VAX™ 3271 Protocol Emulator Installation Guide

November 1989

This document describes how to install the VAX 3271 Protocol Emulator Version 2.5 and all maintenance updates throughout that version. The document also explains how to read the on-line release notes before or after installing the product.

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Preface

The VAX™ 3271 Protocol Emulator software, referred to as the 3271 PE in this manual, allows programs on a VAX or MicroVAX™ system to communicate with programs on an IBM SYSTEM/370™ running MVS™, VM™, or DOS/VSE.

Objectives

This manual describes how to install and load the 3271 PE software on a VAX or MicroVAX system. Use this manual in conjunction with other Digital Equipment Corporation and IBM® documentation.

Intended Audience

This manual is for system managers and network managers responsible for the installation of the 3271 PE software.

Structure

Chapter 1	Introduces the 3271 PE and the hardware and software requirements.
Chapter 2	Describes the installation process. This chapter includes a sample installation procedure that can be used for any one of five communication devices that connect your system with an IBM system.

Chapter 3	Provides postinstallation information which includes a description of loading the 3271 PE software onto a VAX or MicroVAX system and testing the communication lines to the IBM system.
Appendix A	Summarizes error recovery information.

Associated Documents

- *VAX 3271 Protocol Emulator Management and Programming Guide*
- *VAX 3271 Protocol Emulator: 3270 Terminal Emulator User's Guide*
- *VAX 3271 Protocol Emulator: 3270 Terminal Emulator Reference Card*
- *VMS I/O User's Reference Manual (Parts 1 and 2)*
- *VMS System Services Reference Manual*
- *VMS System Messages and Recovery Procedures Reference Manual (Parts 1 and 2)*
- *VMS License Management Utility Manual*
- *VMS System Generation Utility Manual*
- *VMS Authorize Utility Manual*
- *VMS Monitor Utility Manual*
- *Guide to Setting up a VMS System*
- *DPV11 Serial Synchronous Interface User Guide*
- *DUP11 Serial Synchronous Interface User Guide*
- *DSV11 Communications Option User's Guide*
- *DSV11 Communications Option Technical Description*
- *DMF32 Technical Manual*
- *DMB32 Technical Description*
- *DMB32 User Guide*
- *Terminal and Communications Handbook* (a Digital handbook)

Conventions Used in This Manual

Convention	Meaning
`Special Type`	This special type indicates an example of system output or user input. In interactive examples, system output is in black type, and user input is in red type.
UPPERCASE	Uppercase letters in command syntax indicate words that you enter. You can enter these words in either uppercase or lowercase.
Lowercase Italics	Lowercase italics in command syntax or examples indicate variables for which either the user or the system supplies a value.
[ ]	Square brackets in command syntax statements indicate that the enclosed value(s) are optional. Default values apply for unspecified options. (Do not type the brackets.) In the installation procedure, square brackets enclose the default answer for a question. Simply press Ret to choose the default.
( )	In the installation procedure, parentheses enclose the possible options or range of values that you can specify in response to a question.
Ret	This symbol indicates a key that you should press. For example, Ret means that you should press the RETURN key.
Ctrl/*x*	This notation means that you should hold down the CTRL key and press the key specified by *x* at the same time. (Your screen displays this key combination as ^*x*.)

You must press Ret to enter all commands. This manual does not show Ret in command examples except in the sample installation procedure in Chapter 2.

Chapter 1

Preparing for Installation

The VAX™ 3271 Protocol Emulator, referred to as the 3271 PE throughout this manual, is a software product that enables the VAX 3270 Terminal Emulator (3270 TE) and other user application programs to exchange data with IBM® programs and system services. The 3271 PE uses the Binary Synchronous Communications (BSC) protocol to interact with the IBM system.

Before you install the 3271 PE, you must make preparations to ensure proper operation of the software. The following sections outline preinstallation requirements and information:

- Checking the contents of your distribution kit.
- IBM system requirements.
- VAX system hardware requirements.
- VAX system software requirements.
- Site related information.
- Considerations for VAXcluster™ systems.
- Preparing for VMSINSTAL.

1.1 Checking the Distribution Kit

The bill of materials (BOM) included with your distribution kit specifies the number and contents of the distribution kit. Carefully compare the items listed in the BOM with the items in your distribution kit. If any components are missing or damaged, contact your Digital representative before continuing with the installation.

1.2 IBM System Requirements

Make sure the following IBM hardware and software components are available:

- A communications control unit.
- A communications software access method, such as ACF/VTAM.
- An IBM interactive VTAM application, for example, CICS/VS, IMS/DC, or TSO.
- An operating system capable of supporting VTAM interactive applications such as MVS™, VM™, or DOS/VSE.

Before installing the 3271 PE, verify that the following IBM system requirements have been met:

- The correct modems are selected and installed according to the guidelines given in Section 1.3.2.
- The IBM hardware for the 3270 Information Display System is installed and configured properly.
- The IBM software is configured for the multidrop BSC protocol. (The IBM host should be configured as a host station that communicates with tributary stations on a multidrop communications line.)
- The appropriate IBM software has been configured and installed. Make sure the software is configured for the same number of device units as specified for the 3271 PE. Also, verify that the software will accept at least seven negative acknowledgments (NAKs) before dropping the line.
- The line to the IBM is remote and nonswitched.

NOTE

The 3271 PE does not support point-to-point connections or switched lines. It does, however, support transparent monitor mode to allow transparent 2780 and 3780 stations to be attached to the same line used by the 3271 PE.

1.3 VAX System Hardware Requirements

Your VAX or MicroVAX™ system is attached to the IBM environment through a Digital communications device, a line, modems, and an IBM communications controller. For site specific line interface information, see Section 1.5.1.

1.3.1 Digital Communications Devices

Digital communications devices feature half-duplex point-to-point, half-duplex multidrop (multipoint), full-duplex point-to-point, and full-duplex multidrop (multipoint) BSC communications. You need one or more of the following communication devices:

- DUP11

  The DUP11 is a character-buffered, synchronous, serial-line interface that supports either half-duplex or full-duplex lines. This device supports one communications line at speeds from 1.2 Kbps to 9.6 Kbps. The DUP11 is based on the UNIBUS™.

- DPV11

  The DPV11 is a character-buffered, synchronous, serial-line interface that supports either half-duplex or full-duplex lines. This device supports one communications line at speeds from 1.2 Kbps to 9.6 Kbps. The DPV11 is based on the Q-bus™.

- DMB32

  The DMB32 is an asynchronous/synchronous communications device that supports one synchronous communications line at speeds from 1.2 Kbps to 9.6 Kbps. It supports either half-duplex or full-duplex lines. The 3271 PE uses the synchronous port. The DMB32 transmits and receives whole blocks of characters without processor intervention. The DMB32 is based on the VAXBI™ system.

- DMF32

  The DMF32 is an asynchronous/synchronous communications device that supports one synchronous communications line at speeds from 1.2 Kbps to 9.6 Kbps. It supports either half-duplex or full-duplex lines. The DMF32 transmits whole blocks of characters without processor intervention. The DMF32 does require some

processor intervention when receiving data. The DMF32 is based on the UNIBUS.

- DSV11

  The DSV11 is a synchronous communications device that supports two synchronous communications lines at speeds from 1.2 Kbps to 19.2 Kbps for BSC communications protocols. The 3271 PE supports speeds up to 9.6 Kbps. The DSV11 transmits and receives whole blocks of characters without processor intervention. It supports either half-duplex or full-duplex lines. The DSV11 is based on the Q-bus.

Transmission characteristics (such as speed and mode of operation) can vary to satisfy different performance requirements. For additional information about supported communications devices, see the Software Product Description (SPD) for the 3271 PE.

1.3.2 Lines and Modems Connecting the VAX and IBM Systems

A communications line between your VAX or MicroVAX system and the IBM host system requires a pair of synchronous modems or a modem eliminator. (A modem eliminator performs the function of two modems and should be used if the communicating systems are in a close proximity.) Modems can be full-duplex or half-duplex. The type of modems and modem eliminators that you need for the 3271 PE depends on the data transfer rate. You can use any modem that provides synchronous communication at 1200 to 9600 bits per second. Table 1–1 lists modems you can use.

Table 1–1: Modems for 3271 PE Communications

Modem	Speed
Bell 201C	2400 bits/s
Bell 208A	4800 bits/s
Bell 209A	9600 bits/s

You can use modems other than those listed in Table 1–1. However, the modem you select must have the following characteristics:

- The EIA 232-C or EIA 232-D (CCITT V.24) interface. [1]
- Synchronous communication.
- Full-duplex or half-duplex communications.
- Multidrop communications.
- Nonswitched connection (leased or private).

Strap modems for a 0 millisecond Request To Send (RTS) to Clear To Send (CTS) delay. [2] If you experience data loss at the IBM host, you may need to increase the RTS to CTS delay value. The RTS to CTS delay is the amount of time that the modem waits to respond with CTS after receiving RTS from the 3271 PE.

For a complete range of modem options or help in selecting a modem, consult your Digital network specialist.

1.4 VAX System Software Requirements

The following sections discuss the VAX system software requirements for the 3271 PE.

1.4.1 Required Disk Space

The following disk space is required:

Kit	Blocks Needed During Installation	Blocks Needed After Installation
3271 PE	1150	750

[1] The DMB32 and DSV11 devices are designed to work with an EIA 232-D interface; you could have problems if you try to use a DMB32 or DSV11 device with an EIA 232-C interface unless you use a special adapter. See the release notes or your Digital sales representative for more information.

[2] The DMB32 might require a RTS to CTS delay of at least 10 ms if you use it in a half-duplex point-to-point configuration.

To determine the number of free disk blocks on the current system disk, enter the following command at the DCL prompt:

```
$ SHOW DEVICE SYS$SYSDEVICE
```

NOTE

Refer to the release notes for information on conditions that might require more blocks, for example, installation on a diskless MicroVAX in a Local Area VAXcluster.

1.4.2 Required Memory

The following figures estimate the amount of system nonpaged memory required for the 3271 PE operation.

- 10K bytes of nonpaged memory for the first DMF32, DMB32, or DSV11 device. Each subsequent DMF32, DMB32, or DSV11 device requires an additional 300 bytes. These memory requirements are in addition to what the device driver itself needs. Each DMF32, DMB32, or DSV11 uses approximately 4600 bytes of nonpaged memory for data transfer.
- 9K bytes of nonpaged memory for the first DUP11 or DPV11 device. Each subsequent DUP11 or DPV11 device requires an additional 350 bytes.
- Each Emulated Device Unit (EDU) requires an additional 300 bytes for a DMF32, DMB32, or DSV11 device. An additional 350 bytes per EDU are required when a DUP11 or a DPV11 device is used.
- When the 3271 PE is running, further nonpaged memory is allocated to accommodate the number and size of the buffers requested by the user. For all five device types, the 3271 PE adds 24 bytes to the buffer size specified by the user.

For example, a system that has a DMF32 with three EDUs, a DMB32 with ten EDUs, and a DUP11 with ten EDUs would require 26.7K of nonpaged memory for loading. This estimate comes from the following calculation:

10K + 300b + 13*300b + 9K + 10*350b = 26.7K

where

10K	is for the first DMF32.
300b	is for the additional DMB32.
13*300b	is for the 13 EDUs using a DMF32 or DMB32.
9K	is for the first DUP11.
10*350b	is for the 10 EDUs using a DUP11.

The system manager should check for sufficient nonpaged dynamic memory using the SHOW MEMORY or SHOW MEMORY/POOL command. If the nonpaged dynamic memory available needs to be increased, use the System Generation Utility (SYSGEN) to modify the NPAGEDYN parameter. See the *VMS System Generation Utility Manual* for further details.

1.4.3 Required User Process Quotas

In order to use the 3271 PE, some user process quotas might need to be increased. Digital Equipment Corporation suggests the following minimum process quota values for each 3271 PE user:

- ASTLM (AST queue limit)=14
- BIOLM (buffered I/O count limit)=10
- BYTLM (buffered I/O byte count limit)=16,600

Use the Authorize Utility (AUTHORIZE) to compare the current values of these quotas with the requirements for 3271 PE. For example, the account used in the following example is the SMITH account:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> SHOW SMITH
```

To change the values of these quotas, use the VMS Authorize Utility's MODIFY command. See the *VMS Authorize Utility Manual* for further details.

1.4.4 Required VAX System Privileges

A system account is required to install, load, and manage the 3271 PE. The following privileges must be enabled:

- LOG_IO
- PHY_IO
- CMKRNL
- SYSNAM
- SYSPRV

Instead of these privileges, you can enable SETPRV in the account in which the startup procedure is to run. The necessary privileges for installing and starting the 3271 PE are temporarily enabled; the original privileges will be restored later.

1.4.5 Required Software

To install the 3271 PE, the following software components are required:

- VMS™ V5.0, V5.1, V5.2 operating system software. (These versions of the software run on both the VAX and MicroVAX systems.)
- VAX 3271 PE V2.5 software distribution kit. (Note that this kit contains DUP11 and DPV11 device driver software.)
- DSV11, DMB32, and DMF32 synchronous device driver software if these devices are to be used. (Note that this software is packaged separately.) See Table 1–2 for details.

An emulator control program called INS3271 is provided as part of the distribution kit. This program is designed to assist you in determining whether the 3271 PE has been properly installed. See Chapter 3 for more details.

On a MicroVAX system, it is possible that only part of the distribution kit will have been installed. Therefore, before you install the 3271 PE, ensure that you have the following file on your system disk:

- SYS$HELP:HELPLIB.HLB — Help library

If this file is missing, install it by using the following procedure:

1. Execute this command:

```
$ RUN SYS$UPDATE:VMSTAILOR
```

2. When prompted, choose TAILOR-ON.
3. Select the Utilities class and VMS Help Library subclass for the HELPLIB.HLB file.

VMS Software

Before you install the 3271 PE software, you must install the current VMS operating system software on your VAX or MicroVAX system (see the System Support Addendum (SSA) for the correct version of VMS). For information about how to install the operating system software, refer to the guide to your system's installation.

Device Driver Software

Some wide area network (WAN) communications device driver software is consolidated in the WAN Device Drivers kit. Table 1–2 shows which kits contain specific device driver software.

Table 1–2: Device Drivers Prerequisite Software

Device	Device Driver	Kit
DUP11	XKDRIVER	3271 PE kit
DMF32	XGDRIVER	WAN Device Drivers kit
DMB32	SIDRIVER	WAN Device Drivers kit
DPV11	UGDRIVER	3271 PE kit
DSV11	SJDRIVER	WAN Device Drivers kit

If you require drivers from the WAN Device Drivers kit and have not already installed and loaded these drivers, do so at this time. Please refer to the System Support Addendum (SSA) for the required versions of this software. The SSA is part of the Software Product Description (SPD).

1.4.6 VMS License Management Facility Requirements

You must register the 3271 PE license through the VMS License Management Facility (LMF) in accordance with the license agreement signed by your site. You should register your Product Authorization Key (PAK) information with the License Management Facility (LMF) before you install this product. The PAK, which contains information about the license, is a paper certificate shipped with the product.

During the installation, the system asks whether you have registered the 3271 PE and loaded the license. If you have not already done so, you can complete the installation and run the Installation Verification Procedure (IVP). However, the 3271 PE will not run until you register and load the license.

To register and load the license, log in to the system manager's account. Then type the following command:

```
$ @SYS$UPDATE:VMSLICENSE.COM
```

When you are prompted for information, enter the data from your PAK.

If you plan to use the 3271 PE on more than one node in a VAXcluster, you need to load the license on the other nodes that use the 3271 PE. See Section 1.6 for details.

For more information on LMF, see the *VMS License Management Utility Manual* in the VMS documentation set.

1.4.7 VMS Tailor Requirements

The VMS operating system comes with a variety of support classes. Verify that the following four classes are installed on your system before installing the product:

- VMS Required Save Set
- Programming Support
- System Programmer Support
- Utilities

Refer to VMS Tailor documentation in the VMS documentation set for more information.

1.5 Site Related Information

This section discusses gathering the appropriate line interface information prior to installing the 3271 PE.

1.5.1 Line Interface Information

VMSINSTAL creates a file in SYS$STARTUP called V3271E$LOAD.COM. This file contains the commands necessary to load the 3271 PE software into your VMS system. In order to create and load the file, you must supply the following information for each line interface you are using for 3271 communications:

- The name of the synchronous line interface device.
- The controller interface designation of the line.
- The numbers of all device units used on the line.
- **For DUP11 and DPV11 only:**
  - — The address of the Control and Status Register (CSR) of the device.
  - — The interrupt vector address for the device.
- **For the DUP11 only:**
  - — The nexus number of the UNIBUS adapter.

CAUTION

Ensure that you obtain the correct communications device information. If you enter incorrect information during the 3271 PE installation, fatal system errors might occur when the 3271 PE is in use.

After you specify the communications device type, the controller designation, and the device unit numbers, the installation procedure returns a line ID for that particular device. You will need this line ID when using the INS3271 commands.

The line ID is specified as *ddcu*, where:

dd is the device mnemonic. Communications devices and their mnemonics are shown below:

Device	Mnemonic
DUP11	XK
DPV11	UG
DMB32	SI
DMF32	XG
DSV11	SJ

c is an alphabetic controller ID from A to Z.

u is the device unit (DU) number between 0 and 31.

Gather the communications device information for your system, and record it in Table 1–3. You might need to ask the VMS system manager for the controller designations for your communications devices.

Table 1–3: Line Interface Record

Device Information	1st Line	2nd Line	3rd Line	4th Line
Line interface type (DUP11, DPV11, DMB32, DMF32, or DSV11)				
Controller designation (A-Z)				
Device unit numbers				
DUP11 and DPV11 only: CSR address				
DUP11 and DPV11 only: Interrupt vector				
DUP11 only: Nexus number of UNIBUS adapter				

1.5.2 Multidrop Configurations

The 3271 PE meets the protocol requirements of a 3271 interface to the IBM system. The 3271 PE can, therefore, be multidropped on a private or leased communications line with additional 3271 control units (real or emulated) or other multidrop BSC control units such as 2780/3780 units (real only). The multidrop configuration must meet the following requirements:

- All stations (control, host, and tributaries) are using compatible modems.
- Modems (datasets) are strapped for compatible features.
- All stations are using the BSC protocol that is compatible with the 3270 Information Display System (IDS).
- All stations are using EBCDIC transmission codes.
- The method of clocking (modem or host) is the same for all stations.
- Tributaries have unique polling identifiers.
- Tributary modems are set for switched transmit carrier.

1.5.3 CPU Utilization

CPU utilization will be affected if a character-oriented device (such as the DUP11 or DPV11) is being used by the 3271 PE. With a character-oriented device, an interrupt occurs for each character received or transmitted. Even if the 3271 PE is using a DMF32, there might be a significant number of interrupts when the 3271 PE receives a single frame of data. To see the effect of polling or address selection on CPU utilization when the 3271 PE is running and no application programs are engaged in I/O activity with the 3271 PE, execute the MONITOR program:

```
$ MONITOR MODES
```

Observe the time spent in processor modes. Pay special attention to the TIME SPENT ON INTERRUPT STACK parameter both before and after information sent by the IBM host system is received and responded to. The measurements might show some time differences because the 3271 PE spends time responding to polls or address selections issued by the IBM host. Also, some time is spent receiving polls or address selections issued to other control units on the

same multidrop communications line. For more information on the MONITOR program, see the *VMS Monitor Utility Manual*.

CPU utilization tends to be higher when one or both of the following conditions exist:

- The communications line is utilizing a higher baud rate.
- The IBM host system has a higher frequency poll rate or address selection rate.

The frequency of polling or address selection is determined by:

- The number of control units communicating with a particular IBM host system.
- The amount of data transmission activity generated by the control unit requiring IBM host processing.

You can reduce CPU utilization caused by polling or address selection overhead in several ways:

- Reduce the baud rate at which information is transmitted and received over the communications line. Reducing the baud rate reduces CPU utilization for all activity in which the 3271 PE transmits data to or receives data from the IBM host system. If the multidrop line has multiple control units and you change the baud rate for the line, then ALL control units on that line will operate at the reduced baud rate.
- Increase the RTS/CTS delay on the local modem.
- Reduce the rate at which the IBM host system polls or selects control units on a particular communications line by increasing the value of the poll delay parameter, PAUSE. This method, however, requires changing the IBM NCP communications software.

1.6 Considerations for VAXcluster Systems

The 3271 PE may be used in a VAXcluster environment. A VAXcluster is a group of VAX systems that communicate over a high speed communications connection. VAXcluster systems have all the functions of single-node VAX systems and have the ability to share CPU resources, queues, and disk storage.

To install the 3271 PE on a VAXcluster, follow these guidelines:

- Perform a license load on each node on which users plan to access the 3271 PE.

  You must both register and load the license on one node in a VAXcluster as described in Section 1.4.6. You need only load the license on other nodes in the cluster that will use the 3271 PE. (Registering the license on these additional nodes will cause errors.) To load the license on additional nodes, use the following command:

  ```
  $ LICENSE LOAD VAX-3271PE
  ```

  For more information on LMF, see the *VMS License Management Utility Manual*.
- Ensure that one or more synchronous communication devices is installed on each node in the cluster that will use the 3271 PE.
- Install the 3271 PE on each node on which you plan to use the software. Refer to the release notes for information on diskless Local Area VAXcluster nodes.

1.7 Preparing for VMSINSTAL

You install the 3271 PE on a VMS system by running the VMSINSTAL procedure. The installation procedure is described step by step in Chapter 2. The dialogue is self-explanatory. The system prompts you to answer questions and waits for you to tell it to continue.

NOTE

This document does not contain release notes; release notes are provided on line. The prompt for displaying or printing release notes appears in the installation dialogue. You can read the release notes for the 3271 PE during installation if you specify OPTIONS N when starting VMSINSTAL.

After installation, you can read the 3271 PE release notes from the file SYS$HELP:V3271E025.RELEASE_NOTES.

Table 1–4 presents the installation specifications that your system must meet before you install the 3271 PE software.

Table 1–4: Requirements for 3271 PE Installation

Requirements	Specifications
Distribution medium	9-track magnetic tape (1600 bpi) TK50 cartridge (for the MicroVAX) CDROM
Prerequisite software	VMS V5.0, V5.1, V5.2
License registration	Register PAK information and load license
VMS Tailor requirements	Classes required: VMS Required Save Set Programming Support System Programmer Support Utilities
Memory	Varies depending on device (see Section 1.4.2)
Privileges	System manager level
Disk space [1]	1150 blocks for installation 750 blocks after installation
Approximate installation time	5 to 15 minutes, depending on the medium used and target processor speed
Recommended user account quotas	BYTLM (I/O byte count limit) 16,600 minimum ASTLM (AST queue limit) 14 minimum BIOLM (buffered I/O count limit) 10 minimum
Associated documents	The *Guide to Setting Up a VMS System* contains information on setting recommended user account quotas. The *VMS Authorize Utility Manual* contains information on how to change user account quotas. The *VMS System Generation Utility Manual* contains information on modifying system parameters.

[1] Particular conditions can require more blocks, for example, installation on a diskless MicroVAX in a Local Area VAXcluster. Refer to the release notes for more information.

In addition, verify that the following conditions are met prior to installation:

- You have a backup copy of your system disk.
- All users are logged out and all batch jobs are complete.
- Logins and DECnet™ are disabled.

Chapter 2

Installing

This chapter describes how to install the 3271 PE using VMSINSTAL and shows a sample installation procedure. Keep this manual with your distribution kit. You might need to refer to it again if you receive any maintenance updates or need to reinstall the 3271 PE for any reason.

2.1 Installing the 3271 PE on a VMS™ System

The procedure for installing the 3271 PE on a VMS system is automated. It requires little involvement beyond answering the questions displayed while the procedure (VMSINSTAL) runs.

Lines that require a response begin with an asterisk (*). Most questions require a simple yes (Y) or no (N) answer. Some questions display default responses in brackets, for example:

```
* Are you satisfied with the backup of your system disk [YES]?
```

To answer a question with the default response, press Ret.

To abort the installation procedure at any time, press Ctrl/Y. When you press Ctrl/Y, the installation procedure deletes all the files that it has created up to that point and then exits. If you wish to rerun the procedure after pressing Ctrl/Y, you must invoke VMSINSTAL again.

The basic VMSINSTAL procedure is shown here with an explanation of the questions you are asked.

NOTE

The format and content of your system output might differ slightly from that shown in the examples in this chapter.

Step 1: Log in to the system manager's account on your VMS host.

Before you begin installing the distribution kit:

- Make sure that all users are logged out and all batch jobs are complete.
- Disable logins and DECnet™.
- Check that you have backed up the system disk.
- Ensure that you have at least 1150 free blocks on the system disk (see footnote in Table 1–4).

Step 2: Invoke VMSINSTAL.

Enter the following command at the host's console:

$ @SYS$UPDATE:VMSINSTAL V3271E025 *ddcu*: [OPTIONS N]

where

V3271E025	is the distribution kit name for the VAX™ 3271 Protocol Emulator V2.5.
ddcu	is the load device, where:
	dd is the device mnemonic.
	c is the controller ID.
	u is the unit number.
OPTIONS N	specifies that release notes are to be displayed or printed.

If you do not include any parameters, VMSINSTAL prompts you for the device name, product, and options (see Step 4). If you do not specify OPTIONS N, VMSINSTAL does not display the release notes queries. If you omit one or two parameters in the middle of a command, you must use a placeholder ("") to indicate the missing field. For example, the following command instructs VMSINSTAL to prompt for the product and device and to display the release notes options:

```
$ @SYS$UPDATE:VMSINSTAL "" "" OPTIONS N
```

The following installation steps are based on using this command.

Step 3: Check your backup copy.

```
        VAX/VMS Software Product Installation Procedure V5.0

It is 1-AUG-1989 at 08:32.
Enter a question mark (?) at any time for help.

* Are you satisfied with the backup of your system disk [YES]?
```

Before you proceed with an installation that writes to your system disk, make sure you have a good backup copy. If you have not backed up your system disk, answer N to the query, and VMSINSTAL stops to allow you to make a backup copy. When you are ready, restart VMSINSTAL by entering the command in Step 2. If you are satisfied that you have a good copy of your system disk, press Ret to take the default answer YES.

Step 4: Product installation begins.

If you did not specify a device when you invoked VMSINSTAL, you are prompted for it now.

```
* Where will the distribution volumes be mounted:
```

Specify the device (*ddcu*, as described in Step 2) where you mounted the first volume. Next, VMSINSTAL prompts you for the product:

```
Enter the products to be processed from the first distribution volume set.
* Products:
```

Enter the name of the product, V3271E025. If you did not specify OPTIONS N in the command that initiated this installation (see Step 2), VMSINSTAL now prompts you for options. Either enter N to be queried later about printing or displaying release notes or press Ret to bypass them. At this point the system displays:

```
Please mount the first volume of the set on ddcu:.
* Are you ready? Y  Ret
%MOUNT-I-MOUNTED, V3271E mounted on _ddcu:

The following products will be processed:

  V3271E V2.5


        Beginning installation of V3271E V2.5 at 8:35

%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

Step 5: Choose a release notes option.

If you specified OPTIONS N, the installation procedure prompts you for the release notes option you desire.

```
    Release Notes Options:

        1.  Display release notes
        2.  Print release notes
        3.  Both 1 and 2
        4.  Copy release notes to SYS$HELP
        5.  Do not display, print or copy release notes

* Select option [2]:
```

If you select option 1, VMSINSTAL displays the release notes immediately on your terminal. To terminate the display at any time, press Ctrl/C.

If you select option 2 or 3, VMSINSTAL prompts you for a print queue name as follows:

```
Queue name [SYS$PRINT]:
```

Enter a queue name or press Ret to indicate the default output print device, SYS$PRINT.

In either case, VMSINSTAL displays the following:

```
* Do you want to continue the installation? Y Ret
%VMSINSTAL-I-RELMOVED, The product's release notes have been
 successfully moved to SYS$HELP.
```

Type Y and press Ret to continue the installation. If you type N and press Ret, VMSINSTAL discontinues the installation. Whether you continue or not, VMSINSTAL moves the release notes to the SYS$HELP directory unless you selected option 5.

Step 6: License Registration

The installation procedure prints information specific to the particular license and asks if you have registered and loaded your PAK for the 3271 PE, for example:

```
        Product:            VAX-3271PE
        Producer:           DEC
        Version:            2.5
        Release Date:       01-Jan-1989

* Does this product have an authorization key registered and loaded?
```

If you have not registered and loaded your PAK, answer N to this question. The installation reminds you to register the PAK before you run the product. (If you are installing the 3271 PE on a VAXcluster™ system, refer to Section 1.4.6 for licensing information.) The installation continues.

Step 7: Purge files.

The procedure asks whether you would like to purge prior versions of the distribution files it just copied into your VMS system. If you answer Y, the procedure deletes previous versions of the copied files.

```
* Do you want to purge files replaced by this installation [YES]?
```

Press Ret to purge the files being replaced by this installation.

Step 8: Delete previous versions of drivers.

During installation, new drivers are created in SYS$COMMON:[SYSEXE] or SYS$COMMON:[SYS$LDR] to replace existing versions in SYS$SPECIFIC:[SYSEXE]. Digital Equipment Corporation recommends that you delete these older versions to avoid problems with the same file in multiple directories. If you press Ret, the procedure attempts to delete previous versions of the drivers. Answer N only to abort the installation, rename the current drivers, and start over.

```
* Do you want to delete drivers replaced by this installation [YES]?
```

Step 9: Run Installation Verification Procedure (IVP).

The IVP checks to see if the product has been installed correctly. Digital recommends that you run the IVP immediately after installation. However, you can test the 3271 PE installation at any time; a copy of the IVP resides at SYS$TEST:V3271E$IVP.COM.

```
* Do you want to run the IVP after the installation [YES]?
```

Step 10: Identify your communications device.

VMSINSTAL displays the following device information:

```
The command file for loading the VAX 3271 PE is called
V3271E$LOAD.COM.  To set up this file, you must answer
questions that specify the characteristics of each line
interface that you are going to use.

For each line interface, specify:

o  A synchronous line interface device type:
        DUP, DMF, and DMB for VAX processors
        DPV and DSV for MicroVAX processors

NOTE:   For each device type you specify, you must provide
        the necessary information for all devices of that
        type before moving on to the next device type.

o  The controller interface designation
o  The numbers of all Device Units to be used on the line

If you are using a DUP11 or DPV11 line interface, specify for each:

o  The octal address of the CSR (Control and Status Register)
o  The octal interrupt vector address

If you are using DUP11, also specify:

o  The nexus number of the UNIBUS adapter
```

You are prompted to enter the name and characteristics of the communications device you will be using. Refer to Table 1–3 for the correct communications device information.

NOTE

Define all the communications devices of one type before moving on to the next device type.

Supply the following communications device information:

- Type of communications device

  ```
  * Specify a synchronous line interface (DUP, DPV, DMF,
    DMB, DSV) [DONE]:
  ```

  Define the type of device you are using. Press Ret for the default response when you are finished entering device names.

- Controller designation

  ```
  * What is the controller designation of this device (A-Z) [A]:
  ```

  Specify a letter from A to Z. You might need to ask your VMS system manager for the controller designations.

- UNIBUS™ adapter number (for DUP11 only)

  ```
  * What is the UNIBUS adapter number (0-48) [0]:
  ```

  Enter the nexus number of the UNIBUS adapter. You might need to ask your VMS system manager for the UNIBUS adapter number.

- Interrupt vector address (for DUP11 or DPV11 only)

  ```
  * What is the interrupt vector address (300-770) [300]:
  ```

- Control and Status Register address (for DUP11 or DPV11 only)

  ```
  * What is the CSR address (760010-764770) [760050]:
  ```

- Device unit numbers

  ```
  Now specify which units are to be used on line (XKA:)
  You may specify up to 32 units, from Device Unit number 0
  to Device Unit number 31.  At each prompt, type either
  a single Device Unit number or else a range of Device Unit
  numbers (eg:  "0-7" for units 0 through 7 inclusive).
  When you have specified all the units you want, press RETURN.

  * What is the next unit on DUP11 line XKA: [DONE]:
  ```

  NOTE

  After you specify a communications device and controller designation, the installation procedure returns a line ID for that particular device. Use the line ID when you start the 3271 PE software.

  Each communications device corresponds to an IBM 3271 control unit. Each 3271 line can support up to 32 device units. However, the host might be configured so that not all device units are available on all communications devices. You need to determine which device units, each known by a number from 0 through 31, can be used on each communications device.

Ask your IBM® system programmer for the following information:

- How many terminals are available on each control unit?
- What device number should you give each terminal?

NOTE

Up to four Digital line interface devices can be multi-dropped on a single IBM line; the line can support up to four IBM 3271 clusters.

You will continue to be prompted for device units until you press Ret without entering any data.

Step 11: Verify device information.

```
        Now verify what you have specified:

Device XKA:, Nexus number 0, CSR 760050, Vector 300
Units 0
```

VMSINSTAL displays the device information you have entered. After displaying the device information, the system displays the following prompt:

```
* Do you want to change any information for this device [NO]?
```

If you answer Y, this part of the installation runs again, and you can provide different values for the questions.

VMSINSTAL prompts you for information on additional communications devices. When you finish defining your communications device(s), press Ret without entering any data.

Step 12: End the installation procedure.

```
All questions have now been answered.
The command file V3271E$LOAD.COM has been created.

Please wait while files are moved to the system areas....
```

VMSINSTAL now displays several short paragraphs of text and ends with the following messages if installation has been successful:

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
 directories...

V3271E$IVP-S,         Starting VAX 3271 PE V2.5 IVP

V3271E$IVP-S,         VAX 3271 PE V2.5 IVP Successful

        Installation of V3271E V2.5 completed at 08:48

        VMSINSTAL procedure done at 08:48
```

VMSINSTAL automatically returns you to the DCL prompt if you specified the product name when invoking VMSINSTAL.

If you did not specify the product name when you invoked VMSINSTAL, the procedure will prompt you for a product name.

```
* Products:
```

To exit from the procedure, press Ctrl/Z at the prompt. If you have other products to install using VMSINSTAL, you can specify a product name at the prompt.

When the procedure is complete, either reboot your system or enable logins and DECnet manually.

Reboot your system under the following circumstances:

- You are installing the 3271 PE to replace a previous version (for example, upgrading from V2.4 to V2.5).
- The DUP11 or DPV11 you want to use had already been defined for another product.

2.2 Sample Installation

The following sample installation procedure begins with a command that instructs VMSINSTAL to load the 3271 PE from device MTA0 and to bypass the release notes options.

```
$ @SYS$UPDATE:VMSINSTAL V3271E025 MTA0: Ret

        VAX/VMS Software Product Installation Procedure V5.0

It is 1-AUG-1989 at 16:37.
Enter a question mark (?) at any time for help.

* Are you satisfied with the backup of your system disk [YES]? Ret

Please mount the first volume of the set on MTA0:.
* Are you ready? Y Ret
%MOUNT-I-MOUNTED, V3271E mounted on _MTA0:

The following products will be processed:

  V3271E V2.5

        Beginning installation of V3271E V2.5 at 16:38

%VMSINSTAL-I-RESTORE, Restoring product saveset A ...
%VMSINSTAL-I-RELMOVED, The product's release notes have been
 successfully moved to SYS$HELP.

        Product:      VAX-3271PE
        Producer:     DEC
        Version:      2.5
        Release Date: 01-JAN-1989

* Does this product have an authorization key registered
  and loaded? Y Ret

* Do you want to purge files replaced by this installation [YES]? Ret

* Do you want to delete drivers replaced by this installation [YES]? Ret

* Do you want to run the IVP after the installation [YES]? Ret

        The command file for loading the VAX 3271 PE is called
        V3271E$LOAD.COM.  To set up this file, you must answer
        questions that specify the characteristics of each line
        interface you are going to use.

        For each line interface, specify:

        o  A synchronous line interface device type:
                DUP, DMF, and DMB for VAX processors
                DPV and DSV for MicroVAX processors

        NOTE:   For each device type you specify, you must provide
                the necessary information for all devices of that
                type before moving on to the next device type.

        o  The controller interface designation
        o  The numbers of all Device Units to be used on the line
```

```
        If you are using a DUP11 or DPV11 line interface, specify
        for each:

        o  The octal address of the CSR (Control and Status Register)
        o  The octal interrupt vector address

        If you are using DUP11, also specify:

        o  The nexus number of the UNIBUS adapter

* Specify a synchronous line interface (DUP, DPV, DMF,
  DMB, DSV) [DONE]: DUP Ret

* What is the controller designation of this DUP11 (A-Z) [A]: Ret

* What is the UNIBUS adapter number (0-48) [0]: 3 Ret

* What is the interrupt vector address (300-770) [300]: Ret

* What is the CSR address (760010-764770) [760050]: Ret

        Now specify which units are to be used on line (XKA:)
        You may specify up to 32 units, from Device Unit number 0
        to Device Unit number 31.  At each prompt, type either
        a single Device Unit number or else a range of Device Unit
        numbers (eg: "0-7" for units 0 through 7 inclusive).
        When you have specified all the units you want, press RETURN.

* What is the next unit on DUP11 line XKA: [DONE]: 0-31 Ret

* What is the next unit on DUP11 line XKA: [DONE]: Ret

        Now verify what you have specified:

Device XKA:, Nexus number 3, CSR 760050, Vector 300
Units 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31

* Do you want to change any information for this device [NO]? Ret

* Are there any more DUP11s [NO]? Ret

* Specify a synchronous line interface (DUP, DPV, DMF,
  DMB, DSV) [DONE]: DMF Ret

* What is the controller designation of this DMF32 (A-Z) [A]: Ret

        Now specify which units are to be used on line (XGA0:)
        You may specify up to 32 units, from Device Unit number 0
        to Device Unit number 31.  At each prompt, type either
        a single Device Unit number or else a range of Device Unit
        numbers (eg: "0-7" for units 0 through 7 inclusive).
        When you have specified all the units you want, press RETURN.

* What is the next unit on DMF32 line XGA0: [DONE]: 0-31 Ret

* What is the next unit on DMF32 line XGA0: [DONE]: Ret
```

```
        Now verify what you have specified:

Device XGA0:
Units 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31

* Do you want to change any information for this device [NO]? Ret

* Are there any more DMF32s [NO]? Ret

* Specify a synchronous line interface (DUP, DPV, DMF,
  DMB, DSV) [DONE]: Ret

        All questions have now been answered.
        The command file V3271E$LOAD.COM has been created.

        Please wait while files are moved to the system areas....

                    VAX 3271 Protocol Emulator V2.5
               Installation Successful (pending successful IVP)

        The DMB32, DMF32, and DSV11 device drivers are shipped
        separately.  Please install this software before loading
        the VAX 3271 Protocol Emulator if you are using any of
        these devices.

        If a previous copy of the VAX 3271 Protocol Emulator is
        already loaded, then reboot the system before running the
        load procedure: SYS$STARTUP:V3271E$LOAD.COM

        See the VAX 3271 Protocol Emulator Installation Guide for
        details of tests that should be run to check the physical
        communications links and verify the lines and modems are
        working correctly.

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
 directories...

V3271E$IVP-S,         Starting VAX 3271 PE V2.5 IVP

V3271E$IVP-S,         VAX 3271 PE V2.5 IVP Successful

        Installation of V3271E V2.5 completed at 16:52

        VMSINSTAL procedure done at 16:53
```

Chapter 3

Preparing for Use

This chapter provides the following postinstallation information:

- VAXcluster™ considerations.
- Running the IVP after installation.
- Setting user process quotas.
- Loading the 3271 PE.
- Testing the 3271 PE installation.
- Modifying the 3270 alternate screen size.

The final section of the chapter lists the files that are placed on your system during installation.

3.1 VAXcluster Considerations

You can use the 3271 PE in a VAXcluster environment. For installation guidelines, refer to Section 1.6.

3.2 Running the Installation Verification Procedure After Installation

The Installation Verification Procedure (IVP) verifies the success of the software installation. Run the IVP at this time only if you did not run it during installation or if you are encountering problems. The IVP checks that the new files were transferred to their proper locations. The IVP is designed to determine if files are missing and if old files

are left on your system. If a problem develops with the 3271 PE, run the IVP first. To run the IVP after you install the product, invoke the command:

```
$ @SYS$TEST:V3271E$IVP.COM
```

If the IVP fails, correct the situation, and run the IVP again. Appendix A describes IVP failures in more detail.

3.3 Setting User Process Quotas

Before loading the 3271 PE software and using the 3270 TE, make sure that all user accounts have at least the following quota values:

- BIOLM=10
- ASTLM=14
- BYTLM=16,600

Use the Authorize Utility (AUTHORIZE) to verify and change user process quotas. See the *VMS Authorize Utility Manual* for further details.

3.4 Loading the 3271 PE Software

Load the 3271 PE software by executing the following command procedure:

```
$  @SYS$STARTUP:V3271E$LOAD
```

You must execute this command procedure each time your VMS™ system is booted.

You can execute the command procedure in one of two ways:

1. Insert a call to SYS$STARTUP:V3271E$LOAD.COM in SYS$MANAGER:SYSTARTUP_V5.COM. This call causes the 3271 PE to be loaded each time the system is booted.

2. Invoke the command procedure from a privileged user's account each time the system is booted. You need the following privileges to invoke the 3271 PE command procedure:
   - CMKRNL
   - SYSNAM
   - SYSPRV

When deciding which method to use, consider the following:

- Neither SYS$STARTUP:V3271E$LOAD.COM or any other command procedure that reloads a device driver should be executed when any 3271 PE line is on. If the command procedure is executed when a line is on, an error occurs and the reload operation fails.
- For the DSV11, DMF32, and DMB32 devices, once the line has been turned off, these devices can be used by other communications products. However, the DUP11 and the DPV11 have dedicated device drivers; once you have configured and loaded the 3271 PE as a loadable device driver, no other device driver can share the line interface unit.
- For all types of line interfaces, when the 3271 PE is loaded, you cannot unload it unless you first reboot the VMS system (without running SYS$STARTUP:V3271E$LOAD.COM).

3.5 Testing the 3271 PE Installation

Before using the 3271 PE for day-to-day operations, you should test the installation. To determine whether the communications link and its associated equipment are working properly, use the emulator control program, INS3271. For a complete description of INS3271 and its commands, refer to the *VAX 3271 Protocol Emulator Management and Programming Guide*.

To test the 3271 PE, perform the following steps:

- Start INS3271.
- Run the Device_Loopback test.
- Verify 3271 PE to IBM® communication.
- Stop INS3271.

3.5.1 Starting INS3271

Before starting INS3271, log in to the VMS system. Make sure that you use a privileged account (such as the system manager's account). The account that you use must have both of the following privileges:

- LOG_IO
- PHY_IO

Load the 3271 PE, and start INS3271 by executing the following commands:

```
$ @SYS$STARTUP:V3271E$LOAD
%RUN-S-PROC_ID, identification of created process is n
%DCL-I-TABNOTFND, previous table LNM$VAX3271_DEVICES was not found -
new table created
$ RUN SYS$SYSTEM:INS3271
3271>
```

NOTE

You can ignore the messages produced by the V3271E$LOAD command procedure.

3.5.2 Running Device Loopback Tests

Device Loopback tests check that each line interface assigned to the 3271 PE works properly. Run a Device Loopback test on each line interface.

To perform a Device Loopback test, enter the following commands:

```
3271>SET LINE ddcu DEVICE_LOOPBACK
3271>LOOP LINE ddcu COUNT 10 WITH MIXED LENGTH 256
```

where

dd	is the device mnemonic. The mnemonic for a DUP11 is XK; for a DPV11 it is UG; for a DMB32 it is SI; and for a DMF32 it is XG and for a DSV11 it is SJ.
c	is an alphabetic controller ID from A to Z.
u	is a numeric line ID from 0 to 1 (default is 0).

The following example illustrates the type of information entered when using the DMF32 line interface.

```
3271>SET LINE XGA DEVICE_LOOPBACK
3271>LOOP LINE XGA COUNT 10 WITH MIXED LENGTH 256
```

The Device Loopback test, then displays the following information.

```
Total of 10 records LOOPed

         0 records with mismatched length encountered
         0 records with unequal data encountered
         0 unequal bytes encountered
```

This information indicates that the communications line XGA is working properly. If any additional messages appear, check that:

- You entered the commands in the correct format.
- The controller designation you gave in the LOOP command is the same as that you gave in the SET command.
- The controller is one of those specified when you installed the 3271 PE.

3.5.3 Verifying 3271 PE to IBM Communication

Use the SHOW command to verify that the 3271 PE and the IBM host are communicating properly. Use the SHOW command on each of your communications devices.

To verify 3271 PE to IBM communication, perform the following steps:

1. Turn the line off by entering the following command:

   ```
   3271>SET LINE ddcu OFF
   ```

2. Enter the following SHOW command:

   ```
   3271>SHOW COUNTS LINE ddcu
   ```

   ddcu must have the same controller designation you specified for the SET LINE OFF command.

A list of the counters the 3271 PE maintains appears on your terminal. All of the counters except the Currently Active Devices counter should have a value of zero. If they do not, issue the following command to set the counter values to zero:

```
3271>ZERO LINE ddcu
```

3. Issue the following SET LINE command:

```
3271>SET LINE ddcu ON
```

4. INS3271 prompts for the following information:
   - Control unit (CU) number—Enter the number (between 0 and 31) that has been assigned to this device as its IBM control unit number. Refer to the *VAX 3271 Protocol Emulator Management and Programming Guide* for more information on control unit numbers.
   - Number of buffers—Use the default value for this parameter.
   - Buffer size—In most cases, use the default value for this parameter. However, if you are using alternate screens, refer to Section 3.6.2 for suggested buffer sizes.
   - ENQ threshold—Use the default value for this parameter.
   - Modem setting—Use the default value for this parameter. If you are using a DMB or DSV device on a multidrop line, you must specify MUL.

The line is now on, and the 3271 PE should receive and respond to polls sent by the IBM host. Wait 2 minutes and issue the SHOW COUNTS command again. If the value of the General Polls Received counter is greater than zero, you can assume that the IBM host and the 3271 PE are communicating.

If the value of General Polls Received counter is zero, check if the IBM host has sent any address selects or polls to specific device units associated with that line.

To verify whether the IBM host has sent information to a particular device unit, enter the following command:

```
3271>SHOW COUNTS UNIT LINE ddcu UNIT n
```

where

dd	is the device mnemonic.
c	is an alphabetic controller ID from A to Z.
u	is a numeric line ID from 0 to 1 (default is 0)
n	is the device unit (DU) number between 0 and 31.

INS3271 responds by displaying a list of device unit counters on your terminal. For your specified device unit, there should be nonzero values for either the Specific Polls Received counter or the Address Selects Received counter.

3.5.4 Stopping INS3271

When you have finished the tests, shut down all lines by entering the following command for each line you are using:

```
3271>SET LINE ddcu OFF
```

To stop INS3271, enter the following command:

```
3271>EXIT
```

Control is returned to the VMS operating system.

3.6 Modifying the 3270 Alternate Screen Size

The 3271 PE allows you to specify alternate screen sizes larger than the default (1920 characters). If your 3270 host application requires a larger alternate screen size, do the following:

- Edit the configuration file.
- Change the buffer size when starting a line.
- Modify the BUFFER_LIMIT quota for NPACP, if necessary.

3.6.1 Editing the Configuration File

Changing the model number in your configuration file allows you to use alternate screens. The configuration file is named SYS$LIBRARY:V3271E$EDU_CONFIG.DAT. The following example shows the default form of the configuration file for line XGA0:

```
LINE=XGA0
     EDU=0   Model=2
     EDU=1   Model=2
     .
     .
     .
```

The initial configuration file defines all EDUs to emulate a Model 2 terminal (1920 characters). Choose your screen size from Table 3–1.

Table 3–1: Alternate Screen Sizes

3278 Model Number	Alternate Screen Size (rows x columns)	Number of Characters
Model 2 (default)	24 x 80	1920
Model 3	32 x 80	2560
Model 4	43 x 80	3440
Model 5	27 x 132	3564

To modify the alternate screen size for an EDU, change the model number setting that corresponds to this EDU in the configuration file. For example, to change the alternate screen size of EDU0 from 24 x 80 (Model 2) to 43 x 80 (Model 4), change the model number setting from 2 to 4. The configuration file for line XGA0 now has the form:

```
LINE=XGA0
     EDU=0   Model=4
     EDU=1   Model=2
     .
     .
     .
```

The IBM system manager should check that the model number and alternate screen size agree with the default logmode entry definition on the IBM system. Alternatively, determine the correct logmode entry definition to use with the desired application and alternate screen size.

NOTE

For proper operation in a VAXcluster, be sure to edit the configuration file in the SYS$SPECIFIC root. Do not move the configuration file to the SYS$COMMON root.

3.6.2 Changing the Buffer Size When Starting a Line

If you use a larger alternate screen, you must increase the buffer size above the default value of 2200 bytes when you start the line with INS3271. This extra memory allows the larger screen to function properly. This buffer size may not exceed 10,000 bytes.

As in the default case, the buffer size should be somewhat larger than the screen size to allow for protocol and data stream overhead. If the buffer size is not larger than the default, the protocol emulator might not be able to receive the complete data stream from the IBM host. Each message that exceeds the buffer size is negatively acknowledged, and the host shuts down the line. Table 3–2 gives suggested buffer sizes for the larger alternate screens.

Table 3–2: Suggested Buffer Sizes for Alternate Screens

3278 Model Number	Alternate Screen Size	Number of Characters	Suggested Buffer Size
Model 2 (default)	24 x 80	1920	2200
Model 3	32 x 80	2560	2800
Model 4	43 x 80	3440	3700
Model 5	27 x 132	3564	4000

3.6.3 Modifying the Buffer Limit for NPACP

With some drivers, you might exceed the buffer limit of NPACP as defined in the V3271E$LOAD.COM file. When a DMF32, DMB32, or DSV11 (or any device using NPDRIVER and NPACP) is set on with a buffer size greater than the default size, the SET ON operation might give the following message:

```
%SYSTEM-F-EXQUOTA,  exceeded  quota.
```

If you receive this message, you have exceeded the buffered I/O limit on the NPACP process.

The buffer limit depends on the devices you are using. A sufficient buffer limit quota is two times the suggested buffer size for each DMB32 or DSV11 and three times the suggested buffer size for each DMF32. Add an extra 2000 bytes overhead for each device.

For example, if you are using a DMB32 with a suggested buffer of 4000 bytes (Model 5 screen) and a DMF32 with a suggested buffer size of 3700 bytes (Model 4 screen), set the buffered I/O limit for NPACP to at least 23,100 bytes. The following formulas illustrate this example:

```
 1 DMB32           (2) 4000 bytes        2000 bytes
---------     *    --------------    +   (overhead)    =   10,000 bytes
                       buffer

 1 DMF32           (3) 3700 bytes        2000 bytes
---------     *    --------------    +   (overhead)    =    13,100 bytes
                       buffer                             ---------------

Total                                                        23,100 bytes
```

After you have determined a sufficient buffered I/O limit for your system, do the following:

1. Shut down all lines with INS3271.
2. Stop NPACP with the following command from the system manager account:

   ```
   $ STOP NPACP
   ```

3. Type the following command with your new BUFFER_LIMIT value to reload NPACP.

   ```
   $ RUN SYS$SYSTEM:NPACP-
         /PRIORITY=8-
         /PRIVILEGES=(CMKRNL,LOG_IO)-
         /PROCESS_NAME=NPACP-
         /BUFFER_LIMIT=23100-
         /UIC=[1,4]
   ```

Verify that the lines can be started successfully with this new value. If so, edit the V3271E$LOAD.COM file and change the BUFFER_LIMIT value in the file.

3.7 Files Created During Installation

During installation, the files listed alphabetically in Table 3–3 are placed on your system, depending on the devices you use.

Table 3–3: Files Created During Installation

Filename	Directory	Description
DRIVER_TABLES.OBJ	SYS$LIBRARY	Data tables used in the device drivers
INS3271.EXE	SYS$SYSTEM	INS3271 (emulator control program)
INS3271.HLB	SYS$HELP	Help displays for INS3271 operators
NPACP.EXE	SYS$SYSTEM	Ancillary control process (ACP) for DMF32, DMB32, and DSV11
NPACP.OBJ	SYS$LIBRARY	NPACP object code
NPDRIVER.EXE	SYS$SYSTEM	Protocol handler for DMF32, DMB32, and DSV11
NPDRIVER.OBJ	SYS$LIBRARY	NPDRIVER object code
NPSYM.STB	SYS$LIBRARY	NPDRIVER symbol table
TRAPREFIX.MAR	SYS$LIBRARY	Prefix file for translation tables
UGDRIVER.EXE	SYS$LOADABLE_IMAGES	Device driver/protocol handler for DPV11
UGDRIVER.OBJ	SYS$LIBRARY	UGDRIVER object code
V3271E025.RELEASE_NOTES	SYS$HELP	Release notes
V3271E$EDU_CONFIG.DAT	SYS$LIBRARY	Emulated Device Unit Configuration File
V3271E$IVP.COM	SYS$TEST	Installation Verification Procedure (IVP)
V3271E$LOAD.COM	SYS$STARTUP	Command procedure to load the 3271 PE
VAX3271$GETDEVICE.OBJ	SYS$LIBRARY	Procedure that obtains a pseudodevice name and/or next available device unit for a user program
VSE.COM	SYS$LIBRARY	Command procedure to start the 3270 TE
VSE.EXE	SYS$SYSTEM	3270 Terminal Emulator (TE)
VSEMSG.EXE	SYS$MESSAGE	Message texts for the 3270 TE
VSETRANS.MAR	SYS$LIBRARY	Example translation table source file

Table 3–3 (Cont.): Files Created During Installation

Filename	Directory	Description
VSETRANS.OBJ	SYS$LIBRARY	Default translation table object file
VSETRANS.TBL	SYS$LIBRARY	Default translation table
XKDRIVER.EXE	SYS$LOADABLE_IMAGES	Device driver/protocol handler for DUP11
XKDRIVER.OBJ	SYS$LIBRARY	XKDRIVER object code
XKDRV.BAS	SYS$LIBRARY	BASIC definitions of 3271 PE symbols used with BASIC APPEND command
XKDRV.FOR	SYS$LIBRARY	FORTRAN definitions of 3271 PE symbols
XKMSG.OBJ	SYS$LIBRARY	File of message texts for the secondary status codes that the driver can return
XKSYM.BAS	SYS$LIBRARY	BASIC definitions of 3271 PE symbols used with the BASIC %INCLUDE statement in a program

Appendix A
Error Messages

This appendix discusses how to recover from installation errors and IVP errors. If errors occur during the installation or when the IVP is running, VMSINSTAL displays error messages.

Additional error and status information can be found in the *VAX 3271 Protocol Emulator: 3270 Terminal Emulator User's Guide* and the *VAX 3271 Protocol Emulator Management and Programming Guide*:

- 3270 TE Messages - Appendix A, *VAX 3271 Protocol Emulator: 3270 Terminal Emulator User's Guide*
- 3271 PE Status Codes - Appendix A, *VAX 3271 Protocol Emulator Management and Programming Guide*
- INS3271 Error Messages - Chapter 2, Section 2.6, *VAX 3271 Protocol Emulator Management and Programming Guide*

A.1 Recovering from Installation Errors

Errors can occur during the 3271 PE installation if any of the following conditions exist:

- The operating system version is incorrect.
- A prerequisite software version is incorrect.
- Quota values are insufficient.
- System parameter values are insufficient.

- The VMS™ help library is currently in use.
- The product is not properly licensed.
- Your system has insufficient disk space.

For descriptions of the error messages generated by these conditions, see the VMS documentation on system messages, recovery procedures, and VMS software installation. If any of these conditions exist, you should take the appropriate action as described in the message. (You might need to change a system parameter or increase an authorized quota value.) Installation requirements are discussed in Chapter 1.

A.2 Recovering from IVP Errors

This section is designed to assist you if your IVP fails. When an error is detected, a message is displayed telling you how to correct the situation.

IVP error messages can be divided into the following categories:

- A file is in the wrong directory.
- A file does not exist.

File is in the wrong directory

In this case, a file or files are in the wrong directories. To avoid problems where incompatible versions of the same file reside in different directories, delete the file specified in the error message and rerun the IVP. Be sure you delete the specified file; note the directory specification, such as SYS$COMMON: or SYS$SPECIFIC. After deleting the file, run the IVP again to check for further errors.

The format for these error messages is:

```
V3271E$IVP-E, filename is in directory.
              Please delete this file and rerun the IVP.
```

The following is an example of these messages:

```
V3271E$IVP-E, NPDRIVER.EXE is in SYS$SPECIFIC:[SYSEXE].
              Please delete this file and rerun the IVP.
```

File does not exist

In this case, a file or files do not exist. You must reinstall the product to correct the situation.

The format for these error messages is:

```
V3271E$IVP-E, filename is not in directory.
              Please reinstall VAX 3271.
```

The following is an example of these messages:

```
V3271E$IVP-E, INS3271.EXE is not in SYS$COMMON:[SYSEXE].
              Please reinstall VAX 3271.
```

Console output of IVP that failed

The following is a sample of an IVP that shows errors.

```
$ @SYS$TEST:V3271E$IVP

V3271E$IVP-S,         Starting VAX 3271 PE V2.5 IVP

V3271E$IVP-E, V3271E$LOAD.COM is not in SYS$SPECIFIC:[SYS$STARTUP].
              Please reinstall VAX 3271.

V3271E$IVP-E, INS3271.EXE is not in SYS$COMMON:[SYSEXE].
              Please reinstall VAX 3271.

V3271E$IVP-E, VSE.EXE is not in SYS$COMMON:[SYSEXE].
              Please reinstall VAX 3271.

V3271E$IVP-E, VSEMSG.EXE is not in SYS$COMMON:[SYSMSG].
              Please reinstall VAX 3271.

V3271E$IVP-E, VSETRANS.TBL is not in SYS$COMMON:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, VSETRANS.OBJ is not in SYS$COMMON:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, VSETRANS.MAR is not in SYS$COMMON:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, TRAPREFIX.MAR is not in SYS$COMMON:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, VAX3271$GETDEVICE.OBJ is not in SYS$COMMON:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, XKMSG.OBJ is not in SYS$COMMON:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, INS3271.HLB is not in SYS$COMMON:[SYSHLP].
              Please reinstall VAX 3271.
```

```
V3271E$IVP-E, V3271$NUMPAD.FIL is not in SYS$COMMON:[SYSHLP.EXAMPLES].
              Please reinstall VAX 3271.

V3271E$IVP-E, VSE.COM is not in SYS$COMMON:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, V3271E$EDU_CONFIG.DAT is not in SYS$SPECIFIC:[SYSLIB].
              Please reinstall VAX 3271.

V3271E$IVP-E, NPDRIVER, XKDRIVER, AND UGDRIVER do not exist.
              Please reinstall VAX 3271.


V3271E$IVP-E,         VAX 3271 PE V2.5 IVP Failed

$
```

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