FORVUS

QUALITY DATA COMMUNICATIONS

FORVUS Emulator

Windows Version

Fifth Edition (January 1996)

Statement of Limited Warranty

This limited warranty gives you specific legal rights; you may also have other rights which vary from state to state.

This limited warranty is extended only to the original purchaser of the Forvus Emulator and is valid only with respect to purchasers within the United States of America. Subject to the following conditions, should this product prove defective by reason of improper workmanship or material:

- During a period of (90) ninety days from the date of original purchase, Forvus Research, Inc. will repair or, at its option, replace the product without charge for parts or labor.

This limited warranty does *not* apply (a) to any product damaged by accident, misuse, disaster, including water, wind, fire and lightning, transportation, vandalism or burglary, (b) if the product is altered or repaired by anyone other than Forvus Research, Inc. or one of its authorized warranty repair stations.

Forvus Research, Inc.'s entire liability and your exclusive remedy shall be such repair or replacement as is hereinabove provided. In no event will Forvus Research, Inc. be liable to you or your customers for any damages, including any lost profit, lost savings or other incidental or consequential damages arising out of the use of or inability to use this product.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

You may be required to provide a dated proof of purchase of this product in order to obtain warranty service. If you have any questions regarding warranty service, contact your point of purchase, or call Forvus Research, Inc. at (919) 954-8380.

Forvus Research, Inc. reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.

Contents

Introduction 1

Installation and setup 5

Operation 37

Status row messages 63

Problem determination 71

File transfer 75

Error messages   89

Communication Driver   95

Keyboard layouts   97

CHKLNK   105

HLLAPI   107

Index   109

Notes:

Introduction

Thank you for purchasing the FORVUS Emulator!

The FORVUS Emulator provides an excellent emulation of the 3472 display terminal including application defined screen formats, host addressable print, and extended vital product data. The FORVUS Emulator is also downward compatible with the older 3192, 3180, and 3278/79 terminals.

Some of the advanced features of the FORVUS Emulator include:

- Supports attachment to Novell Netware for SAA Version 1.2 or higher.
- Supports DFT and CUT Coaxial interfaces.
- Supports synchronous modem connection with IBM SDLC compatible communication adapter.
- Supports attachment with 802.2 and TN3270 interface.
- Online screen setup - makes it possible to change display characteristics without exiting the program.
- Supports 3472 Partitions - allows more than 7600 characters to reside inside the display in a single session, and allows application programs to change screen formats as needed.
- Host Addressable Print - allows host to send messages to a locally attached printer without operator intervention.
- Print Trim - allows operator to print a selected portion of the screen to a locally attached printer, saves time and paper.
- Record/Playback - Easily save often used keystroke sequences for later playback.
- Selector Pen emulation - Use an attached Mouse to point and select data quickly - without the use of your keyboard.
- File Transfer - allows transfer of files to and from the host application using IND$FILE and PCXFER.
- Pop-Up Keypad - Activate keystrokes with a single mouse click, including Program Function keys.

System requirements

The FORVUS Emulator is designed to work with the following communications interfaces:

- Novell NetWare for SAA Version 1.2 or higher.
- IBM SDLC Communications Adapter
- Forvus Research Coax Adapter
- IBM or IRMA Compatible Coax Adapter
- 802.2 Network Interface
- TCP/IP Interface

In addition to the Communications interfaces, your PC must be equipped with the following features:

- Windows-capable 386 or higher personal computer.
- EGA or VGA (recommended)
- Microsoft Windows Version 3.1 or higher.
- Microsoft Windows-compatible pointing device.
- Either PC-DOS or MS-DOS operating system, Version 3.3 or higher.

Manual organization

The following sections of this manual will provide you with the information you will need to install and operate the FORVUS Emulator.

- Installation and Setup
- Operation
- Status Row Information
- Problem Determination
- File Transfer
- Error Messages
- Keyboard Templates

README.DOC

Should your Diskettes contain the file README.DOC, it contains important information that was not available when this manual went to press. Please review this file before beginning the installation process.

Product support

If you have a question that isn't answered in this manual, our Product Support Department can help. Free telephone support is provided for 90 days to you as a new user when you return the enclosed registration card. Many questions can be answered in this manual. However, if you've checked your manual and still need assistance, please have your computer powered on and the following information available:

- your name and address
- your FORVUS Emulator software serial number
- your computer make and model, the amount of RAM installed, the type and capacity of your hard disk and floppy drives, the display adapter and monitor type, printer name and model number
- Version number of Novell NetWare for SAA (if applicable)
- Type of coaxial adapter installed (if applicable)
- 802.2 interface adapter manufacturer (if applicable)
- TCP/IP vendor stack (if applicable)
- Windows version
- DOS version number (if applicable)
- contents of your CONFIG.SYS and AUTOEXEC.BAT files
- a clear description of your problem

Call Product Support at (919) 954-8380 between 9 a.m. and 5 p.m. EST (excluding US holidays). We will be happy to assist you.

We may also be contacted via the Internet at: http://www.forvus.com

Installation and Setup

This section will guide you through the steps necessary to install the FORVUS Emulator and to set up the many available options. Please take a moment to read these steps before you begin your product installation.

Before You Begin . . .

Forvus Research, Inc. is confident you will find that this software will increase your productivity. So that we can continue to provide you with technical support, and keep you informed about new software developments, please return the enclosed product registration card supplied with this package.

Network Considerations

The FORVUS Emulator can be installed on a file server and accessed by multiple users from their independent workstations. Please refer to your Software License Agreement to determine if this product is a network capable version.

☞   Before installation on a file server, you must log onto the server as the system administrator to ensure that full read/write and file attribute changing rights are available for the drive on which the emulator is to be installed.

Refer to page 35 to complete the installation for each user's workstation.

Setting Up the FORVUS Emulator

You use the Setup program to set up the FORVUS Emulator. Setup checks your system and asks a series of questions about how you want to install the emulator.

To set up the FORVUS Emulator:

1. Start Microsoft Windows.

2. Insert Setup **Disk 1** into the appropriate floppy drive.

3: (Windows 3.1 users) From the File menu in Program Manager, choose **Run...**
   (Windows 95 users) Click the Start button from the taskbar, and then click **Run...**

4. Type **f:setup** in the Command Line box (where **f:** is replaced with the letter of the drive in which the disk was inserted) and choose **Ok**.

5: Follow the setup instructions on the screen.

Configuring the FORVUS Emulator

Before you will be able to start communication with the host, you must customize the FORVUS Emulator for use with your particular application. The Configuration program is used to assign such features as the type of keyboard you wish to emulate, screen size, menu language, communications interface, etc.

The following panel will appear:
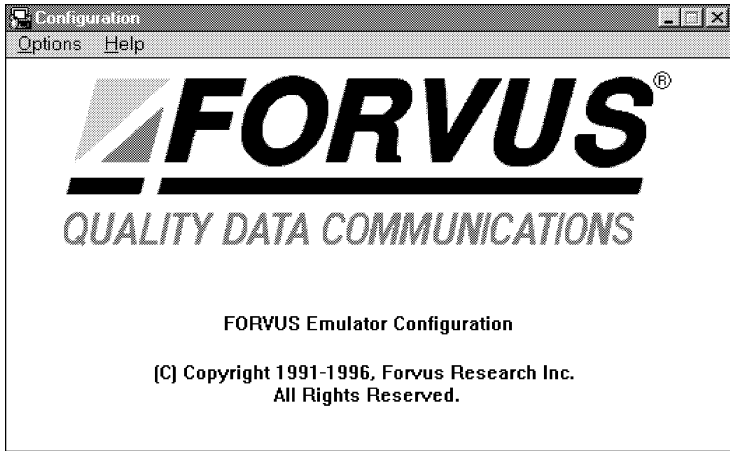
Figure 2-1. Configuration Sign-on panel.

☞   **First Time Installation:** Upon installing the emulator for the first time, the **Configure Communications** dialog box will appear. Refer to Page 26 to configure your host connection parameters.

To set the various configuration options, move the mouse cursor to the menu item **Options** and double-click. A drop-down menu will appear and allow you to set various options described in the sections that follow.

Changing the Language Setup

To setup the language for the various messages the emulator provides (on-line help, message boxes, dialog boxes, etc) follow the steps below:

- Choose **Options** from the main menu.
- Select **Language Setup**.
- Select the desired language to the right of the language setup option (as shown in Figure 2-2 below)
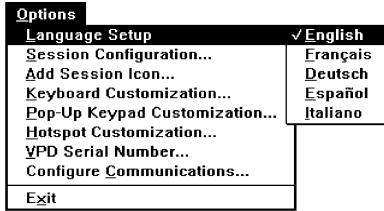
Figure 2-2. Options menu.

Configuring the 3270 Session

To customize the session parameters, follow the steps below:

- Choose **Options** from the main menu.
- Select **Session Configuration . . .**

You will be prompted to select the configuration file you wish to modify as shown below:
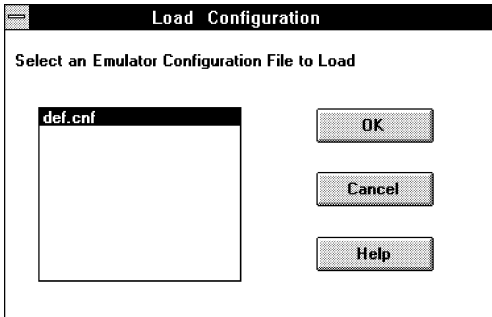
Figure 2-3. Load Configuration dialog box.

After making your selection, the following dialog box will appear:
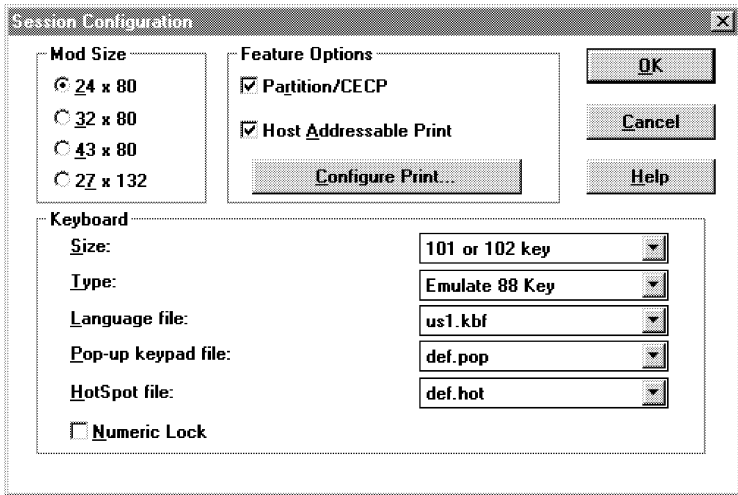
Figure 2-4. Session Configuration dialog box.

Mod Size

This selection sets the number of rows and columns the 3270 screen displays while attached to the host session. Select between 24x80, 32x80, 43x80 or 27x132.

Keyboard

The keyboard options are listed below:

- Size - Informs the FORVUS Emulator of the **size** of the PC keyboard.

- Type - Informs the FORVUS Emulator of the **type** 3270 keyboard emulation to perform.

- Language file - The keyboard language file defines the keyboard key functions. You can modify an existing keyboard file or create a new one, as described in "Configuring the Keyboard" on Page 14. Refer to Appendix C, "Keyboard Layouts" to reference the style layout you prefer.

- Pop-up keypad file - defines the pop-up keypad key functions. You can modify an existing pop-up keypad file or create a new one, as described in "Configuring the Pop-Up Keypad" on Page 18.

- Hotspot file - The Hotspot file defines the screen hotspots. You can modify an existing hotspot file or create a new one, as described in "Configuring Hotspots" on Page 21.

- Numeric Lock - Restricts the characters that can be keyed into a numeric field.

Feature Options

The session feature options are listed below:

- Partition/CECP - When this check box is enabled, the CECP (Country Extended Code Page) and scrolling feature is active when attached to the control unit. This function is under complete control of the host application.

- Host Addressable Print - When this check box is enabled, the host addressable print feature is activated. Also the **Configure Print . . .** pushbutton is activated which enables the operator to set print options for the host addressable print feature.

  When the **Configure Print . . .** pushbutton is pressed, the following dialog box will appear:
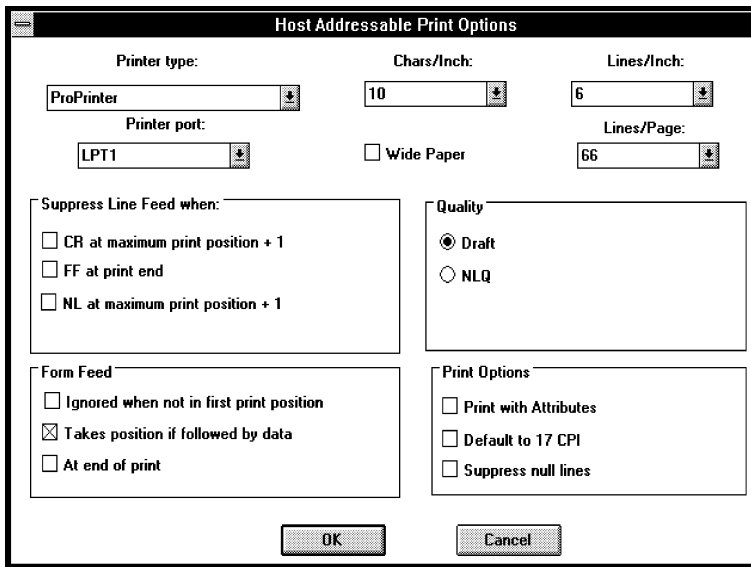
Figure 2-5. Host Addressable Print Options dialog box.

Printer type

Select the type of printer to direct the host addressable print.

Printer port

This selection is used to direct the printer output to the hardware port. Select either a serial or parallel printer using the choices given in the list box.

Chars/Inch

This selection allows you to set the host addressable print Characters per Inch. Select between Default, 10, 12, or 17 CPI. The Default selection uses the printer's default settings.

Lines/Inch

This selection allows you to set the host addressable print Lines per Inch. Select between Default, 3, 4, 6, or 8 LPI. The Default selection uses the printer's default settings.

Lines/Page

This selection allows you to set the host addressable print Lines per Page. Select between Default 51, 60, 66, 68, 72, 88, or 96 LPP. The Default selection uses the printer's default settings.

Wide Paper

If the attached host addressable printer supports a wide carriage, selecting this option enables the printer to utilize the full length of the paper.

Suppress Line Feed when:

These options can suppress an automatic line feed when the following events are encountered:

- **CR at maximum print position + 1** - Deselecting this option will activate any carriage return in the last print position + 1 in addition to the automatic line feed. Selecting this option will permit the action of the carriage return only.

- **FF at print end** - Deselecting this option will activate any form feed included at the end of the print job in addition to the automatic line feed. Selecting this option will permit the action of the form feed only.

- **NL at maximum print position + 1** - Deselecting this option will activate a new line command included in the last print position + 1 in addition to the automatic line feed. Selecting this option will permit the action of the new line command only.

Form Feed

These options will affect the way the Forms Feed character is handled when encountered in a data stream:

- **Ignored when not in first print position** - Select this option if you want any form feed command to be ignored unless it appears in the first print position of any line. Deselecting this option will cause all form feed commands to be executed.

- **Takes position if followed by data** - Select this option if you want form feed commands not located at the end of the print job to cause a form feed to be executed and to insert a blank character in the first position to the next page. Deselect this option if you want printing to begin in the first position of the next page after the form feed.

- **At end of print** - Select this option if you want the printer to eject the last printed page. This positions the next print job on the next page. Deselect this option if you do not want to eject the last printed page.

Quality

If the attached printer supports NLQ (Near Letter Quality), you can select either **NLQ** or **Draft**.

Print Options

The following options are offered to modify the format of the data stream received by the printer:

- **Print with Attributes** - Selecting this option enables you to print with bold and underline attributes. Deselecting this option will increase print speed by printing the data with no attributes.

- **Default to 17 CPI** - Selecting this option enables you to set the print to 10 or 12 CPI for Mod 2, Mod 3, and Mod 4 prints and to change automatically to 17 CPI when a Mod 5 print occurs. After the Mod 5 print, the CPI selection returns to its normal setting. Deselecting this option will default to the normal CPI settings.

- **Suppress null lines** - Selecting this option enables you to print more data on the page by suppressing the printing of null (blank) lines. Deselecting this option will default to normal printing.

- **ASCII Transparency** - This option determines how the 3287 Transparent Data Command is handled. Selecting this option passes ASCII data directly to the selected printer.

Adding a Session Icon

When using the FORVUS Emulator, it is possible to define multiple configuration files and recall them from individual icons.

To add a session icon and assign it to an existing configuration file, follow the steps below:

- Choose **Options** from the main menu.
- Select **Add Session Icon . . .**

The dialog box shown in figure 2-6 will appear:
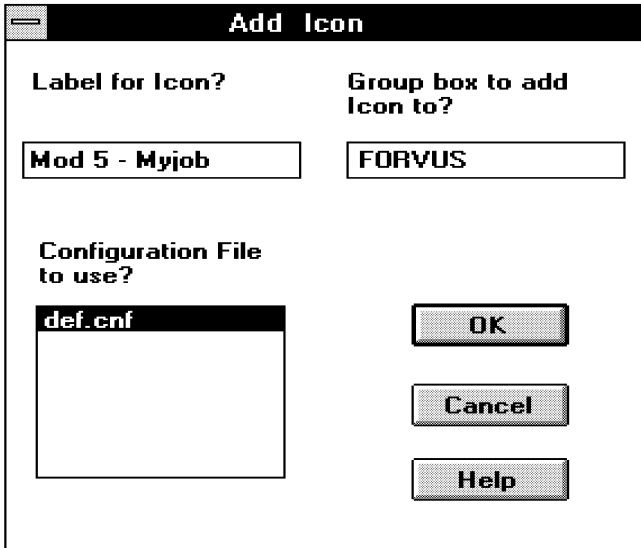
Figure 2-6. Add Icon dialog box.

Label for Icon?

This entry will be the label for the new icon that will be added to the selected group box. Enter the desired label and proceed to define the group box to place the new icon.

Group box to add Icon to?

This entry will be the group box under the Program Manager that the new icon will be added to. Enter the desired group box and proceed to define the configuration file to assign the new icon to.

Configuration file to use?

This entry will assign the desired configuration file to the new icon. Select the desired configuration file and press the **Ok** pushbutton to complete the assignment.

Press the **Cancel** pushbutton to abort the above process.

Configuring the Keyboard

The FORVUS Emulator is capable of using many different types and layouts of system unit keyboards. Although many different layouts of keyboards are provided with the package, the user may wish to relocate various keys for that "custom touch".

The emulator uses the .KBF file extension for its keyboard template configuration files.

To begin the configuration process, follow the steps below:

- Choose **Options** from the main menu.
- Select **Keyboard Configuration . . .**

A dialog box similar to the one shown below will appear:
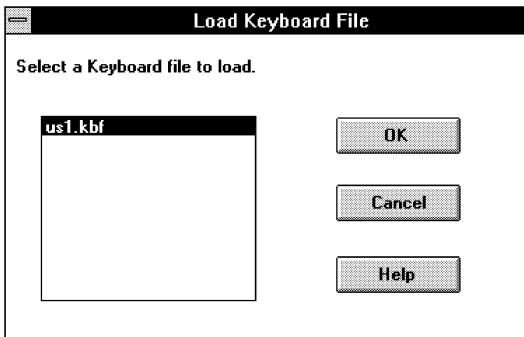
Figure 2-7. Load Keyboard File dialog box.

Select a file to modify from the list box on the left. After you select the file you wish to modify, press the **Ok** pushbutton to continue.

Pressing the **Cancel** pushbutton will exit the keyboard configuration, and return you to the main configuration panel.

After pressing the **Ok** pushbutton, a dialog box similar to the one shown in Figure 2-8 will appear:
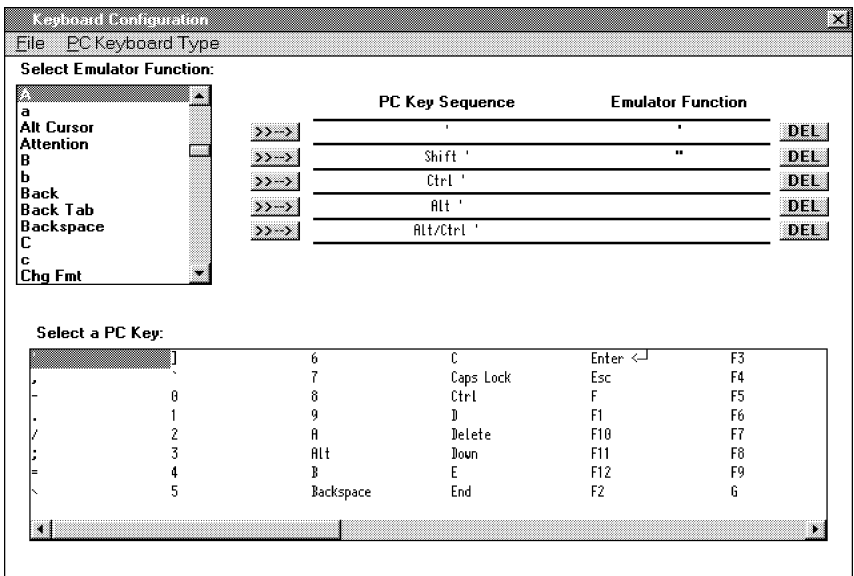
Figure 2-8. Keyboard Configuration dialog box.

File

This menu will allow you to save changes made to any keyboard configuration file.

This selection will also allow you to **exit** the configuration program.

PC Keyboard Type

This menu contains the type of PC keyboard that you have attached to your system unit. Selecting this menu will display the following drop-down menu:

Figure 2-9. PC Keyboard Type menu.

Select the type of keyboard your system unit contains from the menu shown above. After making your selection, a check mark will appear indicating your choice. The corresponding key table will be displayed at the bottom of the keyboard configuration dialog box.

Modifying a Key Sequence

To modify a key sequence, choose the PC key you wish to modify from the "Select a PC key" list box at the bottom of the dialog box. In the example below, the **Apostrophe** key has been selected.

Figure 2-10. Apostrophe key example.

Displayed at the top center of the dialog box is the current key functions assigned to the **Apostrophe** key. The sequences are shown in the following order:

- Normal key
- Shifted key
- Control key
- Alt key
- Alt and Control key

Located to the Left and Right of these sequences are the Add key (**>>--->**) and Delete key (**DEL**) pushbuttons.

Deleting an Emulator Function

Pressing the appropriate **Delete** pushbutton will delete the 3270 keyboard operation found under "Emulator Function".

Adding an Emulator Function

Pressing the appropriate **Add** (**>>--->**) pushbutton will add the 3270 keyboard operation selected in the "Select Function" listbox found at the top left corner of the dialog box.

To modify the key sequence for another PC key, select the desired key from the "Select a PC key" listbox and repeat the above steps.

Saving the Modified Configuration File

After you have completed all modifications to the configuration file, be sure to SAVE the file to disk. Follow the steps below to write the configuration file to disk:

- Select **File** from the sub-menu found at the top of the dialog box.
- Enter the name of the **new** .KBF file you would like to save this configuration under.

☞   It is important to name the new keyboard configuration file different than the original keyboard configuration filename supplied with the emulator; future updates/upgrades may overwrite the factory supplied file.

Selecting the New Keyboard File for Use with a Session

To command the emulator to accept this new configuration, follow the steps below:

- Choose **Options** from the main menu.
- Select **Session Configuration . .**
- Select the name of the **new** .KBF file just saved from the "Pop-Up Keyboard file:" list box.
- Press OK to exit the Session Configuration Dialog box.

Configuring the Pop-Up Keypad

The Pop-Up Keypad configuration will allow the user to customize the on-screen pop-up keypad. This keypad is displayed when the **Right** mouse button is pressed while the emulator window is active. The keypad actually consists of two (2) keypads in one layout. Found at the bottom of the keypad is the pushbutton labeled **Next Keypad**. Pressing this button when the keypad is displayed will result in the display of the alternate keypad.

To begin the Pop-Up Keypad configuration, follow the steps below:

- Choose **Options** from the main menu.
- Select **Pop-Up Keypad Configuration . . .**

A dialog box similar to the one shown in Figure 2-11 will appear:

Figure 2-11. Keyboard template file load dialog box.

- After selecting the Keyboard configuration file you will be using with the Pop-Up Keypad, press the OK button to continue.

A dialog box similar to the one shown below will be displayed:
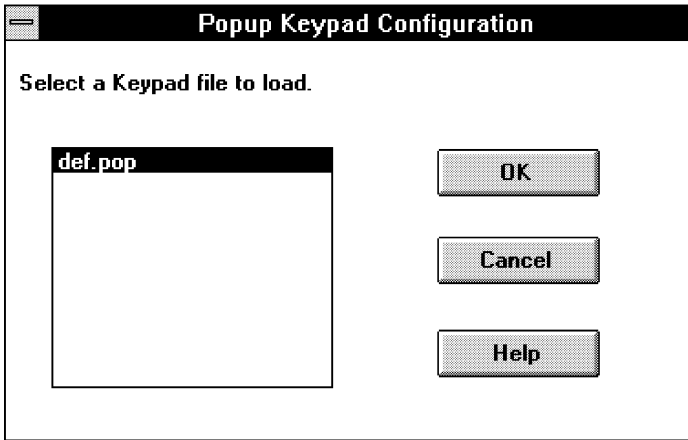
Figure 2-12. Popup keypad file load dialog box.

- Select the Pop-Up Keypad file you would like to modify. The keypad configuration dialog box will appear as shown in Figure 2-13 on the following page:
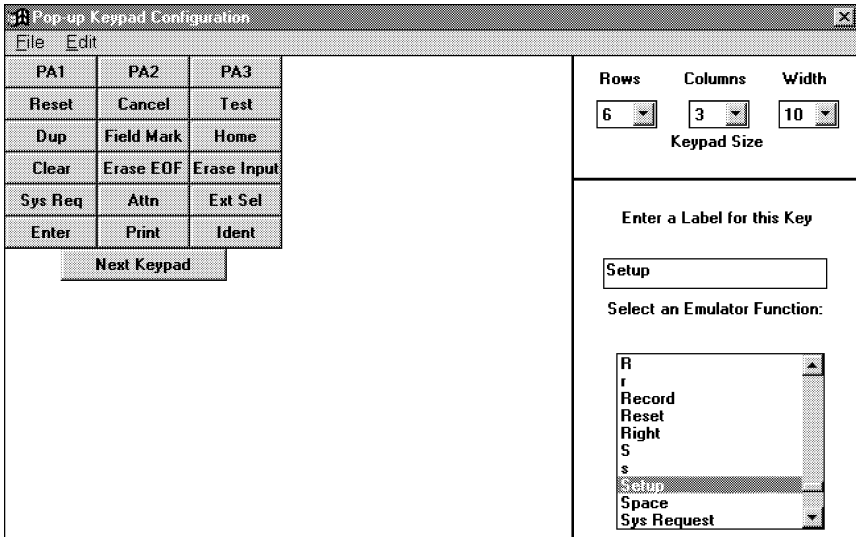
Figure 2-13. Popup Keypad Configuration dialog box.

Displayed at the top left of the dialog box is the actual layout of the keypad. The keypad size controls are found at the top right of the dialog box. The size controls are defined below:

- **Rows** - Determines the number of horizontal rows the keypad contains. Modifying this number will allow you to add or delete rows of keys.

- **Columns** - Determines the number of vertical columns the keypad contains. Modifying this number will allow you to add or delete columns of keys.

- **Width** - Determines the number of character each key can contain.

☞   If you specify a number **less** than the width of the text placed on the key, the full text may not be displayed on the key.

Assigning keys to the keypad

After configuring the format of the keypad, you may elect to assign keyboard keys to each key on the keypad. To begin this procedure, follow the steps below:

- Select a sequence from the "Select an Emulator Function" list box found

at the bottom left of the main dialog box.

- Click on the desired keypad key to place the selected function.

Saving the Modified Keypad File

To save the modified keypad file, follow the steps below:

- After configuring the desired keys on the keypad, select **File** from the menu at the top of the window.
- Enter the name of the **new** .POP file you would like to save.

☞ It is important to name the new Pop-Up Keypad configuration file different than the original configuration filename supplied with the emulator; future updates/upgrades may overwrite the factory supplied file.

Selecting the New Keypad File for Use with a Session

To command the FORVUS Emulator to accept this new configuration, follow the steps below:

- Select **Session Configuration . . .** from the **Options** menu found under the main title bar.
- Select the name of the **new** .POP file just saved from the "Pop-Up keypad file:" list box.
- Press OK to exit the **Session Configuration** dialog box.

Configuring Hotspots

The Hotspot configuration will allow you to customize the hotspots that the FORVUS Emulator recognizes while attached to the host.

Loading a Hotspot Configuration file

To begin the Hotspot configuration, follow the steps below:

- Choose **Options** from the main menu.
- Select **Hotspot Configuration . . .**

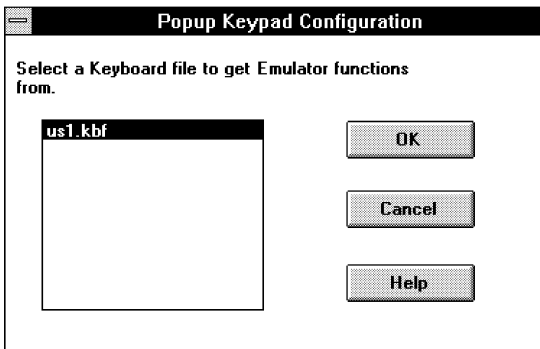A dialog box similar to the one shown in Figure 2-14 will appear:
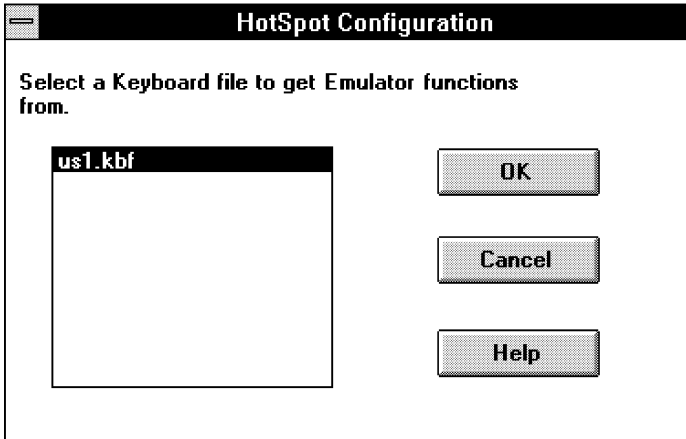
Figure 2-14. Keyboard template file load dialog box.

- After selecting the Keyboard configuration file you will be using with the Hotspot configuration file, click the OK button to continue.

A dialog box as the one shown in Figure 2-15 will be displayed:
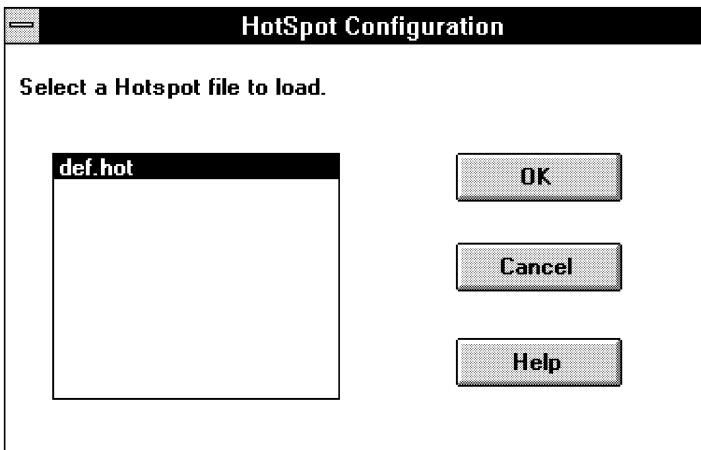
Figure 2-15. Loading a Hotspot File dialog box.

- Select the Hotspot file you would like to modify. The hotspot configuration dialog box will appear as shown below:

HotSpot Configuration		
File		

On Screen Text	Emulator Function		Enter On Screen Text for new HotSpot
PF1	PF1		
PF10	PF10		
PF11	PF11		Select an Emulator Function for above Text:
PF12	PF12		
PF13	PF13		Setup
PF14	PF14		Space
PF15	PF15		Sys Request
PF16	PF16		T
PF17	PF17		t
PF18	PF18		Tab
PF19	PF19		Test
PF2	PF2		Toggle Rule
PF20	PF20		U
PF21	PF21		u
PF22	PF22		Up
PF23	PF23		V
	Delete		Add
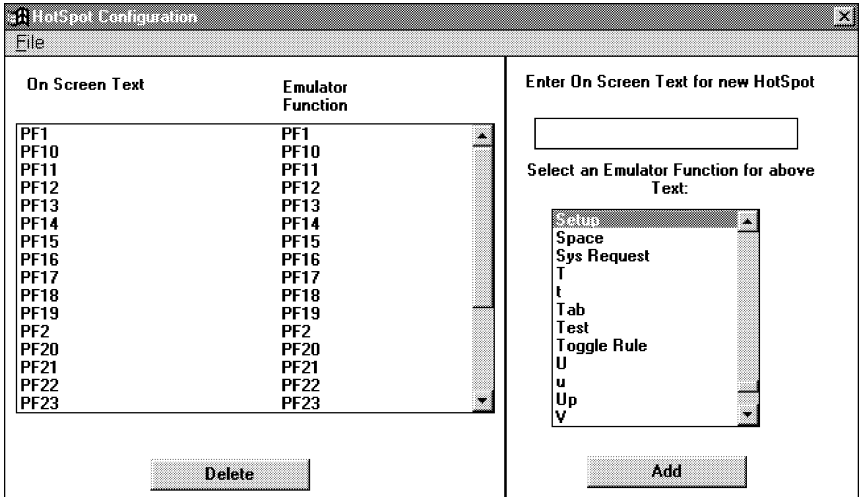
Figure 2-16. Hotspot Configuration dialog box.

Adding a Hotspot

After loading the hotspot file as described in the preceding section, follow the steps below to **Add** a hotspot:

- At the top right of the above dialog box you will see the edit control to "Enter on Screen Text for New Hotspot". This will add the text that the emulator will search for when the mouse is single clicked.

- Locate the "Select an Emulator Function for above Text" edit control. In the list box located at the bottom right of the screen are the keyboard functions that may be sent to the host when the new hotspot is found on the display. Select the function for the new hotspot.

- Press the **Add** pushbutton to add the new hotspot.

Deleting a Hotspot

After loading the hotspot file as described in the preceding section, follow the steps below to **delete** a hotspot:

- Select the hotspot you wish to delete on the left side of the display.
- Press the Delete pushbutton at the bottom left of the dialog box.

Saving a Hotspot configuration file

To save the modified hotspot file, follow the steps below:

- Select **File** from the menu at the top of the window.
- Enter the name of the new .HOT file you would like to save.

☞ It is important to name the new Hotspot configuration file different than the original configuration filename supplied with the emulator; future updates/upgrades may overwrite the factory supplied file.

Selecting the New Hotspot File for Use with a Session

To command the FORVUS Emulator to accept this new configuration, follow the steps below:

- Select **Session Configuration . . .** from the **Options** menu found under the main title bar.
- Select the name of the **new** .HOT file just saved from the "Hotspot file:" list box.
- Press **Ok** to exit the **Session Configuration** dialog box.

VPD Serial Number

To display/change the VPD information, follow the steps below:

- Choose **Options** from the main menu.
- Select **VPD Serial Number. . .**
  (if this selection is grayed, the communication driver you have selected does not support the VPD feature)

A dialog box similar to the one below will be displayed:
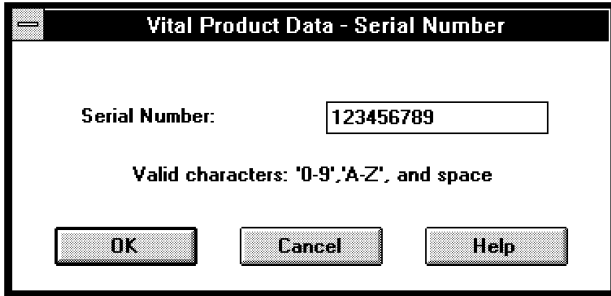
Figure 2-17. Vital Product Data dialog box.

When changing the nine digit serial number, only the characters uppercase A-Z, 0-9 and the space character may be entered. If any other character is entered, an error message will be displayed and you will be prompted to take appropriate action.

☞   The VPD serial number is saved to disk when the dialog box is exited.

Communications Configuration

The Communications configuration option will allow you to customize the individual sessions you will be using when attached to the host.

- Choose **Options** from the main menu.

- Select **Configure Communications . . .**

The following dialog box will appear:
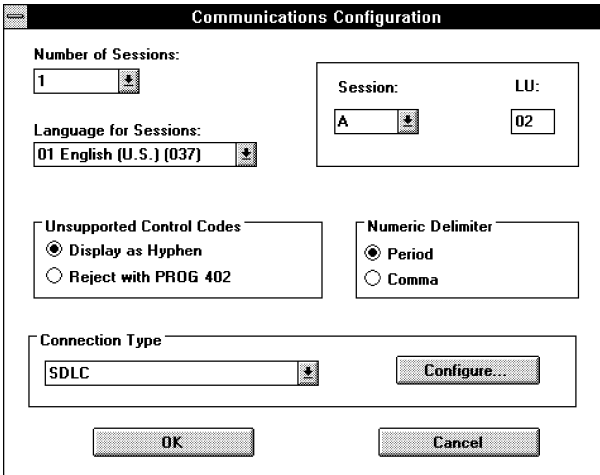
Figure 2-18. Communications Configuration dialog box.

Number of Sessions

(Not Used in CUT mode) Select the Number of Sessions that you will be using while attached to the host. The number you select (1-8) will determine how many individual sessions you will have to configure as explained below.

Language for Sessions

(Not Used in CUT mode) Select the language Code Page you will be using with the host from the drop-down selection box.

Unsupported Control Codes

(Not Used in CUT mode) This selection will determine how unsupported control codes will be handled.

Numeric Delimiter

(Not Used in CUT mode) Select either a period or a comma for a numeric delimiter used during sessions.

Connection Type

To select the type of connection that the FORVUS Emulator will use when communicating with the host you may select between DFT, CUT, SAA, SDLC, 802.2 or TN3270. These connections are further described below:

CUT or DFT Connection

Select **CUT** or **DFT** from the Connection Type and press **Configure . . .** A dialog box similar to the one shown below will appear:
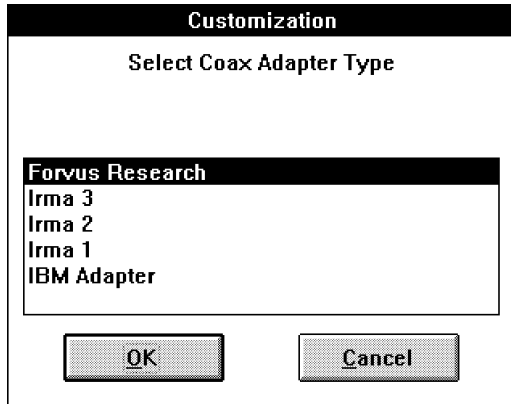
Figure 2-19. Adapter type dialog box.

When your adapter selection been entered, press **OK** to return to the main configuration panel.

SAA Connection

Before you begin, you must obtain the following information from your system administrator:

- The number of sessions you will be using (up to 8)
- The Communications Server ID name
- The Service Profile
- Your User ID
- Your Password
- The LU type (Any, Public, Pooled, or Dedicated)
- LU Name (if required)

Select **SAA** from the Connection Type and press **Configure . . .**
The following dialog box will appear:
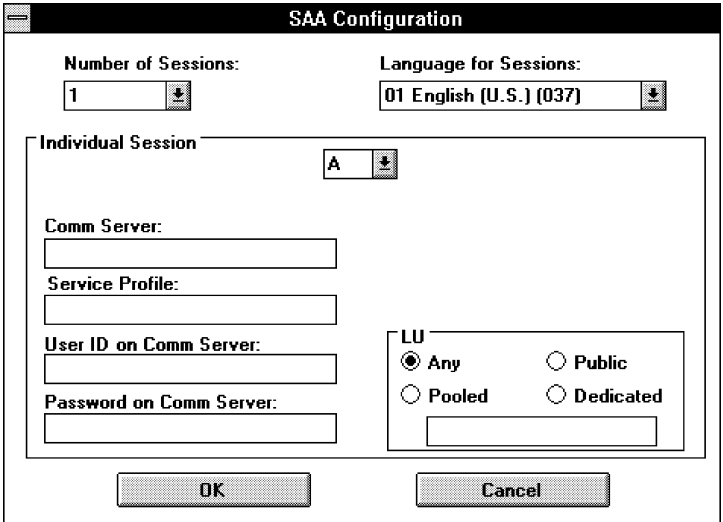
Figure 2-20. SAA Configuration dialog box.

Depending on the Number of Sessions you selected above, you will be required to configure each session (A-H) as described below:

Comm Server

Enter the name of your communication server you wish this session to attach to.

Service Profile

Enter the service profile you wish this session to obtain.

User ID on Comm Server

Enter your User ID for this session

Password on Comm Server

Enter your password for this session

LU

Select the LU type by selecting any one of the options (Any, Public, Pooled, or Dedicated). If you select Pooled or Dedicated, you will have to provide the LU Name in the Entry box.

When all selections have been entered, press **OK** to return to the main configuration panel.

SDLC Connection

Before you begin, you must obtain the following information from your system administrator:

- The Block ID
- The Physical Unit ID
- Physical Unit Address
- RU Size
- NRZ/NRZI
- Switched/Unswitched Line

Select **SDLC** from the Connection Type and press **Configure . .**
A dialog box will appear as shown below:
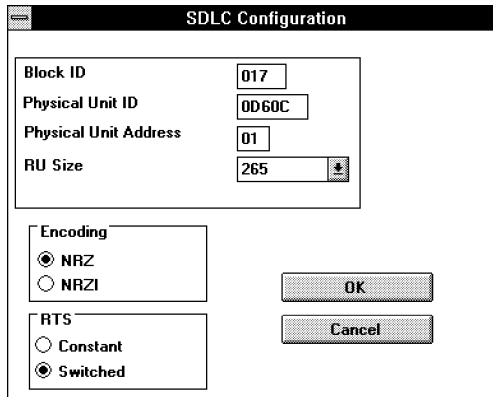
Figure 2-21. SDLC Configuration dialog box.

Block ID

The Block ID is used to inform the host of the type of SDLC connection. Enter the three (3) hex digits you received from your system administrator.

Physical Unit ID

The Physical Unit ID is used to inform the host of the unit ID of the SDLC connection. Enter the five (5) hex digits you received from your system administrator.

Physical Unit Address

The Physical Unit Address is the SDLC address that the FORVUS Emulator uses on the line connection.

RU Size

The RU size is the maximum size that the FORVUS Emulator can receive from the host.

Encoding

Select between NRZ or NRZI type line connection.

RTS

Select between Unswitched or Switched RTS (Request-to-Send).

Press **Ok** to return to the main configuration panel.
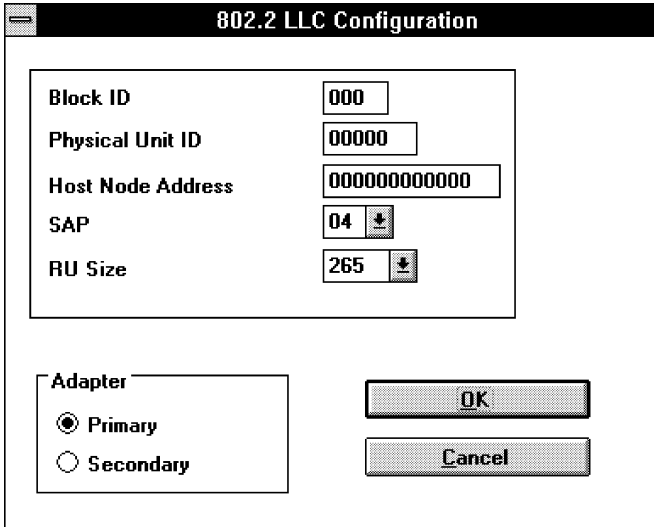
802.2 LLC Connection

Before you begin, you must obtain the following information from your system administrator:

- The Block ID
- The Physical Unit ID
- Node Address
- SAP
- RU Size
- Primary/Secondary Adapter

Select **802.2 LLC** from the Connection Type and press the **Configure . .** pushbutton.

The following dialog box will appear as shown on the following page:

Figure 2-22. 802.2 LLC Configuration dialog box.

Block ID

The Block ID is used to inform the host of the type of SDLC connection. Enter the three (3) hex digits you received from your system administrator.

Physical Unit ID

The Physical Unit ID is used to inform the host of the unit ID of the SDLC connection. Enter the five (5) hex digits you received from your system administrator.

Node Address

The Node Address is the address of the Gateway that the emulator will be using on the network.

SAP

The SAP (Service Access Point) for 802.2 is default 04.

RU Size

The RU size is the maximum size that can be received from the host.

Primary/Secondary Adapter

Select between either a primary or secondary network adapter connection.

Press **Ok** to return to the main configuration panel.

TN3270 Connection

Before you begin, you must obtain the following information from your system administrator:

- TCP/IP Stack
- Destination Host
- Telnet Port

Select **TN3270** from the Connection Type list and press the **Configure . .** pushbutton.
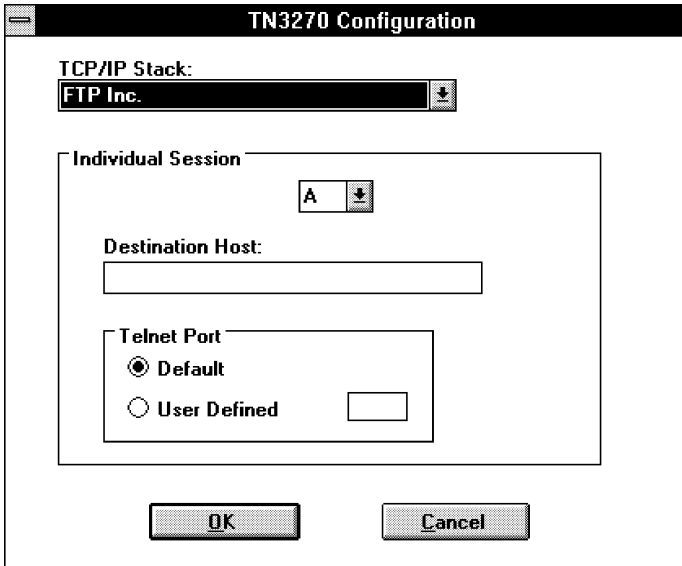
Figure 2-23. TN3270 Configuration dialog box.

TCP/IP Stack

The TCP/IP Stack selection is used to inform the emulator of the Internet Protocol stack you wish to attach to. Select the third party stack you have installed on your system unit.

Destination Host

Enter the name or address of the Host you would like this session to attach to.

Example: 143.238.693.021

Destination LU

When using the TN3287 option of TN3270, enter the destination LU Name of the printer.

☞   The Destination LU is not supported on all gateways. If this function is not supported, then leave this field blank.

Telnet Port

Select the Telnet port address by selecting one of the options (Default or User Defined). If you select User Defined, you will have to enter the four decimal digits for the Telnet port address.

Example: 0023   (Default Telnet Port)

Repeat this step for each session you will be using on the TN3270 connection. (Session A, B, etc)

When all selections have been entered, press **Ok** to return to the main configuration panel.

Exiting the Configuration Program

After you have completed the Configuration program, Select Exit from the **Options** menu bar to exit the Configuration program.

☞   Some selections require that you re-boot your system unit (e.g.. changing a communication driver). You will be notified should this condition occur.

Your FORVUS Emulator is now ready to attach to your host system(s). Refer to the next chapter "Operation" for more information on how to launch the FORVUS Emulator.

Installing a workstation for use with a Network

In order for workstations to start the FORVUS Emulator installed on a file server, an icon must be created for each workstation.

Follow the steps below to complete the workstation installation:

- Create an environment variable that determines where the user's <u>configuration</u> is stored. The environment variable that the emulator uses is **3270USER**. 3270USER should be set to a directory where the user has read/write access. This variable could be initialized in the users Login Script, AUTOEXEC.BAT file or anywhere desired, but it **must** be initialized before COMMDVR or the FORVUS Emulator is loaded.

  Network login script example: (Preferred Method)
  ```
  SET 3270USER = "F:\USER\%Login_name\SAA"
  ```

  AUTOEXEC.BAT example:
  ```
  SET 3270USER=F:\USER\JOHN\SAA
  ```

  The 3270USER variable must be set to a valid (already created) directory.

- After initializing the 3270USER variable, execute COMMDVR.EXE. (found in the emulator subdirectory)
- Start Microsoft Windows.
- (Windows 3.1) Under the **File. . .** menu, click **Run. . .**
  (Windows '95) Click Start on the taskbar and click **Run. . .**.
- In the command line entry field, type

     f:\subdirectory\INIT_USR.EXE

  where *f:\subdirectory* is replaced with the drive and subdirectory where the FORVUS Emulator was installed.
- Press the **Ok** button to start the user workstation installation program.

After INIT_USR creates the Group Box, it loads the Configuration program. Any changes made to the Configuration from this point are saved in the directory specified by the 3270USER environment variable.

☞   If an asterisk (*) is seen beside a session configuration file (.CNF), it indicates that the file is located in the FORVUS Emulator directory on the file server.

       When installing an update/upgrade, all users must exit the FORVUS Emulator and unload the communications driver (COMMDVR.EXE) if loaded.

Operation

This chapter describes the basic operation of the FORVUS Emulator. Before getting started make sure that:

- The FORVUS Emulator has been installed and configured for the type of operation desired.

- All connections both inside and outside the system unit are securely attached.

- The system unit Security Key lock (if equipped) is unlocked.

- Windows 3.1 or Windows '95 is installed and operating on your system unit.

- Necessary network drivers are loaded in memory. For example, IPX/SPX must be loaded for use with SAA.

Starting the FORVUS Emulator

Windows 3.1

To start the FORVUS Emulator while running Windows 3.1, move the mouse pointer to the small terminal icon and double-click the left mouse button to begin program execution as shown below:
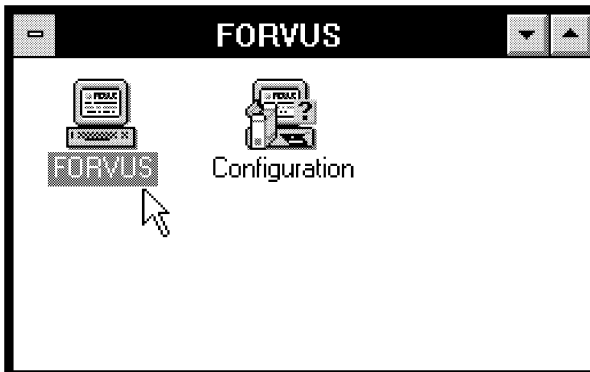
Figure 3-1. FORVUS Group Box.

After initialization, you will be prompted to load a configuration file as shown

by the dialog box below:
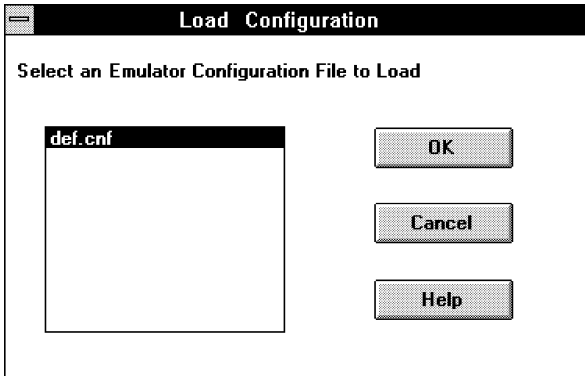
Figure 3-2. Load Configuration dialog box.

Select the desired configuration file you wish the FORVUS Emulator to load and press the **Ok** pushbutton. A session window will open and will attempt to attach to the control unit.

Loading a Configuration File Automatically at Startup

You can command the FORVUS Emulator to automatically load a specified configuration file when you start the program by following the steps below:

- Single click on the FORVUS icon.
- Single click on the **Program Manager - File** menu.
- Select **Properties. . .** from the drop-down menu.
- Shown on the command line is f:\path\FORVUSW.EXE where f: is the drive and \path is the directory where the FORVUS Emulator is installed.
- **Add** <space>/S=*filename*.CNF where *filename* is the name of the desired configuration file you want to automatically load at startup.

  Example = **C:\FORVUS\FORVUSW.EXE /S=DEF.CNF**

Windows '95

To start the FORVUS Emulator while using Windows '95, press the Start button on the taskbar and then point to Programs. Moving the mouse to the right, Point to the Forvus Folder and then to the FORVUS icon and click as shown below:
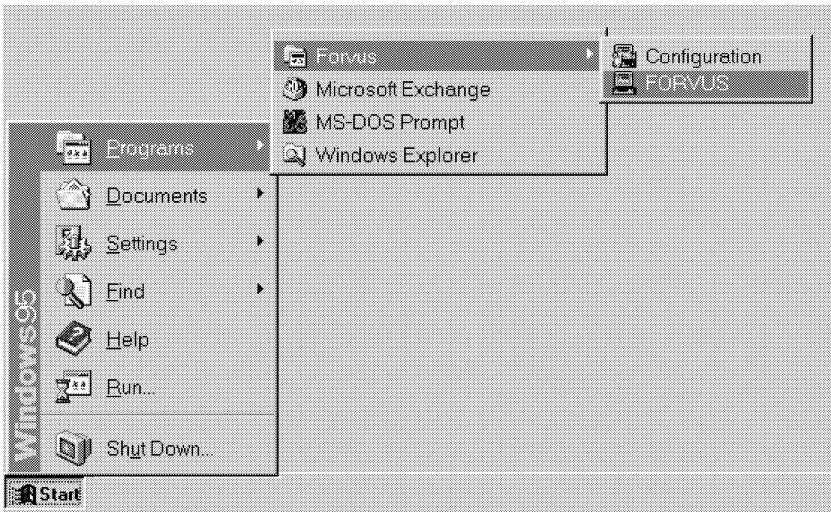
Figure 3-3. Windows '95 Start Example.

Keyboard Operations

The FORVUS Emulator program uses a subset of the IBM 3472 keyboard. In some cases, the FORVUS Emulator must use a different key location than may be found on other types of display stations. Refer to Keyboard Help on the emulator session drop-down Help menu to locate the key functions for your keyboard layout.

Menu Bar Commands

The FORVUS Emulator contains a menu bar that resides under the window title bar as shown below:

<u>F</u>ile	<u>E</u>dit	<u>S</u>etup	<u>R</u>ecord/Play	<u>A</u>ccessories	<u>H</u>elp
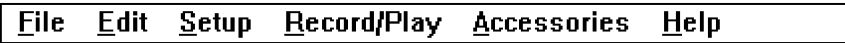
The menu bar contains the above commands that will be described in the sections that follow.

Hiding/Displaying the Menu Bar

You may want to hide the menu bar to increase the size of the session window.

To **hide** the main menu bar select the Control-menu box in the upper-left corner of the session window and select **Hide Emulator Menu**.

To **show** the main menu bar select the Control-menu box in the upper-left corner of the session window and select **Show Emulator Menu**.

Enabling/Disabling the Menu Shortcut Keys

The main menu contains shortcut keys for each command found on the menu. These keys are <u>underlined</u> on each command and may be used with the ALT key to directly access the menu. However, the ALT key sequence conflicts with some control units command sequences. Therefore, if the shortcut keys are **disabled**, the control unit key sequences may be sent to the control unit without conflict.

To Hide/Show the menu shortcut keys, select the Control-menu box in the upper-left corner of the session window and select the appropriate command.

File Command

The **File** menu is used to manipulate certain file load and save procedures used with the FORVUS Emulator. The following submenus are available under the File menu:

◊ Load Configuration

To load a different configuration file, follow these steps:

- Select Load Configuration from the File drop-down menu.
- Select the configuration file you want to load from the Configuration file item selector box, then click on the **Ok** pushbutton.

◊ **Save Configuration**

To save the current configuration file,follow these steps:

- Select Save Configuration from the File drop-down menu.
- Enter the name for the configuration file in the entry box -or- make a selection from the Configuration file listbox, then click on the **Ok** pushbutton.

◊ **File Transfer**

This selection is used to initiate a File Transfer between the host application and the FORVUS Emulator. Refer to "File Transfer" in Chapter 6 found later in this manual.

◊ **Printer Setup**

This selection is identical to the printer setup found in the Setup drop down menu. Refer to page 48 for more information on printer setup.

◊ **Local Print**

This selection is used to send an image of the screen to the locally attached printer. Refer to "Print Function" on page 60 for more information on local screen printing.

◊ **Exit**

This selection is used to exit the FORVUS Emulator.

Edit Command

The **Edit** menu is used to alter the session text displayed on the FORVUS Emulator session window. Text may be transferred between different applications using the Windows clipboard function.

The following submenus are available under the Edit menu:

◊ **Undo Cut**

This command is used to replace text that was **Cut** in a previous operation. The text that is replaced will be inserted in its original location on the display.

 Note: If the **Undo Cut** selection is grayed, either the clipboard is empty, or the text that was cut has been modified and can no longer be replaced on the display.

◊ **Cut**

This command is used to copy all data selected to the clipboard and remove all unprotected data from the 3270 session display. The space occupied by the unprotected data will be left blank on the display.

◊ **Copy**

This command is used to copy all data selected to the clipboard.

◊ **Paste**

This command is used to paste data from the clipboard to the position held by the cursor.

◊ **Select All**

The Select All function is used to select all text displayed on the 3270 session. This is useful when copying (or cutting) the complete session display to the Windows clipboard.

Selecting data to be Cut or Copied to the Clipboard

To select text to be edited on the 3270 session display, follow the steps below:

- Using the mouse as a pointer, place the arrow at the **top left** or **bottom right** of the text to be copied.
- Press the **left** mouse button and drag the selection box around the text to be selected.
- Release the mouse button.

The data now selected will be displayed with a border around the text. This text can now be modified using the Cut or Copy edit commands.

Setup Command

The Setup menus are used to make various changes to the FORVUS Emulator . This allows personal preferences to be made and saved to disk. The following submenus are available under the **Setup** menu:

◊ **Screen/Cursor**

◊ **Sound**

◊ **Printer**

◊ **Color**

◊ **Fonts**

◊ **Session Control**

◊ **HAP Control**

◊ **Reset Logical Unit**

These sub-commands will be explained in more detail on the following pages.

☞   Any options that are changed in Setup mode take immediate effect on any active 3270 sessions.

Screen/Cursor - Setup

The Screen/Cursor menu is used to customize the display of the current session the operator is attached to. Clicking on the Screen/Cursor selection on the **Setup** menu will display the following dialog box:

Figure 3-4. Screen Setup dialog box.

Status Indicators
The Row/Column and Activity Indicator may be enabled/disabled by check-ing the appropriate box.

Cursor
The shape of the cursor may be modified by checking either the **Underline** or **Block** selection. Selecting the **Blink** function will cause the session cursor to blink.

Mark Unprotected
This function allow the operator to mark the unprotected fields that are

displayed on the screen. The characters displayed in the unprotected fields may be selected from either a **Single dot**, **Double dot**, **Underline**, or a **Box** character. When data is placed in these fields, the mark unprotected character will be replaced with the character entered. Selecting **Off** will disable this function.

Rule
The rule style may be changed between a **Crosshair**, **Horizontal**, or **Vertical** cursor. Selecting the **Stationary** box will freeze the rule cursor on the display, which may be used when aligning text on the display surface.

Case
This selection is used to choose between **Monocase** or **Dualcase** character display. Selecting monocase will display uppercase characters only; selecting dualcase will display characters in upper and lower case (as they are entered from the keyboard).

Hotspots
This group box is used to enable the selected hotspot on the display. There are three (3) types of hotspots:

- **Light Pen Fields** - These hotspots are the 3270 type light pen fields, ?, >, and &.
- **Defined Names** - These hotspots are the names as defined under the hotspot customization program.
- **Copy and Enter** - The Copy and Enter hotspot will copy the word pointed to by the mouse cursor to the 3270 cursor location and send an Enter key to the host application.

Sound - Setup

The Sound menu is used to customize the display of the current session the operator is attached to. Clicking on the Sound selection on the **Setup** menu will display the following dialog box:
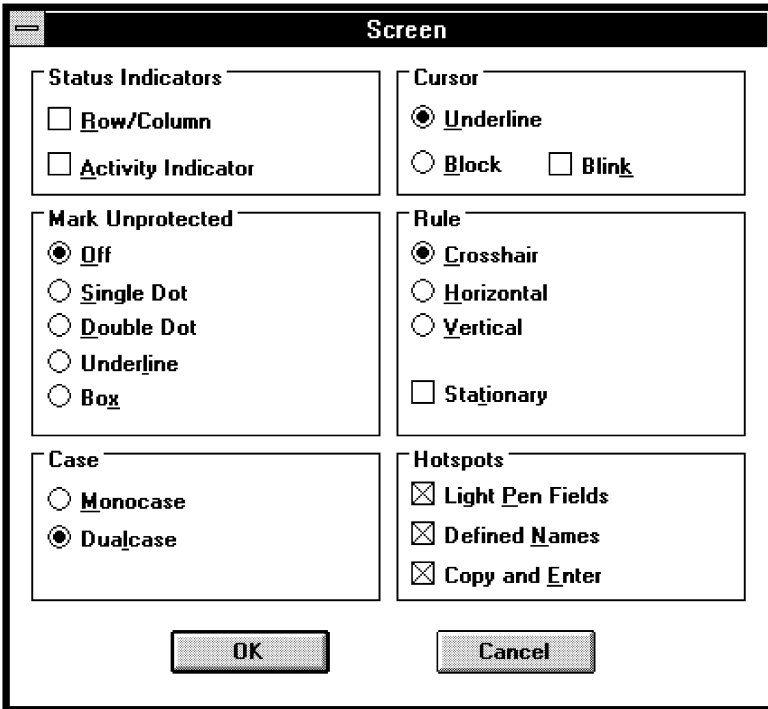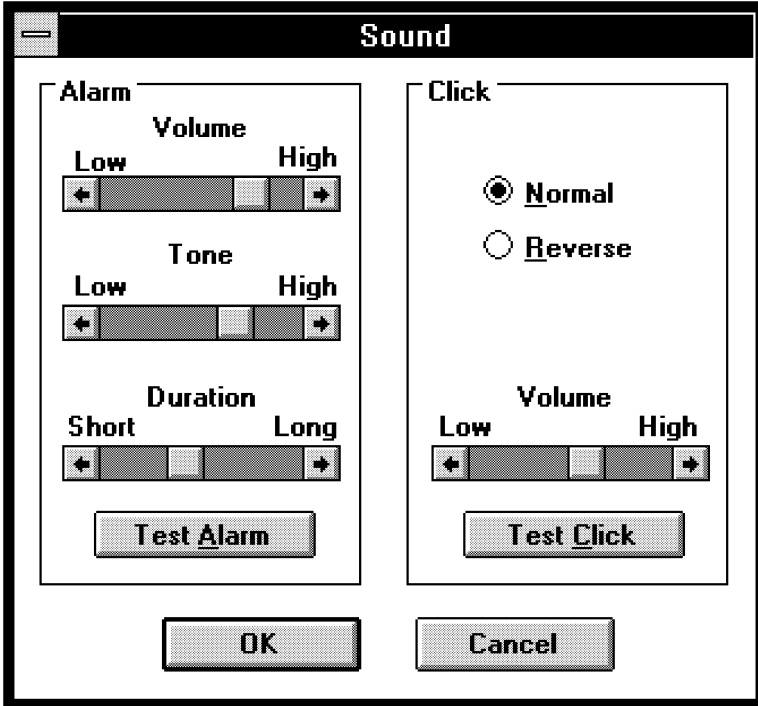

Figure 3-5. Sound Setup dialog box.

Alarm Controls
The alarm controls give you a choice of modifying the alarm **Volume**, **Tone**, and **Duration** of the FORVUS Emulator screen. Moving the scroll bar for each control will modify the current settings for the alarm.

To test the alarm settings, press the **Test Alarm** pushbutton at the bottom of the alarm control group box.

Click Controls
The click control will allow you to change the state of the keyboard clicker and also the Volume of the click.

State

To change the **state** of the keyboard click, select one of the choices below:

- Normal - Clicks with every keystroke press; does not click when an error condition occurs.

- Reverse - Does not click until an error condition occurs.

Volume

Moving the scroll bar for the Click **Volume** will modify the current settings for the keyboard clicker.

To test the click settings, press the **Test Click** button at the bottom of the click group box.

Printer - Setup

The Printer menu is used to customize the format of the print that is directed to the attached printer. Clicking on the Print selection on the **Setup** menu will display the following dialog box:
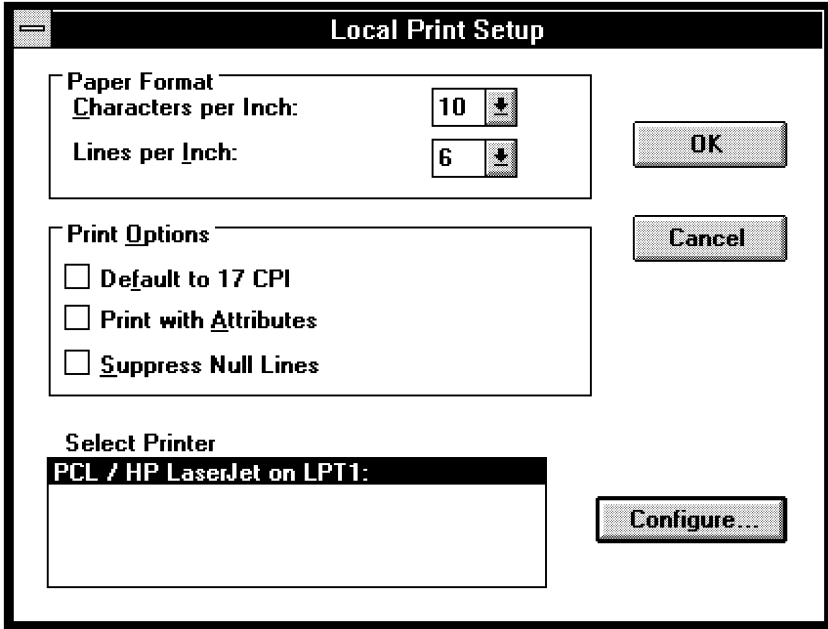
Figure 3-6. Local Print Setup dialog box.

Paper Format
Characters per Inch
This selection sets the characters per inch for a LOCAL print operation. Select either 10, 12, or 17 characters per inch.

Lines per inch
This selection sets the lines per inch for a LOCAL print operation. Select either 3, 4, 6, or 8 lines per inch.

Print Options
Default to 17 CPI
This feature is used to automatically switch to 17 Characters per Inch when a Mod 5 screen print request is sent to the LOCAL printer. Select the check

box to enable this feature.

Print with Attributes
This feature allows the operator to enable or disable the print with attribute feature. When this function is **disabled**, the LOCAL print will not print the **underline** or **bold** attribute on the attached printer. Select the check box to enable this feature.

Suppress Null Lines
This function is used to skip the printing of "null" lines on the display to the LOCAL printer. Select the check box to enable this feature.

Select Printer
To select the current printer attached to the FORVUS Emulator, select a printer from the "Select Printer" list box. These printers are provided by the Windows resources and any printers to be added must be added by using the **Windows Print Manager**.

To configure the selected printer, (landscape or portrait, paper width etc.) press the **Configure** pushbutton at the side of the Select Printer Selection.

Color - Setup

The Color menu is used by the operator to customize the display colors for the Base Field Attributes, the Extended Field Attributes and various Display areas shown on the session display. Either the foreground or background color may be changed for the various fields (exception: Screen background will only allow the background color to be changed).

Clicking on the Color selection on the **Setup** menu will display the following dialog box:
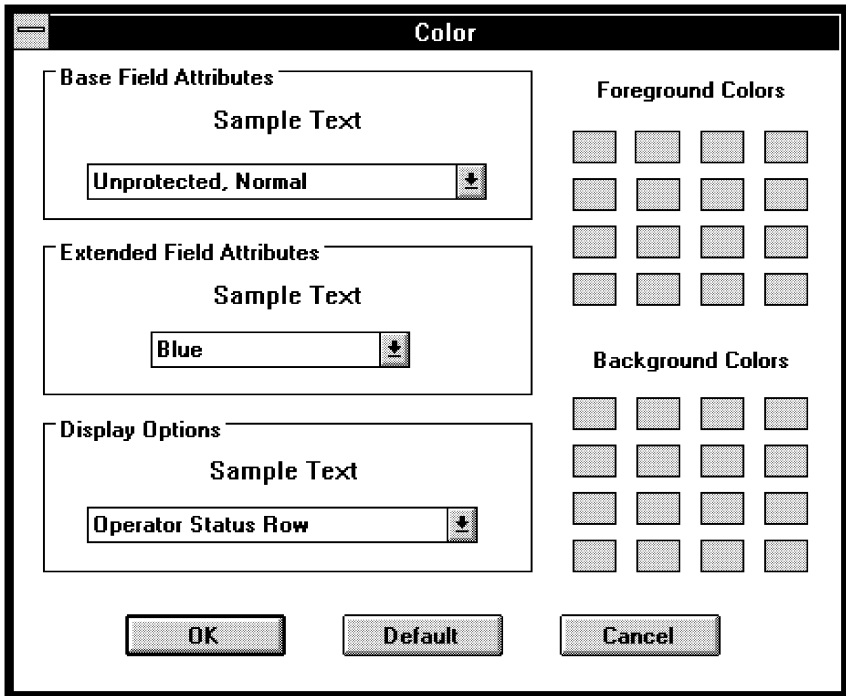
Figure 3-7. Color Setup dialog box.

☞   Care must be taken when selecting foreground and background colors; setting them to the same color will result in no data displayed!

Base Field Attributes

To modify the Base Field Attribute settings, click on the drop-down icon. You will then have the choice between selecting the attribute field to modify. The choices include:

- Normal, Unprotected
- Normal, Protected
- Intensified, Unprotected
- Intensified, Protected

After choosing the selection to modify, click on the foreground and background selections on the right side of the menu box. As you modify the colors, a sample display text field will display the current selections chosen.

Extended Field Attributes

To modify the Extended Field Attribute settings, click on the drop-down icon. You will then have the choice between selecting the attribute field to modify. The choices include:

- Blue
- Red
- Pink
- Green
- Turquoise
- Yellow
- White

After choosing the selection to modify, click on the foreground and background selections on the right side of the menu box. As you modify the colors, a sample display text field will display the current selections chosen.

Display Options

To modify the Display Options settings, click on the drop-down icon. You will then have the choice between selecting the display option to modify. The choices include:

- Operator Status Row
- Screen Background
- Rule
- Print Trim Border

After choosing the selection to modify, click on the foreground and background selections on the right side of the menu box. As you modify the colors, a sample display text field will display the current selections chosen.

☞   **Exception:** Screen background will only allow the background color to be changed. The foreground selection is ignored.

Return Colors to Default Settings
To change **ALL** colors to the factory default settings, press the Default pushbutton at the bottom of the dialog box. You will then be prompted before any colors will be changed.
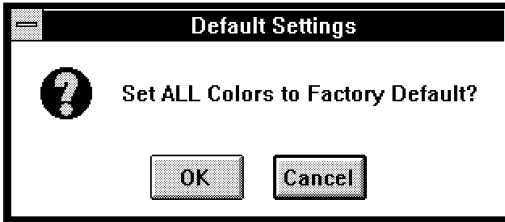
Figure 3-8. Default Color dialog box.

Press OK to return all Colors to the factory default settings.

Session Control - Setup

The Session Control dialog box allows the operator to customize the Multiple Logical Session feature of the host. Selecting the MLS session (A-H) will inform the FORVUS Emulator to send the required key sequence to display the selected session.

Clicking on the Session Control selection on the **Setup** menu will display the following dialog box:
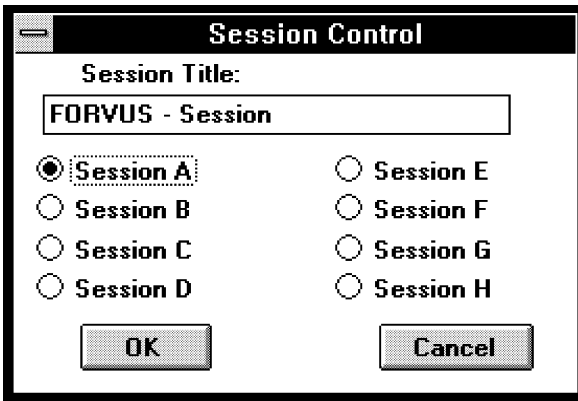
Figure 3-9. Session Control dialog box.

Session Title
To enter the name of the current session, (which will be displayed in the title bar of the session window) place the cursor in the edit control and enter the desired name.

Session
Click on the desired session (A-H) to use with the MLS feature.

Font - Setup

The Font menu will allow you to select the font to be displayed on the current session window. Both the font style and size may be changed to complement the attached video display.

Clicking on the Font selection on the **Setup** menu will display the following dialog box:

```
┌─────────────────────────────────────────────────────┐
│                  Font Selection                      │
├─────────────────────────────────────────────────────┤
│                                                      │
│  Font Style        Font Size                         │
│                                                      │
│  ┌───────────┐    ┌──────────┐ ▲     ┌─────────┐     │
│  │ 472-3270  │    │ 6x10     │       │   OK    │     │
│  │           │    │ 6x12     │       └─────────┘     │
│  │           │    │ 7x8      │                       │
│  │           │    │ 7x10     │       ┌─────────┐     │
│  │           │    │ 7x12     │       │ Cancel  │     │
│  │           │    │ 7x14     │ ▼     └─────────┘     │
│  └───────────┘    └──────────┘                       │
│                                                      │
│                   ☐ Auto Font Sizing                 │
│                   ☐ Auto Screen Sizing               │
│                                                      │
└─────────────────────────────────────────────────────┘
```
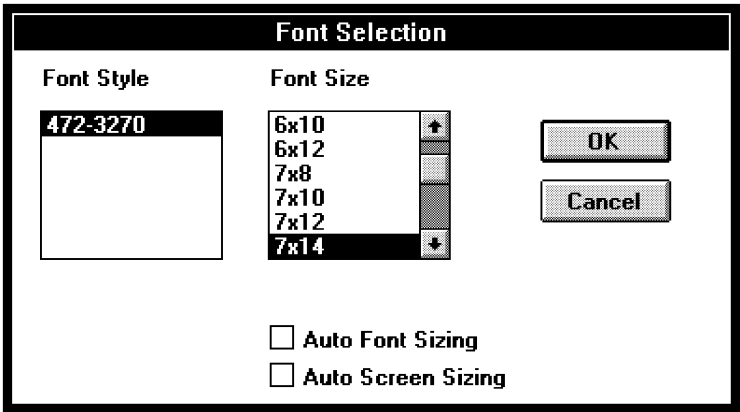
Figure 3-10. Font Selection dialog box.

☞   Although the Windows environment allows the use of multiple font styles, the FORVUS Emulator will only allow the **472-3270** style font to be displayed in the font selection dialog box. This ensures that the 3270 style characters found on the operator status row will be displayed correctly.

While a particular style and size may be selected, you may elect to select **Auto Font Sizing** and/or **Auto Screen Sizing**.

- Auto Font Sizing - When selected, the FORVUS Emulator will change the font size to adapt a full screen display with the largest possible font inside the current window.
- Auto Screen Sizing - When selected,the FORVUS Emulator will modify the current window to remove "blank" areas around the session text.

HAP Control - Setup

The HAP (Host Addressable Print) Control will allow the operator to send paper and control commands to the host addressable printer.

Clicking on the HAP Control selection on the **Setup** menu will display the following dialog box:
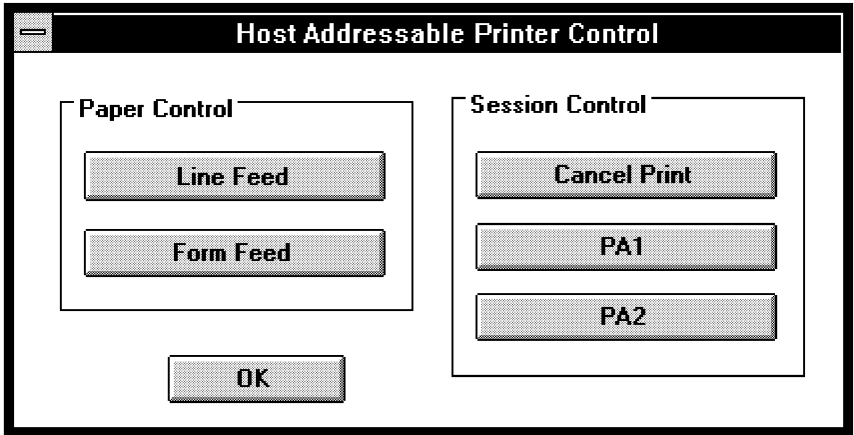
Figure 3-11. HAP Control dialog box.

Paper Control
You can send a line feed or a form feed command to the host addressable printer from the Paper Control group box. Press the **Line Feed** or the **Form Feed** pushbuttons to perform the desired function.

Session Control
You can cancel a print job or send a PA1 or PA2 session control command to the host addressable printer from the Session Control group box. Press the **Cancel Print**, **PA1** or **PA2** pushbuttons to perform the desired function.

Reset Logical Unit - Setup

The Reset Logical Unit menu command will force the emulator to exit the Online session and re-establish communication with the attached control unit. This may be necessary when a new configuration file is loaded and the operator wishes to use the new parameters the file contains.

Clicking on the Reset Logical Unit selection on the **Setup** menu will display the following dialog box:

```
┌─────────────────────────────────────────┐
│ ▬       Logical Unit Reset               │
├─────────────────────────────────────────┤
│  ⬡     A logical unit reset will reset   │
│  STOP  (POR) all active sessions. OK to  │
│        Reset?                            │
│                                          │
│          ┌──────┐   ┌────────┐           │
│          │  OK  │   │ Cancel │           │
│          └──────┘   └────────┘           │
└─────────────────────────────────────────┘
```
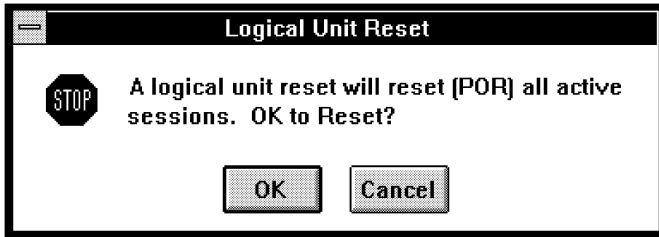
Figure 3-12. Reset Logical Unit dialog box.

Pressing the **OK** pushbutton will reset the logical unit in the attached control unit.

Pressing the **Cancel** pushbutton will return to the session display *without* resetting the logical unit.

☞   **Note:** When this command is executed, the current application's data may be lost! This command simulates a Power Off - Power On sequence to the control unit.

Record/Play Commands

The Record/Play menu allows the operator to save and recall keyboard sequences entered from the keyboard.

The following submenus are available under the Record/Play menu:

◊ **Play**

The play function will allow you to start a keyboard playback sequence from a previously recorded record/play file. To begin a play sequence, follow the steps below:

- Place the 3270 cursor at the point on the screen you wish to playback a sequence.
- Select Play from the Record/Play menu.
- Click on the desired file that contains the playback sequence.

◊ **Begin Recording**

The Begin Recording function will start a new recording key sequence to be saved to a file. This sequence is explained below:

- Place the 3270 cursor at the point you wish to begin recording.
- Select Begin Recording from the Record/Play menu.
- Enter the key sequence you wish to record.

◊ **End Recording**

The End Recording function will end the current recording sequence. This sequence is explained below:

- Select End Recording from the Record/Play menu.
- Enter the filename you wish to save this recording sequence to.

◊ **Pause**

If you wish to enter a Pause sequence while recording, select Pause from the Record/Play menu. When you are playing back a key sequence that has a pause inserted, you will see the pause reminder on the operator status row.

◊ **Resume**

When you are playing a recorded key sequence, you may encounter a pause indicator on the operator status row. This means that when the key sequence was recorded, a pause was inserted. This is helpful when it is anticipated that certain system sequences may take a varying amount of time to complete an operation. Inserting a pause sequence and thereafter issuing a **Resume** sequence will continue the operation.

In response to the pause sequence, you may:

- Select Cancel from the Record/Play menu - to end the Play operation.
- Select Resume from the Record/Play menu - to complete the Play operation.

◊ **Cancel**

The Cancel function is used to:

- Play - Cancel a playback sequence in progress.
- Record - Cancel a record sequence in progress.

Canceling a Play sequence in progress

If you wish to stop a play sequence while it is in progress, follow the steps below:

- Press any key on the keyboard -or- press the left mouse button.
- Respond **Yes** to the dialog box.

Accessories Commands

The Accessories menu will allow you to execute Windows application programs. You may elect to start the following programs without exiting the emulator.

◊ **Calculator**

◊ **Notepad**

◊ **Calendar**

◊ **Clock**

◊ **Cardfile**

To start a program from the Accessories menu, click on the desired program name.

☞   -When starting an application under the Accessories menu, the application will remain active even if the emulator is exited or terminated.
-Accessories availability is dependent on version of Windows.

Help Commands

The FORVUS Emulator provides an on-line help program that will provide operator assistance.

The following facilities are provided with the Help system:

- **Help with Help** - Provides the operator an overview with the Microsoft Windows Help system.
- **Help Index** - Provides the operator an INDEX to procedures and commands for the the FORVUS Emulator.
- **Keyboard Help** - Provides the operator on a key-by-key basis, the system unit keyboard key to 3270 function Help display.

☞   **TIP**:   Double clicking the mouse on the selected key will perform that 3270 function on your active session.

Selecting one of the above Help topics will invoke the Microsoft Help facility. Exiting the Help facility will return the operator to the FORVUS Emulator.
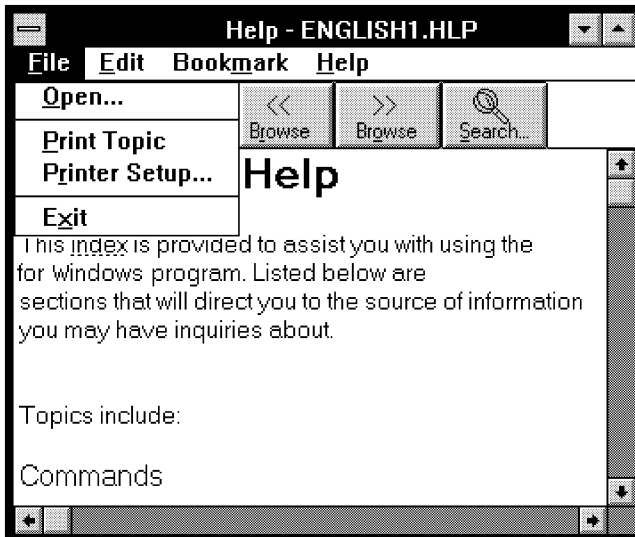

Figure 3-13. Sample Help topic.

Rule Cursor

The FORVUS Emulator contains a Rule Cursor that may be enabled or disabled while working in the active 3270 session. This feature enables you to quickly locate data that may be aligned in columns or tables.

If the Rule Cursor is tagged as **Stationary** in Screen/Cursor setup, it can be placed on the active window in a fixed position. If the Rule Cursor is tagged as **Movable**, it track the current cursor location on the display.

If you are using a color display, the color of the Rule Cursor may be changed to any one of 16 colors. Refer to Color - Setup on page 50 for color setup information.

Local Screen Printing

The FORVUS Emulator will allow the operator to print all or part of the screen to the attached system printer.

Printing the entire screen

To print the entire screen to the attached printer, select **Local Print** from the File drop-down menu. The text shown on the session window will be printed on the attached local printer.

Printing part of the screen

To print only a selected portion of the screen, place the mouse cursor at the beginning of the area you wish to print;press the left mouse button and drag the print trim border around the area of text you wish to print. Select **Local Print** from the File drop-down menu. The area inside the print trim box will be printed on the attached local printer.

Hotspots

Hotspots are areas on the display that the emulator translates to keyboard functions when double clicked with the mouse cursor. There are three (3) types of hotspots recognized by the emulator. These are:

- Light Pen Fields - 3270 Style Light Pen fields that are recognized by the application program. Double-clicking on the "designator" characters ?, >, or & will send light pen sequences to the host.

- Defined Names - are user-definable hotspots that send a specific keyboard functions when the emulator detects that a defined name hotspot has been double-clicked.

- Copy and Enter - will copy the word clicked on (separated by null or spaces on the front and back of the word) to the area located by the application cursor and send an **Enter** key function to the application.

To enable or disable the above hotspots, refer to Screen/Cursor setup found on page 44 for more information.

Pop-Up Keypad

The FORVUS Emulator contains a user-definable pop-up keypad that contains function keys that are frequently used. The keypad actually consists of two (2) keypads in one layout. Found at the bottom of the keypad is the **Next Keypad** pushbutton. Pressing this pushbutton when the keypad is displayed will result in the display of the alternate keypad. The keypad is displayed on the screen when the **right** mouse button is clicked. When one of the pushbuttons on the keypad is pressed, the appropriate function is sent to the control unit.

A sample keypad is shown below:

PA1	PA2	PA3
Reset	Cancel	Test
Dup	Field Mark	Home
Clear	Erase EOF	Erase Input
Sys Req	Attn	Ext Sel
Enter	Print	Ident
	Next Keypad	

Figure 3-14. Sample Pop-Up Keypad.

The layout of the keypad layout is contained in a pop-up configuration file. Refer to page 18 for more information on how to modify the Pop-Up Keypad configuration file.

Status Row Messages

This chapter describes the messages that appear on the status row of the FORVUS Emulator display window. Also, the action to be taken when a particular indicator appears is described in this section. The operator status row is the displayed row below the separator line and the data area above. System messages are grouped into distinct areas of the status row, these being System Status, Do-Not-Enter, Communication Reminders, Shift and Mode Status, Printer Status, and Row/Column. These functions will be described in the sections that follow.

- **System Status** - Displays current attachment and ready status of the FORVUS Emulator program. (Columns 1-8)
- **Do-Not-Enter** - Displays keyboard locked condition and explanation for this condition. (Columns 9-20)
- **Reminders** - Display Communication Reminders, both permanent and temporary communication link errors. (Columns 21-28)
- **Shift Status** - Displays current Shift status of the FORVUS Emulator. (Columns 38-40)
- **Mode Status** - Displays current Mode status such as Insert, Ex. Sel. etc (Columns 41-44).
- **Printer Status** - Displays current Printer status that is attached to the FORVUS Emulator. (Columns 60-65)
- **Record/Play** -Displays current Record/Play indicators.
- **Row/Column** - Displays current Cursor position relative to the position of the Display Buffer. (Columns 73-80)

System Status

▣ 3274 Ready
The FORVUS Emulator is connected to a 3274 type control unit.

▣ 3276 Ready
The FORVUS Emulator is connected to a 3276 type control unit.

S 3174 Ready
The FORVUS Emulator is connected to a 3174 type control unit.

I 43XX Processor Ready
The FORVUS Emulator is connected to a 43XX Processor.

A̲ Online A
The communication access method between the controller and host system is using a method other than SNA.

B̲ Online B
The communication access method between the controller and host system is using SNA.

▉ My Job
The FORVUS Emulator is currently connected to an application type program.

▤ System Operator
The FORVUS Emulator is connected to the host and is communicating with the system operator.

TEST   Test
The control unit is in Test mode.

▢ Unowned
The FORVUS Emulator is connected to the host but is not connected to an application program or to the system operator.

Do-Not-Enter

The Do-Not-Enter symbol indicates to the operator that input to the FORVUS Emulator display is inhibited. The condition indicated must be cleared before further input will be accepted. More information is displayed to the right of the locked condition defining the cause of the Do-Not-Enter condition.

The following examples explain how to clear the Do-Not-Enter function and restore the keyboard to an unlocked condition.

✗ ⟶z— 5nn   Communications Check

There is a problem with the communications link between FORVUS Emulator and the host. When you activated an AID key, there was a Communications Reminder informing you that there was a problem with the link between the host and your Display. Press RESET to restore the keyboard to an unlocked condition.

✗ ▽ nnn   Machine Check

There is a machine detected check with the control unit or with the FORVUS Emulator. Pressing the RESET key may or may not restore the keyboard to an unlocked state.

✗ PROG nnn   Program Check

An error in the data stream from the host has caused the control unit to inhibit operation of the FORVUS Emulator keyboard. This may be caused by a program 'bug' in an application program (eg. a Mod 5 program writing to a Mod 2 display.) Contact the system operator if this situation arises.

✗ ♮✗   Operator Unauthorized

This symbol is displayed when the operator attempts to print to a device which has not been assigned to the control unit. Re-check the printer assignment and retry the operation. Pressing the RESET key will restore the keyboard to an unlocked condition.

✗ ⸬(⸬   Time

The previous command is taking more time to respond to your request than is normally needed. Should this symbol be displayed more than a few minutes, contact your system operator.

✘ -f   Minus Function
The function that you requested was an unavailable keyboard function. Pressing the RESET key will restore the keyboard.

✘ ꝝ>   More Than
While inserting characters using the INSERT function, the field had no more space for the data you were entering. Pressing the RESET key will unlock the keyboard and remove this symbol. *Note:* pressing RESET will remove the emulator from insert mode, press the INSERT key to re-enter that mode.

✘ ←ꝝ→   Go Elsewhere
This symbol is displayed when you tried to change the screen input but the cursor was not inside an input field. This symbol is also displayed when the Cursr Sel key is pressed and the cursor was not in a light-pen type field.

✘ SYSTEM   System Lock
This symbol is displayed when the application program has locked the keyboard. Pressing the RESET key will restore the keyboard for data input.

✘ ꝝNUM   Numeric Input Only
You tried to enter non-numeric data in a field that is specified as numeric data only. Only the characters 0-9, the DUP key, period and comma are the only valid entries for this field. Pressing the RESET key will unlock the keyboard and remove this symbol.

✘ ꝝ#?   What Number
The control unit did not accept the last input. It is caused by:

- While in TEST mode to the control unit, you entered a test number that was invalid.
- You entered an incorrect printer ID number.

✘ ?+   What?
The emulator keyboard is locked because the input was incorrect or was not recognized. No input data will be accepted. Press RESET to restore keyboard to an unlocked state.

✘ ⯈←圀   Message Received
The emulator received and rejected a message from the system operator or control program. Press RESET to restore the keyboard to an unlocked state.

✖ -S **Minus Symbol**

While inputting data, you pressed an unsupported key. Press RESET to restore the keyboard to an unlocked state.

✖ ▭—▷ **Printer Not Working**

There is a problem with the printer that is assigned to the emulator. Attempt to locate the problem with the printer, (Paper Out, Not Selected) before continuing. Press the QUIT key to unlock the keyboard.

✖ ▭—▭ ⠇ **Printer Busy**

The emulator encountered a busy printer while attempting to start a print request. You may elect to wait for the current print operation to complete or press the QUIT key to unlock the keyboard.

✖ ▭—▭ ⠇ ⠇ **Printer Very Busy**

The emulator is unable to print because the host has started a print to the selected printer. Time is needed to complete the print to the device. Press QUIT to unlock the keyboard.

Communication Reminders

Communication reminders are provided to the status row to inform the operator of the current state of the communication link between the FORVUS Emulator display and the host system. Messages may vary, depending on the type of control unit attachment to your host system. Not all messages are error messages, some are provided as information only. Refer to Appendix A, "Error Messages" for a more detailed explanation.

✖ ⟶z⟶ 5nn **Communication Check**

The control unit has detected a problem in the communications link with the host system. Two major types of errors are reported:

- A permanent error has occurred with the communication link, causing all terminals on the control unit to report the error.
- A temporary line error occurred causing the control unit to retry the failing operation again to the host. If the retry is successful, the communication reminder will be reset and the condition cleared.

Shift and Mode Status

↑ Upshift

This symbol is displayed when the keyboard is in Upshift mode. All alpha-numeric characters will be displayed in uppercase.

NUM Numeric

This symbol is displayed when the cursor is located in a numeric field, *and* the Numeric Lock function is enabled. Only characters 0-9, minus sign, period or a comma may be entered in this field.

⌃ Insert

This symbol is displayed when the keyboard is in Insert mode. Characters entered will be inserted to the right of the cursor. Pressing RESET will exit insert mode.

▶ Extended Select

This symbol is displayed when the keyboard is in Extended Select mode. Entering this mode will redefine the Program Function keys. Pressing any key other than a PF key will exit this mode.

Printer Status

⌷━■ nn Printer Printing

The printer that is identified by "nn" is currently busy printing.

⌷━◀ nn Printer Failure

The printer that is identified by "nn" has stopped printing due to a failing condition. Check the printer and correct the condition before attempting to start a new print.

⌷━⌷ nn Printer Assignment

The FORVUS Emulator is currently assigned to the printer with the ID "nn". These ID's are as follows:

- 1-31: Control Unit printer port numbers
- 70-85: Printer Class number
- 99: Local Printer attached to FORVUS Emulator

□—□ ?? **What Printer?**
The previous printer assignment has been changed. Press the printer IDENT key to display the new printer ID assignment.

□—□ – – **Assign Printer**
This symbol is displayed to inform the operator that a new printer ID may be assigned. Entering a new ID will replace the "- -" on the status row.

Error Status

2%% **Invalid Keyboard Attached**
This message is displayed when the keyboard ID and the control unit ID do not match. This may occur when the keyboard is configured for a 3472 keyboard and the control unit is customized to expect a 3278 keyboard. Re-check the keyboard selected in the SETUP panels or contact your system operator.

⚲ > **Record Buffer Full**
This indicator is displayed when the contents of the RECORD buffer is full. You must remove keystrokes from the buffer before additional keystrokes may be added.

Entry Assist Indicators

DOC **Document**
This indicator is displayed when the keyboard is in DOCUMENT mode. Refer to your control unit user's guide for more information on "Entry Assist".

⬇ **Word Wrap**
This indicator is displayed when the WORD WRAP function is enabled. Refer to your control unit user's guide for more information on "Entry Assist".

Record/Play Status

R **Record Mode**

This indicator informs the operator that the emulator is currently in RECORD mode. The number displayed to the right of the indicator shows the number of keystrokes that remain in the RECORD memory area. Pressing the QUIT key while in this mode will CANCEL this recording session and return to normal mode.

P **Play Mode**

This indicator informs the operator that the emulator is currently in PLAY mode. Pressing the QUIT key will stop the PLAY operation and return to normal mode.

R ⚥∧ **Recording Paused**

This indicator informs the operator that the PAUSE key has temporarily stopped the RECORD operation. One of three steps may be taken at this point:

- Pressing the QUIT key will cancel the RECORD operation.
- Pressing the PAUSE key will resume the recording process for this key.
- Pressing the RECORD key will end the recording process and save the keystrokes.

P ⚥∧ **Playback Paused**

This indicator informs the operator that the playback of the current operation has been temporarily stopped. You may:

- Press the QUIT key to end the PLAY operation.
- Press the PLAY key to resume the playback operation.

Problem Determination

This section of the manual is provided to assist you with problems you may have while using the FORVUS Emulator. Messages that might appear on the Operator Status Row may indicate an error condition while some may be for information only. If you see indicators on the Status Row, refer to Chapter 4, "Status Row Messages" on page 63.

If the emulator should indicate a problem, refer to Appendix A, " Error Messages" for a more detailed description.

If you are having problems other than communicating with your host, follow the steps below to further assist you with solving the problem.

Initial Checks

1. If your system unit does not power up as it normally does, check that power is available to both your monitor and system unit. If power is available to both units proceed to step 2.

2. Check all connections to the system unit (keyboard,monitor, and any other connections).

3. Check the contrast and brightness controls on the monitor. Should the screen appear, re-adjust to a comfortable level.

4. If your system is equipped with diagnostics (power on diagnostics, memory test, alarm "beeps") make sure these tests pass normally. If these diagnostics "fail", refer to your system unit user's manual to further identify the system problem.

☞   **Expanded memory Users:** Make sure your expanded memory manager does not interfere with the memory address space of your communications adapter (coax adapter, token ring adapter, etc.) by excluding the required memory area per the hardware manufactures specifications.

FORVUS Emulator Does Not Load

1. Perform Initial Checks (See Page 71) and verify Configuration selections.

2. Is the communications adapter card installed correctly in the system unit? Make sure the Adapter card is firmly seated in the system unit's Main board.

3. If required, has a network driver (for example, IPX/SPX,LLC) been loaded into memory before the Emulator communications driver is started.

☞   IPX/SPX is required for SAA connection.

LLC is required for 802.2 and LANSYS connection.

TCP/IP stack is required for TN3270 connection.

4. The FORVUS Emulator displays an error message while trying to load - Refer to Appendix A, "Error Messages" for further information.

FORVUS Emulator loads. . .
but does not communicate with the Host

1. Perform Initial Checks (see Page 71) and verify Configuration selections.

2. Make sure the communication cable is properly attached to the Communication Adapter. (loose wires, frayed cable, etc.)

3. Are other devices communicating with the same gateway controller? If not, the gateway controller may be malfunctioning. Check with your system operator.

4. If possible, have your system operator restart the line that you are communicating. If the host is operational and other devices are functioning normally, power your system off and back on to retry the operation.

5. LANSYS Connection only - Run the CHKLNK program described in Appendix D.

6. SAA connection only - 505-xx errors (no host connection) - When the FORVUS Emulator is loaded, a 505-xx error will occur if there is no communication with the host. The 2-digit number following the 505 may help you identify the cause. See Appendix A "Status Row Messages" for more information.

☞   A blank screen with no status line usually occurs if IPX/SPX has not been loaded.

Viewing Connection Information (SAA only)

To view the SAA Connection Information screen, follow these steps:

1. Press the Test key from any online screen to enter Test mode. Refer to the Pop-Up keypad (Page 62) or Keyboard Help on the FORVUS Emulator session Help menu to locate the Test key function.

2. Press the 3 key from the Main Test menu. The SAA Connection Information screen is displayed.

3. To leave the SAA Connection Information screen, press the Test key.

Product support

If you have a question that isn't answered in this manual, our Product Support Department can help. Free telephone support is provided for 90 days to you as a new user when you return the enclosed registration card. Many questions can be answered in this manual. However, if you've checked your manual and still need assistance, please have your computer powered on and the following information available:

- your name and address
- your FORVUS Emulator software serial number
- your computer make and model, the amount of RAM installed, the type and capacity of your hard disk and floppy drives, the display adapter and monitor type, printer name and model number
- Version number of Novell NetWare for SAA (if applicable)
- Type of coaxial adapter installed (if applicable)
- Type of network adapter installed (if applicable)
- TCP/IP vendor stack (if applicable)
- Windows version number
- DOS version number
- contents of your CONFIG.SYS and AUTOEXEC.BAT files
- a clear description of your problem

Call Product Support at (919) 954-8380 between 9 a.m. and 5 p.m. EST (excluding US holidays). We will be happy to assist you.

We may also be contacted via the Internet at: http://www.forvus.com

Defective items

If you have registered your software and find a defect in your diskettes or manual within 90 days of the date of purchase, you may return the defective item for a replacement. Proof of purchase is required.

File Transfer

The FORVUS Emulator is capable of sending and receiving files from a host mainframe that uses the VM/CMS, TSO, or CICS environment. This enables the operator to transfer files to and from other users via the host application.

Two types of file transfer tasks supported by the emulator are IBM's IND$FILE and PCXFER. IND$FILE is initiated from the PC while PCXFER is initiated from the host.

Requirements for File Transfer

Before you attempt to transfer files between the system unit and the host, make sure the following steps have been taken:

- The host file transfer programs have been installed. Check with your system operator should you need assistance with the host application.

- Make sure the host will not send any unsolicited messages while the file transfer is in progress. Enter the host command to "set messages off" before starting the file transfer.

Log on to the host application you will be transferring the FORVUS Emulator files to/from.

☞   When the file transfer is in progress, both the emulator session and the host session will be dedicated to the task. Neither session may be used until the file transfer is complete.

Any attempt to enter data from the keyboard may disrupt the file transfer between the host and the emulator session. Data may only be entered in response to messages received from the file transfer program.

Mainframe System Requirements

Subject to the host system you use, one of the following supported file transfer programs must be installed at your host site:

- OS/VS2 TSO-IBM 3270-PC File Transfer Program Rel 1 (5665-311)
- VM/CMS-IBM 3270-PC File Transfer Program Rel 1 (5664-281)
- PCXFER

The installation and support of the IBM host supported file transfer program is outside the scope of this document. See your system administrator for additional help.

Beginning a File Transfer

To initiate a file transfer, select **File Transfer** found under the **File** drop-down menu. The following dialog box will appear:
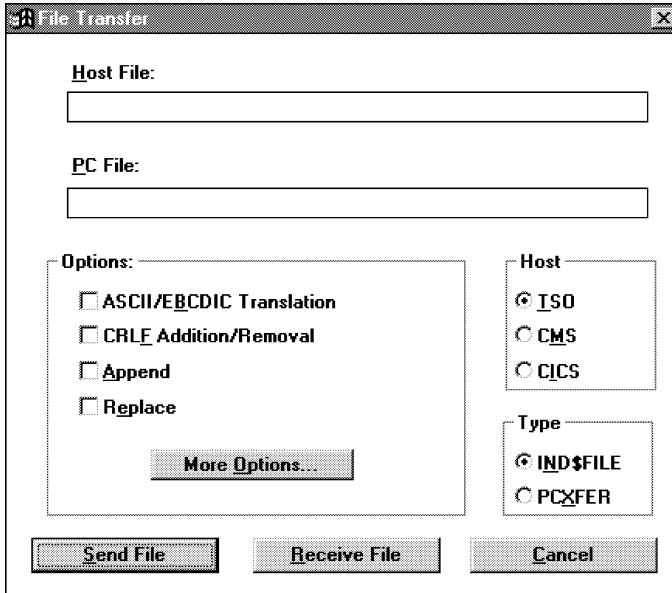

Figure 6-1. File Transfer dialog box.

Fill in the following information when sending a file to the host or receiving a file from the host:

Host File - Enter the name of the host file to be used with the file transfer. The format is **filename<sp>file type.**

PC File - Enter the name of the PC file to be used with the file transfer. The format is **d:\path\filename.ext** where d: is the drive and \path is the subdirectory of the file. **Note:** You must include the drive and directory of the desired PC file.

Host - This setting determines the host environment; select between **TSO**, **CMS** or **CICS**.

Type - Select the type of file transfer, IND$FILE or PCXFER. IND$FILE file transfers are initiated at the PC. PCXFER file transfers are initiated at the host.

Options - The following options are available:

- ASCII/EBCDIC Translation - This option will translate ASCII files sent to the host to EBCDIC and EBCDIC files received from the host to ASCII.
  If this option is not selected, files are transferred between the PC and host without being translated.

- CRLF Addition/Removal - This option replaces trailing spaces on files transferred from the host with **carriage returns (CR)** and **line feeds (LF)**.
  If this option is not selected, files are received from the host with trailing spaces instead of carriage returns and line feeds at the end of lines. Files are sent to the host with carriage returns and line feeds instead of trailing spaces.

- Append - Select this option to have the transferred file appended to an existing file on the receiving system.
  If this option is not selected and a file with the same name as the transferred file already exists on the receiving system, the transferred file underwrites the file on the receiving system.

- More Options - Pressing this key will display another dialog box of options; the options available depend on the selected host environment.

  - For IND$FILE file transfers, refer to "IND$FILE" File Transfers on the following page.
  - For PCXFER file transfers, refer to "PCXFER File Transfer Options" on Page 83.
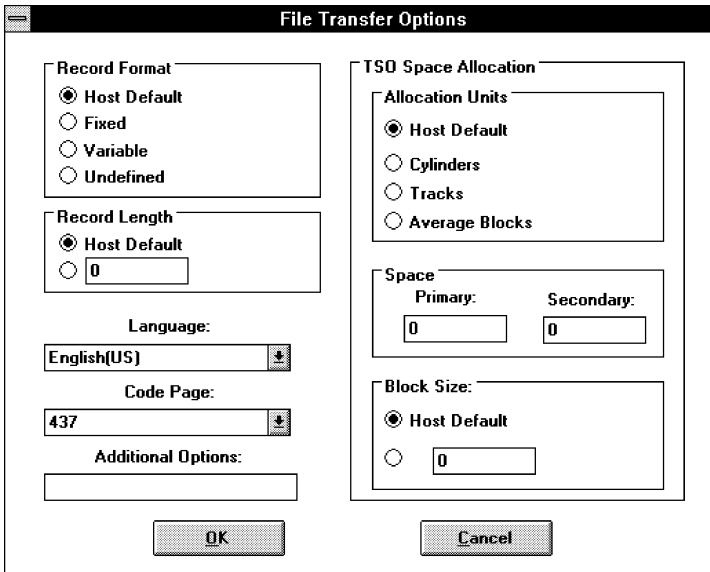
IND$FILE File Transfer Options

Figure 6-2. File Transfer Options dialog box.

Record Format - This option informs the host of the record format to use for the new data set to be created. Select between:

- Host Default
- Fixed
- Variable
- Undefined

Record Length - This option informs the host of the logical record length to use when creating a new data set. Choose between:

- Host Default
- Operator specified length

Language - This selection determines the language that will be used during the file transfer operation.

Code Page - Select the country code page for translation from ASCII to EBCDIC and EBCDIC to ASCII.

Additional Options - Use this box to enter one or more of the following flags (*each flag must be preceded by a space*):

- /H=nnn   Host timeout value (nnn=timeout value in seconds). Sets the length of time the Send/Receive programs waits for a host response before timing out.

- /Q   Quiet mode. Suppress message display during file transfer.

- /S   Display statistics. Displays statistics for a transfer, including the number of bytes transferred and the host timeout value. It is recommended that you use the /S flag to determine these values before using the /H flag to change them.

- /W   Display warning messages. Warning messages are not sent unless this flag is specified.

- /?   Help. Displays a menu of these flags.

Space allocation options available with TSO Environment

If you have specified a file transfer with a **TSO** host, the following space allocation options are available:

Allocation Units - This option informs the host of the type of space to allocate for the new data set. The choices are:

- Host Default
- Cylinders
- Tracks
- Average Blocks

Space - This option informs the host the amount of **Primary** and **Secondary** space to allocate during the file transfer.

Block Size - This option informs the host of the data block size to use when creating a new data set. The choices are:

- Host Default
- Operator specified length

IND$FILE File Transfer Messages

The following messages are provided to inform the operator of the current status of the file transfer application. Some of these messages are for information only, while other messages may report an error situation.

TRANS01   File transfer command being processed.

This message is displayed when the file transfer command has been accepted and communication between the host system and the system unit has begun.

TRANS02   Number of bytes of file transferred so far: ==> XXXXX

This message informs the operator of the number of bytes that have been transferred between the host system and the system unit.

TRANS03   File transfer complete.

This message is displayed when the file transfer has completed without errors.

TRANS05   Personal Computer filespec incorrect: file transfer canceled.

This message informs the operator that the DOS filespec was either not found or incorrect. Verify the drive, path, filename and extension entered matches the file you wish to use.

TRANS06   Command incomplete: file transfer canceled.

The options entered for the SEND or RECEIVE command were invalid or not found. Verify the parameters entered and retry the operation.

TRANS10   Host has not responded within timeout period.

This message is displayed when the host fails to respond within 5 minutes. Contact your system operator or retry the operation.

TRANS12   Error writing to damaged or full PC Disk: File transfer canceled.

This message is displayed when DOS reports a problem while writing to the destination disk. The disk may be full or the media may be damaged.

TRANS25   Keyboard inhibited: file transfer canceled.

While the file transfer was in progress, the host session locked the keyboard.

TRANS27   Out of sequence host: file transfer canceled.

This message is displayed when the host communication sequence did not correspond with the expected sequence. This may be due to either a program or system error.

TRANS41   Host file replaced by new file.

This message is issued to inform the operator that the SEND command has replaced an existing file with a new file.

TRANS42   Disk file replaced by new file.

This message is issued to inform the operator that the RECEIVE command has replaced an existing DOS file with a new file.

TRANS43   Break in progress... please wait.

You pressed the Ctrl+Break key sequence to terminate the file transfer operation. The transfer program is now in progress of informing the host to terminate the file transfer.

TRANS44   Transfer statistics: Total number of chars transferred = XXXXX

This message is displayed to inform the operator of the total number of characters that were transferred between the host and the system unit.

TRANS45   ...actual number of data bytes=XXXXXXXX , overhead = XX %

This message informs the operator of the number of DATA bytes actually contained in the file while the overhead percentage taken to transfer the file is contained in **xx**.

TRANS48   File transfer terminated.

This message is displayed when the file transfer is terminated either by a program or system error or initiated with the Cntl+Break sequence from the system unit keyboard.

TRANS49   Hardware malfunction, command timeout.

This message is displayed when the file transfer program has detected an error with the FORVUS Emulator Hardware Adapter. Retry the operation or contact your system operator.

TRANS50   Host is not processing keys.

This message informs the operator that the host control unit is not accepting keystrokes from the system unit. The control unit may have logged an excessive amount of communication errors or the system may be down. Contact your system operator.

TRANS54   Cursor in protected field.

While the file transfer was in progress, the cursor was found in a protected field. Retry the operation or contact your system operator.

TRANS55   Host input area too small.

While the file transfer was in progress, the cursor was found in an unprotected field that was not large enough to accept the data to be sent. Retry the operation or contact your system operator.

PCXFER File Transfer Options

The following options are available for the PCXFER file transfer as shown below:

Figure 6-3. PCXFER File Transfer Options.

Record Format - This option informs the host of the record format to use for the new data set to be created. Select between:

- Host Default
- Fixed
- Variable

Record Length - This option informs the host of the logical record length to use when creating a new data set. Choose between:

- Host Default
- Operator specified length

Language - This selection determines the language that will be used during the PCXFER file transfer operation.

Additional Options - Enter any options defined by the host.

Record Number Range - Select the Host Default length of the record to be transferred from the CMS file or specify the starting record number (First Record) and the number of records in the file (Count).

Options - The following options are available for PCXFER file transfers:

- Expand Tabs - Select this option to expand the tabs when transferring data from the PC to a CMS file. Specify a number of columns to expand for each tab. The default expansion size is 8.

  Expanding the tabs may cause a record to overflow to the next record.

  If you specify a tab expansion value larger than the file's record length, a new record may be produced for each tab character.

  If you do not select this option, tab expansion is suppressed.

- Add Line Numbers - Select this option to insert line numbers in the data during transfer from the PC to the CMS file. The line numbers are inserted in the last eight positions of each record in increments of 10. The inserted line numbers do not overlay data in the file.

- Wait After Completion - Deselect this option to automatically return control of the terminal to CMS after a file transfer is completed without error. Control is not automatically returned if an error is encountered.

  If you select this option, you must press a key to return control to CMS after a file transfer.

  This option is independent of the Wait After Error option.

- Wait after Error - Deselect this option to automatically return control of the terminal to CMS after a file transfer is terminated because of error. A message describing the cause of the termination is not left on the display.

  If you select this option, you must press a key to return control to CMS after a file transfer termination. A message describing the cause of the termination is left on the display until you press a key

  This option is independent of the Wait After Completion option.

Completing the File Transfer

After all options have been entered, select the type of file transfer you desire:

- Press **Send File** to send a file from the PC to the host.
- Press **Receive File** to receive a file from the host to the PC.

Press **Cancel** to exit the file transfer process without sending or receiving a file.

File Translation

When files are transferred between the host system and the system unit, if the ASCII option is specified, a translation between ASCII and EBCDIC will take place. This occurs because the PC utilizes the ASCII alphanumeric character set and the host system utilizes the EBCDIC alphanumeric character set.

The following observation should be noted while using the ASCII option:

- There are 3 character differences between the ASCII and EBCDIC character sets. These are:

  ASCII Symbol   ^   [   ]
  EBCDIC Symbol   ¬   ¢ |

Although these characters are displayed differently from host system to PC system, their character codes remain the same.

Refer to the following pages for the translation tables.

ASCII to EBCDIC Translate Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	01	02	03	37	2D	2E	2F	16	05	25	0B	0C	0D	0E	0F
1	10	11	12	13	3C	3D	32	26	18	19	3F	27	1C	1D	1E	1F
2	40	5A	7F	7B	5B	6C	50	7D	4D	5D	5C	4E	6B	60	4B	61
3	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	7A	5E	4C	7E	6E	6F
4	7C	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6
5	D7	D8	D9	E2	E3	E4	E5	E6	E7	E8	E9	4A	E0	4F	5F	6D
6	79	81	82	83	84	85	86	87	88	89	91	92	93	94	95	96
7	97	98	99	A2	A3	A4	A5	A6	A7	A8	A9	C0	6A	D0	A1	07
8	20	21	22	23	24	15	06	17	28	29	2A	2B	2C	09	0A	1B
9	30	31	1A	33	34	35	36	08	38	39	3A	3B	04	14	3E	E1
A	41	42	43	44	45	46	47	48	49	51	52	53	54	55	56	57
B	58	59	62	63	64	65	66	67	68	69	70	71	72	73	74	75
C	76	77	78	80	8A	8B	8C	8D	8E	8F	90	9A	9B	9C	9D	9E
D	9F	A0	AA	AB	AC	AD	AE	AF	B0	B1	B2	B3	B4	B5	B6	B7
E	B8	B9	BA	BB	BC	BD	BE	BF	CA	CB	CC	CD	CE	CF	DA	DB
F	DC	DD	DE	DF	EA	EB	EC	ED	EE	EF	FA	FB	FC	FD	FE	FF

EBCDIC to ASCII Translate Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	01	02	03	9C	09	86	7F	97	8D	8E	0B	0C	0D	0E	0F
1	10	11	12	13	9D	85	08	87	18	19	92	8F	1C	1D	1E	1F
2	80	81	82	83	84	0A	17	1B	88	89	8A	8B	8C	05	06	07
3	90	91	16	93	94	95	96	04	98	99	9A	9B	14	15	9E	1A
4	20	A0	A1	A2	A3	A4	A5	A6	A7	A8	5B	2E	3C	28	2B	5D
5	26	A9	AA	AB	AC	AD	AE	AF	B0	B1	21	24	2A	29	3B	5E
6	2D	2F	B2	B3	B4	B5	B6	B7	B8	B9	7C	2C	25	5F	3E	3F
7	BA	BB	BC	BD	BE	BF	C0	C1	C2	60	3A	23	40	27	3D	22
8	C3	61	62	63	64	65	66	67	68	69	C4	C5	C6	C7	C8	C9
9	CA	6A	6B	6C	6D	6E	6F	70	71	72	CB	CC	CD	CE	CF	D0
A	D1	7E	73	74	75	76	77	78	79	7A	D2	D3	D4	D5	D6	D7
B	D8	D9	DA	DB	DC	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7
C	7B	41	42	43	44	45	46	47	48	49	E8	E9	EA	EB	EC	ED
D	7D	4A	4B	4C	4D	4E	4F	50	51	52	EE	EF	F0	F1	F2	F3
E	5C	9F	53	54	55	56	57	58	59	5A	F4	F5	F6	F7	F8	F9
F	30	31	32	33	34	35	36	37	38	39	FA	FB	FC	FD	FE	FF

Notes:

Error Messages

Install Error Messages

The following error messages are provided to assist the user with installing the FORVUS Emulator on the system unit.

No Drive Letter Specified in Destination Path

This message is displayed when FORVUS Emulator could not find a Drive letter in the destination path that was specified. Make sure the drive is specified in the destination path.

No Drive Letter Specified in Source Path

This message is displayed when FORVUS Emulator could not find a Drive letter in the source path that was specified. Make sure the drive is specified in the source path.

Source and Destination paths cannot be the same

This message is displayed when FORVUS Emulator detected that both the source and destination installation paths are the same. Change the paths before continuing.

Make Directory Error

This message is displayed when FORVUS Emulator could not successfully create the directory specified. Check to make sure the drive specified contains enough space for a new directory.

Error Copying Files

While copying the FORVUS Emulator program files, an error was reported. There may not be enough room on the destination disk or a verify error may have occurred while writing the files.

Error Modifying AUTOEXEC.BAT file

This message is displayed when FORVUS Emulator could not successfully modify the file AUTOEXEC.BAT. Check to make sure the drive specified contains enough space for a new file.

Error reading FILELIST file

This message is displayed when FORVUS Emulator could not successfully read the file FILELIST. This file is used to verify the contents of the files to be installed on the system unit.

No Keyboard Files Found

This message is displayed when FORVUS Emulator could not locate the .KBF files. Verify the disk contains the keyboard translate files on the disk and path specified.

No Language Files Found

This message is displayed when FORVUS Emulator could not locate the .MSG files. Verify that the disk contains the language message files on the source disk and path specified.

Insufficient Disk Space to install FORVUS Emulator

This message is displayed when the install program detected that the destination drive does not contain enough space to place the FORVUS Emulator program files. Verify that the destination drive contains enough free space to install the program files.

Insufficient Disk Space in "Windows" directory

This message is displayed when the install program detected that the drive that contains the Windows directory does not contain enough space to place required FORVUS Emulator program files. Verify that the Windows drive contains enough free space to install the program files.

Invalid Characters in Directory Path

This message is displayed when the FORVUS Emulator installation program detected invalid characters in a directory path. Re-check the path and continue.

Error reading PROGMAN.INI

While attempting to read the Windows Program Manager setup file, an error was detected. Retry the previous operation again.

Not Enough DOS memory to run install

This message is displayed when the install program detected insufficient DOS memory to execute. This may be due to too many active programs running under Windows. Terminate any unneeded programs and retry the operation.

Startup Error Messages

The device driver is not loaded.

This message is displayed when FORVUS Emulator has detected that the device driver is not executing. Check the AUTOEXEC.BAT file and make sure the "DEVICE=COMMDVR.EXE" statement is included.

The device driver is downlevel. Make sure you have re-booted since installing the Emulator.

This message is displayed when FORVUS Emulator has detected that the device driver that is currently executing is downlevel. Re-boot the system to load and execute the new driver.

The Host Addressable Print setup for the new session is different from the setup that is currently loaded and running. Do you want to replace the existing HAP setup?

You have attempted to load a session that has different HAP parameters from the setup that is currently running.

The setup parameters for the new session conflict with parameters that are currently loaded and running. If you select 'YES' all active sessions will be reset. Do you want to load the new setup?

You have attempted to load session parameters that are different from the parameters that are currently running. The new parameters require you to reset all sessions currently active in order to use the new setup.

Information Messages

Changes have been made which require the Communications Driver to be reloaded. These changes may not take effect until you exit Windows and reboot.

You have made changes which require the Communications Driver to be reloaded. Since the Communications Driver is loaded from the AUTO-EXEC.BAT file, your system must be re-booted for the new changes to take effect.

Communication Reminders

Communication reminders are messages that are displayed on the operator status row to inform the operator of the status of the communication link. Listed below are explanations for common messages found on the emulator's operator status row.

This list is not all inclusive. For other communication reminders not listed, refer to the *IBM 3270 Information Display System: Reference Summary*.

⎯⎯ᘛᑎᘚ⎯ **501**　Data Set Ready has dropped from the modem.

⎯⎯ᘛᑎᘚ⎯ **504**　There is no line connection with the host.

⎯⎯ᘛᑎᘚ⎯ **505**　Initial state at startup, awaiting response from the host.

⎯⎯ᘛᑎᘚ⎯ **505-05**　(SAA)　No Communication Servers Found
No SAA servers responded to a Nearest Server Query broadcast or could not connect to the nearest server.

⎯⎯ᘛᑎᘚ⎯ **505-08**　(SAA)　Could not find the specified SAA server.
The specified SAA server could not be found. Make sure that you have specified a valid "COMM SERVER" name.

⎯⎯ᘛᑎᘚ⎯ **505-12**　(SAA)　Error connecting to the specified SAA server. An error occurred while trying to connect to the specified SAA server.

⎯⎯ᘛᑎᘚ⎯ **505-15**　(SAA)　Error attaching to the specified SAA server. An error occurred while performing an attach. The common cause for this error is an incorrect "USER ID" or "PASSWORD".

—⌁⌐— **505-18** (SAA) Could not find the service mapping agent. The service mapping agent on the comm server could not be found.

—⌁⌐— **505-22** (SAA) Could not find the specified service (LU) The specified "LU" name or "LU POOL" could not be found or was not available from from the specified "SERVICE PROFILE". Make sure you have specified a valid "LU" or "LU POOL" name and they are available under the specified "SERVICE PROFILE". If the "LU" name is correct, the specified LU is in use.

—⌁⌐— **505-25** (SAA) Error opening route to the specified service (LU). Refer to comm reminder 505-22.

—⌁⌐— **505-28** (SAA) Error opening route to the specified service (LU). Refer to comm reminder 505-22

—⌁⌐— **505-30** (SAA) Connected to SAA Server- No Host Communications. The emulator is connected to the specified SAA server and service. The specified SAA server is not connected to the Host or the specified LU is not active.

—⌁⌐— **505-32** (SAA) Connection to the SAA Server has been interrupted. The connection to the SAA Server was active but has since been interrupted.

—⌁⌐— **510** The PU is not active.

—⌁⌐— **519** A message was received that was larger than the RU size.

—⌁⌐— **532** Approximately 20 seconds have elapsed without communication from the host.

—⌁⌐— **588** (802.2) Could not initalize Token Ring adapter.

—⌁⌐— **589-01** (802.2) Token Ring does not contain enough SAP's.

—⌁⌐— **589-02** (802.2) Token Ring does not contain enough stations.

589-03   (802.2) Emulator could not open a Token Ring SAP.

590   (802.2) Emulator could not open the Token Ring adapter.

Communications Driver

If you elected not to have the installation program install the communications driver and are not running the Emulator's communication driver as a DLL that will automatically be executed when loading the Emulator, then you must install the driver to interface with your hardware adapter. The communications driver should be installed in the AUTOEXEC.BAT file or equivalent file before Windows is loaded.

☞   It is important that the FORVUS Emulator communications driver is installed **after** the network driver (IPX/SPX, LLC. or TCP/IP Stack) is installed

Add to your AUTOEXEC.BAT file the following command statement: f:\subdirectory\COMMDVR.EXE

Where f:\subdirectory\ is replaced with the drive and subdirectory where FORVUS Emulator is installed.

Removing the Communications Driver

To remove the communications driver from memory, follow the steps below:

- Switch to the drive and subdirectory where the emulator is installed. (Usually C:\FORVUS)
- Type COMMDVR /X and press the **Enter** key.
- You will be notified of the removal of the communications driver.

☞   The driver cannot be removed without first removing other resident programs that may have been loaded after the communications driver was loaded.

Reducing DOS memory requirements

The communications driver is able to load into the Upper Memory Area maintained by DOS. This reduces the amount of required DOS conventional memory (space below 640K). This feature is available with DOS Version 5 or greater.

When using DOS Version 6, it is recommended that the user run the DOS MemMaker program after installing the emulator. MemMaker will find the best memory location for loading the communications driver in high memory.

If you do not have enough Upper Memory available to load the entire driver, the communications driver will load smaller data areas into your Upper Memory to maximize the use of your system unit's memory.

Manual installation

To install the driver in Upper Memory, follow the steps below:

- Switch to the drive and subdirectory where the emulator is installed. (Usually C:\FORVUS)
- Type COMMDVR /U and press the **Enter** key.
- You will be notified of the installation of the communications driver.

Automatic installation

To install the driver in Upper Memory using the AUTOEXEC.BAT method, follow the steps below:

- Switch to the drive and subdirectory where the AUTOEXEC.BAT file is located.
- Using an ASCII text editor, open the AUTOEXEC.BAT file.
- Modify the line that contains f:\path\COMMDVR and add the /U command.
- Close the AUTOEXEC.BAT file and reboot your system.
- The communications driver will now be installed in the Upper Memory area.

Keyboard Layouts

This appendix describes US keyboard layouts supported by the emulation program. These keyboards layouts may be referred to during installation or customization procedures. Refer to page 14, "Configuring the Keyboard" to modify these layouts for your personal preference.

US1.KBF   83/84 key - IBM Layout
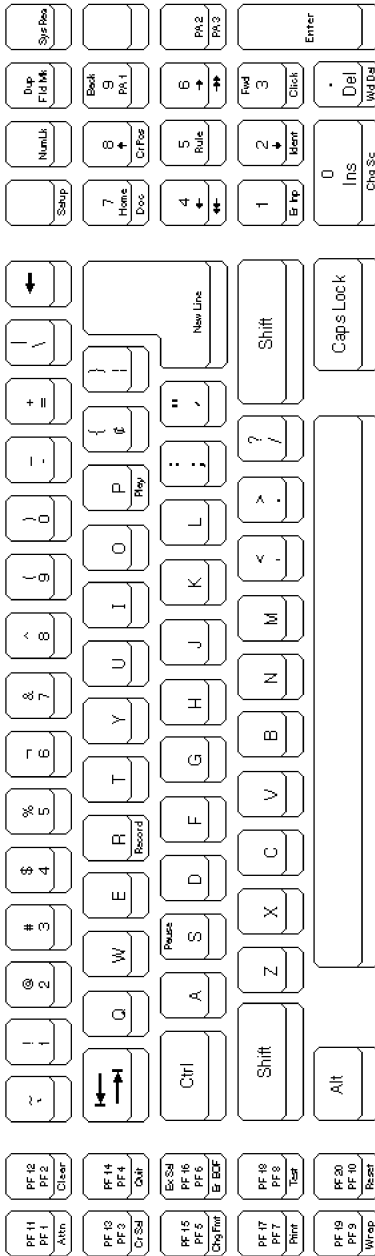
US1.KBF   101 key - IBM Layout
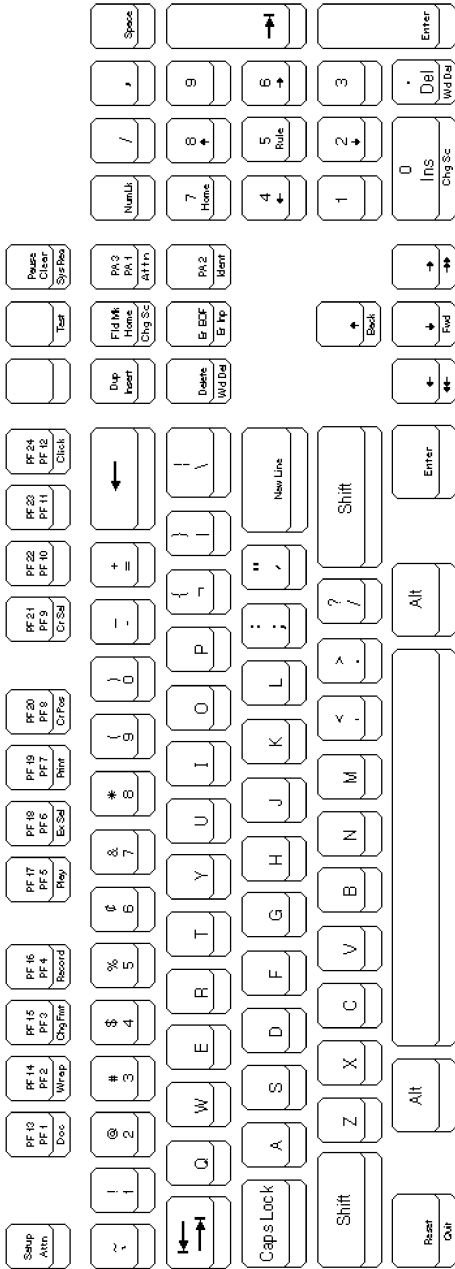
US2.KBF   83/84 key - Attachmate Layout
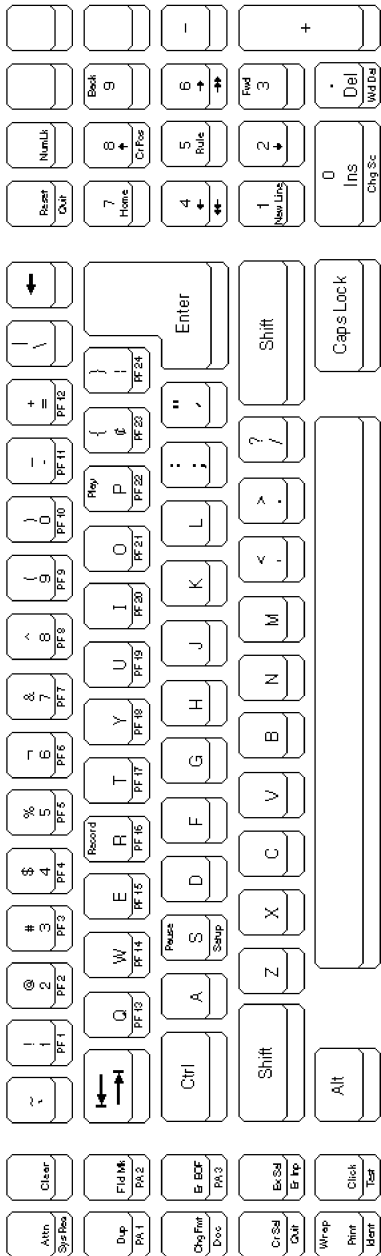
US2.KBF   101 key - Attachmate Layout
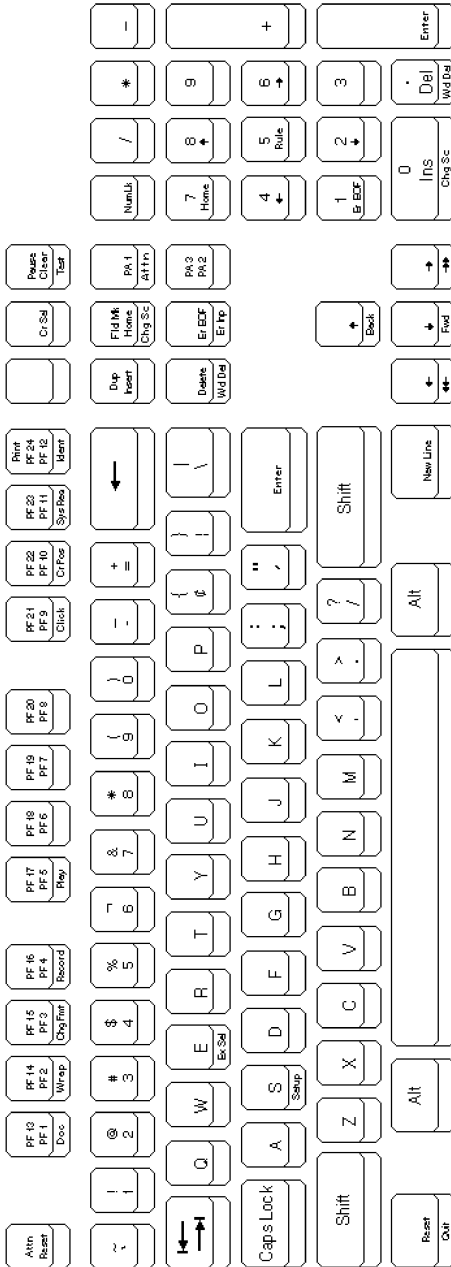
US3.KBF   83/84 key - IRMA E78 Layout
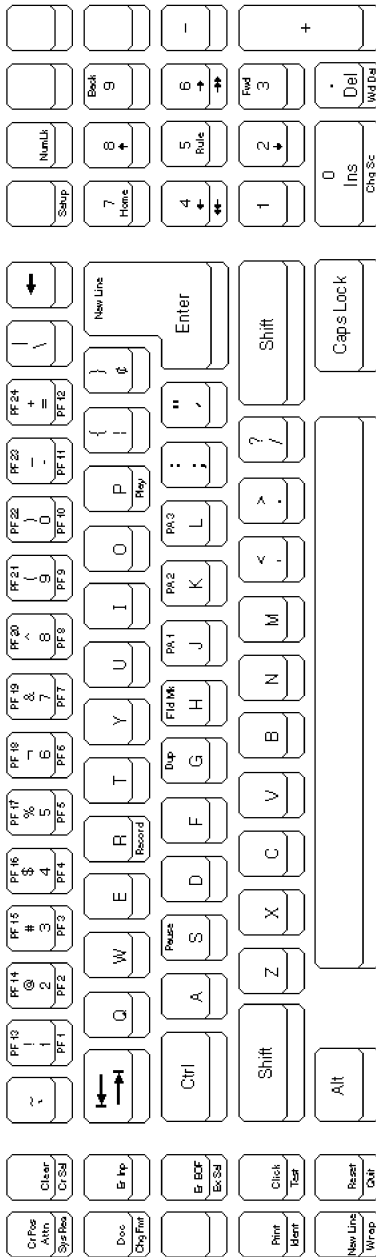
US3.KBF   101 key - IRMA E78 Layout
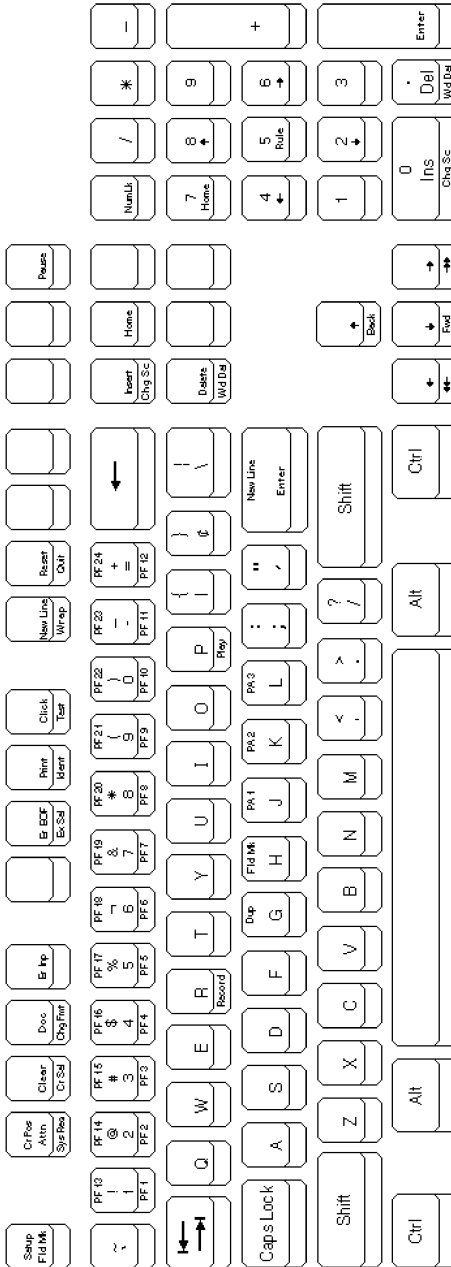
Notes:

CHKLNK

CHKLNK is a problem isolation program that can be used with the FORVUS Emulator to test the LANSYS connection.

The FORVUS Emulator may fail to establish or may lose the link with the Memorex Telex 1174 controller. If the line activity indicator does not function, or if the system status symbol is not displayed on the status line shortly after you enter the DOS command to execute the program, it is likely that a problem exists in the LAN, the PC LAN interface, or in the controller. To isolate the problem, run the CHKLNK program that is supplied on the FORVUS Emulator diskette. CHKLNK tests the resident LAN SUPPORT PROGRAM and uses it to find and test the path to the 1174 controller.

To run CHKLNK, type CHKLNK at the DOS prompt.

If CHKLNK is successful in communication the following is displayed:

> **PC=xxxxxxxxxxx   (the PC's node address on the LAN)**
> **1174=xxxxxxxxxxx   (the 1174's node address on the LAN)**
> **CHKLNK OK!**

The FORVUS Emulator requires the IBM LAN SUPPORT PROGRAM (LSP) or its equivalent to be resident. This is installed through DEVICE= commands in the CONFIG.SYS file. It provides an IEEE 802.2 LLC interface for the FORVUS Emulator. Commands to control communications through the LAN are given to this resident program, and the results are returned to the emulator through a hexadecimal return code. These codes are defined in the IBM PC LAN Technical Reference. If CHKLNK is not successful, a message describing the failure is displayed. Possible error messages from CHKLNK are:

NO LAN SUPPORT PROGRAM
The IBM LAN SUPPORT PROGRAM or its equivalent is not installed. This must be installed through DEVICE= command in CONFIG.SYS.

NO SAP AVAILABLE
There was no Service Access Point (SAP) available for the FORVUS Emulator to use. The number of SAP's must be increased, or NETBIOS must be instructed to reserve an extra SAP. This is done with parameters on the LSP command lines in CONFIG.SYS. See the documentation provided with the

LAN SUPPORT PROGRAM or your network adapter.

NO STATION AVAILABLE.
There was no station available for the FORVUS Emulator to use. The number of stations must be increased, or NETBIOS must be instructed to reserve an extra station. This is done with parameters on the LSP command lines in CONFIG.SYS. See the documentation provided with the LAN SUPPORT PROGRAM or your network adapter.

OPEN ADAPTER FAILED. LSP RETURN CODE=xxxx.
The LAN adapter was not open, and the LSP command to open it failed. This is usually cased by a hardware problem or a conflicting node address on the LAN. All nodes on the LAN must have a unique address. If a node tries to enter the LAN with an address already in use, it automatically removes itself. The following is a list of some hardware problems:

- No adapter cable attached to the PC.
- Device drivers for the LAN adapter not installed.
- Hardware interrupt conflicts within the PC.
- Hardware addressing conflicts within the PC.

OPEN SAP FAILED. LSP RETURN CODE=xxxx.
The usual reasons for OPEN SAP to fail are if there are no SAP's available or if SAP 98 is already in use. (xxxx-0043)

RECEIVE COMMAND TO THE SAP FAILED. LSP RETURN CODE-xxxx.
This should never fail. Make a note of the return code, and contact your support personnel.

NO 1174 RESPONDED TO THIS STATION.
Either there is no 1174 that can be reached through the LAN, or there is an 1174 on the LAN supporting LAN terminals, but it is not configured to accept communications from this node. Compare the node address (displayed by CHKLNK) with the addresses configured in the 1174 for LAN TERMINALS.

INCOMPATIBLE REVISIONS LEVELS.
The microcode in the 1174 is not compatible with this level of the FORVUS Emulator.

TRANSMIT XID FRAME FAILED. LSP RETURN CODE=xxxx.
This should never fail. Make a note of the return code, and contact your support personnel.

HLLAPI

Introduction

High-Level Language Application Program Interface (HLLAPI) works with the FORVUS Emulator and provides a programmatic interface between a host computer and a PC application program. The emulator establishes communications between your PC and the host and allows your PC to appear to both you and the host to be a 3270 display station. HLLAPI then provides the interface between the emulator and the application.

The application communicates with HLLAPI, making the application independent of the PC hardware and communications protocol used. This also frees the programmer from the need to understand the operational details of the hardware and protocol. The application access via function calls to routines and information is passed through the function call parameters.

IBM HLLAPI Compatibility

The FORVUS EHLLAPI is compatible with IBM's High Level Language Application Program Interface (EHLLAPI Version 2.0 Windows). Applications written for standard IBM EHLLAPI Version 2.0 for Windows (not modified be the user to support extended functions) should run under EHLLAPI with no modifications or relink required.

The HLLAPI filename is PCSHLL.DLL

EHLLAPI used the following conventions to provide extended functionality and programming flexibility while maintaining HLLAPI compatibility:

- EHLLAPI supports all HLLAPI functions except the following:
  - Keystroke intercept functions 50-53
  - Set cursor position function 40 in CUT mode.
- EHLLAPI supports all HLLAPI options and features for each function. All parameters have the same meaning as in HLLAPI.
- EHLLAPI supports all HLLAPI return codes except those which apply specifically to the IBM 3270PC.
- EHLLAPI supports all 3270 keys supported by HLLAPI except those which are specific to the IBM 3270 PC keyboard (COPY,FINISH, HELP, JUMP, MAGNIFY). EHLLAPI also supports additional 3270 keys.

Applications using 3270 PC specific keystrokes may have some limitations because of the hardware limitations listed above.

Running EHLLAPI

EHLLAPI is available whenever a Windows emulator session is running. The emulator session can be minimized to an icon, and EHLLAPI will still be available.

Index