DECrouter 2000
MS-DOS Installation Procedures

Order No. AA-PBA4A-TE

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MS-DOS V3.30
PC DOS V3.20
PC DOS V3.30

DECnet-DOS V2.1

SOFTWARE VERSION: DECrouter 2000 V1.2

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How to Use This Manual

Manual Objectives

This manual explains how to:

- Install the DECrouter 2000 software on to a personal computer load host.
- Configure the load host database, so that the software can be down-line loaded onto the hardware unit.
- Configure the DECrouter 2000 permanent database.
- Load the DECrouter 2000 software onto the hardware unit.
- Check the installation.

Intended Audience

This manual is for system and network managers who are familiar with networking concepts and the DECnet products.

The system manager is responsible for installing and configuring the software on to one or more load hosts. The system manager is also responsible for checking that the software can load and dump. The network manager is responsible for configuring the DECrouter 2000.

The manual assumes that readers understand and have some experience of:

- Local Area Networks (LANs)
- Wide Area Networks (WANs)
- Installation of software products on MS-DOS or PC DOS systems

NOTE

This guide applies to personal computers that run either the PC DOS or MS-DOS operating systems. For simplicity, the term MS-DOS is used throughout this manual to mean both PC DOS and MS-DOS.

Structure of the Manual

The manual has 3 chapters and 2 appendixes.

Chapter 1 contains information you will need before installing the software.

Chapter 2 explains how to install the software on to an MS-DOS load host.

Chapter 3 explains how to configure the MS-DOS load host database and the DECrouter 2000 database. This chapter also explains how to load the DECrouter 2000 and check the installation.

Appendix A is an example of installing and configuring the software on an MS-DOS load host.

Appendix B lists the files installed onto the MS-DOS load host.

Associated Manuals

For more information on the DECrouter 2000, refer to:

- *DECrouter 2000 Problem Solving Guide*
- *DECrouter 2000 Management Guide*

You may also find the *Routing and Networking Overview* useful in explaining routing concepts and terminology.

All three of these manuals are in the same binder as this manual.

The following provide information about the hardware used with the DECrouter 2000 software:

- *Installing the DEC MicroServer*
- *Installing the DEC MicroServer-SP*
- *DEC MicroServer Systems Configuration Card*
- *DEC MicroServer-SP Systems Configuration Card*

You are expected to be familiar with the following manuals:

- The DECnet-DOS documentation set, in particular the *DECnet-DOS Network Management Guide* and the *DECnet-DOS User's Guide* and *DECnet-DOS Programmer's Guide*.
- *MS-DOS Reference Manual*

Manual Conventions

<*xxx*>	This 1- to 3-character symbol indicates that you press a key on the terminal. For example: <RET> indicates the RETURN key.
<CTRL/*x*>	This symbol indicates that you press the CTRL key at the same time as you press another key; for example, <CTRL/C>, <CTRL/Y>, and so on.
Red print	Text in red print indicates commands and data that you enter.
Italics	Text in italics indicates variable information.

1
Installation Guidelines

1.1 Introduction

The DECrouter 2000 installation procedure consists of the following steps:

1. Installing the distribution software on the load host(s)
2. Configuring the load host database
3. Configuring the DECrouter 2000 permanent database
4. Down-line loading the DECrouter 2000 software on to the hardware unit

The load host is used to store the DECrouter 2000 software image which is down-line loaded onto the DEC MicroServer or DEC MicroServer-SP hardware unit. The load host also stores the permanent configuration database and is used to receive up-line dumps from the DECrouter 2000.

With personal computer load hosts, down-line loading and up-line dumping is performed by the Maintenance Operations Protocol (MOP), a program installed as part of the distribution kit. If the MOP program is running, your personal computer load host perfoms a down-line load whenever the DECrouter 2000 manager powers up the hardware unit. If the DECrouter 2000 system attempts to dump its memory, MOP automatically up-line dumps the data into a dump file on the load host. This dump file is then available for diagnosing any problems.

While MOP is running, your personal computer cannot be used to run user applications. For this reason, Digital suggests that you only use your personal computer as a load host if no other load host is available. A VMS or ULTRIX load host can down-line load and up-line dump without limiting user applications.

Personal computer load hosts have limited network management capabilities. The *DECrouter 2000 Management Guide* discusses how to use the Network Control Program (NCP) to configure the DECrouter 2000 volatile database. On an MS-DOS load host, only the NCP SHOW command, which displays information about the volatile database, can be used.

In addition, personal computer load hosts cannot receive events from a running DECrouter 2000 system.

Any other VAX/VMS or ULTRIX DECnet node that supports remote network management can provide these services for a DECrouter 2000 system.

You are advised to install the DECrouter 2000 software on at least two load hosts. This means that you can still down-line load the image to the DECrouter 2000 and receive dumps when one load host is unavailable. To install the software on to a second load host, simply repeat the installation procedure.

1.2 Pre-Installation Preparations

The following sections describe the checks and actions you need to take before you install the DECrouter 2000 software onto an MS-DOS load host.

1.2.1 Distribution Media

Table 1–1 shows details of the media on which the DECrouter 2000 software may be delivered. Check the contents of your kit against the media details in Table 1–1. If your kit is damaged, or if you find that parts of it are missing, call your Digital representative.

Table 1–1 Media Used to Install the DECrouter 2000 Software

Media Type	Quantity
RX24 floppy diskette	1
RX31 floppy diskette	2

1.2.2 Hardware Requirements

The MS-DOS load host can be any compatible personal computer connected to the same Ethernet as the hardware unit. These include Digital VAXmate personal computers and the following configured IBM personal computers:

- IBM Personal Computer
- IBM Personal Computer XT

- IBM Personal Computer AT
- IBM Personal System/2

For a full list of compatible personal computers and configuration details, see the *System Support Addendum* and *Software Product Description* for the DECrouter 2000.

1.2.3 Software Requirements

To install the DECrouter 2000 software onto an MS-DOS system, the system must be running DECnet-DOS V2.1. The DECrouter 2000 also requires a compatible version of MS-DOS or PC DOS software. For example:

- MS-DOS V3.10
- MS-DOS V3.30
- PC DOS V3.20
- PC DOS V3.30

For a full list of compatible software, see the *System Support Addendum* and *Software Product Description* for the DECrouter 2000.

1.2.4 Disk Space

Table 1–2 shows how much disk space is needed to install the DECrouter 2000 software.

Table 1–2 Disk Space Required for the DECrouter 2000 Software

	Disk Space
Installation	0.6 Mbytes
Up-line Dumps	2.5 Mbytes per dump

1.2.5 Information Required During Installation

Before you install the software onto the load host, complete Table 1–3. During the installation, you will need to refer to this table for information about your load system and the DECrouter 2000. You will also need to refer to the configuration card which is situated on the front of the hardware unit.

If there is a default answer for any question asked during the installation, the answer will be given in square brackets. So, if the default password is DECNET, it will appear as [DECNET].

Table 1–3 Installation Information

DECrouter 2000 Ethernet address
DECrouter 2000 DECnet node address
DECrouter 2000 DECnet node name
Load host node name(s)

The Ethernet address is the physical address of the DEC MicroServer or DEC MicroServer-SP hardware unit, which can be found on a label on the rear of the unit. The Ethernet address is also listed on the configuration card which is attached to the front of the hardware unit. The DECnet node address is the address assigned to the DECrouter 2000, and the DECnet node name is its node name. Note that the DECnet node name must be no more than five alphanumeric characters (one of which must be a letter). The load host node names are the names of the nodes that will down-line load the DECrouter 2000 image.

Digital suggests that you complete Table 1–3, and then complete the required information about load hosts on the configuration card once the DECrouter 2000 installation has been successfully completed.

Refer to Appendix B for a list of those files which are installed on to the load host.

1.3 Installation Time

The installation of the DECrouter 2000 software takes approximately 15 minutes.

2

Installation Procedures for MS-DOS Load Hosts

This chapter explains how to install the DECrouter 2000 software onto an MS-DOS load host.

During the installation, you will need to provide the information that you supplied in Table 1-3.

2.1 Installing the DECrouter 2000 Software

To install the DECrouter 2000 software, complete the following procedure:

1. If you are installing the DECrouter 2000 software from one diskette, insert the diskette into Drive A. If you are installing the DECrouter 2000 software from two diskettes, insert the first diskette into Drive A.
2. The distribution files on the diskette must be copied to the DECnet directory. Check that the DECnet directory resides on the current volume, with the following command:

   ```
   C:\> NCP SHOW EXECUTOR CHARACTERISTICS
   ```

   The display shows the DECnet directory listed as the Database path:

   ```
   Database path = C:\DECNET\
   ```

   - If you need to change your current volume to the one on which the DECnet directory resides, specify the name of the volume at the MS-DOS prompt. For example:

     ```
     A:\> C:
     ```

- If you need to change your current directory to the DECnet directory, enter the following command:

  ```
  C:\> CD \DECNET
  ```

3. Check your disk space, with the following MS-DOS command:

   ```
   C:\DECNET> FREE
   ```

   The FREE command displays the number of free bytes on the current drive. Table 1–2 shows the disk space required for the DECrouter 2000 software installation. Remember to include enough space for up-line dumps from the DECrouter 2000.

4. Enter the following command to copy all the files on the diskette to the volume:

   ```
   C:\DECNET> COPY A:*.*
   ```

   The names of the files are displayed as they are copied from the diskette.

5. When the files have been copied from the diskette, remove the diskette from Drive A.

6. If you are installing the DECrouter 2000 software from one diskette, the installation procedure is now complete.

7. If you are installing the DECrouter 2000 from two diskettes, insert the second diskette into Drive A.

8. Enter the following command to copy the files on the diskette to the volume:

   ```
   C:\DECNET> COPY A:*.*
   ```

   The names of the files are displayed as they are copied from the diskette.

9. When the files have been copied from the diskette, remove the diskette from Drive A.

For a list of files contained in the DECrouter 2000 distribution software, refer to Appendix B.

2.2 Reading the Release Notes

During the installation procedure, the Release Notes for the DECrouter 2000 are copied to the file ROU012.NOT in the DECnet directory. These Release Notes may contain important information about the DECrouter 2000.

Before you complete the configuration procedures, check the Release Notes for any issues that are likely to affect the operation of the DECrouter software. To read the Release Notes, you can display or print the ROU012.NOT file with the MS-DOS TYPE command or PRINT command.

2.3 Tailoring the Installation

After installing the DECrouter 2000 software, you must complete the following steps to tailor the installation:

1. Configure the load host's database so that it includes details of your DECrouter 2000. To do this, you run a program called **ROUCONFG** which is in the DECnet directory. If you have already run this program for previous installations, you only need to configure the database so that it includes any additional DECrouter units. All previously defined DECrouter units will still be configured within the load host's database.
2. Set up the DECrouter 2000 permanent database before you power up the hardware. To set up the database, you run a program called **ROUSETUP** which is in the DECnet directory.

The ROUCONFG and ROUSETUP programs are described in Chapter 3, Configuring the Databases for MS-DOS Load Hosts.

If you want to modify the DECrouter 2000 permanent database for your specific networking requirements, you must run the **ROUPERM** program which is in the DECnet directory. See Section 3.2.2 for details of how to run ROUPERM on an MS-DOS system.

2.4 Installing on Multiple Load Hosts

You are advised to install the DECrouter 2000 software on to at least one other load host. The second load host can down-line load the software to the DECrouter 2000 if the first load host is not available. The second load host can also be used to receive up-line dumps from the DECrouter 2000.

To install the DECrouter 2000 software on to one or more additional load hosts, repeat the installation procedure given in Section 2.1.

3

Configuring the Databases for MS-DOS Load Hosts

This chapter describes the configuration procedure for:

- The MS-DOS load host database
- The DECrouter 2000 permanent database

The chapter also explains how to load the DECrouter 2000.

The load host database contains information needed for the host to load the software onto the hardware unit. Before you can load the software, you need to configure the database.

The DECrouter 2000 permanent database contains the information required for the DECrouter 2000 to communicate with other nodes in the network.

After you have installed the software on to the load host, you must first run the image ROUCONFG to set up the load host database, and then run the image ROUSETUP to set up the DECrouter 2000's permanent database. Refer to Section 3.1 for details of ROUCONFG; refer to Section 3.2 for details of ROUSETUP.

NOTE

You must not load the DECrouter 2000 until you have run these two command procedures. Refer to Section 3.3 for details of how to load the DECrouter 2000.

3.1 Configuring the Load Host Database

This configuration process is controlled by a menu-driven procedure called ROUCONFG which allows you to define, modify and delete entries about DECrouters in the load host's database.

The ROUCONFG program is copied to your system during the installation procedure.

The ROUCONFG program allows you to:

- List the DECrouters defined in the load host database.
- Add an entry for a new DECrouter in the load host database which will identify the DECrouter on the Ethernet.
- Swap an existing DECrouter for a new one. If you swap a DECrouter, you can either retain the characteristics of the original DECrouter or specify new characteristics. The Ethernet address of the new unit, and any other new characteristics that you specify, are added to the database.
- Delete an entry for a DECrouter from the load host database. When you delete an entry, the load host no longer recognizes the DECrouter, so it is no longer a load host for that DECrouter. Database entries are deleted when the network is reconfigured or when you assign a DECrouter to another load host.

ROUCONFG modifies the load host database (containing information about DECrouters) which is displayed when you select the List option from the menu. This database is stored in the file ROUCONFG.DAT in the DECnet directory.

ROUCONFG enables the service circuit that will be used to down-line load the DECrouter software from the load host to the DECrouter.

3.1.1 Preparation for the Configuration Procedure

Before you run the ROUCONFG program, make sure that:

1. DECnet is running on your load host node, and that NCP (the Network Control Program) has been installed.
2. You know the DECnet node name and DECnet node address for each DECrouter you want to add to the database. The DECnet node name and address can be found on the *DEC MicroServer Systems Configuration Card* on the front of the hardware unit and in Table 1–3 in this manual.

3. You know the Ethernet address of each DECrouter you want to add to the database. The Ethernet address can be found on the back of the hardware unit, on the *DEC MicroServer Systems Configuration Card* on the front of the hardware unit and in Table 1–3 in this manual.

3.1.2 Running ROUCONFG

ROUCONFG is an interactive menu-driven procedure. When the menu is displayed, select an option and enter <RET>. You can obtain HELP by entering a question mark (?). When you have finished answering the questions on a selected option, the program returns you to the menu.

If you want to exit from an option without making any changes, enter 6 and the program returns you to the menu. Enter <CTRL/C> to exit from the procedure.

To run ROUCONFG, the software must already be installed on the load host. The ROUCONFG program is copied to the DECnet directory.

To start ROUCONFG, enter the following command:

```
C:\DECNET> ROUCONFG
```

You are first reminded that each DECrouter must have a unique DECnet node name and DECnet node address. The procedure asks if you want to continue or exit as follows:

```
Press <RETURN> to start, or <CRTL/C> to exit...
```

If you press <RET>, ROUCONFG displays the following:

```
               DECrouter Configuration Procedure V1.0

                        Menu of Options

                   1 - List known DECrouters
                   2 - Add a DECrouter
                   3 - Swap an existing DECrouter
                   4 - Delete an existing DECrouter
           <CTRL/C> - Exit from this procedure

Your selection?
```

Select the number that corresponds to the option you want and press <RET>. Sections 3.1.2.1 to 3.1.2.4 describe the options.

3.1.2.1 List Known DECrouters (Option 1)

If you select this option, the contents of the ROUCONFG.DAT file is displayed. For example:

```
DECnet   DECnet  Router  Service                    Load File
Address  Node    Type    Circuit  Ethernet Address  Dump File
-------  ------  ------  -------  ----------------  ---------

12.1001  KANGA   DR2000  ETHER-1  08-00-2B-02-CC-24 C:\DECNET\ROU012.SYS
                                                    C:\DECNET\ROUKANGA.DMP
12.1002  KOALA   DR2000  ETHER-1  08-00-2B-02-AA-23 C:\DECNET\ROU012.SYS
                                                    C:\DECNET\ROUKOALA.DMP

Total of 2 DECrouters defined.

(Press RETURN for menu)
```

The display shows information about the load host database including the names of the load and dump files used by the database. The naming convention used for the load and dump files is as follows:

ROU012.SYS
ROU*router*.DMP

where *router* is the node name of the DECrouter.

A DECrouter dumps its memory either as a result of a failure or in response to a request by the network manager. If the MOP program is running when the dump occurs, the memory is copied into a dump file on the load host. This file can then be used for diagnosing any problems that may arise when using a DECrouter. See Section 3.3 for details of how to run MOP.

If MOP is not running when the DECrouter 2000 experiences a failure, the up-line dumps from the DECrouter may be lost. You cannot run MOP at the same time as user applications. Therefore, Digital recommends that you run MOP when user applications are not running.

If the DECrouter 2000 experiences a failure while you are running a user application, stop the application and run MOP immediately. If you run MOP within three or four minutes of the failure, MOP creates a dump file and then reloads the system. If you run MOP after three or four minutes, MOP reloads the system but the up-line dump from the DECrouter is lost.

If a DECrouter repeatedly crashes and an up-line dump is produced, copy the dump to a floppy diskette and send it with a Software Performance Report (SPR) to Digital. If the dump file is too large for a single floppy disk, use the BACKUP utility to copy the messages during the dump request. Refer to the *DECrouter 2000 Problem Solving Guide* for details on how to submit an SPR.

3.1.2.2 Add a DECrouter (Option 2)

If you select this option, you can add a new entry to the load host database. When you define a new entry, you must supply:

1. The DECrouter type
2. A unique DECnet node name for the DECrouter 2000
3. A unique DECnet node address for the DECrouter 2000
4. The Ethernet address of the DECrouter 2000

The DECrouter 2000's DECnet node name, DECnet node address and its Ethernet address can be found in Table 1–3 in this manual.

You will be prompted to supply the above information as follows:

```
DECrouter type (DR200, DR2000)?
```

Specify DR2000 for a DECrouter 2000, which allows you to use up to four synchronous lines. If you specify DR200, you can use the DECrouter 200, which has up to eight asynchronous lines. Refer to the DECrouter 200 documentation for details of this product.

```
DECnet node name for unit?
```

Specify the DECnet node name for the DECrouter. This node name consists of up to five alphanumeric characters (one of which must be a letter). The name must be unique for your DECnet network.

```
DECnet node address for unit?
```

Specify the DECnet node address for the DECrouter. This is a decimal number from 1 to 1023 and must be unique for your DECnet network. If your network is divided into areas, include the area number within the address (the area address is inserted in front of the node address). For example, if an address is 12.1001, 12 is the area number and 1001 is the node number. If you omit the area number, the area number of the current load host is used as a default.

```
Ethernet address for unit?
```

Specify the Ethernet address of the DECrouter. This address is situated on the *DEC MicroServer Systems Configuration Card* which is on the front of the hardware unit. If the address is not on the card, it can be found on a label on the back of the hardware unit. Enter the Ethernet address as six pairs of hexadecimal digits, with a hyphen separating each pair. For example: 08-00-2B-02-AA-23.

Once you have specified the Ethernet address of the DECrouter, ROUCONFG adds the new entry to the database and displays:

```
New DECrouter added successfully
```

If you specify a node address that is already defined in the database, a ROUCONFG error message is displayed, nothing is added to the database and the Add option is exited.

3.1.2.3 Swap an Existing DECrouter (Option 3)

If you select this option, you can swap an existing DECrouter for a new hardware unit.

First, the procedure prompts you for the node name of the existing unit:

```
What is the DECnet node name of the DECrouter you want to swap?
```

Specify the node name of the DECrouter that you want to replace. The configuration procedure displays the Ethernet address of the old unit and prompts you for details of the new unit:

```
DECrouter at Ethernet address nn-nn-nn-nn-nn-nn is being modified.

Enter the new Ethernet address, and any other DECnet
characteristics you want to modify.

DECrouter type (DR200, DR2000) ?
```

Specify DR2000 for a DECrouter 2000, which allows you to use up to four synchronous lines. If you specify DR200, you can use the DECrouter 200 which has up to eight asynchronous lines. Refer to the DECrouter 200 documentation for details of this product.

```
DECnet node name for unit [node_name]?
```

Specify the DECnet node name for the new DECrouter. The default name is the same name as the old DECrouter unit. If you specify a new name, it must consist of 1 to 5 alphanumeric characters (one of which must be a letter) and it must be unique for your DECnet network.

```
Ethernet address of unit?
```

Specify the Ethernet address of the new unit. This address is situated on the *DEC MicroServer Systems Configuration Card* which is on the front of the hardware unit. If the address is not on the card, it can be found on a label on the back of the hardware unit. Enter the Ethernet address as six pairs of hexadecimal digits, with a hyphen separating each pair.

3.1.2.4 Delete an Existing DECrouter (Option 4)

If you select this option, you can delete a DECrouter from the database. Deleting is used when you reconfigure the network or change the load hosts. ROUCONFG prompts you for the name of the DECrouter as follows:

```
Enter the DECnet node name of the DECrouter entry you want to delete,
or press <RETURN> to return to main menu:
```

Specify the DECnet node name of the DECrouter you want to delete. The procedure checks that there is an entry for the specified node name in the database, removes the entry, and returns you to the menu.

If the entry does not exist, ROUCONFG informs you about this, and returns you to the menu.

3.2 Configuring the DECrouter 2000's Permanent Database

The DECrouter 2000's permanent database is configured by running the program ROUSETUP. Usually, running this command procedure is all you need to do to set up the permanent database.

If you want to tailor the database to your specific networking requirements, you must run the configurator program, ROUPERM. Section 3.2.2 describes how to run ROUPERM.

The ROUSETUP program consists of a series of questions which allow you to set up the following in the DECrouter 2000's permanent database:

- The node name
- The type of routing node
- The access control strings required to protect the database
- The lines used with their associated parameters
- The circuits used with their associated parameters

ROUSETUP is an interactive procedure. You simply supply the information requested by the displayed question. You can obtain HELP by entering a question mark (?), and you can exit from the procedure by entering <CTRL/C>.

To run ROUSETUP, the DECrouter 2000 software must already be installed on the system. The ROUSETUP program is copied to the DECnet directory.

3.2.1 Running ROUSETUP

To run ROUSETUP, enter the following command:

```
C:\DECNET> ROUSETUP
```

The procedure starts by displaying the following message:

```
        This program sets  up  the  permanent  database  for the
        DECrouter 2000.  Usually, executing this program is  all
        you need to do to set up the database.

        The program asks a series of questions.  If you need
        help with answering a question, enter ? as a response
        and the HELP text will be displayed.

Press <RETURN> to start, or <CTRL/C> to exit...
```

Press <RET> and the procedure asks you for the node name of the DECrouter 2000.

```
DECrouter 2000 node name:
```

Enter the node name of the DECrouter 2000. The DECnet node name for your DECrouter 2000 consists of from 1 to 5 alphanumeric characters, one of which must be a letter. This name identifies the DECrouter within the network.

When you enter the node name, the procedure checks for an existing configuration file. If there is already a file for this DECrouter node, the following is displayed:

```
A configuration file for node-name already exists.

Do you want to create another [YES]:

The old configuration file for node-name will be renamed.
```

If you answer YES, the old file will be renamed and saved in the DECnet directory.

The procedure then asks whether you are running the DECrouter 2000 on a DEMSA or DEMSB.

```
DECrouter 2000 type (DEMSA, DEMSB):
```

If you answer DEMSA, the procedure asks what type of router you want the DECrouter 2000 to be set up as.

```
Do you want node-name to be an AREA router [NO]:
```

A DECrouter 2000 on a DEMSA can be either an AREA (Level 2) router or a ROUTING IV (Level 1) router.

An AREA router can forward packets from one area within a network to another area. A ROUTING IV router can only forward packets within its own area.

If you answer DEMSB, the DECrouter 2000 is set up as a ROUTING IV (Level 1) router.

The procedure then asks you about the Ethernet circuit cost to be used with the DECrouter 2000.

```
Ethernet circuit cost [4]:
```

Specify a value in the range 1 to 63. The cost is a value assigned to a circuit between two adjacent nodes. Packets are routed along paths with the smallest cost.

You are now asked about the router priority for the DECrouter 2000.

```
Router priority [64]:
```

Specify a value in the range 1 to 127. The router with the highest priority will become the designated router for the Ethernet.

If you are running the DECrouter 2000 on a DEMSA, you are then asked about the number of lines that you want to use with the DECrouter 2000. The procedure displays the following:

```
The DECrouter 2000 supports the following combinations of lines,
line speeds and ports. Specify the type you require.

 Type   Number of lines     Maximum speed              Ports
                           (bits per second)
  1            4                64K                 0, 1, 2, 3
  2            2               256K                    0, 1
  3            1             2.084M                      0

Type [1]:
```

The type specifies how you are going to use the DECrouter 2000. The DECrouter 2000 can support three types of operation. Each type has certain lines, line speeds and ports associated with it. For speeds of up to 64K bits per second for each line, specify type 1. For speeds of up to 256K bits per second for each line, specify type 2. For speeds of up to 2.084M bits per second, specify type 3.

The procedure then displays a summary of the configuration details you have provided. For example:

```
node-name will be configured as a ROUTING IV router with
4 lines each capable of operating at speeds up to 64K bits
```

You are then prompted for the following information about each line:

- The line name. The default line name is SYN-*n* where *n* is the port on the hardware that the line uses. For example:

  ```
  Line 1 name [SYN-1]:
  ```

  If you do not use the default, you should specify a string of between 1 and 16 characters for the line name.

- The line state. The default line state is ON. For example:

  ```
  Line line-name state [ON]:
  ```

  The status of the line can be ON or OFF.

- The name of the circuit associated with the line. The default circuit name is the same as the line name. For example:

  ```
  Name of circuit associated with line line-name [linename]:
  ```

  If you do not use the default, you should specify a string of between 1 and 16 characters for the circuit name.

- The state of the circuit. The default circuit state is ON. For example:

  ```
  Circuit circuit-name state [ON]:
  ```

  The status of the circuit can be ON or OFF.

- The cost for the circuit. The default value is 5. For example:

  ```
  Circuit circuit-name cost [5]:
  ```

  Specify a value between 1 and 63 for the circuit cost. The cost is a value assigned to a circuit between two adjacent nodes. Packets are routed on paths with the least cost.

You will now be asked about the access control information which will be used to control who can alter the database and who can use the TRACE utility from a VMS node (if installed). For each set of information, specify a username and password. The username and password each consist of 1-16 alphanumeric or punctuation characters. You will be asked to verify your entry for the password.

NOTE

You are strongly advised to set up a username and password for the NML object. If you do not do so, any user within the network can modify your DECrouter 2000.

```
Enter the username and password to  be  used to control access to
the DECrouter. This  information  must be supplied whenever lines and
circuits on the DECrouter 2000 are being modified.
If this information is not specified, anyone can modify the
DECrouter 2000.

NML Username [NONE]:

NML Password:

Verification:
```

Remember what you have specified for the username and password, as you will need to supply the information in order to make future modifications to the DECrouter 2000 database. The procedure then asks about the username and password for the TRACE utility.

NOTE

> You are strongly advised to set up a username and password for the TRACE utility. If you do not do so, any user within the network with TRACE installed on their VMS node can monitor the traffic on your DECrouter 2000.

```
Enter  the  username and  password to be used  for  the TRACE utility.
This information must be supplied when using the VMS TRACE utility
on the DECrouter 2000.
If this information is not specified, anyone can monitor traffic
on the DECrouter 2000.

TRACE Username [NONE]:

TRACE Password:

Verification:
```

Remember what you have specified for the username and password, as you will need to supply the information when you use the TRACE utility from a VMS system.

The procedure then displays the following message:

```
The following commands will be executed to create the permanent
database:
```

The procedure lists the commands it will use to create the permanent database and then asks:

```
Do you want these commands to be executed [YES]:
```

Answer YES, and the permanent database will be created for you. If you answer NO, you should re-run the ROUSETUP program in order to create the permanent database.

3.2.2 Running ROUPERM

Usually, running ROUSETUP is all you need to do to create and set up the permanent database. If you need to tailor the database to your specific networking requirements, you must run ROUPERM.

ROUPERM is a configurator program copied to the DECnet directory during installation. To start ROUPERM on an MS-DOS system, enter the following command:

```
C:\DECNET> ROUPERM
```

The program prompts you for the node name of your DECrouter 2000:

```
Enter Server node name:
```

Enter the node name for your DECrouter 2000. The ROUPERM program starts and the following prompt is displayed:

```
ROUPERM>
```

Details of the commands that you can use with the ROUPERM program are documented in the *DECrouter 2000 Management Guide*. Although the *DECrouter 2000 Management Guide* is designed for VMS and ULTRIX users, all ROUPERM commands documented in the guide are available on an MS-DOS system. The guide also describes the messages that ROUPERM may produce while you are running the program.

To exit the ROUPERM program, enter <CTRL/C> or EXIT at the ROUPERM prompt.

3.3 Loading the Software and Checking the Installation

There are two stages in checking the installation. First you should check the load host installation by down-line loading the DECrouter software image, and then you should check the DECrouter system by issuing a few NCP commands. Refer to Sections 3.3.1 and 3.3.2 for details.

When you check the load host installation, you can confirm that:

- The correct files are in the correct directory.
- The entry for the DECrouter in the database is correct.
- The down-line load has worked.

When you check the DECrouter system, you can confirm that:

- The correct version of the software is running on the DECrouter.

- The hardware unit works with the DECrouter software.

3.3.1 Loading the Software

There are two ways that you can down-line load the DECrouter software image on to the hardware unit:

- If you can access the hardware unit, run the MOP program from the load host and then plug the hardware unit into the power supply.
- If you cannot access the hardware unit easily, enter the MOP TRIGGER command at the load host node. The hardware unit must be connected to the power supply before you use MOP TRIGGER.

Section 3.3.1.1 describes how to load the software by running MOP and powering up the hardware unit. Section 3.3.1.2 describes how to use the MOP TRIGGER command at your personal computer load host to load the software.

If you use MOP TRIGGER to load the software onto a new DECrouter unit, you need to specify the DECrouter 2000 Ethernet address which can be found in Table 1–3. If a DECnet service password is defined, you must also specify the password. A DECnet service password is a hexadecimal number defined by the DECrouter 2000 system manager. For more information, see the *DECrouter 2000 Problem Solving Guide*.

If you use MOP TRIGGER to reload the software, you need to specify the Ethernet address and the DECnet node name or DECnet node address for the DECrouter 2000. These details can be found in Table 1–3. If a DECnet service password is defined, you must also specify the password. Check with the previous system manager for details of the password.

3.3.1.1 Using MOP and Powering Up the Unit

If you can access the hardware unit, complete the following procedure to load the DECrouter 2000 software:

1. Start the MOP program with the following command:

   ```
   C:\DECNET> MOP
   ```

2. Unplug the power plug for the hardware unit from the power supply (if the unit is plugged in).
3. Insert the power plug for the hardware unit into the power supply.

As the hardware unit comes up, it goes through a series of diagnostic checks and then automatically requests the down-line load of the software image from the load host.

You can also use this procedure if you need to reload the DECrouter 2000 software.

3.3.1.2 Using MOP TRIGGER

If you cannot access the hardware unit easily, you can use the MOP TRIGGER command to down-line load the software image onto the hardware unit. To use MOP TRIGGER, the hardware unit must be connected to the power supply.

To load the software onto a new hardware unit, enter the following command, specifying the Ethernet address for the hardware unit and any DECnet service password defined for the DECrouter 2000:

```
C:\DECNET> MOP TRIGGER nn-nn-nn-nn-nn-nn password
```

If a DECnet service password has not been defined, specify the Ethernet for the hardware unit and 00 with the MOP TRIGGER command:

```
C:\DECNET> MOP TRIGGER nn-nn-nn-nn-nn-nn 00
```

You must include 00 on the command line if a DECnet service password has not been defined.

To reload the software onto the hardware unit, complete one of the following procedures:

- If the hardware unit is already loaded, disable the circuit service with the following command:

  ```
  C:\> NCP SET CIRCUIT SERVICE DISABLED
  ```

  Enter the MOP TRIGGER command and specify the DECnet node address or node name, and the DECnet service password if the previous system manager has defined a password. For example:

  ```
  C:\DECNET> MOP TRIGGER node-name password
  ```

  If the previous system manager has not defined a DECnet service password, specify the DECnet node address or node name and 00 with the MOP TRIGGER command. For example:

  ```
  C:\DECNET> MOP TRIGGER node-name 00
  ```

- If the hardware unit is connected to the power supply but not loaded, specify the Ethernet address for the unit and the DECnet service password if the previous system manager has defined a password:

  ```
  C:\DECNET> MOP TRIGGER nn-nn-nn-nn-nn-nn password
  ```

If the previous system manager has not defined a DECnet service password, specify the Ethernet address for the unit and 00 with the MOP TRIGGER command:

```
C:\DECNET> MOP TRIGGER nn-nn-nn-nn-nn-nn 00
```

3.3.1.3 MOP Messages

In response to the MOP or MOP TRIGGER command, the hardware unit requests the down-line load of the software image from the load host. Once the load is complete, the DECrouter 2000 attempts to down-line load the permanent configuration database created by ROUSETUP.

MOP messages confirm that the down-line loads are successful. For example:

```
Program load request from:  08-00-2b-03-11-22 at Wed Oct 25 15:10:41 1989
Program type: system
Software id:
load complete at Wed Oct 25 15:10:41 1989

Program load request from:  aa-00-04-00-9a-aa at Wed Oct 25 15:10:41 1989
Node address:
Program type: system
Software id: ROUKOALA
load complete at Wed Oct 25 15:10:41 1989
```

The first message confirms that the DECrouter 2000 software image has been loaded. The second message confirms that the permanent database has been loaded.

To exit MOP, press <CTRL/C>.

While MOP is running, other load request messages may be displayed. For example:

```
Program load request from:  06-10-9b-03-19-23 at Wed Oct 25 15:05:41 1989
Program type: system
Software id:
?System load file not defined in nodes data base
```

These messages are displayed when MOP picks up a load request from another node on the same Ethernet. The node is requesting the down-line load of software from another load host. MOP receives the request, but because the node is not defined in the load host database, it does not respond to it.

Load requests from other nodes do not affect loading the DECrouter 2000 software.

When loading the software, the DECrouter 2000 will try for 5 minutes to load the permanent database, and then reboots if the database cannot be loaded.

If there are problems with loading the software, you may have to re-run the ROUCONFG and/or ROUSETUP programs. If load problems still occur, check that the hardware is working correctly. Refer to the *DECrouter 2000 Problem Solving Guide* for details. Although the guide is designed for VMS and ULTRIX load hosts only, the hardware problem solving procedures described in the guide are also valid for MS-DOS load hosts.

If the hardware is working correctly, the problem is probably due to the load host. Check the load host database and make sure that you have entered the correct Ethernet address for the DECrouter. Check that the DECrouter images are in the correct directory and that DECnet is running.

3.3.2 Checking the DECrouter 2000 System Installation

To check that the DECrouter system is working correctly, you must use NCP (the Network Control Program) to display information about the DECrouter 2000.

To start NCP, enter the following command:

```
C:\> NCP
```

The NCP prompt is displayed:

```
    Network Control Program - Version V2.1

NCP>
```

Use the following NCP procedures to check the DECrouter 2000 installation:

1. Check that the DECrouter is running and that the correct version of the software is loaded with the following commands:

   ```
   NCP> DEFINE NODE node-address NAME node-name
   NCP> TELL node-name SHOW EXECUTOR CHARACTERISTICS
   ```

   Specify the node name and node address for the DECrouter 2000 which can be found in Table 1–3 in this manual.

   The DEFINE command assigns the node name of the DECrouter to the node address. The TELL command then instructs the DECrouter node to display information about its executor characteristics.

   For example:

   ```
   Executor Address                = 12.500
   Executor Name                   = KANGA
   ```

```
Executor Identification          = DECrouter 2000 V1.2 BL12
Executor version                 = 4 2 0
Host                             = 12.350 FRED
NSP version                      = 4 1 0
Maximum links                    = 512
Delay factor                     = 80
Delay weight                     = 5
Inactivity timer                 = 60
Retransmit factor                = 10
Routing version                  = 2 0 0
Routing type                     = Area
Routing timer                    = 600
Broadcast routing timer          = 40
Maximum address                  = 1023
Maximum cost                     = 1022
Maximum hops                     = 30
Maximum visits                   = 63
Maximum area                     = 60
Maximum broadcast nonrouters     = 1022
Maximum broadcast routers        = 32
Area maximum cost                = 1022
Area maximum hops                = 30
Maximum buffers                  = 500
Maximum buffer size              = 576
Segment buffer size              = 576
```

2. Check that the circuits are working correctly with the following commands:

```
NCP> DEFINE NODE node-address NAME node-name
NCP> TELL node-name SHOW KNOWN CIRCUIT
```

These commands assign the DECrouter 2000 node name to the node address and instruct the DECrouter node to display information about its circuits. For example:

```
Known Circuit Volatile Status as of 15-OCT-1989 15:39:04

Circuit          State                Loopback     Adjacent  Block
                                        Name         Node     Size

BEAN              on                            12.5  (KANGA)   576
ETHERNET          on                            12.22 (ROO)     576
                                                12.23 (KOALA)  576
PEA               on       -starting
```

For more information on NCP commands, see the *DECnet-DOS Network Management Guide*.

A

Example MS-DOS Installation and Configuration

```
C:\> CD \DECNET
C:\DECNET> COPY A:*.*
A:ROUHELP.EXE
A:ROUPERM.EXE
A:ROUCONFG.EXE
A:ROUSETUP.EXE
A:ROU012.NOT
A:ROU012.SYS
A:MOP.EXE
     7 File(s) copied.

C:\DECNET> ROUCONFG

               DECrouter Configuration Procedure V1.0

You must assign a unique DECnet node name and DECnet node address
for each  new  DECrouter.

You must read the release notes (rou012.not) before proceeding.

Press <RETURN> to start, or <CTRL/C> to exit...  <RET>

               DECrouter Configuration Procedure V1.0

                        Menu of Options

                  1 - List known DECrouters
                  2 - Add a DECrouter
                  3 - Swap an existing DECrouter
                  4 - Delete an existing DECrouter
           <CTRL/C> - Exit from this procedure

Your selection? 1
```

```
There are no DECrouters defined in the data file

(Press RETURN for menu) <RET>

               DECrouter Configuration Procedure V1.0

                        Menu of Options

                     1 - List known DECrouters
                     2 - Add a DECrouter
                     3 - Swap an existing DECrouter
                     4 - Delete an existing DECrouter
            <CTRL/C> - Exit from this procedure

Your selection? 2

Adding a DECrouter:

Type a ? at any time for help on a question. Type <CTRL/C> for any
question to exit from ROUCONFG without adding the unit

DECrouter type (DR200, DR2000) ? DR2000
DECnet node name for unit ? TOM
DECnet node address for unit ? 12.999
Ethernet address for unit ? 08-00-2b-03-11-22
New DECrouter added successfully

(Press RETURN for menu) <RET>

               DECrouter Configuration Procedure V1.0

                        Menu of Options

                     1 - List known DECrouters
                     2 - Add a DECrouter
                     3 - Swap an existing DECrouter
                     4 - Delete an existing DECrouter
            <CTRL/C> - Exit from this procedure

Your selection? 1

DECnet  DECnet Router Service                   Load File
Address Node   Type   Circuit Ethernet Address  Dump File
------  -----  ------ ------- -----------------  ---------

12.999  TOM    DR2000 ETHER-1 08-00-2b-03-11-22 C:\DECNET\ROU012.SYS
                                                C:\DECNET\ROUTOM.DMP

Total of 1 DECrouter defined.

(Press RETURN for menu) <RET>
```

```
                DECrouter Configuration Procedure V1.0

                           Menu of Options

                        1 - List known DECrouters
                        2 - Add a DECrouter
                        3 - Swap an existing DECrouter
                        4 - Delete an existing DECrouter
                     <CTRL/C> - Exit from this procedure

        Your selection? ^C

C:\DECNET> ROUSETUP

This program sets  up  the  permanent  database  for the
DECrouter 2000.  Usually, executing this program is  all
you need to do to set up the database.

The program asks a series of questions.  If you need
help with answering a question, enter ? as a response
and the HELP text will be displayed.

Press <RETURN> to start, or <CRTL/C> to exit... <RET>


DECrouter 2000 node name: tom

DECrouter 2000 type (DEMSA, DEMSB): DEMSA

Do you want TOM to be an AREA router [NO]: yes

Ethernet circuit cost [4]: <RET>

Router priority [64]: <RET>

  The DECrouter 2000 supports the following combinations of lines,
  line speeds and ports. Specify the type you require.

   Type      Number of lines       Maximum speed          Ports
                                   (bits per second)
     1              4                  64K              0, 1, 2, 3
     2              2                 256K                 0, 1
     3              1               2.084M                   0

Type [1]: 2

tom will be configured as an AREA router with 2 lines each capable
of operating at speeds up to 256 Kb

Line 0 name [SYN-0]: l0

Line l0 default state [ON]: <RET>

Name of circuit associated with line l0 [l0]: <RET>

Circuit l0 default state [ON]: <RET>

Circuit l0 cost [5]: <RET>

Line 1 name [SYN-1]: <RET>

Line SYN-1 default state [ON]: <RET>
```

```
Name of circuit associated with line SYN-1 [SYN-1]: <RET>

Circuit SYN-1 default state [ON]: <RET>

Circuit SYN-1 cost [5]: <RET>

Enter the  username and  password to  be  used to control access to the
DECrouter. This information must be supplied whenever lines and
circuits on the DECrouter 2000 are being modified.
If this information is not specified, anyone can modify the
DECrouter 2000.

NML Username [NONE]: dolphin

NML Password: porpoise

Verification: porpoise

Enter the username and password to be used for  the  TRACE utility.
This information must be supplied when using the VMS TRACE utility
on the DECrouter 2000.
If  this  information is not specified, anyone can monitor traffic
on the DECrouter 2000.

TRACE Username [NONE]: dolphin

TRACE Password: porpoise

Verification: porpoise

The following commands will be executed to create the permanent
database:

set executor type area
set logging monitor event 0.0-9
set logging monitor event 2.0-1
set logging monitor event 4.2,16,19
set logging monitor event 5.0-21
set circuit ETHERNET cost 4
set circuit ETHERNET router priority 64
set line l0 device SYN-0 state on
set circuit l0 line l0 state off
set circuit l0 cost 5
set circuit l0 state on
set line SYN-1 device SYN-1 state on
set circuit SYN-1 line SYN-1 state off
set circuit SYN-1 cost 5
set circuit SYN-1 state on
set object nml user DOLPHIN password *set*
set object nettrace$ user DOLPHIN password *set*

Do you want these commands to be executed [YES]: <RET>

ROUPERM V1.2,  DECrouter 2000 Configuration Program

%ROUPERM-I-NEWRTR, this is a new decrouter
%ROUPERM-I-FILNEW, new configuration file created
```

B
List of Files Installed

The following files are installed on your MS-DOS load host in the \DECNET\ directory:

MOP.EXE	MOP (Maintenance Operations Protocol) program that performs down-line loading and up-line dumping.
ROU012.NOT	Release Notes for the DECrouter 2000.
ROU012.SYS	DECrouter 2000 software image.
ROUCONFG.EXE	Configurator program used to set up the load host database.
ROUHELP.TXT	HELP file for the configurator program.
ROUPERM.EXE	Configurator program used to modify the DECrouter 2000 permanent database.
ROUSETUP.EXE	Configurator program used to set up the DECrouter 2000 permanent database.

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