) is an X.25 PPSN node to which a DTE is connected with a leased data communications line. A DCE can be a modem.

DDCMP

Digital Data Communications Message Protocol (DDCMP) is a level of protocol within the DIGITAL Network Architecture (DNA).

DMC11

Single-line microprocessor-based interface to the network. The DMC11 is a synchronous direct memory access device.

DMR11

Single-line multiprocessor-based interface to the network. The DMR11 is a synchronous direct memory access device.

DN20

A DECnet communications front-end. As used in this manual, DN20 is a generic term for a PDP-11 processor that can run DECnet and PSI communications software.

DTE

Data Terminal Equipment is a host processor or communications processor.

DTE20

The hardware interface between the KL main processor in a DECsystem-1090/1091/1095 and the PDP-11 processor in the DN20 communications front end.

DUP11

Single-line microprocessor-based interface to the network. The DUP11 is a synchronous device.

Duplex

Simultaneous independent transmission in both directions. Sometimes referred to as full-duplex, contrast with half-duplex.

Executor node

The node where the active Local Network Management Function is running (that is, the node actually executing the command); the active network node physically connected to one end of a line being used for a load, dump, trigger, or line loop test.

FAL

The File Access Listener is a GALAXY stream that responds to Network File Transfer requests.

Frame

A unit delimited by flags that includes a header, used by the link level to exchange packets, as well as control and error information, between the DTE and the DCE.

Full-duplex

Simultaneous independent transmission in both directions.

Half-duplex

Transmissions in either direction, but not in both directions simultaneously.

Hop

The logical distance between two adjacent nodes in a network.

Host node

The network node at which a host computer provides services such as computation, database access, special programs, or programming languages to other nodes in the network.

Inactivity timer

The length of time, in seconds, that DECnet waits before exercising a logical link when there is no received traffic on the link. This can happen, for example, because the network is disconnected, or because the physical line went down. When the timer runs out, DECnet software sends a data request message over the logical link. If, after a certain amount of time (see Retransmission Threshold), the message has not been acknowledged, the software decides that the physical network supporting the logical link has failed.

Installation

DECnet installation is the process of setting up the DECnet software and modifying several system files to include DECnet-related jobs. DECnet installation occurs after DECnet configuration.

KDP

The combination of a KMC11 controller (a microprocessor-based system) and between one and four DUP11's. With the KMC, the DUP11 functions as a direct memory access device.

LAPB line

Link Access Protocol Balanced (LAPB) line uses the X.25 level 2 data link protocol LAPB. (LAPB protocol is analogous to DDCMP in DECnet.)

Local DTE

The communications node that connects to the public network.

Local node

A relative term indicating the node at which your terminal is logged in. Your commands are usually executed at the local node.

Logical link

A virtual data path between two tasks in a network that permits them to communicate.

Logical node

The node to which the system sends a user's queued output. At login time, the logical node is the same as the physical node.

Loopback

A mode of operation in which data transmitted by a network task is reflected at some point along the communication path and is returned to the originating task.

Loopback node

A special name for a node associated with a line for loopback testing purposes. A loopback node is treated as if it were a remote node. All traffic to the loopback node is to be looped over the associated line.

Maximum cost

The greatest total cost that the path to a node may have if the node is to be able to be reached. When the cost associated with transmitting a message from one node to another exceeds the maximum cost, the transmission is not made.

Maximum hops

The maximum number of hops in a path to a node. The smallest value for maximum hops in a network is the network diameter. The value of maximum hops should be smaller than the value of maximum visits.

Maximum visits

The maximum number of nodes a message coming into the node can have visited. If the number of maximum visits is exceeded and the destination is not the current node, the message is discarded.

MCB

Multifunction Communications Base: the software system that runs in the DN2Ø front end to accomplish DECnet network communications.

NCP

The Network Control Program that processes DECnet network control commands. NCP refers to the OPR command set for network control.

Network

An interconnected or interrelated group of nodes. In this manual, network is synonymous with computer network.

Network diameter

The network diameter is derived by determining the minimum number of hops between all possible pairs of nodes in the network. The largest minimum is the network diameter.

NFT

The Network File Transfer Program which allows you to access files residing on DECnet hosts that provide network file access capabilities.

NIPGEN

The interactive Network Installation Procedure Generator program used to create the command and control files used to verify and load configured nodes.

NML

Network Management Layer of DECnet protocol.

Node

A processor in the network. Every processor in the network is a node, whether it is a remote station, a communications front end, or a host itself. Each node has a unique node address.

Node address

A number uniquely identifying a node within a network.

Node name

A 1- to 6-character name identifying a node within a network. Node names can be any combination of the characters A through Z and Ø through 9 and must begin with an alphabetic character.

Off state

Applied to a node: the state where network traffic will no longer be processed.

Applied to a line: a state where the line is unavailable for any kind of traffic.

Applied to circuits: the state where the circuit is not in use by any network-related software.

On state

Applied to a node: a state of normal network operation.

Applied to a line: a state of availability for normal usage.

Applied to circuits: the state where the circuit is used by the network-related software.

OPR

The operator command language program that provides the operator with one command language to communicate with several TOPS-10 components. OPR processes commands for syntax and passes syntactically correct commands to the appropriate GALAXY component (QUASAR, ORION, NML, or others). For complete information about OPR and OPR commands, see the TOPS-10 Operator's Command Language Reference Manual.

Packet

A group of bits, comprising data and control information, which is transmitted as a composite whole over a physical link. The data, control information, and possibly error control information, are arranged in a specified format.

PAD

Packet Assembly/Disassembly facility allows access from an asynchronous terminal, such as an LA36. The terminal connects to the PAD and the PAD puts the terminal's input data into packets (assembles) and takes the terminal's output data out of the packets (disassembles).

Path

The route that a packet takes from the source node to the destination node.

Path cost

The accumulated total of the costs of the hops between each system on route to a destination node. (See data link cost.)

Permanent Virtual Circuit (PVC)

A virtual circuit always associated with the same remote DTE address. The software references a PVC by its Logical Channel Number (LCN). The correspondence between a PVC and its LCN is established by the public network vendor.

Physical connectivity

The condition of nodes being attached to each other by active lines.

Physical link

A communications path between two adjacent nodes. This can be in the form of a dial-up line, leased line, radio, satellite link, or a channel-to-channel connector such as a DTE20.

PIP

The Peripheral Interchange Program, a TOPS-10 utility for copying files. This program is described in the TOPS-10 User Utilities Manual.

Point-to-point link

A type of network link in which two nodes are connected by means of a communications line and are the only nodes connected by that line.

Port

A logical route for data in or out of a PPI. A port, in use, contains one or more channels all of which carry the same type of information.

PPSN

See Public Packet Switching Network.

Protocol

An agreed set of rules governing the operation of a network link so that data transmission is readily understood by destination processes.

PSITST

The program that provides testing facilities for TOPS-10 PSI.

Public Packet Switching Network (PPSN)

A set of equipment and interconnecting links that provides a packet switching communications service to subscribers within a particular country.

Remote node

Any node in a network that is not your local node.

Retransmit factor

The number of times DECnet retransmits a message with no intervening received acknowledgement before deciding that the physical network supporting a logical link has failed.

Software ID

The name of the DECnet subsystem, which may be user-supplied during the NETGEN procedure.

Switched Virtual Circuits (SVC)

A temporary logical association between two DTEs connected to a PPSN that is analogous to connection by a dial-up line. An SVC is set up only when there is data to transmit and is cleared when the data transfer is complete.

TKB36

The task builder that constructs PDP-11 formatted task images from object files during the configuration procedure for a DECnet MCB node.

Transmit password

A password received by the remote node during a ROUTER initialization sequence. The password is 1 to 64 characters for all network nodes, although the DN20 allows up to 8 characters in its transmit password.

VNP36

The Virtual Network Program that creates the communication front end system image during the configuration procedure for a DECnet MCB (DN2Ø) node.

Volatile database

Dynamic values in memory. When the system is first started, data and control information are read into the volatile database. You may change many of these values using the SET command to NCP. Volatile database values are lost when the system shuts down. They may also be cleared or reset. The volatile database is called the running database in some implementations.

X.25

A CCITT recommendation that specifies the interface between Data Terminal Equipment and Data Circuit-terminating Equipment for equipment operating in the packet mode on public data network.

X.29

A CCITT recommendation that specifies procedures for the exchange of control information and user data between a packet-mode DTE and a Packet Assembly/Disassembly (PAD) facility.

X25-ACCESS

The module that maintains the data base needed to connect to a PPSN. If there is more than one PPSN, entries in the data base are indexed by network name.

X25-PROTOCOL

The module that maintains the X.25 packet level protocol. The packet level protocol is necessary to establish a connection between two users over a logical path called a virtual circuit.

X25-SERVER

The module that maintains the DESTINATION data base. The DESTINATION data base contains all information required to map an X.25 incoming call to a target node and DECnet object.

X29SRV

A privileged user-mode job running in the TOPS-1Ø host. It provides asynchronous terminal access to a TOPS-1Ø system by a user dialed phone connection into a PPSN Packet Assembler/Disassembler (PAD) facility, by performing the X.29 functions necessary to service the terminal session.

INDEX

TOPS–10
DECnet and PSI
Installation Guide
AA–P379B–TB

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