Virtual Machine/
Enterprise Systems Architecture

Graphical User Interface Facility

Version 2 Release 4.0

SC24-5789-03

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Enterprise Systems Architecture

Graphical User Interface Facility

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Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page v.

| **Fourth Edition (July 1999)**

| This edition applies to Version 2 Release 4.0 Modification 0 of IBM® Virtual Machine/Enterprise Systems Architecture (VM/ESA®) (product number 5654-030) and to all subsequent releases of this product until otherwise indicated in new editions.

The edition replaces SC24-5789-02.

Contents

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Preface

Who Should Use This Book

This book is for end users who want to install and use the VM/ESA Graphical User Interface, or system programmers and LAN administrators who want to make VM/ESA GUI applications available to end users. The information provided in this book is useful whether or not you choose to run the CMS Desktop.

How to Use This Book

This book is intended to help you use the VM/ESA Graphical User Interface Facility. It is not intended to teach you how to use your workstation. Be sure to refer to the books provided with your platform when you have questions about your workstation or computing environment.

Pictures of windows are presented throughout this book to clarify procedure descriptions. The windows are taken directly from GUI programs running in an OS/2 environment. Although they are similar to those running in AIX and Microsoft Windows environments, they may not be exactly the same.

What This Book Contains

This book introduces the VM/ESA GUI Facility and provides guidance information on:

- Configuring your workstation
- Installing and starting the workstation agent
- Using the SET WORKSTATION command
- Using the CMS Desktop program
- Using the HELP Facility
- Using the XEDIT editor
- Planning for and administering your GUI environment
- Getting connected using TCP/IP or APPC.

The appendices include the following information:

- Interaction with the virtual console
- Three sample programs
- List of the GIF files used on the CMS Desktop toolbar
- Information on debugging problems.

How to Send Your Comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other VM/ESA documentation:

- Visit our home page at:

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  There you will find the feedback page where you can enter and submit your comments.

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Summary of Changes

This section describes the technical changes made in this edition of the book and in previous editions. For your convenience, the changes made in this edition are identified in the text by a vertical bar (|) in the left margin. This edition may also include minor corrections and editorial changes that are not identified.

How to Obtain Previous Editions of This Book

Previous editions of this book and other books in the VM/ESA library can be ordered using the order numbers listed in the *VM/ESA: General Information* manual. That book lists the order numbers and suffixes for VM/ESA books, as well as certain related books, for currently supported VM/ESA releases. When ordering a previous edition of any book, it is important to specify the correct order number suffix.

Summary of Changes for VM/ESA Version 2 Release 4.0

The VM/ESA GUI function in the Windows 3.1 environment is no longer supported.

Summary of Changes for VM/ESA Version 2 Release 3.0

New Function

- The VM/ESA GUI Facility includes the following new enhancements:
  - Windows NT workstation environment support
  - 32-bit support for Windows 95 and Windows NT
  - Source Help files (IPF files) to allow users to customize their online help information.
  - Security enhancements for the workstation agents. You can now identify the user IDs authorized to display GUI windows on your workstation. You can also specify whether you want to display the security window when you start these GUI applications.

Additional Changes

- The VM/ESA GUI function is now part of the CMS component. The workstation agent files are now located on the MAINT 400 disk.

Summary of Changes for VM/ESA Version 2 Release 2.0

New Function

- The VM/ESA GUI Facility provides the following new function:
  - APPC support for Microsoft Windows and TCP/IP support for Windows 95.
  - Toolbar support for your applications.
  - New DtBitmap object. DtBitmap lets you use graphics in your applications.

- New Picture attribute on the DtPushbutton object. Your program uses the Picture attribute on the DtPushbutton to display a graphic on a push button.

Additional Changes

- The following commands and subcommands have been moved from this manual to the *VM/ESA: CMS Command Reference*:
  - CMSDESK
  - QUERY SYSNAME
  - QUERY WORKSTATION
  - SET SYSNAME
  - SET WORKSTATION
- The following commands and subcommands have been moved from this manual to the *VM/ESA: XEDIT Command and Macro Reference*:
  - XEDIT command and subcommands
- The following CSL routine has been moved from this manual to the *VM/ESA: CMS Application Development Reference*:
  - WorkstationGetAddress CSL routine

Chapter 1. Introduction

The VM/ESA Graphical User Interface (GUI) Facility lets you run programs on your VM/ESA host system that display on a workstation using a *graphical user interface*. A graphical user interface, or GUI, is a type of user interface that takes advantage of high-resolution graphics. GUIs typically include a combination of graphics, objects, the use of pointing devices, menu bars and other menus, and overlapping windows. Figure 1 shows an example of a GUI.

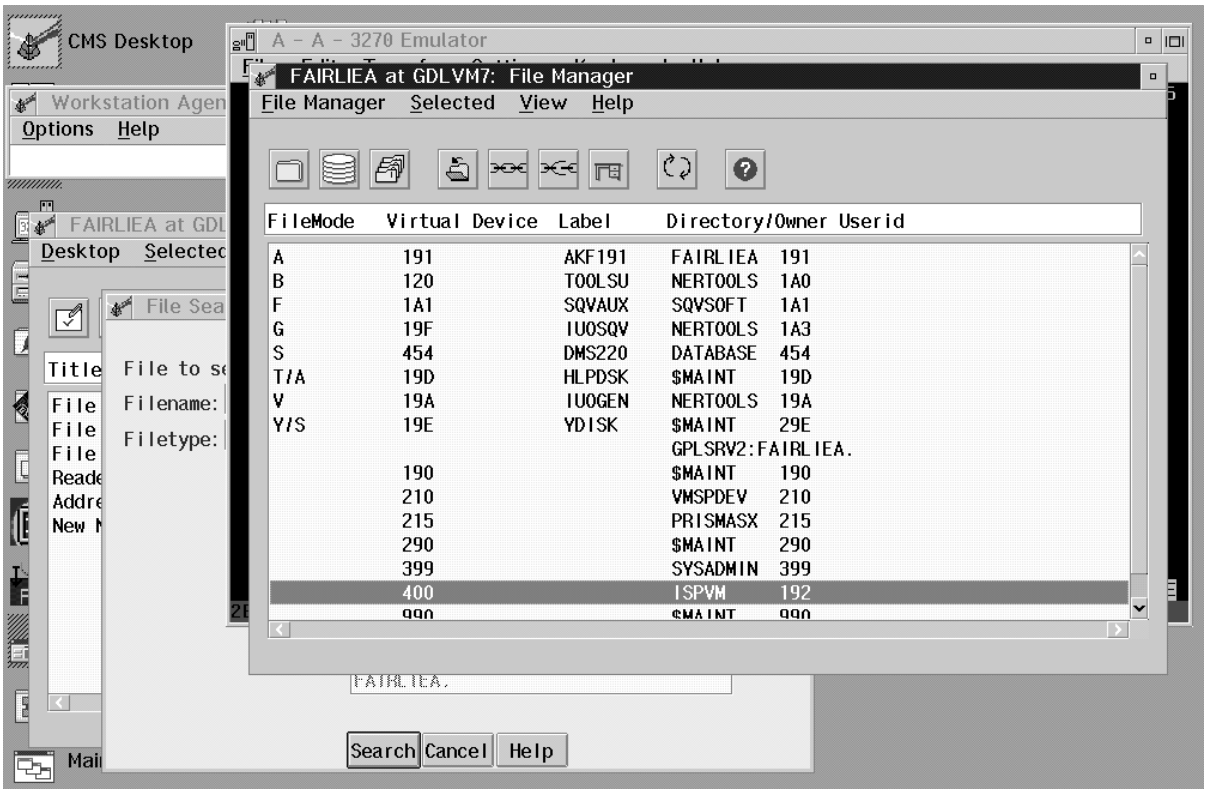

Figure 1. Sample Graphical User Interface (OS/2 system)

The VM/ESA GUI Facility lets you display programs on workstations with the following operating systems and network connections:

- OS/2 connected through TCP/IP or SNA LU 6.2
- Windows 95 connected through TCP/IP
- Windows NT connected through TCP/IP
- AIX connected through TCP/IP

For a complete description of the workstation software requirements, see “Software Requirements for Your Workstation” on page 40.

VM/ESA GUI Facility Structure

The VM/ESA GUI Facility consists of a programming interface called Distributed GUI Toolkit (DT) as well as a CMS Desktop, which is a subset of VM/ESA function that you can work with through a graphical user interface. The following figure shows the structure of the VM/ESA GUI Facility:

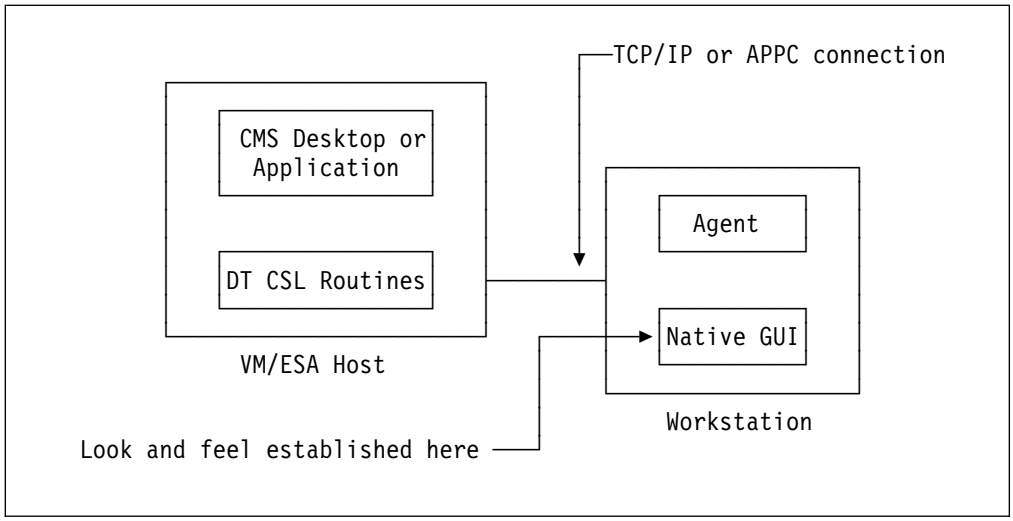

Figure 2. VM/ESA GUI Facility Structure

Distributed GUI Toolkit

Distributed GUI Toolkit is an object-based programming interface that can be used from REXX, C++, C, or Assembler languages through Callable Services Library (CSL) routine calls. Distributed GUI Toolkit provides a distributed presentation that lets programmers write host-resident applications that display on a specified workstation. Distributed GUI Toolkit supports the display of visual controls and elements found in many GUI workstation applications. For example, Distributed GUI Toolkit programs can create windows, menu bars, menus, radio buttons, check boxes, entry fields, and list boxes. With Distributed GUI Toolkit, programs can interact with the workstation clipboard, invoke workstation commands, and upload and download files.

As shown in Figure 2, Distributed GUI Toolkit consists of two parts. One part resides on the host system and the other part resides on the workstation. The CSL library routines comprise the host-resident part. The workstation-resident part of Distributed GUI Toolkit is known as the workstation agent. This agent must be downloaded and started on each workstation on which you want to display Distributed GUI Toolkit programs. The procedures for downloading and starting the workstation agent are described in Chapter 2, “Getting Started” on page 5.

Distributed GUI Toolkit is not a GUI itself. Instead, Distributed GUI Toolkit leaves the details of a window's appearance to the native GUI. That is, the look and feel of a window displayed by Distributed GUI Toolkit is the same as the other applications on that workstation. Due to this approach, some of the window details, such as the minimize and maximize buttons, vary in appearance between workstation platforms. Throughout this manual, sample windows are shown as they appear on OS/2. If you are using another workstation operating system, the appearance of your window may be different.

Refer to *IBM VM/ESA: Distributed Graphical User Interface Toolkit* for more information about creating Distributed GUI Toolkit applications.

CMS Desktop

The CMS Desktop is a subset of CMS function that uses Distributed GUI Toolkit to let you work with the functions through a graphical user interface. The CMS Desktop lets you manipulate files on your minidisks and SFS directories as well as your virtual reader files. Integrated online help, like the help provided by OS/2, is included with the CMS Desktop. If desired, you can add additional Distributed GUI Toolkit programs to the CMS Desktop. Refer to Chapter 3, “Using the CMS Desktop” on page 21, as well as the online help files, for more information about the CMS Desktop.

Advantages of Using the VM/ESA GUI Facility

The distributed structure of the VM/ESA GUI Facility brings you several advantages. Programmers write Distributed GUI Toolkit applications only on the host. No workstation code needs to be created for a Distributed GUI Toolkit application. This means any Distributed GUI Toolkit application created on VM/ESA displays on all the workstation operating systems that Distributed GUI Toolkit supports and no one needs to change a single line of code! Programmers don't even need to know how to write code for the workstation. You get the look of a GUI application without all the work of coding several separate workstation applications. In fact, programmers can write applications that make users think they are using only their workstation, not a mainframe operating system!

Another advantage of VM/ESA Distributed GUI Toolkit results from its distributed structure. Unlike some GUI-enabling systems, Distributed GUI Toolkit is designed to transmit to the host only those events that require an action by the application on the host system. This minimizes network traffic between the host and the workstation.

Advantages of Graphical User Interfaces

In addition to the unique advantages that Distributed GUI Toolkit provides, graphical user interfaces also provide you with many benefits. For example:

- You are required to remember less to use a windowing application (GUI programs are windowing applications), so they are quicker and easier to learn. Windowing applications present visual aids such as lists of choices, menu bars, pull-down menus, and list boxes. Ultimately, you spend more time focused on the task to be accomplished rather than on using the tool.
- When you are familiar with the mechanics of using one desktop application, you can apply the mechanics of the interface to other desktop applications. The supplied GUI applications follow common user interface conventions that make them look and work like other desktop applications. For example, all applications are closed by double-clicking on the upper left corner of the window, windows are maximized or minimized by clicking on the upper right corner of the application window.

Terminology

The VM/ESA GUI Facility introduces many GUI and workstation-related terms. Refer to “Glossary” on page 71 for a list of terms and their definitions.

Chapter 2. Getting Started

This section is intended to help you get started using the VM/ESA GUI Facility on your workstation. In order to use the VM/ESA GUI Facility, you must perform the following steps:

1. Configure your workstation with an appropriate operating system and connectivity product.
2. Download and install the VM/ESA GUI Facility workstation agent on your workstation.
3. Start the workstation agent.
4. Prepare your VM/ESA session to run GUI programs.
5. Start a VM/ESA GUI program (such as the CMS Desktop).

Each of these steps is outlined in more detail in the following sections.

Configuring Your Workstation

In order to use the VM/ESA GUI Facility, you need to have an operating system installed on your workstation along with an appropriate communications product for TCP/IP or APPC.

The supported operating environments are as follows:

- OS/2 with TCP/IP or APPC support
- Windows 95 with TCP/IP support
- Windows NT with TCP/IP
- AIX with TCP/IP support

For complete details on the hardware and software requirements for your workstation, see Chapter 4, “Planning and Setting Up a GUI Environment” on page 39.

Downloading and Installing the Workstation Agent

In order for a GUI program to communicate with your workstation, you need to have the workstation agent installed. The workstation agent is created from a binary VM/ESA file that you download to your workstation. These agents can be found on the workstation code disk (MAINT 400), or any other location designated by your system support personnel.

Refer to the following list to determine which files are appropriate for your workstation:

Platform	Agent File to Download	Workstation File	Other Files to Download
OS/2	VMGUIOS2 EXEBIN	VMGUIOS2.EXE	
AIX	VMGUIAIX EXEBIN	vmguiaix.exebin	IPFRRUN PKGZBIN
Windows 95	VMGUIW32 EXEBIN	VMGUIW32.EXE	
Windows NT	VMGUIW32 EXEBIN	VMGUIW32.EXE	

The workstation agent is important because it allows your workstation to communicate with VM/ESA GUI programs, and provides help files and GIF files for the CMS Desktop. To use the VM/ESA GUI Facility, the workstation agent must be located on the workstation or available to the workstation through a network server and the workstation agent must be running.

VMGUIW32 EXEBIN, used for Windows 95 or Windows NT, is a 32-bit workstation agent file.

Note: If your workstation is connected to a Local Area Network (LAN), it is possible that the workstation agent has already been installed on a network drive by your support personnel. If this is the case, you may proceed to "Starting the Workstation Agent" on page 10.

Downloading the Workstation Agent File

Using the download utility of your choice, such as File Transfer Protocol (FTP), download the appropriate workstation agent file to your workstation being careful to select a binary option.

Installing the Workstation Agent File

After the workstation agent file is downloaded to your workstation, you can begin the installation process. To start the install program, type the name of the workstation agent file at any workstation command prompt.

For example, in the OS/2 environment, type the following:

```
vmguios2
```

In the Windows 95 and Windows NT environments, select the *Start* choice, then select the *Run* choice. Then type:

```
vmguiw32
```

in the command line entry field and enter the path name where the workstation agent file is located.

In the AIX environment, type:

```
vmguiaix.exebin
```

For AIX users, be sure your install program has execute permission, and remember that the suffix is required.

Note: If you do not download the workstation agent to your workstation in binary, the install program will not execute. Depending on the workstation operating system, you will receive one of the following messages:

OS/2 VMGUIOS2 cannot be run in an OS/2 session.

Windows 95 The program cannot fit in memory.

Microsoft NT Program too big to fit in memory.

AIX VMGUIAIX.EXEBIN EXECUTE permission denied.

When the install program executes successfully, the following GUI window appears:

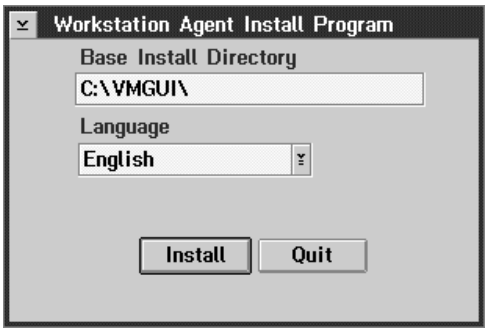

Figure 3. GUI Install Window (for OS/2)

This window lets you enter the:

1. Name of the directory into which the agent is to be installed
2. Language the workstation agent is to use when displaying messages.

The default directory is the directory in which the install program resides. If the specified directory does not yet exist, it is created during the installation process. This window also lets you specify the language in which the workstation agent displays messages. Once you have specified the appropriate choices, select the **Install** push-button. The window shown in Figure 4 should appear.

Note: If you receive an install error at this point, the disk drive you are installing to may be full. Ensure that you have sufficient space to complete the install, then retype the workstation agent file name to restart the install.

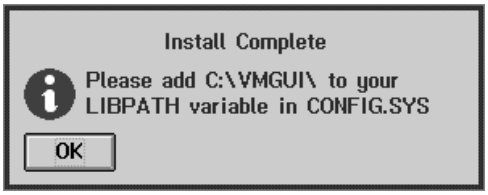

Figure 4. GUI-LIBPATH Reminder Window

This information-message window provides information for updating any necessary files. For example, in an OS/2 environment, you may want to update the LIBPATH statement in CONFIG.SYS to include the workstation agent's resident directory, so that OS/2 searches the resident directory whenever you attempt to start the workstation agent. If you don't update the LIBPATH statement, then the resident directory must be active before you can start the agent.

Note: In Windows 95 and Windows NT, you are reminded to update your PATH statement. In AIX, you are reminded to update your PATH environment.

Select the **OK** push-button and the following window appears:

Figure 5. GUI Install-Complete Window

Select the **Quit** push-button to exit the installation program.

Note that most workstation operating systems support one or more “Path” statements that tell the operating system where to find executable programs, dynamic link libraries, and data files. The VM/ESA GUI workstation agent consists of an executable program, a library, and several help files and GIF files. For simplicity, it is recommended that you start the workstation agent from the directory in which it is installed. Otherwise, you must configure the appropriate statements in your system to find the workstation agent program, library, data (Help) files (see “Making the Help Files Available” on page 10), and graphic (GIF) files (see “Making the GIF Files Available” on page 10).

Using the GIF Files

When you download the workstation agent, the GIF files used for the toolbar are automatically downloaded. However, when you start the CMS Desktop, by default, the toolbar is not displayed. To display the toolbar, select the **View** menu bar item and check the *Show toolbar* menu list item. (See Figure 6)

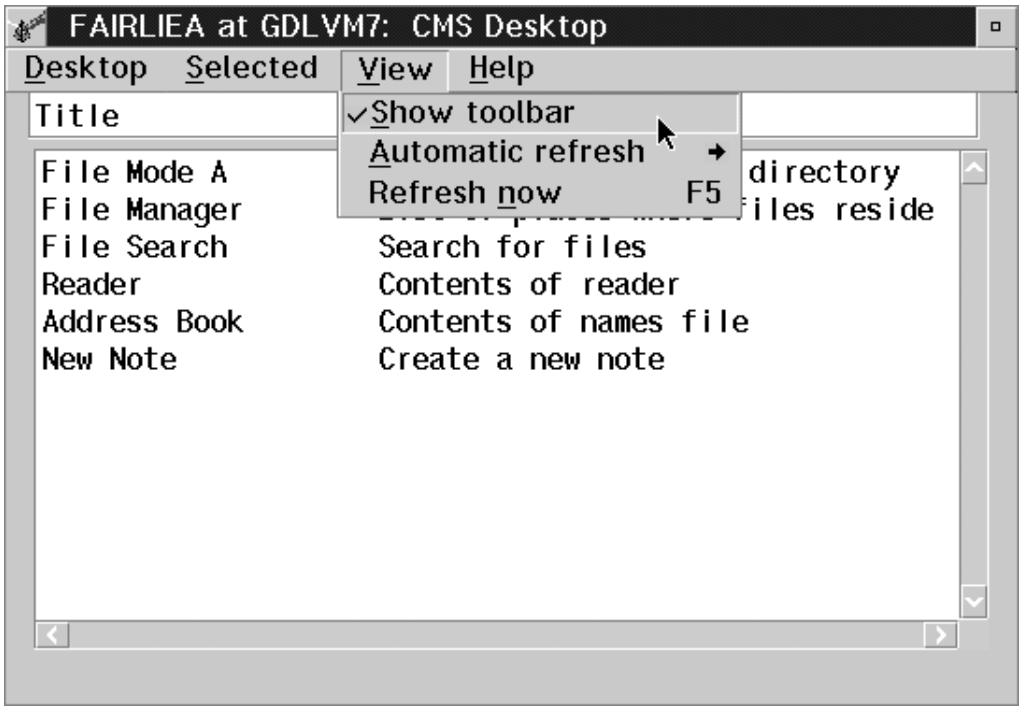

Figure 6. Show Toolbar Menu Choice

Installing HELP

The facility to display help that is specific to the CMS Desktop is automatically installed during the installation process in the OS/2, Windows 95, and Windows NT environments. AIX users need to install a separate HELP Facility to display the CMS Desktop help after the initial installation process is complete.

If you wish to use non-English help files for the CMS Desktop, you will need to separately install workstation help files for the language you wish to use. Refer to “NLS Information” on page 43 for information about installing alternate languages for the CMS Desktop.

Installing the AIX HELP Facility

When installing the workstation agent in an AIX environment, you must install the Information Presentation Facility (IPF) to support the HELP Facility at your workstation. You can install IPF in two ways: using SMIT or the INSTALLP command. SMIT is a menu-like program that guides you through the IPF installation. The INSTALLP command is followed by parameters and options that do the same thing as SMIT.

For either method, perform the following steps:

1. At the command prompt, type

   ```
   mkdir /tmp/ipf
   cd    /tmp/ipf
   ```

2. Using binary mode, download the package IPFRRUN PKGZBIN to your AIX workstation as

   `ipfrrun.pkg.Z.`

   Note that the “Z” must be capitalized.

3. Uncompress the file ipfrrun.pkg.Z by typing

   `uncompress ipfrrun.pkg.Z`

Using SMIT to Install IPF:

1. First logon as root and use "smit install" to install ipfrrun.pkg.
2. Select the options (in the following order):

   ```
   Install / Update Software
   Install / Update Selectable Software (Custom Install)
   Install Software are Latest Available Level
   ```

3. On the Input device/directory window, enter the directory where you have placed the packages (in this example, it would be `/tmp/ipf`).
4. On the SOFTWARE to Install field, type or select from the List option, the names of the packages you want to install (in this case it is `ipfx.Runtime`).
5. On the COMMIT software option field, select "yes"
6. Press Enter to install the IPF package.

Using the INSTALLP Command to Install IPF:

Type the following at the command prompt:

```
installp -ag -c -d /tmp/ipf ipfx.Runtime
```

Once SMIT or INSTALLP processing completes successfully, IPF is installed and the XVIEW command is available.

Making the Help Files Available

The Help files are always available if you start the workstation agent from the directory in which the workstation agent file is installed. However, if you start the workstation agent from another directory, some environment variables must be set or changed to have the Help files available.

For OS/2, add the following to the SET BOOKSHELF, LIBPATH, and SET DPATH statements in your CONFIG.SYS file:

c:\vmgui

*c:**vmgui* is the name of the directory in which the workstation agent file is located.

For AIX, in the following steps, substitute */u/gui/dtwsa* with the name of the directory in which the workstation agent file is located.

1. Add the following statement near the top of cmdexec (this file is located in the same directory as the workstation agent file):

   ```
   export LIBPATH=/u/gui/dtwsa:$LIBPATH
   ```

2. Add the following statements to the .dtprofile file:

   ```
   PATH=/u/gui/dtwsa
   export PATH
   LIBPATH=/u/gui/dtwsa
   export LIBPATH
   BOOKSHELF=/u/gui/dtwsa
   export BOOKSHELF
   ```

For Windows 95 and Windows NT, the Help files are available only if you start the workstation agent from the directory in which the workstation agent file is installed.

Making the GIF Files Available

The GIF files are always available if you start the workstation agent from the directory in which the workstation agent file is installed. If you start the workstation agent from another directory, a window displays prompting you for the name of the directory where the GIF files are located.

Starting the Workstation Agent

Once the workstation agent is installed, you can start it by one of the following:

- Enter `wsa` on your workstation command line or window
- Establish and use an icon that issues the `wsa` command

For more details on creating icons, refer to the documentation provided with your workstation operating system.

Using the Workstation Agent Window

After the workstation agent is running, the following window appears:

Figure 7. Workstation Agent Window

The menu bar offers two choices: **Options** and **Help**. To view the Options pull-down menu, select the **Options** choice. The following menu choices appear:

Information...

Enable TCP/IP

Enable APPC

Set TCP/IP Port...

Set SNA TP Name...

Set WINSOCK Path...

Set Font...

System Register...

The Options menu provides choices that let you tailor the behavior of your workstation agent and query the status of your connections.

Information: This menu choice provides you with status and setting information of VM/ESA GUI host programs to which you are connected. If you select this choice, a window similar to the one shown in Figure 8 is displayed:

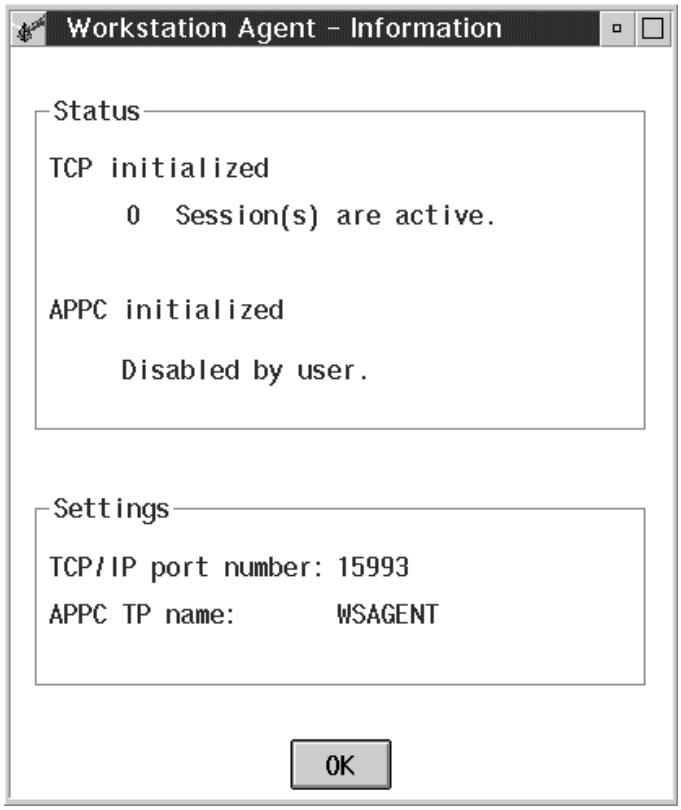

Figure 8. GUI Agent Status Window

Typically, when using multiple windows with the CMS Desktop, multiple connections are established with the workstation. If you start the workstation agent, but have not started the CMS Desktop or GUI applications, then you have zero connections with the host.

Enable TCP/IP: This choice enables or disables TCP/IP. If TCP/IP is enabled, the system uses the default port number or the port number defined in the Set TCP/IP Port menu choice.

Enable APPC: This choice enables or disables APPC. If APPC is enabled, the system uses the default SNA transaction program name or the TP name defined in the Set SNA TP Name menu choice. APPC is only supported in the OS/2 environment.

Set TCP/IP Port: This choice displays the TCP/IP Configuration window shown in Figure 9 on page 13, which lets you define or change your TCP/IP port number. If you don't define a port number, then the system uses a default number. For most users, this will be satisfactory.

AIX users may need to change this option. If you are an AIX user, refer to Chapter 5, “Getting Connected” on page 47.

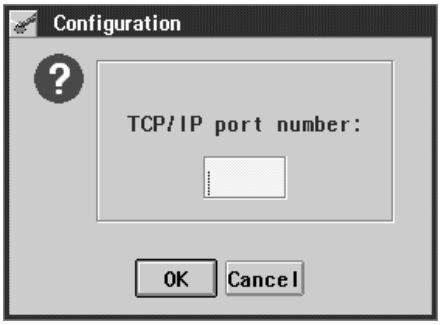

Figure 9. TCP/IP Configuration Window

Set SNA TP Name: This choice displays the SNA Configuration window shown in Figure 10, which lets you define or change your SNA transaction program name. If you do not define a TP name, then the system uses a default name. In most cases this is satisfactory. If you need to use a different TP name, refer to Chapter 5, "Getting Connected" on page 47 for more information. This choice is only available in an OS/2 system configured for APPC.

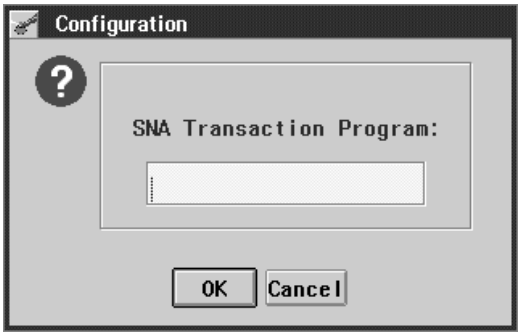

Figure 10. SNA Configuration Window

Set WINSOCK Path: This choice displays the WINSOCK Path window which lets you specify an explicit path to the socket DLL used by the active TCP/IP subsystem in a Windows 95 or Windows NT environment. Although this option is viewable, it is not selectable for the OS/2 or AIX operating environments. In most cases, this setting does not need to be changed from the default. If you need to change this setting, refer to Chapter 5, "Getting Connected" on page 47 for more information.

Set Font: This choice displays the Font window shown in Figure 11, which lets you select a font for all of your GUI windows. If you use CMS Desktop, it is recommended that you do not choose proportional fonts in the VM/ESA GUI programs. The font you select will be used by the workstation agent and all DT programs connecting to the workstation agent.

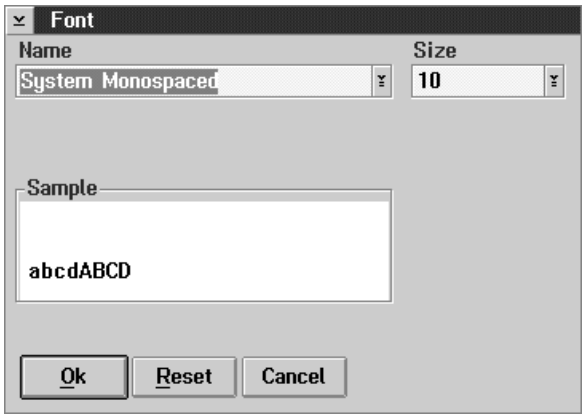

Figure 11. SET FONT Window (in an OS/2 environment)

System Register: This choice displays the System Register window shown in Figure 12, which lets you choose (list) what user IDs are authorized to display GUI windows on your workstation. These settings determine whether the security window is displayed when you start your GUI application. If the window is displayed, the information includes the IP or LU address or the name of the system requesting the connection and the user ID of the user requesting the connection.

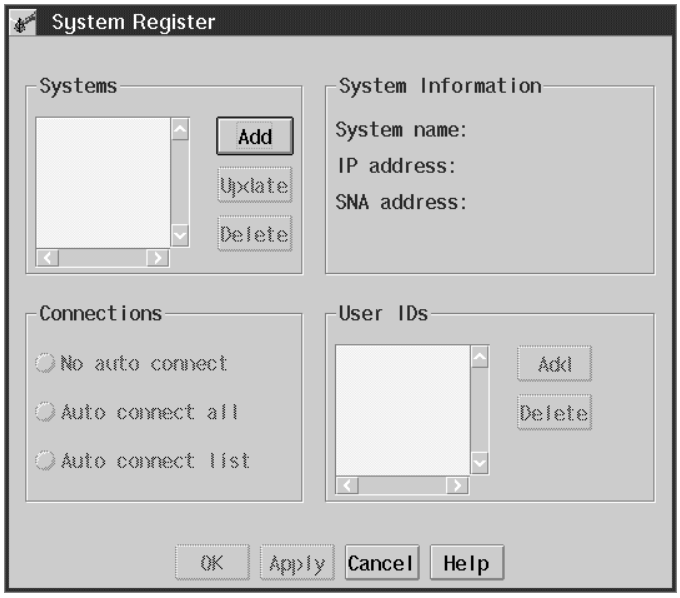

Figure 12. System Register Window

Confirming Option Changes

All changed settings take effect after the workstation agent is closed and restarted. The new settings remain in effect for subsequent invocations of the workstation agent until they are changed again.

The window shown in Figure 13 on page 15 appears each time you change a setting. Select **OK** on the Message window to close it.

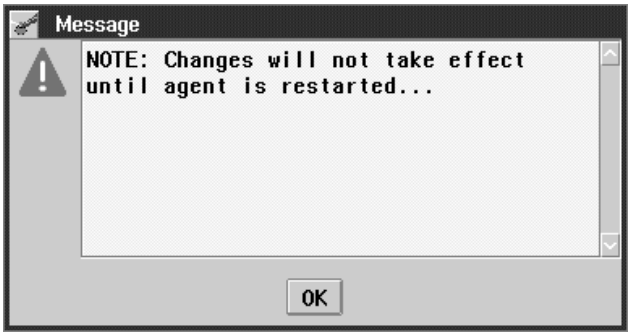

Figure 13. Message Window

Operating in the AIX Environment

When working in the AIX environment, there are a few things you need to consider regarding communications, remote display, and resource names.

Communications

On AIX systems, there can be multiple users on the system using the VM/ESA GUI support. Each user is required to have a unique TCP/IP port number. To define or change your TCP/IP port number, see Chapter 5, “Getting Connected” on page 47.

Remote Display

The AIX workstation agent is a Motif/X Windows program and therefore provides for distributed presentation. The output from the AIX workstation agent (as well as the CMS Desktop) can be routed to a display that is remote from the AIX system on which the workstation agent is running. To accomplish this, you can use any of the X Window methods of rerouting display output (typically the 'export DISPLAY' command).

Resource Names

The AIX workstation agent supports the setting of certain resource names in the .Xdefaults file for fonts and colors. The following resource names are supported:

DtProcess*background: ccccc (color of your choice)

DtProcess*foreground: ccccc (color of your choice)

DtProcess.dtFont: fffff (font of your choice)

The resource names are case-sensitive.

Note: If you change the font using the workstation agent's font dialog, it takes precedence over the value specified in the .Xdefaults file

AIX Fonts

It is recommended to use the *Set Font* choice on the workstation agent's **Options** pull-down menu to establish a font that is satisfactory for you. If you do not choose a font, the AIX workstation agent searches for the first available monospaced font that it finds on your workstation. Because of this searching, the workstation agent window may take a long time to display. Also, if the AIX workstation agent chooses the font, the windows may not look the way you want them to look.

Mouse Click Speed

If the windows do not respond when double-clicking on portions of the windows, you can modify the default value of the mouse click speed. To make this modification, edit the .Xdefaults file, which is found in your home directory. Create the following entry in the .Xdefaults file:

```
Mwm*doubleClickTim: 750
```

The value specified represents the maximum time (in milliseconds) between the two clicks of a double-click. This value allows for double-clicks to be recognized without having to double-click the mouse extremely fast.

XEDIT Cursor

It is not possible in the CMS Desktop environment to change the shape of the XEDIT cursor. For example, the cursor does not change to a block shape cursor when insert mode is entered in a CMS Desktop XEDIT environment.

You may want to use the mouse pointer to position the cursor in a particular field before entering data.

Preparing to Run VM/ESA GUI Programs

In order to run a VM/ESA GUI program, you must first tell your VM/ESA session on which workstation to display the program windows. Use the SET WORKSTATION command from your VM/ESA session to set the workstation address. Once this address is set, VM/ESA GUI programs will obtain the information needed to display windows on the workstation.

Using the SET WORKSTATION Command with TCP/IP

If your workstation is connected to VM/ESA by TCP/IP, issue the SET WORKSTATION command specifying the internet address or the host name for the workstation where you want your output displayed. These parameters represent your primary workstation where your windows are displayed. For example:

```
SET WORKSTATION IP 9.876.54.32
```

If you use a host name instead of a dotted-decimal internet address, then before issuing CMSDESK, the C runtime library (SCEERUN LOADLIB) must be included in the list of libraries specified in a prior GLOBAL LOADLIB command. This is necessary for host name resolution to take place. If you do not include SCEERUN LOADLIB in the list of libraries, you will receive error messages.

AIX users can further qualify the specified target display with a TCP/IP port number. For alternate methods of specifying the target workstation using the SET WORKSTATION command, refer to “Selecting the Workstation” on page 47.

You can determine the current setting of the target display by issuing the QUERY WORKSTATION command. For example:

```
q workstation
WORKSTATION IP 9.876.54.32
Ready; T=0.01/0.01 18:23:17
```

Using the SET WORKSTATION Command with APPC

For programs connected to VM/ESA by APPC, issue the SET WORKSTATION command specifying the logical unit name for the workstation where you want your output displayed. For example:

```
SET WORKSTATION LU GATEWAY1 A1LU0006
```

If an alternative transaction program name is also applicable, you can further qualify the specified target display with a Transaction Program Name.

For alternate methods of specifying the target workstation using the SET WORKSTATION command, refer to “Examples” on page 52.

You can determine the current setting of the target display by issuing the QUERY WORKSTATION command. For example:

```
q workstation
WORKSTATION LU GATEWAY1 A1LU0006
Ready; T=0.01/0.01 18:23:17
```

Starting GUI Programs

You can start VM/ESA GUI programs from a normal 3270 session or from the workstation without a 3270 session.

Starting GUI Programs from a 3270 Session

To start VM/ESA GUI programs from a normal 3270 session, simply type the name of the VM/ESA GUI program (for example, `CMSDESK`).

When a VM/ESA GUI program is started, the workstation agent displays the Connection window shown in Figure 14 informing you of an incoming connection. This window is provided as a safeguard against any unauthorized attempt to access your workstation.

Note: In Windows 95 and Windows NT, the Connection window may be hidden. When invoking GUI applications, the Workstation Agent window (which is the parent window of the Connection window) does not have focus. Therefore, the Connection window is not given focus and may be hidden.

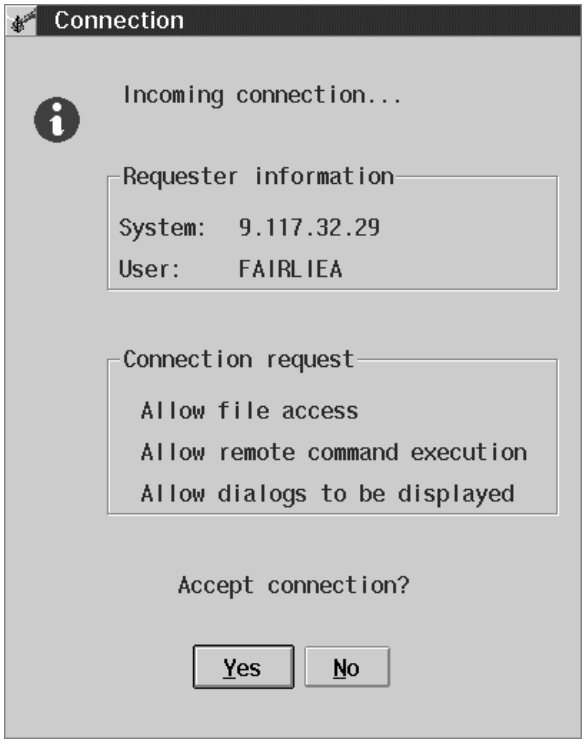

Figure 14. VM/ESA GUI Connection Window

You accept or reject the connection by selecting either the **Yes** or the **No** push button. If you accept the connection, the program continues.

Starting GUI Programs Without Logging On to a 3270 Session

You can call the CMS Desktop or other VM/ESA GUI applications without first logging on to the host VM/ESA system using the Remote Execution Protocol (REXEC) or the Remote Shell (RSH) Protocol of TCP/IP, or the private resource conversation support provided by VM APPC.

Whether you are using TCP/IP or APPC, you do not have access to a VM command line. Therefore, it is not possible to issue CP or CMS commands outside of the context of what is available through the CMS Desktop or local VM/ESA GUI application.

If the host virtual machine spools the console, it is possible to capture the output of any CP or CMS commands issued on the host as a result of using the CMS Desktop or local VM/ESA GUI application. Without spooling the console, any error messages associated with commands on the host are lost, unless trapped and presented in workstation windows by the VM/ESA GUI application.

While the following methods allow the CMS Desktop or a VM/ESA GUI application to run without starting a 3270 session, you can also log on to the VM/ESA host system, start a VM/ESA GUI application, and then disconnect from the host to remove the 3270 window.

Using TCP/IP

To start the CMS Desktop or a VM/ESA GUI application from the workstation desktop without first establishing a 3270 session, you can use the TCP/IP REXEC or RSH command.

For example, to use REXEC to start the CMS Desktop, follow these steps:

- Create a program object on the workstation desktop. The command line associated with program object calls REXEC with parameters specifying the VM/ESA host address and the VM/ESA GUI application name.

  For example, a program object named CMSDESK could be created on an OS/2 desktop. The path and file name associated with the program object is d:\TCPIP\BIN\REXEC.EXE. The optional parameters included in the program object would be a VM/ESA host name or IP address, and the application name, CMSDESK.

- Update the PROFILE EXEC on the host VM/ESA user ID to:
  - Link and access the TCP/IP client minidisk (usually TCPMAINT 592)
  - Issue a SET WORKSTAT IP x.xx.xx.xx command, with the IP address of the workstation that calls REXEC
  - Bypass starting any full screen applications if the virtual machine is running disconnected.
- Ensure that the host virtual machine is logged off.
- Double-click on the new program object to call REXEC or enter the command:

  `rexec` *`hostname`* `cmsdesk`

  You then receive separate prompts for a user ID and password.
- Enter a user ID and password, and the Connection window followed by the CMS Desktop window display on your workstation.

VM/ESA GUI applications do not use the virtual console and do not communicate using the REXEC connection. REXEC detects that the REXEC connection is idle, and after an installation-defined amount of time (usually four minutes), terminates the REXEC connection and logs off your VM/ESA user ID. Therefore, to use this method for long term CMSDESK usage, changes would have to be made to lengthen the timeout period for REXEC.

Note: If you use RSH instead of REXEC, you must make sure that the version of RSH you use allows you to specify a user ID and password. For more information on using REXEC or RSH, see the TCP/IP product documentation for your workstation environment.

Using APPC

In OS/2, you can use CMS APPC private resource server support to start VM/ESA GUI programs without logging on to VM/ESA. Use the following steps to start the CMS Desktop without logging on to VM/ESA:

1. Place GUIAPPC EXEC (Appendix B, “Sample GUIAPPC EXEC” on page 57) on a disk or directory that is automatically accessed for you when you log on.
2. Place the following commands in your PROFILE EXEC:

   SET SERVER ON

SET AUTOREAD OFF

Enter the commands at the CMS command line if you want them to take effect immediately.

If you use Fullscreen CMS, you must turn it off:

SET FULLSCREEN SUSPEND

SET FULLSCREEN OFF

APPC private server programs will not run while Fullscreen CMS is in use.

3. Install CMSDESKR.CMD (Appendix D, “Sample CMSDESKR.CMD” on page 61) on your workstation.
4. Activate the CPI Communications REXX interface by entering the `cpicrexx` command from any OS/2 command line. When your workstation is started, you have to enter this command only once; therefore, you can place this command in your STARTUP.CMD file.
5. If the workstation LU name that you are using for APPC is not your control point (CP) name, then you must indicate the alias assigned to the APPC LU name by entering:

   `SET APPCLLU=`*`alias`*

   There must not be any blanks between the equals sign and the alias. This command sets an OS/2 environment variable named APPCLLU for the current OS/2 session used by CPI Communications. This variable, if set, is used by CPI Communications during the Initialize_Conversation call issued by CMSDESKR.CMD to determine the local LU on which to start the Transaction Program instance.
6. Enter:

   `cmsdeskr` *`avslu vmuserid vmpassword`*

   on your workstation, or create a program object on the desktop that specifies CMSDESKR as the path and file name to call and `avslu vmuserid vmpassword` as the parameters. In this example, `avslu` is the fully-qualified LU name (netid.luname) or the alias of an AVS private gateway on your host VM/ESA system. Contact your network support personnel for the name of the gateway you should use.

   For more information on CMS private resources, see *VM/ESA: Connectivity Planning, Administration, and Operation*.

When the CMSDESKR command is entered or the program object is selected, the host virtual machine is autologged by CP (unless it is already logged on) and the transaction program specified in CMSDESKR is started.

Chapter 3. Using the CMS Desktop

The VM/ESA GUI Facility provides a built-in capability called the CMS Desktop. It provides an alternative operating environment for GUI-capable programs. The CMS Desktop is ready to use as is, or you can tailor it to include your own GUI programs.

Tasks You Can Do With the CMS Desktop

The CMS Desktop is a small starter set of programs related to virtual reader, minidisk, and SFS files. The CMS Desktop lets you use the GUI interface when performing the following functions:

- Manipulate and search data files
  - You can manipulate or search files on your minidisks or within the Shared File System
- Edit host files
  - You can use XEDIT or the workstation editor of your choice
- Manage your reader
  - You can receive, forward, and print notes and files.
- Maintain your NAMES file
- Send notes
  - Send notes to other VM/ESA users on the local or remote nodes.
- Add and delete objects
  - You can add and delete objects from your own desktop.

CMS Desktop Startup Considerations

You can run the CMS Desktop in the foreground or the background. The CMSDESK command lets you select how you want to start the CMS Desktop. If you select to have the CMS Desktop run in the foreground, commands issued from the virtual console will not run until the CMS Desktop is stopped. If you select to run the CMS Desktop in the background, then commands issued from the virtual console will run. The default is for the CMS Desktop to run in the background when it is started. Refer to the CMSDESK command description in the *VM/ESA: CMS Command Reference* and Appendix A, “Interaction with the Virtual Console” on page 55 for restrictions and more information on running CMS Desktop in the foreground and background.

The amount of storage required to run the CMS Desktop varies depending on the number of windows you have open concurrently and the amount of data that is being processed. In general, a virtual machine size of 24MB is satisfactory for most environments. If you run with a virtual machine size of less that 24MB, you may encounter a storage problem. Storage constraints can be minimized by limiting the number of concurrently open windows and by running the CMS Desktop in a shared segment. For more information on using the CMS Desktop in a shared segment, refer to “Using Saved Segments” on page 41

When the CMS Desktop is gathering information from the host to display in a workstation window, temporary files are created on the read/write minidisk or SFS directory accessed as file mode A. Because these files can be quite large, depending on the CMS Desktop function you want to use, it is possible to run out of space on the minidisk or directory. To correct this problem, you can create additional space on this minidisk or directory, or you can access another read/write minidisk or directory as A.

Starting the CMS Desktop

Once you have started the workstation agent and you have a workstation address set on the host, you can start the CMS Desktop by typing `CMSDESK` on the VM/ESA command line. For more information about starting the workstation agent, see “Starting the Workstation Agent” on page 10. The following window appears:

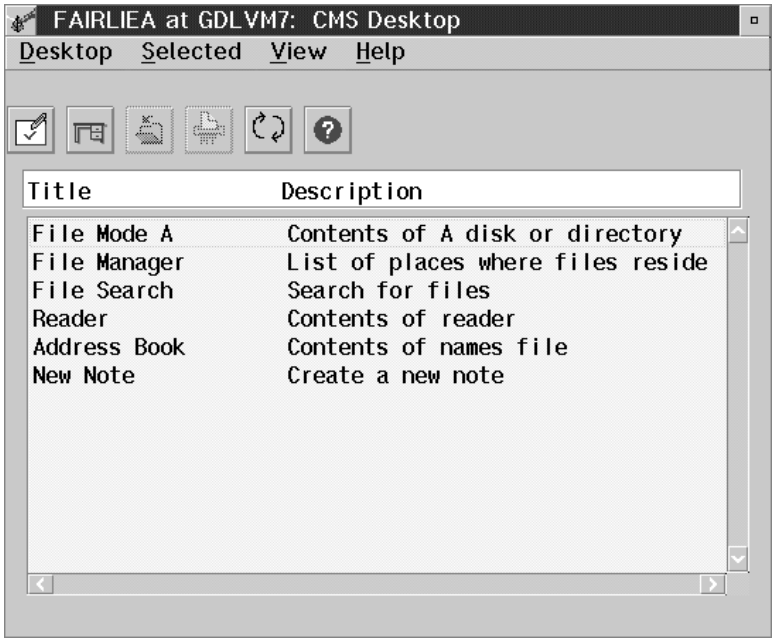

Figure 15. CMS Desktop Primary Window

Note: In Windows 95 and Windows NT, the CMS Desktop window may be hidden. When invoking GUI applications, the Workstation Agent window (which is the parent window of the CMS Desktop window) does not have focus. Therefore, the CMS Desktop window is not given focus and may be hidden.

Most CMS Desktop windows include a standard menu bar that provides similar capabilities. The contents of the standard menu bar are as follows:

Object name
This is the left-most item in the menu bar and will be different for each window. The name usually represents the object name (such as **Desktop**, **Reader**, **Minidisk**, or **Directory**) where data is being displayed. The choices that are available on this menu usually apply to the overall object in the window, such as printing the contents of the entire window.

Selected
Presents choices that act against the selected objects in the window. Examples include *Open*, *Print*, and *Delete*.

Edit
Presents choices that act directly on data in the window. Examples include *Select all* and *Deselect all*.

View
Presents choices that allow you to alter the view of the data that is displayed in your window. *Refresh now* is a typical choice.

Help
Presents choices that provide you information on using the various applications and functions of the CMS Desktop.

Starting a Program

Several choices appear on the CMS Desktop main window. The choices available on the CMS Desktop are as follows:

File Mode A
Displays windows that enable you to manipulate files on the directory or minidisk that is accessed as A.

File Manager
Displays a window with a list of directories and minidisks that are available for your use.

File Search
Displays a window that allows you to search for specific files from a selected set of accessed minidisks and directories.

Reader
Displays windows that let you manipulate the contents of your virtual reader.

Address Book
Displays windows that let you manipulate the contents of your *userid* NAMES file.

New Note
Displays a window that allows you to compose and send a note.

To start an object, simply double-click on it. Alternatively, you can start an object using the following procedure:

1. Select an object from the CMS Desktop window
2. Select *Open* in the pull-down.

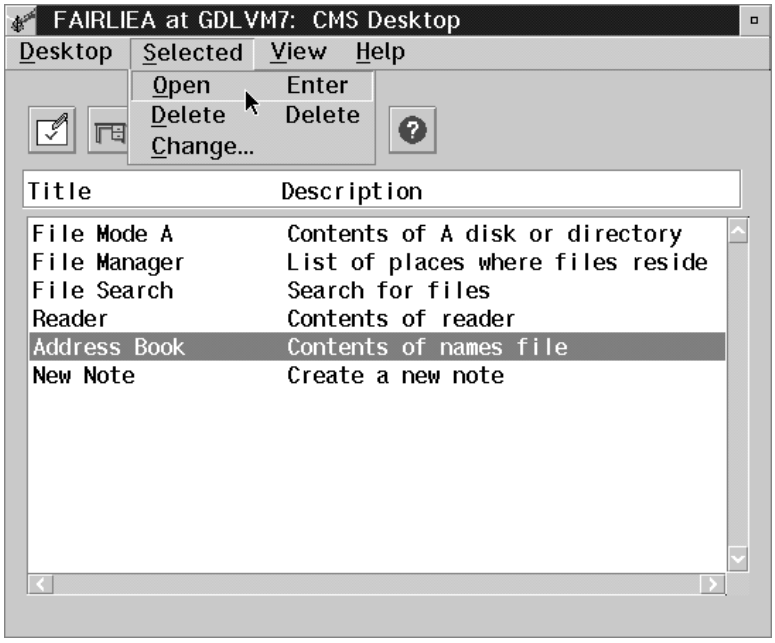

Figure 16. Using the Open Choice in the CMS Desktop Window

The window for the object you selected displays.

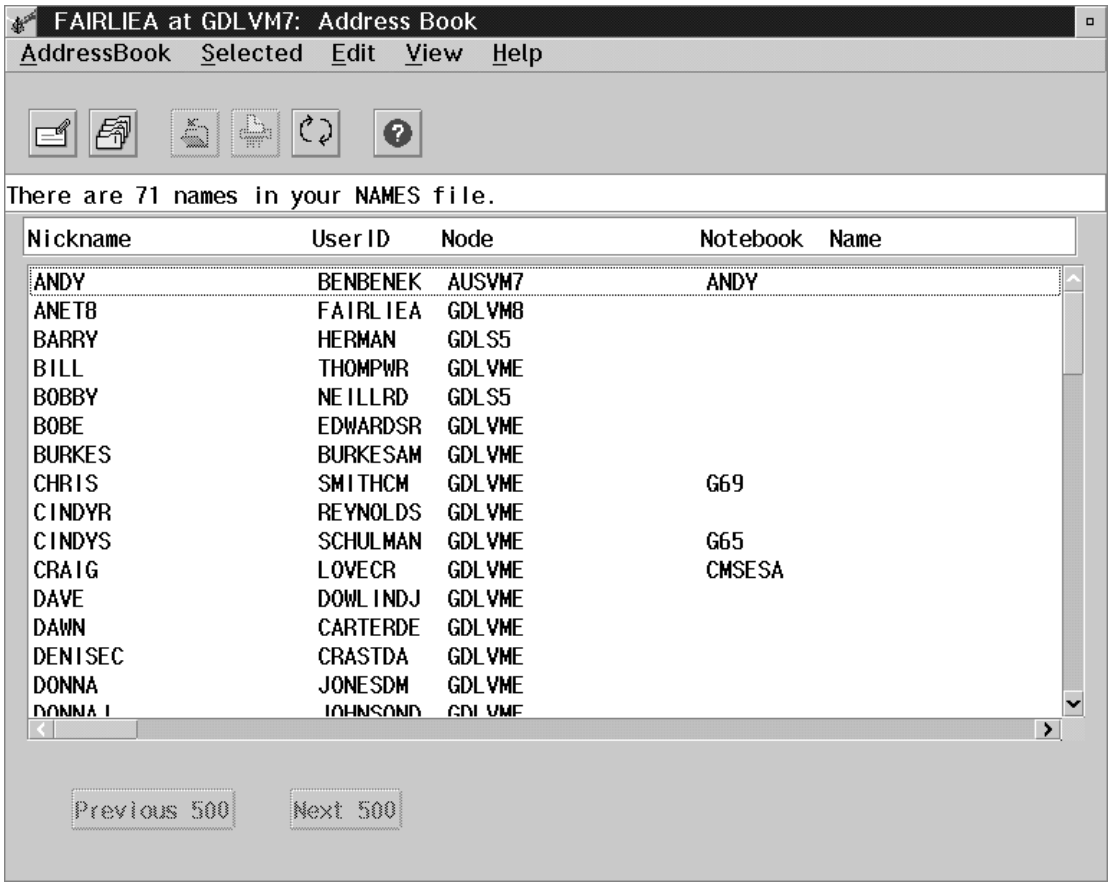

Figure 17. Selected object window (Address Book)

Closing a Window

There are several ways that the CMS Desktop and its windows can be closed.

- Individual windows can be closed by double-clicking on the System Menu symbol in the upper left-hand corner, choosing the *Close* choice in the System Menu pull-down, choosing the *Close* choice from the pull-down menu of the first menu bar item, or using the shortcut key (Alt+F4).
- The Desktop and all of its windows can be closed by choosing the *Close* choice in the Desktop pull-down menu or using the shortcut key (Alt+F4) in the CMS Desktop window. However, if you are using an editor other than XEDIT and an edit window is open, you must close the edit window before closing the CMS Desktop.

  The CMS Desktop displays a window similar to the following before proceeding.

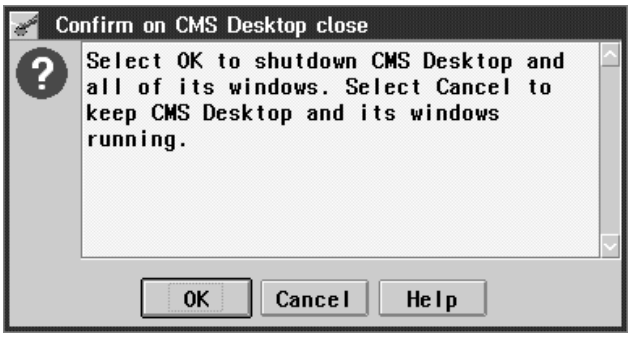

Figure 18. Confirm on CMS Desktop close

- If the CMS Desktop is running in the foreground, a HX command can be issued to terminate execution. If the CMS Desktop is running in the background, HX has no effect.

Attention: Choosing *Close* from the CMS Desktop followed by **OK** on the **Confirm on CMS Desktop close** window closes ***ALL*** VM/ESA GUI windows in your VM session, including those that were not started from the CMS Desktop. For example, the CMS Desktop is active in the background and you also have started a VM/ESA GUI program from the CMS command line. Closing the CMS Desktop window will close the CMS Desktop AND the VM/ESA GUI program that you started from the CMS command line.

Fixed Size Windows

Most of the windows produced by the CMS Desktop are fixed size windows. Therefore, you cannot stretch the borders of the windows. In fact, most of the windows do not have a maximize button in the upper right-hand corner of the window. Most windows only have a minimize button in that location. The exceptions to this are the XEDIT window and the CMS Help windows. The vertical size of these windows can be changed by stretching or contracting the top or bottom border of the window. In addition, these windows have both a maximize and minimize button in the upper right-hand corner of the window.

However, on the XEDIT window and the CMS Help windows, clicking on the maximize window button has no effect on the size of the window. On the OS/2 platform, clicking on the maximize window button causes the window to be moved

to the upper left-hand corner of the physical screen. Clicking again on the maximize button causes the window to move back to its original position on the physical screen.

Even though most windows are fixed size windows, other factors can affect the size of the window. For example, windows that offer a *Settings* menu choice, such as the Reader window, allow you to specify the number of columns and rows displayed. If the maximum number of columns and rows are selected, the resulting window may be too large for the physical screen. This would also be dependent upon the particular font being used with the workstation agent.

Therefore, it is important to be aware of the many factors that can affect the size of a window. If the windows displayed with the default settings are too big for the physical workstation screen, the first course of action should be to choose a new font through the Workstation Agent window. Once you choose a satisfactory font, individual windows can be further customized by selecting the number of rows and columns displayed and by selecting the *Window Size* menu choice.

Changing Fonts

The appearance of CMS Desktop windows displayed on the workstation is significantly affected by the font you select through the Workstation Agent window. If you select a large font, windows displayed by the CMS Desktop may not fit entirely on the physical workstation screen.

When this problem occurs, select the **Options** menu bar choice in the Workstation Agent window, select the *Set Font...* menu choice, and then choose a smaller nonproportional font. The font selection you make does not take effect until you stop and restart the workstation agent. The change, however, remains in effect for subsequent invocations of the workstation agent.

The font selection depends not only upon the workstation platform being used, but also upon the display type (for example, VGA, SVGA, XGA) and resolution. Because you may use different functions than another CMS Desktop user, you must select the font that best fits your needs.

The XEDIT window is one of the CMS Desktop windows where it is important to choose a font that best matches the characteristics of your workstation. Because the number of lines displayed by XEDIT through the CMS Desktop is determined by the characteristics of your 3270 emulator session, a smaller nonproportional font is in many cases the best choice. For more information, see “Effects of Host PROFILE XEDIT” on page 34.

Interaction with the Virtual Console

Your ability to interact with the virtual console while the CMS Desktop is active depends on whether you have decided to run the CMS Desktop in the foreground or background. In general, when you run the CMS Desktop in the background, you are also able to run traditional CMS commands and programs from the CMS command line. For more information, see Appendix A, “Interaction with the Virtual Console” on page 55.

Help Support

All CMS Desktop functions include integrated online Help support in the form of INF files. INF files are integrated information files that are part of the CMS Desktop application. The CMS Desktop help files and necessary support functions are packaged as part of the workstation agent and are installed when the workstation agent is installed. INF files are displayable using the Information Presentation Facility (IPF). IPF is the standard HELP Facility that is part of OS/2 and is shipped as part of the VM/ESA GUI Facility workstation agent for Windows 95, Windows NT, and AIX.

For more information on installing the HELP Facility on the AIX environment, see “Installing the AIX HELP Facility” on page 9.

The HELP Facilities can be invoked through the Help menu on all primary windows and also through selected Help push buttons. The F1 key can also be used to invoke HELP in both primary and secondary windows.

Using HELP

The CMS Desktop provides HELP at the workstation. Selecting **Help** from the menu bar displays a pull-down menu that allows you to access:

General Help
: Task help, as well as a list of HELPs by menu bar or panel title with links to the associated, more detailed HELP.

Using Help
: A brief description of how to use the HELP Facility.

Toolbar Help
: A display of the GIF file on the toolbar and a label for each GIF file.

Product Information
: A display of the title and level of the product.

Using XEDIT on your Workstation

You can use XEDIT in a GUI environment from your workstation's CMS Desktop to view and edit one or more files at the same time.

For information on how to use the XEDIT editor, see *VM/ESA: XEDIT Command and Macro Reference* .

To use the XEDIT editor on your workstation, you must change the default editor choice to XEDIT. To do this, from the CMS Desktop window:

1. Select the **Desktop** menu bar choice
2. Select *Settings* from the pull-down menu
3. Select *Editor preference* from the cascaded menu

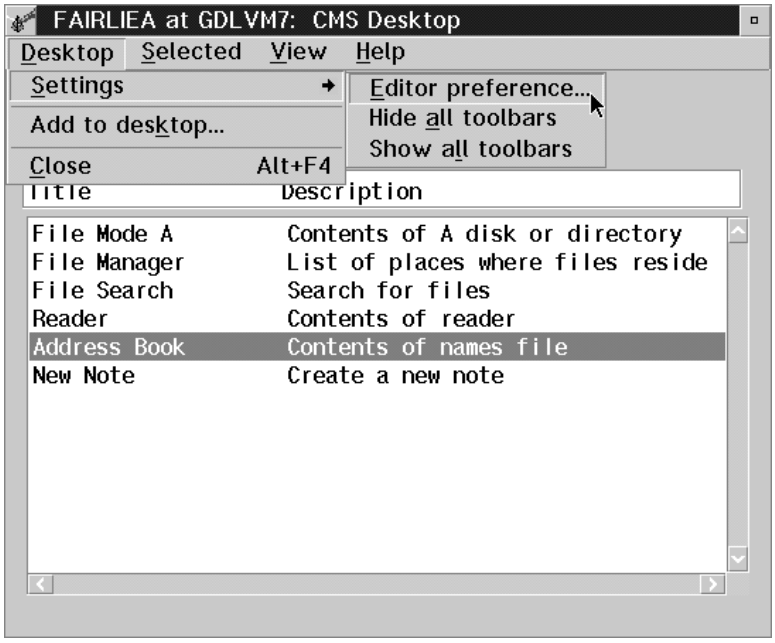

Figure 19. Changing Your Default Editor

4. Select the drop-down list control and select `xedit`, or just type `xedit` in the input field, then click on the **OK** pushbutton.

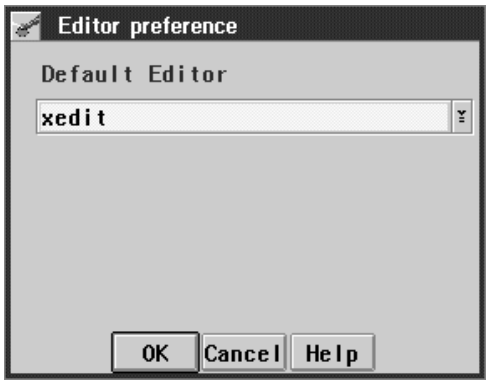

Figure 20. Selecting XEDIT as your Editor

Now you can go into any window in which the CMS Desktop provides editing (for example, File Mode A) and use XEDIT to change and create files.

Opening a File

To open a file, you can do one of the following:

- Double-click on a file object in the window.
- Or, you can
    1. Select a file object from the window
    2. Select the **Selected** menu bar choice
    3. Select *Open* from the pull-down menu.

- Or, you can
  1. Select a file object from the window
  2. Click on the Open object on the toolbar.

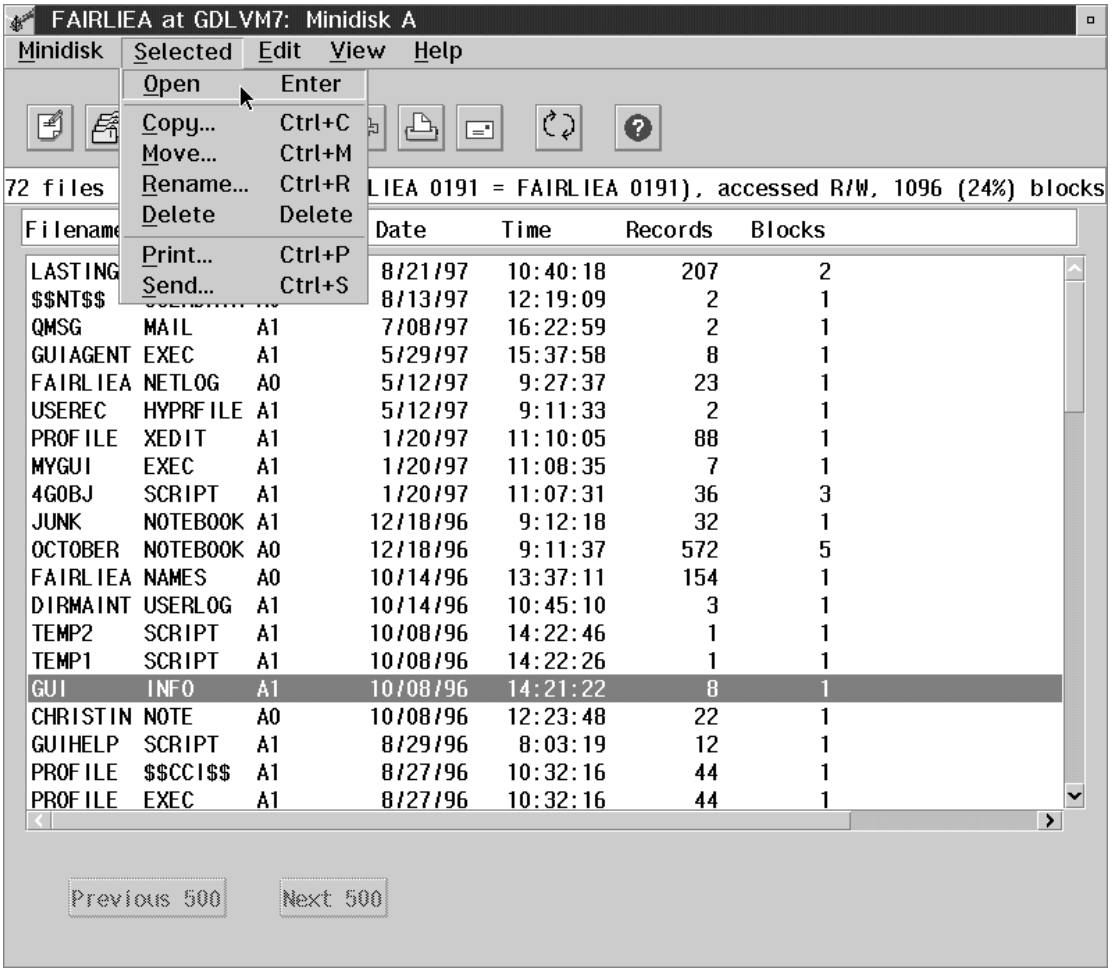

Figure 21. Opening a File

Creating a New File

To create a new file, you can do one of the following from either a Minidisk window or a Directory window:

- Select the **Minidisk** or **Directory** menu bar choice and then select *New file* from the pull-down menu.
- Or, you can click on the New file object on the toolbar.

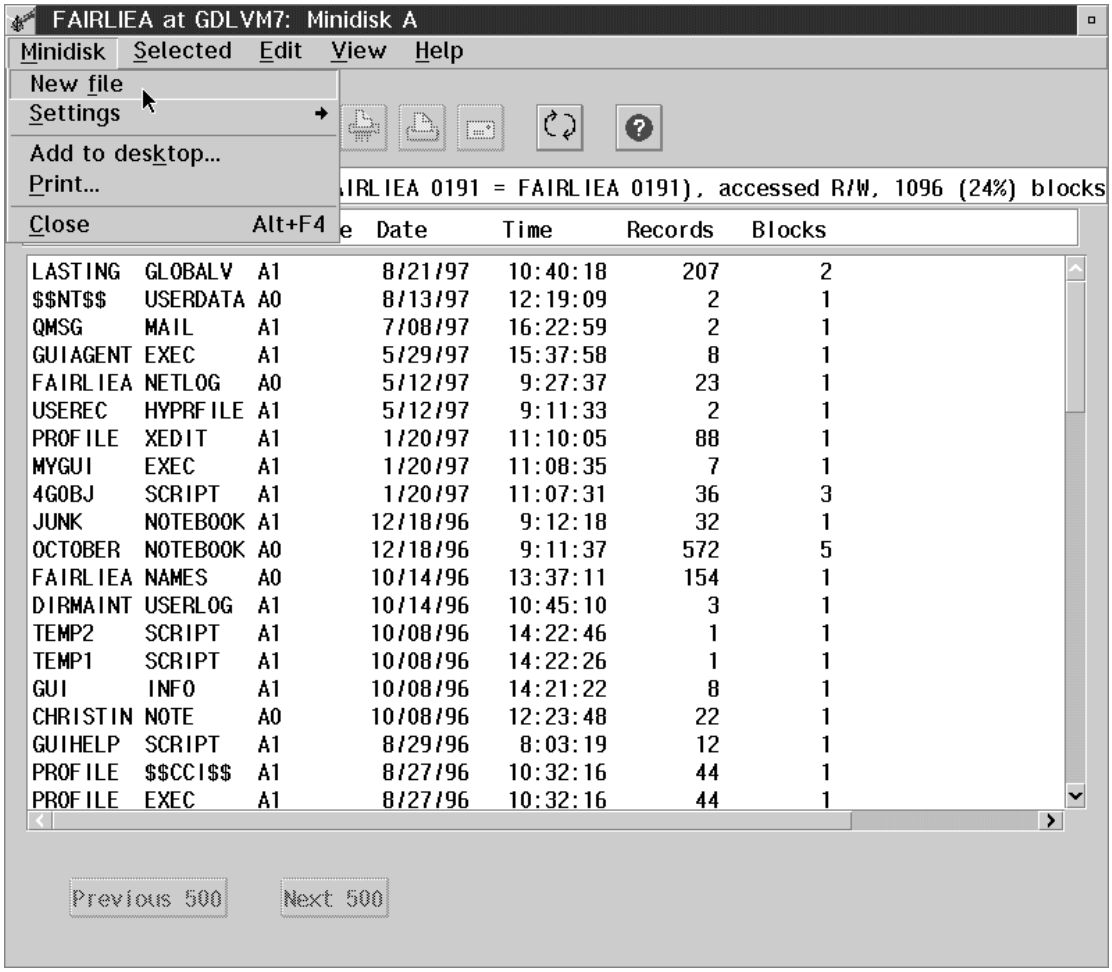

Figure 22. Creating a New File

The XEDIT file ID window displays and prompts you for the following information:

Filename The file name of the file to be edited.

Filetype The file type of the file to be edited.

Filemode The file mode of the file to be edited. A file mode letter is displayed. You may change it if necessary.

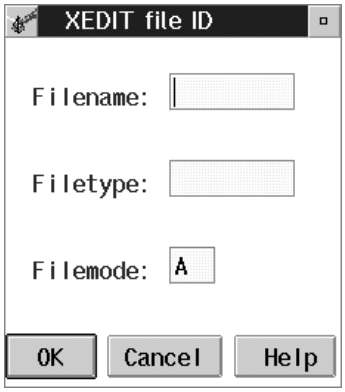

Figure 23. XEDIT File ID Prompt Window

Figure 24 on page 31 is an example of an XEDIT window with a file that is being edited.

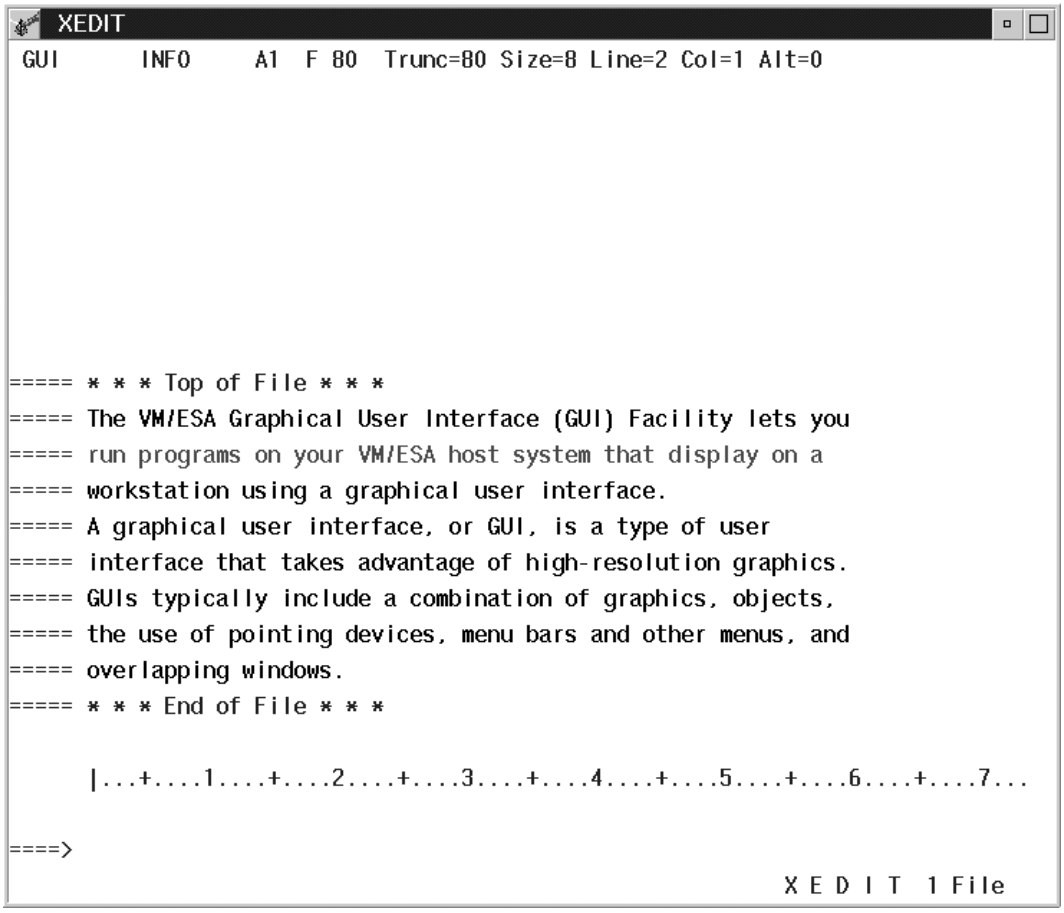

Figure 24. XEDIT Window

To close a window and save changes made to your file, use the XEDIT FILE subcommand. To save changes without closing a window, use the XEDIT SAVE subcommand.

You can close the file (and the XEDIT ring) by double-clicking on the System Menu symbol in the upper left-hand corner. Closing a file is the same as cancelling; therefore, if you have multiple files in an XEDIT ring, any changes to the files in the ring that have not been saved using the XEDIT SAVE subcommand will be lost, and all of the files in the ring will be closed. When you choose *Close*, XEDIT displays a confirmation window like the one in Figure 25 before proceeding.

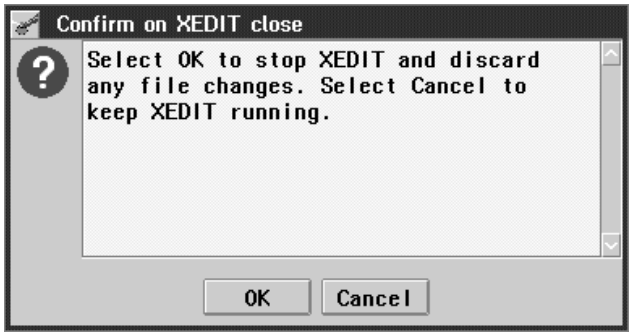

Figure 25. Confirmation Screen (closing XEDIT)

Editing Multiple Rings

You can edit multiple files in multiple rings concurrently. In a GUI environment, each ring is in a separate window. However, editing multiple files in one ring results in only one window. XEDIT manages multiple active rings with multiple files in each ring. Multiple rings can be added by selecting the *Open* or *New* pull-down menu choice on several CMS Desktop windows.

When you have completed editing your files, your rings can be closed in any order.

For information on how to use the XEDIT editor, see *VM/ESA: XEDIT Command and Macro Reference* .

Entering Text

XEDIT uses the GUI capabilities that are available, depending on the particular workstation operating system you are using. For all supported workstation environments, it is recommended that you issue the SET NULLS ON, SET PREFIX NULLS, and SET NUMBER OFF subcommands to make it easier to insert text. However, there are differences in how some of these platforms allow you to enter text. For example:

Overwriting (Typing Over) Existing Text

To overwrite existing text in OS/2, you can use the Insert key to toggle between insert mode and overwrite mode. When in overwrite mode, simply type over existing text.

In Windows 95, Windows NT, and AIX, you cannot overwrite existing text. You are always in insert mode. To replace existing text, you must delete characters and then insert new text. To delete characters, use the Delete key, the Backspace key, or select the characters to be removed by dragging the mouse over the characters and pressing the Delete key or the Backspace key. You can then insert text in that area.

Inserting Text

In OS/2, you can use the Insert key to toggle between insert mode and overwrite mode. When in insert mode and SET NULLS ON is in effect, you can insert text in the file area.

In Windows 95, Windows NT, and AIX, when SET NULLS ON is in effect, you can insert text in the file area.

For all supported workstation environments, when SET NULLS OFF is in effect, blanks are inserted on all lines. Therefore, you cannot insert text unless you first delete some characters. To delete characters, use the Delete key, the Backspace key, or select the characters to be removed by dragging the mouse over the characters and pressing the Delete key or the Backspace key. You can then insert text in that area.

For all supported workstation environments, it is also recommended that you issue the SET PREFIX NULLS and SET NUMBER OFF subcommands. This allows you to use the prefix area without regard to the insert mode.

Message and Command Output

Messages and linemode output from CMS commands and XEDIT subcommands (invoked through the XEDIT command line) are written to a separate message window.

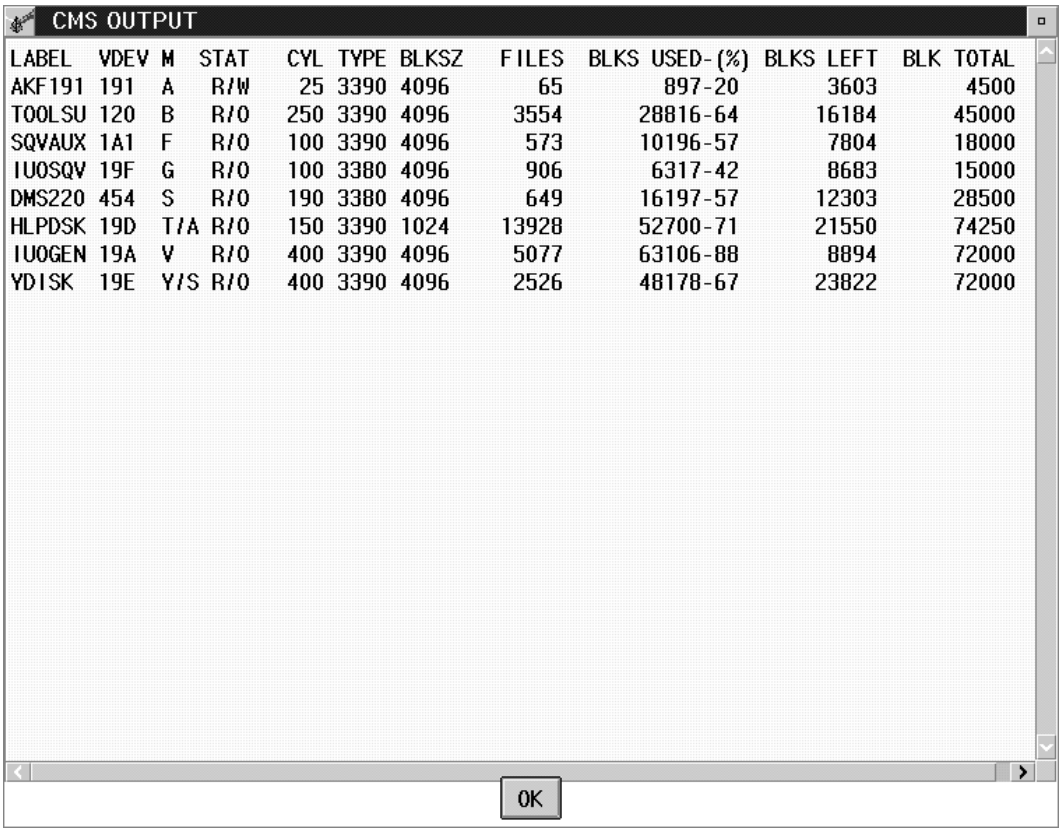

Figure 26. CMS OUTPUT Screen from a GUI XEDIT Session

Messages that do not fit on the XEDIT message line are sent to the "XEDIT Messages" panel. Output from CP commands (invoked through the XEDIT command line) are sent to the virtual console. In the GUI environment, do not issue the CP subcommand without operands. Use your 3270 session to enter CP virtual console function mode. Issuing commands that result in 3270 fullscreen I/O to the virtual console is not supported from an XEDIT session in a GUI environment. Refer to Appendix A, “Interaction with the Virtual Console” on page 55 for more information about restrictions regarding the virtual console when in a GUI XEDIT session.

Using Scroll Bars on XEDIT Windows

When you use the CMS Desktop to display an XEDIT window, a vertical scroll bar is provided if the combination of the selected font and the number of lines included in the window exceeds the window size. The number of lines included in the window is a function of the size of your 3270 emulator window. The scroll bar is provided only to move through the data displayed in the window. The scroll bar does not page through the file. To page through the file, use the XEDIT subcommands, such as FORWARD, BACKWARD, UP, and DOWN, (or function keys associated with those subcommands).

You can control the number of lines in the host file that are displayed in the workstation window by specifying the XEDIT subcommand SET SCREEN SIZE *nn* in your PROFILE XEDIT. The argument *nn* represents the number of lines XEDIT should use instead of the number associated with the size of the 3270 emulator window.

Effects of Host PROFILE XEDIT

When using the CMS Desktop, care should be taken to evaluate host PROFILE XEDIT commands. This is especially true if most users rely upon a common standard PROFILE XEDIT. Users who maintain their own PROFILE XEDIT should read the following information.

It is possible to specify many different color settings in a PROFILE XEDIT macro. While these colors may be satisfactory in a 3270 environment, they may produce different shades when using the XEDIT window from the CMS Desktop. The colors specified for areas, such as the XEDIT file area, message line, command line, prefix area, pending area, scale line, and current line should be checked when using the CMS Desktop. To set the color of the areas previously mentioned, use the following operands on the SET COLOR subcommand: FILEAREA, MSGLINE, CMDLINE, PREFIX, PENDING, SCALE, and CURLINE.

The color statements in PROFILE XEDIT do not affect the color displayed between the entry fields on the XEDIT window. This color can only be changed using the facilities of the workstation.

For example, on the OS/2 platform, the color between entry fields on the XEDIT window is white. Consequently, you may want to modify your PROFILE XEDIT to specify:

```
SET COLOR FILEAREA WHITE REVBARVIDEO
```

This causes the area where text is displayed in the XEDIT window to be entirely white, without the appearance of individual entry fields for each line in the file area. Similar changes can be made to the prefix area and the current line using the host PROFILE XEDIT file. Specifying these areas as WHITE REVBARVIDEO reduces the appearance of separate and distinct areas on the workstation XEDIT window. Remember, however, any changes made to colors through the host PROFILE XEDIT file should be coordinated with any changes being made through workstation facilities. For more information, see “Workstation Colors” on page 37.

PROFILE XEDIT macros should also be reviewed for subcommands that have different responses in the GUI environment. See Table 1 on page 35 for a list of these XEDIT subcommands and options.

When modifying PROFILE XEDIT to be compatible with the CMS Desktop environment, it is possible to use the GUI operand of the XEDIT EXTRACT command. EXTRACT /GUI/ returns an indication of either ON or OFF. If ON is returned, the file is being displayed in a GUI window rather than a terminal emulator screen. This information can then be used to tailor PROFILE XEDIT for both the CMS Desktop environment and 3270 environment.

XEDIT HELP Panels

When you select the **Help** push button from the XEDIT file ID window or enter `help` from the XEDIT command line, the HELP information displays in a separate window.

EDIT Migration Mode

EDIT is not supported in the GUI environment. It is only supported in virtual console windows.

XEDIT Responses in a GUI Environment

Table 1 shows the subcommands and options that are not supported when the GUI environment is active or ON. When the GUI environment is active, XEDIT is running in a workstation window rather than a 3270 session.

Table 1 (Page 1 of 2). Responses in a GUI Environment

Affected Command or Option	**Action**
CMS	Generates an error message. Use your 3270 session if a CMS input screen is needed.
CMS *cmd*	CMS responses go to the CMS OUTPUT window.
CP	Generates an error message. Use your 3270 session if CP console mode is needed.
INPUT	SET NULLS ON is in effect.
POWERINP	TAB key starts a new line.
SET APL	Ignored.
SET BRKkey	The BRKKEY is treated as OFF. Use the 3270 session to cause a control break-in by CP.
SET COLOR	The BLINK, UNDERLINE, and PSS options are ignored.
SET CTLchar	The BLINK, UNDERLINE, and PSS options are ignored.
SET ENTer	The NULLKEY option is ignored.
SET FULLread	Ignored.
SET NONDisp	Ignored.
SET NULLS	Treated as ON during INPUT mode.
SET PAn	The NULLKEY option is ignored.
SET PFn	The NULLKEY option is ignored.
SET REMOte	Ignored.
SET RESERved	The BLINK, UNDERLINE, and PSS options are ignored.
SET TERMINAL	The TYPEWRITER option is ignored.
SET TEXT	Ignored.

Table 1 (Page 2 of 2). Responses in a GUI Environment	
Affected Command or Option	**Action**
SOS	NULLS and ALARM parameters are ignored.
XEDIT (NOCLear	Option ignored.
XEDIT (NOSCreen	Option ignored.
XEDIT (WINdow	Option ignored.

ESAMIGR Migration Tool

The ESAMIGR Migration Tool can be used to identify the use of unsupported XEDIT subcommands and options in your existing macros when you are using the GUI environment.

The following example shows some possible additions you can make to the records in the ESAMIGR SAMPLIST file:

```
K  31      XEDIT                              F
O  1   AND NOSCREEN                           F
K  11      SOS                                FR
```

These examples detect occurrences of XEDIT with the NOSCREEN option or occurrences of SOS. You may also want to add CMS help files for these records if the interactive scanning option is used for ESAMIGR. See *VM/ESA: REXX/EXEC Migration Tool for VM/ESA* for more information on the use of ESAMIGR.

Editing Files on the Workstation

Within the CMS Desktop, it is possible to select the editor you want to use to view or update files. Either a workstation based editor can be used (for example, EPM or VI) or XEDIT. When you select XEDIT, only the amount of data needed to fill one workstation window is sent at a time.

When you select a workstation editor, the entire file to be edited is downloaded to the workstation for use with the editor. This operation may take a long time if the file is large. In addition, if the file is large and the workstation disk space is small, an error may occur when editing the file. When using AIX, the amount of space in the file system from which the workstation agent is called determines whether the edit operation is successful.

When you use the CMS Desktop and select a workstation editor, you should have a large amount of space available on your workstation. If sufficient workstation disk space does not exist, you should use XEDIT.

Note: The CMS Desktop does not provide a browse function for looking at files. Therefore, if you are using a workstation editor and selecting a file from a R/O disk, an attempt is made to transfer the file back to the host when the editor session ends. In the case of a R/O disk, the upload operation fails and a message window displays. When you respond to this message window, a second message window displays regarding the disposition of the work file on the workstation. If you select a file on a R/W disk, the file is rewritten on the host when the editor session ends, even if no changes

were made. If you do not make any changes to the file, the original date/time stamp for the file is preserved.

Workstation Colors

Because the VM/ESA GUI Facility workstation agents use the native workstation platform to display windows, it is possible to use the capabilities of the workstation to change the colors associated with VM/ESA GUI Facility windows. Each workstation platform has a different method of doing this.

The colors on the XEDIT window in the CMS Desktop can be modified through the host PROFILE XEDIT file (see “Effects of Host PROFILE XEDIT” on page 34). One area of the window, however, that cannot be changed from the host is the space between the entry fields in the file area portion of the window.

For example, in the OS/2 environment, the VM/ESA GUI Facility uses the default color scheme associated with the OS/2 desktop to display all windows. To change the colors used with an application such as the CMS Desktop, you must change the color scheme associated with the OS/2 desktop. This also changes the window color scheme for other OS/2 applications that are not associated with a specific color scheme. To change the background color for all of the CMS Desktop windows, including the XEDIT window, follow these steps (The Folder Background element listed below is the window element that affects the color of the spaces between entry fields on the XEDIT window. Use the EntryField/Listbox Background color element to change the color of the entry fields.)

1. Select System Setup in the OS/2 System folder
2. Select Scheme Palette
3. Select the particular scheme you are using
4. Modify the EntryField/Listbox Background color
5. Modify the Folder Background color
6. Close the open selections
7. Press ALT, and press mouse button 2
8. Drag the modified scheme to the OS/2 desktop
9. Release the ALT key and mouse button 2

After completing these steps, the background colors that apply to all of the CMS Desktop windows, including XEDIT, change. You may need to look at some of your native OS/2 applications to ensure that the new default color scheme is acceptable for those applications. (It is recommended that you change the EntryField/Listbox Background and the Folder Background (or Window Background) color to white.)

Chapter 4. Planning and Setting Up a GUI Environment

To use the VM/ESA GUI Facility, you need a workstation, a host system, and a connection between them. This chapter describes information system programmers need to plan and set up a host and workstation environment to support a GUI environment.

Hardware and Software Requirements

Your host and workstation must meet specific hardware and software requirements in order to create a GUI environment. This section helps you determine the correct hardware and software requirements for your system.

Hardware Requirements

The hardware required to use the VM/ESA GUI Facility is as follows:

The Host System: Any System/390 processor supported by VM/ESA 2.4.0 with the appropriate host network attachment devices for either TCP/IP or APPC.

Workstation: You can use programmable workstations or RS/6000 workstations. You do not need both types, but both are supported.

Programmable Workstation: This type of workstation should have the following minimum specifications:

- 486 processor
- 2 MB available disk storage
- 8 MB of memory

The RS/6000 Workstation: This type of workstation should have the following minimum specifications:

- RS/6000 machine (model 340 or higher)
- 8 MB available disk storage

Software Requirements for Your Host System

In order for the VM/ESA GUI Facility to communicate properly with the workstation agent, you need the following software installed and operational on your host system.

Base Operating System:

- VM/ESA Version 2 Release 4.0

TCP/IP Environment: If your host is operating in a TCP/IP environment, you need the following:

- Any supported release of IBM TCP/IP for VM

APPC Environment: If your host is operating in an APPC environment, you need the following:

- The AVS and GCS components of VM/ESA

- Any supported release of IBM ACF/VTAM for VM/ESA

Programming Environment: One or more of the following host and workstation language products are required to write host GUI programs:

- IBM High Level Assembler for MVS and VM and VSE Version 1 Release 2
- IBM C for VM/ESA Version 3 Release 1
- SAS C/C++ 5.50K (available from SAS Corporation)
- REXX (part of VM/ESA)

Software Requirements for Your Workstation

In order for the VM/ESA GUI workstation agent to communicate properly with your host, you need the following software installed and running on your workstation.

For TCP/IP environments, the following workstation products are supported:

Table 2. Supported Workstation Environments and TCP/IP Products for VM/ESA

Operating System	Connectivity Product
OS/2 Warp	One of the following: • IBM TCP/IP for OS/2 Version 2.0 • IBM TCP/IP for OS/2 Version 3.0 • Novell LAN Workplace for OS/2 Version 3.0
Windows 95	• TCP/IP connectivity is included in Windows 95
Windows NT	• TCP/IP connectivity is included in Windows NT.
AIX 3.2.5 with AIX Windows	• TCP/IP connectivity is included in AIX.

For APPC environments, the following workstation products are supported:

Table 3. Supported Workstation Environments and APPC Products for VM/ESA

Operating System	Connectivity Product
OS/2 Warp	• IBM Communications Manager/2 Version 1.11 • Communications Server/2 (CS/2) Version 4.0 Access feature for OS/2 Warp

Host to Workstation Download Capability: In order to install the workstation agent, you need to download files from the host to your workstation. You can use FTP to complete the file transfer or any other appropriate download utility.

Verifying and Changing the VM/ESA GUI CSL Library

The Distributed GUI Toolkit routines are designed to be invoked from a VM/ESA Callable Services Library (CSL). This library consists of a single load module with entry points for each of the callable service routines. This load module can reside either in a segment or on disk. The library is located and loaded automatically by CMS when the first call to the library is generated by a program.

The standard name for this CSL library is VMGUILIB. CMS uses this name to first find a logical shared segment or, if no segment exists, to find the library on disk (VMGUILIB CSLSEG).

It is also possible to use another name for the library. The SET SYSNAME command supports the parameter, CMSGUI, for the specification of the VM/ESA GUI library name. The QUERY SYSNAMES command displays the current name of the VM/ESA GUI library. The following are examples of the QUERY SYSNAMES and SET SYSNAME commands.

To query the VM/ESA GUI library name as it is shipped:

```
query sysnames
SYSNAMES:     CMSVSAM   CMSAMS   CMSDOS   CMSBAM   CMSGUI
ENTRY:      CMSVSAM   CMSAMS   CMSDOS   CMSBAM   VMGUILIB
```

To change and then query the VM/ESA GUI library name:

```
set sysname cmsgui mylibr
R;
query sysnames
SYSNAMES:     CMSVSAM   CMSAMS   CMSDOS   CMSBAM   CMSGUI
ENTRY:      CMSVSAM   CMSAMS   CMSDOS   CMSBAM   MYLIBR
```

Note: Once the VM/ESA GUI library is loaded, a new name does not take effect until the loaded library is dropped. This may be done automatically with a re-IPL of CMS or explicitly by issuing the following command:

```
rtndrop * (group dt
```

Using Saved Segments

You are not required to use the VM/ESA GUI Facility from saved segments, but it is recommended that you use the following two segments:

GUICSLIB
: Contains the CSL library (VMGUILIB) that supports applications written with the VM/ESA Distributed GUI Toolkit, including the CMS Desktop. This segment is loaded automatically when the first DT application is called.

GUIVMGUI
: Contains execs and modules that make up the CMSDESK command (CMSDESK LSEG). This segment is **not** loaded automatically. The segment must be loaded explicitly with a SEGMENT LOAD CMSDESK command. This command can be placed in SYSPROF EXEC or a locally written "front-end" exec to the CMSDESK command.

The *VM/ESA: Planning and Administration* identifies the steps required to define and save segments. Both segments can be located above the 16MB boundary. You should load the GUIVMGUI segment above the 16MB boundary because its size is

5MB. After entering the CMSDESK command, enter the QUERY SEGMENT command to check that the two segments are loaded.

Making Installation-Wide Changes to the CMS Desktop

A control file exists that lets system programmers add or delete objects from the CMS Desktop for users. The control file is named DESKSYS CONTROL. It has entries similar to the following:

```
*Files &9222                                                    GUIDMD
*Oth   &9223                                                    GUIDFM
*Seek  &9224                                                    GUIDSO
*Rdr   &9225                                                    GUIDMB
*AddrB &9226                                                    GUIDAB
*Note  &9227                                                    GUINOT
```

The fields beginning with &922 are translatable fields representing the titles and descriptions, respectively, of the objects on the CMS Desktop. The actual text for the IBM-supplied objects reside in the user message repository for the VM/ESA GUI Facility. The actual message repository numbers are represented as 9222 and so forth. If the title or description field does not begin with an &, then the actual text in the field is used.

The example below shows the default CMS Desktop using actual text instead of message numbers.

```
*Files File Mode A         Contents of A disk or directory    GUIDMD
*Oth   File Manager        List of places where files reside  GUIDFM
*Seek  File Search         Search for files                   GUIDSO
*Rdr   Reader              Contents of reader                 GUIDMB
*AddrB Address Book        Contents of names file             GUIDAB
*Note  New Note            Create a new note                  GUINOT
```

To add or delete system functions from the CMS Desktop, you must edit the DESKSYS CONTROL file. To delete a function, delete the appropriate line from this file. To add your own program to the CMS Desktop, include an entry using the following format:

```
Columns 1-5       the character string "*Site"
Columns 6-7       must be blank
Columns 8-27      program title (will appear on Desktop)
Columns 28-62     descriptive text (will appear on Desktop)
Columns 63-70     name of MODULE or EXEC to invoke
Columns 71-285    any additional parameters needed
```

Once the entry has been added, the CMS Desktop invokes this program using the CMSCALL macro with a CALLTYP of SUBCOM.

The following is an example of a control file with a new entry:

```
*Files File Mode A         Contents of A disk or directory    GUIDMD
*Oth   File Manager        List of places where files reside  GUIDFM
*Seek  File Search         Search for files                   GUIDSO
*Rdr   Reader              Contents of reader                 GUIDMB
*AddrB Address Book        Contents of names file             GUIDAB
*Note  New Note            Create a new note                  GUINOT
*Site  Calculator          General Purpose Calculator         RCALC
```

NLS Information

The VM/ESA GUI Facility provides national language support as follows:

Messages

Messages that are displayed as part of the VM/ESA GUI support are translated as follows:

1. Messages associated directly with the CMS Desktop (items such as menu bars, push-buttons, and prompts) reside in a separate user message repository provided as part of the VM/ESA GUI Facility. The application ID of this repository is GUI. When the CMS Desktop is started, the repository matching the language currently in effect is loaded. The message repository has versions in the following languages:

Language	Language Repository Name
American English	GUIUME TEXT
Japanese (Kanji)	GUIUMEA TEXT
Uppercase English	GUIUMEB TEXT
French	GUIUMED TEXT
French Canadian	GUIUMEJ TEXT
German	GUIUMEE TEXT

2. Messages that are associated with CMS System Services and displayed by the CMS Desktop when necessary (often error situations) reside in the CMS system message repository. For VM/ESA Version 2 Release 4.0, these messages are available in the following languages:
   - American English
   - Japanese (Kanji)
   - Uppercase English
   - French
   - French Canadian
   - German
3. Except for uppercase English, messages displayed by the workstation agent are translated into the same languages as the CMS Desktop messages. When installing a workstation agent, you can select which language to use for the workstation agent (see “Installing the Workstation Agent File” on page 6 for more information).

CMS Desktop Help

CMS Desktop Help is available in the same languages as the messages displayed by the CMS Desktop, except for uppercase English.

The workstation agent file that is downloaded contains help files (INF files) in American English. To obtain help files in another language, you must download another file (in binary) into the same directory as the workstation agent.

The source help files (IPF files) are also available if you want to modify them for your own use. To obtain the source help files, you must download a file (in binary) into the same directory as the workstation agent. You must also have an IPF compiler to generate the INF file.

Files available for downloading, by language, are listed in the following tables.

For OS/2, Windows 95, and Windows NT:

Table 4. Help Files (INF Files) for Downloading in OS/2, Windows 95, and Windows NT

Language	File to Download	Workstation File
Japanese	GUIHELPA EXEBIN	GUIHELPA.EXE
French	GUIHELPD EXEBIN	GUIHELPD.EXE
French Canadian	GUIHELPJ EXEBIN	GUIHELPJ.EXE
German	GUIHELPE EXEBIN	GUIHELPE.EXE

Table 5. Source Help Files (IPF Files) for Downloading in OS/2, Windows 95, and Windows NT

Language	File to Download	Workstation File
American English	GUIHLPS EXEBIN	GUIHLPS.EXE
Japanese	GUIHLPSA EXEBIN	GUIHLPSA.EXE
French	GUIHLPSD EXEBIN	GUIHLPSD.EXE
French Canadian	GUIHLPSJ EXEBIN	GUIHLPSJ.EXE
German	GUIHLPSE EXEBIN	GUIHLPSE.EXE

For AIX:

Table 6. Help Files (INF Files) for Downloading in AIX

Language	File to Download	Workstation File
Japanese	GUIHELPA PAXBIN	GUIHELPA.PAXBIN
French	GUIHELPD PAXBIN	GUIHELPD.PAXBIN
French Canadian	GUIHELPJ PAXBIN	GUIHELPJ.PAXBIN
German	GUIHELPE PAXBIN	GUIHELPE.PAXBIN

Table 7. Source Help Files (IPF Files) for Downloading in AIX

Language	File to Download	Workstation File
American English	GUIHLPS PAXBIN	GUIHLPS.PAXBIN
Japanese	GUIHLPSA PAXBIN	GUIHLPSA.PAXBIN
French	GUIHLPSD PAXBIN	GUIHLPSD.PAXBIN
French Canadian	GUIHLPSJ PAXBIN	GUIHLPSJ.PAXBIN
German	GUIHLPSE PAXBIN	GUIHLPSE.PAXBIN

Once the file is downloaded, it needs to be unpacked as follows:

OS/2

Type the name of the downloaded file in an OS/2 command line window and press Enter.

Windows 95

Select the *Start* choice, select the *Run* choice. Then type the name of the downloaded file in the command line entry field, enter the path name where the workstation agent file is located, and select **OK**.

Windows NT

Select the *Start* choice, select the *Run* choice. Then type the name of the downloaded file in the command line entry field, enter the path name where the workstation agent file is located, and select **OK**.

AIX

Type the following command:

```
pax -rf filename
```

where *filename* is the name of the downloaded file.

Changing the Language for VM/ESA GUI

The steps you need to take as an end user to activate VM/ESA GUI in a language other than English are as follows:

1. Install the workstation agent choosing the desired language during the installation process.
2. Download the CMS Desktop help files (INF files) in the language you desire into the directory that contains the workstation agent.
3. Unpack the downloaded file.
4. Use the CMS SET LANGUAGE command to activate the appropriate language for the CMS Desktop messages and help files.

   The language on the host should match the language for the codepage on the workstation. To use DBCS data on the CMS Desktop, you must set the language to Kanji before entering the CMSDESK command.

DBCS Support

Some objects in the Distributed GUI Toolkit support DBCS. For more information, see *IBM VM/ESA: Distributed Graphical User Interface Toolkit*. XEDIT continues to be supported for DBCS in the VM/ESA GUI environment.

Problems will occur if you set the host language to AMENG or UCENG and try to use a different codepage on the PC. The current language set on the host is used to set the codepage that the workstation agent uses on the CMS Desktop.

The DBCS translation from host to workstation and back deletes and adds SO/SI characters, respectively. Therefore, some strings may have different lengths and alignments when viewed on the host versus on the workstation.

Entry Field Length Considerations

SBCS is required whenever a file name or file type is requested to limit the number of characters entered. Also, use SBCS when entering fields that access VM/ESA system resources.

Setting Fonts in AIX

If you are using a DBCS language, you cannot select a font. Include the following statement in the **.Xdefaults** file:

```
*fontList: *gothic*:
```

Locales

Do not run the AIX workstation agent in locales other than Ja_JP. When you run the AIX workstation agent in locales such as ja_JP or En_US, it requires several minutes until the initial panel is displayed. During initialization, the other processes are locked.

Address Book Restrictions

The Address Book application on the CMS Desktop uses the CMS NAMEFIND command extensively. Because the NAMEFIND command does not support DBCS and certain English characters (such as, X'5E' (semicolon) or X'7A' (colon)), you cannot use any DBCS characters in addresses that contain the hex value of these restricted English characters. For example, you cannot specify an address that contains a DBCS character containing X'5E' (semicolon) or X'7A' (colon).

Support for Japanese Versions of Workstations

The VM/ESA GUI workstation agent is supported for use in Japanese versions of all the supported workstation platforms.

Chapter 5. Getting Connected

In order for the VM/ESA GUI Facility to function properly, your workstation requires specific connectivity capabilities. This section helps you define and configure your computing environment.

You must have a TCP/IP or APPC connection enabled to support VM/ESA GUI communication between the VM host system and your workstation. This section describes the host and workstation configurations for both TCP/IP and APPC connections. Typically, workstation configuration is done by the end user or LAN administrator, and host configuration is done by the system or network support staff.

Configuring TCP/IP Connections

In order to use VM/ESA GUI Facility with TCP/IP, the end user must ensure that CMS knows of the workstation's TCP/IP host identity as represented by a dotted decimal internet address or, optionally, a TCP/IP host name.

Selecting the Workstation

In order for your VM/ESA user ID to establish a TCP/IP connection with your workstation, you must provide the VM/ESA GUI Facility with the internet address of your workstation. The internet address may be a dotted decimal internet protocol (IP) address or a host name.

IP addresses may be specified on the SET WORKSTATION command or as part of DT. Host names may only be specified on the SET WORKSTATION command.

In addition to the internet address, the VM/ESA GUI Facility also uses a TCP/IP port number, enabling VM/ESA to communicate with the workstation agent program. The default port number is 15993, which is valid for most applications.

Sometimes, however, you may need to change the port number. For example, when operating in an AIX environment you may need to specify a unique port on your workstation to be used for communication, in addition to the internet address. See “Running on AIX” on page 49. Also, from a TCP/IP management perspective, specifying a port address makes it easier to monitor usage and solve problems.

All well-known (reserved) TCP/IP ports are defined in the “services” file in the “etc” directory. You can view the file to select any available port number. Even though they may not be listed in the “services” file, ports 1 through 1024 are reserved for system use and should not be used. Specifying a port address is also a good practice for all CMS Desktop users to follow. From a TCP/IP management perspective, specifying a port address makes it easier to monitor usage and solve problems.

Examples of SET WORKSTATION command for TCP/IP:

- TCP/IP internet address in dotted decimal format:

  ```
  SET WORKSTATION IP 9.876.54.32
  ```

- TCP/IP internet address in dotted decimal format with port number:

```
SET WORKSTATION IP 9.876.54.32 19111
```

- TCP/IP host name:

  ```
  SET WORKSTATION IP MYHOST
  ```

- TCP/IP host name with port number:

  ```
  SET WORKSTATION IP MYHOST 19111
  ```

Automating Workstation Selection

If you TELNET into your VM/ESA system, you can use the program in Appendix C, “Sample QRYIPADR EXEC” on page 59 to have the VM/ESA GUI Facility use the same workstation. By using TELNET and by including this program in your user profile (PROFILE EXEC), the VM/ESA GUI Facility follows you, no matter what workstation you use (as long as the workstation has the VM/ESA workstation agent installed and running). QRYIPADR EXEC determines the workstation IP address used to log on to the host virtual machine and issues a SET WORKSTAT command.

To ease configuration for VM/ESA GUI Facility users, system support personnel may wish to include this program in the system profile (SYSPROF EXEC). The program may need to be customized for your installation.

TCP/IP Virtual Machine Designation

The VM/ESA GUI Facility must determine the user ID of the TCP/IP virtual machine that it is intended to communicate with. The VM/ESA GUI Facility obtains this identification by first checking the TCPIPID entry in the CENV group in the user’s LASTING GLOBALV file. If unable to locate the identification, the VM/ESA GUI Facility looks for the user ID designated by the TCPIPUSERID entry in the TCPIP DATA file on any accessed disk. If the TCPIP DATA file is not found, the TCP/IP user ID defaults to TCPIP.

The TCPIPID entry can be set in the LASTING GLOBALV by issuing the following command:

```
GLOBALV SELECT CENV SETLP TCPIPID userid
```

where *userid* is the TCP/IP virtual machine name.

Running on IBM OS/2

The workstation agent requires that the TCP/IP API dynamic link library (DLL) be available in a directory specified on the DPATH statement in CONFIG.SYS.

When the workstation agent is started it tries to use IBM TCP/IP. If IBM TCP/IP support is not available, the workstation agent then tries to use Novell LAN Workplace. If TCP/IP API support cannot be loaded, a TCP/IP connection cannot be used.

Note: IBM TCP/IP support is contained in TCP32DLL.DLL and SO32DLL.DLL. Novell LAN Workplace support is in RCB43.DLL.

Running on Windows 95 and Windows NT

The workstation agent requires that the TCP/IP API dynamic link library (DLL) be present in the standard search order or in a directory of your choosing.

Windows 95 and Windows NT searches for DLLs in the following order:

1. Current directory
2. *WINDOWS* directory
3. *WINDOWS\SYSTEM* directory
4. Directory containing the executable file for the current task
5. Directories listed in the *PATH* environment variable
6. List of directories mapped in a network.

Running on AIX

When multiple users use a single RS/6000 workstation as the target for the CMS Desktop, each user must specify a TCP/IP port number when starting the workstation agent and issuing the SET WORKSTAT command.

To specify a TCP/IP port number on the workstation, each user must first start the workstation agent (exporting their display to the proper device). Then from the "Options" pull-down menu, select the "Set TCP/IP Port..." menu choice and set the port number. After setting the port number, stop the workstation agent and restart it. When entering the SET WORKSTAT command on the VM host, specify the IP address as x.xx.xx.xx nnnnn, where nnnnn is the port number they specified when they called the workstation agent.

Getting Back a Lost TCP/IP Connection

Occasionally, you may experience an abnormal ending to your communications session. An abnormal ending includes events such as powering off the workstation before closing the session with your VM/ESA GUI workstation agent.

The VM/ESA GUI Facility is designed to detect program and network failures and to notify you when they occur. However, there are differences in the way some non-IBM versions of TCP/IP report error conditions, and there may be times when a lost TCP/IP connection is not detected, requiring that you close and restart the workstation agent program or the CMS application, or both, to clear the problem.

Adjustment of the VM/ESA host TCP/IP keep-alive timer by your TCP/IP network administrator may improve error reporting.

Starting VM/ESA GUI Applications from Your Workstation

You can use TCP/IP to run the CMS Desktop and other VM/ESA GUI programs without a 3270 session. This function is provided by the REXEC or RSH command. See "Using TCP/IP" on page 19 for more information.

Verifying Your Connection

It is important that you verify the TCP/IP connectivity between the host and your workstation, ensuring that all necessary components are installed, customized, and activated correctly.

To test for TCP/IP connectivity, use the PING command. For more information about the PING command, see your TCP/IP product documentation.

Configuring APPC Connections

This section discusses some of the configuration concerns when using APPC in the OS/2 environment.

Configuring the Host Network

Since VM/ESA GUI requests flow from the host to the workstation, VTAM must be able to locate the workstation LU. The requirements to achieve this are dependent upon the type of network in use (APPN or subarea) and VTAM start options. For more information about VTAM, see the *VTAM Network Implementation Guide*. For information about configuring AVS, see the *VM/ESA: Connectivity Planning, Administration, and Operation*.

Your VTAM Version 3 installation may want to add the APPN logmode name #INTER to ISTINCLM. For VTAM Version 4 installations, this is built-in.

```
#INTER    MODEENT LOGMODE=#INTER,FMPROF=X'13',TSPROF=X'07',
          ENCR=B'0000',SSNDPAC=7,RUSIZES=X'F7F7',
          SRCVPAC=7,PSNDPAC=7
```

Because dependent LUs cannot be used, there must be an independent LU type 6.2 (ILU) defined for each user. ILU's can be defined by one of the following:

- Starting VTAM with DYNLU=YES and a valid control point name (cpname) in the workstation SNA configuration
- Pre-definition through the use of CDRSC's
- Using APPN support provided by VTAM Version 4

Selecting the Workstation

For the VM/ESA GUI Facility to establish an APPC connection with your workstation, it needs three pieces of information:

1. An APPC-capable LU name defined for your workstation
2. The AVS gateway to be used to reach the SNA network
3. The APPC transaction program name assigned to the workstation agent.

Within your workstation, there are communications end-points known as "logical units" (LUs). These LUs are used by applications to communicate with other applications in the network. For example, some support 3270 terminal emulation (LU Type 2), some may support printer emulation (LU Type 2 or 3), and others may support APPC functions (LU Type 6.2). Each different LU type can perform only certain functions. That is, an LU that is used for 3270 emulation cannot be used for APPC functions required by the VM/ESA GUI Facility.

The control point (CP) within your workstation can perform APPC functions as can any other “independent” LU defined on your workstation. 3270 terminal or printer emulator LUs cannot be used.

The AVS gateway you select must be a global or non-dedicated private AVS gateway. All available AVS gateways can be displayed using the CP QUERY GATEWAY command.

The combination of the AVS gateway LU name and the workstation LU name is called the “locally known LU name.”

The APPC transaction program name (TPN) is not the name of the workstation agent program (WSA), but is a special name used by APPC to associate APPC requests with the workstation agent. The default name is WSAGENT, and can be changed by selecting *SET SNA TP NAME* from the **Options** pull-down menu on the workstation agent. The default should be sufficient for most cases.

All of these names may be specified on the SET WORKSTATION command.

Keep in mind:

- AVS gateway and workstation LU names are each 1 to 8 characters in length.
- The workstation LU name must be unqualified, and therefore cannot include the network ID.

  VM/ESA supports workstations that are logically in the same network as the AVS gateway. Workstations in other networks may be used as long as they have aliases on the local network.

If you are not sure what names should be used, contact your network support personnel.

Using the CMS Communications Directory

If desired, you can package the AVS gateway and workstation LU information into a CMS Communications Directory (COMDIR) entry. For example, you could update UCOMDIR NAMES to include:

```
:nick.me
   :luname.gateway luname
```

You can then simply specify the nickname on the SET WORKSTATION command. For more information on the SET WORKSTATION command, see “Using the SET WORKSTATION Command with APPC” on page 17.

If UCOMDIR NAMES did not already exist, create it by issuing:

```
SET COMDIR FILE USER UCOMDIR NAMES *
```

otherwise just issue:

```
SET COMDIR RELOAD
```

Examples

- Specifying only the locally known LU name (gateway and LU name):

  ```
  SET WORKSTATION LU GATEWAY1 A1LU0006
  ```

- Specifying the locally known LU name with TPN:

  ```
  SET WORKSTATION LU GATEWAY1 A1LU0006 MYGUITPN
  ```

- Specifying a Communications Directory entry name:

  ```
  SET WORKSTATION LU ME
  ```

  where UCOMDIR NAMES contains

  ```
  :nick.ME
    :luname.GATEWAY1 A1LU0006
  ```

Verifying Your Connection

Use the APING command to verify your connection. For more information about the APING command, see the *APPC Application Suite Administration Version 1 for MVS/ESA and VM/ESA* manual and the *APPC Application Suite User's Guide Version 1 for MVS/ESA and VM/ESA*.

Setting the APPC Session Limit

When using an APPC connection, the default logmode is #INTER. With this logmode, you can have four concurrent GUI windows open. Within the CMS Desktop, this limitation translates into being able to open windows associated with four CMS Desktop functions concurrently. For example, a CMS Desktop user could have the Reader window, Open window, Reply window and the CMS Desktop window open. When an attempt is made to open a window associated with another CMS Desktop function, the request is queued until one of the four GUI windows in use is released. No message is given to the CMS Desktop user that this is happening. The operation appears to hang.

System programmers should carefully review the default logmode used when setting up the AVS gateways for use with the VM/ESA GUI Facility. The logmode can be changed by combining the `LU` *COMDIR_nickname* form of SET WORKSTAT with a CMS Communications Directory entry that has :modename. specified.

Each VM/ESA GUI application requires at least two APPC connections; some use only two — others use more. In order to prevent excessive use of system resources by any one user, APPC has the concept of a “session limit.” This limit determines the maximum number of APPC connections that can be in use at the same time.

The session limit is the lesser of:

- Your CP directory MAXCONN value
- The limit negotiated between the VM/ESA host and your workstation

Your MAXCONN value determines the limit on the “total” number of connections your virtual machine can have. This includes the VM/ESA GUI Facility, the Shared File System, and any other function that communicates with another part of the VM/ESA system. Look at a copy of your directory entry to learn your MAXCONN value. If no limit is specified, the default is 64. Only your system support personnel can change this limit.

For more information on MAXCONN, see the description of the OPTION directory entry in the *VM/ESA: Planning and Administration*.

The negotiated limits are determined when your workstation and the AVS gateway on VM/ESA participate in a Change Number of Sessions (CNOS) exchange. In a CNOS, each partner sends a request to set the session limit to a particular value. The actual limit will be the lesser of the two requests. You have control over the limit requested by your workstation. To make such a request, include a statement like the following in your Communications Manager configuration (.NDF) file:

```
CNOS  LOCAL_LU_ALIAS(alias)
      FQ_PARTNER_LU_NAME(netid.avsluname)
      MODE_NAME(#INTER  )
      SET_NEGOTIABLE(YES)
      PLU_MODE_SESSION_LIMIT(nn)
      MIN_CONWINNERS_SOURCE(0)
      MIN_CONWINNERS_TARGET(nn)
      AUTO_ACTIVATE(2);
```

alias
: is the LU alias for the APPC LU that you will be using.

netid.avsluname
: is the fully-qualified LU name of the AVS gateway.

nn
: is the maximum number of APPC connections you plan to have active at the same time. Set this number to your MAXCONN value. Both PLU_MODE_SESSION_LIMIT and MIN_CONWINNERS_TARGET should have the same value to achieve best performance.

When you have updated your configuration file, it must be verified. To do this:

1. Open your Communications Manager/2 folder and start **Communications Manager Setup**.
2. Select **Setup**.
3. Select your configuration file name and select **OK**.
4. Select **Close** - verification begins.
5. Answer `yes` when asked if you would like to dynamically update your SNA resources..

You can then close the configuration program and the Communications Manager folder.

The negotiated session limit can be changed dynamically using the Subsystem Management application:

1. Open your Communications Manager/2 folder and start **Subsystem Management**
2. Select *SNA subsystem*
3. Select *LU 6.2 sessions*
4. Use the **Session** or **Establish** pull-down menu items to change or initialize sessions limits, respectively.

The changes you make using Subsystem Management are temporary. Permanent changes can only be made by editing the configuration file.

See the *Multi-Platform APPC Configuration Guide* for more additional configuration information.

Appendix A. Interaction with the Virtual Console

Your ability to interact with the virtual console while the CMS Desktop is active will depend on the environment that you choose to run the CMS Desktop in.

One way to run the CMS Desktop is in the background, leaving the command line available for traditional VM commands. This works correctly if you do not initiate virtual console I/O from the CMS Desktop. Virtual console I/O can occur from the CMS Desktop, for example, when you add a program to the CMS Desktop that performs traditional CMS console I/O (CONSOLE macro or LINERD/LINEWRT macros, for example).

Running CMS programs that perform virtual console I/O on the CMS Desktop is unsupported and should be avoided.

The following is a summary of the environments in which the CMS Desktop runs and how you can interact with the virtual console while the CMS Desktop runs.

1. CMS Desktop in the Foreground

   In this environment, the CMS Desktop runs as the active CMS command and other commands cannot be entered from the CMS command line. Although unsupported, the following results can be expected if a program from the CMS Desktop performs virtual console I/O.

   - Full Screen programs (those that use the CONSOLE macro and/or VM Session Services operations such as the VSCREEN command to write full screens of data)

     These programs can be invoked and will be displayed in the 3270 window. Interaction with CMS Desktop is inhibited while the 3270 program is active. In this environment, use of some CMS fullscreen programs may result in the 3270 screen not being cleared on program exit. However, the next program that performs a 3270 I/O operation will clear the screen.

   - Line mode programs (those that perform I/O operations to read and write individual lines to the 3270 screen)

     These programs should work correctly. Interaction with CMS Desktop is inhibited if you enter a More/Holding situation. You can reduce or eliminate More/Holding problems by using the TERMINAL MORE command and the TERMINAL HOLDING command.

     Another way to eliminate the More/Holding problem is to run with SET FULLSCREEN ON.

2. CMS Desktop in the Background

   In this environment, the CMS Desktop runs in the background and traditional CMS commands can be entered from the CMS command line. This is the recommended and supported environment to use if you wish to invoke traditional CMS commands while the CMS Desktop is active. This support is subject to the following limitations.

   - Full Screen programs (those that use the CONSOLE macro and/or VM Session Services operations such as the VSCREEN command to write full screens of data)

These programs can be invoked and will be displayed in the 3270 window. Interaction with CMS Desktop is possible while the 3270 program is active.

This is possible only if the fullscreen program is using the facilities of the CONSOLE macro or the VSCREEN command to wait for user input. Use of other WAIT facilities (WAITECB, WAITRD, and so on) will inhibit interaction with the CMS Desktop.

- Line mode programs (those that perform I/O operations to read and write individual lines to the 3270 screen)

  These programs will work correctly. Interaction with CMS Desktop is inhibited if you enter a More/Holding situation. You can reduce or eliminate More/Holding problems by using the TERMINAL MORE command and the TERMINAL HOLDING command.

  Another way to eliminate the More/Holding problem is to run with SET FULLSCREEN ON.

- EXEC 2 execs

  Execs written in the EXEC 2 language should not be issued from a desktop application or from a GUI XEDIT environment whenever you are executing programs on the 3270 virtual console, or issuing commands to the 3270 virtual console.

As with foreground mode, initiating 3270 virtual console I/O from the CMS Desktop is unsupported. If you choose to do this, results are unpredictable and may often result in a CMS system failure.

Appendix B. Sample GUIAPPC EXEC

The GUIAPPC EXEC source is available on the samples minidisk.

```
/* GUIAPPC EXEC - Starts the CMS Desktop via remote APPC request */
address command
arg symdest .
Call Apiload(CMREXX)

address CPICOMM
'CMACCP convid cmrc'
if cmrc <> 0 then
  do
    say 'This program must be invoked as a CMS Private Server'
    exit 88
  end
'CMEPLN convid plu plu_len cmrc'
length = 0
Do until cmrc <> CM_OK
  'CMRCV convid buffer length data',
        'received_length status rts cmrc'

  if cmrc = CM_OK & status = CM_CONFIRM_RECEIVED then
    'CMCFMD convid cfm_rc'
End

parse value 'LEFT'(plu,plu_len) with avs remote
say 'Remote LU' remote 'has requested the CMS Desktop ('symdest')'
address command
'SET WORKSTAT LU' avs remote

address command 'CMSDESK'
if rc = -3 then
  say 'but the desktop is not available on this release of CMS'
exit rc
```

Appendix C. Sample QRYIPADR EXEC

The QRYIPADR EXEC source is available on the samples minidisk.

```
/* See if user is logged on through TCP/IP.  If so, get their IP      */
/* address and issue SET WORKSTATION.                                 */
user = 'USERID'()
address command

gottcp = 0                              /* Need NETSTAT command       */
'ESTATE NETSTAT MODULE *'               /* Is it out there somewhere? */

if rc = 28 then do                      /* If we can't find NETSTAT,  */
  'EXEC VMLINK TCPIP (NOI NOTYPE PUSH' /* see if site has established */
  if rc <> 0 then exit                  /* a nickname for TCP/IP client*/
  gottcp = 1                            /* disk or directory.  If not, */
end                                     /* we can't go any further.   */

'PIPE CP QUERY USER' user,              /* See if user is a logical   */
   '| spec 11-* 1',                    /* device (LDEV).  If not,    */
   '| strip',                          /* stop now.                  */
   '| var device'
If rc <> 0 | 'LEFT'(device,1) <> 'L' then
  Signal Cleanup

'PIPE CP QUERY LDEV' device,            /* See who owns LDEV.  We are */
    '| spec w8 1',                     /* only interested in those   */
    '| var owner'                      /* owned by TCPIP userids.    */
If rc <> 0 then Signal Cleanup
If 'LEFT'(owner,5) <> 'TCPIP' then Signal Cleanup

'PIPE command NETSTAT TELNET TCP' owner,  /* Get IP address from TELNET*/
   '| locate / LOGON  AS' left(user,8)'/',
   '| var resp',
   '| spec w3 1',
   '| var ipaddr'
                                        /* If response good, use it. */
if 'WORD'(resp,1) <> 'Cannot' & ipaddr <> 'IPADDR' then
  'SET WORKSTATION IP' ipaddr

Cleanup:
if gottcp then 'EXEC VMLINK TCPIP (POP NOTYPE'
exit
```

Sample QRYIPADR EXEC

Appendix D. Sample CMSDESKR.CMD

The CMSDESKR.CMS source is available on the samples minidisk.

```
/*************************  CMSDESK  ********************************/
/*  Description:                                                    */
/*    Start CMS Desktop using VM APPC Private Server support.       */
/*                                                                  */
/*    CMSDESK netid.avsgateway userid password                      */
/* or            avs_alias     userid password                      */
/*******************************************************************/

Call Initialize_Constants
Call Process_Options

Address CPIComm                         /* Switch environments     */
retry = 1                               /* Retry CMALLC if error   */

Init_Conversation:                      /* Initialize conversation */
  _resource = left(' ',8)
  'CMINIT conversation_id _resource CM_RC'
  If CM_RC <> CM_OK then
    Call EMSG 'Unable to init conversation to' _resource

  tpname = 'GUIAPPC';  id_length = length(tpname)
  'CMSTPN conversation_id tpname id_length CM_RC'

  security_level = XC_SECURITY_PROGRAM
  'XCSCST conversation_id security_level CM_RC'

  id_length = length(_userid)
  'XCSCSU conversation_id _userid id_length CM_RC'

  id_length = length(_password)
  'XCSCSP conversation_id _password id_length CM_RC'

  plul = length(_at)
  'CMSPLN conversation_id _at plul CM_RC'

  modename = '#INTER'; modenamel = length(modename)
  'CMSMN conversation_id modename modenamel CM_RC'

  synclvl = CM_CONFIRM
  'CMSSL conversation_id synclvl CM_RC'

  'CMALLC conversation_id CM_RC'
  if CM_RC = CM_ALLOCATE_FAILURE_RETRY & retry then
    do
      retry = 0
      Signal Init_Conversation
    end

  if CM_RC <> CM_OK then
    Call EMSG 'Unable to allocation conversation'

  'CMCFM conversation_id rts CM_RC'    /* Flush allocate thru network */
  if CM_RC <> CM_OK then
```

```
    Call EMSG 'Unable to start CMSDESK'

  deal_type = CM_DEALLOCATE_FLUSH      /* Don't bother with confirm   */
  'CMSDT conversation_id deal_type CM_RC'

  'CMDEAL conversation_id CM_RC'       /* Deallocate conversation     */
  if CM_RC <> CM_OK then
    Call EMSG 'Unable to deallocate conversation'
  exit 0

Process_Options:
  /*********************************************************/
  /* Get options from command line                         */
  /*********************************************************/
  parse upper args _at _userid _password .

  if _at = '' then
    say 'AVS gateway not specified'

  if _userid = '' then
    say 'VM userid not specified'

  if _password = '' then
    do
      say 'VM password not specified'
      say
      say 'Syntax: CMSDESK netid.avsgateway userid password'
      say '    or             avs_alias     userid password'
      exit
    end
Return

EMSG:
  /*********************************************************/
  /*  An error has occurred in a CPI-Communications call.  */
  /*  If the return code text is defined in the REXX       */
  /*  CM_Return_Code. array, then display text.            */
  /*********************************************************/
  parse arg msg
  Say msg                          /* Display caller's text        */
  CM_RC = CM_RC + 0                /* Strip leading zeroes from RC */

  if symbol('CM_Return_Code.'CM_RC) = 'VAR' then
    Say 'RC =' CM_Return_Code.CM_RC
  else
    Say 'RC =' CM_RC '  (message text not defined)'

  Exit CM_RC

Initialize_Constants:
  /*********************************************************/
  /*  Constants we want to use                             */
  /*********************************************************/
  CM_OK                          = 0
  CM_ALLOCATE_FAILURE_RETRY      = 2
  XC_SECURITY_PROGRAM            = 2
  CM_DEALLOCATE_FLUSH            = 1
  CM_CONFIRM                     = 1
```

```
CM_RETURN_CODE.                 = 'CM_UNKNOWN_RETURN_CODE'
CM_RETURN_CODE.0                = 'CM_OK'
CM_RETURN_CODE.1                = 'CM_ALLOCATE_FAILURE_NO_RETRY'
CM_RETURN_CODE.2                = 'CM_ALLOCATE_FAILURE_RETRY'
CM_RETURN_CODE.6                = 'CM_SECURITY_NOT_VALID'
CM_RETURN_CODE.7                = 'CM_SYNC_LVL_NOT_SUPPORTED_LU'
CM_RETURN_CODE.8                = 'CM_SYNC_LVL_NOT_SUPPORTED_PGM'
CM_RETURN_CODE.9                = 'CM_TPN_NOT_RECOGNIZED'
CM_RETURN_CODE.10               = 'CM_TP_NOT_AVAILABLE_NO_RETRY'
CM_RETURN_CODE.11               = 'CM_TP_NOT_AVAILABLE_RETRY'
CM_RETURN_CODE.17               = 'CM_DEALLOCATED_ABEND'
CM_RETURN_CODE.18               = 'CM_DEALLOCATED_NORMAL'
CM_RETURN_CODE.19               = 'CM_PARAMETER_ERROR'
CM_RETURN_CODE.20               = 'CM_PRODUCT_SPECIFIC_ERROR'
CM_RETURN_CODE.21               = 'CM_PROGRAM_ERROR_NO_TRUNC'
CM_RETURN_CODE.22               = 'CM_PROGRAM_ERROR_PURGING'
CM_RETURN_CODE.23               = 'CM_PROGRAM_ERROR_TRUNC'
CM_RETURN_CODE.24               = 'CM_PROGRAM_PARAMETER_CHECK'
CM_RETURN_CODE.25               = 'CM_PROGRAM_STATE_CHECK'
CM_RETURN_CODE.26               = 'CM_RESOURCE_FAILURE_NO_RETRY'
CM_RETURN_CODE.27               = 'CM_RESOURCE_FAILURE_RETRY'
CM_RETURN_CODE.28               = 'CM_UNSUCCESSFUL'
return
```

Sample CMSDESKR.CMD

Appendix E. List of GIF Files

The following is a list of the GIF files used for the CMS Desktop toolbar. Two lists are provided:

- List by the application name
- Alphabetical list by the GIF file name

You can create and use your own GIF files instead of the ones provided by the applications. To do so:

1. Create a GIF file
2. Replace a GIF file currently located in the workstation agent directory, using the same name as the old GIF file in the directory. The new GIF file is then used everywhere the old GIF file was formerly used.

List by Application Name

```
Address Book        - AddressBook/New address...            - newaddr.gif
Address Book        - AddressBook/Settings.../Sort...       - sort.gif
Address Book        - Selected/Open                         - open.gif
Address Book        - Selected/Delete                       - delete.gif
Address Book        - View/Refresh now                      - refresh.gif
Address Book        - Help/General help                     - help.gif
File Manager        - FileManager/Open unlisted dir         - newdir.gif
File Manager        - FileManager/Open unlisted mini        - disk.gif
File Manager        - FileManager/Settings.../Sort...       - sort.gif
File Manager        - Selected/Open                         - open.gif
File Manager        - Selected/Access                       - access.gif
File Manager        - Selected/Release                      - release.gif
File Manager        - Selected/Add to desktop...            - addtodt.gif
File Manager        - View/Refresh now                      - refresh.gif
File Manager        - Help/General help                     - help.gif
Reader              - Reader/New note                       - newnote.gif
Reader              - Reader/Settings.../Sort...            - sort.gif
Reader              - Selected/Open                         - open.gif
Reader              - Selected/Receive                      - receive.gif
Reader              - Selected/Delete                       - delete.gif
Reader              - Selected/Print...                     - print.gif
Reader              - View/Refresh now                      - refresh.gif
Reader              - Help/General help                     - help.gif
Minidisk            - Minidisk/New file                     - newfile.gif
Minidisk            - Minidisk/Settings.../Sort...          - sort.gif
Minidisk            - Minidisk/Add to desktop...            - addtodt.gif
Minidisk            - Selected/Open                         - open.gif
Minidisk            - Selected/Copy...                      - copyfile.gif
Minidisk            - Selected/Delete                       - delete.gif
Minidisk            - Selected/Print...                     - print.gif
Minidisk            - Selected/Send...                      - send.gif
Minidisk            - View/Refresh now                      - refresh.gif
Minidisk            - Help/General help                     - help.gif
File Search         - File/New file                         - newfile.gif
File Search         - File/Settings.../Sort..               - sort.gif
File Search         - Selected/Open                         - open.gif
File Search         - Selected/Copy...                      - copyfile.gif
File Search         - Selected/Delete                       - delete.gif
File Search         - Selected/Print...                     - print.gif
File Search         - Selected/Send...                      - send.gif
File Search         - View/Refresh now                      - refresh.gif
```

```
File Search          - Help/General help                          - help.gif
Directory            - Directory/New file                         - newfile.gif
Directory            - Directory/New directory...                 - newdir.gif
Directory            - Directory/Settings.../Sort...              - sort.gif
Directory            - Directory/Properties...                    - property.gif
Directory            - Directory/Add to desktop...                - addtodt.gif
Directory            - Selected/Open                              - open.gif
Directory            - Selected/Copy...                           - copyfile.gif
Directory            - Selected/Delete                            - delete.gif
Directory            - Selected/Print...                          - print.gif
Directory            - Selected/Send...                           - send.gif
Directory            - View/Refresh now                           - refresh.gif
Directory            - Help/General help                          - help.gif
Desktop              - Desktop/Settings.../Editor preference...   - edpref.gif
Desktop              - Desktop/Add to desktop...                  - addtodt.gif
Desktop              - Selected/Open                              - open.gif
Desktop              - Selected/Delete                            - delete.gif
Desktop              - View/Refresh now                           - refresh.gif
Desktop              - Help/General help                          - help.gif
Reader/Selected/Open - Note/Forward                               - forward.gif
Reader/Selected/Open - Note/Reply                                 - reply.gif
Reader/Selected/Open - Note/Receive                               - receive.gif
Reader/Selected/Open - Note/Delete                                - delete.gif
Reader/Selected/Open - Note/Print...                              - print.gif
Reader/Selected/Open - Edit/Copy                                  - copy.gif
Reader/New note      - Note/Get a file...                         - getfile.gif
Reader/New note      - Note/Save                                  - save.gif
Reader/New note      - Note/Print...                              - print.gif
Reader/New note      - Note/Send                                  - send.gif
Reader/New note      - Edit/Cut                                   - cut.gif
Reader/New note      - Edit/Copy                                  - copy.gif
Reader/New note      - Edit/Paste                                 - paste.gif
Reader/New note      - Help/General help                          - help.gif
```

Alphabetical Listing by GIF File Name

```
File Manager         - Selected/Access                            -access.gif
File Manager         - Selected/Add to desktop...                 -addtodt.gif
Minidisk             - Minidisk/Add to desktop...                 -addtodt.gif
Directory            - Directory/Add to desktop...                -addtodt.gif
Desktop              - Desktop/Add to desktop...                  -addtodt.gif
Reader/Selected/Open - Edit/Copy                                  -copy.gif
Reader/New note      - Edit/Copy                                  -copy.gif
Minidisk             - Selected/Copy...                           -copyfile.gif
File Search          - Selected/Copy...                           -copyfile.gif
Directory            - Selected/Copy...                           -copyfile.gif
Reader/New note      - Edit/Cut                                   -cut.gif
Address Book         - Selected/Delete                            -delete.gif
Reader               - Selected/Delete                            -delete.gif
Minidisk             - Selected/Delete                            -delete.gif
File Search          - Selected/Delete                            -delete.gif
Directory            - Selected/Delete                            -delete.gif
Desktop              - Selected/Delete                            -delete.gif
Reader/Selected/Open - Note/Delete                                -delete.gif
File Manager         - FileManager/Open unlisted minidisk...      -disk.gif
Desktop              - Desktop/Settings.../Editor preference...   -edpref.gif
Reader/Selected/Open - Note/Forward                               -forward.gif
Reader/New note      - Note/Get a file...                         -getfile.gif
Address Book         - Help/General help                          -help.gif
File Manager         - Help/General help                          -help.gif
Reader               - Help/General help                          -help.gif
Minidisk             - Help/General help                          -help.gif
File Search          - Help/General help                          -help.gif
```

```
Directory            - Help/General help                        -help.gif
Desktop              - Help/General help                        -help.gif
Reader/New note      - Help/General help                        -help.gif
Address Book         - AddressBook/New address...               -newaddr.gif
File Manager         - FileManager/Open unlisted directory...   -newdir.gif
Directory            - Directory/New directory...               -newdir.gif
Minidisk             - Minidisk/New file                        -newfile.gif
File Search          - File/New file                            -newfile.gif
Directory            - Directory/New file                       -newfile.gif
Reader               - Reader/New note                          -newnote.gif
Address Book         - Selected/Open                            -open.gif
File Manager         - Selected/Open                            -open.gif
Reader               - Selected/Open                            -open.gif
Minidisk             - Selected/Open                            -open.gif
File Search          - Selected/Open                            -open.gif
Directory            - Selected/Open                            -open.gif
Desktop              - Selected/Open                            -open.gif
Reader/New note      - Edit/Paste                               -paste.gif
Reader               - Selected/Print...                        -print.gif
Minidisk             - Selected/Print...                        -print.gif
File Search          - Selected/Print...                        -print.gif
Directory            - Selected/Print...                        -print.gif
Reader/Selected/Open - Note/Print...                            -print.gif
Reader/New note      - Note/Print...                            -print.gif
Directory            - Directory/Properties...                  -property.gif
Reader               - Selected/Receive                         -receive.gif
Reader/Selected/Open - Note/Receive                             -receive.gif
Address Book         - View/Refresh now                         -refresh.gif
File Manager         - View/Refresh now                         -refresh.gif
Reader               - View/Refresh now                         -refresh.gif
Minidisk             - View/Refresh now                         -refresh.gif
File Search          - View/Refresh now                         -refresh.gif
Directory            - View/Refresh now                         -refresh.gif
Desktop              - View/Refresh now                         -refresh.gif
File Manager         - Selected/Release                         -release.gif
Reader/Selected/Open - Note/Reply                               -reply.gif
Reader/New note      - Note/Save                                -save.gif
Minidisk             - Selected/Send...                         -send.gif
File Search          - Selected/Send...                         -send.gif
Directory            - Selected/Send...                         -send.gif
Reader/New note      - Note/Send                                -send.gif
Address Book         - AddressBook/Settings.../Sort...          -sort.gif
File Manager         - FileManager/Settings.../Sort...          -sort.gif
Reader               - Reader/Settings.../Sort...               -sort.gif
Minidisk             - Minidisk/Settings.../Sort...             -sort.gif
File Search          - File/Settings.../Sort...                 -sort.gif
Directory            - Directory/Settings.../Sort...            -sort.gif
```

List of GIF Files

Appendix F. Debugging

Communications Problems

To resolve some VM/ESA GUI Facility problems, you can obtain a VM/ESA GUI Facility communications trace. To start the trace, enter the command:

```
GLOBALV SELECT CENV SET DTTRACE 3
```

This creates GUIAPPC DTTRACE A or GUITCPIP DTTRACE A, depending on whether you are using APPC or TCP/IP. If the trace file already exists, the trace records are appended to the end of the file. When obtaining new traces, be sure to erase or rename the old trace file.

To stop the trace, enter the command:

```
GLOBALV SELECT CENV SET DTTRACE
```

Only applications started after the trace has been activated appear in the trace file. Applications that already have windows displayed are not traced.

General Debugging

Many of the operations associated with CMS Desktop functions are implemented on the host as REXX execs with imbedded pipelines. Therefore, it is tempting to resolve problems by simply tracing the host execs. However, due to the manner in which the CMS Desktop code is implemented on the host, it is not possible to view an interactive exec trace (such as with SET EXECTRAC ON). The following is one method of tracing the host execs:

- Copy the particular GUIxxxx EXEC you want to trace over to your A-disk as some other name, for example, TUIxxxx EXEC.
- XEDIT the copy of the exec on your A-disk inserting a Trace R statement at the beginning of the exec.
- Create a new version of the GUIxxxx EXEC on your A-disk with the following statements:

```
/*******/
Parse SOURCE . . me .
date_and_time = 'Trace of' me 'on' date() 'at' Time()
Address COMMAND 'PIPE COMMAND EXEC TUIxxxx',
                        '| LITERAL' date_and_time,
                        '| > GUIxxxx TRACE A'
Exit
```

When the specified exec is called through interaction with the CMS Desktop, a file with the trace output is placed on your A-disk. Each invocation of the exec writes a new version of the trace file. If you want each invocation of the particular exec appended to a single trace file, substitute:

```
'| >> GUIxxxx TRACE A'
```

for

```
'| > GUIxxxx TRACE A'
```

To resolve problems more quickly, gather all information from the workstation and the host. For example, if a trap error occurs on the workstation, display and note the register contents. Also, make note of the workstation operating system level, the function being used (for example, File Manager, Note), the communication protocol being used (APPC or TCP/IP), and the level of the workstation agent. You can determine the level of the workstation agent by selecting the “About...” menu choice from the “Help” pull-down menu on the Workstation Agent window. This displays a window that identifies the service level of the workstation agent. On the VM host side, record any host messages that may appear on the 3270 console, the CMS service level, and the segment load address for the CMSDESK logical segment. To obtain the segment address, enter the CMS command QUERY SEGMENT and note the address under the heading “Location” for CMSDESK.

Glossary

A list of VM/ESA terms and their definitions is available through the online VM/ESA HELP Facility. For example, to display the definition of “cms,” enter:

```
help glossary cms
```

You will enter the HELP Facility's online glossary file and the definition of “cms” will be displayed as the current line. When you are in the glossary file, you can also search for other terms.

If you are unfamiliar with the HELP Facility, you can enter:

```
help
```

to display the main HELP Menu, or enter:

```
help cms help
```

for information about the HELP command.

For more information about the HELP Facility, see the *VM/ESA: CMS User’s Guide* ; for more about the HELP command, see the *VM/ESA: CMS Command Reference*.

You can find additional information about IBM terminology in the *IBM Dictionary of Computing*, New York: McGraw-Hill, 1994.

Bibliography

This bibliography lists the publications that provide information about your VM/ESA system. The VM/ESA library includes VM/ESA base publications, publications for additional facilities included with VM/ESA, and publications for VM/ESA optional features.

VM/ESA publications may be available as Adobe Portable Document Format (PDF) files, IBM BookManager® files, or printed books. For abstracts of VM/ESA publications and other library-related information, including current editions and available publication formats, see *VM/ESA: General Information*.

VM/ESA Base Publications

Evaluation

VM/ESA: Licensed Program Specifications, GC24-5744

VM/ESA: General Information, GC24-5745

Installation and Service

VM/ESA: Installation Guide, GC24-5836

VM/ESA: Service Guide, GC24-5838

VM/ESA: VMSES/E Introduction and Reference, GC24-5837

Planning and Administration

VM/ESA: Planning and Administration, SC24-5750

VM/ESA: CMS File Pool Planning, Administration, and Operation, SC24-5751

VM/ESA: Conversion Guide and Notebook, GC24-5839

VM/ESA: REXX/EXEC Migration Tool for VM/ESA, GC24-5752

VM/ESA: Running Guest Operating Systems, SC24-5755

VM/ESA: Connectivity Planning, Administration, and Operation, SC24-5756

VM/ESA: Group Control System, SC24-5757

VM/ESA: Performance, SC24-5782

Customization

IBM VM/ESA: CP Exit Customization, SC24-5672

Operation

VM/ESA: System Operation, SC24-5758

VM/ESA: Virtual Machine Operation, SC24-5759

Application Programming

VM/ESA: CP Programming Services, SC24-5760

VM/ESA: CMS Application Development Guide, SC24-5761

VM/ESA: CMS Application Development Reference, SC24-5762

VM/ESA: CMS Application Development Guide for Assembler, SC24-5763

VM/ESA: CMS Application Development Reference for Assembler, SC24-5764

VM/ESA: CMS Application Multitasking, SC24-5766

VM/ESA: REXX/VM Primer, SC24-5598

VM/ESA: REXX/VM User's Guide, SC24-5465

VM/ESA: REXX/VM Reference, SC24-5770

IBM VM/ESA: Distributed Graphical User Interface Toolkit, SC24-5724

IBM VM/ESA: Reusable Server Kernel Programmer's Guide and Reference, SC24-5852

VM/ESA: Enterprise Systems Architecture/Extended Configuration Principles of Operation, SC24-5594

VM/ESA: Programmer's Guide to the Server-Requester Programming Interface for VM, SC24-5455

VM/ESA: CPI Communications User's Guide, SC24-5595

Common Programming Interface Communications Reference, SC26-4399

Common Programming Interface Resource Recovery Reference, SC31-6821

External Security Interface (RACROUTE) Macro Reference for MVS and VM, GC28-1366

End Use

VM/ESA: CP Command and Utility Reference, SC24-5773

VM/ESA: CMS Primer, SC24-5458

VM/ESA: CMS User's Guide, SC24-5775

VM/ESA: CMS Command Reference, SC24-5776

IBM VM/ESA: Graphical User Interface Facility, SC24-5789

VM/ESA: CMS Pipelines User's Guide, SC24-5777

VM/ESA: CMS Pipelines Reference, SC24-5778

CMS/TSO Pipelines: Author's Edition, SL26-0018

VM/ESA: XEDIT User's Guide, SC24-5779

VM/ESA: XEDIT Command and Macro Reference, SC24-5780

VM/ESA: Quick Reference, SX24-5290

Diagnosis

VM/ESA: System Messages and Codes, GC24-5841

VM/ESA: Dump Viewing Facility, GC24-5853

VM/ESA: Diagnosis Guide, GC24-5854

VM/ESA: CP Diagnosis Reference, SC24-5855

VM/ESA: CP Diagnosis Reference Summary, SX24-5292

VM/ESA: CMS Diagnosis Reference, SC24-5857

Note: CP and CMS control block information is not provided in book form. This information is available on the IBM VM/ESA operating system home page (http://www.ibm.com/s390/vm).

Publications for Additional Facilities

OpenEdition® for VM/ESA

IBM OpenEdition for VM/ESA: POSIX Conformance Document, GC24-5842

IBM OpenEdition for VM/ESA: User's Guide, SC24-5727

IBM OpenEdition for VM/ESA: Command Reference, SC24-5728

IBM OpenEdition for VM/ESA: Advanced Application Programming Tools, SC24-5729

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DFSMS/VM®

VM/ESA: DFSMS/VM Function Level 221 Planning Guide, GC35-0121

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Planning for the System/390 Open Systems Adapter Feature, GC23-3870

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Language Environment®

Language Environment for OS/390 & VM: Concepts Guide, GC28-1945

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CMS Utilities Feature

VM/ESA: CMS Utilities Feature, SC24-5535

TCP/IP Feature for VM/ESA

VM/ESA: TCP/IP Function Level 320 Planning and Customization, SC24-5847

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OpenEdition Distributed Computing Environment Feature for VM/ESA

IBM OpenEdition DCE for VM/ESA: Introducing the OpenEdition Distributed Computing Environment, SC24-5735

IBM OpenEdition DCE for VM/ESA: Planning, SC24-5737

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IBM OpenEdition DCE for VM/ESA: Administration Guide, SC24-5730

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LAN File Services/ESA

Discovering LAN File Services/ESA, GK2T-5762

Introducing LAN File Services/ESA, GH24-5259

LAN File Services/ESA: Licensed Program Specifications, GH24-5260

LAN File Services/ESA: VM Guide and Reference, SH24-5264

LAN Resource Extension and Services/VM

LAN Resource Extension and Services/VM: Licensed Program Specifications, GC24-5617

LAN Resource Extension and Services/VM: General Information, GC24-5618

LAN Resource Extension and Services/VM: Guide and Reference, SC24-5622

CD-ROM

The following CD-ROM contains PDF versions of many VM/ESA publications and publications for some related IBM licensed programs. It also contains all the IBM libraries that are available in IBM BookManager format for current VM system products and current IBM licensed programs that run on VM/ESA.

IBM Online Library Omnibus Edition: VM Collection, SK2T-2067

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