DECnet–DOS

Getting Started

Order No. AA–EV70C–TV

April 1988

This manual provides an overview of basic tasks that can be performed over the DECnet network using DECnet–DOS. It introduces frequently used DECnet–DOS commands.

Supersession/Update Information:	This is a new manual.
Operating System and Version:	PC DOS V3.10 PC DOS V3.20 PC DOS V3.30 VAXmate MS–DOS V3.10
Software Version:	DECnet–DOS V2.0 DECnet–VAXmate V2.0

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Preface

DECnet-DOS is a communications software product that lets you use your personal computer in a DECnet network. DECnet-DOS Version 2.0 runs on supported IBM personal computer systems and compatibles using the PC DOS operating system and on Digital Equipment Corporation's VAXmate workstation using the MS-DOS operating system. For a list of all supported personal computers, including IBM compatibles, and supported operating systems, see the *DECnet-DOS Software Product Description 55.15.xx* or *DECnet-VAXmate Software Product Description 55.05.xx*.

Manual Objectives

DECnet-DOS Getting Started provides an overview of the DECnet-DOS product and introduces the various DECnet-DOS utilities. This guide does not describe the hardware and software installation procedures. You should install DECnet-DOS before reading this manual. To install DECnet-DOS, refer to the *DECnet-DOS Installation Guide* or the *DECnet-VAXmate Installation Guide*.

Intended Audience

New DECnet-DOS users who may be unfamiliar with networking concepts and terminology should read this manual. This manual assumes that the user is familiar with personal computers and has a working knowledge of basic MS-DOS commands.

Structure of This Manual

This manual consists of three chapters:

- **Chapter 1** introduces DECnet-DOS and defines basic concepts within a DECnet environment.

- **Chapter 2** introduces the DECnet-DOS utilities.
- **Chapter 3** describes how to use the DECnet-DOS menu-driven user interface.

Graphic Conventions

The following graphic conventions are used in this manual:

Convention	Meaning
Special type	This special type indicates examples of system output or user input. System output is in black; user input is in red.
COMmand	Represents acceptable abbreviations, for example DELete.
UPPERCASE	Uppercase in commands and examples indicates that you should enter the characters as shown.
Lowercase italics	Lowercase italics in commands and examples indicate that either the system supplies or you should supply a value.
[*key*]	Indicates that you should press the specified key. [CTRL/*x*] indicates that you should hold down the [CTRL] key while you press the [*x*] key, where *x* is a letter. Note that unless otherwise specified, you should end every command line by pressing the [RETURN] key.

Associated Documents

You should have the following documents available for reference:

- *DECnet-DOS Installation Guide* or *DECnet-VAXmate Installation Guide*
- *DECnet-DOS User's Guide*
- *DECnet-DOS Programmer's Reference Manual*
- Any introductory manuals for your computer

1
Introducing DECnet-DOS

1.1 What is DECnet?

DECnet is Digital's family of software and hardware communications products that let users of various Digital and other vendor computer systems participate in a computer network. DECnet's peer-to-peer network environment allows any computer (or node) to communicate with every other node in the network without consulting a central controlling node. In this environment, each node is equally responsive to user requests, allowing network users to easily gain access to applications and facilities on other nodes. This simplifies communications and data handling, and provides flexibility when configuring a network.

DECnet software, located on each system in a DECnet network, provides users with an interface that extends their computer's operating system. This network interface lets users communicate and share resources with other users in the DECnet network. Users in a network can exchange information, files, and programs.

Digital provides DECnet software for different operating systems, including:

- DECnet-VAX for VAX computers running the VAX/VMS operating system.
- DECnet-ULTRIX for VAX computers running the ULTRIX operating system.
- DECnet-DOS for IBM personal computers and supported compatibles running the PC DOS or MS-DOS operating system.

  Refer to your software product description for a specific list of supported personal computers and operating systems.

- DECnet-VAXmate for Digital's VAXmate workstation, running MS-DOS.

Figure 1-1 illustrates a sample DECnet network.

Figure 1-1: A Sample DECnet Network

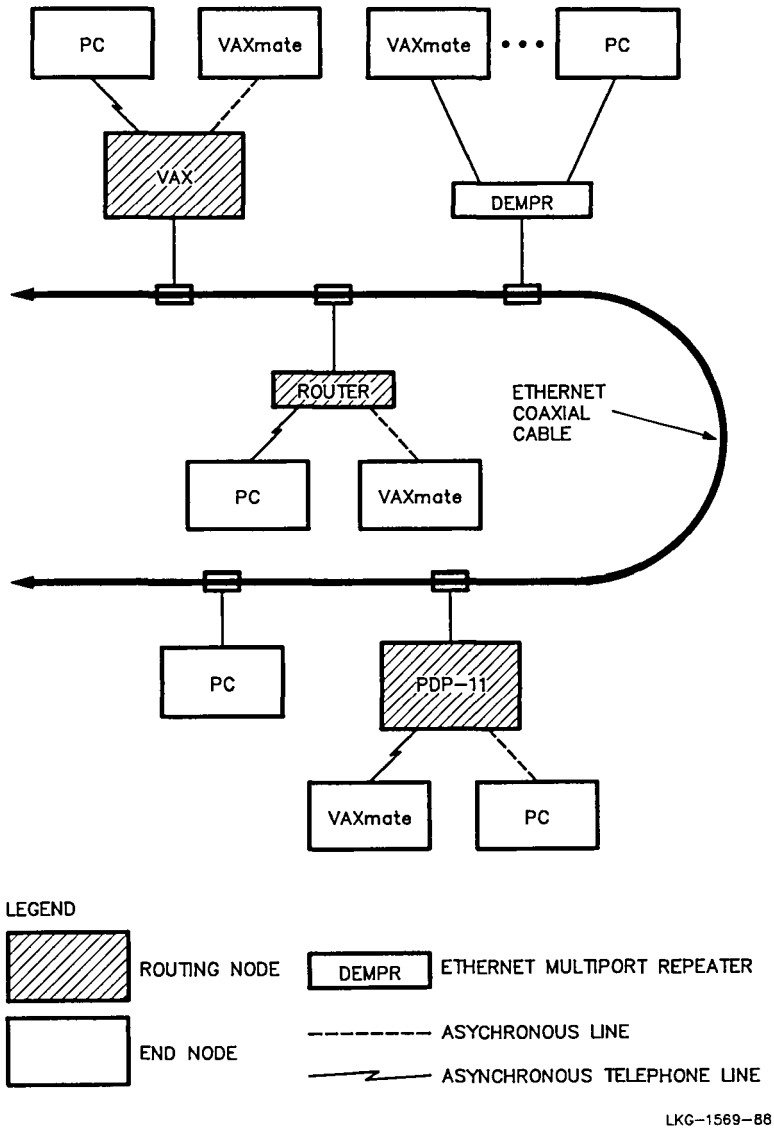


Figure 1–1 introduces several terms that define computers in the context of a DECnet network:

- A DECnet **routing node** can receive and forward information from one node to another.
- An **end node** can only receive information for its own use; it cannot receive and then forward information intended for another node. All DECnet-DOS nodes are end nodes and can communicate with any other node in the DECnet network because they are either physically or logically connected to a routing node.
- A **local node** is the node you are physically working on when you enter commands.
- A **remote node** is any node in the network other than your local node.
- An **executor node** is the node from which you perform network management functions. For DECnet-DOS, the executor node is your local node.

1.2 What is DECnet-DOS?

DECnet-DOS is DECnet software that lets supported personal computers, running the MS-DOS or PC DOS operating system, participate in a DECnet network. DECnet-DOS consists of a set of software components, or modules, that work with your operating system. Table 1–1 lists some of the tasks you can accomplish with DECnet-DOS utilities.

Table 1–1: What You Can Do With DECnet-DOS

If You Want to	Use This Utility
Emulate a VT200 terminal to directly access a VAX and run VMS applications	Network Virtual Terminal (SETHOST)
Test and maintain your network configuration	Network Control Program (NCP)
Monitor your PC from another system	Network Management Listener (NML)
Share hardware peripherals	Network Virtual Disk (NVD) Network Virtual Printer (NVP)
Exchange files with other users	Network File Access (NFT) Transparent File Access (TFA)
Send electronic mail	Mail Sender
Back up files from the PC to another DECnet node	Network Virtual Disk (NVD)
Access your PC from a remote terminal or another PC	Job Spawner (SPAWNER) File Access Listener (FAL) Network File Transfer (NFT)
Create applications that communicate with applications on remote nodes	DECnet-DOS programming interfaces

Turn to Chapter 2 for more information about DECnet-DOS utilities.

2

DECnet-DOS Utilities

This chapter provides a brief overview of the DECnet-DOS utilities. For detailed information about using these utilities, refer to the *DECnet-DOS User's Guide.*

2.1 User Interfaces

All DECnet-DOS utilities share a DOS-like command-line interface, making it easy for you to run, use, and exit from any utility. Each DECnet-DOS utility also provides on-line help explaining command parameters, syntax, or usage.

DECnet-DOS also provides a menu-driven interface that makes it easy to run your DECnet-DOS software. With DECnet-DOS Menus, there is no need to memorize command parameters or syntax. Refer to Chapter 3 for help getting started with DECnet-DOS Menus.

2.2 Emulating a Terminal

The DECnet-DOS virtual terminal utility (SETHOST) provides your PC with terminal emulation capabilities in a wide area and Ethernet local area network. These emulation capabilities include:

- VT220 emulation for IBM PC and supported compatibles
- VT240 emulation, with full graphics capability,for VAXmate workstations

With SETHOST, your PC can connect to a remote host by emulating a VT200-series terminal to utilize the resources of a larger system. For example, if you need to run VAX/VMS applications, your PC can emulate a VT220 terminal to connect to a remote VAX.

SETHOST offers a choice of different connection types. You can establish an asynchronous terminal connection through your PC's communications port or establish multiple network terminal sessions by using LAT or CTERM network protocols.

SETHOST provides:

- Support for VT200-series Set-Up screens you use to customize your terminal emulation environment. SETHOST makes it easy to save the terminal characteristics that you set.
- The ability to create and maintain up to four multiple sessions. A simple control key sequence lets you move easily between active sessions.
- The ability to create a new DOS process so you can perform a local task and then return to your terminal session where you left off.
- A script language you can use to create scripts. A script is a text file that contains commands to allow SETHOST to perform many operations automatically. For example, you can write a script to:
  1. Log into a VAX system using a network LAT connection
  2. Read any new mail messages
  3. Store the new messages in a file
  4. Print the file
  5. Log out

2.3 Sending Mail

The DECnet-DOS Mail utility lets you send electronic mail to other users in the DECnet network. You can send messages you create with any text editor, or send existing documents or files. An initialization file lets you personalize your Mail environment. You can supply:

- A node address where you can receive mail replies and carbon copies
- A default node name

- The name of the text editor you use for creating messages
- A personal message to appear in the mail header

2.4 Accessing Remote Files

With the DECnet-DOS Network File Transfer (NFT) utility, you can use the NFT COPY command to transfer sequential ASCII and binary files between your personal computer and another DECnet node.

DECnet software components handle the conversion of files, during transfer operations, to a format usable on your PC. For example, NFT converts the remote ASCII text file into a DOS stream file that you can use at your PC. NFT then converts the DOS stream file back to ASCII before returning it to the remote node.

2.5 Sharing Network Resources

DECnet-DOS provides utilities that let you share network resources. These utilities include:

- The Network Device Utility (NDU)—controls access to remote printers and remote disks.
- The File Access Listener (FAL)—provides the means for users on remote nodes to access the disks and files on your PC.
- The Job Spawner—enables your PC to perform multiple service functions.

2.5.1 Using Network Devices

The NDU utility lets you control remote printers and disks as if they were additional local devices physically attached to your personal computer.

Virtual disks are files that appear as logical disks to the PC user. The ability to name virtual disks is useful for providing extra storage or a target for backing up local files. Data back-up and security of your PC database can be provided centrally by your VAX/VMS file storage system.

NDU allows you to create a network disk by assigning a local DOS device name (such as F:) to a file on a remote system. You can then perform standard DOS I/O operations to this virtual disk as if it were a local hard-disk. You can open up to four network (virtual) disks at one time. Multiple DECnet-DOS nodes can simultaneously access the same virtual disk but DECnet-DOS ensures that the access for the shared disk is read-only.

NDU also allows you to assign a local device name to a remote printer. You can then direct output to the virtual network device by specifying the device identifier, such as NPRN: or LPT1:. This sends the data to a file located on the remote node. When you close the connection with NDU, the file will be queued to the remote system's printer.

2.5.2 Your PC as a Server

DECnet's File Access Listener (FAL) server software lets you access your personal computer's file resources from a remote terminal that is connected to a DECnet node or from another personal computer. You place your PC in a listening state by running the FAL software. Then, from a remote terminal or PC, you can use the Network File Transfer (NFT) utility to copy files, list directories, and/or type files that reside on the first PC. The normal DOS output which result from these commands will appear on the remote terminal's screen.

For example, you can start FAL on your office PC before leaving for the evening. If you need to continue work on an important memo later that evening, you can issue NFT commands, from a PC at home, to locate and copy the text file from the office PC. After completing edits to the file, you can transfer it back to the office PC. In this example, the home PC accesses the network using an asynchronous DECnet communications link.

FAL receives file access requests from a remote node and translates them into DOS system calls. After you start it, FAL checks for appropriate access control information, and if valid, translates the requests to send or receive data. FAL can simultaneously accept requests from multiple nodes.

2.5.3 Spawning Multiple Services

With the Job Spawner utility running, your PC acts as a server, performing multiple service functions for remote systems. When you start the Job Spawner it "listens" for connection requests from other network nodes. These requests may include requests to access certain DECnet-DOS utilities such as FAL or the DECnet Test Receiver. When the Job Spawner receives a connection request, it starts the appropriate utility to service that request. When the requested activity is complete, the Job Spawner continues to listen for other connection requests.

2.6 Managing and Monitoring Your Network Software

The Network Control Program (NCP) is a DECnet-DOS utility you use to manage your network software. You can use NCP to:

- Set up your PC as a DECnet end node
- Maintain and update your node's DECnet databases
- Monitor your node's operation in the network
- Diagnose and solve communication problems

At installation time, the DECnet-DOS installation procedure (DIP) prompts you for information about your node name and address. DIP runs NCP commands for you that define your node and start the network software for you. You only need to use NCP at this point if you want to modify or add node information, or to troubleshoot your network operation.

Refer to the *DECnet-DOS Network Management Guide* for more information about when and how to use NCP commands.

2.7 Task-to-Task Network Programming

DECnet-DOS offers programming interfaces that let you enhance DECnet's task-to-task communication capabilities. You can create network task-to-task applications that suit your specific needs. Programmers, for example, can take advantage of the VAX's computational power by passing problems to a subroutine on the VAX, with results returned to the PC-based program.

DECnet-DOS provides a programming library of subroutines a programmer can use to write task-to-task applications. A program can access these subroutines through C or MACRO Assembly system calls. Your DECnet-DOS Kit provides source files you can use to build a programming library.

The DECnet-DOS programming interface offers different levels of entry to the network software for network programmers. The interface you choose depends upon several factors, including:

- The type of task you want your program to complete.
- Whether you are modifying an existing program or creating a new program.
- The level of control over the communications process that you want your program to have.

- The programming language you want to use.
- Your programming skill knowledge of DOS and of DECnet networking concepts.

DECnet-DOS also provides a NETBIOS emulation interface for network applications. NETBIOS is an industry standard session-layer interface developed by IBM for network applications that are written to use IBM's PC LAN program. With the DECnet-DOS NETBIOS emulation installed on your PC, your industry-standard NETBIOS applications can communicate over a DECnet network.

For more information about network programming with DECnet-DOS, refer to the *DECnet-DOS Programmer's Reference Manual.*

3

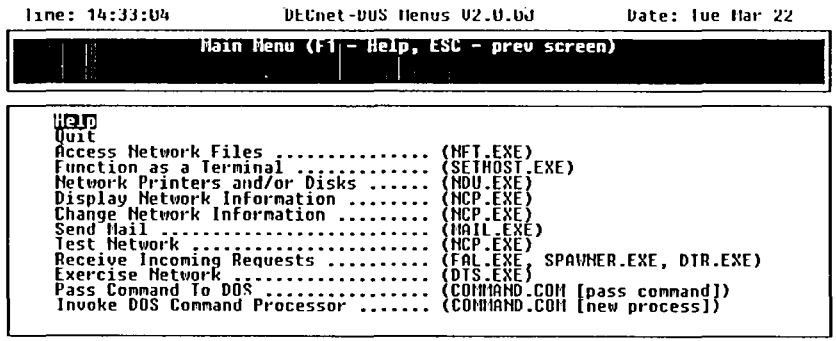
Using DECnet-DOS Menus

The DECnet-DOS menu-driven interface makes it easy for you to get started with the DECnet-DOS software. You simply run DECnet-DOS Menus and make selections. Menus runs the appropriate DECnet-DOS utility, building the command lines for you.

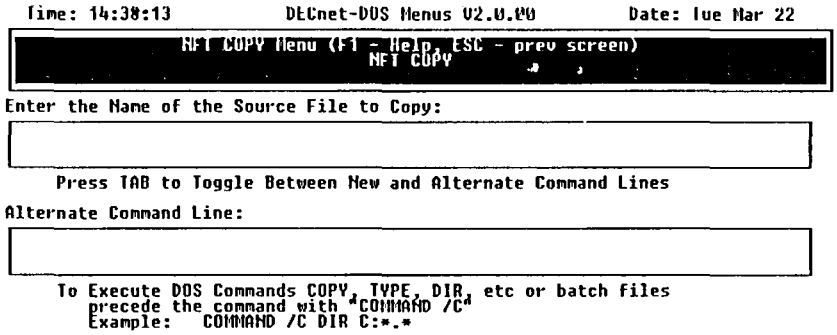
This chapter provides you with the information you need to use DECnet-DOS Menus.

3.1 How Menus Works

There are two major types of menus in the DECnet-DOS Menus utility. One is a menu that gives you a list of items to select from, as follows:



The second type is a fill-in menu. This menu leaves blank spaces for you to fill in, as shown here.



With the first menu type, the Menus utility provides default values. If you want to use the default item, all you need to do is to press RETURN to select it. If you want another choice, use the arrow keys to move the cursor to the item you want to select, then press RETURN to make your selection.

For fill-in menus, you type information as prompted and use TAB to move from one field to the next. After you fill in the required field, press RETURN.

For a list of special keys you can use with DECnet-DOS Menus, see Table 3-1.

Table 3-1: Special Keys

Use This Key	When You Want to
Arrow Keys	Move through menu items. Also for editing command lines or fields in fill-in menus.
RETURN	Make a selection or command take effect.
ESC	Return to the previous screen. Also, to cancel a command or selection.
F1	Get on-line HELP.
CTRL/C	Exit from Menus.
TAB	Toggle back and forth between fields in a fill-in menu.
Delete	Delete a character or characters while editing fields or command lines in a fill-in menu.
Insert (Editing Keypad)	Enable the insert editing mode while editing fields or command lines in a fill-in menu. Overstike is the default editing mode.
Home (Editing Keypad)	Move the cursor to the beginning of the line while editing fields or command lines in a fill-in menu.
End (Editing Keypad)	Move the cursor to the end of the line while editing fields or command lines in a fill-in menu.

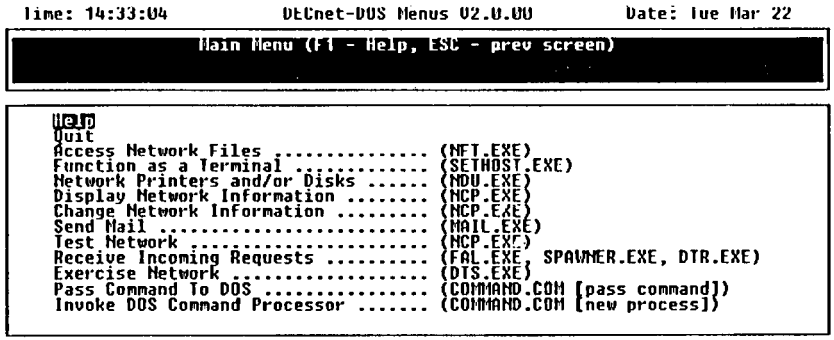
Notice that both menu types display a highlighted title bar near the top of your screen. The first line of the title bar displays the menu title. For example, "Main Menu" or "NFT COPY menu." The second line of the title bar displays the command line that Menus builds for you. Menus uses this command line to run the appropriate DECnet-DOS utility. For example, the second line in the title bar of the NFT COPY Menu could read "NFT COPY" —the beginning of a COPY command line.

3.2 Starting DECnet-DOS Menus

To run DECnet-DOS Menus, type the following at the DOS prompt:

```
C> DECNET [RET]
```

The DECnet-DOS banner appears on your screen. Press [RETURN] to display the Main menu.

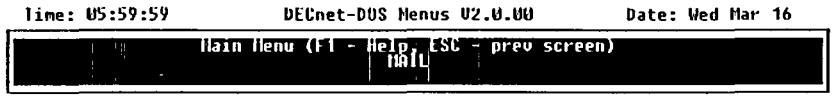


When the Main menu appears, you will see your cursor positioned on the first option, "Help." Notice that "Help" is highlighted. This means that "Help" is the default selection on your Main menu. If you want to use help, all you have to do is press [RETURN].

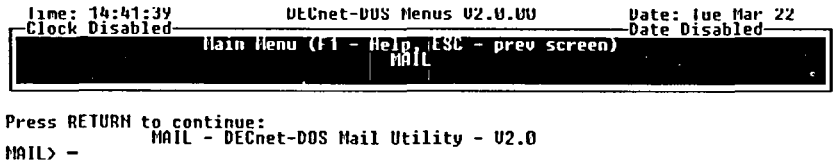
If, however, you want to choose something else, use [⇩] to move your cursor down to the option you want, then press [RETURN].

For example, if you want to send electronic mail to a user on a remote DECnet node, use [⇩] to move the cursor to the line that reads "Send Mail" and press [RETURN].

A new menu appears as follows:



When you press RETURN, Menus will start the DECnet-DOS Mail Sender utility. You see the following on your screen.

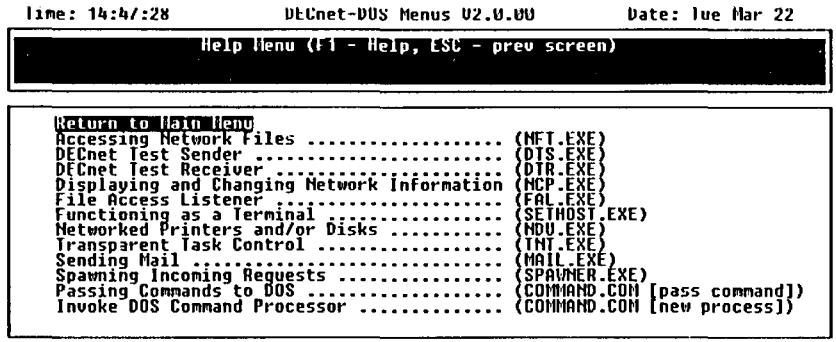


Your cursor is positioned after the MAIL> prompt. You can use the mail utility as you normally would. If you are not familiar with the DECnet-DOS Mail Sender utility, you should refer to the *DECnet-DOS User's Guide* for more information.

When you are finished sending mail, type EXIT at the MAIL> prompt, then press RETURN to return to Menus.

3.3 Getting Help

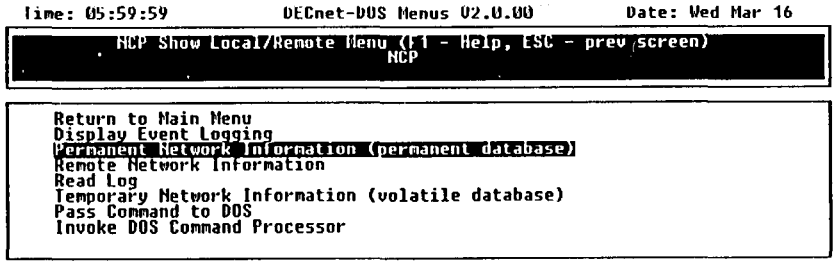
You can access on-line HELP while using DECnet-DOS Menus in two different ways. One way is by selecting the Help option at the Main menu. The following Help menu appears on your screen when you select the Help option.



Use the arrow keys to make your selection.

You can also access on-line HELP for individual items in a menu by pressing F1. For example, if you want to display network information about your node and need help remembering what information is stored in the the permanent database, you can:

Use ⇩ to move the cursor to the Permanent Network Information line.



Press F1 and read the help display that appears as follows:

```
Time: 14:51:41          DECnet-DOS Menus V2.0.00          Date: Tue Mar 22
Clock Disabled                                            Date Disabled
        NCP Show Local/Remote Menu (F1 - Help, ESC - prev screen)
                              NCP HELP LIST

  HELP is available for the following LIST commands:

    LIST ACCESS      LIST CIRCUIT     LIST EXECUTOR     LIST KNOWN
    LIST LINE        LIST NODE        LIST OBJECT
    LIST REMOTE-ADAPTER-NAME

Status display successful.

Press RETURN to continue: -
```

Return to the NCP menu and proceed with the SHOW procedure.

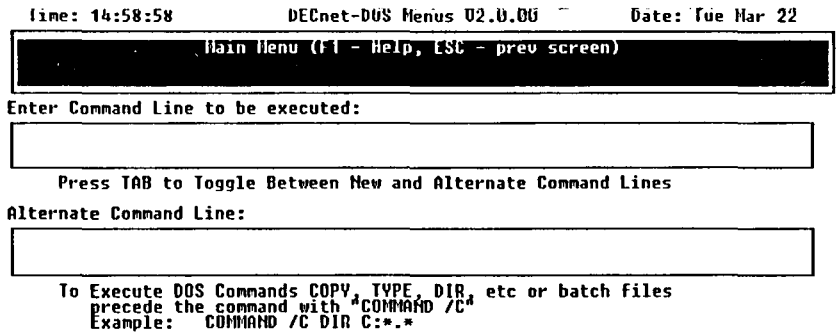
3.4 Passing Commands to DOS

You can issue commands, such as COPY, TYPE, or DIRECTORY, to the DOS operating system from DECnet-DOS Menus. The option "Pass Command To DOS" is available in every list-type menu as shown here.

```
Time: 14:55:11          DECnet-DOS Menus V2.0.00          Date: Tue Mar 22
                    Main Menu (F1 - Help, ESC - prev screen)

    Help
    Quit
    Access Network Files ............... (NFT.EXE)
    Function as a Terminal ............. (SETHOST.EXE)
    Network Printers and/or Disks ...... (NDU.EXE)
    Display Network Information ........ (NCP.EXE)
    Change Network Information ......... (NCP.EXE)
    Send Mail .......................... (MAIL.EXE)
    Test Network ....................... (NCP.EXE)
    Receive Incoming Requests .......... (FAL.EXE, SPAWNER.EXE, DTR.EXE)
    Exercise Network ................... (DTS.EXE)
    Pass Command To DOS ................ (COMMAND.COM [pass command])
    Invoke DOS Command Processor ....... (COMMAND.COM [new process])
```

If you select the "Pass Command" option, the following fill-in menu appears on your screen.



This fill-in menu provides two boxes for you to fill. The first box is blank and labeled with the instruction:

```
Enter Command Line to be executed:
```

This is where you type the DOS command you want to issue. Press RETURN when you are finished entering the command.

DOS processes the command and returns results to your screen. Press RETURN to continue using Menus.

The second box, labeled "Alternate Command Line" appears in all fill-in menus. This box always displays the last command you issued. You can use TAB to move the cursor back and forth between the two boxes.

3.5 Spawning Another DOS Session

In addition to passing one command at a time to the DOS operating system, you can start a new DOS session from DECnet-DOS Menus. The option "Invoke DOS Command Processor" is available in every list-type menu. If you select this option, Menus invokes the DOS command processor COMMAND.COM to start a new DOS session. The following appears on your screen:

```
Type EXIT to Return to DECnet-DOS Menus

The IBM Personal Computer DOS
Version 3.2 (C)Copyright International Business Machine Corp 1981, 1986
          (C)Copyright Microsoft Corp 1981, 1986

C:\>
```

The DOS prompt appears after the copyright text. You can enter any DOS command or run other programs. Do not, however, try to run DECNET or any terminate-and-stay-resident task, from the spawned process. When you finish, remember to type EXIT at the DOS prompt to return to Menus.

3.6 Understanding Messages

While using DECnet-DOS Menus, you may receive status or error messages. These messages are generated either by the Menus utility itself, or by the DECnet-DOS utility that Menus runs for you.

For example, Menus displays messages that tell you what to do next, such as:

- Please Press Up-Arrow, Down-Arrow or RETURN
- Press RETURN to continue:
- Type EXIT to return to DECnet-DOS Menus

Menus also displays informational messages, including:

- Status display successful
- Status display failed

DECnet-DOS utilities may return messages that indicate an error condition. For example:

- From NFT: Error: File not found: filename.ext
- From NCP: Could not find node name with node address = 55.10

If you receive messages that indicate an error condition, you should refer to the *DECnet-DOS User's Guide* or the *DECnet-DOS Network Management Guide* for an explanation and for information about what you should do next.

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DECnet–DOS
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