IBM

# Virtual Machine/ Extended Architecture Migration Aid Remote 3270 Display Option

## User's Guide and Reference

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## User's Guide and Reference

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This edition, GC28-1329-0, applies to the VM/Extended Architecture Migration Aid Remote 3270 Display Option and Release 2 of the VM/Pass-Through Facility (Program Number 5748-RC1), when run with the VM/Extended Architecture Migration Aid (Program Number 5664-169) Release 1, and to all subsequent releases until otherwise indicated in new editions or Technical Newsletters. Changes are continually made to the information contained herein; before using this publication in connection with the operation of IBM systems, consult the latest *IBM System/370 Bibliography,* GC20-0001, for editions that are applicable and current.

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# Preface

This publication will help you:

- Plan for Remote 3270 Display Option
- Install Remote 3270 Display Option
- Use Remote 3270 Display Option
- Determine the source of problems

People responsible for these activities should have some knowledge of teleprocessing systems.

## Audience

This book is intended for system operators and system programmers of Remote 3270 Display Option—VM/Pass-Through. Remote 3270 Display Option—VM/Pass-Through is transparent to people who use it only to "pass through" to target systems.

## How to use the Remote 3270 Display Option library

The following diagram is a guide to using the Remote 3270 Display Option library.

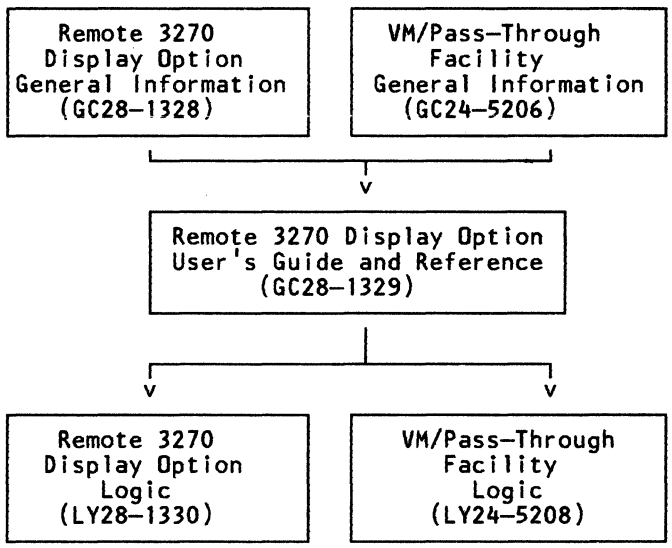


**Figure 1. Remote 3270 Display Option Library Guide**

## Related Publications

The following publications provide additional information for the Remote 3270 Display Option—VM/Pass-Through Facility user.

### *Remote 3270 Display Option*

- *VM/XA Migration Aid: Remote 3270 Display Option General Information*, GC28-1328
- *VM/XA Migration Aid: Remote 3270 Display Option Logic*, LY28-1330

### *Other systems*

- *VM/System Product: VM/Pass-Through Facility General Information*, GC24-5206
- *VM/System Product: VM/Pass-Through Facility Logic*, LY24-5208
- *VM/XA Migration Aid: System Generation and Service Application Guide*, GC20-6217
- *VM/XA Migration Aid: User's Guide*, GC20-6216

See the *VM/XA Migration Aid: General Information* (GC20-6213) for a list of other VM/XA Migration Aid publications.

### *Information about Equipment*

- *An Introduction to IBM 3270 Information Display Systems Components*, GA27-2739
- *IBM 3270 Information Display System, 3271 Control Unit, 3272 Control Unit, 3275 Display Station Description and Programmer's Guide*, GA23-0060
- *IBM 3270 Information Display System, 3274 Control Unit Description and Programmer's Guide*, GA23-0061
- *IBM 3270 Data Stream Programmer's Reference*, GA23-0059
- *IBM 3276 Control Unit Display Station Description and Programmer's Guide*, GA18-2081
- *IBM 4321 Operating Procedure*, GA33-1549
- *IBM 4331 Processor Operating Procedures and Problem Determination Guide*, GA33-1525
- *IBM 4341 Processors Operator's Guide*, GA24-3669

# Contents

# Figures

# Introduction

The VM/Extended Architecture Migration Aid Remote 3270 Display Option is a program product that is an option for the VM/Extended Architecture Migration Aid (VM/XA Migration Aid), Program Number 5664-169. It is designed as an extension to the VM/Pass-Through Facility (VM/Pass-Through) Release 2, Program Number 5748-RC1. Remote 3270 Display Option allows users to access VM/XA Migration Aid from a remote 3270 display terminal.

The VM/Pass-Through Facility is a program product that allows virtual machine users to interactively access target systems (including the local system) and remote processors from their local system. Target systems can be other VM[1] systems, with or without VM/Pass-Through installed, or any System/370 or XA system.

The Remote 3270 Display Option adds function to the VM/Pass-Through Facility Program Product. It allows users whose 3270 display terminals are connected through a 3705 (EP) communications controller to logon to the VM/XA Migration Aid system. The option also enhances VM/Pass-Through Facility's selection screen and permits the use of remote printers and 3270 extended data streams for both local and remote display terminals.

This publication is divided into two sections:

- User's Guide
- Reference

Most of the services provided by Remote 3270 Display Option—VM/Pass-Through require no special user knowledge. From the user's point of view, logging on to a target system requires little more than logging on to the local system. Once he logs on to the target application, most VM/Pass-Through activity is transparent to him. However, system programmers and operators do have to be concerned with normal installation and operational activities. Therefore, this book is a planning, programming, and system control manual for system programmers and operators, rather than a display station user's guide. The terminal user interacts primarily with the target application, not with VM/Pass-Through itself.

"Part One: User's Guide" on page 3 contains information to guide you in:

- Planning
- Installing
- Using
- Determining the source of problems

IBM provides a set of execs and commands for using and managing the Remote 3270 Display Option—VM/Pass-Through. A configuration file, created by the system programmer, contains key parameters for facility definition. This book describes the format and use of each exec, command, and configuration file record.

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[1] "VM systems" can be VM/SP, VM/SP High Performance Option, VM/XA Migration Aid, or their non-IBM equivalents.

"Part Two: Reference Summary" on page 71 contains reference information about:

- Remote 3270 Display Option—VM/Pass-Through Configuration File Records
- Remote 3270 Display Option—VM/Pass-Through Commands
- Remote 3270 Display Option—VM/Pass-Through Messages

The Glossary, in the back of the book, defines common terms used in this book and in all Remote 3270 Display Option books.

The term "Remote 3270 Display Option—VM/Pass-Through," used in this book refers to the Remote 3270 Display Option when installed with VM/Pass-Through Facility on a VM/XA Migration Aid system.

The term "PVM" in this book is used only when necessary to refer to a specific file, data area, or message text. The term refers to the pass-through virtual machine.

# Part One: User's Guide

This section is divided into two parts:

- Chapter 1 - Remote 3270 Display Option—VM/Pass-Through User's Guide
- Chapter 2 - Using VM/Pass-Through Facility Under VM/XA Migration Aid

"Chapter 1 - Remote 3270 Display Option—VM/Pass-Through User's Guide" provides the information you need to install, run, and service the Remote 3270 Display Option and VM/Pass-Through Facility under VM/XA Migration Aid. Chapter 2 considers working with VM/Pass-Through Facility under the VM/XA Migration Aid.

The purpose of the Remote 3270 Display Option is to allow you to attach and use remotely connected 3270 Information Display System displays and printers on your VM/XA Migration Aid system. Once you, the system programmer, design, configure, and install your system, the user needs only respond to the initial screen and then logon to your local system.

However, if you and your users want to take advantage of the VM/Pass-Through Facility's networking capabilities, there are some things you should know about it. "Chapter 2 - Using VM/Pass-Through Facility Under VM/XA Migration Aid" will provide you with information and examples of the different ways to use VM/Pass-Through. For the most part, Chapter 2 does not duplicate information in Chapter 1.

# Chapter 1 - Remote 3270 Display Option—VM/Pass-Through User's Guide

## How to Install and Update Remote 3270 Display Option—VM/Pass-Through

This section describes:

- Preparing for Installation
- Installing the System
- Bringing Up the System
- Storage Considerations
- Restrictions
- Requirements
- Installing Service
- Customizing the System

The first thing that you should know about installing VM/Pass-Through and Remote 3270 Display Option is that the installation will be done by the vmid MAINT, the VM/XA Migration Aid service userid. The Remote 3270 Display Option—VM/Pass-Through system will be installed on a combination of MAINT's minidisks and PVM's (the pass-through virtual machine's vmid) 191 minidisk to which MAINT has write access.

**Note:** If PVM is logged on while MAINT has the write-link to PVM's 191, results are unpredictable--CMS does not monitor multiple write accesses to the same minidisk. To prevent such a situation from occurring, put the command CP DETACH 496 in MAINT's PROFILE EXEC to remove MAINT's write link. Remember to ATTACH 496 when MAINT wants to write to PVM to install or apply service).

IBM assumes that you will want to install the Remote Spooling Communications Subsystem (RSCS) Networking Program Product to provide remote 3800 printer support to the VM/XA Migration Aid system. VM/Pass-Through files and RSCS files share the same MAINT minidisks. These minidisks are MAINT's 29E, 39E, and 49E.

The major steps that are involved with installing Remote 3270 Display Option and VM/Pass-Through Facility are:

1. Make a directory entry
2. Install VM/Pass-Through Facility
3. Apply service
4. Install Remote 3270 Display Option on top of VM/Pass-Through, using the same minidisks.

The following sections describe these activities.

### *Preparing for Installation*

Before you install Remote 3270 Display Option—VM/Pass-Through Facility on VM/XA Migration Aid, you should learn about:

- The directory entry
- The disks

- The configuration file (PVM CONFIG)
- The PROFILE PVM exec (optional)

When you prepare for installation, you should also:

- Make sure that your installation has loaded the 3704-3705's emulation program using an operating system other than VM/XA Migration Aid. (VM/XA Migration Aid cannot load the 3704-3705.)
- Coordinate telecommunications line/feature requirements.
- Make sure that users have userids on their target systems and know the nodeids of target systems. Nodeids are one to eight character names, which are made known to all users who may wish to use that node.

### The Directory Entry

The directory that was supplied with your VM/XA Migration Aid system allocates the minidisks that you need to install VM/Pass-Through Facility and Remote 3270 Display Option. The directory also contains links to the pass-through virtual machine disks for the system's service userid (vmid MAINT).

The directory entry for the pass-through virtual machine (vmid PVM) contains:

| Entry | Comments |
|---|---|
| USER PVM PVM 3M 8M BG | This statement defines some basic things about the pass-through virtual machine: its userid (PVM), password (PVM), minimum and maximum storage size (3M and 8M), and privilege class(es) (B and G). |
| AUTOLOG AUTOLOG1 OP1 MAINT | This statement allows userids AUTOLOG1, OP1, and MAINT to automatically logon userid PVM. |
| ACCOUNT 14 SYSTEM | This statement specifies the account number (14) and distribution code (SYSTEM) for userid PVM. |
| IPL 190 | This statement automatically IPLs the CMS system disk (190). |
| CONSOLE 009 3215 | This statement specifies a console at address 009. It is a 3215. |
| SPOOL 00C 2540 READER * | This statement specifies the pass-through virtual machine's reader at address 00C. |
| SPOOL 00D 2540 PUNCH A | This statement specifies the pass-through virtual machine's punch at address 00D. |
| SPOOL 00E 1403 A | This statement specifies the pass-through virtual machine's printer at address 00E. |
| LINK MAINT 190 190 RR<br>LINK MAINT 19E 19E RR<br>LINK MAINT 19D 19D RR | These statements link the pass-through virtual machine to MAINT's CMS, program product, and CMS HELP disks. |
| MDISK 191 3330 404 004 XASRES MR RPVM WPVM MPVM | This is the allocation for the pass-through virtual machine's work and staging disk (A-disk, 191). |

**Figure 2. Pass-Through Virtual Machine Directory Entry**

In the VM/XA Migration Aid environment, you should assign the pass-through virtual machine class G privilege and another class. Class G enables the pass-through virtual machine to IPL CMS (190). You need another class so that the pass-through virtual machine can issue Diagnose 7C to create logical devices.

(Diagnose 7C is available to users with a class privilege other than G.) In this case, class B was chosen so that the pass-through virtual machine can attach telecommunication lines by issuing ATTACH commands from the pass-through virtual machine console.

These are the links to PVM's disks as they are stated in MAINT's directory:

```
USER MAINT....
.
.
.
 LINK PVM   191 496  MW          This gives MAINT write access to the
                                 pass-through virtual machine's system
                                 disk (191).
.
.
.
 MDISK 29E 3330 412 008 XASRES MR RNET  WNET  MNET

                                 MAINT's 29E is the disk that holds
                                 preventive service for VM/Pass-Through,
                                 Remote 3270 Display Option, and RSCS.

 MDISK 39E 3330 420 060 XASRES MR RNET  WNET  MNET

                                 MAINT's 39E holds source for VM/Pass-
                                 Through, Remote 3270 Display Option,
                                 and RSCS.

 MDISK 49E 3330 480 008 XASRES MR RNET  WNET  MNET

                                 MAINT's 49E holds TEXT and EXECs for
                                 VM/Pass-Through, Remote 3270 Display
                                 Option, and RSCS.
.
.
.
```

The other disks that MAINT requires for installation belong to MAINT already.

For information about the system directory see *VM/XA Migration Aid: System Generation and Service Application Guide*, GC19-6217.

## The Disks

You use six minidisks to install VM/Pass-Through and Remote 3270 Display Option. They are:

- System disk
- Base TEXT staging disk
- Source staging disk
- Service staging disk
- System Extension disk
- HELP file disk.

The addresses and contents of these disks are listed in Figure 3 on page 8.

Remote 3270 Display Option is a superset of VM/Pass-Through. As such, it contains some files that may have the same filenames. In the case of the text files, the filenames are the same but the filetypes have been changed to 'TXTR3270.' They were 'TEXT.' You can tell which text files are for VM/Pass-Through and which are for Remote 3270 Display Option. In certain cases, your disks will

| Minidisk | Disk at Address PVM | MAINT | Contents |
|---|---|---|---|
| System Disk (PVM's A-disk) | 191 | 496 | Operational files for VM/Pass-Through and Remote 3270 Display Option |
| Base TEXT Staging Disk | | 49E | TEXT & EXECS for Pass-Through TXTR3270 and EXECs for Remote 3270 Display Option and RSCS |
| Source Staging Disk | | 39E | Source for Pass-Through Source for Remote 3270 Display Option Source for RSCS |
| Service Staging Disk | | 29E | Preventive Service for Pass-Through and Remote 3270 Display OPtion and RSCS |
| System Extension Disk (This is the system's program product disk.) | | 19E | Modules and EXECs required For general users to use Pass-Through and Remote 3270 Display Option |
| HELP Disk (This is CMS's HELP file disk.) | | 19D | HELP files for Pass-Through No data for Remote 3270 Option |

**Figure 3. Minidisks Used for Remote 3270 Display Option—VM/Pass-Through Installation**

contain two files with the same filename and filetype--one for VM/Pass-Through and one for Remote 3270 Display Option. This double naming is particularly true in the case of PVM and DVMUSI MODULEs. The system will contain pointers to the Remote 3270 Display Option files. This means that:

1. If, for some reason, you want to remove Remote 3270 Display Option from your system, you must rebuild VM/Pass-Through.

2. You must install the two program products (VM/Pass-Through Facility and Remote 3270 Display Option) in the order cited in this book. Otherwise, your system will refer to the wrong PVM and DVMUSI MODULEs.

These are descriptions of the disks you will be using for this installation:

***System Minidisk***: This minidisk holds files required for the operation of VM/Pass-Through and Remote 3270 Display Option.

The system disk is at PVM's 191 (MAINT's 496).

***Base TEXT Staging Minidisk***: You will use the base TEXT staging minidisk to load all the files from the VM/Pass-Through distribution tape file 1 and then distribute them to other minidisks.

The base TEXT staging disk is located at MAINT's 49E.

***Source Staging Minidisk***: The source staging minidisk contains the source modules for Remote 3270 Display Option and VM/Pass-Through Facility, as well as the updates to both of them.

The source staging minidisk is MAINT's 39E.

***Service Staging Minidisk***: Use this minidisk if you want to apply preventive service updates for VM/Pass-Through Facility and Remote 3270 Display Option.

The service staging minidisk is MAINT's 29E.

***System Extension Minidisk***: The system extension minidisk is VM/XA Migration Aid's program product disk (MAINT's 19E). Users have common read access to this disk. The system extension minidisk contains the modules and execs that general users need when they want to access the pass-through virtual machine.

***HELP Minidisk***: You put the VM/Pass-Through HELP files on the same CMS minidisk that contains the CMS HELP files (MAINT's 19D). VM/Pass-Through adds a menu file and a HELP file for the CMS PASSTHRU command. There are no HELP files for Remote 3270 Display Option. You must also edit the CMS HELP HELPMENU file and add the following to the list of components:

```
*PVM
```

## Distribution Tapes

The VM/Pass-Through Facility licensed program consists of four tape files shipped on a distribution tape. These four files contain:

File 1 - VM/Pass-Through load modules, maps, and exec files

File 2 - VM/Pass-Through object modules

File 3 - VM/Pass-Through/IPCS HELP file and object modules

File 4 - VM/Pass-Through and VM/Pass-Through/IPCS source modules, COPY and MACRO files, and DVMMAC MACLIB

Since VM/XA Migration Aid does not support IPCS, you will not use the VM/Pass-Through/IPCS information on files 3 and 4. You do not load any of file three but you must load file 4 to get the VM/Pass-Through source files.

Remote 3270 Display Option is shipped on an additional distribution tape that should be installed immediately after the VM/Pass-Through Facility tape and update files. It contains six tape files:

File 1 - Remote 3270 Display Option load exec

File 2 - Remote 3270 Display Option sample files and user execs

File 3 - Remote 3270 Display Option load modules and execs

File 4 - Remote 3270 Display Option text files and HCPXA MACLIB

File 5 - Remote 3270 Display Option auxiliary files and update decks

File 6 - Remote 3270 Display Option source assemble, MACRO, and COPY files

Files are read from the tape using the VMFPLC2 command's LOAD option.

Next, create a configuration file to define the pass-through virtual machine and a PROFILE EXEC to issue the commands that you want executed every time the pass-through virtual machine is logged on. At this time, you can also create a PROFILE PVM file to initialize the system automatically. The PROFILE EXEC should call the RUNPVM EXEC. All data in these files must be in uppercase.

***Creating the Configuration File***: To create a configuration file for your system, use the syntax diagrams and operand descriptions contained in "Chapter 3 - Remote 3270 Display Option—VM/Pass-Through Configuration File Records" on page 73. See Appendix A, "Devices Supported by Remote 3270 Display Option-VM/Pass-Through Facility" on page 171 for a list of supported devices. The configuration file is named PVM CONFIG.

A configuration file for a Remote 3270 Display Option—VM/Pass-Through system running in the VM/XA Migration Aid environment might look like this:

```
**********************************
* Configuration file for NEWYORK *
**********************************
```

| Record Text | Comments |
|---|---|
| LOCAL NEWYORK | This node is to be named NEWYORK. |
| LINK 100 CTCASYST CTCA | |
| LINK 90 REMOTE90 R3270 | Define the first remote link. |
| CLUSTER 00 02<br>CLPORT 00 3277<br>CLPORT 01 3277 | And its CLUSTER and CLPORTs. |
| LINK 92 REMOTE92 R3270 | Define another remote link. |
| CLUSTER 00 04 3274E<br>CLPORT 00 3278-4<br>CLPORT 01 3278-4<br>CLPORT 02 3279-3<br>CLPORT 03 3278-5<br>CLUSTER 01 32 3274E<br>CLPORT 15 3287<br>CLPORT 31 3286 | And its CLUSTERs and CLPORTS. |
| LINK 110 PVM6 CTCA | |
| LINK 09C CICSSYS5 327X | Define the link to CICS system 5 via 327X simulator line and then define the ports available on CICSSYS5. |
| PORT 00 3277 PVMLOCAL A-3BB | This port is reserved for terminal address 3BB on this node. |
| PORT 01 3278-4 PASSYS5 P135ND2 | This port is reserved for user P135ND2 on node PASSYS5. |

**Figure 4 (Part 1 of 2). Sample Configuration File for a Remote 3270 Display Option—VM/Pass-Through System**

| Record Text | Comments |
|---|---|
| PORT 02 3277 PVMLOCAL A-212 | This port is reserved for the user on terminal address 212. |
| PORT 03 3278-3 PVMLOCAL A-1003 | This port is reserved for the user on terminal address 1003. |
| LINK 050 PASSYS2 BSCA | Define the link to Pass-Through system PASSYS2 via BSC line. |
| LINK 09D TSOSYS2 327X | Define the link to TSO system 2 via 327X simulator line and then define the three ports available on TSOSYS2. |
| PORT 00 3278-2 NEWYORK USER1 | Port 00 is restricted to use by local node, USER1 |
| PORT 01 3278-2 NEWYORK USER2 | PORT 01 is restricted to use by local node, USER2 |
| PORT 02 3278-3 NEWYORK USER3 | PORT 02 is restricted to use by local node, USER3 |
| ROUTE PASSYS5 PASSYS2 | This ROUTE entry informs VM/Pass-Through that VM/Pass-Through system 5 can be reached through PASSYS2. |
| ROUTE TSOSYS1 PASSYS2 | This ROUTE entry informs VM/Pass-Through that TSO system 1 can be reached through PASSYS2. |
| AUTHORIZ OPERATOR | This AUTHORIZ entry authorizes the operator to issue restricted commands. |
| SELECT PVM6 | A user can choose node PVM6 using a PF Key. |
| SELECT CTCASYST | A user can choose node CTCASYST using a PF Key. |
| AUDIT | Create an audit file (Default name CONSOLE LOG A) |
| * LET THE FOLLOWING<br>* PARAMETERS USE THE DEFAULT<br>* VALUES: BUFFERS, DUMP,<br>* EXT, I/O, TDISC, AND<br>* TIMEOUT. HAVE MESSAGES<br>* RETURNED USING CP MSG<br>* (DON'T SPECIFY MSGNOH). | These are comment records. |

**Figure 4 (Part 2 of 2). Sample Configuration File for a Remote 3270 Display Option—VM/Pass-Through System**

You can find this sample configuration file on tape file 2 of the Remote 3270 Display Option distribution tape.

Use the following algorithms to compute the values for the EXT, I/O, and BUFFERS records if you specify them in the configuration file.

*EXT Record*: This record specifies how many entries the system will create to handle external interrupts. The system uses one entry as the default VMCF message handler. One entry must exist for each active user who will access VM/Pass-Through using the PASSTHRU command. (This includes Remote 3270 Display Option users in session with the local node.) Each user who will access the local CP system as a target node must have an entry also. Each entry fills 12 bytes of storage.

The value for EXT can be calculated as:

```
EXT = 2 + VMAX + AMAX
```

**where:**

**VMAX**
is the maximum number of users who will simultaneously access the pass-through virtual machine using the PASSTHRU command.

**AMAX**
is the maximum number of users who will simultaneously access the local CP system as a target node.

*I/O Record*: This record specifies how many entries the system will create to handle I/O interrupts. The system uses one entry to handle console attention interrupts. There must also be an entry for each active line driver, each active attached display support task, and each active attached printer support task (VM/Pass-Through Facility printer support). Each entry fills 12 bytes of storage.

The value for I/O can be calculated as:

```
I/O = 1 + LMAX + GMAX + PMAX
```

**where:**

**LMAX**
is the maximum number of active line drivers (including the remote line drivers).

**GMAX**
is the maximum number of attached display support tasks.

**PMAX**
is the maximum number of attached printer support tasks.

*BUFFERS Record*: This record specifies how many 4096-byte pages of virtual storage the system will reserve for use as internal buffers. The number of buffers required by the system depends on the number and type of active line drivers, the number of active users, and the number of commands being executed. If there are not enough buffers, there will be a severe performance penalty. A guide for estimating the value for BUFFERS is:

```
IF UMAX IS GREATER THAN 30:
   BUFF = 10 + 3(NMAX) + 2(EMAX) + 2(RMAX)
          + 2(AMAX)/3 + (30+((UMAX-30)/2))

                    --OR--

IF UMAX IS EQUAL TO OR LESS THAN 30:
   BUFF = 10 + 3(NMAX) + 2(EMAX) + 2(RMAX)
          + 2(AMAX)/3 + UMAX
```

**where:**

**BUFF**
is the number of buffers the system requires.

**NMAX**
is the maximum number of active Pass-Through-to-Pass-Through network line drivers (BSCA or CTCA).

**EMAX**
is the maximum number of active emulator line drivers (327x) and remote line drivers (R3270).

**RMAX**
is the maximum number of active ROCF line drivers.

**UMAX**
is the maximum number of local user and printer sessions simultaneously accessing the pass-through virtual machine plus the maximum number of remote 3270 ports that are currently active.

**AMAX**
is the maximum number of users simultaneously accessing the local CP system as the target node.

***PROFILE EXEC***: Write a PROFILE EXEC to issue the CP and CMS commands that you would normally issue when you initialize the pass-through virtual machine. For information on writing a CMS PROFILE EXEC, see the *VM/XA Migration Aid: User's Guide*, GC19-6216.

For automated initialization, the final statement in the PROFILE EXEC for the pass-through virtual machine must invoke the RUNPVM EXEC, supplied with the product. For example, a PROFILE EXEC might be:

```
&CONTROL ERROR
SET AUTOREAD OFF
CP SET RUN ON
        .
        .
        .
&STACK RUNPVM
```

**Figure 5. Sample PROFILE EXEC**

RUNPVM EXEC loads and starts the Remote 3270 Display Option—VM/Pass-Through program. It executes the PROFILE PVM file (if one exists) for that pass-through virtual machine.

**Note:** In its processing, the RUNPVM EXEC attempts to SET AUTOPOLL ON. This option is not available in VM/XA Migration Aid Release 1. You will receive the message "INVALID OPTION -- AUTOPOLL". Disregard this message. It will have no effect on your processing.

You should also add this statement to the PROFILE EXEC of the userid AUTOLOG1:

```
AUTOLOG PVM
```

This statement logs on the userid PVM whenever AUTOLOG1's PROFILE EXEC is executed. (Remember you authorized AUTOLOG1 to logon PVM in Figure 2 on page 6.)

***PROFILE PVM***: PROFILE PVM is an optional installation-written file containing Remote 3270 Display Option—VM/Pass-Through commands. You need this file if you want system initialization to be fully automated. The PROFILE PVM issues START commands for the defined lines and issues START GRAF commands for attached display support. These START GRAF commands allow users to issue the CP DIAL command to initiate an interactive session with VM/Pass-Through. If you include a PROFILE PVM, it is executed as part of system initialization.

The example below illustrates a PROFILE PVM file for the pass-through virtual machines running Remote 3270 Display Option—VM/Pass-Through in the VM/XA Migration Aid environment. Line addresses on the START LINE entries must match those in the configuration file LINK records for the associated pass-through virtual machine. These addresses must be from X'20' to X'FF' for telecommunications lines, and from X'100' to X'5F0' (the low-order digit must be 0) for CTCA links. Addresses on the START GRAF and START PRT (VM/Pass-Through Facility printers) entries must be from X'20' to X'5FF'.

Note that VM/Pass-Through "execs" must have a filetype of PVM. The PROFILE PVM file for the Remote 3270 Display Option—VM/Pass-Through system described above might be:

```
*****************************
* PROFILE PVM for REM3270 *
*****************************

START LINE 09C      This statement starts the line to 'CICS'
START LINE 09D      This statement starts the line to 'TSO'
START GRAF 200      These statements enable
START GRAF 201       users to dial to
START GRAF 202       Pass-Through
```

**Figure 6. Sample PROFILE PVM**

You can find this sample PROFILE PVM on tape file 2 of the Remote 3270 Display Option distribution tape.

## *Installing the System*

To install the Remote 3270 Display Option—VM/Pass-Through system, you must follow these steps (as directed in the Remote 3270 Display Option Program Directory distributed with the program tape).

1. Install the VM/Pass-Through Facility
2. Apply service to the PUT level described in the Remote 3270 Display Option Program Directory
3. Install the Remote 3270 Display Option
4. Install additional service (if any).

Figure 7 describes the step-by-step installation of VM/Pass-Through.

These procedures assume that the minidisks have already been formatted using the CMS FORMAT command.

The installation procedure outlined below is the console log from an actual installation of VM/Pass-Through Facility Program Product. The log has been edited for clarity. Your installation process may not appear **exactly** as this one does, but this procedure gives you an idea of what to expect. Remember that you are userid MAINT to perform this installation. MAINT usually installs and services VM/Pass-Through Facility and Remote 3270 Display Option. MAINT owns the staging, source, and service minidisks (49E, 39E, 29E).

Things that you will enter are completely in lower case. Responses are all in upper case. There are some explanatory comments to the right of the page.

```
link * 496 496 wr                                  You link to MAINT's 496. This will
DASD   0496 LINKED R/W                             be PVM's 191 (A) disk.
R; T=0.01/0.01 11:30:09
```

**Warning: If the 39E, 29E and 49E minidisks are already formatted (for instance, for RSCS), access the base TEXT staging minidisk as 'A' (type 'ac 19e a') and begin with attaching the distribution tape below.**

```
format * 39e a                                     You format MAINT's 39E.

DMSFOR603R FORMAT WILL ERASE ALL FILES ON DISK 'A(39E)'. DO YOU WISH TO CONTINUE? (YES | NO):
yes
DMSFOR605R ENTER DISK LABEL:
pvm39e
FORMATTING DISK 'A'.
'32' CYLINDERS FORMATTED ON 'A(39E)'.
R; T=0.04/1.12 11:31:27

format 29e a                                       You format MAINT's 29E.

DMSFOR603R FORMAT WILL ERASE ALL FILES ON DISK 'A(29E)'. DO YOU WISH TO CONTINUE? (YES | NO):
yes
DMSFOR605R ENTER DISK LABEL:
pvm29e
FORMATTING DISK 'A'
'8' CYLINDERS FORMATTED ON 'A(29E)'.
R; T=0.01/0.12 11:31:43

format 49e a                                       You format MAINT's 49E.

DMSFOR603R FORMAT WILL ERASE ALL FILES ON DISK 'A(49E)'. DO YOU WISH TO CONTINUE? (YES | NO):
yes
DMSFOR605R ENTER DISK LABEL:
pvm49e
FORMATTING DISK 'A'
'6' CYLINDERS FORMATTED ON 'A(49E)'.
R; T=0.01.12 11:31:43

att c40 * 181                                      You mount and attach the VM/Pass-Through
TAPE   0181 ATTACHED                               distribution tape. (c40 is an example
R; T=0.01/0.01 11:31:51                            address. Enter the actual address.)
rew 181                                            make sure that you are at the
TAPE 0181 REWIND STARTED                           beginning of the tape and.....
R; T=0.01/0.01 11:31:55
```

**Figure 7 (Part 1 of 5). Installing VM/Pass-Through Facility**

```
vmfplc2 load
 LOADING.....
 PVMGEN  EXEC   A1
 DVMMAC  EXEC   A1
 DVMUSIE EXEC   A1
 PASSTHRU EXEC   A2
 PVM     EXEC   A1
 PVMBLD  EXEC   A1
 RUNPVM  EXEC   A1
 PVM     CONFIG  A1
 PASSTHRU HELPPVM  A1
 PROFILE PVM     A1
 PVM     CNTRL   A1
 DVMUSI  MODULE  A2
 PVM     MODULE  A2
 DVMUSI  PRELMAP A2
 PVM     PRELMAP A2
 DVMUSI  MAP     A2
 PVM     MAP     A2
 PVM     HELPMENU A2
 END-OF-FILE OR END-OF-TAPE
R; T=0.10/0.30 11:33:05
```

load the files from tape file 1.

These are the files contained in tape file 1.

```
ac 19d b
R; T=0.03/0.07 11:35:25
l * help*
PASSTHRU HELPPVM  A1  3.
PVM     HELPMENU A2
R; T=0.01/0.01 11:36:06
copy passthru helppvm a = = b ( rep olddate
R; T=0.05/0.08 11:36:27
copy pvm helpmenu a = = b ( rep olddate
R; T=0.03/0.04 11:36:45
```

You access MAINT's 19D (the HELP file disk) as the B-disk.
List the two help files...

And copy them onto the HELP minidisk.

```
ac 19e b
'19E' REPLACES ' B (19D) '
'19E Y/S' RELEASED
R; T=0.01/0.02 11:36:53
copy passthru exec a = = b ( rep olddate
R; T=0.02/0.04 11:37:13
copy dvmusi * a = = b ( rep olddate
R; T=0.03/0.07 11:37:41
```

You access MAINT's 19E (the system extension minidisk) as the B-disk and....

copy the files PASSTHRU EXEC and

all the DVMUSI files onto the B-disk.

```
l dvmusi * *
DVMUSI  MODULE  A2
DVMUSI  PRELMAP A2
DVMUSI  MAP     A2
DVMUSI  MODULE  B2
DVMUSI  PRELMAP B2
DVMUSI  MAP     B2

R; T=0.01/0.01 11:37:54
```

These are the DVMUSI files that you'll have on the system extension minidisk.

```
rel b

R; T=0.01/0.01 11:38:12
ac 19e y/s
Y (19E) R/O
R; T=0.01/0.01 11:38:19
```

You want the system extension minidisk to be your Y/S (extension to CMS) disk so you release it as B and access it as Y/S.

```
acc 496 b

R; T=0.01/0.01 11:39:00
```

This is PVM's 191 (the system) minidisk.

**Figure 7 (Part 2 of 5). Installing VM/Pass-Through Facility**

```
copy pvm module a = = b (rep oldate
R; T=0.01/0.01 11:39:15
copy pvm prelmap a = = b (rep oldate
R; T=0.01/0.01 11:39:30
copy pvm map a = = b (rep oldate
R; T=0.01/0.01 11:39:45
erase pvm module a
R; T=0.01/0.01 11:40:00
erase pvm prelmap a
R; T=0.01/0.01 11:40:15
erase pvm map a
R; T=0.01/0.01 11:40:30
```

You copy these files onto the system minidisk and erase the originals.

```
vmfplc2 load
 LOADING.....
 DVMABR  TEXT   A1
 DVMAIN  TEXT   A1
 DVMAPP  TEXT   A1
 DVMATT  TEXT   A1
 DVMBFR  TEXT   A1
 DVMBSC  TEXT   A1
 DVMCHK  TEXT   A1
 DVMCON  TEXT   A1
 DVMCOQ  TEXT   A1
 DVMCTC  TEXT   A1
 DVMDET  TEXT   A1
 DVMDIR  TEXT   A1
 DVMEND  TEXT   A1
 DVMEXE  TEXT   A1
 DVMEXT  TEXT   A1
 DVMGRF  TEXT   A1
 DVMGTP  TEXT   A1
 DVMINT  TEXT   A1
 DVMIOE  TEXT   A1
 DVMNET  TEXT   A1
 DVMNEV  TEXT   A1
 DVMNOT  TEXT   A1
 DVMNUE  TEXT   A1
 DVMPGM  TEXT   A1
 DVMPID  TEXT   A1
 DVMPOS  TEXT   A1
 DVMPST  TEXT   A1
 DVMPTP  TEXT   A1
 DVMQRY  TEXT   A1
 DVMRSF  TEXT   A1
 DVMSCH  TEXT   A1
 DVMSCN  TEXT   A1
 DVMSEL  TEXT   A1
 DVMSIM  TEXT   A1
 DVMSNP  TEXT   A1
 DVMSTR  TEXT   A1
 DVMSVC  TEXT   A1
 DVMTIM  TEXT   A1
 DVMUGR  TEXT   A1
 DVMUIN  TEXT   A1
 DVMUPR  TEXT   A1
 DVMUSI  TEXT   A1
 DVMVMC  TEXT   A1
 DVMWAI  TEXT   A1
 DVMWAT  TEXT   A1
 DVMWTR  TEXT   A1
 DVMXVM  TEXT   A1
 END-OF-FILE OR END-OF-TAPE
R; T=0.16/0.50 11:39:38
```

Next you want to load tape file 2.

These are the files contained in tape file 2. These files are now on PVM's 191 (system minidisk).

**Figure 7 (Part 3 of 5). Installing VM/Pass-Through Facility**

```
tape fsf
R; T=0.01/0.01 11:39:43
```

You skip tape file 3. It contains only IPCS support files which VM/XA Migration Aid won't support.

```
ac 39e a
'497' REPLACES ' A (496) '
R; T=0.01/0.01 11:39:49
vmfplc2 load
 LOADING.....
 DVMABR  ASSEMBLE A1
 DVMAIN  ASSEMBLE A1
 DVMAPP  ASSEMBLE A1
 DVMATT  ASSEMBLE A1
 DVMBFR  ASSEMBLE A1
 DVMBSC  ASSEMBLE A1
 DVMCHK  ASSEMBLE A1
 DVMCON  ASSEMBLE A1
 DVMCOQ  ASSEMBLE A1
 DVMCTC  ASSEMBLE A1
 DVMDET  ASSEMBLE A1
 DVMDIR  ASSEMBLE A1
 DVMEND  ASSEMBLE A1
 DVMEXE  ASSEMBLE A1
 DVMEXT  ASSEMBLE A1
 DVMGRF  ASSEMBLE A1
 DVMGTP  ASSEMBLE A1
 DVMINT  ASSEMBLE A1
 DVMIOE  ASSEMBLE A1
 DVMNET  ASSEMBLE A1
 DVMNEV  ASSEMBLE A1
 DVMNOT  ASSEMBLE A1
 DVMNUE  ASSEMBLE A1
 DVMPGM  ASSEMBLE A1
 DVMPID  ASSEMBLE A1
 DVMPOS  ASSEMBLE A1
 DVMPST  ASSEMBLE A1
 DVMPTP  ASSEMBLE A1
 DVMQRY  ASSEMBLE A1
 DVMRSF  ASSEMBLE A1
 DVMSCH  ASSEMBLE A1
 DVMSCN  ASSEMBLE A1
 DVMSEL  ASSEMBLE A1
 DVMSIM  ASSEMBLE A1
 DVMSNP  ASSEMBLE A1
 DVMSTR  ASSEMBLE A1
 DVMSVC  ASSEMBLE A1
 DVMTIM  ASSEMBLE A1
 DVMUGR  ASSEMBLE A1
 DVMUIN  ASSEMBLE A1
 DVMUPR  ASSEMBLE A1
 DVMUSI  ASSEMBLE A1
 DVMVMC  ASSEMBLE A1
 DVMWAI  ASSEMBLE A1
 DVMWAT  ASSEMBLE A1
 DVMWTR  ASSEMBLE A1
 DVMXVM  ASSEMBLE A1
 DVMZCO  ASSEMBLE A1
 DVMZDS  ASSEMBLE A1
 DVMZDV  ASSEMBLE A1
 DVMZEX  ASSEMBLE A1
 DVMZLI  ASSEMBLE A1
 DVMZRO  ASSEMBLE A1
 DVMZSY  ASSEMBLE A1
 DVMZTK  ASSEMBLE A1
 DVMZUS  ASSEMBLE A1
```

You access MAINT's 39E (the staging minidisk as A....

and load onto it the files from tape file 4. These are the files you will have on the source staging minidisk.

**Figure 7 (Part 4 of 5). Installing VM/Pass-Through Facility**

```
DVMAAT  COPY   A1
DVMALT  COPY   A1
DVMAUT  COPY   A1
DVMBLK  COPY   A1
DVMBUF  COPY   A1
DVMDEVT COPY   A1
DVMEXTT COPY   A1
DVMPFLG COPY   A1
DVMPORT COPY   A1
DVMPQE  COPY   A1
DVMROUT COPY   A1
DVMSVCT COPY   A1
DVMUSRL COPY   A1
DVMMAC  MACLIB A1
DVMABRT MACRO  A1
DVMATCH MACRO  A1
DVMCBUF MACRO  A1
DVMCHAN MACRO  A1
DVMCOMN MACRO  A1
DVMDCHN MACRO  A1
DVMDETC MACRO  A1
DVMEXCP MACRO  A1
DVMFREB MACRO  A1
DVMGETL MACRO  A1
DVMGETS MACRO  A1
DVMHNDI MACRO  A1
DVMHNDV MACRO  A1
DVMLCB  MACRO  A1
DVMNUCN MACRO  A1
DVMPOST MACRO  A1
DVMSETT MACRO  A1
DVMSYSB MACRO  A1
DVMTASK MACRO  A1
DVMTCB  MACRO  A1
DVMTRAC MACRO  A1
DVMWAIT MACRO  A1
DVMXVMC MACRO  A1
END-OF-FILE OR END-OF-TAPE
R; T=0.76/2.58 11:41:10

det 181                                    Now you detach and dismount the
TAPE  0181 DETACHED                         VM/Pass-Through distribution tape
R; T=0.01/0.01 11:41:24

ipl 190                                    You initialize CMS.
VM/XA REL 1 05/20/83 10:46

CMSSEG SYSTEM NAME 'CMSSEG' NOT AVAILABLE.
R; T=0.01/0.01 11:41:44                    Now you are ready to apply service.
```

**Figure 7 (Part 5 of 5). Installing VM/Pass-Through Facility**

## Applying Service (VM PUT)

Programming service is distributed on a service tape (VM PUT). Before you install Remote 3270 Display Option, you must apply VM/Pass–Through Service to the level specified in the *VM/XA Migration Aid Program Directory*, the "Memo to Users," included with the tape, contains instructions for applying the service updates.

## Installing Remote 3270 Display Option

You install Remote 3270 Display Option using an exec supplied on the product tape. Figure 8 describes the installation procedure for Remote 3270 Display Option using this exec. However, the installation exec uses default addresses set up in the sample VM/XA Migration Aid directory. If you have changed any of these addresses, you must install Remote 3270 Display Option manually. This manual installation process is described in the Program Directory. As in the VM/Pass-Through installation procedure, things that you will enter are completely in lower case. Responses are all in upper case. There are some explanatory comments to the right of the page.

```
att c40 * 181                                  You mount and attach the Remote 3270
TAPE   0181 ATTACHED                            Display Option distribution tape.
R; T=0.01/0.01 16:18:38
tape rew                                       You make sure that you are at the
R; T=0.01/0.01 16:18:47                         beginning of the tape.

acc 191 c                                      You access MAINT's 191 disk as C and
'191 A ' RELEASED                              ...
R; T=0.01/0.01 16:19:16

vmfplc2 load * * c                             load the Remote 3270 Display
 LOADING.....                                   Option installation exec.
 R3270DO  EXEC    C1
 END-OF-FILE OR END-OF-TAPE
R; T=0.01/0.02 16:19:31

exec r3270do                                   You execute r3270do, the installation
                                                exec. This exec does the installation
PVM NOT LOGGED ON                               work for you. (If you should
DEVICE 0496 DOES NOT EXIST                      want to install Remote 3270 Display
                                                Option manually, an installation
DASD   0496 LINKED R/W                          procedure is contained in the Remote
                                                3270 Display Option program directory.

    LOADING THE SAMPLE FILES ON PVM'S 191.
        (MAINT'S 496)
TAPE 0181 REWIND STARTED

    LOADING THE USER MODULES & EXECS ON MAINT'S 19E.
*

    LOADING THE TEXT FILES ON MAINT'S 49E
        (MAINT'S  49E)

    LOADING THE UPDATE FILES ON MAINT'S 29E.
         (MAINT'S  29E)

    LOADING THE SOURCE FILES ON MAINT'S 39E.
        (MAINT'S  39E)
PRT FILE 0083 FROM MAINT   PRT RECS 0047 COPY 001 A NOHOLD NOKEEP
R; T=0.39/1.31 16:20:15
```

**Figure 8. Remote 3270 Display Option Installation Procedure**

***Installation is now complete.***

## *Bringing Up the Pass-Through Virtual Machine*

The pass-through virtual machine can be started automatically if the required files (execs) are properly set up. Otherwise, you must start the system manually.

### Automatic Startup

If the files required for automatic startup have been set up properly, the pass-through virtual machine can be started either by issuing:

```
CP AUTOLOG PVM
```

OR by following these steps:

1. Logon to the pass-through virtual machine and IPL CMS (the CMS system disk, 190).

   ```
   LOGON PVM
   IPL 190
   ```

2. Enter a null line to execute the PROFILE EXEC.

The pass-through virtual machine should now initialize and start all specified lines.

### Manual Startup

1. Logon to the pass-through virtual machine and IPL CMS (the CMS system disk, 190).

   ```
   LOGON PVM
   IPL 190
   ```

2. Enter a null line to execute the PROFILE EXEC.

3. If the line driver lines are not defined in the directory by DEDICATE records, ATTACH the appropriate lines.

   ```
   ATTACH 080 *
   ATTACH 450 *
   (etc.)
   ```

4. If the 3270 Information Display System printer addresses (to be used as VM/Pass-Through Facility printers) are not defined in the directory by DEDICATE records, then ATTACH the appropriate printers.

   ```
   ATTACH 491 *
   (etc.)
   ```

5. Issue RUNPVM EXEC to load and start the PVM module.

   ```
   RUNPVM
   ```

   **Note:** In its processing, the RUNPVM EXEC attempts to SET AUTOPOLL ON. This option is not available in VM/XA Migration Aid Release 1. You will receive the message "INVALID OPTION -- AUTOPOLL". Disregard this message. It will have no effect on your processing.

6. After initialization, issue START commands for the appropriate lines, attached display support tasks, and attached printer support tasks.

```
START LINE 080
START GRAF 451
START PRT  491 VS1APL
(etc.)
```

## *Storage Considerations*

The two kinds of storage you must consider are virtual machine size and auxiliary storage.

### Minidisks

The approximate auxiliary direct access storage space required on the various minidisks (mdisks) is:

| Minidisk | Cylinders on | |
|---|---|---|
| | 3330 | 3350 |
| System | 4 | 2 |
| Base TEXT Staging | 6 | 2 |
| Source Staging | 32 | 15 |
| Service Staging | 8 | 4 |
| System Extension | 1 | 1 |
| HELP | 1 | 1 |

Allow for equivalent space on other supported DASD devices. VM/XA Migration Aid supports certain DASD devices in dedicated mode only.

Be sure that adequate auxiliary storage space is provided for daily operations. For example, additional storage is required for AUDIT records if that option is used.

### Virtual Machine Size

To calculate an approximate value for the pass-through virtual machine's storage requirements, use the values calculated for the configuration file (See "Creating the Configuration File" on page 10.) along with certain fixed storage requirements. This figure is used on the USER statement of the system directory. It is the pass-through virtual machine's virtual machine size.

The equation for virtual machine size is:

```
VSIZE = CMS + NUC + PQE + CONF + BMAX(4952) + CMAX(1848)
        + EMAX(5088) + RMAX(1808) + GMAX(1040) + PMAX(1040)
        + VMAX(672) + AMAX(824) + IMAX(48) + LDRT
        + R3270MAX(1442) + RUMAX(48)
```

**where:**

**CMS**
is the CMS low storage size, approximately 2,097,152 decimal bytes (2M).

**NUC**
is the VM/Pass-Through module size, approximately 173,928 decimal bytes (170K).

**PQE**
is the size of the PQE buffer pool. Its decimal value can be calculated:

```
PQE = 4096((7 x BUFF) + 35)/68
```

**where:**

**BUFF**
is the BUFFERS value (from "Creating the Configuration File" on page 10).

**CONF**
is the size of the table built from the configuration file entries. Its decimal value can be calculated by:

```
CONF = 48(NLINK+1) + 688(ELINK) + 16(ROUT+10)
       + 16(AUTH) + 4096(BUFF) + 12(EXT) + 12(I/O)
       + 40(CLUSTER) + 28(CLPORT)
```

**where:**

**NLINK**
is the number of LINK statements for BSCA, CTCA, ROCF or R3270 lines.

**ELINK**
is the number of LINK statements for 327x lines.

**ROUT**
is the number of ROUTE statements.

**AUTH**
is the number of AUTHORIZ statements.

**BUFF**
is the BUFFERS value.

**EXT**
is the EXT value.

**I/O**
is the I/O value.

**CLUSTER**
is the number of CLUSTER records.

**CLPORT**
is the total number of ports specified on the CLUSTER record (not the number of CLPORT records).

**BMAX**
is the maximum number of active BSCA line drivers.

**CMAX**
is the maximum number of active CTCA line drivers.

**EMAX**
is the maximum number of active emulator line drivers (327x).

**RMAX**
is the maximum number of active ROCF line drivers.

**GMAX**
is the maximum number of attached display support tasks.

**PMAX**
is the maximum number of attached printer support tasks.

**VMAX**
is the maximum number of users who will simultaneously access the pass-through virtual machine via the PASSTHRU command.

**AMAX**
is the maximum number of users simultaneously accessing the local CP system as the target node.

**IMAX**
is the maximum number of sessions for which this (the local system) is an intermediate node.

**LDRT**
is the storage required for the CMS loader table.

**R3270MAX**
is the maximum number of active remote 3270 line drivers.

**RUMAX**
is the maximum number of concurrently active remote 3270 users.

From the original equations for CONF and VSIZE:

```
CONF = 48(NLINK+1) + 688(ELINK) + 16(ROUT+10) + 16(AUTH)
       + 4096(BUFF) + 12(EXT) + 12(I/O) +40(CLUSTER)
       + 28(CLPORT)

VSIZE = CMS + NUC + PQE + CONF + BMAX(4952)
        + CMAX(1848) + EMAX(5088) + RMAX(1808)
        + GMAX(1040) + PMAX(1040) + VMAX(672)
        + AMAX(824) + IMAX(48) + LDRT
        + R3270MAX(1442) + RUMAX(48)
```

using defaults for BUFFERS, EXT, and I/O, and assuming:

- One 327x line driver
- One BSCA line driver
- No CTCA line drivers
- One ROCF line driver
- Ten active DIAL users
- One active printer task
- Five active PASSTHRU users
- Five users accessing the local CP system
- Three ROUTE entries
- Two AUTHORIZ entries

- One CLUSTER entry
- Three CLPORTS
- Five sessions for which the local system is an intermediate node
- One active remote 3270 line driver
- Three active remote 3270 users.

```
CONF =   48(2+1)
          688(1)
        16(3+10)
           16(2)
        4096(30)
          12(50)
          12(50)
           40(1)
  +        28(3)
-------------------------------------
CONF =  125,276 decimal bytes, or 123K

Therefore:

VSIZE = 2,097,152
          147,456
           14,758
          125,276
              856
                0
              992
            1,808
           10,400
            1,040
            3,360
            4,120
              240
           12,228
            1,442
        +     144
-------------------------------------
VSIZE = 2,421,272 decimal bytes (2.5M)
                  of virtual storage
```

## *Performance Considerations*

The Remote 3270 Display Option itself needs no enhancements to increase its performance.

If you want to work with VM/Pass-Through Facility under VM/XA Migration Aid, you can use certain CP options to enhance the pass-through virtual machine's performance. You may need one or more of these options to provide adequate performance on heavily loaded systems. These options are described in "Performance Considerations" on page 43.

## *Restrictions*

The following restrictions apply to Remote 3270 Display Option—VM/Pass-Through operations. Restrictions for the VM/Pass-Through Facility can be found under "Restrictions" on page 64.

- To use a logical printer as a part of a remote cluster under the Remote 3270 Display Option support, both the target system and the origin system must have the Remote 3270 Display Option support installed (unless the target is a 327x node).

- In order to send and receive extended data streams, both the target and the origin systems must support the use of extended data streams.

## *Requirements*

These are requirements for Remote 3270 Display Option—VM/Pass-Through operations:

- Each node in the network must have a unique nodeid. If you need more than one LINK to a non-VM/Pass-Through system node, you must assign a unique nodeid for each LINK. You cannot have more than one link between two VM/Pass-Through node names. (However, a particular system may have more than one node name and therefore, more than one link between the physical systems.)

  **Note:**

  The system considers R3270 lines to be nodes. They must also have unique nodeids.

- Class B privilege must be assigned to the pass-through virtual machine if lines or 3270 devices are connected using ATTACH statements. ATTACH statements can either be contained in the PROFILE PVM or be issued from the pass-through virtual machine console.

- 327x emulator lines must have either:

  – The Station Select feature installed (270X Communications Controller), or
  – The tributary addresses generated (370X Communications Controller)

- You must enter all data in the configuration file and PVM execs in uppercase.

- You must enter all configuration file records in the sequence illustrated in Figure 24 on page 74.

- The port numbers and types that you define in the configuration file must be the same as the definitions of these ports at the remote node.

## *Installing Additional Service*

Programming service will be distributed on a service tape. The "Memo To Users," included with the tape, contains instructions for applying the service update(s).

## *Customizing the System*

IBM provides the following execs for customizing the system to fit your installation's needs.

- PVMBLD EXEC
- R3270BLD EXEC
- R3270GEN EXEC

They are contained on the installation tape.

## PVMBLD EXEC

Use the standard updating procedures to modify Remote 3270 Display Option—VM/Pass-Through. The user can invoke VMFASM to assemble Remote 3270 Display Option—VM/Pass-Through source modules using the supplied control file. Invoke the PVMBLD EXEC when regenerating the pass-through virtual machine module as follows:

| EXECNAME | PARAMETERS |
|---|---|
| PVMBLD | [[loadlist [ctlfile [NOSAVE]]] ?] |

**where:**

*loadlist*
: is the name of an EXEC file that contains the names of object modules in the order in which they are to reside in the resulting module. The default value is PVM. The module created will have the same filename as the *loadlist* parameter. You may modify the exec supplied on the distribution tape to customize it for the installation.

*ctlfile*
: is the filename of the control file (filetype CNTRL). The default value is PVM.

**NOSAVE**
: if specified, the new files (filetype MODULE, MAP, and PRELMAP) will replace the original files. The default is to save the current files by prefixing the filenames of the original files with an "O" and then saving them prior to creating new files.

**?**
: may be entered to cause the valid parameter format to be displayed at the user's terminal.

**Note:** You will not normally execute the PVMBLD EXEC. R3270BLD EXEC executes PVMBLD EXEC as part of its normal processing.

## R3270BLD EXEC

Use the standard updating procedures to modify Remote 3270 Display Option—VM/Pass-Through. The user can invoke VMFASM to assemble Remote 3270 Display Option—VM/Pass-Through source modules using the supplied control file. Invoke the R3270BLD EXEC when regenerating the pass-through virtual machine module as follows:

| EXECNAME | PARAMETERS |
|---|---|
| R3270BLD | [[loadlist [ctlfile [NOSAVE]]] ?] |

**where:**

*loadlist*
is the name of an EXEC file that contains the names of object modules in the order in which they are to reside in the resulting module. The module created will have a filename of PVM. You may modify the exec supplied on the distribution tape to customize it for the installation.

*ctlfile*
is the filename of the control file (filetype CNTRL). The default value is R3270.

**NOSAVE**
if specified, the new files (filetype MODULE, MAP, and PRELMAP) will replace the original files. The default is to save the current files by prefixing the filenames of the original files with an "O" and then saving them prior to creating new files.

**?**
may be entered to cause the valid parameter format to be displayed at the user's terminal.

**Note:** You must have both the PVMBLD and the R3270BLD execs available to be able to build both modules.

## R3270GEN EXEC

Use the R3270GEN EXEC to generate the VM/Pass-Through module that executes in the user's CMS virtual machine. It is invoked as follows:

| EXECNAME | PARAMETERS |
|---|---|
| R3270GEN | [[loadlist [ctlfile [NOSAVE]]] ?] |

**where:**

*loadlist*
is the name of the loadlist exec that will be used in creating the module "DVMUSI." This loadlist exec contains the names of the object modules as well as the order in which they are to reside in the resulting module. The default *loadlist* is USI3270E.

*ctlfile*
is the control file name (filetype CNTRL). The default filename is R3270.

**NOSAVE**
if you specify NOSAVE, the new files (filetype MODULE, MAP, and PRELMAP) will replace the original files. The default is to save the current files by prefixing the filenames of the original files with an "O" and then saving them prior to creating new files.

**?**
may be entered to cause the valid parameter format to be displayed on the user's terminal.

## Using the Remote 3270 Display Option

To use the Remote 3270 Display Option to access VM/XA Migration Aid from your remote terminal, you first respond to the initial screen and then logon to the local system.

### *The Initial Screen*

When you turn on the power to your remote terminal, you receive the initial screen. This screen indicates that the Remote 3270 Display Option is operational and gives you instructions for responding.

Figure 9 on page 30 represents the initial screen.

The initial screen indicates your terminal's local node name, virtual line address, cluster (control unit) address, and port address. After the instruction line, mentioned above, a PF key line lists some nodeids frequently accessed by users at your installation and the PF keys that you can use to select them. If you cannot use PF keys to select nodes, this line is blank. After the PF key line, there is a message line that the system uses to send you immediate error messages and session termination messages. These messages are described in "Remote 3270 Display Option—VM/Pass-Through Facility Messages without Identifiers" on page 105. The last area on the initial screen is the LOGMSG area. This space contains two lines of information of common interest to VM/Pass-Through users at your installation. The operator sets the LOGMSG for this screen and for the selection screen (the same messages are displayed on the selection screen) using the LOGMSG command. If there is no LOGMSG information, this space is blank.

If you wished to work on your local system, you would respond to the initial screen by pressing the ENTER key. You would then proceed to logon to your local system normally.

However, if you prefer to work with VM/Pass-Through Facility, press the CLEAR key to see the node selection screen or press one of the program function keys listed on the screen to pass through to a specific node. Read the next chapter for information on using VM/Pass-Through Facility with the VM/XA Migration Aid. Be sure to tell people who will be working at remote terminals at your installation how to use the initial screen.

### *Using Remote 3270 Display Option's Remote Printer Support*

Remote 3270 Display Option allows you to access a printer as part of a remote line. This support is particularly useful if printing hardcopy is either not convenient or not possible at the local site.

If you want to access a remote printer, you must first specify the proper information on the CLPORT configuration file record. (See "Chapter 3 - Remote 3270 Display Option—VM/Pass-Through Configuration File Records" on page 73 for information about writing configuration file records.) The second form of the CLPORT record allows you to attach a remote printer to a VM/Pass-Through system. The third form allows you to specify that a remote printer should be attached to a non-VM/Pass-Through node.

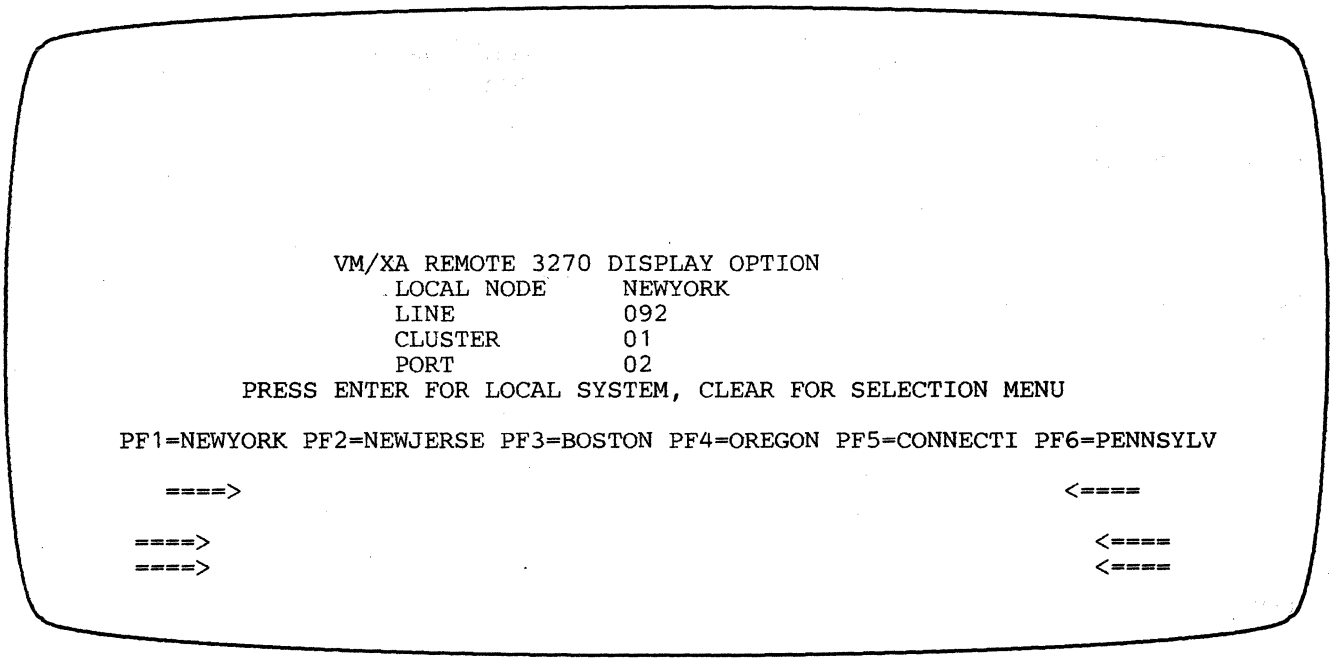


**Figure 9. Initial Screen Format**

If you have properly specified the CLPORT record for the remote printer attachment you desire, the system will attempt to start a printer session when it starts the line. You could have the system attach the printer to any virtual machine at the nodeid.

If you specify *nodeid* without any of the subsequent operands, on the CLPORT record the system creates a logical device but does not attach the printer to a specific user. The operator can query the origin pass-through virtual machine to find out the printer's logical device address. Then, the operator can attach the logical device to a user.

The system will not be able to start the printer session for a printer that supports extended features if the printer is in a "not ready" state when the line is started. In this case, the system will start the session when the printer becomes ready.

The system will always try to restart an abnormally terminated printer session. If, for some reason, you do not want the printer session restarted, first vary the port for the printer offline and then issue the drop command for the printer. If VM/Pass-Through terminated the printer (indicated by message 808 on your screen) and you do not want to return to the printer session, you only need to vary the port offline. (In this case, a drop command is not necessary.) (See "Chapter 4 - Remote 3270 Display Option—VM/Pass-Through Commands" on page 87 for information about issuing the VARY and DROP commands.)

## Problem Source Determination

*VM/Pass-Through Facility Logic* is the primary publication to use to help locate problems. This section points out the problem determination aids that are available, and how to invoke them. Refer to *VM/Pass-Through Facility Logic* for more complete information, including examples.

Remote 3270 Display Option—VM/Pass-Through provides several facilities of its own to enhance problem isolation. Brief descriptions of these facilities follow.

### *The Trace Facility*

You can trace three kinds of activity:

- Line driver I/O
- Line driver data transfer
- System functions

#### Tracing Line Driver I/O Activity

You can trace line driver I/O activity in both internal tables and on hardcopy.

- Internal Recording

Line driver I/O activity tracing begins automatically when the associated line driver is started, and continues as long as the line driver is active. Tracing records this information in an internal wrap-around trace table. If the line driver terminates abnormally because of an unexpected line problem, the line driver uses the CP DUMP command to automatically print out the trace table contents. This includes a record of the events that took place on that line just before the failure.

This facility is described in more detail under "Problem Determination Aids" in *VM/Pass-Through Facility Logic*.

- Producing Hardcopy

Use the line trace facility whenever there appears to be a problem in communication on one of the links. It records all I/O activity on the line, and can indicate problems in teleprocessing hardware, and possible protocol problems. Interpreting TRACE LINE results requires a knowledge of IBM System/370 channel commands and basic teleprocessing protocol.

You invoke the facility by issuing:

```
TRACE LINE ......
```

See "TRACE" on page 101 for more information about starting tracing.

#### Line Driver Data Transfer Tracing

You can trace chronology and the contents of data buffers passed to and from a line driver by issuing the command:

```
VARY ....
```

The VARY command can be useful when a problem with data transfer between VM/Pass-Through components or between systems in a network is suspected.

See "VARY" on page 102 for more information about line driver data transfer tracing. For more information and examples see "Problem Determination Aids" in *VM/Pass-Through Facility Logic*.

**Tracing System Activity**

This facility assists in problem source determination when internal trouble is suspected. It traces services within the pass-through virtual machine. The trace contains a record of all services performed by the VM/Pass-Through system. These services include:

- SVC, I/O, and external interrupt processing
- Buffer activity
- VMCF and logical device transactions
- Task scheduling

To invoke the facility issue:

```
TRACE SYstem ......
```

The output resulting from this command can be directed to the VM/Pass-Through console or to a virtual printer. However, the output may be lengthy so it should not normally be displayed on the console. See "TRACE" on page 101 for more information about starting system activity tracing. For more information and examples, see "Problem Determination Aids" in *VM/Pass-Through Facility Logic*.

## *Producing Snapshots of System Related Data*

Snapshots capture data at specific points in time. They can assist in performance analysis, tracking resource allocation/use, and supplement problem data.

***System Control Blocks***: You can produce dumps of key control blocks by issuing the command:

```
SNAP
```

See "SNAP" on page 99 for more information about creating snapshot dumps. For more information, see "Problem Determination Aids" in *VM/Pass-Through Facility Logic*.

**System/Task Status**

You can obtain the current status of the system and various support tasks by issuing:

```
STATUS ...
```

Data relating to the current (when command received) status of the specified parameter is displayed.

See "STATUS" on page 100 for more information about obtaining status information.

## *The Dump Facility*

The system can produce both full and partial dumps as a result of errors. If a problem, such as a program check, causes Remote 3270 Display Option—VM/Pass-Through to terminate abnormally, the system produces a full CP dump. (VM/XA Migration Aid does not support virtual machine dumps.) Abnormal termination of some component parts of VM/Pass-Through can cause the system to take partial dumps. Informational messages are written to the console and to an audit file (if an AUDIT record is included in the configuration file) when a dump is taken.

Dump facilities are described in *VM/Pass-Through Facility Logic* under "Program-Generated Dumps".

# Chapter 2 - Using VM/Pass-Through Facility Under VM/XA Migration Aid

This chapter gives you basic information on using the distributed data processing capabilities of a VM/Pass-Through network on the VM/XA Migration Aid system. Information contained in this chapter applies only to the uses of VM/Pass-Through and, for the most part, does not duplicate information included in Chapter One. Please refer to Chapter One for information on planning, installing, using, and determining the source of problems on a VM/XA Migration Aid system with Remote 3270 Display Option—VM/Pass-Through installed.

VM/Pass-Through Facility (VM/Pass-Through) is a program product that allows display station users to interactively access target systems (including the local system) and remote processors from their local system.

Target systems can be:

- VM[2], with or without VM/Pass-Through installed
- Any other System/370 or XA operating system.

These systems must be run on System/370 or XA processors. For systems other than VM with VM/Pass-Through installed, the processors must support remotely attached IBM 3271/3274 Control Units. These different types of systems are illustrated in Figure 10 on page 36.

The VM/Pass-Through user can access the local system on which the facility is installed.

If the target system's control program is other than VM with VM/Pass-Through installed, the target system perceives the accessing VM/Pass-Through system as a remotely attached 3271/3274 Control Unit, communicating over nonswitched multipoint binary synchronous communications (BSC) lines. This is why all systems to be accessed must include remote 3271/3274 support. This support in VM/Pass-Through, called 3271/3274 emulation, also allows you to direct target application output to an IBM 3270 Information Display System printer.

Communication between two VM/Pass-Through systems is over a point-to-point nonswitched BSC line or a channel-to-channel adapter. If two pass-through virtual machines reside in the same processor, they can also communicate over a virtual channel-to-channel adapter.

When one VM/Pass-Through system accesses another, the target system's pass-through virtual machine uses the CP Logical Device Support Facility to establish communications. Through the combination of the Logical Device Support Facility and the VM/Pass-Through Facility, a user attached to system A by a 3270 Information Display System display terminal can access system B as though the display were locally attached to system B. This CP facility is described more fully in in *VM/XA Migration Aid: Concepts*, GC19-6214.

---

2 "VM systems" can be VM/SP, VM/SP High Performance Option, VM/XA Migration Aid, or their non-IBM equivalents.

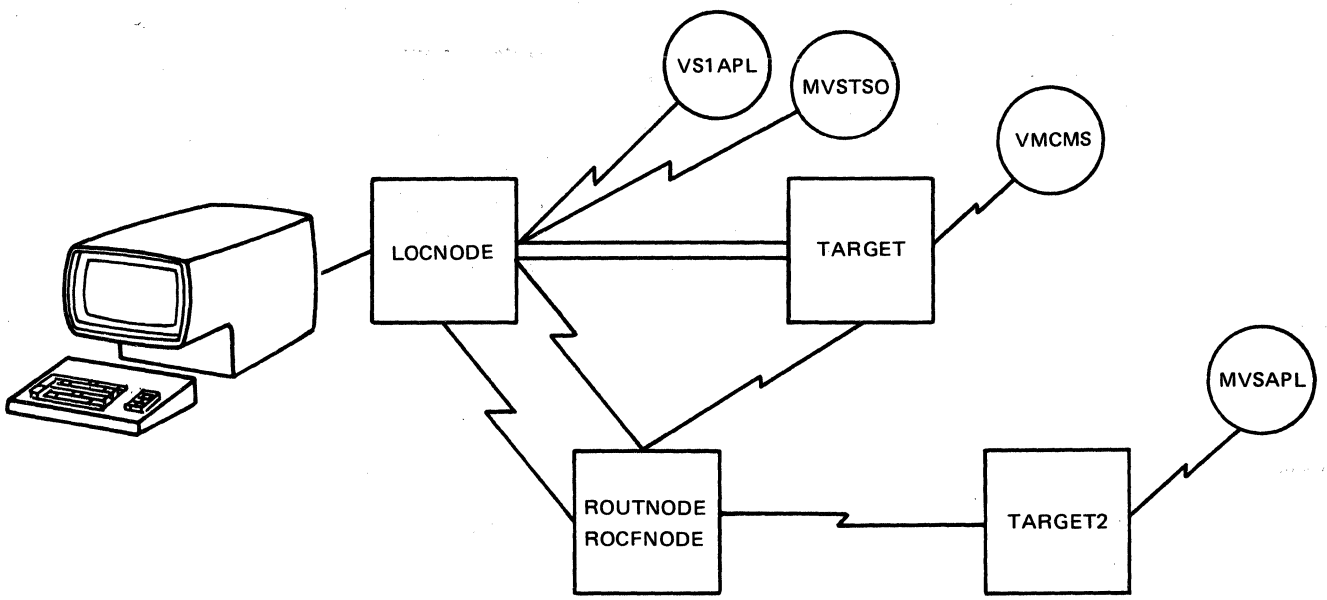


**Figure 10. A Pass-Through Network.** LOCNODE represents the local node. This is the node to which you are locally attached. TARGET is a node that can be accessed directly through VM/Pass-Through Facility. ROUTNODE is a system that is passed through on the way to TARGET2. ROCFNODE is a 4300 processor node. (It happens to be the same physical system as ROUTNODE.)

For more introductory information about VM/Pass-Through, see *VM/Pass-Through Facility General Information*, listed in the Preface.

## Communication

The local pass-through virtual machine can communicate with:

- A VM/Pass-Through system node

In this case, the VM/Pass-Through system may be the target or it may be an intermediate node in the path to a target VM/Pass-Through or non-VM/Pass-Through system. VM/Pass-Through systems communicate with other VM/Pass-Through systems over directly connected point-to-point BSC lines or channel-to-channel adapters. An intermediate VM/Pass-Through system uses routing lists from its configuration file to determine how to route data passing through it .

When the target is a VM system with VM/Pass-Through, the target pass-through virtual machine uses the CP Logical Device Support Facility to perform terminal I/O. This allows CP and the user virtual machine in the target system to communicate as if the user were locally attached at a real display station. The system node selected can be the local system. This gives you the option of accessing local as well as target applications.

- A non-Pass-Through system node

When communicating with non-VM/Pass-Through system nodes, the VM/Pass-Through Facility functions as an IBM 3271/3274 Control Unit emulator. These target nodes consider the local pass-through virtual machine to

be a remotely attached 3271/3274 Control Unit, supporting up to 32 IBM 3270 Information Display System printers and/or display stations. Each of these target systems must support a remote 3271/3274 Control Unit.

- A remote 4300 processor (Remote Operator Console Facility) node.

You communicate with the remote 4300 processor over switched, voice-grade telephone lines. You establish this communication by manual dial. VM/Pass-Through conveys console functions to the remote 4300 processor using Remote Operator Console Facility (ROCF).

## VM/Pass-Through Facilities

The following are facilities you can use in different VM/Pass-Through environments.

### *Notepad*

The Notepad Facility allows you to store the current screen image in a CMS file on your A-disk. You can use Notepad only when you issue the PASSTHRU command from the CMS environment. When you issue the PASSTHRU command, specify a program function key that you will use for this function. Then, at any time during your VM/Pass-Through session, press the program function key you designated and Notepad will store the current screen image in a file named PASSTHRU DATA A1. The system creates a PASSTHRU DATA file the first time you press your Notepad key. After the file is created, every time you press the Notepad key the system appends new screen images to those already in the file. The system decides how much of the screen to record based on your entries for the 'lines' and 'columns' variables following the program function key entry on the PASSTHRU command line, or uses the defaults. (See "PASSTHRU" on page 88 for the command's exact syntax.) The PASSTHRU DATA file stays on your A-disk until you erase it.

**Note:** In the VM/XA Migration Aid environment with Remote 3270 Display Option installed, you cannot use the Notepad facility to record the selection screen. However, you can use it to record other screens in this environment.

### *Temporary Disconnect*

This facility is available to CMS PASSTHRU users. It allows you to temporarily disconnect from the target system in order to interact with CMS. You resume the previous target application session by reissuing the PASSTHRU command. You can invoke the facility by using the disconnect sequence you entered on the PASSTHRU command.

### *Session Control Exits*

VM/Pass-Through provides four exits for using optional session control routines. There are session initiation exits for installations to control sessions originating at, passing through, or targeted for their node. There is another exit for session termination from the VM/Pass-Through node. You develop and install these routines at your installation. "Developing Session Control Exits" on page 66 gives you information to help write these routines.

### *Hardcopy Output*

With VM/Pass-Through's 3271/3274 emulation support, you can write output to 3270 Information Display System printers that are locally attached to the origin. This is the same facility that provides interactive access to target non-VM/Pass-Through systems.

A printer is assigned one of the 32 logical port addresses on the emulated 327x serving a given non-VM/Pass-Through system. Once you have established an active printer session between the target printer and the system, VM/Pass-Through can send your output from the application to the target printer. In this arrangement, a printer is a resource of the system to which it is **logically** (not locally) connected. The installation to which a printer is logically connected controls scheduling output and procedures for the printer's use.

## Installing and Updating the System

Installation and service for the VM/Pass-Through run under VM/XA Migration Aid is basically the same as that described in Chapter 1. In order to use the networking capabilities of VM/Pass-Through you must write configuration files and sample PROFILE PVMs for the other systems and processors that you plan to access.

This section contains sample PROFILE PVM files and configuration files for each of the VM/Pass-Through systems shown in Figure 11 on page 39.

The first group of files presented includes examples of each type of configuration file record and descriptive comments. Descriptive comments are not part of the record text. They are included here to explain the record to you. The comment (*) record is also used here.

The examples for the remaining three systems shown in Figure 11 on page 39 contain only those configuration records (LOCAL, LINK, PORT and ROUTE) that are unique for that type of system in a network. The complete format description of each configuration file record is contained in "Chapter 3 - Remote 3270 Display Option—VM/Pass-Through Configuration File Records" on page 73.

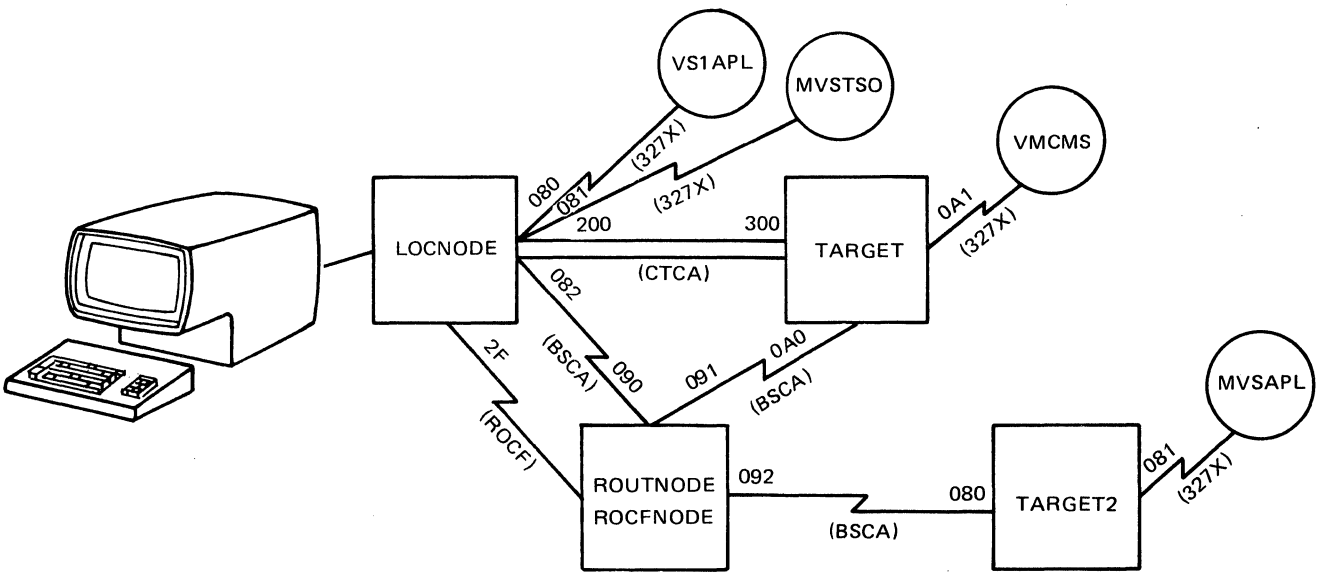


**Figure 11. A Pass-Through Network.** This is the same network presented in Figure 10 on page 36. This figure also includes information on device numbers. The numbers are shown on the connecting lines. The type of connection is indicated in parentheses along the line.

```
**************************
* PROFILE PVM for LOCNODE *
**************************
   START LINE 080
   START LINE 081
   START LINE 082
   START LINE 02F
   START LINE 200
   START GRAF 450
   START GRAF 451
   START GRAF 452
   START GRAF 453
   START GRAF 454
   START PRT  491 VS1APL*
     (etc.)
```

**Figure 12. Sample PROFILE PVM for the Local System**

```
**********************************
* Configuration file for LOCNODE *
**********************************
```

| Record Text | Comments |
|---|---|
| LOCAL LOCNODE | The local VM/Pass-Through system is assigned node identification of LOCNODE. |
| LINK 080 VS1APL 327X | Defines line address 080 as an emulator link to node VS1APL. |
| PORT 0 3278-2 LOCNODE USERA | Defines the first port available to VS1APL on line 080 to be a 3278-2 port. The last two parameters of this record reserve port 0 for exclusive use by the user identified as USERA at node LOCNODE. Note that PORT records immediately follow the associated LINK record. |
| PORT 1 3278-4 LOCNODE A-351 | Defines the second port available to VS1APL on line 080 to be a 3278-4 port. The last two parameters of this record reserve port 1 for exclusive use by a user at the real local terminal whose address is 351. Remote device addresses used in this fashion to restrict port usage are specified in the format of A-xxxx (4-digit resource id). |
| PORT 8 3277 * | Defines the ninth port available to VS1APL on line 080 to be a 3277 port. Up to 32 ports can be defined for each 3271/3274 emulator line. The asterisk (*) specifies that any user may access VM/Pass-Through through this port. |
| PORT 9 328X LOCNODE A-360 | Defines the tenth port available to VS1APL on line 080 to be a 3270 printer port. The last two parameters of this record reserve port 9 for exclusive use by a printer whose real address is 360. |
| LINK 081 MVSTSO 327X | Defines line address 081 as an emulator link to node MVSTSO. |
| PORT 0 3278-4 * | Defines the first port available to MVSTSO on line 081 to be a 3278-4. Additional PORT records may be added to accommodate the maximum number of concurrent users expected for the LINK being defined. Port definition must be consistent with the definition in the target system. |
| PORT 1 328X LOCNODE A-360 | Defines the second port available to MVSTSO on line 081 to be a 3270 printer port. The last two parameters of this record reserve port 1 for exclusive use of a printer at real address 360. This same printer is defined (above) for use by LOCNODE's MVSTSO users. Only one VM/Pass-Through system at a time may be in session with the printer. |
| PORT 2 328X TARGET A-0310 | Defines the third port available to MVSTSO on line 081 to be a 3270 printer port. The last two parameters of this record reserve port 2 for exclusive use by the printer known by resource id 0310. |
| LINK 200 TARGET CTCA | Defines line address 200 as a channel-to-channel adapter link to target VM/Pass-Through node TARGET. |
| LINK 082 ROUTNODE BSCA | Defines line address 082 as a BSC link to target VM/Pass-Through node ROUTNODE. |
| LINK 2F ROCFNODE ROCF | Defines line address 2F as a remote 4300 link (ROCF) to VM/Pass-Through node ROCFNODE. (In this example, this is the same physical system as ROUTNODE above.) |

**Figure 13 (Part 1 of 2). Sample Configuration File for the Local System**

| Record Text | Comments |
|---|---|
| * This group of records<br>* illustrates the use of<br>* the comment record.<br>* PORT records are not valid<br>* for Pass-Through to Pass-<br>* Through links because, in<br>* that case, the local pass-<br>* through virtual machine<br>* does not emulate a<br>* 3271/3274 Control Unit.<br>* ROUTE records immediately<br>* follow LINK or PORT<br>* records. | |
| ROUTE VMCMS TARGET | Defines the path to VMCMS from LOCNODE to be through TARGET. |
| ROUTE ROUTNODE TARGET | Defines an alternate path to ROUTNODE from LOCNODE if the normal BSCA route is not available. |
| ROUTE TARGET ROUTNODE | Defines an alternate path to TARGET from LOCNODE if the normal CTCA route is not available. |
| ROUTE TARGET2 ROUTNODE | Defines the path to TARGET2 from LOCNODE to be through ROUTNODE. |
| ROUTE MVSAPL ROUTNODE | Defines the path to MVSAPL from LOCNODE to be through ROUTNODE. The configuration file in ROUTNODE must define the remaining linkage to MVSAPL to be through TARGET2. |
| * The configuration file re-<br>* cords to this point are<br>* required to define all<br>* routes from LOCNODE to the<br>* other nodes. LOCAL, LINK,<br>* PORT, and ROUTE records<br>* for the other nodes are<br>* included later in this<br>* example. The records im-<br>* mediately following are<br>* samples of the remaining<br>* types of configuration<br>* file records. Because<br>* these samples might apply<br>* to any Pass-Through node,<br>* they are not repeated for<br>* all nodes. | |
| AUTHORIZ OPR | Specifies that the person identified to the local system as OPR is authorized to issue restricted commands from the local node. |
| AUDIT DATA RECORD | Causes console data to be stored in a CMS file named DATA RECORD. |
| TIMEOUT 500 | Specifies that emulator and network line drivers should check the status of the target nodes at 500-second intervals. |
| TDISC 600 | Specifies that a user in a CMS environment may remain temporarily disconnected from a target application for 600 seconds before VM/Pass-Through terminates the session. |
| DUMP CP | Specifies that a CP DUMP is to be taken if abnormal termination of VM/Pass-Through occurs. |
| * The BUFFERS, EXT, and<br>* I/O entries are not<br>* illustrated because the<br>* default values are<br>* satisfactory for this<br>* configuration. | |

**Figure 13 (Part 2 of 2). Sample Configuration File for the Local System**

```
*****************************
* PROFILE PVM for TARGET *
*****************************
   START LINE 0A0
   START LINE 0A1
   START LINE 300
   START GRAF 460
   START GRAF 461
   START PRT  4A0 MVSTSO
   START PRT  4A1 VMCMS
      (etc.)
*****************************
* Configuration file for TARGET *
*****************************
   LOCAL  TARGET
   LINK   0A1    VMCMS   327X
   PORT 0 3278-2   TARGET USERX
   PORT 1 3278-2   *
   PORT 2 328X   TARGET  A-380
   PORT 3 328X   ROUTNODE A-370
   LINK   300    LOCNODE  CTCA
 (No ports are assigned on Pass-Through-
 to-Pass-Through connections.)
   LINK   0A0    ROUTNODE BSCA
   ROUTE  VS1APL  LOCNODE
   ROUTE  MVSTSO  LOCNODE
   ROUTE  LOCNODE ROUTNODE
   ROUTE  ROUTNODE LOCNODE
   ROUTE  TARGET2 ROUTNODE
   ROUTE  MVSAPL  ROUTNODE
```

**Figure 14. Sample Files for a Target System**

```
*********************************
* PROFILE PVM for ROUTNODE *
*********************************
   START LINE 090
   START LINE 091
   START LINE 092
   START GRAF 470
   START PRT  4B1 MVSAPL
     (etc.)
***********************************
* Configuration file for ROUTNODE *
***********************************
   LOCAL  ROUTNODE
   LINK   090    LOCNODE  BSCA
   LINK   091    TARGET   BSCA
   LINK   092    TARGET2  BSCA
   ROUTE  VS1APL  LOCNODE
   ROUTE  MVSTSO  LOCNODE
   ROUTE  LOCNODE TARGET
   ROUTE  TARGET LOCNODE
   ROUTE  VMCMS   TARGET
   ROUTE  MVSAPL  TARGET2
```

**Figure 15. Sample Files for an Intermediate Node**

```
*****************************
* PROFILE PVM for TARGET2 *
*****************************
   START LINE 080
   START LINE 081
   START GRAF 480
     (etc.)

*******************************
* Configuration file for TARGET2 *
*******************************
   LOCAL TARGET2
   LINK  080    ROUTNODE BSCA
   LINK  081    MVSAPL  327X
   PORT  0 3278-4 TARGET2 USERY
   PORT  1 3278-4 *
   PORT  2 328X  ROUTNODE A-370
   ROUTE TARGET  ROUTNODE
   ROUTE LOCNODE ROUTNODE
   ROUTE VS1APL  ROUTNODE
   ROUTE MVSTSO  ROUTNODE
   ROUTE VMCMS   ROUTNODE
```

**Figure 16. Sample Files for a Target Node Routed through an Intermediate**

## Performance Considerations

You can use certain CP options to enhance the pass-through virtual machine's performance. You may need one or more of these options to provide adequate performance on heavily loaded systems. Remember that enhancement of the pass-through virtual machine's performance is normally at the expense of the performance of other virtual machines. In some cases, enhancing VM/Pass-Through's performance could be detrimental to the system as a whole.

The pass-through virtual machine is interrupt-driven. It spends most of its time waiting to service an interrupt. When it gets an interrupt, the virtual machine should begin working on it quickly to give your users good response time.

These performance options involve the use of CP commands. For additional information see *VM/XA Migration Aid: User's Guide* listed in the Preface. The control blocks referred to in this section are documented in *VM/Pass-Through Facility Logic*.

### *Reserved Pages*

On systems that have a high paging load, the pass-through virtual machine will probably be paged out when an interrupt comes in. To avoid this, issue SET RESERVED to allow the most active pages in the pass-through virtual machine to remain in real storage. This command essentially gives the pass-through virtual machine a certain number of private pages. These pages are not locked. They can be swapped, but only for pages belonging to the pass-through virtual machine.

To estimate the number of pages to reserve, monitor the working set of the running machine, or roughly calculate it by:

```
RES = 8 + 3(EMUL) + 2(BSCA) + 2(CTCA) + 2(DIAL)
      +4(R3270) + 2(PRT) + 2(PASS) + APP
```

where:

**RES**
is the number of pages to be reserved.

**EMUL**
is 1 if any 327x line drivers are active.

**BSCA**
is 1 if any BSCA line drivers are active.

**CTCA**
is 1 if any CTCA line drivers are active.

**DIAL**
is 1 if any attached display support tasks are active.

**R3270**
is 1 if any remote 3270 line drivers are active.

**PRT**
is 1 if any attached printer support tasks are active.

**PASS**
is 1 if any users are using the PASSTHRU command.

**APP**
is 1 if any users are accessing the local CP system.

This algorithm provides a rough estimate. The results may need to be larger based on individual activity and number of users.

SET RESERVED is a class A CP command. You can only give it to one virtual machine at a time.

## *Locked Pages*

If you are using the RESERVED PAGES option for another virtual machine or if reserving the pass-through virtual machine's pages does not sufficiently reduce response time, you can improve the pass-through virtual machine's performance by locking some of its key pages into real storage. If you choose to lock pages, the RESERVED PAGES option should not be used for the pass-through virtual machine.

To help determine which pages to lock, use the PVM MAP file and display certain areas of the system control block DVMSYSB. There are two categories of storage you might want to lock.

1. Program Storage

   Lock these pages:

   - Page 0 and the VM/Pass-Through multitasking supervisor. The multitasking supervisor begins at DVMSYSB in PVM MAP and ends the page before DVMDIR.
   - The buffer manager, DVMBFR.

- The three pages starting at DVMSIM (if the 327x emulator is heavily used).
- The two pages starting at DVMBSC (if the BSCA line driver is heavily used).
- The two pages starting at DVMCTC (if the CTCA line driver is heavily used).
- The six pages starting at DVMRMA (if the remote 3270 line driver is heavily used).
- The two pages starting at DVMUGR (if the DIAL attached display support task is heavily used).
- The two pages starting at DVMUPR (if the PRT attached printer support task is heavily used).
- The two pages starting at DVMUIN (if the VMCF PASSTHRU user support is heavily used). It might also be advantageous to lock the CP VMCF support module, DMKVMC, or to alter the CP LOADLIST to make the module resident.
- The page starting at DVMAPP (if the logical device support task is heavily used).

2. Working Storage

To locate the pages of dynamic virtual storage that should be locked, IPL the pass-through virtual machine. Then use the CP DISPLAY command to display the value at SYSPQE in DVMSYSB, and COMSTRT and COMNPOOL in the DVMCOMN extension of DVMSYSB. Lock these pages:

- The page referred to by the value at SYSPQE
- The three pages starting at the value in COMSTRT
- At least three pages starting at the value in COMNPOOL

For large active VM/Pass-Through systems, try reducing the working set of the pass-through virtual machine. To reduce the working set, lock pages of dynamic storage starting at the page preceding the one SYSPQE points to, and working downward.

LOCK is a class A CP commmand.

## *ROCF Sessions*

The user will notice a slower response time during ROCF sessions when the system is heavily loaded. This is primarily due to a combination of the ROCF line speed (1200 bps) and the scheduling of the pass-through virtual machine in a heavily loaded system. If this becomes a problem:

- Review the performance options established for the pass-through virtual machine to make sure that they are adequate

- Reserve ROCF sessions for interactions that require its exclusive capabilities, like remote IPL.

You must weigh the benefits of the various options against their effect on overall system performance when you decide which options to choose.

## Configuration File Considerations

There are some factors that you should be aware of when you begin to write your configuration file. Two of these considerations concern the ROUTE and the TIMEOUT records.

### *Routing Considerations*

VM/Pass-Through uses the LINK and ROUTE configuration file records to determine how to initiate a session with a target node. The procedure that the system uses to determine a route is:

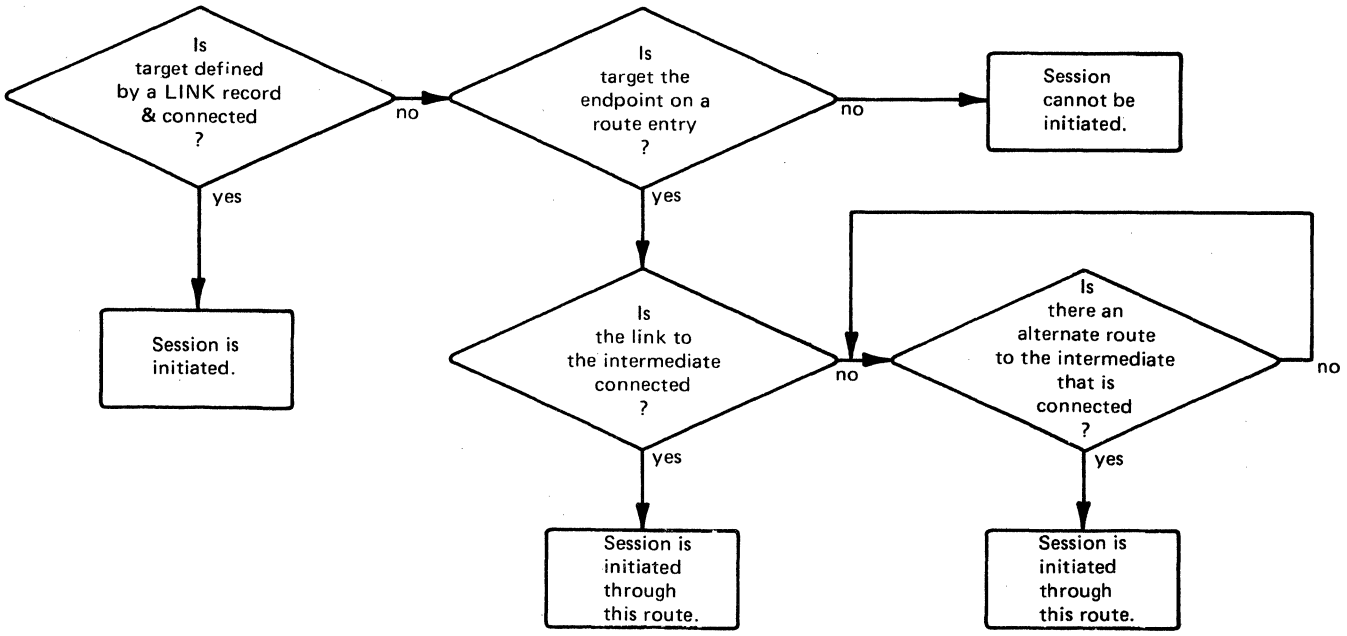


**Figure 17. Routing Procedure**

If the system has routed a session through an alternate route because the primary link was not available, and then the primary route becomes available:

- The session routed through the alternate route will continue to use the alternate route
- Any new sessions will be routed through the primary route.

Specify alternate paths in the configuration file (PVM CONFIG). When you write ROUTE records, be careful that loops do not occur. Make certain that routing is consistent among nodes.

### *Timeout*

The system uses the value you specify in the TIMEOUT record to determine if a link is still active. The testing method varies with line driver type. Each emulator and network line driver sets a timer to the TIMEOUT value when the system first connects the associated link. When the time expires, the system does the following:

- Emulator line driver

The emulator line driver sets a new time interval if the other end of the link has polled the line within the most recent time interval. Otherwise, the line driver terminates with an indication of a line timeout condition.

- Network line driver

The network line driver sets a new time interval if line activity occurred during the most recent interval. Otherwise, the network line driver sets a new time interval, and tries to transmit to the other end. If this transmission is not successful, the line driver terminates with an indication of a line timeout condition.

## VM/Pass-Through Sessions

Once you have installed and tailored the system using the information presented in Chapter 1 and the previous section, you can then use VM/Pass-Through to conduct different types of sessions. These sessions include:

- Interactive sessions
- ROCF sessions
- Printer sessions

The following sections describe some of the ways you can use VM/Pass-Through on the VM/XA Migration Aid system. Be sure to tell the people who will be using VM/Pass-Through at your installation how to initiate and terminate these sessions.

### *Interactive Sessions*

VM/Pass-Through Facility executes in a CMS virtual machine. The manner in which you communicate with the pass-through virtual machine is determined by the method you used to initiate the VM/Pass-Through session. The three possible methods are:

1. PASSTHRU command from the CMS environment

This method allows a user to temporarily disconnect from the target application, interact with CMS, then resume the session with the target application. Your virtual machine communicates with the pass-through virtual machine using VM/XA Migration Aid's VMCF facility.

2. DIAL command from the CP environment

When you DIAL, the VM/XA Migration Aid system does not have to create a CMS virtual machine for you. This reduces the work for the VM/XA Migration Aid system and improves your response time. An attached display support task helps you communicate with the pass-through virtual machine. To initiate a VM/Pass-Through session, issue the CP DIAL command.

3. Initial Screen Response from a Remote Terminal.

The initial screen on a remote terminal offers you two options for initiating a VM/Pass-Through session. You can either press the CLEAR key to see a selection screen or press one of the program function keys listed on the initial screen. (See "The Initial Screen" on page 29 for more information about using the initial screen.)

### Interactive Session Initiation

To initiate a VM/Pass-Through interactive session:

1. Issue the PASSTHRU command while running under CMS.
2. Issue the CP DIAL command from the CP environment, using a 3277/3278/3279 Display Station.
3. Respond to the initial screen on a remote terminal.

### The PASSTHRU Command

When using the PASSTHRU command, you can either select the target system by including its nodeid or by your response to VM/Pass-Through's selection screen. If you wanted to access the node identified as VMCMS, you could enter:

```
PASSTHRU VMCMS
```

together with any appropriate optional PASSTHRU command parameters. The system would then initiate the session without first presenting the selection screen.

If you wish to see the VM/Pass-Through selection screen, enter:

```
PASSTHRU * * PVM 6 20 40 pf10 GOAWAY
```

Information presented in this section is based on this command. The parameters on this command line specify (left to right):

- The defaults (*) have been selected for:
  - Node selection (displayed selection screen)
  - Port selection (displayed selection screen or system assignment)
- (PVM) You wish to access the pass-through virtual machine whose vmid is PVM. (PVM is the default vmid. If you had specified *, the system would have assumed PVM.)
- (6) You will invoke Notepad Facility by pressing program function key number six.
- (20) Notepad will store the first twenty lines of the current screen image.
- (40) Notepad will store the first forty columns of the current screen image.
- (pf10) You will use program function key number 10 to initiate temporary disconnect.
- (GOAWAY) You will use this string to signal session termination. (The default, assumed if you specify * or do not specify this parameter, is ####.)

The PASSTHRU command parameters are described completely in "PASSTHRU" on page 88.

### The DIAL Command

To initiate a session with the the pass-through virtual machine without creating a CMS virtual machine, issue the CP DIAL command. The command would be specified as:

```
DIAL PVM
```

where PVM is the virtual machine identification (vmid) of the pass-through virtual machine. The system answers you with the VM/Pass-Through selection screen. (The selection screen is illustrated in Figure 18 on page 51.)

### Initial Screen Response

To initiate a VM/Pass-Through session from a remote terminal, respond to the instructions contained on the initial screen. (See Figure 9 on page 30 for an illustration of the initial screen.) You can press a program function key if the target system with which you wish to initiate a session is listed among the program function keys. Or you can press the CLEAR key to see the VM/Pass-Through node selection screen.

### The Selection Screen

The system sends you the VM/Pass-Through selection if you:

- Issue the PASSTHRU command (without a target node), or
- Issue the CP DIAL command, or
- Press the CLEAR key in response to the initial screen.

Be sure to tell the people who will be using VM/Pass-Through at your installation how to use the selection screen. The node selection screen contains:

- User (PVMTEST)

This space includes your userid (if you initated the session with a PASSTHRU command) or your display device address in the format GRAFnnn (if you used the DIAL command). If you are working from a remote terminal, this area contains the cluster (or control unit) address and the port (or device) address in the form CLxx-Pyy.

- Session Terminate String

In this space, you can specify a character string that you will use later to indicate to the system that you have terminated an interactive session with a target. You can specify a PF key, a PA key, or a string of one to eight characters. If you do not specify your own session terminate string, the system will expect the default string (####).

If you want to assign a PA key or a PF key as the session terminate string, first be sure that the key is not currently assigned another function, such as temporary disconnect. Then, type "PAn" or "PFn" (where "n" is a number) over the #### default string.

When you are finished with your target application, enter the session terminate string to notify the system to terminate your VM/Pass-Through session.

- Specific Nodeid

In this space, you can specify a defined node that you want to access. When the selection screen first appears, the cursor is positioned at this field. If you know which node you want to access, type the nodeid in this space and hit the enter key. Otherwise, you can select the node you want from the list in the node selection area.

- Port Selection

Normally if you connect to a target system using 3271/3274 emulation, the system assigns you to the first port available on that line for your display station type. You could choose any port assignment by entering the port number (from 0 to 31) in the PORT area, selecting a node, and pressing the enter key.

- Instructions

This space contains instructions for using the selection screen. It tells you how to select a node using the node selection list and which keys to use to scroll, return to the first panel of the selection screen, and to exit.

- PF Keys

This line lists some nodeids frequently accessed by users at your installation and the PF keys that you can use to specify them. If you cannot use PF keys to select nodes, this line is blank.

- Message Line

The system uses this space to show you immediate error messages and session termination messages. (These messages are described in "&r3270± VM/Pass-Through Facility Messages without Identifiers" on page 105.) The line begins and ends with an arrow.

- Node Selection

This space contains a list of the node identifications that the local pass-through virtual machine recognizes. This list includes the local VM/Pass-Through system and all nodes that are directly connected to it and are defined in configuration file LINK records.

Letters precede some nodeids in the list. A letter means that the nodeid the letter is next to is:

  - L - the vmid of the local VM/Pass-Through system.
  - S - a non-VM/Pass-Through system accessible by a local link.
  - N - another VM/Pass-Through system accessible by the local VM/Pass-Through system.
  - R - an ROCF node available for remote initialization, etc.

  The absence of a letter indicates a node routed through a preceding VM/Pass-Through network node.

To select a node from this list, position the cursor under any character of the desired node and press the enter key. If there are more nodeids, you can see them by scrolling using a PF key as instructed on the instruction line.

- LOGMSG

This area contains two lines of information of common interest to VM/Pass-Through users at your installation. The operator sets the LOGMSG using the LOGMSG command. If there is no LOGMSG information, this space is blank.

Figure 18 illustrates the format of the selection screen.

```
REMOTE 3270 DISPLAY OPTION      PVMTEST SESSION TERMINATE STRING ==> ####
SPECIFIC NODE ID ==>          PORT ==>
SELECT A NODE BY PLACING THE CURSOR UNDER THE PROPER ENTRY AND PRESSING ENTER
  USE PF8 TO SCROLL, CLEAR TO RETURN TO THE FIRST SCREEN, PA1 TO EXIT
PF1=NEWYORK PF2=NEWJERSE PF3=BOSTON PF4=OREGON PF5=CONNECTI PF6=PENNSYLV
====>                                                          <====

 L NEWYORK    N NEWJERSE N CONNECTI  S BOSTON    S ALASKA     S MAINE
 S OREGON     N PENNSYLV N UTAH      N PHILADEL N VERMONT    N MINNEAPO
 N PITTSBU    R CLEVELAN N CHICAGO     ALABAMA    ANAHEIM      ARIZONA
   ARKANSAS     BALTIMOR   BURLINGT    CALIFORN   CAMBRIDG     CINCINNA
   COLORADO     COLUMBUS   DARTMOUT    DELAWARE   DETROIT      FLORIDA
   GEORGIA      HAWAII     HOUSTON     IDAHO      ILLINOIS     INDIANA
   IOWA         KANSAS     KENTUCKY    LOSANGEL   LOUISIAN     LYNCHBUR
   MARYLAND     MASSACHU   MIAMI       MICHIGAN   MILWAUKE     MINNESOT
   MIRAMAR      MISSISSI   MISSOURI    MONTANA    NEBRASKA     NEVADA
   NEWCASTL     NEWHAMPS   NEWMEXIC    NEWPORT    NEWYORKC     NCAROLIN
   NODAKOTA     OHIO       OKLAHOMA    OREGON     PASADENA     PELHAM
   POUGHKEE     RHODEISL   SANFRANC    SCAROLIN   SODAKOTA     STLOUIS
   TENNESSE     TEXAS      UTAH        UTICA      VIRGINIA     WASHINGT
   WASHDC       WESTVIRG   WISCONSI    WYOMING    MEXICO       PUERTORI
   ALBERTA      ATLANTIC   MANITOBA    ONTARIO    QUEBEC       SASKATCH

====>                                                          <====
====>                                                          <====
```

**Figure 18. Selection Screen Format**

The selection screen is displayed during VM/Pass-Through initialization if:

- The display station is dedicated to VM/Pass-Through using a DEDICATE statement in the directory
- OR, the VM/Pass-Through PROFILE PVM contains an ATTACH statement for that display station.
- AND, a START GRAFnnn (nnn is the display station virtual address) is included in the PROFILE PVM for the pass-through virtual machine and the display station is powered on.

If you select a node on the PASSTHRU command line, you will not receive the selection screen. If you issue a CP DIAL command to begin a VM/Pass-Through session, you will always receive the selection screen.

***Selecting a Target Node***: You can select a target node in any one of the three ways described briefly in "The Selection Screen" on page 49.

First, you can enter the nodeid in the specific nodeid area at the top of the screen. You might prefer this method if you know that:

- You will be specifying a port number (the next field), or
- The nodeid that you want is on a successive screen.

You may know the nodeid that you want and find it easier to type it into this space.

You can also use one of the PF keys that are listed after the instruction line. Simply press the PF key associated with the nodeid that you want. Of course, if your screen does not list available PF keys, you cannot use a PF key to select a node.

The third method of selecting a target node is to use the node selection list. Look down the list to find the nodeid that you want. If the id of the node that you want to access is not on the screen, you can press the PF key identified on the instruction line to see subsequent screens. If you find the nodeid you want, position the cursor anywhere under the field containing the desired nodeid and press the ENTER key. (The first position of a nodeid field is not necessarily the first character position of the nodeid.)

***Note***: If you change any nodeid on the selection screen before you press the ENTER key, the system assumes you have selected that node regardless of where the cursor is positioned. The system selects the node that was changed as its original name. For example, if the screen reads "TARGET1" and you, purposely or inadvertently, erase the "1", the system still selects nodeid "TARGET1" even if there is a "TARGET" node in the network. You may want to use this method to select a node if you want to also specify a specific port assignment. Modify the field of the nodeid that you want, fill in a port number in the port selection area, and then press enter. If you accidentally change a nodeid and access a node that you don't want, just enter the session terminate string. The "application" is terminated and you return to the selection screen.

After you select a node by any of these methods, you are connected to the target node. You can dial the remote 4300 processor or logon to the target system.

You may select the local node as the target system. If you do select the local node while in the CMS PASSTHRU environment, you can:

1. DIAL another virtual machine in the system from your "logical", **locally** attached display station.

2. Return to the CMS environment (using the temporary disconnect feature) to modify a program being developed and to edit saved screen images to check previous program test results. Then you can return to the test session by reissuing the PASSTHRU command.

3. Logon to the local system.

*Note*: If you receive a warning message during a session, the cursor may not be restored to the position it was in when the message came through. The target system controls the cursor.

If you are selecting a 327x emulator target system node and want the system to assign a specific port number to your display station, type the port number that you want into the port selection area **before** you press the ENTER key to select the node. Sometimes installations designate specific ports for special uses (like a particular application) or associate specific ports with exit routines. Make sure users know these port assignments.

### Temporary Disconnect

If you connected to a target system using the PASSTHRU command, you can temporarily disconnect from your VM/Pass-Through session with that system and return control to local CMS. You can set up the system to allow you to temporarily disconnect by specifying the *tdisc* parameter on the PASSTHRU command line. In the example in "The PASSTHRU Command" on page 48, program function key 10 was specified on the PASSTHRU command line. If you specified the command that way, you can temporarily disconnect by pressing PF10. When you have finished your work with the local CMS system, you can resume the session with the target system by reissuing the PASSTHRU command. If you selected any options the first time you issued the PASSTHRU command (except a session terminate string), you must respecify them when you resume your target session. You must resume a temporarily interrupted session within the time limit on the TDISC record to avoid VM/Pass-Through terminating it. The screen image when you temporarily disconnected is saved and restored if and when you resume the session.

"Security Considerations" on page 61 contains important information about temporary disconnect from non-VM/Pass-Through target systems.

If you initiate a session with CP DIAL, you cannot temporarily disconnect. If you want to return to the local system, you must logoff your target application and enter the session terminate string to notify the pass-through virtual machine that your session is over. VM/Pass-Through then shows you the selection panel again. You can either select another node or exit from VM/Pass-Through.

### Interactive Session Termination

Terminating a VM/Pass-Through interactive session is the same whether you initiated the session with PASSTHRU or CP DIAL. First you end your session with the target. For example, you would terminate a session with a VM target by entering:

```
LOGOFF
```

If the target is a non-VM/Pass-Through system, you must also terminate the VM/Pass-Through session after terminating the target session. In the example in "The PASSTHRU Command" on page 48, the last parameter was GOAWAY, indicating that GOAWAY was the session terminate string. So you can terminate the VM/Pass-Through session by pressing the ERASE INPUT key and then entering the string:

```
GOAWAY
```

In a Pass-Through-to-Pass-Through session, your interactive session can be terminated **automatically** when you logoff or disconnect from the target application.

After you enter the session terminate string, VM/Pass-Through shows you the selection screen again. You have the option of initiating another target node session or pressing the PA1 key to exit from VM/Pass-Through.

You will get the selection screen after you terminate a session only if the session was initiated through the selection screen. Otherwise, you are returned to the CMS or CP environment after session termination.

"Security Considerations" on page 61 provides information about protecting files from access by other users.

### Sample VM/Pass-Through Interactive Sessions

The following sample sessions illustrate procedures for using VM/Pass-Through with CMS PASSTHRU and with CP DIAL. You may find that some responses from non-VM/Pass-Through components are different from those in the examples. Installations can select options and make modifications that will change these responses.

In the examples:

- Words shown in all uppercase are information that is displayed on the screen.
- Words in all lowercase are commands you enter on the display station.
- Words in parentheses are actions you should take at a given point.

If you are working on a remote terminal, these sessions begin after you have received the initial screen and notified the system that you wish to conduct a VM/Pass-Through session.

***Interactive Session Initiated by a CMS User***: The first eight steps in the following example represent a normal VM logon and IPL CMS procedure.

| ACTION | NOTES |
|---|---|
| Logo is displayed. | The logo appears on the screen. |
| logon passuser | You logon to the system. |
| ENTER PASSWORD | The system requests your password. |
| xxxxxxxx | You enter the password. |
| LOGMSG 07:36:00 EST MONDAY 4/05/83 | The system displays a logon message. |
| ipl 190 | You IPL CMS using the virtual device number of the CMS system disk. |
| IPL RESPONSE TEXT | A message appears to tell you that the IPL was successful. |
| passthru mvstso | You enter the PASSTHRU command to load and execute the VM/Pass-Through module DVMUSI. This module connects you to the pass-through virtual machine that has a vmid of PVM. PVM is the default if you do not enter a vmid parameter on the PASSTHRU command line. The first parameter you entered on the PASSTHRU command requested connection to node MVSTSO. |
| USER CONNECTED TO PORT #00 | The pass-through virtual machine assigns you logical port 00. You get this message to tell you your port number. |
| TSO LOGON PROMPT | VM/Pass-Through sends a "power-on" sequence to the MVSTSO. The target node responds with this message sent through the pass-through virtual machine to your CMS virtual machine. Your CMS virtual machine's VM/Pass-Through module writes the message on your display screen. |
| logon tsouser/password | You logon to MVSTSO and conduct a TSO session. You can send output to MVSTSO's 3270 Information Display System printer if you have established a VM/Pass-Through printer session. |
| . . . | |
| | You conduct a normal TSO session. |
| logoff | You logoff from the TSO session. |
| LOGGED OFF TSO AT 10:00 | The system sends you a message indicating that you have logged off TSO. |
| #### | You enter #### to notify the pass-through virtual machine that the session with MVSTSO is terminated. VM/Pass-Through removes you from the logical port it assigned you to earlier. |
| <PA1> | You press the PA1 key to indicate that you don't want to work on VM/Pass-Through any more. |
| SESSION TERMINATED BY USER | The system informs you that the VM/Pass-Through session is over. |
| . . . | |
| | Resume CMS environment. |
| logoff | Logoff from CP. |

**Figure 19. Sample Interactive Session for a CMS PASSTHRU User**

You can now turn off the display station or do some other work on it.

*Interactive Session Initiated by a CP DIAL User*

| ACTION | NOTES |
|---|---|
| logo is displayed. | The logo appears on the screen. |
| dial pvm | You enter the CP DIAL command to connect your display station to the pass-through virtual machine. |
| Selection screen is displayed. | VM/Pass-Through acknowledges your connection by writing the VM/Pass-Through selection screen on your display station. The selection screen contains a list of the nodes the installation has defined. You position the cursor on MVSTSO and press ENTER. |
| <ENTER><br>SER CONNECTED TO PORT #00 | VM/Pass-Through assigns your display station to an available logical port and sends you a message to tell you which port you are on. |
| TSO LOGON PROMPT | VM/Pass-Through sends a "power on" sequence to MVSTSO. The node responds by sending a logon prompt message to you through VM/Pass-Through. |
| logon tsouser/password | You logon to MVSTSO and conduct a TSO session. You can send output to MVSTSO's 3270 Information Display System printer if you you have established a VM/Pass-Through printer session. |
| . . . | You conduct a normal TSO session. |
| logoff | You logoff from the TSO session. |
| LOGGED OFF TSO AT 10:00 | The system sends you a message indicating that you have logged off TSO. |
| #### | You enter #### to notify the pass-through virtual machine that the session with MVSTSO is terminated. VM/Pass-Through removes you from the logical port it assigned you to earlier. |
| Selection screen is displayed. | You receive a selection screen, and can now select another node if you so desire. |
| <PA1> | You press the PA1 key to indicate that you don't want to work on VM/Pass-Through any more. You exit from the selection screen. |

**Figure 20. Sample Interactive Session for a CP DIAL User**

You can now turn off the display station or do some other work on it.

*Interactive Session Initiated by a Remote Terminal User*

| ACTION | NOTES |
|---|---|
| initial screen is displayed. | The initial screen appears. |
| <CLEAR> | You press the CLEAR key to indicate that you wish to conduct a VM/Pass-Through session |
| Selection screen is displayed. | VM/Pass-Through acknowledges your connection by writing the VM/Pass-Through selection screen on your display station. The selection screen contains a list of the nodes the installation has defined. You position the cursor on MVSTSO and press ENTER. |
| <ENTER><br>USER CONNECTED TO PORT #00 | VM/Pass-Through assigns your display station to an available logical port and sends you a message to tell you which port you are on. |
| TSO LOGON PROMPT | VM/Pass-Through sends a "power on" sequence to MVSTSO. The node responds by sending a logon prompt message to you through VM/Pass-Through. |
| logon tsouser/password | You logon to MVSTSO and conduct a TSO session. |
| . . . | You conduct a normal TSO session. |
| logoff | You logoff from the TSO session. |
| LOGGED OFF TSO AT 10:00 | The system sends you a message indicating that you have logged off TSO. |
| #### | You enter #### to notify the pass-through virtual machine that the session with MVSTSO is terminated. VM/Pass-Through removes you from the logical port it assigned you to earlier. |
| Selection screen is displayed. | You receive a selection screen, and can now select another node if you so desire. |
| <PA1> | You press the PA1 key to indicate that you don't want to work on VM/Pass-Through any more. You exit from the selection screen. |

**Figure 21. Sample Interactive Session for a Remote Terminal User**

You can now turn off the display station or do some other work on it.

## *ROCF Sessions*

IBM 4321/4331/4341 processors (4300 processors) contain support to allow you to conduct certain operations from a remote console. This support, the Remote Operator Console Facility (ROCF), provides the capability to:

- Initialize the processor (IML),
- Initialize the control program (IPL), and
- Use the processor's operational display screens.

You can use ROCF either from an IBM 3275 display station or through VM/Pass-Through Facility.

VM/Pass-Through Facility contains an ROCF line driver that allows this communication. VM/Pass-Through communicates with the 4300 processor's ROCF support over switched, voice-grade telephone lines you connect by manual dialing.

The ROCF line driver does not use the TIMEOUT value from the configuration file to determine if a link is still active. The ROCF line driver's timeout interval is one minute. If the time expires and no activity has occurred on the line, the ROCF line driver breaks the connection. In effect, the ROCF line driver hangs up the telephone receiver.

If the local VM/Pass-Through system terminates abnormally, the operator reinitializes it and restarts the ROCF line driver. Then, the ROCF line driver tests to see if the switched connection is still open. If it is open, the ROCF line driver breaks it, simulating hanging-up the telephone receiver.

**Restrictions**

- The maximum data length that you can transfer as one unit between an ROCF node and a 3270 terminal is 4040 bytes.
- Only local users (those logged on to the local system or accessing from a terminal connected to the local system) may access ROCF nodes defined on the local VM/Pass-Through system.
- Remote 3277/3278 display stations used for ROCF sessions must be equipped with 24 PF keys. Normally, users at 3277/3278 display stations that have only 12 PF keys use the TEST REQUEST/SYS REQUEST keys to change program function mode settings. The signal from pressing these keys is not passed to VM/Pass-Through. Since these devices cannot change to System Function (<S>) mode, you cannot use them as ROCF consoles.
- Only one session at a time can be active with each ROCF node.

Refer to the operator's guide for the 4300 processor you will be operating to find out procedures and restrictions for using remote consoles. The document numbers of these books are listed in the preface of this book.

**Sample Session with a Remote 4300 Processor**

As in the other examples in this book,

- Words shown in all uppercase are information that is displayed on the screen.
- Words in all lowercase are commands you enter on the display station.
- Words in ( ) are actions you should take at a given point.
- Words in < > are the symbols printed on keys you should press.

| ACTION | NOTES |
|---|---|
| (Power on the display station.) | Power on the 327x display station. |
| Logo is displayed. | The logo appears. |
| dial pvm | Enter the CP DIAL command on the display station. Your station is now logically connected to the pass-through virtual machine. |
| Selection screen is displayed. | The system acknowledges your CP DIAL connection by writing the VM/Pass-Through selection screen on your display station. The selection screen contains a list of the nodes defined by the installation. Position the cursor on the "R" type node you want (for example, ROCFNODE) and press ENTER. |
| <ENTER><br>LINE ENABLED FOR MANUAL DIAL | This message means that the ROCF communication line is enabled and you can manually dial the ROCF node. The operator must initiate a telephone dial connection to the target node. |
| REMOTE SITE NOW CONNECTED. | This message is flashed onto your screen and and is immediately replaced by the next screen sent from ROCFNODE. |
| 4300 ROCF Logon screen appears. | The 4300 ROCF Logon screen means that the connection to the 4300 processor is complete. |
| (Enter processor's password) | Enter the password. If the password is not right, you cannot access this node any longer. |
| 4300 General Selection screen appears.<br>I | The 4300 node sends you the General Selection screen, signifying correct entry of the password. Request the 4300 Program Load manual control mode screen by entering "L" after the SELECTION label; press ENTER. |
| <ENTER> | |
| Program Load screen appears. | This screen controls processor IML and system IPL. |
| (User requests IPL.)<br>p<br>ipl unit addr<br><ENTER> | If the screen indicates that IML is complete, invoke an IPL by entering "P" after the SELECTION label; fill in the IPL UNIT ADDR parameters; press ENTER. |
| The Program Load screen's STATUS field reads IPL COMPLETE. | Initial program load is complete. The session is complete. You have the option now to return the console to the programming system or to terminate the VM/Pass-Through session and the connection. |
| #### | You end the VM/Pass-Through session by entering "####" after the selection label, and pressing the ENTER key. The system terminates the |
| SESSION TERMINATED BY USER | The VM/Pass-Through selection screen appears in order to indicate that the ROCF session is over. You can now select another node. |

**Figure 22. Sample Interactive Session with an ROCF Node**

## *VM/Pass-Through Printer Sessions*

Using 3271/3274 emulation, VM/Pass-Through supports printer sessions between local 3270 Information Display system printers and

non-VM /Pass-Through target systems. You can assign any 3271/3274 logical port to a directly attached 3270 Information Display System printer. You define printer ports in the configuration file.

**Note:** VM/Pass-Through printer sessions are **not** the same as the remote printer support contained in the Remote 3270 Display Option. (In Remote 3270 Display Option, you can attach a printer as part of a remote cluster.) **VM/Pass-Through's printer support** allows you to dedicate a printer at your local system to producing output for users working on target applications. Figure 23 describes the support offered by VM/Pass-Through's printer support.

You attach printers to the VM/Pass-Through system using the CP command ATTACH or by a DEDICATE control statement in the directory.

Once you establish a printer session, users can send output from their interactive sessions with the target application to the logical port for the printer. Target applications must support 3270 Information Display System printers.

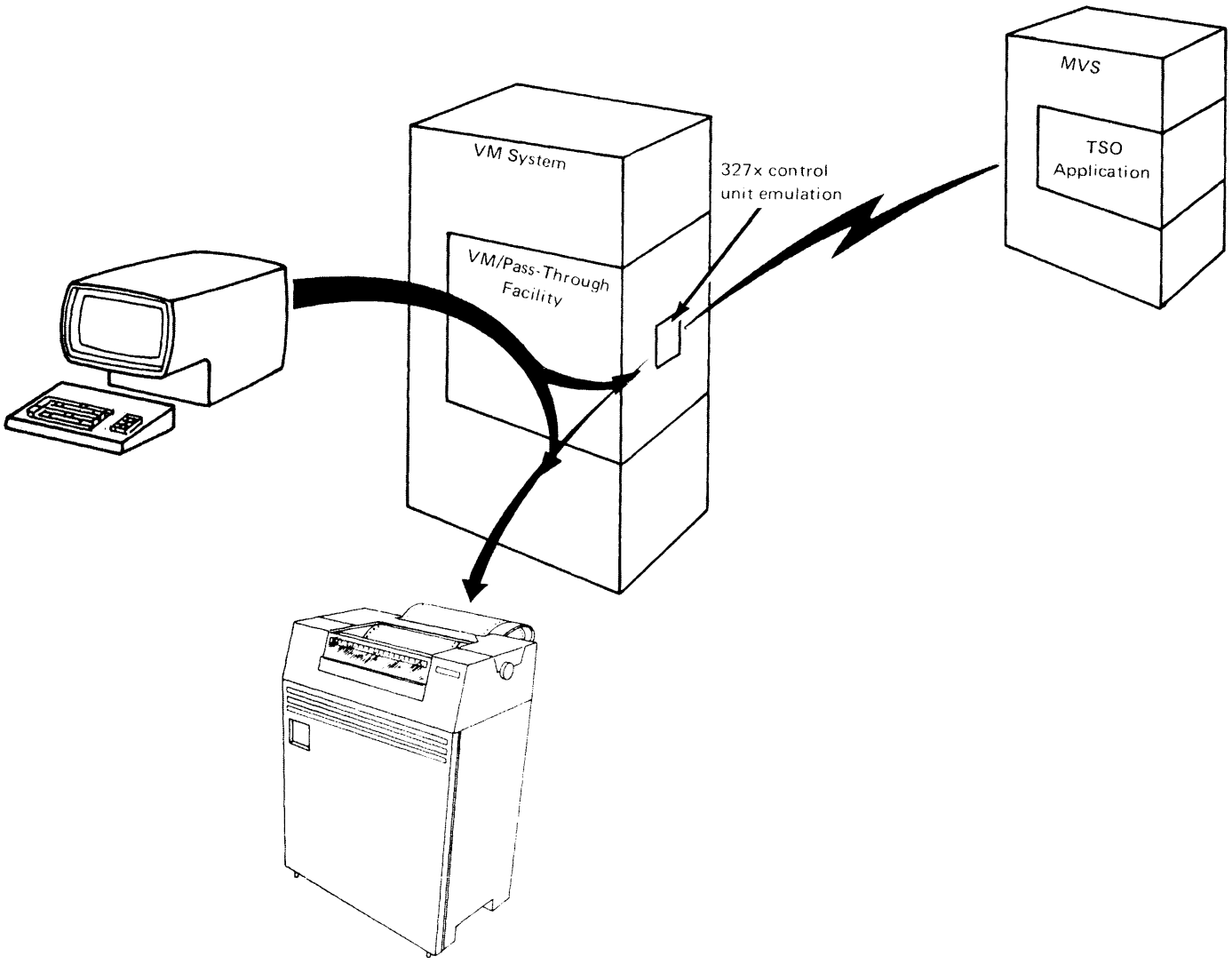


**Figure 23. VM/Pass-Through Facility's Printer Support**

### Printer Session Initiation

Unlike interactive sessions that individual users control, an installation usually runs printer sessions. You initiate a printer session with the restricted START PRT command. You could place this command in an EXEC like the PROFILE PVM or you could enter it in a command stream.

The START PRT command specifies the target non-Pass-Through node for the printer session; it could also set up a logical port number to be associated with the printer. If you don't specify a port, VM/Pass-Through tries to find a port defined for the printer in the configuration file or assigns you an unreserved port on the emulator line. IBM suggests that you assign specific printers to specific ports to be sure that the target application gets the printer it wants and that it matches the actual printer device type and characteristics.

The START PRT command activates a session between the specified printer and the target non-Pass-Through system. Once you establish the printer session, a target application's users can direct output to the printer device using its associated port.

You send output from the target application to the emulator printer port using procedures established by the target application. The target application manages the transfer of data to the port. The VM/Pass-Through installation and the target application control the scheduling of 328X printer output. Procedures for use and management of this resource are the responsibility of the customer.

### Printer Session Termination

You can terminate a printer session using either a DROP PRT command, causing immediate termination of the session, or a QUIESCE PRT command, terminating the printer session whenever there is no I/O activity for two minutes.

## Security Considerations

The following are security considerations for the VM/Pass-Through Facility.

### *Sessions with Non-VM/Pass-Through Target Systems*

VM/Pass-Through uses 3271/3274 emulation to access non-VM/Pass-Through target systems. The user will know that 3271/3274 emulation is being used for a session by this message:

```
USER CONNECTED TO PORT # nn
```

(where *nn* is a number between 0 - 31).

Interaction with the target during the session proceeds normally. However, when interaction with the target system is complete, the user should terminate the session by precisely following these two steps:

1. First, logoff the target system to terminate the target session
2. Then, enter the session terminate string or press the the designated key to terminate the VM/Pass-Through interactive session.

If you do not follow this sequence, and the VM/Pass-Through session is terminated **first**, the target session may remain active. This leaves the target session exposed: a subsequent user of the **same** target assigned the **same** port

could gain access to your still-active session. If any of the following conditions occurs before you logoff from the target application, the VM/Pass-Through session will be terminated:

- You turn off power to the terminal.
- You turn the key in the terminal's security lock (optional hardware feature) to the locked position, then return it to the unlocked position.
- You terminate the VM/Pass-Through session by entering the session terminate string (default ####) or pressing the designated key.
- You temporarily disconnect from the target session, and do not resume the session within the defined or default (20 minutes) time limit.
- The operator (or other authorized user) issues a DROP command that affects your session.
- The pass-through virtual machine abnormally terminates because of either an internal failure or a failure in the operating system.
- A hardware failure affects your terminal or the communication path between the terminal and the target system.

Installations have several methods of minimizing or eliminating this security exposure. You may:

- Remind users to terminate all sessions with non-Pass-Through target systems by the standard logoff procedure. (You can either send a hardcopy memorandum to users or issue a message to users at their terminals.)
- Modify the target application program to require a new logon sequence after it receives a power-on reset condition. (VM/Pass-Through Facility notifies the target of an interruption or termination of the VM/Pass-Through session via a power-on reset condition. The security exposure exists because some target applications ignore the condition.)
- Reserve use of specific ports for specific users or devices. (This option is discussed in detail in the next section.)

### *The Configuration File PORT Record*

If a user's session is interrupted by an unusual condition and you have restricted port usage to that user or terminal, another user or terminal cannot accidentally gain access to the session after the unusual condition is corrected. Two parameters on the configuration file PORT record can be used to reserve port usage. They are:

- nodeid

reserves use of the specified port for exclusive use by VM/Pass-Through users accessing the port from the system node specified by this parameter.

- userid/devid

reserves use of the specified port for exclusive use by the user identified by "userid/devid".

If neither "nodeid" nor "userid/devid" is specified, an * parameter must be specified to indicate that no access restrictions apply to this port. Complications may arise from reserving 327x logical ports to both CMS users and devices. If a CMS user has a port reserved for his userid and is using a 3270 display station whose real address also has a port reserved, then VM/Pass-Through initiates a session with the lowest number available port that has a matching id. For example, two ports may be defined as follows:

```
PORT   2   3278-2   LOCNODE   A-371
PORT   8   3278-2   LOCNODE   USERA
```

If USERA issues the PASSTHRU command from a 3278-2 display station at real address 371 to initiate a session with a 327x emulator node, based on the above PORT definitions, VM/Pass-Through will assign that session to port 2. If USERA does not logoff from the target node prior to terminating the VM/Pass-Through session, then the next user of real device 371 could gain access to USERA's active session if: the new user also selects the 327x emulator node and the target system had not disconnected USERA's session when VM/Pass-Through sent it the power-on reset status. Some ways to avoid this problem are:

- Inform users of this possibility and of the necessity to logoff from sessions with non-VM/Pass-Through systems prior to terminating the session.

- When reserving ports for both users and devices, reserve the lower number ports for userids and the higher number ports for real device addresses. This will assure that CMS users will get ports reserved for their userids and not those reserved for specific device addresses.

The safest policy for printer sessions, however, is to specify "nodeid" and "devid". This will ensure that the desired printer is assigned a particular port and prevent output mistakenly being sent to other printers and/or locations than intended.

***Note***: Under unusual circumstances the selection of a nodeid may cause a problem. When a START PRT command is input to VM/Pass-Through, CMS transforms the command arguments into a series of eight-byte tokens. If a keystroke error causes the nodeid argument and emulator port number to be concatenated, then CMS treats this as one argument and returns the first eight bytes. If the nodeid is eight bytes long then the effect of this operation eliminates the emulator port number. When CMS returns a START PRT command without an emulator port argument, VM/Pass-Through finds the first unrestricted 3270 printer port and assigns it to the virtual printer. This port may be different from the port number originally input via the START PRT command.

To minimize or eliminate this problem the installation has several options. In assigning emulator nodeids, it may use nodeids with character lengths of less than 8 characters. Then, if a keystroke error connects the nodeid and port number, an invalid nodeid error is returned. Another technique includes restricting each logical 3270 port on an emulator node to a particular virtual printer so that the port number is not required on the START PRT command.

### Abnormal VM/Pass-Through Termination

If a pass-through virtual machine terminates because of an abnormal condition while a session is active, the action taken depends on whether the session is executing in a Pass-Through-to-Pass-Through environment or in a 3271/3274 emulator environment.

- Pass-Through-to-Pass-Through environment

If the local pass-through virtual machine abnormally terminates, other VM/Pass-Through machines in the network will terminate all sessions associated with the abnormally terminating system. The local CP forces a disconnect of all users logged on through local VM/Pass-Through.

- 3271/3274 emulation environment

When the local VM/Pass-Through system is reinitialized following abnormal termination, all ports on emulator lines are treated as being powered off. When a user establishes a connection with one of these ports, the local pass-through virtual machine emulates a power-on reset condition. It is the responsibility of the target system to assure that any previous sessions are terminated when it receives the power-on reset. This will assure that the next user of a port will not have access to the prior user's session. If the target installation does not have this capability, the "nodeid" and "userid/devid" parameters of the configuration file PORT records can be used to reserve ports for exclusive usage. See "The Configuration File PORT Record" on page 62.

## Restrictions

Be aware that the following restrictions apply to VM/Pass-Through Facility operations.

### General Restrictions

- VM/Pass-Through cannot pass the signal from the TEST REQUEST/SYS REQUEST key to a target system that was accessed either through 3271/3274 emulation or from a remote terminal. This is because remote 3270 control units do not indicate the terminal from which the request was sent.

  **Note:** Remote 3270 Display Option supports the use of the TEST REQUEST/SYS REQUEST key on all of the display terminals that it supports.

- VM/SP or VM/370 target systems with VM/Pass-Through, Release 1 installed do not support 3278-5 display stations in large screen mode.
- The maximum data length that can be transferred as one unit to or from a 3270 terminal varies by line type. For CTCA and BSCA links the maximum input data length is 8080 bytes; the maximum output data length is 64k bytes. See the restrictions for 3271/3274 emulator ("3271/3274 Emulator Restrictions" on page 65) and ROCF lines ("ROCF Sessions" on page 57).
- To use the Notepad facility, a user's terminal must have program function keys.
- The Notepad facility does not support single APL/TEXT characters whose hex representations require 2 bytes, such as underscored APL characters.

- If you issue the CMS command, HX, from the VM/Pass-Through console while VM/Pass-Through Facility is executing, results may be unpredictable. Instead, use the VM/Pass-Through commands QUIESCE, QUIT, or SHUTDOWN to halt execution. (See "Chapter 4 - Remote 3270 Display Option—VM/Pass-Through Commands" on page 87 for information on the format and use of these commands.)
- Local printer sessions are supported only with non-VM/Pass-Through system nodes accessed via 3271/3274 emulation.
- The 3270 command, ERASE ALL UNPROTECTED (EAU), cannot be totally supported due to a Diagnose X'58' restriction. If VM/Pass-Through receives an ERASE ALL UNPROTECTED command, it substitutes the EAU with a WRITE command and a 3270 ERASE UNPROTECTED TO ADDRESS order. This causes the following differences:
  - All Modified Data Tags (MDTs) are reset. (The EAU command only resets the MDTs of unprotected fields.)
  - The keyboard is always unlocked.

**3271/3274 Emulator Restrictions**

- The maximum data length that can be transferred as one unit to or from a 3270 terminal is 8080 bytes.
- The READ/BUFFER command is not recognized. If the target node issues this command, the system returns a data string of X'604040'.
- The READ/MODIFIED command is supported. However, if there is no immediate data to send when the target node issues this command, the system returns a data string of X'604040'.
- 3270 orders are not checked by the emulator. Therefore, if you issue an invalid 3270 order, error status is not sent to the host. However, the user session will terminate when the orders are written to the user's 3270 display station.
- The 3270 Information Display System printer COPY function is not supported.
- If you use a 370X TP controller, it must have at least one (Type 2) communication scanner that will support the 2700 tributary feature.
- 3270 extended data streams are not supported on 3271/3274 links.

**Logical Device Support Restrictions**

- The system treats all command-chained CCWs as separate unchained CCWS. Therefore, results that depend on commands being chained are unpredictable. There is one condition that is emulated: a READ, chained from a WRITE of length 4, which contains a WCC character and a SBA character. The DVMSCN routine processes data from the READ and discards all data prior to the address referred to by the SBA in the WRITE command.
- Data-chained CCWs have the data combined into a single buffer. The combined length cannot exceed the VM/Pass-Through data length restrictions.

## *Developing Session Control Exits*

DVMNUE provides for four session control exit routines:

- DVMNUE1 - The system calls this routine when a user initiates a session. It allows the system to track sessions in which the target is:
  - The local node itself
  - Emulator or ROCF nodes defined in the configuration file of the local node.

You may program the exit routine to permit or refuse session initiation. For emulation sessions, you may program it to substitute a different port than the user requested.

Note that execution of either session control exit DVMNUE3 (local requests) or DVMNUE4 (nonlocal requests) precedes this exit's execution.

- DVMNUE2 - The system calls this routine when a user terminates a session. It allows the system to track the termination of sessions for which the target is:
  - The local node itself
  - Emulator or ROCF nodes defined in the configuration file of the local node.

- DVMNUE3 - The system calls this routine when a user initiates a session to begin tracking any and all session requests that originate at the local node. You can program the exit to permit or refuse the request to proceed. You can also make it able to alter the requested port and/or destination. If the exit alters the request, it calls the routine again.

- DVMNUE4 - The system calls this routine when a user initiates a session to begin tracking session requests that originate at another node. You can program this exit to permit or refuse the request to proceed. You can also program it to alter the port and/or destination requested. If the exit changes the requested port/destination, it calls the routine again.

IBM supplies these four exits in the module DVMNUE. The module also contains dummy routines that return control to the caller. If you want to use installation options in any of these exits, you must replace the source code for the routines and reassemble it. (Rebuild the PVM load module using the PVMBLD EXEC. See "Customizing the System" on page 26.) The four exits are described in more detail below.

***DVMNUE1 - Session Initiation Exit***: Session control exit DVMNUE1 is entered on session initiation. On entry to the user routine, register contents are:

R1 - Address of a 39-byte area to provide an explanatory message if the session is to be aborted.
R2 - Address of a parameter list containing:
00-07 - originating nodeid
08-15 - originating userid
16-19 - address of DVMPORT control block list (hexadecimal), if accessing a port on an emulator link; zero if not

20-21 - port number (binary). Valid if bytes 16-19 are not zero.
22-23 - user console address (hexadecimal)
24-25 - user console device type and class
26 - user console device model (hexadecimal)

R3 - Address of DVMALT control block for emulator line if connection is to a port on an emulator link.
R14 - Return address
R15 - Entry address

On return:

R15 - Must contain one of the following return codes:
0 - Allow the session to continue.
4 - For emulator links only, this means try another port. For nonemulator links, terminate the session.
8 - Terminate the session.

If R15 does not contain zero on return, the system must return an explanatory message in the 39-byte area displayed on the user's screen. On entry to the exit routine, R1 points to this area.

R0-R12 need not be restored upon return; R13 must not be altered.

***DVMNUE2 - Session Termination Exit***: The second exit to optional user routines, DVMNUE2, is entered at session termination. Register usage and parameters passed are very similar to that for session initiation. The differences are:

1. On entry, R1 does not contain the address of an area for returning a reason. Since the session is now completed, you do not need this area.
2. On return, R15 contains zero.

***DVMNUE3 and DVMNUE4 - Session Request Exits***: The third and fourth session control exits handle session requests that originate at the local node (DVMNUE3), and for those that originate outside the local node (DVMNUE4). They are used when the node receives the session request. On entry to the user routine, register contents are:

R1 - Address of a 39-byte area to provide a reason if the session is to be aborted.
R2 - Address of a parameter list containing:
00-07 - originating nodeid
08-15 - originating userid
16-19 - (unused)
20-21 - port number (binary) or zero
22-23 - user console address (hexadecimal)
24-25 - user console device type and class
26 - user console device model (hexadecimal)
27-34 - destination node
R11 - Address of DVMSYSB control block
R12 - Address of session manager's (DVMNET's) DVMTCB control block
R14 - Return address
R15 - Entry address

On return:

R15 - Must contain one of the following return codes:
0 - Allow the session to continue.
4 - Try another destination, (because the installation has altered[3] the destination and/or port within the exit routine. If neither field is altered, the session is terminated.)
8 - Terminate the session.

If R15 does not contain zero on return, an explanatory message must be returned in the 39-byte area displayed on the user's screen. R1 points to this area on entry to the exit routine. R0-R12 need not be restored upon return; R13 must not be altered.

**Sample Session Control Exit**

A session control exit sample follows. You would add this code to the dummy exit routine DVMNUE, in the pass-through virtual machine. This routine checks to see if a user at another system is attempting to connect to an emulator port number 1 on a node called "MVSSYS." If so, the origin nodename is checked. If the name begins with "TARGET," the session is allowed to complete. If not, a code of 4 is returned.

[3] The ability to alter nodenames involves the use of synonym nodenames. For example, an installation may have two MVS systems running CICS accessible via VM/Pass-Through. The installation wants the ability to decide which MVS system the users actually use for a specific CICS application. The system programmer can set up a synonym nodename for the application (such as, CICSAPP1). Then he can design a session control exit that recognizes the request for "node" CICSAPP1, chooses which real node the user should access, and alters the parameter list to point to the real node as the destination.

```
DVMNUE1  EQU   *
         USING *,R15
         L     R12,=A(DVMNUE)              LOAD BASE
         USING DVMNUE,R12
         USING DVMEXIT,R2
         USING DVMALT,R3
         DROP  R15
*  If there is no port pointer, it is not an emulator line
         ICM   R15,15,UCALPADR
         BZ    ALLOW                       THIS IS NOT AN
*                                          EMULATOR LINE
*  We can now check the nodename
         CLC   ALTNODE,=CL8'MVSSYS'        IS THIS FOR MVSSYS?
         BNE   ALLOW                       NO...NO CHECK NEEDED
         LH    R15,UCALPORT                GET PORT NUMBER
         CL    R15,=F'1'                   IS THIS PORT NUMBER 1?
         BNE   ALLOW                       NO...ALLOW CONNECTION
         CLC   =C'TARGET',UCALORIG         IS THE USER AT A NODE
*                                          STARTING WITH
*                                          'TARGET'?
         BE    ALLOW                       YES...ALLOW IT
         MVC   0(L'MSG1,R1),MSG1           INSERT MSG
         B     REJECT                      GO REJECT IT
ALLOW    EQU   *
         SR    R15,R15                     SET RETURN CODE
         BR    R14                         AND RETURN
REJECT   EQU   *
         LA    R15,4                       SET RETURN CODE
         BR    R14                         AND RETURN
         EJECT
MSG1     DC    CL39'PORT 1 RESERVED FOR TARGET NODES'
DVMEXIT  DSECT
UCALORIG DS    CL8                         ORIGIN NODE
UCALOUID DS    CL8                         ORIGIN USERID
UCALPADR DS    A                           PORT SLOT ADDRESS
UCALPORT DS    XL2                         PORT NUMBER
UCALREAL DS    XL2                         DEVICE ADDRESS
UCALCLAS DS    XL2                         DEVICE CLASS AND TYPE
UCALMDL  DS    X                           DEVICE MODEL NUMBER
```

# Part Two: Reference Summary

This part contains a combined reference summary including syntax diagrams, parameter lists, and notes for:

- Configuration File Records
- Commands

This section also contains message lists for both unnumbered and numbered messages.

# Chapter 3 - Remote 3270 Display Option—VM/Pass-Through Configuration File Records

The configuration file is a CMS file named PVM CONFIG A1. (Note that here "PVM" is the filename, not the filetype, as is the case for other VM/Pass-Through files.) Its records define the pass-through virtual machine for the system in which the configuration file resides.

Configuration file records contain:

- The local VM/Pass-Through node name
- A description of each link to a target system or remote display
- Port definitions for 327X emulator links
- Cluster and port definitions for remote 3270 links
- Routing paths
- Restricted command use authorizations
- Nodeid assignments for PF keys
- Other VM/Pass-Through management parameters

Configuration files contain fixed-length, 80-character records. Input must be in uppercase, and is restricted to columns 1 through 71, with no continuation. Entries in a configuration file record must be separated by one or more blanks.

Optional and required values are in the syntax diagrams as follows.

- Parameters enclosed in brackets [] are optional.
- Parameters shown within braces {} indicate that one of these parameters must be specified in the record.
- Multiple parameters separated by | marks indicate that they are alternatives. (Whether you can or must choose one or more is indicated by the brackets or braces.)

**All data in the file must be in uppercase.**

Records in the configuration file must be in the sequence illustrated in Figure 24 on page 74.

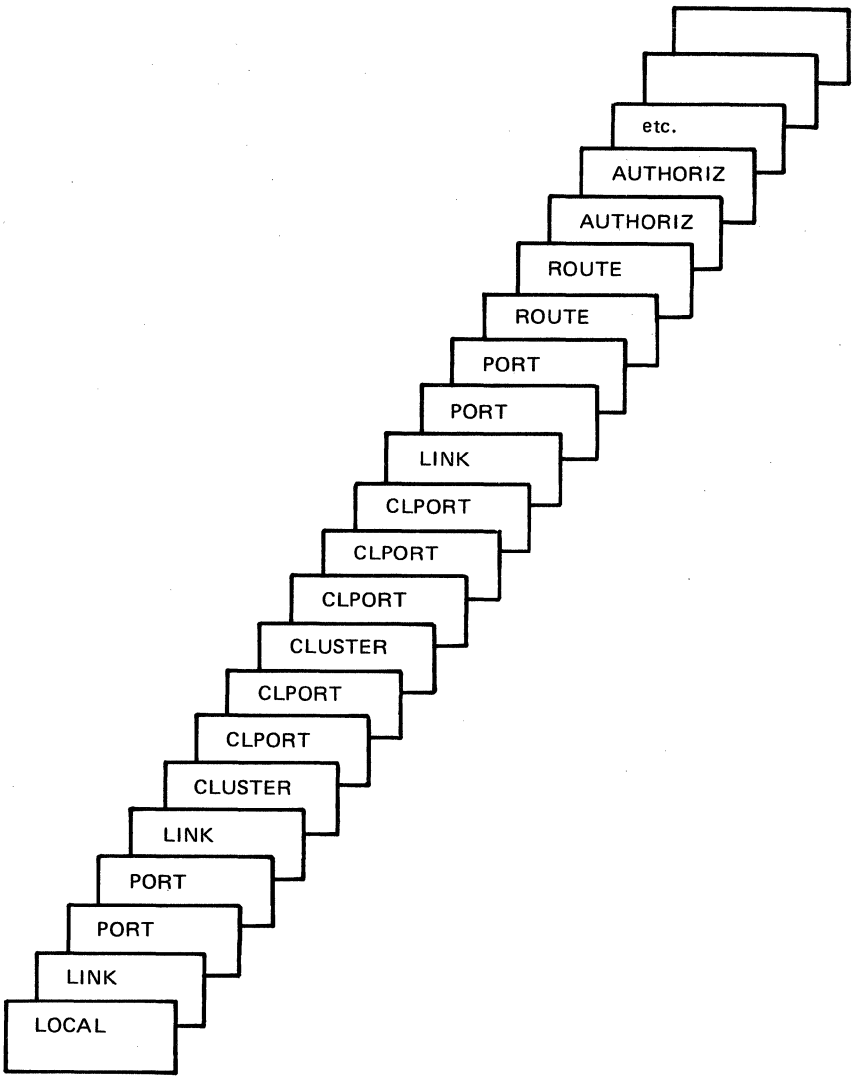


**Figure 24. Order of Configuration File Records**

## *Configuration File Record Formats*

### AUDIT Record

The AUDIT record indicates that the system is to store console data in a specified CMS file. The system creates this file the first time there is data to be written to it. Message identifiers, console data resulting from CMS commands, and commands submitted directly to CP are not stored. The AUDIT file contains data in chronological order, listed with their dates and times. All LOCAL, LINK, PORT, CLUSTER, CLPORT, ROUTE, or AUTHORIZ records must precede this record. If you omit this record, there will be no audit file.

The format of the AUDIT record is:

| NAME | OPTIONS |
|---|---|
| AUDIT | [filename [filetype [filemode]]] |

**where:**

*filename*
is the file name of the CMS file to contain the console data. If not specified, the default value is CONSOLE.

*filetype*
is the file type of the CMS file to contain the console data. If not specified, the default value is LOG.

*filemode*
is the file mode of the CMS file to contain the console data. If not specified, the default value is A1.

**Note:** You must provide adequate storage space for AUDIT files. If the AUDIT space is full, the system stops recording and sends a message to the VM/Pass-Through console. You must erase the audit file periodically to prevent it from filling up.

## AUTHORIZ Record

This record identifies users authorized to issue the restricted subset of VM/Pass-Through commands, and the nodes from which these commands may be issued. All LOCAL, LINK, PORT, CLUSTER, CLPORT, or ROUTE records must precede this record.

The format of the AUTHORIZ record is:

| NAME | OPTIONS |
|---|---|
| AUTHORIZ | [ vmid / SYSTEM ] [ * / nodeid ] |

**where:**

*vmid*
identifies a user (or virtual machine) authorized to issue restricted VM/Pass-Through commands. If you do not specify an * or *nodeid*, you authorize the local node only.

**SYSTEM**
extends the VM/Pass-Through operator's recognition to nodes other than the local node. Use this option, rather than the *vmid*, to authorize the VM/Pass-Through operator to issue commands from * or *nodeid*.

*
allows the user to issue restricted VM/Pass-Through commands from any node.

*nodeid*
allows the user to issue restricted VM/Pass-Through commands from the specified node.

**Note:** Do not try to authorize a user to issue restricted commands. Because VM/XA Migration Aid does not support the use of the SMSG command, users cannot communicate commands to the pass-through virtual machine.

### BUFFERS Record

The BUFFERS record indicates the number of 4096-byte pages that the system should allocate for internal data buffers. VM/Pass-Through also uses this parameter to compute the size of the PQE pool. See "BUFFERS Record" on page 12 for algorithms to help in determining values to specify in the BUFFERS record.

All LOCAL, LINK, PORT, CLUSTER, CLPORT, ROUTE, or AUTHORIZ records must precede this record. If you do not specify this record, the system assumes a default of 30 pages.

The format of the BUFFERS record is:

| NAME | OPTIONS |
|---|---|
| BUFFERS | nnn |

**where:**

*nnn*
is the number of pages to be allocated. The number of pages you specify should be greater than half the maximum number of users at any one time, but must be in the range of 5 to 999. If you do not specify enough buffers, there can be serious system bottlenecks or the pass-through virtual machine may completely quiesce.

### CLPORT Record

The CLPORT record defines a 3270 device connected to a remote 3270 cluster control unit.

There is one CLPORT record for each 3270 device, and all the CLPORT records for a CLUSTER must follow that CLUSTER record definition. The CLPORT records need not be in numeric order. The system will ignore any device ports not defined by a CLPORT record.

There are three forms of the CLPORT record. The first form defines a display or printer port. Both the second and third forms apply only to printers. The differences are:

- The second form defines a printer, allows a logical device to be created on a CP system (*nodeid*) representing the printer, optionally assigns an offset value for the logical device address (*lda*), and optionally causes the pass-through virtual machine to attach the logical device to a virtual machine (*vmid*) at a given address (*vaddr*).

- The third form defines a printer, causes connection to the next available port on an emulator link (non-VM/Pass-Through nodeid), or optionally to a specific port (*port number*).

All of the definitions except for printer definition take place at session initiation.

If you specify a printer as the *devtype* on a record in the first form, the system will not start a printer session. In effect, the system will ignore the record.

The format of the CLPORT record is:

| NAME | OPTIONS |
|---|---|
| CLPORT | nnnn devtype<br>nnnn devtype nodeid [lda [vmid vaddr]]<br>nnnn devtype nodeid [port number] |

**where:**

*nnnn*
is the device port address on the control unit. It is a one to four digit number ranging from 0 to 31.

*devtype*

**3277**
is a 3277 Model 2 Display Station.

**3278-2**
is a 3278 Model 2 Display Station, 3270 extended data streams are supported.

**3278-3**
is a 3278 Model 3 Display Station. 3270 extended data streams are supported.

**3278-4**
is a 3278 Model 4 Display Station. 3270 extended data streams are supported.

**3278-5**
is a 3278 Model 5 Display Station. 3270 extended data streams are supported.

**3279-2**
is a 3279 Model 2. 3270 extended data streams are supported.

**3279-3**
is a 3279 Model 3. 3270 extended data streams are supported.

**3284**
is a 3284 Model 1 or 2 Display System printer

**3286**
is a 3286 Model 1 or 2 Display System printer

**3287**
is a 3287 Model 1, 1C, 2 or 2C Display System Printer. 3270 extended data streams are supported.

**3288**
is a 3288 Model 2 Display System printer

**3289**
is a 3289 Model 1 or 2 Display System printer

**328X**
IBM provides this option for release compatibility. You must specify it (instead of *3284*, *3286*, *3287*, *3288*, or *3289*) if the support pass-through node for a non-VM/Pass-Through node is at Pass-Through release 2 or lower. If you specify this option, VM/Pass-Through assumes that the device has the characteristics of a 3284 printer device.

*nodeid*
is an optional parameter that is valid only for the second or third form of the CLPORT record, and only for printer devices. It specifies either the pass-through target nodeid (for the second form) where a logical device is to be created, or a non-VM/Pass-Through emulator target nodeid (for the third form). *nodeid* may be from 1 to 8 characters long. If you do not specify any subsequent parameters and the target is a pass-through node, then *nodeid*'s CP creates a logical printer with the next available logical device address. It will leave the device in a CP enabled state. If you do not specify any subsequent parameters and the target is a non-VM/Pass-Through (emulator) node, emulator line driver at the target's support node will use the next available emulator port for the connection. The system will ignore the optional parameters is you specify a non-VM/Pass-Through node for the second form or a VM/Pass-Through node for the third form.

*lda*
is an optional parameter that is valid only for the second form of the CLPORT record, and only for printer devices. If you specify *lda*, you must have also specified *nodeid*. *lda* is a logical device address offset, in the form Lxxx, where xxx is a hexadecimal value from x'000' to x'1FF.' This value, the logical device address offset, will be added to the starting (base) logical device address assigned to *nodeid*'s pass-through virtual machine. The sum of the two is the logical device address used for all future communication with this logical device.

*vmid vaddr*
is an optional parameter that is valid only for the second form of the CLPORT record, and only for printer devices. If you specify *vmid vaddr*, you must also have specified *nodeid* and *lda*. VM/Pass-Through will attempt to start a printer session at the system identified by *nodeid*. It will also attempt to attach the logical printer at *nodeid* to the virtual machine identified by *vmid* at *nodeid* at virtual address *vaddr*. *vmid* may be from one to eight characters long and must be a valid CP virtual machine ID defined in the target node's CP directory. *vaddr* may be from one to eight digits in length, within the range of x'0001' to x'0FFF.' The target node must support logical printers.

*port number*

is an optional parameter that is valid only for the third form of the CLPORT record, and only for printer devices. If you specify *port number*, you must also have specified *nodeid*. *port number* requests connection at session initiation to a specific port on *nodeid*'s emulator line. It is a one to four digit number within the range of 0 to 31.

## CLUSTER Record

The CLUSTER record defines a 3270 control unit on a remote line and indicates whether or not the control unit cluster handles 3270 extended data streams.

There is one CLUSTER record per control unit. The CLUSTER record must follow either the LINK record defining the remote line to which the control unit is connected, or the last CLPORT record defining the ports for a previous cluster on the same line.

The format of the CLUSTER record is:

| NAME | OPTIONS |
|---|---|
| CLUSTER | nnnn devmax [3274E] |

**where:**

*nnnn*

is the remote 3270 control unit address that is hardwired into the 3271/4 control unit. It is a one to four digit number ranging from 0 to 31.

*devmax*

is the maximum number of 3270 devices to be supported for this control unit. It is a one to four digit number ranging from 1 to 32. This field also sets the address range of the devices connected to the control unit. If the value of *devmax* is 8, then only devices 0 through 7 can be defined by CLPORT records.

**3274E**

is an optional parameter that indicates that the control unit supports 3270 extended data streams. The VM/Pass-Through Facility will determine on initial contact with both the control unit and devices if extended data streams are actually supported, and will set the device characteristics table according to the results. The system references this table during data transfer when deciding whether to transmit extended data streams.

## DUMP Record

The DUMP record indicates whether a dump taken during abnormal termination of VM/Pass-Through should be a CP dump or a virtual machine dump. All LOCAL, LINK, PORT, CLUSTER, CLPORT, ROUTE, or AUTHORIZ records must precede this record.

**Note: VM/XA Migration Aid does not support virtual machine dumps. IBM cannot predict the results if you specify a virtual machine dump.**

If you do not enter a DUMP record, the system assumes the default (DUMP CP).

The format of the DUMP record is:

| NAME | OPTIONS |
|---|---|
| DUMP | CP [vmid] |

**where:**

**CP**
indicates that, on abnormal termination of the pass-through virtual machine, the dump will be CP DUMP 0-END.

*vmid*
is an optional parameter indicating to which *vmid* the dump is to be spooled. The default is to dump to the printer for a CP dump.

**EXT Record**

The EXT record specifies the maximum number of entries the system should allocate in the internal table for VMCF and logical device external interrupts. The system makes entries for users accessing this pass-through virtual machine from CMS and for logical devices created for this pass-through virtual machine. Add two extra entries for use by the system. You should specify enough entries to handle the peak number of of simultaneous CMS PASSTHRU users plus logical devices. See "EXT Record" on page 11 for algorithms to help in determining values to specify in the EXT record.

All LOCAL, LINK, PORT, CLUSTER, CLPORT, ROUTE, or AUTHORIZ must precede this record. If you omit this record, the system assumes the default value (50).

The format of the EXT record is:

| NAME | OPTIONS |
|---|---|
| EXT | nnn |

**where:**

*nnn*
is the maximum number of entries to be created. You may specify any value from 2 to 999.

**I/O Record**

The I/O record specifies the maximum number of entries the system should allocate in the internal table for I/O devices. The system uses one entry for each virtual address for which the pass-through virtual machine performs I/O operations. Therefore, the system will use one entry for each:

active line driver (START LINE);

attached display support task (START GRAF);

attached printer support task (START PRT);

and one for the Pass-Through console. You should specify enough entries to handle the peak number of active line drivers and attached display support tasks. See "I/O Record" on page 12 for algorithms to help in determining values to specify in the I/O record.

All LOCAL, LINK, PORT, CLUSTER, CLPORT, ROUTE, or AUTHORIZ records must precede this record. If you omit this record, the system assumes the default value (50).

The format of the I/O record is:

| NAME | OPTIONS |
|---|---|
| I/O | nnn |

**where:**

*nnn*
is the maximum number of I/O devices expected. You may specify a value in the range of 2 to 999.

## LINK Record

The LINK record defines lines to the pass-through virtual machine. Specify one LINK record per line. The LINK record must follow either a LOCAL record or the last record (may be a LINK, a PORT, a CLUSTER, or a CLPORT record) that exists for the previous LINK. The order of LINK records in the configuration file should correspond to their frequency of use. You cannot enter the same *nodeid* in more than one LINK record.

The format of the LINK record is:

| NAME | OPTIONS |
|---|---|
| LINK | nnnnnnnn nodeid type |

**where:**

*nnnnnnnn*
is the line address. It is a one to eight digit hexadecimal number. This address must be within the range of X'20' to X'FF' for telecommunications lines, and X'100' to X'5F0' for CTCA lines. For CTCA lines, the last digit must be zero.

*nodeid*
is the node name to be assigned to the system or remote display on the other end of this link. At session initiation, *nodeids* (except remote display *nodeids*) are available to the user on the selection screen. *nodeid* is one to eight digits.

**Notes:**

1. Nodeids should be unique within a network since the nodeid and userid are the user's network identification. In Remote 3270 Display Option, the cluster and port numbers are the userid of the remote display and are the same for all remote lines. Be especially careful to give a unique nodeid to a remote display node.

2. For a remote 3270 line, *nodeid* is the name assigned to the TP line. Remote 3270 line *nodeid*s do not appear on the selection screen since they are not accessible to network users.

*type*

**327X**
specifies that a 3271/3274 emulator line driver is to be used. If *327X* is specified, associated PORT records must immediately follow this record for the line to be usable.

**Note:** To function properly, this line must have either the Station Selection feature on 270X, or the Tributary option on 370X or the 4321/4331's Communication Adapter.

**BSCA**
specifies that this line is a link to another pass-through virtual machine over a binary synchronous communications line.

**CTCA**
specifies that this link to another pass-through virtual machine is over a channel-to-channel adapter.

**ROCF**
specifies that the system should use an ROCF line driver to communicate with a remote 4300 processor over a switched, voice-grade telephone line. (ROCF is the Remote Operator Console Facility in the 4300, which communicates with the pass-through line driver.)

**R3270**
specifies that the line is a remote 3270 line and that the system should use the remote 3270 line driver. The line connection may be switched point-to-point, nonswitched point-to-point, or nonswitched multipoint.

**Note:** If you specify a R3270 link but do not follow the LINK record with a CLUSTER record, the system will ignore the R3270 LINK record.

## LOCAL Record

The LOCAL record defines the name that the system should give to the local pass-through virtual machine. This record must be the first record in the configuration file.

The format of the LOCAL record is:

| NAME | OPTIONS |
|---|---|
| LOCAL | nodeid |

**where:**

*nodeid*
is the name of the local node. *nodeid* must be from one to eight characters.

## PORT Record

The PORT record indicates that a port on the 327x line defined in the prior LINK record is accessible. It also specifies the type of display station to be emulated.

All PORT records associated with a particular LINK record must immediately follow that record. PORT records for a given link need not be in numeric port number sequence.

The port numbers and types that you define in the configuration file must match those defined for those ports at the target node.

The format of the PORT record is:

| NAME | OPTIONS |
|---|---|
| PORT | nnnn type {nodeid [userid/devid]} {*} |

**where:**

*nnnn*
is the device port number. It is a one to four digit number ranging from 0 to 31.

*type*

**3277**
is a 3277 Model 2 Display Station.

**3278-2**
is a 3278 Model 2 Display Station.

**3278-3**
is a 3278 Model 3 Display Station.

**3278-4**
is a 3278 Model 4 Display Station.

**3278-5**
is a 3278 Model 5 Display Station.

**3279-2**
is a 3279 Model 2 Display Station.

**3279-3**
is a 3279 Model 3 Display Station.

**3284**
is a 3284 Model 1 or 2 Display System printer

**3286**
is a 3286 Model 1 or 2 Display System printer

**3287**
is a 3287 Model 1, 1C, 2 or 2C Display System Printer. 3270 extended data streams are not supported.

**3288**
is a 3288 Model 2 Display System printer

**3289**
is a 3289 Model 1 or 2 Display System printer

**328X**
indicates that the port is for a 3270 Information Display System printer. Device types supported are those listed above: 3284, 3286, 3287, 3288, 3289 and the 3262 model 3 and 13, when defined as a 3289.

*nodeid* [*userid/devid*]
is a parameter that is valid only for the first form of the PORT record. It reserves this port for exclusive use by those users accessing it via the pass-through node identified by this parameter.

*userid/devid*, is an optional parameter. If you specify *userid/devid*, you must have specified *nodeid*. This parameter reserves the exclusive use of this port for the user or device identified by *nodeid userid/devid*. This entry can be either a one to eight-character userid, or a real device (display station or printer) address in the form A-xxx for a local 3270 display station or printer, or A-xxxx for a remote 3270 display station or printer. For local devices, xxx is the real address of the device. For remote devices, xxxx is the resource id for that device. When reserving ports using **both** *userid*s and *devid*s, be aware that VM/Pass-Through will assign the lowest number available port with **either** a matching userid or devid.

*
specifies that no access restrictions apply to this port.

**Note:** The printer required by a target application must have the same characteristics as the actual printer device handling its output. To ensure this match, IBM recommends that the installation reserve specific ports for exclusive use by specific printers.

## ROUTE Record

The ROUTE record defines the routing path to a specified target node from the local Pass-Through node. For Pass-Through-to-Pass-Through communications, routing must be defined consistently by both ends of network paths.

All LOCAL, LINK, PORT, CLUSTER, and CLPORT records must precede this record.

The format of the ROUTE record is:

| NAME | OPTIONS |
|---|---|
| ROUTE | nodeid1 nodeid2 |

**where:**

*nodeid1*
is the target system *nodeid.*

*nodeid2*
is the identification of the next sequential Pass-Through node (defined in a configuration file LINK record) in the routing pattern from the local node to the target system node.

**Note:** Since access to ROCF links is supported only from the local system, do not specify ROCF nodes on the ROUTE record.

### SELECT Record

Using the SELECT record, you assign frequently used node names to PF keys. There may be from 0 to 6 SELECT records in the CONFIG file. The first SELECT record nodeid will be assigned to PFKEY1, the second SELECT record nodeid will be assigned to PFKEY2, and so forth.

All of the SELECT records must follow any AUTHORIZ records.

The format of the SELECT record is:

| NAME | OPTIONS |
|---|---|
| SELECT | nodeid |

**where:**

*nodeid*
is the *nodeid* to be assigned to the PFKEY represented by this SELECT record. The *nodeid* may be from one to eight characters long.

### TDISC Record

The TDISC record specifies the maximum length of time a CMS user may remain in a temporary disconnected state from a Pass-Through session before Pass-Through forces session termination.

All LOCAL, LINK, PORT, CLUSTER, CLPORT, ROUTE, or AUTHORIZ records must precede this record. If you omit this record, the system assumes the default value (1200 seconds, or 20 minutes).

The format of the TDISC record is:

| NAME | OPTIONS |
|---|---|
| TDISC | nnnn |

**where:**

*nnnn*
is the number of seconds to be allowed for temporary disconnect. You may specify any value in the range of 30 to 9999 seconds.

## TIMEOUT Record

The TIMEOUT record specifies the amount of time the emulator and network line drivers should leave between line status checks during periods when there is no data being transferred. For an emulator line driver, if a POLL has not been received on the TP line within the specified time interval, the line driver will terminate with an indication that the line is down. For the network line drivers, if there has been no activity on the line during the specified time interval, a transaction will be sent down the line to ensure that the line is still up.

This record does not apply to R3270 type links. The system continuously polls clusters on a remote line so there is no need for a timeout interval.

This record does not apply to ROCF line drivers. The ROCF line drivers use a self-defined interval of 1 minute.

All LOCAL, LINK, PORT, CLUSTER, CLPORT, ROUTE, or AUTHORIZ record must precede this record. If you omit this record, the system assumes the default (300 seconds, or five minutes).

The format of the TIMEOUT record is:

| NAME | OPTIONS |
|---|---|
| TIMEOUT | nnnn |

**where:**

*nnnn*
is the number of seconds between status checks. You may specify a value in the range of 30 to 9999 seconds.

## Comment Record

Use this record to imbed comments in the configuration file. The system ignores this record during configuration file processing, and you can place it anywhere in the file.

The format of the comment record is:

| NAME | OPTIONS |
|---|---|
| * | comments |

**where:**

*comments*
can be in any format, following the asterisk (*) and at least one blank.

# Chapter 4 - Remote 3270 Display Option—VM/Pass-Through Commands

You must enter all commands in the formats shown below. Optional and required values are illustrated as follows.

- Parameters enclosed in brackets [] are optional.
- Multiple parameters shown stacked within braces {} indicate that one of these parameters must be specified on the command line.

The uppercase letters within command names are the minimum that must be entered to cause command execution. For example if you wanted to execute Query SYstem, you only need to enter Q SY.

In a VM/XA Migration Aid system, all VM/Pass-Through commands are restricted to use by operators. All users can issue CP and CMS commands.

The following are the sections that describe VM/Pass-Through commands:



## CP and CMS Commands Used in the Pass-Through Environment

These are the CP and CMS commands that you can use in the VM/Pass-Through environment. You use them to gain access to the pass-through virtual machine. Any user can issue them.

### *DIAL*

Use this command to connect your display station directly to the pass-through virtual machine. You must have issued a corresponding START GRAF command from the PROFILE PVM or from the operator's console to accommodate each user who accesses the pass-through virtual machine via the DIAL command.

The format of the DIAL command is:

| Command | Parameters |
|---|---|
| DIAL | vmid [vaddr] |

**where:**

*vmid*
is the identification of the desired pass-through virtual machine.

*vaddr*
is the virtual display device address desired. You can use this to select a specific display device.

## *PASSTHRU*

Invoking VM/Pass-Through Facility under CMS

You can only issue this command from a 3270 display station. If you are logged on to CMS, you establish initial contact with the pass-through virtual machine by issuing the PASSTHRU command. You can specify the target system with which you want to interactively communicate by including the target node identification on the command line, or by responding to the selection screen that is displayed if you don't specify a target.

The VM/Pass-Through session is active until you terminate the target application session and exit from the pass-through virtual machine. For a more complete description see "Interactive Sessions" on page 47.

The format of the PASSTHRU command is:

| Command | Parameters |
|---|---|
| PASSTHRU | [ ? [nodeid\|*] [port\|*] [vmid\|*] [notepf\|*] [lines\|*] [columns\|*] [tdisc\|*] [term\|*] ] |

**where:**

**?**
requests a display defining the other optional positional parameters.

*nodeid*
is the node identification of the target system or remote 4300 processor. If you specify an *, a selection screen appears on your terminal.

*port*
is a specific port number (if the specified node is an emulator node). If you specify *port*, you must also specify *nodeid*. Acceptable values are 1 through 31. If you specify * (if a node has been selected with *nodeid*), the system will assign the first available port matching your display station type.

*vmid*
is the identification of the pass-through virtual machine. If you specify *, the default (PVM) will be used.

*notepf*

is the number of the program function key to be used to cause the currently displayed screen to be written to a CMS file (Notepad facility). Acceptable values are 1 through 24.

In a VM/XA Migration Aid system, you cannot use the Notepad Facility to record the selection screen. You can, however, record any other screen using the Notepad Facility.

If you specify *, the Notepad facility is bypassed. This key cannot be the same one specified for *tdisc* or *term*.

*lines*

specifies the number of lines from the currently displayed screen that the Notepad facility should write to a CMS file. It writes from the top of the screen down.

If you specify *, the number of lines is the screen size minus 2. Acceptable values are 1 through nn, nn being the maximum number of lines on the screen of the accessing device. You can only specify this parameter if you have also specified a value for *notepf*.

*columns*

specifies the number of columns from the currently displayed screen that the Notepad facility should write to a CMS file. It writes from the leftmost column on the screen. If you specify *, the number of columns is the screen width. Acceptable values are 1 through 132 for 3278, Model 5; or 1 through 80 for other display stations. You can only specify this parameter if you have also specified a value for *notepf*.

**Note:** If a PASSTHRU DATA A1 file already exists, its record length must be equal to the value specified for *columns*, or the file will not accept Notepad records. Otherwise, you must either rename or erase the file. The system will create a new PASSTHRU DATA A1 file, with the correct record length, the next time you use the Notepad facility.

*tdisc*

specifies a sequence that you will enter to temporarily disconnect from a VM/Pass-Through session. The sequence can be either a one to eight-character string (other than a single *), or a PF or PA function key. The temporary disconnect function can be assigned to PA1, PA2, or PFnn.

You can remain disconnected up to the time limit specified by the installation. Your screen image is saved, and then restored after the the VM/Pass-Through session is resumed. If you enter the disconnect sequence while the selection screen is being displayed, the system will return you to the CMS environment. (Temporary disconnect is not activated in this case).

If you specify *, temporary disconnect is not available for that session.

**Note:** Any characters specified for *tdisc* or *term* are converted by CMS to uppercase. Therefore, any character strings you enter for temporary disconnect or session termination **must be in uppercase** for the system to recognize them.

*term*

specifies the sequence you will use to terminate a VM/Pass-Through session (following a disconnect from a target application).

This mode of session termination is not required if the target node is a pass-through virtual machine. In that case the session automatically terminates when you logoff or disconnect from the target application.

The sequence can be either a one to eight character string, or a PF or PA function key. If you specify *, the system assumes the default string of ####. You can assign the terminate function to PA1, PA2, or one of the program function keys by specifying PAn or PFnn respectively as *term*. Each terminal input is tested for the terminate sequence, and if found, the VM/Pass-Through session terminates.

**Note:** Any characters you specify for *tdisc* or *term* are converted by CMS to uppercase. Therefore, character strings you enter for temporary disconnect or session termination **must be in uppercase** for the system to recognize them.

You cannot use the same PF or PA key for more than one function.

## Remote 3270 Display Option—VM/Pass-Through Commands

### *CMD*

Use the CMD command to route commands to another pass-through virtual machine for execution. Output resulting from the execution of this command is routed back to you.

The format of the CMD command is:

| Command | Parameters |
|---|---|
| CMD | nodeid command |

**where:**

*nodeid*

is the identification of the node where the specified command is to be executed.

*command*

is the command to be executed at *nodeid*.

### *CMS*

This command executes CMS commands within the pass-through virtual machine. Output from this command appears only at the pass-through virtual machine console. You can only execute CMS subset commands using this command.

***Warning***: The pass-through virtual machine will stop functioning while the CMS command is being executed. If this interval is long, the communications links and users **will be affected.**

The format of the CMS command is:

| Command | Parameters |
|---|---|
| CMS | command |

**where:**

*command*
is the CMS command to be executed within the pass-through virtual machine.

## CP

Use this command to issue CP commands within the pass-through virtual machine.

The format of the CP command is:

| Command | Parameters |
|---|---|
| CP | command |

**where:**

*command*
is the CP command to be executed within the pass-through virtual machine. The CP-generated output from this command is returned to the issuer of *command*. A maximum of 500 characters of output are returned; the rest are ignored.

***Warning***: The system does not check to make sure that *command* is not the CP LOGOFF command. If you have issued the CP LOGOFF command, you will logoff the pass-through virtual machine.

## DISC

Use this command to disconnect the VM/Pass-Through operator's console. Use this command rather than the CP DISC command.

The format of the DISC command is:

| Command | Parameters |
|---|---|
| DISC | |

## DROP

The operator uses the DROP command to terminate an attached display support task, a line, the remote 3270 line driver, an attached printer support task, or a user session. You are notified of impending system action.

The format of the DROP command is:

| Command | Parameters |
|---|---|
| DROP | GRAF nnn<br>LINE nnn<br>PRT nnn<br>USER nodeid userid |

where:

**GRAF** *nnn*
indicates that the system should immediately terminate the specified attached display support task. It will also terminate any active user session. *nnn* is the virtual address of the attached display support task to be terminated. The address you specify must be the same as the address used to start the corresponding attached display support task.

**LINE** *nnn*
indicates that the system should immediately terminate the specified line. It will also terminate any active user sessions associated with this link. You can use this command to immediately terminate the remote 3270 line driver for the specified line. *nnn* is the virtual address of the line to be terminated. The address you specify must be the same as the address used to start the corresponding line.

**PRT** *nnn*
indicates that the system should immediately terminate the attached printer support task for the specified printer. The system terminates the printer session and deactivates the attached printer support task. *nnn* is the virtual address of the 3270 Information Display System printer being supported by the task that is to be dropped. The address you specify must be the same as the address used to start the corresponding attached printer support task.

**Note:** You cannot use DROP PRT to terminate a session with a Remote 3270 Display Option logical printer. In order to immediately terminate a logical printer session, drop the line or the user created for the printer at the target node. To terminate the session gradually, vary the port offline.

**USER** *nodeid userid*
indicates that the system should terminate the specified user session. ***nodeid*** is the identification of the user's originating node from which the system should terminate the session. *userid* is the identification of the user whose session the system should terminate.

The identification is either the user's *userid* if he was connected using the PASSTHRU command, or GRAF*xxx* if he connected to the pass-through virtual machine using the CP DIAL command. A Remote 3270 Display Option user's *userid* is in the form CL*xx*-P*yy* where *xx* is the cluster number and *yy* is the port number.

## *EXEC*

This command causes the execution of all VM/Pass-Through commands in the CMS file specified on the command line. **The file type of this file must be PVM.**

The format of the EXEC command is:

| Command | Parameters |
|---|---|
| EXEC | filename |

**where:**

*filename*
is the name of the file (file type PVM) that the system should execute.

**Note:** The file may contain any valid VM/Pass-Through commands. The system processes the file by reading and stacking all the records within the file, and then processing the records as individual commands.

## *LOGMSG*

Use the LOGMSG command to enter the variable data text that will appear in the LOGMSG area on both the node selection screen and the remote 3270 initial screen.

When you enter the LOGMSG command, you overlay the previous LOGMSG text. If you issue a LOGMSG command with no text, you overlay the previous LOGMSG text with blanks.

The format of the LOGMSG command is:

| Command | Parameters |
|---|---|
| LOGMsg | [message] |

**where:**

*message*
is the text of the message. You can use any characters. This field may be from 0 to 125 characters long, using two lines.

## *MODIFY*

The operator uses this command to remove from use, or to put back into use, a specified port on a specified 327x emulator line. If a session is active on the port, it is allowed to complete.

The format of the MODIFY command is:

| Command | Parameters |
|---|---|
| MODify | LINE nn PORT pp {ON / OFF} |

**where:**

**LINE** *nn*
indicates that the system should remove from use the specified port on the specified 327x emulator line or put the port back into use. *nn* is the address of the affected 327x emulator line. The address you specify must be the same as the address used to start the corresponding line.

**PORT** *pp*
indicates that the specified port is to be removed from use or put back into use. *pp* is the number of the affected port on the specified line. The value of *pp* must be a decimal number from 0 through 31.

**{ON | OFF}**
ON specifies that a port previously removed from use is to be returned to the available queue. OFF specifies that the port is to be unavailable for system use.

## *MSG*

Use this command to cause message text to be routed to the specified user(s) at the specified node(s). When it arrives at the specified user's system, the message replaces the current image on the user's display. The user recalls the stored image by pressing any interrupt key. As the sender, your nodeid and vmid are displayed with the message at the receiving location(s).

The format of the MSG command is:

| Command | Parameters |
|---|---|
| MSG | nodeid userid/grafid message<br>ALL message |

**where:**

*nodeid*
is the identification of the target user's node when you send a message to a single user.

*userid/grafid*
is the identification of the user or the user's attached display support task *grafid*. Use *userid/grafid* when you send a message to a single VM/Pass-Through user. You cannot use this command to send messages to printer devices. You must be at a Remote 3270 Display Option user's local node to send a message to a single Remote 3270 Display Option user. If you are not at his/her local node, use CMD to send him/her a message (CMD *localnode* MSG CL*xx*-P*yy message*).

**ALL**
specifies that you want the message sent to all users whose sessions originate, terminate, or go through this pass-through virtual machine.

*message*
is the text of the message to be routed. The message can be of any format and any characters acceptable to the CP command processor. The total length is limited to the CP command input limit.

## *QUERY*

Use this command to cause one of the following to be displayed.

- Current status of each line supported by the pass-through virtual machine
- Current status of a logical device
- Current status of ports on a line
- Contents of the routing table
- Current value accumulated in the error counter for a specified line
- Current session status of a particular printer supported by the pass-through virtual machine
- User session information.

If no parameters are entered, the Query SYstem option is the default.

The format of the QUERY command is:

| Command | Parameters |
|---|---|
| Query | SYstem {Active / Queue}<br>NODF nodeid {Ports {nnnn} / Queue}<br>ROUte<br>PRT aaa<br>LINE nnn CTRS<br>LINE nnn {Ports {nnnn} / Queue}<br>USER userid/grafid<br>APPL Lxxx |

**where**:

**SYSTEM {ACTIVE | QUEUE}**
specifies that information concerning the status of the system is to be displayed. If you do not enter any other parameters, the system displays the status of each link defined to the system.

If you do not enter any parameters on the QUERY command line, the system assumes the default value (SYstem). ACTIVE specifies that the system should only display the status of active links. QUEUE specifies that the system should display both the status and the associated user sessions for each active link.

ACTIVE and QUEUE are optional parameters.

**NODE** ***nodeid*** **{PORTS {*nnnn*} | QUEUE}**
specifies that the system should display the status of the associated link. PORTS specifies that the system should display port status of all ports associated with *nodeid*. You can only specify PORTS for emulator and remote 3270 links. *nnnn* specifies that the system should display the status of port(s) *nnnn*. *nnnn* is a one to four digit number, ranging from 0 to 31 that specifies a remote 3270 port number. You can only specify *nnnn* for remote 3270 links. If there is more than one cluster on line *nnnn*, the system will display the specified port for each cluster on the line. If you do not specify *nnnn*, then the system presents the status of all remote 3270 clusters and ports and the LINK. QUEUE specifies that the system should display the status and the associated user sessions for the specified node. If you do not specify either the PORT nor the QUEUE suboption, the system assumes the default (QUEUE).

**Note:** The system displays cluster status along with line information.

**ROUTE**
specifies that the system should display the contents of the routing table.

**PRT** *aaa*
specifies that the system should display the status of the printer associated with the virtual address *aaa*. The response indicates the status of the printer's session:

- ACTIVE Initiated, but connection not completed.
- CONNECTED Established, connection complete.
- NOT READY Waiting for manual intervention.

**LINE** *nnn* **CTRS**
causes the system to display the cluster port status of line ***nnn***. The address you specify for *nnn* must be the same as the address used to start the corresponding line. If you specify CTRS, the system displays the contents of the error counters for the line whose address is ***nnn***. You can use this command for 327x, BSCA, and ROCF type lines, but you may **NOT** use it for CTCA lines.

**LINE nnn {PORTS {nn} | QUEUE}**
causes the system to display the status of a link, and/or user sessions, and/or remote 3270 clusters and ports. *nnn* must be a two or three digit hexadecimal line address for the line status you want. PORTS specifies that the system should display port status of all ports associated with LINE *nnn*. You can only specify PORTS for emulator and remote 3270 links. *nnnn* specifies that the system should display the status of port(s) *nnnn*. *nnnn* is a one to four digit number, ranging from 0 to 31 that specifies a remote 3270 port number. You can only specify *nnnn* for remote 3270 links. If there is more than one cluster on line *nnn*, the system will display the specified port for each cluster on the line. If you do not specify *nnn*, then the system presents the status of all remote 3270 clusters and ports and the LINK. QUEUE is an optional parameter that specifies that the system should display status and associated user sessions for the specified remote 3270 node.

**Note:** The system displays cluster status along with line information.

**USER** *userid/grafid*
specifies that the system should display information concerning the associated local *userid* or attached display *grafid*. The user you specify must be connected to the local pass-through virtual machine. The response includes the user's real terminal address, type, and model number, along with the session node and id.

**APPL** *Lxxx*
specifies that the system should display information concerning the associated logical device. *Lxxx* is the logical device address where *xxx* is the three hexadecimal digit address the Logical Device Support Facility assigned to the logical device. This number must be between X'000' and X'FFF.'

## *QUIESCE*

The operator uses this command to quiesce:

- An attached display/printer support task
- A line driver task (such as the remote 3270 line driver)
- The VM/Pass-Through system.

The effect of the QUIESCE command can be reversed by issuing the RESUME command. This command does not terminate any line drivers, attached display support tasks, or user sessions.

The format of the QUIESCE command is:

| Command | Parameters |
|---|---|
| QUIesce | GRAF nnn<br>LINE nnn<br>PRT nnn<br>SYstem |

**where:**

**GRAF** *nnn*
indicates that the system should quiesce attached display support task *nnn*. A user currently dialed into the pass-through virtual machine using this task is allowed to complete the session. At session termination, the user is dropped and the specified attached display support task terminates.

If there is no active user session, the specified task terminates immediately. *nnn* specifies the address of the attached display support task the system should quiesce. The address you specify must be the same as the address used to start the corresponding attached display support task (START GRAF *nnn*).

**PRT** *nnn*
indicates that the system should quiesce attached printer support task *nnn*. If the printer session was started, but the system never established connection, the session will be terminated. If an established session has had no I/O activity for a 2-minute interval, the session will be terminated. *nnn* specifies the address of the attached printer support task the system should quiesce. The address you specify must be the same as the address used to start the corresponding attached printer support task (START PRT *nnn*).

**LINE** *nnn*
indicates that the system should quiesce line *nnn*. After you issue this command, no new users are allowed to initiate sessions using the associated line. When the last user session on the line terminates, the line driver terminates. If no user session is active, the specified line terminates immediately. *nnn* specifies the address of the line to be quiesced. The address you specify must be the same as the address used to start the corresponding line.

**SYSTEM**
indicates that the entire VM/Pass-Through system is to be placed in a quiesced state. No new sessions can be initiated within or through this system after this command is issued.

## *QUIT*

This command terminates the system immediately. No users are notified that the system is terminating. Not all allocated storage is freed when control returns to CMS. For this reason, CMS should be reinitialized, or an HX command issued to free allocated storage.

Before you issue the QUIT command, you may issue a DROP command for each active line or attached display support task so that all sessions will be terminated.

The format of the QUIT command is:

| Command | Parameters |
|---|---|
| QUIT | |

## *RESUME*

The operator uses the RESUME command to reverse the effect of a previously issued QUIESCE command. As a result, VM/Pass-Through makes the specified line, attached display/printer support task, or the entire system available for use.

**Note:** If the quiesced line driver or attached display/printer support task has already terminated due to the QUIESCE command, you will have to issue a START command instead of the RESUME command.

The format of the RESUME command is:

| Command | Parameters |
|---|---|
| RESume | GRAF nnn<br>LINE nnn<br>PRT nnn<br>SYstem |

**where:**

**GRAF** *nnn*
indicates that the system should not terminate the attached display support task *nnn* when the current user's session ends. *nnn* is the address of the affected attached display support task. The address you specify must be the same as the address used to start the corresponding attached display support task (START GRAF *nnn*).

**LINE** *nnn*
indicates that the system may resume use of line *nnn*. After you issue this command, new users are allowed on the affected line. The QUIESCE command you issued before did not terminate the line. *nnn* is the address of the affected line driver. The address you specify must be the same as the address used to start the corresponding line.

**PRT** *nnn*
indicates that the system should not terminate the attached printer support task *nnn* after all. *nnn* is the address of the affected attached printer support task. The address you specify must be the same as the address used to start the corresponding attached printer support task (START PRT *nnn*).

**SYSTEM**
indicates that VM/Pass-Through may resume operation. New sessions may be initiated after you issue this command.

## *SHUTDOWN*

The operator uses this command to terminate the system, while allowing all users to terminate active sessions. The system places all line drivers and attached display support tasks in a quiesced state. It terminates the attached display support tasks as soon as the user session terminates. Line drivers are terminated when the last users of associated lines terminate their sessions. VM/Pass-Through terminates when the last user session terminates, and all associated tasks terminate with it.

Not all allocated storage is freed when control returns to CMS. Therefore, you should reinitialize CMS, or issue an HX command to free allocated storage.

The format of the SHUTDOWN command is:

| Command | Parameters |
|---|---|
| SHUTDOWN | |

## *SNAP*

This command causes the system to issue CP DUMP commands to dump key VM/Pass-Through control blocks. You can then use the output for problem determination. Dump facilities and VM/Pass-Through control blocks are described in *VM/Pass-Through Facility Logic*, listed in the Preface.

***Warning***: The pass-through virtual machine will stop functioning while the system executes the SNAP command. If this interval is long, the communications links and users will be affected.

The format of the SNAP command is:

| Command | Parameters |
|---|---|
| SNAP | |

## *START*

This command starts a line driver task for a specified line, or starts a specified attached display or attached printer support task.

The format of the START command is:

| Command | Parameters |
|---|---|
| STArt | LINE nnn<br>GRAF nnn<br>PRT nnn nodeid [port] |

**where:**

**LINE** ***nnn***
indicates that the system should start a line driver to line *nnn*. You must have defined this address in the configuration file LINK record. For a

CTCA line, the last digit of the address must be zero. *nnn* is the address of the affected line driver.

**GRAF** *nnn*
indicates that the system should start a attached display support task to virtual address *nnn*. This address must have a value from X'20' to X'5FF'. *nnn* is the address of the affected attached display support task.

**PRT** *nnn*
indicates that the system should activate an attached printer support task and initiate a printer session with the printer at *nnn*. *nnn* is a virtual address that must have a value from X'20' to X'5FF.'

If the printer session cannot complete because a network path is down or is not connected, VM/Pass-Through will attempt connection five more times at 30-second intervals, and thereafter, at 10-minute intervals. The system continues to retry connection until system shutdown or until you enter a DROP PRT or QUIESCE PRT command. *nnn* is the address of the affected attached printer support task.

*nodeid*
is the target system node with which the session is to be initiated. The target must be a non-VM/Pass-Through system accessed via 3271/3274 emulation.

*port*
specifies a logical port that the system should assign to the printer session. The system will assign you the port you specify if it is not already being used or reserved for another printer. In the PORT record in the configuration file, you must have designated the logical port you request as a 3270 printer port. If you do not specify a logical port, the system will assign either the logical port that you defined in the system configuration file for the printer's real address, or the first available logical 3270 printer port.

## *STATUS*

The system uses the STATUS command to determine the status of the system pools or the status of tasks within the system. You can use the output from STATUS SYSTEM to determine whether the sizes of the system pools are correct. You can use the other options for problem determination.

The format of the STATUS command is:

| Command | Parameters |
|---|---|
| STATUS | SYstem<br>LINE nnn<br>USER userid/devid<br>APPL ldid |

**where:**

**SYSTEM**
specifies that the system should display information concerning the system Post Queue Element pool and buffer pool. This information gives the

allocated size, peak usage, and current usage of each pool. To adjust these allocations, change the value specified on the BUFFERS statement in the configuration file.

**LINE** *nnn*
specifies that the system should display information concerning the associated line driver. This information includes the DVMTCB control block address, current task status, task flags, last (or current) CAW address, next trace entry address in the wrap trace table, and the CCW pointed to by the CAW. *nnn* is the address of the line driver for which you want status.

**USER** *userid/devid*
specifies that the system should display information concerning the task associated with the specified id. This information includes the DVMTCB control block address, current task status, and task flags. *userid/devid* identifies the user, attached display, or printer device for which you want status. The id must be on the local system.

**APPL** *ldid*
specifies that the system display information concerning the logical device support task associated with the specified id. This information includes the DVMTCB control block address, current task status, and task flags. *ldid* is the address of the logical device support task for which you want status. You should specify this address in the form *Lnnn*.

## *TRACE*

The operator uses this TRACE command to initiate or stop the line tracing facility or the VM/Pass-Through multitasking supervisor trace facility. For more information about this facility see "The Trace Facility" on page 31, or see *VM/Pass-Through Facility Logic*, listed in the Preface.

The format of the TRACE command is:

| Command | Parameters |
|---|---|
| TRACE | LINE nnn {ON [vmid / rscsid nodeid vmid]} / {OFF}<br>SYstem {PRT} / {ON} / {OFF} |

**where:**

**LINE** *nnn*
indicates that a trace is for the specified line. The system defines a virtual printer at the first available address starting at X'10'. If no address between X'10' and X'0FF' is available, the system does not complete TRACE LINE command execution. *nnn* is the address of the affected line. The address you specify must be the same as the address used to start the corresponding line.

**ON**
causes the system to begin tracing activity on the specified line. The system spools the output to the printer queue at the defined address unless you

specify one of the additional, optional parameters to redirect it.

**[***vmid* | *rscsid nodeid vmid***]**
*vmid* causes the system to issue a CP SPOOL command to transfer output to the *vmid* reader queue. *rscsid nodeid vmid* causes the system to issue a CP SPOOL (to *rscsid*) and a CP TAG command to send the output over the RSCS network to the *vmid* reader at the specified node.

**OFF**
causes the system to terminate tracing activity for the specified line.

**SYSTEM**
indicates that a trace is for the VM/Pass-Through multitasking supervisor.

**PRT {ON | OFF}**
causes the system to route output to the virtual printer at address 00F instead of the system console. ON causes the system to route output to the VM/Pass-Through console 009. If you have already specified the PRT option, the system routes output to both virtual devices. OFF causes the system to terminate all tracing activity. If the PRT option is currently active, the system closes the virtual printer and detaches printer 00F detached.

## *VARY*

Use this command to trace data buffers passed to and from a a specified line driver. You can also use VARY to vary remote 3270 control units and/or individual ports online or offline. Once you have varied a port or control unit offline, the system will not start any new sessions on that cluster or port. Once all existing sessions on that cluster or port have ended, the system will not communicate with the control unit or port.

The format of the VARY command is:

| Command | Parameters |
|---|---|
| VARY | LINE nnnnnnnn SNAP {ON \| OFF} |
| | LINE nnnnnnnn CLuster xxxx {ON \| OFF} |
| | LINE nnnnnnnn CLuster xxxx Port yyyy {ON \| OFF} |

**where:**

**LINE** *nnn*
indicates the line; *nnnnnnnn* is its one to eight digit hexadecimal address. You must already have started the associated line driver using a START command.

**SNAP {ON | OFF}**
indicates that the system should start or stop snapshot dumps. ON begins the snapshot dumping; OFF terminates it.

**CLUSTER** *xxxx* **{ON | OFF}**
indicates that the system should vary a specific cluster on or offline. *xxxx* is the address of the remote 3270 control unit you specified on the CLUSTER

record in the configuration file. It is a one to four digit hexadecimal number ranging from 0 to 31. ON indicates that the system should vary the control unit online, and that the remote 3270 line driver will begin or resume communications with it. OFF indicates that the system should vary the control unit offline. VM/Pass-Through will stop communicating with the cluster and all of its ports only after all of the sessions associated with any of its ports have ended. The system will not allow any new sessions to initiate.

You can only use this parameter for a remote line.

**PORT** *yyyy* **{ON | OFF}**
indicates that the system should vary an individual device port on or offline. *yyyy* is the address of the remote 3270 device you specified in the CLPORT record in the configuration file. It is a one to four digit number ranging from 0 to 31. ON indicates that the system should vary the device port online, and the the remote 3270 line driver will begin or resume communications with it. OFF indicates that the system should vary the device port offline. VM/Pass-Through will cease communicating with the port only after any current session that the port is involved in has ended.

You can only use this parameter for a remote line.

## *

This command does not really do anything. You use it to write comments about the operation you are performing on the console and in the AUDIT file if you are using one.

The format of the * command is:

| Command | Parameters |
|---|---|
| * | comment |

**where:**

*comment*
is the information to be reflected on the VM/Pass-Through console and in the optional AUDIT file.

# Chapter 5 - Remote 3270 Display Option—VM/Pass-Through Messages

There are two kinds of VM/Pass-Through messages: those without number identifiers and those with them. The messages without identifiers follow. The numbered messages are found in "Numbered Pass-Through Messages" on page 114.

## Remote 3270 Display Option—VM/Pass-Through Facility Messages without Identifiers

The messages in this group are normally displayed on the initial and selection screens, or during session initiation or termination. These messages do not have identifiers. Their descriptions are listed alphabetically, according to message text. In each case the system action following the message is normal processing until the user takes the suggested action. Each message description includes a suggested user or system programmer action.

☐ *localnode* **ROUTE TABLE FULL**

**Explanation:** At the specified Pass-Through node *localnode* attempted to add a new entry to its internal route list, but 10 new ones had already been added, and there was no more room for the new entry.

**User Response:** Contact the system programmer at the specified VM/Pass-Through node and have the configuration file updated to include the appropriate LINK or ROUTE records.

**Modules Issuing:** DVMNEV

☐ *localnode* **SYSTEM QUIESCING**

**Explanation:** At the indicated node, the command QUIESCE SYSTEM has been executed indicating that no new sessions are to be allowed to start.

**User Response:** Contact the VM/Pass-Through operator at the indicated node to determine the status.

**Modules Issuing:** DVMNET, DVMNEV

☐ *localnode destnode* **LOOP IN ROUTING**

**Explanation:** One of the following has occurred at *localnode*,

- A control record was received from a target VM/Pass-Through system whose destination indicates that it must be returned to the same target VM/Pass-Through system. This indicates erroneous routing.
- A session start control record was received from an origin for which there is already a session being started. This indicates there is a loop in the routing within the network.
- A CMD command control record was received that had already passed through 256 nodes, indicating a possible loop in routing.

**User Response:** Compare the routing lists in the local and target VM/Pass-Through systems' configuration files to correct the conflict.

**Modules Issuing:** DVMNEV

☐ *localnode nodeid* **IS QUIESCING**

**Explanation:** User attempted to begin a session with, or send a CMD or MSG command to, a node that is routed through the link *nodeid* at the VM/Pass-Through node *localnode*. The specified link is currently quiescing due to a QUIESCE LINE command.

**User Response:** Contact the VM/Pass-Through operator at the indicated node or at the local node to determine the status.

**Modules Issuing:** DVMNET, DVMNEV

☐ *localnode nodeid* **LINE DROPPED BY REMOTE SITE**

**Explanation:** During an ROCF session, the ROCF line driver received an indication that the remote site is terminating the link.

**User Response:** None

**Modules Issuing:** DVMRSF

☐ *localnode nodeid* **LINK IS ALREADY IN USE**

**Explanation:** User attempted to initiate a session with the ROCF node, *nodeid* which already has a session active.

**User Response:** None

**Modules Issuing:** DVMNET

☐ *localnode nodeid* **LINK IS DOWN**

**Explanation:** User attempted to begin a session with, or send a CMD or MSG command to, a node that is routed through the link *nodeid* at the VM/Pass-Through node *localnode*. The specified link is not currently started.

**User Response:** Contact the VM/Pass-Through operator at the indicated node to determine the status.

**Modules Issuing:** DVMNET, DVMNEV, DVMRSF

☐ *localnode nodeid* **LINK IS NOT CONNECTED**

**Explanation:** User attempted to begin a session with, or send a CMD or MSG command to, a node that is routed through the link *nodeid* at the VM/Pass-Through node *localnode*. The specified link is currently started but not connected.

**User Response:** Contact the VM/Pass-Through operator at the indicated node to determine the status.

**Modules Issuing:** DVMNET, DVMNEV

☐ *localnode nodeid* **NODE INVALID**

**Explanation:** User attempted to begin a session with, or send a CMD or MSG command to, a node that is routed through the link *nodeid* at the VM/Pass-Through node *localnode*. At that node, the specified link has not been defined either by a LINK record or a ROUTE record.

**User Response:** Contact the system programmer at the specified VM/Pass-Through node and have the configuration file updated to include the appropriate LINK or ROUTE records.

**Modules Issuing:** DVMNET, DVMNEV

☐ *localnode nodeid* **PORT NOT AVAILABLE**

**Explanation:** User attempted to begin a session with an emulator node, however:

- No ports are available for the specified device type and model
- The specified port is not available
- The port reserved for the userid/devid for which the session is requested is not available at this time
- The port has been MODIFIED OFF.

**User Response:** CMS users issue a QUERY NODE *nodeid* PORT command on the appropriate VM/Pass-Through system to determine which ports are available; other users contact the VM/Pass-Through operator to perform the same QUERY.

**Modules Issuing:** DVMNET, DVMNEV

☐ *localnode nodeid* **REMOTE ACCESS NOT ALLOWED**

**Explanation:** User attempted to initiate a session with an ROCF node through the the network. Such sessions are supported only for local users on the local system.

**User Response:** None

**Modules Issuing:** DVMNEV

☐ *localnode nodeid* **TIMEOUT ON ENABLE**

**Explanation:** The ROCF line driver has enabled the teleprocessing line for AUTOANSWER and has waited 15 minutes for a manual connection.

**User Response:** Select the ROCF node again and be sure to establish the connection via manual dial before 15 minutes expire.

**Modules Issuing:** DVMRSF

☐ *localnode userid/grafid* **COULD NOT BE FOUND**

**Explanation:** A session complete control record was returned to the origin node, but the user support task is no longer around. This can happen if, while waiting for the session to complete, the user entered the session disconnect string. The message will not be displayed because the connection is broken.

**User Response:** None

**Modules Issuing:** DVMNET, DVMNEV

☐ *nodeid* **LINK IS NOT A NETWORK LINK**

**Explanation:** A CMD command was issued to a node that is an emulator link or a remote 3270 node, not a VM/Pass-Through system node. CMD commands can be directed only to VM/Pass-Through system nodes.

**User Response:** None

**Modules Issuing:** DVMNEV, DVMRMB

☐ **ALREADY SIGNED ON--TRY AGAIN**

**Explanation:** A user has issued a PASSTHRU command after the termination of a previous VM/Pass-Through session, but the previous session has not completed termination.

**User Response:** Retry the PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET

☐ **APPL END - DROP COMMAND**

**Explanation:** User was in an active session using the logical device support task with either the local CP system or a target CP system, and the session terminated because a DROP USER command was executed on the VM/Pass-Through system running the logical device support task.

**User Response:** If this sequence occurs frequently, contact the VM/Pass-Through operator to determine the reason for the DROP command.

**Modules Issuing:** DVMAPP

☐ **APPLICATION TERMINATED**

**Explanation:** While the user was in an active session using the logical device support task with either the local CP system or a target CP system, the session terminated, either by a LOGOFF OR DISCONNECT if logged on, or by a DETACH or RESET if dialed to a virtual machine.

**User Response:** This is a normal disconnect sequence.

**Modules Issuing:** DVMAPP

☐ **DATA TOO LONG TO PROCESS**

**Explanation:** A remote 3270 device sent data which must be divided into segments. The current session does not support segmented data.

**User Response:** Contact system programmer to determine which nodes will support segmented records.

**Modules Issuing:** DVMRMB

☐ **DEVICE NOT SUPPORTED**

**Explanation:** User is at a display station whose device type or model number is not supported by the CP Logical Device Support Facility at the target node.

**User Response:** Contact the system programmer at the target installation to determine which devices are supported.

**Modules Issuing:** DVMAPP

☐ **DIAGNOSE ERROR...SESSION TERMINATED**

**Explanation:** While the user was in an active session using the logical device support task with either the local CP system or a target CP system, the session terminated because of an error from the logical device support.

**User Response:** If the problem persists, contact system programmer at the VM/Pass-Through installation to determine the reason for the error.

**Modules Issuing:** DVMAPP

☐ **DROP COMMAND ISSUED**

**Explanation:** A DROP USER command was issued for the affected user.

**User Response:** If the problem persists, contact the VM/Pass-Through operator to determine why the DROP command was issued.

**Modules Issuing:** DVMRSF

☐ **INTERNAL FAILURE ATTACHING INTERFACE TASK**

**Explanation:** A user issued the PASSTHRU command and the pass-through virtual machine received an error attaching the appropriate user support task.

**User Response:** Retry the PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET

☐ **INVALID GRAPHIC DATA - SESSION TERMINATED**

**Explanation:** An I/O error occurred while writing display data to the user's screen. The error indicated that some portion of the data was invalid.

**User Response:** If the problem persists, contact the system programmer.

**Modules Issuing:** DVMUGR

☐ **INVALID NODE FOR 328X**

**Explanation:** User attempted to initiate a 3270 printer session with a non-3270 emulation node. This capability is not supported.

**User Response:** Contact your system programmer to determine the nodes that support 3270 printer sessions.

**Modules Issuing:** DVMNET

☐ **INVALID PORT SPECIFICATION**

**Explanation:** User entered a port number on the selection screen that was not a number between 0 and 31.

**User Response:** Repeat selection, using proper sequence.

**Modules Issuing:** DVMSEL

☐ **INVALID 3270 OP CODE**

**Explanation:** The output writer was to write an operation code to a remote 3270 device. The operation code is invalid.

**User Response:** If the problem persists, contact your system programmer.

**Modules Issuing:** DVMRMA

☐ **INVALID 3270 ORDERS**

**Explanation:** An I/O error has occurred while the output writer was writing data to the user's screen. The error indicated that some portion of the data was invalid.

**User Response:** If the problem persists, contact your system programmer.

**Modules Issuing:** DVMRMA

☐ **KEY NOT SUPPORTED**

**Explanation:** User pressed an unsupported interrupt key during selection screen processing.

**User Response:** Repeat selection, using proper sequence.

**Modules Issuing:** DVMSEL

☐ **LINE ENABLED FOR MANUAL DIAL**

**Explanation:** A local user has selected an ROCF node that has been started for manual dialing. The user must manually establish the connection within 15 minutes, or the session will be terminated.

**User Response:** Manually establish the TP line connection with the remote site.

**Modules Issuing:** DVMRSF

☐ **MAKE A SELECTION**

**Explanation:** User pressed ENTER key during selection screen processing without making a selection.

**User Response:** Repeat selection, using proper sequence.

**Modules Issuing:** DVMSEL

☐ **MESSAGE FROM** *nodeid userid msg*

**Explanation:** VM/Pass-Through displays for the user a message sent from the indicated *nodeid userid*; *msg* is the transmitted message.

**User Response:** None

**Modules Issuing:** DVMUGR, DVMUIN, DVMRMB

☐ **NO NODENAME SPECIFIED**

**Explanation:** The user entered a node name on the selection screen, erased it using the EOF key, then subsequently positioned the cursor for node selection and pressed ENTER.

**User Response:** Reselect target node either by entering the node name or by positioning the cursor.

**Modules Issuing:** DVMSEL

☐ **PERMANENT ERROR STATUS**

**Explanation:** An unrecoverable error occurred while the system was communicating with a remote 3270 device. The system has terminated the current session.

**User Response:** If the problem persists, contact the system programmer.

**Modules Issuing:** DVMRMA

☐ **PF OR PA KEY INCORRECT - IGNORED**

**Explanation:** During selection screen processing, user modified the session terminate string and entered either PF or PA with an invalid number after it.

**User Response:** Repeat string in proper format.

**Modules Issuing:** DVMSEL

☐ **PORT SPECIFIED NOT VALID FOR NODE**

**Explanation:** During selection screen processing, user entered a port number and selected a node that was not an emulator node.

**User Response:** Repeat selection, using proper sequence.

**Modules Issuing:** DVMSEL

☐ **REMOTE SITE NOW CONNECTED**

**Explanation:** A connection has now been established with an ROCF remote site.

**User Response:** The user should now wait for the first transaction from the remote site.

**Modules Issuing:** DVMRSF

☐ **SEGMENT ERROR**

**Explanation:** A data record directed to or from the user's display station was divided into segments and the target has indicated that it has not received one or more of the segments. The current session will be terminated.

**User Response:** If the problem persists, contact the system programmer to determine the cause of the problem.

**Modules Issuing:** DVMAPP, DVMUGR

☐ **SEGMENT ERROR ON INPUT**

**Explanation:** A data record directed to a remote 3270 device was divided into segments and the target has not received one or more of the segments.

**System Action:** Terminate the current session.

**User Response:** If the problem persists, contact the system programmer to determine the cause of the problem.

**Modules Issuing:** DVMRMB

☐ **SELECT ONLY ONE NODE**

**Explanation:** During selection screen processing, user modified a node in the selection area, and also entered a node name in the specific node area.

**User Response:** Repeat selection, using proper sequence.

**Modules Issuing:** DVMSEL

☐ **SESSION TERMINATED BY USER**

**Explanation:** User has terminated the VM/Pass-Through session by entering the session terminate sequence.

**User Response:** None

**Modules Issuing:** DVMUGR, DVMUIN, DVMRMB

☐ **SYSTEM IS SHUTTING DOWN**

**Explanation:** User issued the PASSTHRU command to a pass-through virtual machine that is shutting down because of the SHUTDOWN command.

**User Response:** Contact the VM/Pass-Through operator at the indicated node to determine the status.

**Modules Issuing:** DVMNET

☐ **USER CONNECTED TO PORT # *nn***

**Explanation:** User has completed a session initiation with an emulator link and has been assigned to port number *nn*.

**User Response:** User should save the port number in the event it is necessary to access the same port.

**Modules Issuing:** DVMUGR, DVMUIN, DVMRMB

☐ **USER REQUESTED TEMP DISCONNECT**

**Explanation:** User had an active VM/Pass-Through session going using the PASSTHRU command, but has been disconnected from the pass-through virtual machine because he has entered the temporary disconnect sequence.

**User Response:** Reissue the PASSTHRU command when the session is to be resumed.

**Modules Issuing:** DVMUIN

☐ **VMCF TABLE OVERFLOW IN PASS-THROUGH**

**Explanation:** User attempted to begin a session requiring an entry in the external interrupt table within the pass-through virtual machine, but all external interrupt entries were in use.

**User Response:** If the problem persists, contact the system programmer to to examine appropriate configuration file records (EXT).

**Modules Issuing:** DVMAPP, DVMUIN

□ **WAITING FOR REMOTE SESSION INITIATION**

**Explanation:** User has requested a session with a node separate from the local VM/Pass-Through system. The request has been forwarded to the next node in the path.

**User Response:** Wait for the session initiation to complete or for an error message to return.

**Modules Issuing:** DVMUGR, DVMUIN, DVMRMB

## Numbered Pass-Through Messages

VM/Pass-Through message identifiers, like all VM/Pass-Through object module names, begin with the letters DVM. The next three letters identify the module issuing the message. To simplify the message description format in this section the module identification message prefix is not included. For example, message DVMDIR012E is issued by module DVMDIR. The message number is 012, and E indicates that this is a error message. Other suffixes used are I (informational messages) and W (warning messages).

**000E MULTITASKER ABORT** *abend code*

**Explanation:** The pass-through virtual machine multitasking supervisor has encountered a situation it cannot handle.

**System Action:** Produces a storage dump and terminates the VM/Pass-Through program.

**System Programmer Action:** Use the abend code descriptions below to assist in problem determination.

**Modules Issuing:** DVMABR

**001E AUTHORIZE RETURN CODE =** *code*

**Explanation:** The pass-through virtual machine has received an error return code as a result of issuing the VMCF AUTHORIZE function.

**System Action:** Terminates the VM/Pass-Through program.

**System Programmer Action:** Use the VMCF return code descriptions in ***VM/XA*** *Migration Aid: System Messages and Codes Reference* to assist in problem determination.

**Modules Issuing:** DVMAIN

| Abend | Module Code | Issuing Reason |
|---|---|---|
| 02 | DVMEXT | Received timer interrupt and no timer element is on the queue. |
| 03 | DVMEXT | Task to be posted with external interrupt is no longer attached |
| 04 | DVMIOE | The task to be posted with I/O interrupt is no longer attached |
| 06 | DVMGTP | No free PQEs could be found. |
| 07 | DVMGTP | No flag bits are on in the PQE. |
| 08 | DVMSCH | The Interrupt Pending flag is on, but there is no PQE to satisfy the wait. |
| 09 | DVMSCH | There is no task ready to run. |
| 10 | DVMATT | DMSFREE error allocating space for TCB. |
| 11 | DVMSVC | Invalid multitasking superviso SVC issued. |
| 20 | DVMDET | DMSFRET error freeing TCB |

### 002E ERROR ALLOCATING STORAGE

**Explanation:** The pass-through virtual machine was unable to allocate virtual storage.

**System Action:** Act according to the issuing module:

- AIN, DIR: Terminate the VM/Pass-Through program.
- NET, NEV: Produce a storage dump and terminate the VM/Pass-Through program.
- RMB: Terminate the remote line driver and take a CP DUMP of control blocks.
- USI: Terminate the PASSTHRU command.

**System Programmer Action:** Check storage requirements and increase the size of the pass-through virtual machine if necessary.

**Modules Issuing:** DVMAIN, DVMDIR, DVMNET, DVMNEV, DVMRMB, DVMUSI

### 003E ERROR FRETTING STORAGE

**Explanation:** The pass-through virtual machine received an error code when issuing a DMSFRET macro.

**System Action:** Terminate the VM/Pass-Through program. If module issuing was DVMRMA or DVMRMB, terminate the line driver and take a CP dump of control blocks.

**System Programmer Action:** Attempt to restart the system. (If the module was RMA or RMB, attempt to restart the remote line driver.) If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMAIN, DVMNEV, DVMDIR, DVMRMA, DVMRMB

**010E** *text of invalid configuration file record*

**Explanation:** This message is issued whenever a configuration file record is ignored because of an error.

**System Action:** None

**System Programmer Action:** See preceding associated error message displayed on screen.

**Modules Issuing:** DVMDIR

**011E INVALID CONFIGURATION TYPE RECORD**

**Explanation:** Record name of configuration file record is invalid.

**System Action:** The record is ignored.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**012E CONFIGURATION RECORD OUT OF ORDER**

**Explanation:** You have improperly ordered the configuration records.

**System Action:** The record is ignored.

**System Programmer Action:** Move the affected configuration file record. See Figure 24 on page 74.

**Modules Issuing:** DVMDIR

**013E CONFIGURATION FILE DOES NOT EXIST**

**Explanation:** There is no PVM CONFIG file.

**System Action:** VM/Pass-Through terminates.

**System Programmer Action:** Create the necessary configuration file and restart VM/Pass-Through.

**Modules Issuing:** DVMDIR

**014E LINK ADDRESS IS INVALID**

**Explanation:** The address field in the LINK record of the configuration file is in error.

**System Action:** Ignore the record or command.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**015E DUPLICATE TERMINATION NODE**

**Explanation:** The associated configuration file ROUTE record has a termination node name that is a duplicate of one already defined by a ROUTE record.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**016E LINK TYPE INVALID**

**Explanation:** Configuration file LINK record has an invalid type field.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**017E LINK ADDRESS ALREADY DEFINED**

**Explanation:** Configuration file LINK record has an ADDRESS field that has been defined in a previous LINK record.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**018E PREVIOUS LINK TYPE NOT 327X**

**Explanation:** The LINK record preceding this PORT record is not a 327x emulator link.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**019E PORT ADDRESS INVALID**

**Explanation:** Address field in a configuration file PORT or CLPORT record is not within the range of 0 to 31.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**020E PORT TYPE INVALID**

**Explanation:** The configuration file PORT or CLPORT record has an invalid type field.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**021E PORT ADDRESS ALREADY DEFINED**

**Explanation:** A previous configuration file PORT or CLPORT record exists that defines the same port address for this 327X LINK record.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**022E BUFFER VALUE INVALID**

**Explanation:** The *nnn* value specified in the BUFFERS record of the configuration file is not within the valid range.

**System Action:** Ignore the record and use the system default value.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**023E EXT ENTRY VALUE INVALID**

**Explanation:** The *nnn* value specified in the EXT record of the configuration file is not within the valid range.

**System Action:** Ignore the record and use the system default value.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**024E I/O ENTRY VALUE INVALID**

**Explanation:** The *nnn* value specified in the I/O record of the configuration file is not within the valid range.

**System Action:** Ignore the record and use the system default value.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**025E NO LOCAL ENTRY IN CONFIGURATION FILE**

**Explanation:** The LOCAL record is not the first record in the configuration file.

**System Action:** Terminate VM/Pass-Through.

**System Programmer Action:** Create a LOCAL record.

**Modules Issuing:** DVMDIR

**026E INCORRECT NUMBER OF PARMS**

**Explanation:** The configuration file record contains an incorrect number of parameters.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**027E TERMINATION NODE CANNOT BE LOCAL NODE**

**Explanation:** The local node cannot be specified for the nodeid1 parameter on the ROUTE record of the configuration file.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**028E NEXT NODE NOT DEFINED BY LINK RECORD**

**Explanation:** The node specified for the nodeid2 parameter on a ROUTE record was not defined on a prior LINK record.

**System Action:** Ignore the record.

**System Programmer Action:** Define the affected node on a LINK record preceding this ROUTE record.

**Modules Issuing:** DVMDIR

**029E LINK NODE NAME ALREADY DEFINED**

**Explanation:** The node specified on the following LINK record has been used in a previous LINK record.

**System Action:** Ignore the record.

**System Programmer Action:** Change the affected node name to a unique name.

**Modules Issuing:** DVMDIR

**030E AUDIT FILEMODE IS INVALID**

**Explanation:** The filemode parameter on an AUDIT record is not a valid CMS filemode.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**031E DUMP OPTION INVALID**

**Explanation:** CP or VMDUMP parameter incorrectly specified on the DUMP configuration file record.

**System Action:** Ignore the record and use the default, CP.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**032E LINE TIMEOUT VALUE IS INVALID**

**Explanation:** The *nnnn* value specified in the TIMEOUT configuration file record is not in the valid range.

**System Action:** Ignore the record and use the default value.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**033E TEMP DISCONNECT VALUE IS INVALID**

**Explanation:** The *nnnn* value specified for the TDISC record in the configuration file is not in the valid range.

**System Action:** Ignore the record and use the default value.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**034E TERMINAL ADDRESS IS INVALID**

**Explanation:** The user parameter specifying the real terminal address in the PORT configuration file record is not within the valid range.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**035E RETURN CODE *nnn* FROM CMS READ**

**Explanation:** An I/O error occurred while reading the configuration file. The return code *nnn* was received from the CMS FSREAD macro.

**System Action:** Terminate VM/Pass-Through.

**System Programmer Action:** Correct the cause of the I/O error and restart the pass-through virtual machine.

**Modules Issuing:** DVMDIR

**040I VM/XA MA REMOTE 3270 DISPLAY OPTION REL 01 READY**

**Explanation:** The pass-through virtual machine is initialized and ready for use.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMBFR

**041E UNEXPECTED POST**

**Explanation:** This is a system program error. The task associated with the module issuing this message has been posted for an event that it is not programmed to handle.

**System Action:** The associated task abnormally terminates. If the module that issued this message was BFR or NET, a storage dump is taken and the Pass-Through program terminates.

**System Programmer Action:** Attempt to restart the system. (If the issuing module was RMB, attempt to restart the remote line driver.) If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMAPP, DVMBFR, DVMBSC, DVMCTC, DVMNET, DVMRMB, DVMRSF, DVMSIM, DVMUGR, DVMUIN, DVMUPR

**042E BUFFER NOT FREED BY OWNER**

**Explanation:** System program error in buffer management.

**System Action:** Terminate VM/Pass-Through. Produce dump of type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBFR

**043E BUFFER POOL FLAG ERROR**

**Explanation:** System program error in buffer management.

**System Action:** Terminate VM/Pass-Through. Produce a dump of the type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBFR

**044E TRIED TO ALLOCATE BUFFER ALREADY IN USE**

**Explanation:** System program error in buffer management.

**System Action:** Terminate VM/Pass-Through. Produce a dump of the type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBFR

**045E INVALID COMMAND** *command*

**Explanation:** Command name is not a valid VM/Pass-Through command. The QUERY LINE CTRS command is not valid for CTCA line drivers.

**System Action:** Ignore the command.

**User Action:** Reissue the command with the correct command name.

**Modules Issuing:** DVMBFR, DVMBSC, DVMCON, DVMCOQ, DVMCTC, DVMNET, DVMRMB, DVMRSF, DVMSIM

**046E COULD NOT ATTACH NETWORK TASK**

**Explanation:** System program error. Buffer manager received an error return code when attempting to attach the session manager.

**System Action:** Terminate VM/Pass-Through. Produce a dump of the type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBFR

**047E COULD NOT ATTACH CONSOLE TASK**

**Explanation:** Buffer manager received an error return code when attempting to attach the command processor task.

**System Action:** Terminate VM/Pass-Through. Produce a dump of the type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBFR

**048E SEGMENT COUNT NOT IN RANGE**

**Explanation:** The value on a system macro call DVMGETL or DVMCBUF was not within the range (1-16).

**System Action:** The buffer manager task aborts itself, dumps storage, and terminates the pass-through virtual machine.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBFR

**049E RETURN CODE *code* FROM FSWRITE OF AUDIT FILE**

**Explanation:** A permanent error has occurred writing to the VM/Pass-Through audit file. The error code *code* indicates the type of error, and can be found in the *VM/XA Migration Aid: CMS Command Reference for Installation and Service.*

**System Action:** Stop writing to the audit file.

**System Programmer Action:** Determine the reason for error and take corrective action.

**Modules Issuing:** DVMWTR

**050I** *command text*

**Explanation:** Displayed text of a previously issued VM/Pass-Through command.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCON

**051I PVM**

**Explanation:** Displayed after a null line is entered through the VM/Pass-Through console.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCON

**052E INVALID ADDRESS** *addr* **ON** *command parameter*

**Explanation:** The specified address for the given command is incorrect. *addr* is the address specified in the command; *command* and *parameter* are the first two tokens entered on the command. If this is for a START LINE, the LINK record may not be in the configuration file. If this is for a QUERY LINE, the specified address is not defined by a LINK record in the configuration file.

**System Action:** Ignore the command.

**User Action:** Reenter the command specifying the correct line address.

**Modules Issuing:** DVMCON, DVMCOQ, DVMNET, DVMQRY

**053E I/O ERROR READING EXEC** *execname*

**Explanation:** The system experienced an I/O error while reading *execname* EXEC

**System Action:** Ignore the EXEC command.

**User Action:** Reissue the command. If error persists, check the *execname* PVM file.

**Modules Issuing:** DVMCON

**054E INVALID NUMBER OF PARMS ON** *command* **COMMAND**

**Explanation:** You have placed too many parameters in the *command* command

**System Action:** Ignore the command.

**User Action:** Check format and reenter the command.

**Modules Issuing:** DVMCON, DVMCOQ, DVMQRY

**055E INVALID EXEC NAME** *execname*

**Explanation:** The file *execname* PVM was not found on the pass-through virtual machine's A-disk.

**System Action:** Ignore the command.

**User Action:** Check the *execname* PVM file name and reenter the command.

**Modules Issuing:** DVMCON

**056E INVALID SUBCOMMAND *name* ON *command* COMMAND**

**Explanation:** The specified subcommand (parameter on the command line) is not valid for the specified command.

**System Action:** Ignore the command.

**User Action:** Reenter command with valid parameters.

**Modules Issuing:** DVMBSC, DVMCON, DVMCOQ, DVMCTC, DVMQRY, DVMRMB, DVMRSF, DVMSIM

**057I COMMAND COMPLETE**

**Explanation:** This message notifies the user that a previously entered command completed execution.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCON, DVMNET, DVMRMB

**058E RETURN CODE *code* FROM CP/CMS COMMAND**

**Explanation:** Indicates completion status of previously entered CP or CMS command through VM/Pass-Through.

**System Action:** Varies with the command issued and the return code.

**User Action:** Take action indicated by return code description in *VM/XA Migration Aid: System Messages and Codes Reference.*

**Modules Issuing:** DVMCON

**059E USERID *userid/devid* NOT FOUND**

**Explanation:** The specified *userid/devid* could not be found for either a DROP USER, DROP PRT, QUERY USER, QUERY PRT, MSG, or STATUS command.

**System Action:** Ignore the command.

**User Action:** Use the QUERY SYS Q command to determine the correct userid, then reenter the command.

**Modules Issuing:** DVMCON, DVMCOQ, DVMQRY

**060E ADDRESS *nnn* IS ALREADY STARTED**

**Explanation:** The specified address was used on a START command, but the task was already started.

**System Action:** Ignore the command.

**User Action:** Use the QUERY command to find out which line drivers are already active. Issue CP command, QUERY VIRTUAL GRAF, to determine what virtual display devices are defined.

**Modules Issuing:** DVMCON

**061E INVALID PORT NUMBER** *number*

**Explanation:** The specified PORT number used on a MODIFY command is outside the range of 0 to 31. If this is a response to a QUERY LINE *nnn* PORT *nnn* or a QUERY NODE *nodeid* PORTS *nn* command, the specified port number *number* is not defined by a CLPORT record in the configuration file.

**System Action:** Ignore the command.

**User Action:** Reenter the command with a valid port specified.

**Modules Issuing:** DVMCON, DVMQRY

**062E RESTRICTED COMMAND** *command parameter*

**Explanation:** The user is not authorized to execute the specified command or parameter of that command.

**System Action:** Ignore the command.

**User Action:** Have the system programmer check the AUTHORIZ records in the configuration file and modify them if required.

**Modules Issuing:** DVMCON

**063E PORT** *nn* **IS ALREADY RESERVED**

**Explanation:** The port specified on a MODIFY PORT OFF command is already reserved.

**System Action:** Ignore the command.

**User Action:** Be sure the correct port is being specified. Use QUERY command to determine port status.

**Modules Issuing:** DVMCON

**064E PORT** *nn* **IS NOT RESERVED**

**Explanation:** The port specified on a MODIFY PORT ON command is not reserved.

**System Action:** Ignore the command.

**User Action:** Be sure the correct port is being specified. Use QUERY command to determine port status.

**Modules Issuing:** DVMCON

**065E ADDRESS *nnn* IS NOT ACTIVE**

**Explanation:** The specified address was used in a DROP, QUIESCE, RESUME, TRACE, QUERY, or VARY command, but the task is currently not started.

**System Action:** Ignore the command.

**User Action:** Use the QUERY SYSTEM command to find out what tasks are started. Issue CP command, QUERY VIRTUAL GRAF, to determine what virtual display devices are defined.

**Modules Issuing:** DVMCON, DVMCOQ, DVMNET

**066E ADDRESS *nnn* IS NOT A DISPLAY/PRT TASK**

**Explanation:** The specified address is not an address used in a START GRAF or START PRT command.

**System Action:** Ignore the command.

**User Action:** Issue CP command, QUERY VIRTUAL GRAF, to determine what virtual addresses are defined.

**Modules Issuing:** DVMCON

**067E ADDRESS *nnn* IS NOT AN EMULATOR LINK**

**Explanation:** The specified address used in a MODIFY command is not defined in the configuration file as an emulator (327X) link.

**System Action:** Ignore the command.

**User Action:** Reenter the command with the correct address.

**Modules Issuing:** DVMCON

**068I *response to previous CP command***

**Explanation:** This is the text of a response (from CP) to a CP command entered through VM/Pass-Through.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCON

**069E INVALID CMS SUBSET COMMAND**

**Explanation:** A CMS command entered through VM/Pass-Through is not one of the valid CMS subset commands.

**System Action:** Ignore the command.

**User Action:** Check command validity, then reenter.

**Modules Issuing:** DVMCON

**070E POST ERROR ON COMMAND** *command parm1 parm2*

**Explanation:** An error occurred when the indicated command was posted to the subject task.

**System Action:** Ignore the command.

**User Action:** Reissue the command. If problem persists, notify system programmer to initiate local diagnostic procedures.

**Modules Issuing:** DVMCON

**072E LOGICAL DEVICE** *lda address* **NOT FOUND**

**Explanation:** This is the response to STATUS APPL command. The specified logical device address *lda address* is not currently associated with the pass-through virtual machine executing the command.

**System Action:** Ignore the command.

**User Action:** Use the QUERY command to determine the correct logical device address, then reenter the command.

**Modules Issuing:** DVMCOQ, DVMQRY

**073I TOTAL PQES** *number*, **MAX USED** *number*, **CURRENT** *number*

**Explanation:** Response to STATUS SYSTEM command, The information gives the total number of Post Queue Elements allocated by the system (a function of the buffer pool size), the maximum used, and the current number in use.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCOQ

**074I TOTAL BUFFER PAGES** *number*, **MAX USED** *number*, **CURRENT** *number*

**Explanation:** Response to STATUS SYSTEM command, The information gives the total number of pages in the buffer pool (specified by the BUFFER statement in the configuration file), the maximum used, and the current number in use.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCOQ

**075I** **CURRENT CAW** *address*, **TRACE AT** *address*, **CCW** *value*

**Explanation:** Response to STATUS LINE command. The information gives the current (or last, if no I/O is active) Channel Address Word (CAW), the address of the next entry in the wrap trace table for the associated line driver, and the CCW pointed to by the CAW.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCOQ

**076I** **TASK** *address*, **WAITING ON I/O BUSY** *xxx*, **FLAGS** *yyyyyyyy*

**Explanation:** Response to STATUS LINE, STATUS USER, or STATUS APPL command when the associated task is suspended because the I/O could not be started due to a channel busy condition. The information gives the task address, the device address, and the contents of the flag bytes associated with the type of task.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCOQ

**077I** **TASK** *address*, **RUNNING PSW** *address*, **FLAGS** *xxxxxxxx*

**Explanation:** Response to STATUS LINE, STATUS USER, or STATUS APPL command when the associated task is not in a wait state. The information gives the task address, the current PSW address, and the contents of the flag bytes associated with the type of task.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCOQ

**078I** **TASK** *address*, **WAITING, PSW** *address*, **WAIT** *xxxxxxxx*, **PQES** *yy*, **FLAGS** *zzzzzzzz*

**Explanation:** Response to STATUS LINE, STATUS USER, or STATUS APPL command when the associated task is in a wait state. The information gives the task address, the WAIT PSW address, the WAIT flags for which the task is waiting, the number of Post Queue Elements queued to the task, and the contents of the flag bytes associated with the type of task.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMCOQ

**080I** **LOCAL NODE IS** *nodeid*

**Explanation:** Displays the name of the local node in response to a QUERY command.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**081I** **LINE** *line address* **ID=***id* **NAME=***name*, **USERS=***number status*

**Explanation:** This is the response to QUERY command, indicating line status.

The *id* can be:

| | |
|---|---|
| NB | Pass-Through-to-Pass-Through over BSCA line. |
| NC | Pass-Through-to-Pass-Through over CTCA line. |
| S | 327X emulator line. |
| R1 | ROCF line. |

The *status* can be:

| | |
|---|---|
| DOWN | Terminated or not started. |
| ACTV | Started but communications not established. |
| CONN | Communications established. |

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**082I** **NODE** *nodeid* **USER** *userid/devid* **ON NODE** *nodeid* **PORT** *port number*

**Explanation:** Response to QUERY SYSTEM Q or QUERY NODE command.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**0831** **NODE** *nodeid* **USER** *userid/devid* **IN SIGNON AT** *nodeid*

**Explanation:** The indicated user/device is initiating a session at the time the QUERY command is issued.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**0841** **NODE** *nodeid* **USER** *userid/devid* **ATTACHED TO** *nodeid* **LDA** *address*

**Explanation:** Response to QUERY SYSTEM Q or QUERY NODE command. LDA is a logical device address.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**0851** **NODE** *nodeid* **USER** *userid/devid* **CONNECTED TO** *nodeid* **APPL** *port number or logical devaddr*

**Explanation:** Response to QUERY SYSTEM Q or QUERY NODE command when userid is only passing through this node (not using this node as an originating or target node).

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**0861** **PORT** *port number device type* **MDL** *model port status nodeid* ]*userid/devid*

**Explanation:** Response to QUERY NODE *nodeid* PORT command. The optional fields are present if they were specified in the VM/Pass-Through configuration file for this particular port entry. If a device does not have an explicit model number (for example, 3270 printer devices), then a value of "0" is displayed for model.

*port status* can be:

RESERVED - port has been modified OFF.
ACTIVE - port is in use.
FREE - port is available for use.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**087I** **USER** *userid/devid* **DEV** *real devaddr* **INACTIVE**

**Explanation:** Response to QUERY USER command. The message indicates that there is no session active for this attached display support task. If the console address is not zero, the associated user is in the selection screen processing.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**088I** **USER** *userid/devid* **DEV** *real devaddr device type*MDL *model* **IN SESSION AT** *nodeid port number or logical devaddr*

**Explanation:** Response to QUERY USER command. This response gives information concerning a VM/Pass-Through session. Not only is the origin and destination information given, but also information concerning the physical terminal being used. If a device does not have an explicit model number (for example, 3270 printer devices), then a value of "0" is displayed for model.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**089I** **NODE** *nodeid* **ROUTED THROUGH** *nodeid*

**Explanation:** If module issuing was:

NEV: Routing has been dynamically added to the internal route list.
QRY: Response to a QUERY ROUTE or QUERY NODE command.

**System Action:** None

**User Action:**

NEV: System programmer puts indicated route in configuration file if appropriate.

QRY: none

**Modules Issuing:** DVMNEV, DVMQRY

**090I** **NO ROUTE ENTRIES**

**Explanation:** In response to a QUERY ROUTE command, no ROUTE entries were found in the configuration file, and no dynamic ROUTE entries have been made.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**091I SYSTEM IS QUIESCING**

**Explanation:** In response to a QUERY SYSTEM command, indicates that a QUIESCE SYSTEM command has been issued.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**092E NODE *nodeid* DOES NOT HAVE PORTS**

**Explanation:** In response to a QUERY NODE *nodeid* PORT command, this indicates that the specified node is not connected via a 327X emulator or remote 3270 line. The PORT parameter is valid for 327X emulator and remote 3270 lines only.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**093E NODE NAME *nodeid* NOT FOUND**

**Explanation:** In response to a QUERY NODE command, indicates that the specified node is not defined in the configuration file.

**System Action:** None

**User Action:** Check the configuration file for specified node names.

**Modules Issuing:** DVMQRY

**095I *prtid* REAL *devaddr prt status* NODE *nodeid* PORT *port***

**Explanation:** This is the response to a QUERY PRT command.

*prt status* can be:

ACTIVE indicates printer session initiation in progress.
CONNECTED indicates a printer session has been established.
NOT READY indicates that the printer requires operator intervention.

*port* can be:

nnn
NOT ASSIGNED

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**101E RETURN CODE *code* FROM SIGNON USER EXIT**

**Explanation:** Installation session control exit returned to VM/Pass-Through with an invalid return code.

**System Action:** Return code is treated as a zero return code, and processing continues.

**System Programmer Action:** Correct the exit routine if required.

**Modules Issuing:** DVMNET, DVMNEV

**102I SESSION START FROM *nodeid userid/devid* TO *nodeid port number or logical devaddr***

**Explanation:** Notifies the VM/Pass-Through console that a session has started as indicated.

**System Action:** None

**System Programmer Action:** None

**Modules Issuing:** DVMNEV

**103I SESSION ENDED FROM *nodeid userid/devid* TO *nodeid port number or logical devaddr***

**Explanation:** Notifies the VM/Pass-Through console that a session has ended as indicated.

**System Action:** None

**System Programmer Action:** None

**Modules Issuing:** DVMNEV

**104I LINE *line address* IS UP**

**Explanation:** The line driver for the indicated line is connected and communications established.

**System Action:** None

**System Programmer Action:** None

**Modules Issuing:** DVMNEV

**105W LINE *line address* IS DOWN**

**Explanation:** The indicated line driver is terminating. If module DVMNET issued this message, the line driver will not be automatically restarted.

**System Action:** Terminate all sessions being conducted through this link.

**System Programmer Action:** Restart the line when it becomes available.

**Modules Issuing:** DVMBSC, DVMCTC, DVMNET, DVMRMA, DVMRSF, DVMSIM

**106I RESTARTING LINE *line address***

**Explanation:** A line driver is attempting automatic restart of a down line.

**System Action:** Attempts to restart the down line.

**System Programmer Action:** None

**Modules Issuing:** DVMNET

**110E COULD NOT ATTACH LINE DRIVER**

**Explanation:** System program error. Session manager received an error return code when attempting to attach a line driver task.

**System Action:** Terminate VM/Pass-Through. Produce a dump of the type specified in the configuration DUMP record.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET

**111E RETURN CODE *code* ON VMCF RECEIVE *userid msgid***

**Explanation:** VM/Pass-Through received a bad return code from CP after issuing a RECEIVE to VMCF.

**System Action:**

NET: Terminate VM/Pass-Through and produce a dump of the type specified in the DUMP record of the configuration file.

UIN: Terminate the user session and take a partial dump.

USI: Exit to CMS.

**System Programmer Action:** Take action indicated by return code explanation in *VM/XA Migration Aid: System Messages and Codes Reference.*

**Modules Issuing:** DVMNET, DVMUIN, DVMUSI

**114E COULD NOT HANDLE VMCF DEFAULTS**

**Explanation:** System program error. The session manager's request to be the VMCF default task is rejected by the multitasking supervisor.

**System Action:** Terminate VM/Pass-Through.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET

**116E ADDRESS *nnn* ALREADY IN USE**

**Explanation:** The address specified on a START command line is already in use.

**System Action:** Ignore the command.

**System Programmer Action:** Use the QUERY command to determine related status. Reenter the command, specifying the correct address. Issue CP command, QUERY VIRTUAL ALL, to determine what virtual devices are defined.

**Modules Issuing:** DVMNET

**118E RETURN CODE *code* ON VMCF REPLY *userid***

**Explanation:** VM/Pass-Through received a bad return code from CP after issuing a REPLY to VMCF.

**System Action:**

NET: Terminate VM/Pass-Through and produce a dump of the type specified in the DUMP record of the configuration file.

UIN: Terminate the user session and take a partial dump.

**System Programmer Action:** Take action indicated by return code explanation in *VM/XA Migration Aid: System Messages and Codes Reference*.

**Modules Issuing:** DVMNET, DVMUIN

**119E COULD NOT ATTACH USER INTERFACE**

**Explanation:** System program error. Session manager received an error return code when attempting to attach a user support task.

**System Action:** Terminate VM/Pass-Through. Produce a dump of the type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET, DVMNEV

### 120E INTERNAL ROUTE LIST IS FULL

**Explanation:** The system attempted to add a node to the route list but the list is full (10 dynamic entries used).

**System Action:** The session with the affected node is not allowed. The user at that node is sent the "ROUTE LIST FULL" message.

**System Programmer Action:** Update the configuration file to include all dynamically added ROUTE entries as well as the one just rejected.

**Modules Issuing:** DVMNET

### 121E COULD NOT POST INTERFACE ON LINE DROP

**Explanation:** System program error.

**System Action:** Ignore the POST and continue.

**System Programmer Action:** If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET

### 122E NO TABLE ENTRY ON LINE DOWN

**Explanation:** No active link table could be found for the line that caused message 121 to be issued.

**System Action:** Terminate VM/Pass-Through and produce a dump of the type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET

### 123E COULD NOT DETACH LINE DRIVER

**Explanation:** System program error. Session manager received an error return code when attempting to detach a line driver.

**System Action:** Ignore the DETACH and continue.

**System Programmer Action:** If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMNET

### 126E LINE ADDRESS *nnn* DOES NOT EXIST

**Explanation:** The virtual address of the line does not exist.

**System Action:** Ignore the command.

**User Action:** Issue a START command for the proper line address.

**Modules Issuing:** DVMNET

**127E** *error message*

**Explanation:** This response specifies the reason why a command or message could not be forwarded to appropriate nodes.

**System Action:** None

**User Action:** Take action appropriate for the message.

**Modules Issuing:** DVMNET, DVMRMB

**128E** **PRT *nnn* IS NOT AVAILABLE**

**Explanation:** The request specifies a 3270 Information Display System printer device that is not available to VM/Pass-Through. This is because either the device has not been attached or the virtual address is incorrect.

**System Action:** Reject the request for printer session initiation.

**User Action:** Determine if the problem is due to the lack of a defined printer in CP or to an incorrect printer address specified on the START request. If the printer is not defined to CP, then the system programmer must resolve the omission. If the printer address is incorrect, then resubmit the command using the correct address. To determine what virtual printer devices are defined, issue the CP command, QUERY VIRTUAL ALL or NETWORK QUERY ALL.

**Modules Issuing:** DVMNET

**130E** **PRT *nnn* IS NOT DEFINED AS A 3270 PRINTER**

**Explanation:** The request is to start an attached printer task. The virtual device identified in the request is not defined as a 3270 Information Display System printer.

**System Action:** Reject the request for printer session initiation.

**User Action:** Use the CP command, QUERY VIRTUAL ALL or NETWORK QUERY ALL, to determine which virtual printers are defined. Resubmit the request with the appropriate virtual printer address.

**Modules Issuing:** DVMNET

**133E** **PRT *nnn* ASSIGNED AN INVALID PORT NUMBER**

**Explanation:** Valid port numbers range from 0 to 31. The port number entered on the session initiation request did not fall within this range.

**System Action:** The request for the printer session is terminated.

**User Action:** Resubmit the request with a valid port number specified.

**Modules Issuing:** DVMNET

**140E CONVERTED BUFFER NOT FULL PAGE**

**Explanation:** Macro DVMCBUF was called upon to convert a full page buffer to a smaller buffer, but the address supplied was not a full-page boundary.

**System Action:** Terminate VM/Pass-Through. Produce dump of type specified in the DUMP record of the configuration file.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBFR

**150I USER** *userid/devid* **CONNECTED TO NODE** *nodeid logical devaddr or port number*

**Explanation:** The local system has initiated a VM/Pass-Through session with the indicated user or device. Printer sessions can be initiated only by authorized users.

**System Action:** None

**System Programmer Action:** None

**Modules Issuing:** DVMUGR, DVMUIN, DVMUPR

**151I USER** *userid/devid* **DROPPED FROM NODE** *nodeid logical devaddr or port number*

**Explanation:** A VM/Pass-Through interactive or printer session has been terminated. In the case of printer sessions, termination may have resulted either from a DROP command or because the connection to the target was broken. Printer sessions can be terminated (DROP command) only by authorized users.

**System Action:** If a printer session terminated because of a broken connection, the system will attempt to reestablish the session. No action is taken for other conditions.

**System Programmer Action:** None

**Modules Issuing:** DVMUGR, DVMUIN, DVMUPR

**152E RETURN CODE** *code* **ON VMCF SEND** *userid msgid*

**Explanation:** VM/Pass-Through received a bad return code from CP after issuing a SEND to VMCF.

**System Action:**

UIN: Terminate the user session and take a partial dump.
USI: Return to CMS

**System Programmer Action:** Take action indicated by return code explanation in *VM/XA Migration Aid: System Messages and Codes Reference.*

**Modules Issuing:** DVMUIN, DVMUSI

**153E RETURN CODE 4 FROM DVMHNDV**

**Explanation:** This is a program error. Error return code resulted from a request to handle VMCF interrupts.

**System Action:** Terminate the connection to the VMCF user.

**System Programmer Action:** Attempt to restart the system. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMAPP, DVMUIN

**154E DVMEXTT TABLE OVERFLOW**

**Explanation:** Error return code resulted from a request to handle an EXTERNAL interrupt. The EXT table is full.

**System Action:** Terminate the connection with the user.

**System Programmer Action:** Check the number of entries defined on the EXT record of the configuration file.

**Modules Issuing:** DVMAPP, DVMUIN

**155E INVALID VMCF SIGNON DATA**

**Explanation:** A user support task received a user SIGN request, but the associated data was not valid.

**System Action:** Reject the VMCF transaction and terminate the user session.

**System Programmer Action:** If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUIN

**156E BAD RETURN FROM POST**

**Explanation:** System program error on POST of another task by UGR, UIN, or UPR.

**System Action:** Terminate the interactive or printer session.

**System Programmer Action:** If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUGR, DVMUIN, DVMUPR

**157E VMCF *nn* NOT A SEND FOR *userid msgid***

**Explanation:** A user support task received the indicated VMCF interrupt that is not a SEND and is therefore invalid.

**System Action:** Reject the VMCF transaction and terminate the user session.

**System Programmer Action:** If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUIN

**158E SEGMENT MISSING ON INPUT**

**Explanation:** The specified task received segmented data either in the wrong order or with a segment missing.

**System Action:** Terminate the associated session and take a partial dump.

**System Programmer Action:** If the problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMAPP, DVMRMB, DVMUGR, DVMUPR, DVMUSI

**170E CHANNEL ERROR STATUS *code* DEV *devaddr***

**Explanation:** There was a hardware channel error on the specified line. *code* is the CSW status, and *devaddr* is the virtual device address.

**System Action:** Terminate the specified link.

**System Programmer Action:** Check error status and take action defined for installation hardware problems.

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM, DVMUGR

**171E UNKNOWN DEVICE STATUS ON INITIALIZATION**

**Explanation:** VM/Pass-Through is not programmed to handle hardware display status received (session initiated via DIAL command).

**System Action:** Detach affected display.

**System Programmer Action:** Check error status and take action defined for installation hardware problems.

**Modules Issuing:** DVMUGR

**172E UNIT CHECK ON SENSE**

**Explanation:** VM/Pass-Through received hardware sense information error.

**System Action:** Detach affected device.

**System Programmer Action:** Check error status and take action defined for installation hardware problems.

**Modules Issuing:** DVMUGR, DVMUPR

**173E RETURN CODE 4 FROM DVMHNDI**

**Explanation:** This is a system program error. Error return code resulted from a request to handle I/O interrupts.

**System Action:** Terminate the affected task.

**System Programmer Action:** Attempt to restart the system. (If RMB, attempt to restart the task.) If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMBSC, DVMRMA, DVMRSF, DVMSIM, DVMUGR, DVMUPR

**174E DVMDEVT TABLE OVERFLOW**

**Explanation:** Error return code resulted from a request to handle I/O interrupts. The table is full.

**System Action:** Terminate the affected task.

**System Programmer Action:** Check the number of entries defined on the I/O record of the configuration file.

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMA, DVMRSF, DVMSIM, DVMUGR, DVMUPR

**176E PERM I/O ERROR ON DEV *nnn***

**Explanation:** VM/Pass-Through received uncorrectable I/O errors with the device on address *nnn*, which was dialed to the pass-through virtual machine.

**System Action:** Take a CP DUMP of the affected control blocks and detach the device.

**System Programmer Action:** Check error status and take action defined for installation hardware problems.

**Modules Issuing:** DVMUGR, DVMUPR

**177E PRINTER *nnn* IS NOT READY**

**Explanation:** A request was made to use, in a VM/Pass-Through session, the 3270 Information Display System printer at address *nnn*. However, the printer is in a 'not ready' state.

**System Action:** The request for a session is rejected.

**User Action:** Determine the problem with the device, correct it, and resubmit the request for a printer session.

**Modules Issuing:** DVMUPR

**178E** *prtid status message*

**Explanation:** A request was made for a printer session to a node. The *message* describes the reason for the failure to initiate the session.

*status* can be:

NOT STARTED
WAITING

**System Action:** If the *message* indicates the failure is because the link is not connected, the system will retry the request up to five times at 30-second intervals, and subsequently at 10 minute intervals. Any other failure will cause the START request to be terminated.

**User Action:** If the system is in its 10-minute retry cycle because the link was not connected and you find it necessary to break the cycle, issue the DROP PRT or QUIESCE PRT command. For other failures, determine the cause of the problem and take corrective action.

**Modules Issuing:** DVMUPR

**179I** *prtid* **WAITING FOR REMOTE SESSION INITIATION**

**Explanation:** A printer session was requested between the 3270 Information Display System printer whose virtual address is identified in the message at a node distant from the local VM/Pass-Through system. The request has been forwarded to the next node in the path.

**System Action:** None

**User Action:** Wait for the session initiation to complete or for an error message to be returned.

**Modules Issuing:** DVMUPR

**180I** **LDA** *lda address* **CREATED FOR** *nodeid userid*

**Explanation:** The specified logical device *lda address* has been created on the local VM/Pass-Through system for the user at *nodeid* identified by the *userid* field.

**System Action:** None

**System Programmer Action:** None

**Modules Issuing:** DVMAPP

**181I** **LDA** *lda address* **ENDED FOR** *nodeid userid*

**Explanation:** The specified logical device has been deleted on the local VM/Pass-Through system for the user at *nodeid* identified by the *userid* field.

**System Action:** None

**System Programmer Action:** None

**Modules Issuing:** DVMAPP

**183E** **CC =** *cond code* **RC =** *return code* **ON** *function* **FUNCTION**

**Explanation:** Logical device support task received an error condition while issuing the specified function to logical device DIAGNOSE.

*function* can be:

INITIATE
PRESENT
ACCEPT

**System Action:** Terminate the affected session. Produce a CP dump of affected control blocks and terminate task.

**System Programmer Action:** Check the codes in the *VM/XA Migration Aid: CP Command and Diagnose Reference* for DIAGNOSE 7C. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMAPP

**187I** **SNAP STOPPED**

**Explanation:** Upon request, the issuing module has halted tracing of its data blocks/buffers.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**188I** **SNAP STARTED**

**Explanation:** The issuing module (line driver) has begun the requested trace of its data blocks/buffers.

**System Action:** The line driver will take a snapshot dump of each data block/buffer it receives and sends across the telecommunication line. This activity continues until the line driver receives a corresponding request to stop the tracing.

**User Action:** None

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**201E U/C ON SET MODE COMMAND**

**Explanation:** Unit check on hardware.

**System Action:** Terminates affected line driver and produces a partial dump.

**System Programmer Action:** Check the I/O trace in the dump produced to determine cause of the error.

**Modules Issuing:** DVMSIM

**202E U/E ON SET MODE COMMAND**

**Explanation:** Unit exception on hardware.

**System Action:** Terminates the affected line driver and produces a partial dump.

**System Programmer Action:** Check the I/O trace in the dump produced to determine cause of the error.

**Modules Issuing:** DVMSIM

**203E U/C ON ENABLE COMMAND**

**Explanation:** Unit check on hardware.

**System Action:** Terminates affected line driver and produces a partial dump.

**System Programmer Action:** Check the I/O trace in the dump produced to determine cause of the error.

**Modules Issuing:** DVMRSF, DVMSIM

**204E U/E ON ENABLE COMMAND**

**Explanation:** Unit exception on hardware.

**System Action:** Terminates affected line driver and produces a partial dump.

**System Programmer Action:** Check the I/O trace in the dump produced to determine cause of the error.

**Modules Issuing:** DVMRSF, DVMSIM

**205E U/C ON PREPARE READ COMMAND**

**Explanation:** Unit Check on hardware.

**System Action:** Terminates affected line driver and produces a partial dump.

**System Programmer Action:** Check the I/O trace in the dump produced to determine cause of the error.

**Modules Issuing:** DVMRSF, DVMSIM

**206E U/C ON SENSE COMMAND**

**Explanation:** Unit check on hardware.

**System Action:** Terminate affected line driver and produce a partial dump.

**System Programmer Action:** Check the I/O trace in the dump produced to determine cause of the error.

**Modules Issuing:** DVMBSC, DVMRMB, DVMRSF, DVMSIM

**207E TRACE DEVICE COULD NOT BE ALLOCATED**

**Explanation:** On a TRACE LINE command the system could not find an available address between X'10' and X'FF' to allocate for a virtual printer.

**System Action:** Ignore the command.

**System Programmer Action:** Free an address for the virtual printer and reissue the command.

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**208E INVALID DATA FROM POLL OR SELECT**

**Explanation:** The information received from a target system is not a valid 3271/3274 poll or selection address.

**System Action:** Ignore the POLL or SELECT.

**System Programmer Action:** If problem persists, check for a telecommunications line problem.

**Modules Issuing:** DVMSIM

**209E UNCORRECTABLE LINE ERRORS**

**Explanation:** The number of 'Command Reject's, 'Equipment Check's, 'Bus Out Check's, or 'Intervention Required' sense status has reached its limit, ten.

**System Action:** Terminate the associated line driver.

**System Programmer Action:** Wait for subsequent messages (211 and 257), which will contain error data.

**Modules Issuing:** DVMBSC, DVMRMB, DVMRSF, DVMSIM

**211I** **NAK=*nnn*,EQ=*nnn*,CR=*nnn*, IR=*nnn*,BO=*nnn*,EC=*nnn*, DC=*nnn*,OR=*nnn***

**Explanation:** These are line error statistics displayed in response to a QUERY LINE CTRS command or as a result of a line driver termination.

**Explanation:**

NAK is number of negative acknowledgements sent due to received errors.
EQ is number of ENQ control characters sent due to error conditions.
CR is number of COMMAND REJECTS received.
IR is number of INTERVENTION REQUIRED status received.
BO is number of BUS OUT checks.
EC is number of EQUIPMENT CHECKS.
DC is number of DATA CHECKS.
OR is number of DATA OVERRUNS.
LD is number of LOST DATA conditions.
TO is number of line TIMEOUTS.

**System Action:** None

**System Programmer Action:** Take action appropriate for the statistics displayed.

**Modules Issuing:** DVMRMA, DVMRMB, DVMRSF, DVMSIM

**212E** **U/C OR NAK ON WRITE ACK/RD/RESPONSE**

**Explanation:** Teleprocessing protocol error recovery failed because of a unit check.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**213E** **U/C ON WRITE NAK READ RESPONSE**

**Explanation:** Unit check condition occurred.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMSIM

**214E** **U/C ON WRITE DATA READ RESPONSE**

**Explanation:** Unit check condition occurred.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**215E ENQUIRY ON WRITE DATA READ RESPONSE**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**216E RECEIVE WACK ON WRITE DATA READ RESPONSE**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**217E RECEIVED ACK0 SHOULD HAVE RECEIVED ACK1**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**218E RECEIVED ACK1 SHOULD HAVE RECEIVED ACK0**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**220E NAK ON WRITE DATA READ RESPONSE**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**221E NO RESPONSE ON WRITE DATA READ**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**225E NO ETX RECEIVED**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**226E PROGRAM TIME OUT ON ENABLE OR SET MODE COMMAND**

**Explanation:** ENABLE or SET MODE did not complete within the specified time period.

**System Action:** Program waits for command execution to complete.

**System Programmer Action:** Check teleprocessing hardware for ready condition.

**Modules Issuing:** DVMSIM

**227E U/C ON WRITE EOT**

**Explanation:** Unit check condition occurred.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF

**229E ENQUIRY ON INPUT**

**Explanation:** Teleprocessing protocol error.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF, DVMSIM

**230E LINE DETACHED**

**Explanation:** Line driver has determined that a line's virtual address no longer exists.

**System Action:** Terminate affected line driver.

**System Programmer Action:** Determine if the affected line should have been detached. If not, notify the operator to have the line reattached.

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMA, DVMRMB, DVMRSF, DVMSIM

**231I LINE TRACING TERMINATED**

**Explanation:** This is a response to a TRACE LINE OFF command.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMA, DVMRMB, DVMRSF, DVMSIM

**232I LINE TRACING STARTED**

**Explanation:** This is a response to a TRACE LINE ON command.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**233I LINE TRACING NOT STARTED**

**Explanation:** This is a response to a TRACE LINE OFF command when the affected line was not started.

**System Action:** Ignore the command.

**User Action:** Verify the line address, then reissue command.

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**234E TRACE DESTINATION VMID NOT VALID; DEFAULT USED**

**Explanation:** This is a response to a TRACE LINE ON command that specifies a destination vmid for the output. The CP SPOOL command returned an error condition indicating that the vmid specified is not valid.

**System Action:** The default spooling will occur.

**User Action:** If the default spooling is not wanted, issue a CP SPOOL command to spool the allocated printer as wanted, or issue a TRACE OFF command and reissue the TRACE ON command with a proper vmid.

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**235E DIAGNOSE 28 RETURN CODE *nnn***

**Explanation:** This message is produced by either the emulator line driver (SIM) or the remote 3270 line driver (RMB) when an attempt has been made to dynamically modify the channel program; the CP DIAGNOSE used to accomplish this returned an error return code.

**System Action:** Issue error message and terminate the task.

**System Programmer Action:** Attempt to restart the line driver. If problem persists, initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMRMB, DVMSIM

**236I LINE TRACING ALREADY STARTED**

**Explanation:** This is a response to a TRACE LINE ON command when the affected line already had tracing started.

**System Action:** Ignore the command.

**System Programmer Action:** Verify the line address, and if necessary, reissue command.

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**250E REMOTE NODE IS LOOKING FOR *nodeid***

**Explanation:** The nodeid on the ROUTE or LINK record in the local VM/Pass-Through system configuration file does not match the LOCAL nodeid defined for a target node.

**System Action:** Terminates associated line driver.

**System Programmer Action:** Correct the configuration file that is in error.

**Modules Issuing:** DVMBSC, DVMCTC

**251E SIO ERROR CSW=*csw* RETRY=*nn* LINE=*line address***

**Explanation:** Response from an SIO by CP indicates an error condition on the local hardware or system program. The CSW status is *csw*, the number of times the I/O was retried is *nn*, and the line address is *line address*.

**System Action:** Issue error message and terminate the affected line driver.

**System Programmer Action:** None

**Modules Issuing:** DVMBSC, DVMCTC, DVMRMB, DVMRSF, DVMSIM

**252E PERMANENT U/C**

**Explanation:** Telecommunications error recovery for BSC line failed due to unit check.

**System Action:** Terminate the affected line driver.

**System Programmer Action:** Take action indicated by analysis of associated dump or messages.

**Modules Issuing:** DVMBSC

**253E PERMANENT U/C ON INITIALIZATION**

**Explanation:** Telecommunications recovery failed for BSC line at initial line connection due to a unit check condition.

**System Action:** Terminate the associated line driver.

**System Programmer Action:** Take action indicated by analysis of associated dump or messages.

**Modules Issuing:** DVMBSC

**254E U/C OR U/E ON ENABLE CCW SEQUENCE**

**Explanation:** A BSC line driver received a unit check or unit exception condition on initial line startup.

**System Action:** Terminate the affected line driver.

**System Programmer Action:** Check teleprocessing hardware status.

**Modules Issuing:** DVMBSC

**255E LINE HAS TIMED OUT**

**Explanation:** The specified timeout limit was reached without receiving data from the other end of the line.

**System Action:** Terminate affected line driver. Session manager attempts to restart the line driver if it was previously connected to a target system.

**System Programmer Action:** If connection is not automatically reestablished, check the line status and target system status.

**Modules Issuing:** DVMBSC

**257I** **NR=*nnn*,NS=*nnn*,CR=*nnn*, IR=*nnn*,BO=*nnn*,EC=*nnn*, DC=*nnn*,OR=*nnn*,LD=*nnn*, TO=*nnn***

**Explanation:** These are line error statistics displayed in response to a QUERY LINE command or as a result of a line driver termination.

NR is number of negative acknowledgements received from the other side.
NS is number of negative acknowledgements sent to the other side.
CR is number of COMMAND REJECTS received.
IR is number of INTERVENTION REQUIRED status received.
BO is number of BUS OUT checks.
EC is number of EQUIPMENT CHECKS.
DC is number of DATA CHECKS.
OR is number of DATA OVERRUNS.
LD is number of LOST DATA conditions.
TO is number of line TIMEOUTS.

**System Action:** None

**User Action:** Take action appropriate for the statistics displayed.

**Modules Issuing:** DVMBSC

**258I** *text of target shut down message*

**Explanation:** Explanation to local VM/Pass-Through why a target system is shutting down.

**System Action:** Terminate the associated line driver. The session manager attempts to restart the line driver.

**System Programmer Action:** Take action appropriate for the displayed message text.

**Modules Issuing:** DVMBSC

**259E** **DATA BUFFER TOO LONG**

**Explanation:** The associated task was posted with a data buffer that exceeds the maximum that can be placed in a transmission buffer.

**System Action:** Issue a CP DUMP command to print the buffer, and then release it.

**System Programmer Action:** If the problem persists, the system programmer should initiate local diagnostic procedures to handle system program problems.

**Modules Issuing:** DVMBSC, DVMCTC

**271E U/C ON DISABLE**

**Explanation:** A unit check condition has occurred on a DISABLE command to the TP line. This is probably a hardware problem.

**System Action:** Terminates affected line driver and produces a partial dump.

**System Programmer Action:** If connection is not automatically reestablished, check the line status, teleprocessing control unit, and modem.

**Modules Issuing:** DVMRSF

**272E U/C ON WRITE BID**

**Explanation:** Teleprocessing protocol error recovery failed due to a unit check.

**System Action:** Dump associated areas, then ignore the error condition.

**System Programmer Action:** Take action indicated by associated dump or messages.

**Modules Issuing:** DVMRSF

**300E REMOTE NODE ID IS** *nodeid*

**Explanation:** There is a nodeid conflict between the local and the target VM/Pass-Through system's configuration files.

**System Action:** Terminates associated line driver.

**System Programmer Action:** Correct the configuration file that is in error.

**Modules Issuing:** DVMCTC

**303I LINE IS DRAINING**

**Explanation:** Either a channel-to-channel line driver has received an indication from the other end that the remote system is shutting down, or a QUIESCE command has been issued for that line driver.

**System Action:** Terminates associated line driver.

**System Programmer Action:** None

**Modules Issuing:** DVMCTC

**304E NULL OR UNKNOWN DATA RECEIVED**

**Explanation:** The line driver received either no data from the other side, or the data was not of the correct format.

**System Action:** Dumps the DVMTCB control block and data buffer, and terminates the line driver.

**System Programmer Action:** Check for hardware errors on the CTCA. If you find none and the problem persists, initiate local diagnostic procedures for handling system program errors.

**Modules Issuing:** DVMCTC

**400E INVALID PF KEY SPECIFIED**

**Explanation:** User entered a PF key number on the PASSTHRU command line that is not within the range of 1 to 24.

**System Action:** Return to CMS.

**User Action:** Reenter command with valid PF key number.

**Modules Issuing:** DVMUSI

**401E INVALID NUMBER FOR NOTEPAD**

**Explanation:** User entered an invalid line or column number on the PASSTHRU command line.

**System Action:** Return to CMS.

**User Action:** Reenter command with valid line and/or column numbers.

**Modules Issuing:** DVMUSI

**402E CANNOT USE SAME KEY FOR MORE THAN ONE USE**

**Explanation:** You specified the same PA or PF key for more than one function on the PASSTHRU command line. For example, you specified the same key for Notepad facility and for session terminate.

**System Action:** Return to CMS.

**User Action:** Specify a different PA or PF key for each function on the PASSTHRU command line.

**Modules Issuing:** DVMUSI

**403E RETURN CODE *code* FROM WAITD**

**Explanation:** VM/Pass-Through received an error code from the WAITD macro.

**System Action:** Terminate the session.

**User Action:** Check the return code in the *VM/XA Migration Aid: CMS Command Reference for Installation and Service*, GC19-6231. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**404E RETURN CODE *code* FROM DVMXVM GET**

**Explanation:** DVMUSI received error code following a CALL to DVMXVM with the GET option. The code returned is:

1 - invalid parameter list

**System Action:** Terminate the session.

**User Action:** Reissue the PASSTHRU command. If problem persists, have the system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**405E NO NOTEPAD PF KEY SPECIFIED**

**Explanation:** User entered a line or column number on the PASSTHRU command line, but has not entered a PF key for the notepad option.

**System Action:** Return to CMS.

**User Action:** Reenter command adding the PF key, or deleting the line and/or column numbers.

**Modules Issuing:** DVMUSI

**406E RETURN CODE *code subcode* FROM GRAPHICS INITIALIZATION**

**Explanation:** DVMUSI received an error return code from DVMGRF on initialization. The return codes are:

4 - ATTENTION bit stored in CSW
8 - screen in use by CP
12 - unexpected error
For return code 12, the subcodes are:
1 - console not a 327x
2 - device not available (cc 3)
3 - unexpected I/O error
4 - chained CCW string not completed
5 - bad 3270 orders in output data
6 - full-screen CP support not available

**System Action:** Return to CMS.

**User Action:** Reissue PASSTHRU command. If problem persists, have the system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**407E VMCF SEND DATA ERRORS *code* ON SEND OF LENGTH *length* *msgid***

**Explanation:** DVMUSI received an error status from a VMCF SEND request.

**System Action:** Return to CMS.

**User Action:** Check VMCF return code in *VM/XA Migration Aid: System Messages and Codes Reference*. Reissue PASSTHRU command. If problem persists, have the system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**408E RETURN CODE *code* FROM ERASE WRITE**

**Explanation:** DVMUSI received an error return code from DVMGRF. See VM/Pass-Through Facility message 406 for return code definitions.

**System Action:** Terminate the session.

**User Action:** Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**409E RETURN CODE *code* ON GRAPHIC READ**

**Explanation:** DVMUSI received an error return code from DVMGRF. See VM/Pass-Through Facility message 406 for return codes. In addition, if the return code is 12 and the subcode is 7, then the input buffer length or address was not positive.

**System Action:** Terminate the session.

**User Action:** Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**411E UNEXPECTED MESSAGE ID *msgid* RECEIVED**

**Explanation:** Either DVMUSI received an unexpected VMCF message id from the pass-through virtual machine, or the pass-through virtual machine received an unexpected VMCF message id from the user virtual machine.

**System Action:** If the module that issued this message was:

USI: Return to CMS.
UIN: Reject the VMCF transaction and terminate the session.

**User Action:**

USI: Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

UIN: If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI, DVMUIN

**412E INVALID VMCF FUNCTION CODE**

**Explanation:** DVMUSI received a VMCF interrupt with an unexpected function code.

**System Action:** Terminate the session.

**User Action:** Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**414E UNSUPPORTED SCREEN COMMAND** *command*

**Explanation:** The display data contains an unsupported command.

**System Action:** Terminate the session.

**User Action:** Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**415E RETURN CODE** *code* **ON GRAPHIC WRITE**

**Explanation:** DVMUSI received an error return code from DVMGRF.

4 - ATTENTION bit stored in CSW
8 - screen in use by CP
12 - unexpected error

**System Action:** Terminate the session.

**User Action:** Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**417E RETURN CODE *code* FROM DVMNOT INITIALIZATION**

**Explanation:** DVMUSI received an error return code from DVMNOT on initialization.

4 - error allocating storage for internal buffer
8 - invalid parameter list

**System Action:** Terminate the Notepad function.

**User Action:** If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**418E RETURN CODE *code* FROM DVMNOT ORDER PROCESSING**

**Explanation:** DVMUSI received an error return code from DVMNOT during order processing.

**System Action:** Terminate the Notepad function.

**User Action:** If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**419E RETURN CODE *code* FROM DVMNOT SCREEN SAVE**

**Explanation:** DVMUSI received an error return code from DVMNOT while invoking the screen copy function.

**System Action:** Terminate the Notepad function.

**User Action:** Check the *VM/XA Migration Aid: CMS Command Reference for Installation and Service* under the FSWRITE macro for return code reasons. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**420E RETURN CODE *code* FROM DVMNOT CLOSUP**

**Explanation:** DVMUSI received an error return code from DVMNOT during termination.

4 - error closing the CMS file
8 - error freeing the screen buffer

**System Action:** Terminate the Notepad function.

**User Action:** If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**421I PVM *vmid* MACHINE IS UNAVAILABLE FOR VMCF**

**Explanation:** The virtual machine specified on the PASSTHRU command line is not authorized for VMCF interrupts.

**System Action:** Return to CMS.

**User Action:** First check that the vmid specified on the PASSTHRU command line is the pass-through virtual machine. If correct, have the operator check pass-through virtual machine status.

**Modules Issuing:** DVMUSI

**422E DEVICE NAME *name* RETURNED FROM WAIT**

**Explanation:** Device *name*, which was returned from a WAIT macro, was not recognized.

**System Action:** Terminate the session.

**User Action:** Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**423E VMCF SEND *msgid* REJECTED**

**Explanation:** The pass-through virtual machine rejected the VMCF send from the user virtual machine.

**System Action:** Exit to CMS

**User Action:** Reissue PASSTHRU command. If problem persists, have system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**426E INVALID PORT NUMBER**

**Explanation:** User specified an invalid port number on the PASSTHRU command.

**System Action:** Return to CMS.

**User Action:** Reenter command with valid parameter; port numbers range from 0-31.

**Modules Issuing:** DVMUSI

**427E RETURN CODE *code* FROM VMCF IDENTIFY**

**Explanation:** DVMUSI received an error status from VMCF IDENTIFY function.

**User Action:** Check VMCF return code in

**System Action:** Return to CMS. *VM/XA Migration Aid: System Messages and Codes Reference*. Reissue the PASSTHRU command. If problem persists, have the system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**428E MUST SPECIFY NODE IF PORT SPECIFIED**

**Explanation:** User specified a port number on the PASSTHRU command, but did not specify a node name.

**System Action:** Return to CMS.

**User Action:** Reenter the command with either no port number, or both a node and port number specified.

**Modules Issuing:** DVMUSI

**429E DEVICE NOT SUPPORTED**

**Explanation:** The user is attempting to access VM/Pass-Through from a device that is either not a 3270 type display station or is an unsupported 3270 display model.

**System Action:** Return to CMS.

**User Action:** Check Appendix A, "Devices Supported by Remote 3270 Display Option-VM/Pass-Through Facility" on page 171 for supported devices.

**Modules Issuing:** DVMUSI

**800I LINE *line address* CLUSTER *xx* IS ACTIVE**

**Explanation:** The remote 3270 cluster *xx* on line *line address* has now become active and is responding to polling by the remote 3270 line driver.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMRMA

**801E LINE *line address* CLUSTER *xx* IN ERROR RECOVERY**

**Explanation:** I/O errors are occurring on the remote 3270 cluster *xx* on line *line address* that have not been corrected by the initial error recovery procedures.

**System Action:** The cluster has been taken out of the AUTO-POLL list and will be retried after a specific time interval has expired. If five retry sequences fail, the cluster will be placed in "DOWN" status, and all sessions will be terminated.

**User Action:** Check error message RMA807E to determine the type of error and execute installation procedures for locating TP problems.

**Modules Issuing:** DVMRMA

**802E LINE *line address* CL *xx* PORT *pp* STATUS *status***

**Explanation:** The specified port *pp* on cluster *xx* on line ***line address*** has received the status *status* while being driven by the remote 3270 line driver. This status is the status returned by the 3270 control unit. The line driver has already performed error recovery on the device without correcting the error.

**System Action:** The retry counter for the device is reset, and any session is terminated.

**System Programmer Action:** If the error continues, vary the device offline and determine the cause of the error from the status.

**Modules Issuing:** DVMRMA

**803E LINE *xxx* APPEARS TO BE IN LOOP-BACK**

**Explanation:** The remote 3270 line whose address is *xxx* appears to be returning the same data that the system is sending to it. This indicates that a modem on the TP line is in test mode.

**System Action:** The system takes a snap dump of the line driver's working storage and terminates the line driver.

**Operator Response:** Check the TP hardware to make sure that it is in proper working status.

**Modules Issuing:** DVMRMA

**804E VIRTUAL OR LDA ADDRESS IS INVALID**

**Explanation:** The lda or vaddr field of the CLPORT record is not within the range of x'00' to x'1FF' and x'00' to x'FFF' respectively.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**805E LINE *line address* CLUSTER *xx* IS DOWN**

**Explanation:** Error recovery procedures for the remote 3270 cluster *xx* on line ***line address*** have failed.

**System Action:** The cluster is now in DOWN status, all sessions are terminated, and the cluster is rechecked at a longer time interval.

**System Programmer Action:** If the cluster is supposed to be online, check error message RMA807E to determine type of error and execute your installation's procedures for locating TP problems.

**Modules Issuing:** DVMRMA

**806I** **LINE** *line address* **CLUSTER** *xx* **IS NOW OFFLINE**

**Explanation:** All sessions have terminated on the remote 3270 cluster *xx* on line *line address* and a VARY OFFLINE command had been proviously issued for the cluster.

**System Action:** The cluster is removed from the active list, and will not be checked until varied back online.

**System Programmer Action:** None

**Modules Issuing:** DVMRMA

**807E** **LINE** *line address action* **CSW** *csw* **SENSE** *xx* **DATA** *hex*

**Explanation:** The specified line *line address* has experienced I/O errors that initial error correction procedures did not correct. The *action* field indicated what function the line driver was attempting to perform. It can contain:

DISABLE

ENABLE

I-POLL - general poll issued when initializing the cluster

W-POLL - AUTO-WRAP POLL channel program

G-POLL - single cluster GENERAL POLL

S-POLL - write-specific POLL, read response

WRT-ACK - write positive acknowledgement, read response

WRT-NAK - write negative acknowledgement, read response

WRT-RVI - write reverse interrupt, read response

SELECT - write SELECT, read response

WRT-ENQ - write inquiry, read response

WRT-DATA - write data, read response

The *csw* is CSW status from the last I/O operation, *xx* is the sense byte if the last status was a UNIT CHECK, and *hex* is the first two characters read-in if applicable.

**System Action:** Place the affected cluster in IN-ERR state and retry it later.

**System Programmer Action:** Execute your installation procedures for locating TP problems.

**Modules Issuing:** DVMRMA

**808E** **LINE** *line address* **PRT** *prtid* **ENDED:** *reason*

**Explanation:** The printer session for the remote printer defined by *prtid* on line *line address* has terminated. The reason is given in *reason*

**System Action:** The system will try to initiate the session at one minute intervals five times. If the session is not initiated in this process, the system will then try to initiate the session at five minute intervals.

**System Programmer Action:** If you do not want the system to try to initiate the session, vary the port offline with the command VARY LINE *line address* CLuster *xx* Port *pp* OFFLINE.

**Modules Issuing:** DVMRMB

**809E** **LINE** *line address* **PRT** *prtid* **NOT STARTED:** *reason*

**Explanation:** The printer session for the remote printer defined by *prtid* on line *line address* could not be started. The reason is given in *reason*

**System Action:** The system will try to initiate the session at one minute intervals five times. If the session is not initiated in this process, the system will then try to initiate the session at five minute intervals.

**System Programmer Action:** If you do not want the system to try to initiate the session, vary the port offline with the command VARY LINE *line address* CLuster *xx* Port *pp* OFFLINE.

**Modules Issuing:** DVMRMB

**810E** **CLUSTER OR PORT NOT FOUND**

**Explanation:** On a VARY LINE command to a remote 3270 line driver, either the cluster or port specified in the command is not defined for that line.

**System Action:** Ignore the command.

**User Action:** Check the cluster and port specified and reissue the command.

**Modules Issuing:** DVMRMB

**811I** **CLUSTER** *xx device* **IS** *status*

**Explanation:** This is the reponse to a QUERY command referring to a remote 3270 line driver line. It gives the current status of cluster *xx* on the specified line.

*device* can be:

3271/4 not supporting extended data streams

3274E supporting extended data streams

*status* of the cluster can be:

ONLINE - active and being serviced by the line driver

IN-ERR - completed initial error recovery, waiting to attempt to correct error at time interval

DOWN - not responding to polling or has failed all efforts to correct an error. Cluster will be rechecked at a time interval.

OFFLINE - VARY OFFLINE command was issued for this cluster and it will not be serviced.

**System Action:** None

**System Programmer Action:** None

**Modules Issuing:** DVMQRY

**812I PORT** *xxx type* **MDL** *yy status* **[***feat* **LSTAT** *ssss***]**

**Explanation:** This is the response to a QUERY LINE *nnn* PORT or QUERY NODE *nodeid* PORT command referencing a remote 3270 line driver line. *xx* is the port number, *type* is the type of port, *yy* is the device model number.

This response indicates the current status of the port on the specified line. *status* of the device can be:

INACTIVE - online (not ready)
ACTIVE - ready (initial screen is displayed)
SELECT - selection screen is displayed
SIGNON - session is being started for the device
SESaION - active VM/Pass-Through session is in progress
OFFLINE - VARY OFFLINE command was issued (device is offline)

If there is more than one cluster on the line, the specified port on each cluster will be displayed.

*feat* is the 3270 extended features that are available on the device. This field will not be present if there are no extended features available on the device. *feat* can be:

H - extended highlighting
P - programmable symbols
C - color

*ssss* is the last remote 3270 status received from the device. The LSTAT *ssss* field will not be present if the associated cluster is not active.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**813I** **LDA** *lda address type* **MDL** *yy* **CONNECTED TO USER** *nodeid userid* **DEV** *addr*

**Explanation:** This is the response to a QUERY APPL command referencing a logical device created by the pass-through virtual machine executing the command. In the response, *lda address* is the specified logical device address, *type* is the type of logical device, *yy* is the device model number, *nodeid* is the VM/Pass-Through node to which the user is connected. *userid* is the VM/Pass-Through userid of the user, and *addr* is the user's physical terminal address. If the user is on a remote cluster, the physical terminal address will be the user's port number.

This response indicates the current status of the port on the specified line. If there is more than one cluster on the line, then the specified port on each cluster will be displayed.

**System Action:** None

**User Action:** None

**Modules Issuing:** DVMQRY

**814E** **CLUSTER OR PORT RANGE ERROR**

**Explanation:** On a VARY LINE *nnn* CLUSTER command, either the cluster address or the port number is not valid for the specified line.

**System Action:** Ignore the command.

**System Programmer Action:** Reissue the command specifying a correct address.

**Modules Issuing:** DVMCON

**815E** **PREVIOUS LINK TYPE NOT R3270**

**Explanation:** The link record preceding this CLUSTER or CLPORT record is not defined as an R3270 type of link.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**816E** **CLUSTER ADDRESS INVALID**

**Explanation:** The address specified in the CLUSTER record is not between 0 and 31.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**817E NUMBER OF CLUSTER PORTS INVALID**

**Explanation:** The *devmax* field on the CLUSTER record is not between 1 and 32.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**818E CLUSTER ADDRESS ALREADY DEFINED**

**Explanation:** The address specified in the CLUSTER record has already been defined by a previous CLUSTER record for the same LINK record.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**819E FOURTH PARM CAN ONLY BE 3274E**

**Explanation:** The fourth parameter on the CLUSTER record is not blank or 3274E.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the affected configuration file record.

**Modules Issuing:** DVMDIR

**820E CLPORT NOT PRECEDED BY CLUSTER**

**Explanation:** There is no CLUSTER record between the affected CLPORT record and the preceding LINK record.

**System Action:** Ignore the record

**System Programmer Action:** Insert a proper CLUSTER record in the configuration file.

**Modules Issuing:** DVMDIR

**821E SELECT NODE INVALID**

**Explanation:** The node specified in the SELECT record of the configuration file is either not defined by a LINK or ROUTE record, or is a remote 3270 line driver node.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the node name in the SELECT record.

**Modules Issuing:** DVMDIR

**822E GREATER THAN 6 PFKEYS ENTERED**

**Explanation:** There have already been six SELECT records processed in the configuration file. Only six records are allowed.

**System Action:** Ignore the record.

**System Programmer Action:** Be sure to insert only six SELECT records in the configuration file.

**Modules Issuing:** DVMDIR

**823E ATTACH FAILED RC** *code* **FOR** *lda address* **TO** *vmid vaddr*

**Explanation:** A session has been started for a printer supported by the remote 3270 line driver. The associated CLPORT record specified a *vmid* and *vaddr* for the associated logical device *lda address* to be attached to. When the logical device support task attempted to issue the CP ATTACH command to attach the device to the specified virtual machine, the ATTACH failed with return code *code*.

**System Action:** Leave the session started with the logical printer in a disabled state and not attached.

**System Programmer Action:** If the specified virtual machine is not yet logged on, manually issue the ATTACH command after the virtual machine is logged on. If the specified virtual machine is logged on, but the virtual address is incorrect, issue the ATTACH command with a proper virtual address, and correct the CLPORT record to reflect that address.

**Modules Issuing:** DVMAPP

**824E NO CLUSTERS DEFINED ON R3270 LINK**

**Explanation:** You defined a R3270 link without any valid clusters following it.

**System Action:** Ignore the record.

**System Programmer Action:** Correct the invalid cluster record(s) or add a valid record.

**Modules Issuing:** DVMDIR

**825E RETURN CODE** *code subcode* **ON MESSAGE PROCESSING**

**Explanation:** DVMUSI was processing a VM/Pass-Through message and received an error return code from DVMGRF. *code* can be:

4 - ATTENTION bit stored in CSW
8 - screen in use by CP
12 - unexpected error

*subcode* can be:

1 - console not a 327x
2 - device not available (cc 3)
3 - unexpected I/O error
4 - chained CCW string not completed
5 - bad 3270 orders in output data
6 - full-screen CP support not available

**System Action:** Terminate the session.

**User Action:** Reissue the PASSTHRU command. If the problem persists, have the system programmer initiate local diagnostic procedures for handling system program problems.

**Modules Issuing:** DVMUSI

**826E LDA ADDRESS IS INVALID**

**Explanation:** You specified a logical device address that was not in the valid range or did not begin with an 'L.' Valid addresses are 'L000' to 'LFFF.'

**System Action:** Ignore the command.

**User Action:** Reenter the command using a correct logical device address.

**Modules Issuing:** DVMQRY

**827E CANNOT QUERY SPECIFIC PORTS FOR THIS NODE**

**Explanation:** You issued a QUERY NODE *nodeid* PORTS *nnnn* or a QUERY LINE *nnn* PORTS *nnnn* for a 327x link. These commands are only valid for R3270 type links.

**System Action:** Ignore the command.

**System Programmer Action:** Reenter the command with the correct node or without a specific port requested.

**Modules Issuing:** DVMQRY

# Appendix A. Devices Supported by Remote 3270 Display Option-VM/Pass-Through Facility

These are the devices that you can use with the Remote 3270 Display Option.

### Control Units

Control units you can use are:

3271 Model 2
3274 Models 1C, 21C, 31C[4],51C[4]
3276 Models 2, 3, 4

### Display Terminals

Display terminals you can use are:

3277 Model 2
3278 Models 2[4], 3[4], 4[4], 5[4]
3279 Models 2A, 2B[4], 3A, 3B[4], S2A, S2B[4], S3G[4], 2X[4] , 3X[4]

### Printers

Printers you can use are:

3284 Models 1, 2
3286 Models 1, 2
3287 Models 1[4], 1C[4], 2[4], 2C[4]
3288 Model 2
3289 Models 1, 2

### Line Connections

The line protocol is nonswitched multipoint BSC (Binary Synchronous Communication) for all types of connection.

The types of line connections between the remote 3270 and the VM/XA Migration Aid system are:

- Switched point-to-point
- Nonswitched point-to-point
- Nonswitched multipoint

### Transmission Control Units

Transmission control units you can use are:

- 2701 Data Adapter Unit with Synchronous Data Adapter Type II
- 3704, 3705-I, 3705-II Communications Controllers in BSC Emulation Mode or under PEP (Partitioned Emulator Program)

---

[4] This support INCLUDES extended features

# Glossary

Several terms used in this book need to be defined from the perspective of the Remote 3270 Display Option—VM/Pass-Through user. The definitions below are not intended to apply if used outside the context of these books. The user is assumed to have some knowledge of telecommunications.

## B

**Binary Synchronous Communication (BSC).** A uniform procedure, using a standardized set of control characters and control character sequences, for synchronous transmission of binary-coded data between stations.

## C

**cluster.** A control unit and its associated devices.

**counterpart.** In sessions involving multiple pass-through virtual machines, each of the network line drivers that communicate with one another in those virtual machines is a counterpart. In sessions initiated from CMS, each of the components that communicate with one another (through VMCF) in the virtual machines is a counterpart. For example: the CMS support task in the pass-through virtual machine and the support application in the CMS virtual machine are counterparts.

## E

**emulation program (EP).** A control program that allows a local 3704/3705 Communications Controller to emulate the function of an IBM 2701 Data Adapter Unit, an IBM 2702 Transmission Control, or an IBM 2703 Transmission Control.

**emulator line.** The connection of a pass-through virtual machine to a multidrop telecommunications line as a tributary station on that line. The pass-through virtual machine emulates a 3271/3274 Control Unit to the non-Pass-Through target.

## H

**host software system.** A data processing system to which a network is connected and with which the system can communicate. Can be one of the following: VM/SP, VM/SP HPO, VM/XA Migration Aid, MVS/SP, MVS/XA.

**host virtual machine.** The virtual machine that owns and maintains logical devices.

## I

**initial screen.** The logo that is the first screen presented to a remote 3270 user.

**intermediate node/intermediate system.** A VM/Pass-Through node that is neither the origin nor the target (destination) node, but that exists on the path between the origin and target nodes, and whose function is to pass data between the origin and target. A support node is not considered an intermediate node because it performs functions other than those that an intermediate node would perform.
A node that is not an endpoint node.

## L

**line driver.** Software that communicates with a teleprocessing line or CTCA.

**load map.** A CMS file identifying control sections and entry points of a program loaded into storage. For Remote 3270 Display Option—VM/Pass-Through, these are PVM MAP and DVMUSI MAP created through execution of the PVMBLD and PVMGEN execs respectively.

**local.** Channel attached (as in local node, local terminal, local system).
Contrast with remote.

**local node/local system.** From the perspective of a given user, the local node is the pass-through virtual machine with which communications are first established (session initiation). See also local.

**local request.** From the perspective of a given pass-through virtual machine, a local request (for session initiation or termination) is one received from one of the user support tasks or the remote line driver.

**local terminal.** A channel-attached terminal.

**local user.** From the perspective of a given pass-through virtual machine, a local user is one who is communicating with it via one of the user support tasks or the remote line driver.

**local system.** The system that a device is connected to, even if the connection is a remote one.

**logical device.** A device that exists only in software. (However, the Control Program sees these devices as real.)

## M

**message-packeting.** A technique for packaging teleprocessing data, together with its originating and target addresses. Several such message-packets may be grouped in any sequence and transferred as an entity in a single transmission. Because of its efficiency, this technique is used by Pass-Through's networking line drivers.

**multi-leaving.** A fully synchronized two-directional transmission of a variable number of data streams (one direction at a time) between terminals and a computer, using Binary Synchronous Communication facilities. Because of its efficiency, this protocol is used by VM/Pass-Through's networking line drivers.

**multipoint link.** A type of data link where one or more clusters, each comprised of one or more devices, can each communicate in turn over one teleprocessing line with a host system at the other end of the line. Only one device may be communicating across the line with the host system at any one time. When a message transmission is completed or aborted, another device may then communicate with the host system. Communications take place in an orderly fashion using Binary Synchronous Communication multipoint protocol. The multipoint data link is nonswitched.

## N

**network node.** A point where one or more functional units interconnect transmission lines. The term node derives from graph theory, in which a node is a junction point of links, areas, or edges.
A nonlocal node that is accessible via VM/Pass-Through's network line drivers.

**network(ing) line drivers.** Line drivers involved in communications between multiple pass-through virtual machines. The BSCA, CTCA, and remote line drivers.

**node.** A point where one or more functional units (systems) interconnect transmission lines.

**nonlocal node/nonlocal system.** Any node in a VM/Pass-Through network other than the local node, regardless of the physical distance between it and the local node. Same as target node.

**nonlocal request.** From the perspective of a given pass-through virtual machine, a nonlocal request (for session initiation or termination) is one received in the form of a session control record from one of the network line drivers.

**nonlocal user.** From the perspective of a given pass-through virtual machine, a nonlocal user is one who is communicating with it via one of the network line drivers.

**non-Pass-Through node/non-Pass-Through system.** A node in a VM/Pass-Through network that is accessible from a pass-through virtual machine via a 327X emulator line. To the non-Pass-Through node, the accessing pass-through virtual machine appears to be an IBM 3271/3274 Control Unit.

**nonswitched connection.** A connection that does not have to be established by dialing. The parties on both ends of the teleprocessing line never change.

**nonswitched point-to-point line.** A telecommunication line that is permanently connected to a station.

## O

**origin node/origin system.** For a given session, it is the node at which that session is initiated.
The node to which the local or remote 3270s are connected. This is also considered the "local" system for those devices (even though the connection to the 3270s may be a remote connection).
A station from which a message or other data originates.

## P

**Pass-Through node/Pass-Through system.** A system installed with VM/Pass-Through (with or without Remote 3270 Display Option) and accessed through its pass-through virtual machine.

**point-to-point link.** A link that connects a cluster by a teleprocessing line to a node. It may be switched or nonswitched. Communications take place in an orderly fashion using Binary Synchronous Communication.

**port.** A 3270 device.
An access point for data entry or exit.

**PRELMAP.** A CMS file created through execution of the CMS PRELOAD command invoked by the PVMBLD and PVMGEN execs. The files PVM PRELMAP and DVMUSI PRELMAP contain a printable record of preloader processing including the output text filename, input file identifications, DASD storage locations, file creation dates, and diagnostic information. The PRELOAD command is documented in *VM/XA Migration Aid: CMS Command Reference for Installation and Service* (GC19-6231).

**processor node.** A 4300 processor, with the Remote Operator Console Facility, accessible via VM/Pass-Through Facility's ROCF support. The primary purpose of sessions with this type node is initialization of the processor by loading it with the VM control program. Contrast with system node.

**PVM.** Abbreviation for pass-through virtual machine.

## R

**remote.** Attached by telecommunications lines.
Not channel-attached.

**remote 3270/remote terminal.** A terminal connected to a control unit that in turn is connected via a teleprocessing line to a host software system.

**ROCF node.** A remote 4300 processor accessible via VM/Pass-Through Facility's ROCF support.

## S

**session control records.** The medium by which two pass-through virtual machines (or a pass-through virtual machine and the remote line driver) communicate session status/requests, commands, and messages between one another via network line drivers.

**support node.** The node just prior to a non-Pass-Through target node on the path from the origin node. A support node performs the emulator function for the target non-Pass-Through node.

**switched connection.** Requires establishing physical connection by a dial-up operation that is performed either manually or automatically through software. Dial up involves participation from both ends in the dial-up operation. This type of nonfixed connection allows different host systems to dial different device/control units at different times. Only one host system at a time, and only one device/control unit at a time, may dial up, be connected, carry on a session, and then hang up. Contrast this to a nonswitched connection where the link is always established to the same device/control unit (point-to-point) or clusters (multipoint).

**system node.** An initialized processor (i.e. one loaded with and running a control program). It is either a VM/Pass-Through (with or without Remote 3270 Display Option) or non-Pass-Through node and can be either a target, or for VM/Pass-Through nodes, an origin or intermediate node.

## T

**target node/target processor/target system.** For a given session, the target node is the node with which a user wishes to conduct a session. The target node is specified on the PASSTHRU command line, or selected from the displayed selection screen. Any node in the VM/Pass-Through network other than the local node, regardless of the physical distance between it and the local node.
The VM/Pass-Through or non-Pass-Through node in session with the origin node. It may be a virtual machine, a Release 1 VM/Pass-Through Facility system, or a non-Pass-Through system (such as MVS). Synonymous with nonlocal node.

## U

**userid.** The unique identification of a user to the system (pass-through virtual machine).

**user support tasks.** Those support tasks through which a local user first communicates with a pass-through virtual machine to establish a session.

# Index

## Special Characters



## A



## B



## C

## D



## E

## F



## G



## H



## I



## L

## M



## N



## P

## Q



## R

## S

## T

## U



## V



## W



## 3

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