EXTRA!
for
WINDOWS

™

REFERENCE MANUAL

Attachmate

Extra!
for
Windows

Reference Manual

Release 3.2

For help with this product, contact Attachmate's Technical Support Department at 1-800-388-3270.

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Introduction

In many businesses, communicating with an IBM main-frame is a frequent and necessary task. One increasingly common communication method is to use a PC or PS/2 to emulate a 3270 terminal. By using hardware adapters and software programs, a variety of methods have been developed that emulate a 3270 terminal and also take advantage of the power of the PC. When comparing all these methods, the two most important factors to be aware of in 3270 micro-to-mainframe connectivity are compatibility and flexibility: compatibility to ensure future growth; flexibility to adapt to system needs.

That's why Attachmate developed *EXTRA! for Windows*, a PC-mainframe connectivity product that operates with Microsoft Windows. *EXTRA!* offers an exceptionally high degree of IBM compatibility, so you're guaranteed to be compatible with IBM's latest technologies, and as a Microsoft Windows application it functions with all other Windows applications. By running in the Windows environment, *EXTRA!* offers an easy-to-learn, easy-to-use interface between the PC workstation and the IBM mainframe.

Before you begin installing and setting up *EXTRA!*, take a few minutes to read the following pages and become familiar with *EXTRA!'s* features and the sections of this manual.

EXTRA! for Windows Features

With *EXTRA!*, you can run up to 26 mainframe sessions simultaneously—while running Windows applications. And, if you have more than one communications adapter in your PC, you can operate sessions that use different adapters all at the same time.

EXTRA! can be personalized to suit your computing environment and has the flexibility to connect to a mainframe through coax cable and over local area networks. *EXTRA!* also supports IBM's high-speed Token-Ring Interface Coupler (TIC) and both Attachmate and IBM gateways.

Besides basic 3270 connectivity, *EXTRA!* offers additional features, which are described below.

Multiple Sessions

EXTRA! can run up to 26 sessions at one time, depending on the communications adapter and the PC memory available. Multiple sessions allow you to continue working while the mainframe processes data or transfers files; you can work on another mainframe session or a PC application instead of waiting for the job to finish.

File Transfer

EXTRA! supports IBM-standard Send/Receive (IND$FILE) file transfer, a high-speed method of transferring both text and binary files. With *EXTRA!*, you can work in other windows while you transfer files.

| Windows | EXTRA! works with Microsoft Windows, allowing you to integrate EXTRA! with other Windows applications. You can operate EXTRA! using either a keyboard or a mouse. You can even copy data between mainframe sessions and PC applications using the Windows Clipboard. |

| Multiple Adapters | EXTRA! can run with more than one adapter at a time. If you have different adapters, you could set up some sessions to run over coax to a controller, some to run over a LAN and through a gateway, and the rest to run with a direct token-ring connection. EXTRA! helps you make the most of your mainframe resources. |

A Quick History of EXTRA!

In 1984, while 3270 terminal emulation was still in its relative infancy, Attachmate introduced the first 3270-PC emulation program. This program, when coupled with a coax adapter, allowed a standard PC to perform all the functions of IBM's higher priced 3270-PC. It provided mainframe access through terminal emulation and offered advanced features such as multiple mainframe sessions, windowing, and file transfer. In short, it offered an inexpensive alternative to IBM, without sacrificing IBM compatibility.

Today, 3270 connectivity is a flourishing industry, and Attachmate's 3270 PC-Emulation Program has evolved into EXTRA!, the leading high-performance 3270 PC-mainframe software for the DOS environment, and EXTRA! for Windows, a new 3270 PC-mainframe product for the Microsoft Windows environment. Flexible and easy to use, EXTRA! sets a new standard for 3270-PC emulation and connectivity.

About this Manual

The *Reference Manual* is designed to provide step-by-step instructions for installing and setting up *EXTRA!* and to act as a reference on *EXTRA!*, connectivity, and system and error messages.

This manual is written for trained technical personnel with a solid background in both hardware and software and a good understanding of PC-to-mainframe connectivity.

If you want a review of 3270 connectivity, refer to Chapter 1, "An Overview of 3270 Connectivity."

If you are responsible for installing and configuring *EXTRA!*, read Chapters 2, 3, and 4 of this manual.

What You Should Know

Before using *EXTRA!*, you should know how to use Windows and how to select icons, menus, commands, and options using the keyboard or mouse. This manual is not designed to teach you how to use Microsoft Windows. For more detailed information on making selections in the Windows environment, refer to the Microsoft Windows User's Guide.

In this manual, *EXTRA! for Windows* and *EXTRA!* are used interchangeably. PC and PC workstation refer to both PCs and PS/2s.

What's Included

The following list describes each chapter and appendix in this manual.

● Chapter 1, "An Overview of 3270 Connectivity," explains the general concepts of PC-to-mainframe communications. If you are unfamiliar with 3270 communications, we recommend you read this chapter before you configure *EXTRA!*

● Chapter 2, "Installing EXTRA! for Windows," leads you through the steps for installing *EXTRA!* on your PC.

● Chapter 3, "Setting Up EXTRA! for Windows," leads you through configuring *EXTRA!* for your PC and mainframe specifications.

● Chapter 4, "Designing Screen Layouts," shows you how to create a screen layout (a group of session windows on the PC screen).

● Chapter 5, "Understanding Mainframe Messages," explains the mainframe status messages that appear in the Operator Information Area (OIA).

● Chapter 6, "Troubleshooting," is a quick reference for problems, error messages, and *EXTRA!'s* Message Services and log file.

● Appendix A, "For More Information," tells about the README! file and offers sources of information about *EXTRA!* and connectivity.

● Appendix B, "Tracing and Other Utilities," explains the API Trace Services and how it can be used to help diagnose problems in running *EXTRA!* This appendix also tells about the interface utilities that come with *EXTRA!*

- Appendix C, "3270 Function Keys," describes the 3270 function keys and what they do.

- Appendix D, "Keyboard Maps and Tables," provides keyboard templates that show how the 3270 keys are mapped to PC keyboards.

- Appendix E, "Token-Ring Networks," offers technical information about direct token-ring connections and how to install token-ring workstations.

- Appendix F, "Display Information," contains information about the terminal models and the 3270 display buffer code set that *EXTRA!* supports.

- Appendix G, "A Tour of EXTRA!," leads you through illustrations of each *EXTRA!* menu and dialog box, providing definitions as you go.

- "Glossary" contains definitions of the technical terms used in this manual and the *User's Manual*.

Instructional and Keyboard Conventions

Throughout the *EXTRA! for Windows* documentation, the following conventions are followed:

Menu commands and dialog box options appear in quotes: for example, select "Open."

User input is presented in *italicized* type, as shown in the example below.

copy a:.** b:* [Enter]

Important information can be found next to the note icon that appears in the outside margin, as shown here.

All function and letter keys are presented in [square brackets]. For example, if you are to hold down the Alt key and the letter A key to perform a function, you will be instructed to "Press [Alt]/[A]."

You need to know how to select menu options using either a mouse or a keyboard, whichever your system has. Below is a quick reminder of how to select menus, commands, and options.

Using a Keyboard

1   To select a menu, press [Alt] and the letter that is underlined in the menu name. For example, to select the Configuration menu, press [Alt]/[C].

If you are using an 84-key keyboard with Attachmate mapping (explained later in this manual), some of the top row of letters on the keyboard used with the [Alt] key are unavailable as menu keys because they are used as 3270 function keys.

2   To select a menu command, press the letter underlined in the command.

Another way to use the keyboard to select menu options is to press the [Alt] key to select the menu bar and then use the direction keys to select menus and commands.

3   To select an option within a dialog box, press [Tab] until the cursor is on the option you want to change; the option will be highlighted or will have a dotted box around it. Press the spacebar to select a check box or option button; press the direction keys to change a scroll bar; type a change in a text box.

4   When you finish selecting options, press [Enter] to carry out the selections, or [Esc] to cancel the selections.

Using a Mouse

1   To select a menu, command, dialog box option,
     text box, or button, point the mouse at it and click.

2   To change a scroll bar, click on the scroll box and drag
     it, or click in the gray area of the bar or on the scroll bar
     arrows.

3   When you finish selecting options, click on "OK" to
     carry out the selections, or "Cancel" to cancel the selec-
     tions.

1 What's New

This chapter describes all the new features you will find in this latest release of *EXTRA! for Windows*. Included in this chapter is the following information:

- Using, recording, and playing macros

- Creating and editing macros with the Macro Editor

- Using the Printer Emulator's new Preferences menu

- Using High Level API (HLLAPI) and Extended HLLAPI (EHLLAPI)

- Explaining Dynamic Data Exchange (DDE)

- Translating files using the ANSI character set

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Using Macros

When working on the mainframe, you probably carry out tasks that never vary from one time to another. You always give the same commands and press the same keystrokes every time you perform that task. Logging on to the mainframe, for example, is such a task. But with *EXTRA!* you can automate such tasks by entering those keystrokes and commands into a macro. Then whenever you want to perform that task, you can simply run its macro.

Macros make your work on the mainframe faster and easier because they run quickly and flawlessly every time. Macros are not new to *EXTRA!*, but this version has expanded *EXTRA!*'s macro capacity. And there are two ways that you can create a macro: by recording it as you actually perform the task, or by creating it using the Macro Editor. Throughout the rest of this section, you will find information on how to record macros, as well as how to use the Macro Editor to create new macros and edit existing ones. You'll also learn about the different ways that you can run a macro, such as assigning a keystroke to a macro, listing a macro in the Macro menu, and running a macro from a SmartPad.

Recording Macros

Recording a macro takes place while you are interacting with the mainframe. Since the macro records the actual task that you want the macro to duplicate, you have the assurance that if you carry out your task successfully, the macro too will carry out the task successfully when you run it in the future.

1-3

To start recording a macro, follow these steps:

1   Start an *EXTRA!* terminal session.

2   From the Macro menu of your terminal session, select
     "Record...". The Record Macro dialog box appears on
     your screen.

3   In the Macro Name text box, enter the name you want
     to give the macro. If you wish, in the Description text
     box briefly describe what the macro does.

4   Click on "Start Recording". *EXTRA!* immediately starts
     recording all keystrokes you make in the mainframe
     session. The title bar on the window indicates that
     EXTRA! is recording a macro.

5   Type the keystrokes and commands you wish to record.

     HotSpots and SmartPads cannot be used while you are
     recording a macro; you'll need to enter all keystrokes
     using your keyboard. If you give a command that
     requires the mainframe to do some processing, it's
     advisable after such a command to insert a "Wait"
     function into the macro. This way when you do
     actually execute the macro, the macro will wait for the
     mainframe to catch up before giving the next command
     in the macro. You can insert "Wait" functions into the
     macro now using the "Insert" command in the Macro
     menu. Or you can insert a "Wait" later using the Macro
     Editor. For more information on inserting a "Wait"
     function as well as inserting other functions, turn to
     page 1-13.

6 If you need to, pause the recording of the macro. For more information on pausing a recording, refer to the next section, Pausing a Recording.

7 When you have finished recording the macro, select "End Recording" from the Macro menu.

Pausing a Recording

While recording a macro, you can interrupt the recording at any time to do something else. For example, while recording suppose you want to type the name of a file but can't remember the name. Instead of discarding the macro, you can pause it, confirm the name, then continue the macro.

To pause a recording, follow these steps:

1 Select "Pause Recording" from the Macro menu.

2 When you are ready to continue recording, select "Continue Recording" from the Macro menu.

Inserting Functions as You Record

When you are recording a macro, *EXTRA!* has to have some way of taking every step you make and expressing it as an instruction that the macro can understand and execute. In a way, everything you do needs to be expressed in an intelligible "macro language." *EXTRA!* accomplishes this by expressing every step you take as an instruction called a function.

For example, while recording a macro, when you type the word *profs* and then press the [Enter] key, *EXTRA!* expresses that step with the SendKeys function. It would look like this: SendKeys("profs{enter}"). Three of *EXTRA!*'s five functions can be inserted into a macro as you are recording it. Those three functions are: Position Cursor, Prompt User,

and Wait. These functions are explained in detail beginning on page 1-13.

Giving you the ability to insert functions into your macro while you are actually recording is designed to simplify the process of perfecting a macro. You will find that most of the macros you create will need to be modified and polished to one degree or another so that they operate smoothly and correctly every time. You can see then that adding some of those necessary modifications as you are actually recording the macro will reduce editing time later. The more familiar you become with *EXTRA!*'s macro capabilities, the more knowledgeable you will become about when and what functions should be inserted during a recording.

The following procedure is designed to give you an overview of what's involved in inserting a function into a macro that's being recorded. It does not go into the details of how to insert specific functions. Such details, which are virtually identical to inserting a function using the Macro Editor, can be found starting on page 1-13.

To insert a function during a recording, follow these steps:

1   Start recording a macro as explained starting on page 1-3.

2   When you come to the point in the macro when you want to insert a function into a macro, select "Insert" from the Macro menu.

3   Select which function you want to insert into your macro. The function's dialog box will appear on your screen.

4 Fill out the dialog box with the options you desire. Specific instructions for this part of the procedure can be found starting on page 1-13.

5 Once the dialog box is filled out, click "Insert." The function has been added to your macro. You are now ready to continue recording your macro, typing keystrokes, commands, and inserting other functions.

Playing Back a Macro

Once you have recorded a macro and made any necessary edits, you can play it back. There are a number of ways that you can set up *EXTRA!* to play back your macros, depending on what's most convenient for you.

- Assigning a Keystroke to a Macro
- Listing a Macro in the Macro Menu
- Listing a Macro in a SmartPad
- Playing Back a Macro Automatically as the Session Opens

You can also run a macro by selecting "Run... from the Macro menu. The following procedures explain how to set up *EXTRA!* to run your macros in these different ways.

Assigning a Keystroke to a Macro

You can assign a keystroke to a macro. Having done so, you can run the macro just by pressing its keystroke.

To assign a keystroke to a macro, follow these steps:

1 Select "Assign to Key..." from the Macro menu. The Assign to Key dialog box will appear on your screen.

2   In the Macro list box, click on the macro that you want to assign a keystroke to.

3   In the box following [Shift]/[Ctrl], enter the keystroke that you want to associate with the macro. This means that when you press [Shift]/[Ctrl]/[the key you select], the macro will execute.

4   Click OK.

Listing a Macro in a Menu

To list a macro in the Macro menu, follow these steps.

1   Select "Assign to Menu..." from the Macro menu. The Assign to Menu dialog box will appear on your screen.

2   In the Macro list box, click on the macro that you want to place in the Macro menu.

3   Click on Assign. The name of the macro will be added to the list of any other macros that have been placed in the Macro menu.

4   Click OK. When you pull down the Macro menu, you will see the macro you assigned listed in the menu.

Listing a Macro in a SmartPad

To add a macro to a SmartPad, follow the instructions below.

1   If the SmartPad is not showing on the screen, select "Show SmartPad" from the Preferences menu.

2   Select "Allow Edits" from the SmartPad's control menu. A stack of blank keys will appear in the lower right corner of the SmartPad.

3   Drag a key from the stack of blank keys to the place on the SmartPad where you want the new key to go. When you release the mouse button the "Create SmartPad Key" dialog box appears, allowing you to choose what macro you want to assign to the new key.

4   Select the macro you want displayed in the SmartPad.

5   Select "OK." The macro's name will now appear on the new key in the SmartPad.

6   If you want to save your changes to the SmartPad, select "Save SmartPad As..." from the control menu of the SmartPad. You can either keep the same SmartPad name, or give the SmartPad a new name.

7   Select "OK."

Playing Back a Macro at Startup

With this command, you can have a macro execute automatically when you open a session, saving you that one step of having to select the macro after the session opens.

For example, let's say you have already recorded or written a macro that will log you on to the mainframe, saving you the trouble of doing so manually. Set Auto Start Macro... takes that convenience one step farther. You can set that logon macro to run automatically whenever you select to open that particular session.

And if that session with the automated logon happens to be in the default screen layout (layout 0), its possible to go from the DOS prompt to being logged on to the mainframe and ready to work just by typing at the DOS prompt *win extra!* and pressing [Enter].

To have a macro playback automatically when a session is opened, follow these steps.

1   Open the session that you want the macro to run in.

2   Select "Set Auto Start Macro..." from the Macro menu. The Assign Automatic Macro dialog box will appear on your screen.

3   Select from the list box the macro that you would like to have run when the session starts up. Its name will appear in the Macro Name text box.

4   Click OK.

The next time you open that session, the macro will automatically execute.

Executing a Macro

To play back a macro follow the instructions below.

1   Start the macro by using one of these approaches.
    • Selecting "Run..." from the Macro menu
    • Selecting the macro from the Macro menu
    • Using a SmartPad
    • Using the macro's Shortcut key

2   As the macro is running, answer any prompt that appears on your screen. If the prompt box gets in your way, simply move it to one side by dragging the title bar of the prompt. To resume playing the macro, select "Resume" in the Macro Prompt box.

3   To stop a macro that is running, select "Cancel Playback" from the Macro menu.

The Macro Editor

Recording is one way to create macros. The other way is to use the Macro Editor. This easy-to-use editor makes it simple for you to create new macros and edit existing ones.

Macros are composed of instructions that tell the macro exactly what you want it to do. Every step you want to take on the mainframe is expressed in the macro as a line of instruction. The different instructions are called functions.

For example, if you want the macro to launch you into PROFS, an IBM mainframe program, you would want the macro to type the word *profs* and then press the [Enter] key. *EXTRA!* expresses that step to the macro using the SendKeys function. It would look like this: SendKeys("profs{enter}").

For this release, the Macro Editor has a repertoire of five functions: Position Cursor, Prompt User, Send Keys, Run an Application, and Wait. Each of these functions is explained in detail later in this section.

To help you learn the Macro Editor's macro language, the Macro Editor will practically write for you every function line in your macros. All you need to do is select the appropriate macro for what you want to do, respond to the dialog boxes, and then when the macro is written check the macro's syntax to make sure that it is "grammatically" correct. Eventually, you will become very familiar with the Macro Editor's functions and their specific syntax. You will then probably find it faster to create macros in the Macro Editor by typing out the function lines yourself. But of course, if you want you can always get the Macro Editor to do your work for you.

Starting the Macro Editor

To create a new macro or edit an existing one, you first need to start the Macro Editor.

There are a couple of ways you can start the Macro Editor. You can start it from Windows' Program Manager, or from an open *EXTRA!* Terminal Session.

To start the Macro Editor from Windows' Program Manager, follow these steps:

1   In Windows' Program Manager, select *Extra! for Windows* as the current program group.

2   Double-click on the Macro Editor icon. The Macro Editor will appear along with the "Open a Macro..." dialog box.

3   If you want to edit an existing macro, click on the macro you want to edit and click "Open." The macro will appear in its own window within the presentation space of the Macro Editor. You can now edit the macro.

4   If you want to create a new macro, first close the "Open a Macro..." dialog box by clicking "Cancel." You will see the Macro Editor on your screen and its presentation space will be blank.

5   Select "New" from the File menu. A new window will appear in the presentation space of the Macro Editor.

     You can open as many windows as you need and can arrange them within the presentation space of the Macro Editor using the Tile and Cascade commands found in the Windows menu. You can also reduce a macro window to an icon.

To start the Macro Editor from an open *EXTRA!* Terminal Session, do this:

1   Select "Edit..." from the Macro menu of the Terminal Window. The Macro Editor will appear along with the "Open a Macro..." dialog box.

2   Click on the macro you want to edit and click "Open." The macro will appear in its own window within the presentation space of the Macro Editor. You can now edit the macro.

Creating and Editing Macros With the Macro Editor

EXTRA! macros are created and edited using five different functions: Position Cursor, Prompt User, Send Keys, Run an Application, and Wait.

These functions provide the instructions necessary for carrying out the task that you want the macro to accomplish. If the task involves 11 steps, your macro would have 11 function lines, each function line describing a step.

For the sake of maintaining continuity and avoiding any misunderstanding in what you want the macro to do, the Macro Editor has a set of rules that govern how a function is to be expressed in a macro.

●   A function line always begins with the function's name.

●   Everything following the function name that is a part of the function line is enclosed in parentheses ( ). Comments are not included in the parentheses.

- Within the parentheses, you can express strings, number fields, and modes, which are separated from each other by commas.

- Strings are surrounded by double quote marks.

- 3270 keystrokes, which are always a part of a string, are surrounded by curly brackets, such as {PF12}.

- Number fields, such as row and column references, are separated by commas.

- Comments within a macro are started with a single quote mark (') or the three letters REM. Any text following these comment marks on the same line of text, even if it's a function, will be ignored by the Macro Editor. Comments cannot be embedded within a function line.

The following explanations describe what each function does, how it might be used in a macro, and instructions on how to place the function into your macro.

Placing the Mainframe Cursor

This function allows you to write a line in your macro that tells *EXTRA!* to place your mainframe cursor at a particular place on your mainframe screen. A dialog box appears on your screen where you can designate the row and column where you want the cursor to be placed.

As an example, let's say that in the course of working on the mainframe, you regularly encounter a screen that has eight fields that you must fill before you can move on. And the information you put in those fields never changes. You can imagine that filling out a screen like this would be time-consuming and monotonous.

With "Position Cursor..." you can write a macro that
automatically jumps to each field's position on the screen.
Once the PositionCursor function line places the mainframe
cursor in the right place for that particular field, you can
then use a Send function line, which would type the
appropriate information for that field. With such a macro, a
task that used to take a few minutes (and longer if you made
mistakes) would only take a few seconds.

Syntax

This macro consists of the function's name and two number
fields: row and column. The italicized type represents
information that you must supply.

PositionCursor(*row,col*)

Instructions

To indicate a particular cursor position, follow these steps.

1   Make sure that you are at the start of a new line in the
Macro Editor.

2   Select "Position Cursor..." from the Function menu. The
Move Cursor Location dialog box appears on your
screen.

3   Type the row and column location where you want to
position the cursor.

    Notice that at the bottom of the dialog box, the macro
function line that will appear in your macro reflects the
row and column choice you made. For instance, the
macro function line might read, PositionCursor(12,6).

4   Click Insert. The macro function line is automatically written into your macro.

Prompting the User

This function allows you to create a prompt. A prompt is text that appears on the screen for the purpose of giving the user directions about what to do next or for helping the user understand what the program is currently doing. When the macro executes and comes to the line that expresses the prompt, the prompt you write will display on the screen.

Syntax

This macro consists of the function's name and the string that you want to appear in the dialog box. The italicized type represents information that you must supply.

PromptUser("*text for the prompt*")

Instructions

To prompt the user, follow these steps:

1   Make sure that you are at the start of a new line in the Macro Editor.

2   Select "Prompt User..." from the Function menu. The Insert User Prompt dialog box appears on your screen.

3 In the text box, type what you want the prompt to say. The default prompt is "Pausing Macro Playback, click 'Resume' to continue."

Notice that at the bottom of the dialog box, the macro function line that will appear in your macro reflects the prompt written in the text box. For instance, the macro function line might read, PromptUser("Pausing Macro Playback, click 'Resume' to continue").

4 Click Insert. The macro function line is automatically written into your macro.

Sending Keystrokes to the Mainframe

Choosing this function brings up a dialog box in which you can tell *EXTRA!* to send certain keystrokes to the mainframe.

"Send Keys..." is a helpful function for two reasons. For one, it enables you to automate the tedious and potentially error-ridden process of typing in information that doesn't change but must regularly be typed, such as logging on to the mainframe.

For another, "Send Keys..." lets you send 3270 keystrokes to the mainframe that your PC keyboard might not be set up to send. For example, let's say you need to send the 3270 keystroke [PF22] to the mainframe. But there isn't a key on your keyboard that is mapped to accommodate [PF22]. "Send Keys..." leads to a dialog box that allows you to select and send [PF22], and any 3270 keystroke for that matter, regardless of whether or not your keyboard is mapped to send that key.

In a word, "Send Keys..." lets you send keystrokes to the mainframe that you might not otherwise be able to send.

Syntax

This macro consists of the function's name and the string
that you want to send to the mainframe, including any 3270
keystrokes. The 3270 keystrokes must appear in curly
brackets. The italicized type represents information that you
must supply.

SendKeys("{*key*}...")

SendKeys("*text*")

SendKeys("*text*{*key*}...")

Instructions

To send keystrokes to the mainframe, follow these steps:

1   Make sure that you are at the start of a new line in the
     Macro Editor.

2   Select "Send Keys..." from the Function menu. The Send
     Keys to the Mainframe dialog box appears on your
     screen.

3   In the "Keystrokes to be sent" text box, type the
     keystrokes that you want to send to the mainframe,
     such as "logon raeok."

     Notice that at the bottom of the dialog box, the macro
     function line that will appear in your macro reflects the
     keystrokes that you type in the text box. For instance,
     the macro function line might read, SendKeys("logon
     raeok").

4   If you want instead to send a 3270 key, or send a 3270 key in addition to the keystrokes in step 3, double-click the desired key(s) in the 3270 keys list box, such as {Enter}. Scroll through the list box if necessary to find the key you're looking for.

As in step 3, the key(s) you select are added to the macro function line at the bottom of the dialog box. For instance, the macro function line might now read, SendKeys("logon raeok"{Enter}).

5   When you have completed selecting the keystrokes you want to send to the mainframe, click Insert. The macro function line is automatically written into your macro.

Running a PC Application

This function allows you to run a Windows or DOS application from a macro.

As an example, you may regularly need to update information in a mainframe file with portions of information found in a Microsoft Excel file. Rather than clicking over to Windows' Program Manager, locating Excel and then running it, you can use "Run Application..." to write a function line which will run Excel automatically, when you need it. And by including the appropriate filename, you can even have Excel bring up the specific file you want.

Syntax

This macro consists of the function's name and the string that describes the path, application name, and filename that you want to run. Following the string is the mode under which the application will run, either normal, minimized, or maximized. The italicized type represents information that you must supply.

Shell("*application*", SH_NORMAL)

Shell("*application*", SH_MINIMIZED)

Shell("*application*", SH_MAXIMIZED)

Instructions

To run an application, follow these steps:

1   Make sure that you are at the start of a new line in the
     Macro Editor.

2   Select "Run Application..." from the Function menu.
     The Run an Application... dialog box appears on your
     screen.

3   In the Function line text box, type the full path of the
     application you want to run, including the drive, any
     directories,the application's filename and, if you wish
     the file that you want to bring up. As an example, to
     run Microsoft's Word for Windows, you might type,
     C:\winword\winword.exe recruit.doc.

4   Select what state you want the application to initially
     run in, either normal, maximized, or minimized.

     Notice that at the bottom of the dialog box, the macro
     function line that will appear in your macro reflects the
     path and window state that you have indicated. For
     instance, the macro function line might read,
     Shell("c:\winword\winword.exe",SH_NORMAL).

5   Click Insert. The macro function line is automatically
     written into your macro.

Placing a Wait in the Macro

This function allows you to insert a Wait into your macro. The macro will continue to execute when one of the following conditions is met:

- ● The mainframe is ready
- ● A set number of seconds pass
- ● The cursor reaches a certain position
- ● The cursor moves so many rows and columns

Wait Until the Mainframe is Ready

This Wait watches the mainframe until the mainframe stops processing information. Then after the mainframe has been quiet for five seconds, the next function in your macro will execute.

The idea behind this macro is to give the mainframe an opportunity to catch up with your much faster macro. For instance, it's a good idea to place this kind of Wait between SendKeys that are logging you on to the mainframe. As you know, it takes the mainframe a little while to respond to your logon request and give you the Ready status. If the mainframe continues to receive macro functions while it's still finishing its response to your logon request, the mainframe will never catch up and your macro will fail to accomplish its purpose. Inserting Waits can alleviate this problem. If you don't think this kind of Wait allows the mainframe enough time to catch up, try the next kind of Wait.

Wait Until a Set Number of Seconds Pass

With this Wait, you can tell the function how long the macro should wait before it executes the next function in the macro. The purpose of this Wait is to allow the mainframe the time it needs to catch up with the rapid pace of the macro. If the

macro continues to execute while the mainframe is not ready, the macro will likely cause the mainframe to hand you an input error when it finally does catch up.

For instance, let's say you want to launch PROFS, an IBM mail/calender program. And then you want to immediately check the new mail you received. You would first use a SendKey to request PROFS and send an [Enter] to get the mainframe to process the request. Getting you into PROFS might take ten seconds or so, so you wouldn't want to request to open your new mail until you knew the mainframe had gotten you to PROFS. So after your request for PROFS you would insert a Wait that would wait for, let's say, 15 seconds before executing your request to open new mail.

As you can see, figuring out how many seconds to wait can be fairly subjective. You'll need to experiment a little bit to find the number of seconds appropriate for whatever you're waiting for.

Wait Until the Cursor Reaches a Certain Position

The two previously mentioned Waits depend on a period of time to pass before the macro is allowed to continue. These next two deal not with time but position. Designating a particular cursor position is yet another way of assuring that the mainframe will indeed catch up before the next function in the macro is forced upon it.

For instance, let's say you are creating a macro that will log you onto the mainframe and then launch a mainframe graphics program. To do this, you would have a SendKeys function that logs you on and a SendKeys function that launches the graphics program. But it takes a few seconds for the mainframe to log you on. So if the mainframe receives a request to launch the graphics program before it

finishes logging you on, the mainframe might hand you an input error.

However, you know that in the past whenever the mainframe has finished logging you on, it puts your cursor at row 23, column 1. And it has been from that cursor position that you have always launched the graphics program. By placing a Wait that specifies that cursor position, you can ensure that the mainframe will not be asked to launch the graphics program until it is ready and has reached that cursor position.

Wait Until the Cursor Moves so many Rows and Columns

As with the other Wait functions, the purpose of this Wait is to ensure that the mainframe has had a chance to catch up before it is requested to do something else. This Wait, however, is not looking for an absolute cursor position, like row 20 column 16. It's looking for a cursor position that is relative to the last cursor position. For instance, your macro might be entering commands that cause the mainframe to do some processing and then take you to a new screen. You need to have some way of knowing when the mainframe is once again ready to take the next command. Since from screen to screen the cursor does not end up at the same fixed cursor position, you can't give a specific cursor position as an indication that the mainframe is ready.

However, you do know that from screen to screen the cursor always ends up three rows down and five columns over from the last cursor position. Knowing this, you could use a Wait that specifies that kind of cursor movement, ensuring that the macro will continue only when the mainframe is ready and that cursor movement has taken place.

Syntax

This macro consists of the function's name, the mode under which the WAIT is functioning, and when applicable, the number fields that specify a period of time or a particular cursor position. The italicized type represents information that you must supply.

Wait(WA_HOSTQUIET)

Wait(WA_TIMED,# *of seconds*)

Wait(WA_CURSORPOS,*row,col*)

Wait(WA_CURSORMOVE,*row,col*)

Instructions

To add a Wait to your macro that will wait until the mainframe is ready, follow these steps:

1   Make sure that you are at the start of a new line in the Macro Editor.

2   Select "Wait..." from the Function menu. The Wait for Mainframe... dialog box appears on your screen.

3   Select "Until the Mainframe is Ready".

Notice that at the bottom of the dialog box, the macro function line that will appear in your macro reflects the option you chose. For instance, the macro function line will read, Wait(WA_HOSTQUIET).

4   Click Insert. The macro function line is automatically written into your macro.

To add a Wait to your macro that will wait for a set number
of seconds to pass, follow these steps:

1   Make sure that you are at the start of a new line in the
     Macro Editor.

2   Select "Wait..." from the Function menu. The Wait for
     Mainframe... dialog box appears on your screen.

3   Select the option that reads "For __ seconds."

4   In the option's box, type in the number of seconds you
     want the macro to wait before it resumes.

     Notice that at the bottom of the dialog box, the macro
     function line reflects the option you chose. For instance,
     if you assigned the number of seconds to 180, the macro
     function line will read, Wait(WA_TIMED, 180).

5   Click Insert. The macro function line is automatically
     written into your macro.

To add a Wait to your macro that will wait until your cursor
reaches a particular position, follow these steps:

1   Make sure that you are at the start of a new line in the
     Macro Editor.

2   Select "Wait..." from the Function menu. The Wait for
     Mainframe... dialog box appears on your screen.

3   Select the option that reads "Until the Cursor Position is
     at:".

4   In the option's Row and Column boxes, type in the row
     and column numbers to indicate at what cursor position
     the macro is to resume.

     Notice that at the bottom of the dialog box, the macro
     function line reflects the options you chose. For
     instance, if you assigned the row and column to be 20
     and 60 respectively, the macro function line will read,
     Wait(WA_CURSORPOS, 20, 60).

5   Click Insert. The macro function line is automatically
     written into your macro.

To add a Wait to your macro that will wait until the cursor
moves so many rows and columns, follow these steps:

1   Make sure that you are at the start of a new line in the
     Macro Editor.

2   Select "Wait..." from the Function menu. The Wait for
     Mainframe... dialog box appears on your screen.

3   Select the option that reads "Until the Cursor Moves:".

4   Select how many rows up or down the cursor is to
     move and how many columns to the left or right.

     Notice that at the bottom of the dialog box, the macro
     function line reflects the options you chose. For
     instance, if the macro is to resume after the cursor has
     moved 5 rows up and 14 columns to the right, the
     macro function line will read:
     Wait(WA_CURSORMOVE, -5, +14).

5   Click Insert. The macro function line is automatically
     written into your macro.

Finding a Word or Phrase

There are a number of reasons why you might have a need to find a particular function line, word, phrase, or parameter. For example, you may need to update a macro so that it uses a new user id for logging on to the mainframe. You could use "Find..." to locate that old user id and update it. You could then use "Next" or "Previous" to look for any other occurrences of the obsolete user id and make appropriate changes. "Next" has it's own shortcut key, [F3], and so does "Previous", [F4].

To find a word or phrase in your macro, follow these steps:

1   Place the insertion point in the place in the macro where you want to start your search. For example, you might want to place the insertion point at the very beginning of the macro.

2   Select "Find..." from the Search menu. Doing so brings up the Find dialog box.

3   In the Find text box, enter the exact word or phrase that you want to find. Make sure you do not misspell a word or add any extra spaces that do not exist in the actual phrase you're trying to find.

4   If you want the "Find" to pay attention to upper and lower case letters in the search, click on the case sensitive check box.

5   This step depends on where your insertion point is in the macro and which direction you want to search in. If you want to find the next occurrence of what you're looking for, click "Next" or press [F3]. If you want to find the previous occurrence of what you're looking for, click "Previous" or press [F4].

Checking the Syntax of a Macro

A macro will not run if there are errors in any of the macro's function lines. Any such errors are called syntax errors.

The Check Syntax command makes it easier for you to troubleshoot your macro by telling you how many function lines have errors and then highlighting the first error it encountered. If you wish, you can continue to select Check Syntax and correct the error it highlights until you have made your macro error-free.

You can also check the syntax for each line individually by scrolling through the macro line-by-line using the cursor arrow keys or by clicking on any line with the mouse. With each line you scroll through, the Syntax Status Bar will tell you "Line OK" or will point out the first error that it encountered in that line, such as: 'Syntax Error: "POZITIONCURSOR".'

It's important to note that within a function line there actually may be more than one error, but the Syntax Status Bar will read only the first error that it encountered within that function line.

To check your macro for syntax errors, follow these steps:

1   Select "Check Syntax" from the File menu or press [F2]. The Macro Editor will scan your entire macro and then display a dialog box telling you how many function lines in your macro contain syntax errors.

2   Click OK in the dialog box. The Macro Editor will highlight the first error from the beginning of the macro. The Syntax Status Bar, located just below the menus, will tell you what part of the function line is unacceptable. For instance, the Syntax Status Bar might read: Syntax Error: "POZITIONCURSOR".

3 Correct the error, then scroll down to the next line. If the Syntax Status Bar reads: Line OK, then there is no error in that line. If the line reads: Syntax Error, you need to correct the error that the Syntax Status Bar indicates.

4 Repeat step 3 until you have worked your way through the entire macro.

5 Select Check Syntax again from the File menu or press [F2]. Some function lines may have had more than one error, and a Syntax Check only takes note of the first error that it encounters in a function line.

6 Repeat steps 3 through 5 until a Syntax Check encounters no errors.

Saving a Macro and Exiting the Editor

You should save periodically in the course of creating and editing a macro. When you have finished doing all your macro work for the time being, you can exit the Macro Editor.

Saving a Macro File

To save a macro file, follow these steps:

1 Select "Save" from the File menu. If this is the first time you have ever saved this macro, you need to name it, which is why the Save Macro As... dialog box appears on your screen.

2 In the Directories list box, locate and double click on the directory that you want to save the macro to.

3   In the file box, type a filename that is two to eight characters in length. The Macro Editor will automatically add to the end of the name the filename extension .EWM.

4   Click OK. The file will be saved and the name of the macro file will appear in the title bar of the macro's window.

Saving a Macro File Under a Different Name

To save a macro file under a different filename, follow these steps:

1   Select "Save As..." from the File menu. The Save Macro As... dialog box appears on your screen.

2   In the Directories list box, locate and double click on the directory that you want to save the macro to.

3   In the file box, type a filename that is two to eight characters in length. The Macro Editor will automatically add to the end of the name the filename extension .EWM.

4   Click OK. The file will be saved under the new name and the name of the macro file will appear in the title bar of the macro's window.

Deleting a Macro

To delete a macro, follow the instructions below.

1   Start the Macro Editor.

2   Select "Delete..." from the File menu of the Macro
     Editor. The Delete a Macro... dialog box will appear on
     your screen.

3   Select the file you want to delete.

4   Click "OK".

Exiting the Macro Editor

To exit the Macro Editor, follow these steps:

1   Save whatever macros in your presentation space you
     want to save.

2   Select Exit from the File menu.

The Printer Emulator Preferences Menu

This version of *EXTRA!* has restructured the Preferences
menu for the Printer Emulator. When you pull down the
Preferences menu, you will find two menu commands:

⊙   Page Layout...
⊙   Printer Timeout...

The following explains each of these menu commands and
provides instructions for setting up your page for printing.

The Page Layout... Command

The "Page Layout..." command from the Preferences menu displays the Page Layout dialog box. This dialog box lets you select the margins, font, font size, and other related formatting options that affect the appearance of the printed page. Included in the dialog box are the following options:

Margins

This option lets you select the top, bottom, and side margins of the page. The sizes you enter are in number of inches. For example, setting "Top" to 1 specifies a margin of 1" at the top of the page.

Font

This portion of the dialog box allows you to select what font style your file will be printed in, such as Times-Roman or Courier.

Format

This portion of the dialog box displays how many characters per line and lines per page will be printed. If you wish to change these settings, you can click on "Edit." Setting the characters per line to a certain number will cause *EXTRA!* to automatically select the font size that best suits the number of characters per line that you specified. When the check box labelled Auto Page Layout is checked, the Format portion of the dialog box is disabled.

Auto Page Layout

If you don't want to bother with trying to set up the page layout, you can select Auto Page Layout. When this option is checked, the Format box and Font Size... are gray and *EXTRA!* will automatically use the mainframe's selection for the number of lines per page and characters per line.

In addition, Auto Page Layout will attempt to fit the number of lines and characters per line into the page layout margins, but will override both left and right margins if necessary.

Wrap Printer Text at Right Margin

This option applies to lines that run past the specified characters per line. If "Line Wrap" is selected, then longer lines will continue on to the next printed line on the page. If "Line Wrap" is not selected, then any line of data that goes beyond the line length will be cut off at that point and will not be printed.

Mainframe Overrides Settings

The mainframe has the capacity to set all the many options that contribute to how a page looks when it's printed. These options include margins, type of font, and lines per page. However, just which of these options the mainframe actually sets and what those settings are varies from mainframe to mainframe. To find out the settings that your mainframe has for page layout options, consult your System Administrator.

By selecting Mainframe Overrides Settings, you give the mainframe the authority to dictate the settings for whatever options it is configured to control. Whatever options the

mainframe is not configured to control, your settings for
those options in the Page Layout dialog box will be used.

Be aware that a combination of the mainframe's settings
with your settings might require some experimentation on
your part before you get printed output that is satisfactory to
your expectations.

Uppercase

This option prints all text in UPPER CASE letters. When it is
not selected (a check mark does not appear next to it), then
all text will be printed the same way it was typed in the
mainframe application.

Align Form...

This feature assumes that you already have a body of data
that is formatted to be printed onto a form. All the fields or
tabs have been set, all the spacing is correct. Align Form...
allows you to get that first bit of information lined up
correctly on the form so that all the information going onto
the form prints out in the places where they belong.

Test Layout

Selecting this command will cause *EXTRA!* to print out a
sample page of text, applying the page layout choices you
made. The sample allows you to see if the layout is set up
the way you really want it.

Font Size...

This dialog box lists the font sizes that are available from the current printer given the font size that you have picked. As you select a different font size, the numbers in Characters per line and Lines per page change automatically to reflect the font size you've selected.

The number of characters per line, the font size, and lines per page are directly related to each other. You can't change one without the others automatically changing. When the check box labelled Auto Page Layout is checked, the Font Size... button is disabled.

The Printer Time Out... Command

Selecting "Printer Time Out" opens the "Print Job Timeout" dialog box. In this dialog box, you can enter the number of minutes that the printer should wait before deciding that the print job is finished. Once the print job times out, the printer ejects the last page and is free to accept another print job.

Page Layout Procedures

This section provides you with the procedures that are related to the commands found in the Preferences menu of the Printer Emulator. These procedures comprise the following:

- Setting the Page Margins
- Selecting a Font
- Selecting a Font Size
- Using the Auto Page Layout
- Setting the Number of Characters per Line
- Setting the Number of Lines per Page
- Aligning Text that will be Printed on a Form

- ◉ Wrapping Text at the End of a Line
- ◉ Using the Mainframe's Default Settings
- ◉ Printing in Uppercase
- ◉ Testing Your Page Settings
- ◉ Setting the Printer Time Out

Setting the Page Margins

To set the margins for your page, follow these steps.

1   Select "Page Layout..." from the Preferences menu of the Printer window. The Page Layout dialog box will appear on your screen.

2   In the Margins portion of the dialog box, indicate how much space you want from the top, bottom, and to the left and the right of the text. You can indicate margins that are less than an inch using a decimal, such as .75.

3   When you are finished making your other page layout selections, click "OK."

Selecting a Font

To select a font for your print job, follow these steps.

1   Select "Page Layout..." from the Preferences menu of the Printer window. The Page Layout dialog box will appear on your screen.

2   In the Font portion of the dialog box, click on the arrow button to pull down the font list box. This list includes all the fonts that are available from your current printer.

3   Click on the font of your choice. The list box will close
and you will see the name of your selected font in the
box next to the word Font.

4   When you are finished making your other page layout
selections, click "OK."

Selecting a
Font Size

To change the size of your font, follow these steps.

1   Select "Page Layout..." from the Preferences menu of the
Printer window. The Page Layout dialog box will
appear on your screen.

2   Click on the Font Size... button. Doing so brings up the
Font Size dialog box, which includes a list box of font
sizes as well as numbers for the characters per line and
lines per page that the selected font size will print.

3   In the list box click on the size you want your font to
print in. When you make your selection, the numbers
for the characters per line and lines per page will
automatically change to reflect the font size you chose.
If you wish, later you can change the lines per page to a
number different than the default.

4   Click "OK." This returns you to the main Page Layout
dialog box.

5   When you are finished making your other page layout
selections, click "OK."

Setting the Number of Characters per Line

Characters per Line is an option that is directly related to Font size. If you choose, then, to modify the number of characters per line, be aware that *EXTRA!* will change the font size to a size that will best accommodate your request.

To set the number of characters per line, follow these steps:

1   Select "Page Layout..." from the Preferences menu of the Printer window. The Page Layout dialog box will appear on your screen.

2   In the Format portion, click Edit.

3   In the box for characters per line, entire the number of characters that you want. Then Click "OK."

4   When you are finished making your other page layout selections, click "OK."

Setting the Number of Lines per Page

To set the number of lines per page, follow these steps.

1   Select "Page Layout..." from the Preferences menu of the Printer window. The Page Layout dialog box will appear on your screen.

2   In the Format portion of the dialog box, click on the Edit button. The Format dialog box will appear.

3   In the box for lines per page, entire the number of lines that you want on each page you print. Then click "OK."

4   When you are finished making your other page layout selections, click "OK."

Using the Auto Page Layout

When Auto Page Layout is active, *EXTRA!* will automatically choose the font size that is appropriate for the lines per page and characters per line that are specified in the Page Layout... dialog box.

In addition, Auto Page Layout will attempt to fit the number of lines and characters per line into the page layout margins, but will override both left and right margins if necessary.

1   Select "Page Layout..." from the Preferences menu of the Printer window. The Page Layout dialog box will appear on your screen.

2   Click the Auto Page Layout check box.

3   When you are finished making your other page layout selections, click "OK."

Aligning Text that will be Printed on a Form

This feature assumes that you already have a body of data that is formatted to be printed onto a form. All the fields or tabs have been set, all the spacing is correct. However, you need to get that first bit of information lined up correctly on the form so that all the information going onto the form prints out in the places where they belong. This feature allows you to align and test your formatted, form-printed information.

To align text that will be printed on a form, follow these steps.

1   Select "Page Layout..." from the Preferences menu of the Printer window. The Page Layout dialog box will appear on your screen.

2   Click on the Align Form... button. The Align Form dialog box will appear on your screen.

3   In the "Print" text box, type a line of text that will serve as a reference point for where text should start printing on your form.

    For instance, if the first thing to print on your form is the date, you might want to type the date.

4   In the row and column boxes, indicate the row and column position that would place in the correct place on the form the date you typed in step 3.

5   Click "Print Now". With the print-out, compare where the date printed in relation to where it should have printed.

6   Repeat steps 4 and 5 until the text is aligned correctly on your form.

Wrapping Text at the End of a Line

This option applies to lines that run past the specified characters per line. If "Line Wrap" is selected, then longer lines will continue on to the next printed line on the page. If "Line Wrap" is not selected, then any line of data that goes beyond the line length will be cut off at that point and will not be printed.

To use this option in your printing, follow these steps.

1   Select "Page Layout..." from the Preferences menu of the
     Printer window. The Page Layout dialog box will
     appear on your screen.

2   Click the check box labelled Wrap printer text at right
     margin.

3   When you are finished making your other page layout
     selections, click "OK."

Using the Mainframe's Default Settings

By selecting Mainframe Overrides Settings, you give the
mainframe the authority to dictate the settings for whatever
page layout options it is configured to control.

However, just which of these options the mainframe actually
sets and what those settings are varies from mainframe to
mainframe. To find out the settings that your mainframe
has for page layout options, consult your System
Administrator.

Whatever options the mainframe is not configured to
control, your settings for those options in the Page Layout
dialog box will be used.

To allow the mainframe to override your page layout
selections, follow these steps.

1   Select "Page Layout..." from the Preferences menu of the
     Printer window. The Page Layout dialog box will
     appear on your screen.

2   Click the check box labelled Mainframe overrides
     settings.

3   When you are finished making your other page layout
          selections, click "OK."

Printing in   To print your print job all in uppercase letters, follow these
Uppercase   steps.

1   Select "Page Layout..." from the Preferences menu of the
          Printer window. The Page Layout dialog box will
          appear on your screen.

2   Click the Uppercase check box.

3   When you are finished making your other page layout
          selections, click "OK."

Testing   Once you have set all your page settings, you can print a
Your Page   sample page of text to see how your settings will appear on
Settings   the printed page. The "Test Layout" feature takes some
                    sample text already included in *EXTRA! for Windows* for
                    this purpose, formats it with your settings, and then prints it
                    out.

To run a test on your page layout, follow these steps.

1   Select "Page Layout..." from the Preferences menu. The
          Page Layout dialog box will appear on your screen.

2   Set the page layout with the settings you want.

3   Click on the "Test Layout" button.

4   After looking at the test printout, make any adjustments
          to the page layout options that you feel are appropriate
          and click on the "Test Layout" button again.

5   Repeat step 4 until the printout gives you the results you want, then click "OK" in the Page Layout dialog box.

Setting the Printer Time Out

Printer time out is helpful in those situations when the mainframe responds slowly, or when a print job, for one reason or another, does not finish. When printer time out is set, the printer will assume, after not hearing from the mainframe after a set amount of time, that the job is completed, upon which it will eject the last page of the print job and become available to accept another print job.

To set the printer time out, follow these steps:

1   Select "Printer Time out..." from the Preferences menu. The "Print Job Timeout" dialog box will appear on your screen.

2   Enter the amount of time you want the printer to wait before it is to assume that the print job is done.

3   Select "OK."

Using HLLAPI

HLLAPI (High-Level Language Application Program Interface) helps you write micro-to-mainframe programs that work with mainframe applications to speed up log-ons, simplify user screens, control mainframe access, or provide totally unattended operations. And, you can write these micro-to-mainframe programs in your preferred high-level language.

What is HLLAPI?

HLLAPI is an interface to *EXTRA!* which consists of a set of functions that allow you write micro-to-mainframe applications. Using these functions, HLLAPI applications can exchange information between a mainframe and PC, and can simulate or intercept actions of a 3270 user. (Refer to the *EXTRA! for Windows Programmers Toolkit* for details about HLLAPI functions.)

Why Use HLLAPI?

HLLAPI applications can reduce operating costs, decrease support time, and simplify training — since nearly any operation performed by a 3270 user can be automated.

You develop HLLAPI applications on your PC, rather than on a mainframe — saving time and mainframe resources. And, you can write HLLAPI programs in the programming language of your choice.

Multi-tasking vs. Single Tasking HLLAPI

EXTRA! for Windows supports two HLLAPI interfaces. The multi-tasking interface (HLLAPI) lets you communicate with more than one mainframe session at the same time. The single tasking interface (EHLLAPI) is consistent with OS/2's EHLLAPI. If you are writing your own HLLAPI programs, consider using HLLAPI for its multi-tasking benefits. Note however, that many third party programs are written using the single tasking interface, EHLLAPI. For more information on these interfaces, refer to the *EXTRA! for Windows Programmer's Toolkit*.

Using Dynamic Data Exchange

Using Window's Dynamic Data Exchange (DDE), Windows applications can communicate and share data with each other. They can issue commands to each other, request data from each other, and send data to each other.

Windows applications can work with an IBM mainframe by communicating with *EXTRA!'s* DDE. Through *EXTRA!*, Windows applications can issue commands to a mainframe, get data from a mainframe, or send data to a mainframe.

Why Use DDE?

EXTRA!'s DDE can help you simplify and automate your work with a mainframe. For example, say you produce a daily memo that includes a text file from a mainframe, and you produce the memo manually — as outlined in the following procedure:

1   Using *EXTRA!*, you start a session with the mainframe.

2   Then, you issue a command to the mainframe, telling it to log you on.

3   Once you are logged on, you issue a command to the mainframe, directing it to send a file to your PC.

4   When the file arrives at your PC, you start your Microsoft *Word for Windows*.

5   After loading the memo into *Word for Windows*, you copy the file into the memo.

Using DDE, you can automate the entire process by representing the steps as DDE commands in the memo. To put such commands in the memo, follow the steps below.

1   Open the memo under *Word for Windows*.

2   In *Word for Windows'* macro language, enter DDE
     commands appropriate for starting a session, logging
     on, and transferring the needed file.

3   Save the memo.

To execute the commands just entered, simply reopen the
memo under *Word for Windows*. When you open it, *Word*
automatically executes the commands in it. These
communicate with *EXTRA!* to start a session with the
mainframe, log you on to the mainframe, and transfer the
appropriate file.

How Does DDE Work?

To understand DDE, you must understand certain concepts
and terms. The following paragraphs explain what you
need to know.

A Windows application communicates with another
Windows application by initiating a conversation with it.
The application starting the conversation is the client
application, and the application conversing with the client is
the server application.

DDE describes data passed between a client and server by
using a three-level hierarchy consisting of an item, topic and
application name.

To initiate a conversation, a client names a server application
and the topic of the conversation. This application and topic
are unique for each conversation and cannot change during
the conversation. For example, suppose you open a
mainframe session using *EXTRA!* and want to get some

mainframe data using *Word for Windows*. In this case, the client application is *Word for Windows*, the server application is *EXTRA!*, and the topic is the mainframe session's name — as defined under *EXTRA!*

The client application's macro or script language includes a command for initiating a DDE conversation. In the command, you typically specify the server application and topic by putting them in double quotes. For instance, if the server is *EXTRA! for Windows*, you specify the application as "EXTRA!". (Refer to your client application's documentation for details about initiating a conversation.)

Once a conversation starts, the client and server applications can converse by issuing commands to each other. For example, a client can issue a variety of commands to *EXTRA!* These include commands that only *EXTRA!* recognizes or commands that *EXTRA!* passes on to a mainframe.

The commands passed to a mainframe are processed by HLLAPI. These perform tasks such as transferring files from the mainframe to the PC, getting information about the mainframe's presentation space, or changing information in the presentation space.

A DDE topic typically represents data exchanged during a conversation. For instance, applications that exchange files typically use file names for topics. (Other applications might use application-specific names.)

Related to a topic, a DDE data item is the actual data exchanged between applications. A client application can pass values for a data item to a server application, and a server application can pass values to a client. DDE is a message-based protocol. DDE transactions occur when DDE messages are passed between client and server windows.

The nine DDE messages are as follows.

MESSAGE	DESCRIPTION
INITIATE	Starts a conversation between a DDE client and server application.
ACK	Acknowledges a received message. ACK is sent in response to a received message and provides a positive or negative acknowledgement.
ADVISE	Asks the server application to provide an update or notification for a data item whenever it changes. (This establishes a permanent data link.)
REQUEST	Asks the server application to provide the value of a data item.
POKE	Sends the value of a data item to the server application.
DATA	Sends a value for a data item to the client application.
EXECUTE	Sends a string to the server application. (The server processes the string as a series of commands.)
UNADVISE	Terminates a permanent data link.
TERMINATE	Ends a conversation.

Using EXECUTE Messages

Once a conversation starts, the client and server applications can converse by issuing commands based upon the EXECUTE message. For example, a client can issue a variety of commands to *EXTRA!* These include commands that only *EXTRA!* recognizes or commands that *EXTRA!* passes on to a mainframe.

The commands passed to a mainframe are processed by HLLAPI. These perform tasks such as transferring files from the mainframe to the PC, and controlling the terminal emulator.

The table on the following pages summarizes the commands a client can give *EXTRA!* You can type the commands in upper, lower, or mixed case. But, you must put square brackets around each command. Additionally, you must provide the information in *italics* (if appropriate) and must put parentheses around it.

If a command includes several words, you must leave one space — but only one space — between words. (If you leave more than one space, the command will not work.)

COMMAND	DESCRIPTION AND SYNTAX
Allow Emulator Updates	This command allows the terminal emulator in a mainframe session to refresh the screen as updates come from the mainframe. Syntax: [allow emulator updates]
Block Emulator Updates	This command prevents the terminal emulator in a mainframe session from refreshing the screen as updates come from the mainframe. Syntax: [block emulator updates]
Close Configuration	Closes the current *EXTRA!* configuration. You can issue this command only when the current topic is the System topic and no mainframe session is open. Syntax: [close configuration]
Open Configuration	Opens the *EXTRA!* configuration file you specify. You can issue this command only when the current topic is the System topic and no mainframe session is open. You must specify the configuration file's path and file name. Syntax: [open configuration (*path + file name*)]

continued

COMMAND	DESCRIPTION AND SYNTAX
Open Layout	Opens the *EXTRA!* screen layout that you specify. The layout has a typical DOS file name. Syntax: [open layout (*file name*)]
Pause	Stops the client application for the number of one-half seconds you specify. Syntax: [pause (*duration in 1/2 seconds*)]
Send File Receive File	Sends a file you specify to a mainframe or receives a file from a mainframe. (The mainframe can be one other than the mainframe specified for the topic session.) To transfer a file, you must be logged on to the mainframe. Syntax: [send file (*PC-path-and-file-name session-short-name*: *host-file-name options*)] [receive file (*PC-path-and-file-name session-short-name*: *host-file-name options*)]
Start Emulator	Starts a terminal emulator for the topic session. Syntax: [start emulator]
Stop Emulator	Stops the terminal emulator for the topic session. Syntax: [stop emulator]

continued

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COMMAND	DESCRIPTION AND SYNTAX
Terminal On	Powers on a session that was powered off. Syntax: [terminal on]
Terminal Off	Powers off a session that was powered on. Syntax: [terminal off]

When sending or receiving a file, be sure to include the colon (:) in the session short name. (For more information about session short names, read the discussion about naming sessions in the *EXTRA! for Windows Reference Manual*.

Using REQUEST, POKE, and ADVISE Messages

A client application can converse with *EXTRA!* to REQUEST, POKE, or ADVISE certain data items. These messages are used for getting information from the mainframe's presentation space, or changing information in the presentation space. (The presentation space is the area on the mainframe's screen in which you enter information or in which the mainframe displays information that you request.) When a conversation has been established, the client can get the value of a data item using the REQUEST message. The POKE message allows the client to send a value to the server application. The ADVISE message asks the server application to send a notice for a data item when the item changes.

A client application can use data items that refer to fields or Presentation Space Positions (PSPs) in a mainframe session's presentation space.

Field references in data items have the form "F<number>[U | P]", where

●   "F" means field.

- "<number>" is the field number, counting from left-to-right and top-to-bottom, starting at row 1 column 1 of the presentation space.
- "U" means an unprotected field, i.e., one whose contents you can change.
- "P" means a protected field, i.e., one whose contents you cannot change.

The result of a field reference depends on whether a client requests or pokes data. Requesting a field retrieves the contents of the field; poking a field puts data at the first character after the field attribute.

For example, to request the contents of the second unprotected field in the presentation space, specify F2U as the item name.

Besides referring to fields in a presentation space, a client application can refer to PSPs, using data items in the form "Pnnnn", "PnnnnF", or "PnnnnLmmmm", where

- "P" means presentation space.
- "nnnn" is the presentation space position.
- "L" means length.
- "mmmm" is the length of the reference from the PSP.
- "F" implies that you want to use a PSP to locate a field whose length is specified in the presentation space by the location of field attributes.

Consider the following examples:

- "P123L20" refers to the 20 characters starting at PSP 123.
- "P123" refers to the presentation space from PSP 123 to the end of the field containing PSP 123.
- "P123F" refers to the field containing PSP 123.

A PSP number is a unique location in a presentation space. The number of PSPs in a presentation space depends on the

size of the space. For example, a presentation space containing 24 rows and 80 columns has 1920 PSPs. These have numbers starting at 1 and ending at the presentation space size (for example, from 1 [row 1 column 1] to 1920 [row 24, column 80].

The following tables describe the data items DDE can process: one table lists data items you can request, a second lists items you can poke, a third lists items you can advise, and a fourth summarizes all data items — indicating which ones you can REQUEST, POKE, and ADVISE.

The rules for typing data items are the same as those for commands: type the items in upper, lower, or mixed case, but include only one space between words.

The following table lists data items that a client application can REQUEST.

REQUEST Data Items

Item Name	Description
Alarm	A message you get indicating that an alarm sounded in the topic session.
Columns	Specifies the number of columns in the topic session's presentation space.
Configuration Name	Specifies the path and file name of the current *EXTRA!* configuration.
Configured Topics	Specifies the names of all sessions defined in the current *EXTRA!* configuration.
Cursor	Specifies the cursor's position in the topic session's presentation space.

REQUEST Data Items

Item Name	Description
Directory Name	Specifies the path and name of the *EXTRA!* directory.
Emulator	Specifies the identifier of the terminal emulator associated with the topic session, or zero if no emulator exists.
File Transfer	Relates to file transfers between a client application and a mainframe session. Returns the topic session's short name and the identifier of a file transfer application, or zero if no transfer is taking place.
Keyboard	Specifies the status of the keyboard (clear, locked, or Xclock). Xclock is a keyboard status that occurs when the mainframe session is processing the last command entered.
Keystroke	Refers to keystrokes entered at a topic session. Returns queued keystrokes one at a time. (To represent 3270 function keys as ASCII characters in this data item, refer to the description of 3270-PC keyboard mnemonics in the *EXTRA! for Windows Programmers Toolkit.*)
Layout Name	Specifies the file name of *EXTRA!*'s current layout.
Model	Specifies the model number of the terminal used in the topic session. Possible numbers are 0, 2, 3, 4, and 5.

continued

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REQUEST Data Items

Item Name	Description
OIA	Refers to the contents of the Operator Information Area (OIA) in the topic session's presentation space. (For details about the OIA, refer to the *EXTRA! for Windows Reference Manual*.)
Power	Specifies the topic session's power status (on or off).
PS	Refers to the topic session's presentation space.
Rows	Specifies the number of rows in the topic session.
Search	Locates a string in the topic session's presentation space. Searches the topic session and returns the position(s) of the string, or zero if the search is unsuccessful.
Sysitems	Lists data items for which you can request data.
Topic	Specifies the name of the topic session.
Topics	Specify the names of all open mainframe sessions.

end

The following table lists data items that a client application can POKE.

POKE Data Items

Item Name	Description
Cursor	Specifies the cursor's position in the topic session's presentation space. (This position is presented as a PSP number.) Accepts a PSP number or a field reference.
Keystroke	Refers to keystrokes entered at a topic session. Can send one keystroke or several keystrokes. (The maximum string length is 256 characters.).
PS	Refers to the topic session's presentation space. Copies a string to the presentation space, beginning at row 1 column 1.
Search	Locates a string in the topic session's presentation space. Use POKE to define the string then REQUEST to search for it.

The following table lists data items that a client application can ADVISE.

ADVISE Data Items

Item Name	Description
Alarm	Gives you a message indicating that an alarm sounded in the topic session.
Cursor	Specifies the cursor's position in the topic session's presentation space. (This position is presented as a PSP number.)
File Transfer	Relates to file transfers between a client application and a mainframe session. Returns the short name of the session in which the file transfer completed, and returns the file transfer completion code.
Keystroke	Refers to keystrokes entered at a topic session. Returns single keystrokes, as they are entered from the keyboard.
Model	Specifies the model number of the terminal used in the topic session. Possible numbers are 2, 3, 4, and 5.
OIA	Refers to the contents of the Operator Information Area (OIA) in the topic session's presentation space.
Power	Specifies the topic session's power status (on or off).
PS	Refers to the topic session's presentation space.

The following table summarizes the data items you can use and shows which ones you can REQUEST, POKE, and ADVISE.

Item Name	REQUEST	POKE	ADVISE
Alarm	X		X
Columns	X		
Configuration name	X		
Configured topics	X		
Cursor	X	X	X
Directory name	X		
Emulator	X		
File transfer	X		X
Keyboard	X		
Keystroke	X	X	X
Layout name	X		
Model	X		X
OIA	X		X
Power	X		X
PS	X	X	X
Rows	X		
Search	X	X	
Sysitems	X		
Topic	X		
Topics	X		

Getting Help with DDE

If you are not sure whether a DDE application worked properly, you can use *EXTRA!*'s trace facility to examine the application's DDE messages and return codes.

To use the trace facility, follow the steps below.

1   Go to the EXTRA! program group.

2   Select the EXTRA! Executive by double-clicking on the Executive's icon.

3   Select "API Trace Services" from the File menu.

4   In the API Trace window, select ExtraDDE from the Trace menu.

Then you see a list of messages beginning with "ExtraDDE" or "HLLAPI". If you need help finding the appropriate message and return code, call Attachmate's Technical Support.

If you find the appropriate return code but do not understand it, refer to the appendix of return codes described in the *EXTRA! for Windows Programmers Toolkit*.

Sample DDE Programs

The following two DDE sample programs illustrate how to use *EXTRA!* with DDE. Each program is explained in its own comments, which are preceded on a line by "REM". The samples are *Word for Windows* macros written in *Word for Windows Basic*.

Sample 1:

```
REM  This Word for Windows Macro copies a multi-page PROFS note from the host into
REM  the insertion point of the current Word for Windows document. The Macro first
REM  checks to make sure that a PROFS Note has been selected on the host, and
REM  displays a warning message and exits if no Note is detected. If a Note is found,
REM  then the Note is copied screen by screen and pasted into the Word document, and
REM  keystrokes are sent to the host session to return it to the in-basket panel.

Sub MAIN
        REM ***** Terminate all current DDE conversations and initiate one with Extra! for
        REM ***** Windows, and attempt to connect to Session A (the first configured
        REM ***** session).
        DDETerminateAll
        dcl = DDEInitiate("Extra!", "A")
        REM ***** Check to see if the PROFS Note is displayed and continue if it is,
        REM ***** otherwise put up a warning message and terminate.
        DDEPoke(dcl, "Search", "VIEW THE NOTE")
        Test$ = DDERequest$(dcl, "Search")
        If Left$(Test$, 1) <> "0" Then Goto Copy
        MsgBox("You must first select a PROFS Note on the host!")
        Goto Quit
Copy:
        REM ***** Copy successive pages of the PROFS Note into the string variable
        REM ***** Note$.
        FirstScreen = 1
        Note$ = ""
        NotDone = 1
        While NotDone
          GetString$ = ""
```

```
If FirstScreen Then
  REM ***** Get first screen of PROFS Note
  GetString$ = DDERequest$(dcl, "P81L1678")
  FirstScreen = 0
Else
  REM ***** Get next screen of PROFS Note
  GetString$ = DDERequest$(dcl, "P161L1598")
End If
REM ***** Add current screen to Note buffer
Note$ = Note$ + GetString$
REM ***** Check to see if END OF NOTE has been reached on the Host
If InStr(GetString$, "E N D") Then
  NotDone = 0
End If
REM ***** If not at END OF NOTE, send a PF10 to the Host to move to the next
REM ***** page of the PROFS Note.
If NotDone Then
  DDEPoke dcl, "Keystroke", "@a"
End If
REM ***** Wait for Host to repaint screen
DDEExecute(dcl, "[Pause(1)]")
Wend
REM ***** Copy of PROFS Note from Host completed, Paste it into the current
REM ***** Word for Windows document.
For counter = 1 To Len(Note$) Step 80
  Insert Mid$(Note$, counter, 80)
  If((counter - 1) Mod 1600) <> 0 Then
    InsertPara
  End If
Next counter
REM ***** Paste of PROFS Note into document complete, send a PF12 to the Host
REM ***** to return to the PROFS in-basket.
DDEPoke dcl, "Keystroke", "@c"
REM ***** Terminate the DDE conversation with EXTRA! for Windows
DDETerminate(dcl)
Quit:
End Sub
```

Sample 2:

```
REM  This Word for Windows Macro allows a user to open a Word for Windows document
REM  that is stored on the host.  The Macro has the intelligence to query the user for their
REM  USERID and Password, log into a host session, present the user with a list of the
REM  files available on the host, transfer the selected file to a PC file, then open that
REM  file in Word for Windows.  This macro makes extensive use of EXTRA! for
REM  Windows' Host Aware DDE capabilities, and also shows how to structure a macro
REM  to completely handle the interaction with the host.  Note that the user is
REM  never required to directly interact with the host session for any reason.  Upon
REM  successful completion of the file transfer, the macro will logoff from the host session
REM  that was established.

REM ***** 16 files max per file list *****
      Dim Shared FileList$(15)

Sub MAIN
      REM ***** Definition of Dialog box used to get USERID and Password
      Begin Dialog UserDialog 380, 80
        GroupBox 12, 4, 266, 70, "Please Enter Account and Password"
        Text 24, 25, 70, 13, "Account:"
        TextBox 128, 24, 136, 18, .Account
        Text 24, 50, 70, 13, "Password:"
        TextBox 128, 48, 136, 18, .PASSWORD
        OKButton 286, 20, 80, 21
        CancelButton 286, 45, 80, 21
      End Dialog
      Dim Accntrec As UserDialog

      REM ***** Terminate all current DDE conversations and initiate one with EXTRA!
      REM ***** for Windows, and attempt to connect to Session A (the first configured
      REM ***** session).
      DDETerminateAll
      dcl = DDEInitiate("Extra!", "A")

StartSearch:
      REM ***** This main loop determines which mainframe screen is present, and calls
      REM ***** the appropriate routine to move to the next mainframe screen.
```

```
        timer = 0
        While timer < 100
          If FindHostText(dcl, "Ready") Then Goto DisplayFiles
          If FindHostText(dcl, "USERID") Then Goto UserName
          If FindHostText(dcl, "incorrect password") Then Goto BadPassword
          If FindHostText(dcl, "Reconnected") Then Goto Reconnected
          If FindHostText(dcl, "MORE. .") Then Goto MORE
          timer = timer + 1
        Wend
        REM ***** The current host screen is unrecognized, put up a warning message
        MsgBox "Unrecognized Host Panel!"
        Goto Finish


UserName:
        REM ***** Host is at logon banner.  Put up dialog to get USERID and Password,
        REM ***** then send those to the host to logon.
        On Error Goto Quit
        Dialog Accntrec
        On Error Goto 0
        If Accntrec.Account = "" Then Goto UserName
        If Accntrec.PASSWORD = "" Then Goto UserName
        Aname$ = Left$(Accntrec.Account, 8)
        Pwrd$ = Accntrec.PASSWORD
        SendHostKeys dcl, Aname$
        SendHostKeys dcl, Pwrd$
        SendHostKeys dcl, "@E"
        REM ***** Check to see if user is already logged on in another session.
        If FindHostText(dcl, "Already logged on") Then Goto Busy
        Goto StartSearch


BUSY:
        REM ***** If user is logged on to another session, put a warning message and
        REM ***** send keystrokes to get the host back to the logon banner.
        MsgBox "That Account is already in use", "EXTRA! for Windows"
        SendHostKeys dcl, "LOGOFF@E"
        Goto StartSearch


BadPassword:
```

```
REM ***** If password was incorrect, put up a warning message and
REM ***** prompt for new USERID and Password.
SendHostKeys dcl, "LOGOFF@E"
MsgBox "Bad Password, please try again", "EXTRA! for Windows"
SendHostKeys dcl, "@E"
Goto StartSearch

Reconnected:
    REM ***** If user was reconnected, send the BEGIN command to the host
    SendHostKeys dcl, "begin@E"
    SendHostKeys dcl, "begin@E"
    Goto StartSearch

MORE:
    REM ***** If user's session is holding at MORE...., then send CLEAR SCREEN
    REM ***** keystroke to host.
    SendHostKeys dcl, "@C"
    Goto StartSearch


DisplayFiles:
    REM ***** Get the list of available Display Host Files using the FILEL utility on the
    REM ***** Host.
    SendHostKeys dcl, "FILEL@E"
Fileloop:
    REM ***** Wait for the list of files to be displayed by the host
    WaitForHostText dcl, "Directory"
    REM ***** Call the subroutine to get the list of files from the Host screen and put
    REM ***** them into the FileList$[] array..
    GetList dcl

    REM ***** Define and display the dialog box with the list of available host files.
    Begin Dialog UserDialog 430, 240
        GroupBox 12, 4, 266, 230, "Select Host File Name:"
        ComboBox 14, 20, 260, 214, FileList$(), .FileName
        OKButton 286, 20, 80, 21
        CancelButton 286, 45, 80, 21
        CheckBox 286, 70, 120, 21, "More Files", .More
    End Dialog
```

```
Dim Files As UserDialog

Files.FileName = "No File"
Files.More = 0
GetCurValues Files
On Error Goto Quit
Dialog Files
On Error Goto 0


REM ***** The following section manages the dialog box and ensures that a valid
REM ***** filename was selected by the user from the listbox. When the ENDEXT
REM ***** label is reached, PCFile$ and HostFile$ contain the file identifiers
REM ***** needed to perform the file transfer from the Host.
If(Files.FileName = "No File")  Or  (Left$(Files.FileName, 1) = " ") Then
  MsgBox "No Valid File Name was Selected, Please Try Again"
  Goto Fileloop
End If
REM ***** If More Files was checked, get next screen full of files
If Files.More = 1  Then
  SendHostKeys dcl, "@8"
  Goto Fileloop
End If
SendHostKeys dcl, "@3"
For rootlen = 1 To 8 Step 1
  If Mid$(Files.FileName, rootlen, 1) = " " Then
  Goto Endroot
  End If
Next rootlen
Endroot:
  rootlen = rootlen - 1
  For extlen = 1 To 3 Step 1
    If Mid$(Files.FileName, extlen + 9, 1) = " " Then
    Goto Endext
    End If
  Next extlen
Endext:
  extlen = extlen - 1
  PCFile$ = Left$(Files.FileName, rootlen) + "." + Mid$(Files.FileName, 10, extlen)
```

```
        HostFile$ = Files.FileName

RECEIVE:
        REM ***** Receive the selected file from the Host ************
        receive$ = "[Receive File (d:\winword\library\" + PCFile$ + " A: " + Hostfile$ + ")]"
        DDEExecute(dcl, receive$)

        REM ***** Look for the Ready prompt to know that the transfer is complete
        While Not(FindHostText(dcl, "Ready"))
            DDEExecute(dcl, "[Pause(4)]")
        Wend

        REM ***** File transfer from host complete, now open the file in Word
        FileOpen "d:\winword\library\" + PCFile$

Finish:
        REM ***** Before terminating the DDE conversation with Extra! for Windows, send
        REM ***** the keystrokes to the Host to log the user off
        SendHostKeys dcl, "LOGOFF@E"
        SendHostKeys dcl, "@E"
Quit:   DDETerminate(dcl)
End Sub


REM ******************************************************************
REM  The following are subroutines that have been defined for commonly
REM  used functions, such as sending keys to a mainframe session, and searching
REM  a host session for the existence of a text string.
REM ******************************************************************


REM **************** Function FindHostText*************************
REM  Function to Search the Host Session for the existence of test$, returns
REM  either zero if the string is not found, non-zero if it is found.  This function uses Extra!
REM  for Windows' DDE capabilities to search the host screen for the desired text.
REM ******************************************************************

Function FindHostText(channel, test$)
        DDEPoke(channel, "Search", test$)
        check$ = DDERequest$(channel, "Search")
```

```
        If Left$(check$, 1) = "0" Then
          FindHostText = 0
        Else
          FindHostText = 1
        End If
End Function


REM ******************Subroutine WaitForHostText ***************************
REM  This Subroutine is similar to Function FindHostText above, but will search for a text
REM  string on the host screen until it is found (i.e. wait for the Host to complete updating
REM  the screen), or until the countdown timer variable 'timer' reaches 200 (approximately
REM  20 seconds).  Like the above function, WaitForHostText uses the DDE capabilities
REM  of EXTRA! for Windows to search the screen, but also uses Extra! for Windows'
REM  DDE pause function.
REM ***********************************************************************

Sub WaitForHostText(channel, test$)
        timer = 0
        found = 0
        While(found = 0) And(timer < 200)
          DDEPoke(channel, "Search", test$)
          check$ = DDERequest$(channel, "Search")
          If Left$(check$, 1) = "0" Then
            found = 0
          Else
            found = 1
          End If
          DDEExecute(channel, "[Pause (4)]")
          timer = timer + 1
        Wend
        If timer = 200 Then MsgBox("Timed out searching for " + test$)
End Sub


REM *************** Subroutine SendHostKeys ***************
REM  This subroutine uses EXTRA! for Windows' DDE Keystroke ability to send
REM  the requested keystrokes to the Host session.
REM ***********************************************************************
```

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```
Sub SendHostKeys(channel, keys$)
      DDEPoke(channel, "Keystroke", keys$)
End Sub
REM *************** Subroutine GetList *******************
REM  The GetList subroutine uses the DDE capabilities of EXTRA! for Windows to
REM  read the list of files off the Host  screen.  Note the ability to select an individual
REM  field (protected or unprotected) with a single DDE rather than having to search
REM  the host presentation space with your program.
REM *******************************************************************************

Sub GetList(channel)
      WaitForHostText(channel, "X E D I T")
      For Filenum = 0 To 15 Step 1
         Field$ = "F" + Mid$(Str$(Filenum + 1), 2, 2) + "U"
         HostFileName$ = DDERequest$(channel, Field$)
         FileList$(Filenum) = Mid$(HostFileName$, 7, 17)
      Next Filenum
End Sub
```

Translating Files Using the ANSI Character Set

Microsoft Windows uses the ANSI character set, rather than
the ASCII character sets that DOS uses, because ANSI
contains a full set of all international characters. Therefore,
EXTRA! now uses the ANSI character set for file transfers.
All of your characters, such as è and ü, will translate
correctly.

If you have a DOS text file, which is in ASCII, and you want
to convert it to ANSI before transferring it to the mainframe,
you can convert it using Microsoft Windows Write. Open
up Write in Windows, then open the ASCII file in Write.
Write will ask if you want to convert the file to Write format;
select Yes. The file will then be in ANSI format.

Mapping Terminal Languages Using Country Extended Code Page (CECP)

Country Extended Code Page (CECP) is IBM's standard for terminal language mapping on the mainframe. The main benefit of CECP is that it provides a single character set for all of the languages that have CECP support defined.

This release of *EXTRA!* includes support for the CECP mainframe language mappings. In order to continue support for older mainframe applications that do not support CECP, we have supplied the pre-CECP versions of the languages as well.

Selecting a Terminal Language

You can select what mainframe language your terminal should use to communicate with the mainframe. A CECP language is one of the options you can select—for most mainframe languages, it is not the default.

1   In the EXTRA! Executive window, select "Host Language..." from the Configure menu. The Host Language dialog box appears on your screen.

2   Select a host language. This language will be used in all your sessions that use this configuration. Both the old language mappings and the CECP mappings are in the list box; if you want *EXTRA!* to support CECP, then select one of the CECP languages.

When you save the configuration, the language information is saved with it.

2 Installing
EXTRA! for Windows

This chapter will help you to install *EXTRA! for Windows* efficiently and easily. Inside, you will find step-by-step instructions on how to load *EXTRA!* onto your PC, as well as thorough information on what kind of hardware and software you need to run *EXTRA!* and what optional software programs are supported by *EXTRA!* In addition, you will find information on how *EXTRA!* works with several DOS applications.

Table of Contents

Discussion: Before You Begin

Before you can begin installing *EXTRA! for Windows*, be sure that you have the right hardware and software loaded on your PC. (See "What Hardware and Software You Need" for these requirements.) After making sure you have the correct hardware and software, you are ready to install *EXTRA!* using its INSTALL program. This program will load all EXTRA's program files and then give you the option of creating a basic configuration or returning to DOS.

In your *EXTRA!* software package, you will find a diskette envelope containing the *EXTRA! for Windows* diskettes. Do not open the envelope until you have read the license agreement on the envelope. By breaking the seal on the diskette envelope, you accept the terms of that agreement.

The *EXTRA!* software program is available on two 3.5 inch diskettes, or two 5.25 inch diskettes. The diskettes for both diskette sizes are labelled as follows:

● EXTRA! for Windows Diskette 1

● EXTRA! for Windows Diskette 2

Before you install *EXTRA!* onto your system, you should make a backup copy of the diskettes and then store the master diskettes in a place where you are sure they will not be damaged. Later, in the event that your backup diskettes are damaged, you can make a new copy from your master diskettes.

Installing EXTRA! for Windows

After installing Microsoft Windows onto your hard drive and configuring it for your environment, you are ready to install *EXTRA! for Windows*. When installing *EXTRA!*, you will be asked several questions about your system, if you want to create a new basic configuration, and then all the *EXTRA!* files will be copied onto your PC's hard drive.

To copy the *EXTRA!* files onto your hard disk, follow the instructions below.

You can not install *EXTRA!* while running Windows. Do not run DOS from within Windows, or one of its applications, when you run the installation program.

1   If you are installing *EXTRA!* for the first time and want to create a basic configuration, find out what type of communications adapter is installed in your PC. You need to know what type of adapter your PC is using to communicate with the mainframe before you run *EXTRA!'s* installation program. If you don't know what type of adapter is installed on your system, ask your System Administrator.

2   Place the EXTRA! for Windows Diskette 1 into drive A.

3   Switch to drive A by typing the following at the DOS prompt:

   a: [Enter]

Make sure Windows is installed on your PC before you run INSTALL.

4   Start *EXTRA!'s* installation program by typing the following after the DOS prompt.

   install [Enter]

2-4

5   Follow the instructions that appear on your screen. If
    you are not creating a new basic configuration, *EXTRA!*
    will be installed when the program takes you back to
    DOS. But, if you are creating a new basic configuration,
    continue with the next step when the installation
    program takes you into the Windows environment and
    runs SETUP.

You are now ready to create *EXTRA!*'s basic configuration.
The installation program has copied all the *EXTRA!* files to
the drive and directory that you specified earlier, and now
EXTRA!'s setup program has taken you into the Windows
environment. In the setup program (SETUP), you will set
the basic parameters *EXTRA!* needs to run. These settings
include the parameters for the communication adapter you
specified earlier, the number of mainframe sessions you'll be
using when you run *EXTRA!*, and several mainframe session
parameters. (To save memory, SETUP is automatically
deleted from your PC when you exit it.)

6   *EXTRA!* automatically displays one of the Adapter
    Parameters dialog boxes shown on the next few pages.
    Find the one that corresponds to the adapter you
    specified earlier (the type of adapter installed on the PC
    using *EXTRA!*) and set all the parameters using the
    descriptions following the illustration. If you would
    like more detailed information about how to set these
    parameters, refer to "Setting Adapter Parameters" in
    Chapter 3, or contact your System Administrator.

Coax Adapter Parameters

```
┌─────────────────────────────────────────────────────────────┐
│  ┌─────────────────────────────────────────────────────┐    │
│  │ ▭                      SETUP                          │    │
│  │                                                       │    │
│  │                               ┌─────────────────────┐ │    │
│  │    ┌──────────────────┐       │  Edit Connection... │ │    │
│  │    │                  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓    │
│  │    │              COAX DFT ADAPTER PARAMETERS    │ ┌──┐│    │
│  │    │                                             │ │. ││   │
│  │    │   Adapter Type:                             │ └──┘│   │
│  │    │   ▓▓Attachmate 3270 Coax Adapter▓▓▓▓▓▓▓▓▓▓ ▲ │     │
│  │    │   Attachmate 3-M-1 Coax Adapter            │   │     │
│  │    │   Attachmate Advanced 3270 Adapter (PC/AT) │   │     │
│  │    │   Attachmate Advanced 3270 Adapter (PS/2)  │   │     │
│  │    │   IBM 3270/79 Emulation Adapter            │   │     │
│  │    │   IBM Advanced 3270/79 Emulation Adapter ▼ │     │
│  │ ▓▓ │  ┌─I/O Port Address:─┐   Memory Address:   │     │
│  │ ▓▓ │  │ ◉ 2D0  ○ 6D0      │   ┌───────────────┐ │  ┌─┐│   │
│  │ ▓▓ │  │ ○ AD0  ○ ED0      │   │ CE00▓▓▓▓▓▓▓▓▓▓ │ │  │.││   │
│  │    │  └───────────────────┘   └───────────────┘ │  └─┘│   │
│  │    │                                             │     │   │
│  │    │  ┌──────────┐              ┌──────────┐     │     │   │
│  │    │  │    OK    │              │  Cancel  │     │     │   │
│  │ Ext│  └──────────┘              └──────────┘     │     │   │
│  │    ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓     │     │   │
│  │                                                       │   │
│  │   ┌──┐                                                │   │
│  │   │▤▤│                                                │   │
│  │   └──┘                                                │   │
│  │ Program Manager                                       │   │
│  └─────────────────────────────────────────────────────┘    │
└─────────────────────────────────────────────────────────────┘
```
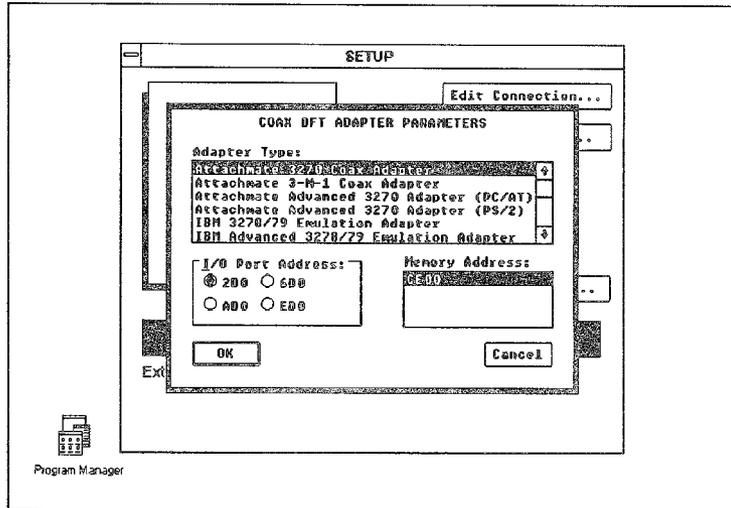
Adapter Type: Select the type of adapter that your
system uses.

I/O Port Address: (Default 2D0) Select the starting
address of your adapter's I/O registers.

Memory Address: (Default CE00) Select the starting
address where your adapter's random access memory
(RAM) is mapped in your PC's memory.

NETBIOS Adapter Parameters

```
┌──────────────────────────────────────────────────────────────┐
│ ┌──────────────────────────────────┐                          │
│ │ NETBIOS ADAPTER PARAMETERS       │                          │
│ │ User Name:             ┌─────────┴──── SETUP ──────────────┐ │
│ │ ┌──────────────────┐   │                                   │ │
│ │ │                  │   │         ┌─ Edit Connection... ─┐   │ │
│ │ └──────────────────┘   │         └──────────────────────┘   │ │
│ │ ┌─Adapter─────────┐    │         ┌─ Edit Sessions... ───┐   │ │
│ │ │ ⦿ Primary  ○ Alternate         └──────────────────────┘   │ │
│ │ └─────────────────┘    │                                   │ │
│ │ Resources:             │                                   │ │
│ │ ┌────────────────────┐ │                                   │ │
│ │ │ [--Undefined-->]   │ │                                   │ │
│ │ │ [--Undefined--]    │ │                                   │ │
│ │ │ [--Undefined--]    │ │                                   │ │
│ │ │ [--Undefined--]    │ │                                   │ │
│ │ └────────────────────┘ │                                   │ │
│ │ ┌─Copy─┐ ┌─Paste─┐ ┌─Edit...─┐    ┌─ Done ... ─┐           │ │
│ │ └──────┘ └───────┘ └─────────┘    └────────────┘           │ │
│ │ ┌─ OK ─┐ ┌─Reset─┐ ┌─Cancel─┐                              │ │
│ │ └──────┘ └───────┘ └────────┘                              │ │
│ │       ▓▓▓▓▓▓▓▓ Attachmate ▓▓▓▓▓▓▓▓                         │ │
│ └────────────────────────────────────────────────────────────┘ │
│         Extra! for Windows is a trademark of Attachmate Corporation. │
│                                                                │
│ ┌──┐                                                           │
│ │▓▓│                                                           │
│ └──┘                                                           │
│ Program Manager                                                │
└──────────────────────────────────────────────────────────────┘
```
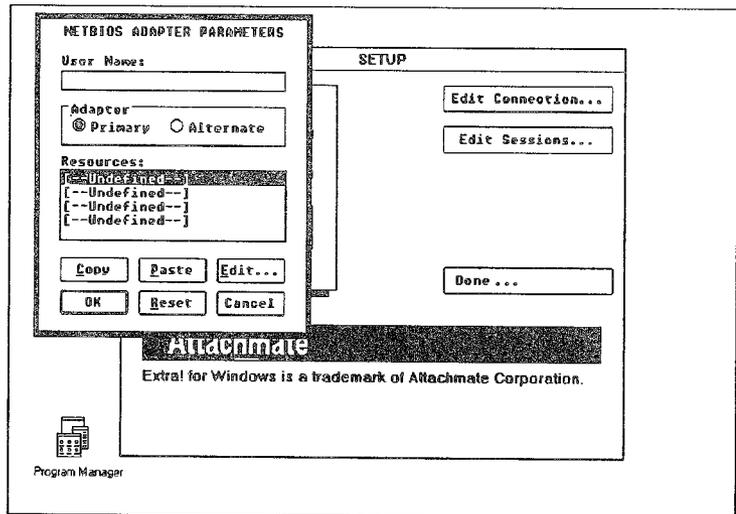
User Name: Enter your local LAN workstation name or any other unique name (1 - 15 characters).

Adapter: (Default Primary) Always select "Primary" unless your PC has two adapter cards installed in it. When using two adapter cards, set the second card to "Alternate."

Resources: Define a resource for each mainframe session (up to four) that you will be using. Resources are "logical units" or pools of logical units; each resource in this dialog box represents a single, separate mainframe connection.

To define a resource, highlight the first undefined resource and select "Edit." The dialog box shown on the next page will be displayed on your screen.

```
                  RESOURCE PARAMETERS

         Name: [==Undefined==]

         ┌─Station Type─┐ ┌─LU Type──┐
         │ ◉ Attachmate │ │ ◉ Terminal│
         │ ○ IBM        │ │ ○ Printer │
         └──────────────┘ └───────────┘

         ☐ Keyboard Override

         ┌───────────┐      ┌───────────┐
         │    OK     │      │  Cancel   │
         └───────────┘      └───────────┘
```

Name: Enter the name that your gateway uses for the resource. See your System Administrator for available resource names.

Station Type: (Default Attachmate) Select "Attachmate" unless you are using an IBM 3270 Emulation Program gateway. If you are using an IBM program, select "IBM."

LU Type: (Default Terminal) If you have set "Station Type" to IBM, select "Terminal" if you want to emulate a 3270 mainframe terminal or "Printer" if you want to emulate a 3270 mainframe printer.

Keyboard Override: (Default Off) If you have set "Station Type" to Attachmate, select this option if you want *EXTRA!* to ask you for a resource each time you open a session.

Once you've defined one resource and returned to the NETBIOS Adapter Parameters dialog box, you can copy its settings to other resources by using the "Copy" and "Paste" commands. Highlight the resource you just defined and select "Copy." Now highlight the next undefined resource and select "Paste." Repeat this step until you define all the resources you need, then select "OK."

Token-Ring DLC Adapter Parameters

```
┌──────────────────────────────────────────────────────────┐
│                    SETUP                                   │
│              TOKEN-RING DLC ADAPTER PARAMETERS       [ .. ]│
│           ┌─Parameters────────────────────────────┐   [.] │
│           │ Physical Unit ID:        [01700000   ]│       │
│           │ DLC Destination Address: [40000000000D1]│     │
│           │ LAN Adapter Number:      [0]           │       │
│           │ DLC Service Access Point:[04]          │       │
│           │                                        │       │
│           │ ┌─I-Frame Size──────────────────────┐  │       │
│           │ │ ⊙ 265  ○ 521  ○ 1033 ○ 2042 ○ 3964│  │  [ .. ]│
│           │ │ ○ Custom I-Frame Size: [       ]   │  │       │
│           │ └───────────────────────────────────┘  │       │
│           │ ☒ End with REQDISCONTACT (REQDSC)      │       │
│        Ex │ □ IBM PC/3279 Gateway Connection       │       │
│           │ [   OK   ]               [ Cancel ]    │       │
│           └────────────────────────────────────────┘       │
│ Program Manager                                            │
└──────────────────────────────────────────────────────────┘
```
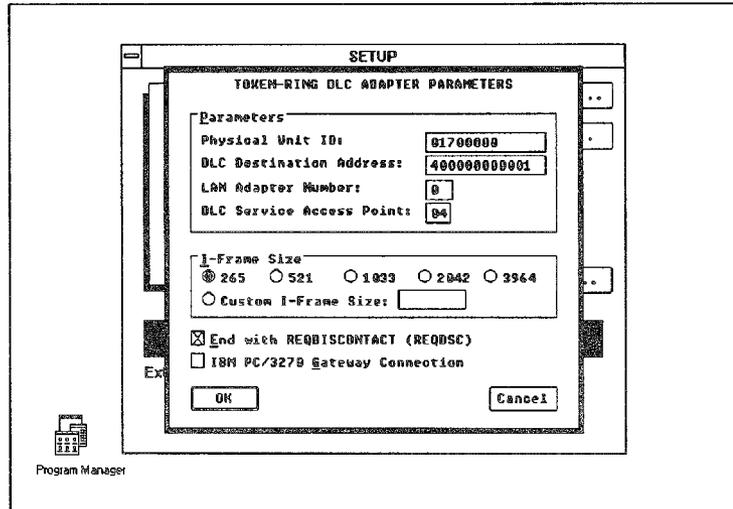
Physical Unit ID: Enter the Physical Unit ID (PUID) number assigned to your workstation.

DLC Destination Address: Enter the 12-digit number that represents the destination address of the TIC on your controller, FEP, or mainframe. This number is also called the Locally Administered Address (LAA).

LAN Adapter Number: (Default 0) Specify whether the token-ring card installed in your PC is primary or secondary. Enter 0 for primary or 1 for secondary.

DLC Service Access Point: (Default 04) Specify the Service Access Point (SAP) defined by your mainframe.

I-Frame Size: Select an I-Frame size that is consistent with both your PC's token-ring card and the I-Frame size specified at your mainframe.

End with REQDISCONTACT: (Default On) Select
this parameter if your mainframe is configured for "End
with REQDISCONTACT."

IBM PC/3270 Gateway Connection: (Default Off)
Select this parameter if your gateway is using IBM
PC/3270 gateway software.

7   Specify the number of mainframe sessions that you will
     use when running *EXTRA!* (see the illustration below).
     This includes both printer and emulator (terminal)
     sessions.
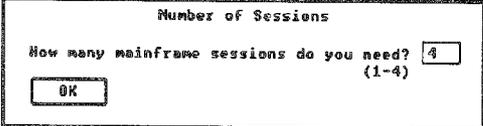
```
╔══════════════════════════════════════════════════╗
║              Number of Sessions                    ║
║                                                    ║
║  How many mainframe sessions do you need?  [4]     ║
║                                    (1-4)           ║
║    [  OK  ]                                         ║
╚══════════════════════════════════════════════════╝
```

8   Set each mainframe session's parameters. The dialog
     box shown on the next page will automatically be
     displayed on your screen. Make sure that each
     mainframe session listed in the dialog box is the correct
     type. Highlight each session and then select "Terminal"
     if you want to emulate a 3270 mainframe terminal in
     the session, or select "Printer" if you want to emulate a
     3270 mainframe printer. Then select the mainframe
     terminal model you want *EXTRA!* to emulate from the
     profile list. Repeat this step for each session listed.

```
┌─────────────────────────────────────────────────┐
│  [−]              E4WSETUP                        │
│ ┌─────────────────────────────────────────────┐  │
│ │                          [ Edit Connection... ]│ │
│ │        ┌──────────────────────────┐           │
│ │   ▓▓   │      SESSION SETUP        │  ions...  │
│ │   ▓▓   │ Session:                  │           │
│ │   ▓▓   │ M NetBIOS0    ┌Type──┐    │ plete...  │
│ │        │ O NetBIOS1    │ ◉ Terminal│           │
│ │        │ P NetBIOS2    │ ○ Printer │           │
│ │        │                           │           │
│ │   W.1  │ Profile:                  │           │
│ │        │ ┌───────────────────────┐ │           │
│ │        │ │                       │ │           │
│ │  ▓Att▓ │ │                       │ │           │
│ │ Extra! for │ ┌──────┐            │ │ oration.  │
│ │        │ │ OK    │                │ │           │
│ │        └──────────────────────────┘           │
│ └─────────────────────────────────────────────┘  │
│ ▦                                                 │
│ Program Manager                                   │
└─────────────────────────────────────────────────┘
```
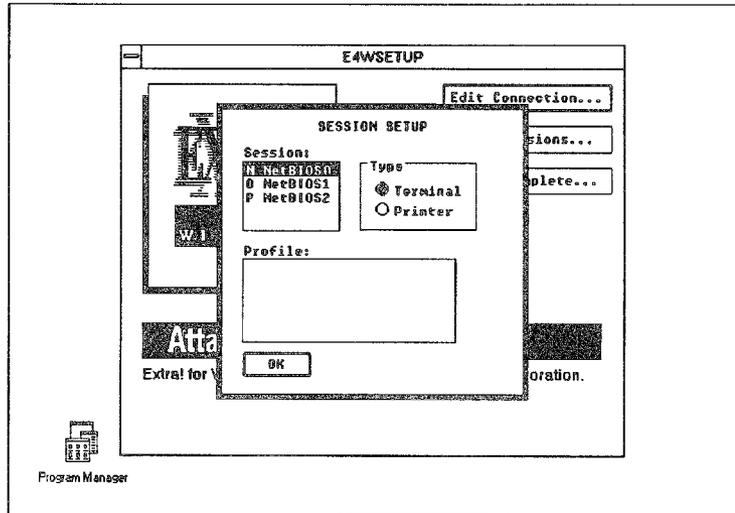
9   You may now review and change any of the parameters
     you've set by selecting "Edit Connection. . ." or "Edit
     Sessions. . ."

10   Once you are done editing the the adapter and session
     parameters, select "Done. . ." The dialog box shown
     below will be displayed on your screen.


```
┌─────────────────────────────────────────────────┐
│  [−]              E4WSETUP                        │
│ ┌─────────────────────────────────────────────┐  │
│ │                          [ Edit Connection... ]│ │
│ │  ▀▀▀                                          │
│ │ ┌─────────────── SETUP COMPLETE ─────────────┐│ │
│ │ │ Congratulations, you have successfully installed Extra! for Windows. │
│ │ │                                            ││ │
│ │ │ You may now run the terminal emulator by pressing the RUN EXTRA! │
│ │ │ button or you can return to Windows by selecting the DONE button. │
│ │ │                                            ││ │
│ │ │ To manually run Extra! for Windows select the Emulator icon in the │
│ │ │ Extra! for Windows program group.  For more information on │
│ │ │ customizing Extra! for Windows refer to your  Users Manual. │
│ │ │ [ Run Extra! ]              [ Exit to Windows ]│ │
│ │ └────────────────────────────────────────────┘│ │
│ │    Extra! for Windows is a trademark of Attachmate Corporation. │
│ └─────────────────────────────────────────────┘  │
│ ▦                                                 │
│ Program Manager                                   │
└─────────────────────────────────────────────────┘
```

11 From the "Setup Complete" dialog box shown on the previous page, you have the following options.

TO RUN ...	SELECT...
EXTRA!	"Run EXTRA!." You will go directly into *EXTRA! for Windows'* Executive window.
Windows	"Run Windows." You will go directly into Microsoft Windows. INSTALL has added the *EXTRA!* Program Group to Windows. From that new program group you can open a mainframe session or further customize *EXTRA! for Windows.*

What Hardware and Software Do You Need?

This section explains what kind of hardware and software you need to run *EXTRA! for Windows.* It includes the general requirements needed to run *EXTRA!* and the specific requirements for different connection types.

General Require-ments

This section contains the general requirements that are needed to run *EXTRA!*, regardless of the type of connection you are using. For the specific requirements that depend on the connection type, refer to one of the sections that follow.

GENERAL REQUIREMENTS

TYPE	REQUIREMENTS
Computers	Must be compatible with one of the following: • IBM 286/386 • PS/2
Monitor	Must have one of the following: • Monochrome Graphics Monitor • Enhanced Color Monitor Note: A 200-line color monitor will not display *EXTRA! for Windows* correctly.
Graphics Adapter	Must be compatible with one of the following: • Hercules • EGA • VGA Note: Each PC running *EXTRA!* needs a graphics adapter card.
Keyboard	Must be compatible with one of the following: • PC/AT Standard keyboard (84-key) • IBM Enhanced keyboard (101-key) Note: If you are using an 84-key keyboard with Attachmate mapping, some of the top row letters on the keyboard used with the [Alt] key are unavailable as menu keys because they are used as 3270 function keys.

Installing EXTRA!

GENERAL REQUIREMENTS (Cont.)

TYPE	REQUIREMENTS
Mice	Must be compatible with requirements for Windows 2.0 and above. If you are not sure, consult the Microsoft compatibility list included in your Windows package.
Disk space and RAM	For Windows/286: • 3 megabyte disk space • 640K RAM (Random Access Memory) For Windows/386 • 3 megabytes disk space • 640K RAM (Random Access Memory) Note: *EXTRA!* is also compatible with any Windows-supported expanded memory.
Disk Drives	One hard drive, and at least one floppy drive that accepts 3.5 or 5.25 inch disks.
Windows	Windows 3.0 or Windows version 2.xx.
Operating System	DOS 3.0 or above. Note: DOS 3.0 has a few limitations in the LAN environment. Consult your DOS documentation or a DOS technical support representative for details on these limitations.
Software Network Drives	*EXTRA!* is compatible with IBM's LAN Support Program, IBM's TOKREUI, and any IBM-compatible LAN NETBIOS.

COAX Connection Requirements

This section contains the requirements that are needed when you are using a Coax connection to communicate with your mainframe.

COAX CONNECTION REQUIREMENTS

TYPE	REQUIREMENTS
Supported Coax Adapters	One of the following adapters must be installed on your PC. • Attachmate 3-N-1 Coax Adapter • Attachmate 3270 Coax Adapter • Attachmate Advanced 3270 Adapter • Attachmate Advanced 3270 Adapter/2 (for the PS/2) • IBM 3278/Emulation Adapter • IBM Advanced 3278/79 Emulation Adapter • IBM 3270 Connection (for the PS/2)
Compatible Systems	The following hardware and software are some of the systems supported by *EXTRA!* • 3174, 3274, and 3276 Cluster Control Units • 360, 370, 3081, 3083, 3090, 4300, and 9370 Mainframes
Supported Software	*EXTRA!* can co-exist with these two software products in the same PC without limiting their capabilities: • 4700 Financial Systems • SNA and Bisync Protocols

Installing EXTRA!

LAN Connection Requirements

This section contains the requirements that are needed when you are using a LAN connection to communicate with your mainframe.

LAN CONNECTION REQUIREMENTS

TYPE	REQUIREMENTS
Supported LAN Adapters	*EXTRA!* will work on any LAN adapter that supports NETBIOS, including, but not restricted to, one of the following: • IBM PC Network Adapter • IBM PC Network Adapter II/A • IBM Token-Ring Network PC Adapter, types /I, /II, and /A • IBM PC Network Baseband Adapter • Ungermann-Bass LAN PC Adapter
Gateway Software	Gateways must have one of the following software packages loaded: • Attachmate Gateway Option • IBM PC 3270 Emulation Program (Version 3.01 or later).
Network Software	*EXTRA!* can co-exist with any network operating system software that fully supports IBM compatible NETBIOS. These software packages include, but are not restricted to, the following: • IBM PC Network Program • Novell Netware • Ungermann-Bass Net/One • 3Com 3+ Network Program

EXTRA! will co-exist with the workstation version of this software, but not with the server version. *EXTRA!* must not be run on your network's server. It must be run on a separate PC.

Token-Ring DLC Connection Requirements

This section contains the requirements that are needed when you are using a Token-Ring DLC connection to communicate with your mainframe.

TOKEN-RING DLC CONNECTION REQUIREMENTS

TYPE	REQUIREMENTS
Interface Coupler	IBM's Token-Ring Interface Coupler (TIC) must be installed in a 3720, 3725, or 3745 Front End Processor, a 3174 Control Unit, or a 9370 mainframe.
Supported LAN Adapters	*EXTRA!* will work with any token-ring LAN adapter, including, but not restricted to, any at the following: • IBM PC Network Adapter II/A • IBM Token-Ring Network PC Adapter, types /I, /II, or /A
Supported Software	*EXTRA!* can co-exist with a number of LAN software packages. These packages include, but are not restricted to, the following: • IBM PC Network Program • Novell Netware • Ungermann-Bass Net/One • 3Com 3+ Network Program

EXTRA! will co-exist with the workstation version of this software, but not with the server version. *EXTRA!* must not be run on your network's server. It must be run on a separate PC.

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Changes to Files During Installation

During the installation of *EXTRA!*, the WIN.INI and AUTOEXEC.BAT files are modified.

When you run Windows, the Windows program consults the WIN.INI file for important information regarding the configuration of Windows. Modifying the WIN.INI file is necessary for allowing *EXTRA!* to run under Windows. The information that installation adds to your WIN.INI file looks something like the following lines.

> *[Extra!]*
> *Directory=C:\windows\extrawin*
> *Startup=extra.ewc*

The first line tells Windows that the next few lines pertain to *EXTRA!*; the second line gives Windows the DOS path to *EXTRA!*—in accordance with the selection you made during installation—and the third line tells Windows the configuration *EXTRA!* uses by default, which is EXTRA.EWC.

The installation program also adds the following two lines to the [extensions] section in your WIN.INI file.

> *ewl=extra!.exe ^.ewl*
> *ewc=extra!.exe ^.ewc*

The *ewl* line lets *EXTRA!* start up with a particular screen layout when you click on or run the layout you want to use (see Chapter 4 for more information on screen layouts). Similarly, the *ewc* line lets *EXTRA!* start up with a particular configuration if you have more than one (see Chapter 3 for more information on configurations).

The third addition to the WIN.INI file is the section which
specifies where to find the EXTRA! message log file and
tracing file, and gives their default configurations. This
section looks something like the following:

[Extra!Log]
XTrace API=APITrace, 0, 1, 1, 150, 0, 1, 0, 1,
XLog=XLog, 0

In addition to changing the WIN.INI file during installation,
EXTRA! also modifies the AUTOEXEC.BAT file. In this file,
EXTRA! adds a path statement telling DOS the path to your
EXTRA! files.

Getting the Most out of Your PC's Memory

When you are running *EXTRA! for Windows* under real
mode, there are certain parameters you can add to your
WIN.INI file to optimize memory usage. The list below
gives some useful hints to help you set-up Windows, and
also to save memory when booting up DOS.

● Make sure that you do not allocate too many open files
and buffers in the CONFIG.SYS file.

● Do not load unnecessary device drivers. For instance,
you could use alternate configuration files when you're
switching to non-Windows applications that need a
specific device driver.

These drivers will compete for memory, especially if
you are running Windows 3.0 in either real mode, or as
a virtual machine in enhanced mode.

- Do not load unnecessary Terminate-Stay-Resident programs (TSRs). For instance, since Windows provides a mouse driver, there is no need to load MOUSE.COM.

- If you are running Windows/286 version 2.xx, add the following command to your CONFIG.SYS file:

    device=himem.sys

  This command allows Windows to run 64K of its code from extended memory. This frees 45K of conventional memory so that *EXTRA!* can perform better under normal conditions, and run in low memory conditions. Windows/386 does this internally. (The file in this command is not the same as Windows 3.0's *himem.sys* file. The Windows 3.0 file is an extended memory driver.)

- If you are connecting to the host via a token-ring DLC connection, when loading the DLCINTFC utility use the /I=xxx parameter. For instance, if your DLC connection uses an I-frame size of 265, the command line in your AUTOEXEC.BAT file would look like this:

    DLCINTFC /I=265

  If you do not specify the /I parameter, DLCINTFC will default to a 2K I-frame size. The difference in memory would be about 25K. (For additional information on DLCINTFC parameters, refer to the *EXTRA! for Windows Reference Manual*, Appendix B.)

Software Compatibility Issues

EXTRA! can be used with a number of PC applications. Although it would be impossible to list all of them here, this section covers some helpful hints that will help you run some of the most commonly used applications.

Running DOS Applications

You can run DOS applications under Windows no matter what mode Windows is running in—either real, standard, or enhanced. The difference is that when Windows is running in real or standard mode, you can only run one application at a time, all other applications are suspended. But, if Windows is running in enhanced mode, you can run several DOS applications, as well as Window's applications, at the same time.

Enhanced mode, sometimes called 386 mode, provides you with two important features. First, it allows your PC to act as a virtual machine and secondly, it allows you to run two or more DOS applications at the same time. To run in

Virtual Machine. A computer whose memory is structured so that each application is tricked into thinking it has more available memory than it actually has.

enhanced mode, your PC must use a 386, 386SX, or newer processor.

For information on setting DOS applications to exclusive mode, refer to your DOS manual.

Sometimes, when you are running multiple applications with Windows in enhanced mode, one of them may be set to run in exclusive mode. When this happens, the exclusive DOS application will force Windows to suspend any other application that

Exclusive DOS Application. A DOS application that is running in exclusive mode. It gets most, but not all, of your PC's resources when it is running in an active window.

is running (such as EXTRA!) and only run the one application. For example, if you were running EXTRA! at

the same time you tried to run an exclusive DOS application, EXTRA! would be suspended and lose its connection to the mainframe.

To allow *EXTRA!* to work with exclusive DOS applications, *EXTRA!*'s Enhanced 386 driver (VE4WD.386) must be loaded on your PC. To load the driver automatically each time Windows runs in enhanced mode, add the following line to the enhanced section ([386Enh])of your SYSTEM.INI file.

    device=ve4wd.386

This driver overrides the exclusive mode settings that have been set for the application.

If you have loaded the driver and are not satisfied with how your exclusive mode applications run, you can disable the driver by inserting a semicolon at the front of the driver's command line as shown below.

    ;device=ve4wd.386

To enable the driver again, simple remove the semicolon from the beginning of the command line.

Running with Word for Windows

When you are using Word for Windows with *EXTRA!*, you can minimize the amount of memory Word uses by turning off some of its options when you are not using them. For instance, under the "View" option you can turn off the "Ribbon," "Ruler," and "Status Bar" options. You can also save memory by turning on "Field Codes." The "Field Codes" option displays the content of the fields in code, rather than displaying the text or graphics, thus saving memory.

There are two more menus that have options that can be turned off. Under the "View + Preferences" menu, turning both "Display as Printed" and "Pictures" off will also save memory. Under the "Utilities + Customize" menu, turning off both "Background Pagination" and "Prompt for summary Info" options will also help save conventional memory.

Running with Microsoft Excel

Microsoft Excel is fully compatible with *EXTRA!* However, for the most efficient use of your PC's memory you may want to make some changes to your WIN.INI file when you are running in real

> *Real mode. An operating mode that Windows 3.0 runs in to provide maximum compatibility with applications written for Windows version 2.xx.*

mode. Under the [Excel] section of your WIN.INI file, add the following commands. (You can use Windows Notepad, or any text editor, to modify your WIN.INI file.)

● To reduce the conventional memory needed to start Excel by about 32K, add the following command line to the [Excel] section of your WIN.INI file.

   swap=96

● If you have large spreadsheets that are wider than 60 columns, and your PC has expanded memory, you can tell Excel to load the entire worksheet into expanded memory, instead of loading portions of it in conventional memory. To load the entire spreadsheet into expanded memory, add the following command line to the [Excel] section of your WIN.INI file.

   block=2

For additional information that may help you customize Excel, browse through Excel's README file. And, if you want in-depth information on setting up Excel in your environment, refer to "Getting the Most From Your Hardware with Microsoft Excel," (a Microsoft publication).

Conclusion

In this chapter you have made backup copies of the *EXTRA!* program diskettes, and you have used the INSTALL program to load *EXTRA!* and set some of its default settings. You are now ready to either open a mainframe session or further customize your *EXTRA!* software. For information on opening a session, go to "Using EXTRA! for Windows" in your *User's Manual*. For information on customizing *EXTRA!*, continue with the next chapter, "Setting Up EXTRA! for Windows." In the next chapter you will learn how to further configure *EXTRA!* to meet your specific connectivity needs.

3 Setting up EXTRA! for Windows

This chapter guides you through the process of configuring and personalizing *EXTRA!* for your PC environment. Each phase of the process is explained thoroughly to give you a clear understanding of what you are doing.

It is assumed that you are familiar with the technical aspects of computer hardware and software and that *EXTRA!* has been installed on your PC. Although *EXTRA!* is easy to operate, its configuration should be performed by your Systems Administrator.

Table of Contents

Discussion: Configuring EXTRA! for Windows

With *EXTRA!*'s configuration feature, you have a flexible
method for personalizing the program to your specific PC
requirements. You can configure it to operate with a coax
(CUT or DFT), NETBIOS local area network (LAN), or
token-ring DLC connection, or any combination simul-
taneously. In addition, *EXTRA!* lets you choose from a
variety of session options.

The configuration process, shown in the diagram on the
following page, is simple and straightforward. The entire
process probably won't take much more than 30 minutes.
But before selecting any of the options shown in the
diagram, you should read this chapter thoroughly. For more
illustrations and descriptions of the Configure menu and
dialog boxes, see Appendix G, "A Tour of EXTRA!"

When you have finished configuring mainframe and printer
sessions on one machine, you can easily copy the configura-
tion files to other machines, cutting down on the amount of
time you spend setting up systems. You can even have
several different configurations on one machine, selecting
any one to run with *EXTRA!*

EXTRA! comes with default configurations; you might find
that these configurations suit many of your needs and that
you need to make only a few changes. You can then use this
chapter to change only those items that need changing,
rather than creating a new configuration from scratch.

Diagram of the Configure Menu and Dialog Boxes

```
┌─────────────────┐
│  New or Open    │
│  Configuration  │
└────────┬────────┘
         │              ┌─────────────────┐
         │         ┌───→│     Define      │
         │         │    │ Communications  │
         │         │    │     Profile     │
         ↓         │    └─────────────────┘
┌─────────────────┐│
│ Communications  ││   ┌─────────────────┐
│   Adapters      │←───│    Adapter      │
└────────┬────────┘    │   Parameters    │
         │             └─────────────────┘
         │
         │             ┌─────────────────┐
         │         ┌──→│  Define Logical │
         │         │   │  Unit Profile   │
         ↓         │   └─────────────────┘
┌─────────────────┐│
│    Session      │←──┐┌─────────────────┐
│    Profiles     │←───│    Terminal     │
└────────┬────────┘    │    Profile      │
         │             └─────────────────┘
         │                              ┌─────────────────┐
         │                          ┌──→│     Select      │
         │                          │   │ Communications  │
         │                          │   │    Adapter      │
         ↓          ┌───────────┐   │   └────────┬────────┘
┌─────────────────┐ │           │   │            ↓
│    Sessions     │←│ Configure │───┘   ┌─────────────────┐
│                 │ │  Session  │←──────│     Select      │
└────────┬────────┘ └───────────┘       │ Communications  │
         │                              │    Resource     │
         │                              └────────┬────────┘
         │                                       ↓
         │                              ┌─────────────────┐
         ↓                          ┌───│     Select      │
┌─────────────────┐                 │   │    Session      │
│    Keyboard     │                 │   │    Profile      │
│    Mapping      │                 │   └─────────────────┘
└────────┬────────┘
         │
         ↓
┌─────────────────┐
│ Host Attribute  │
│    Mapping      │
└────────┬────────┘
         │
         ↓
┌─────────────────┐
│     Lock        │
│  Configuration  │
└────────┬────────┘
         │
         ↓
┌─────────────────┐
│     Save        │
│  Configuration  │
└─────────────────┘
```
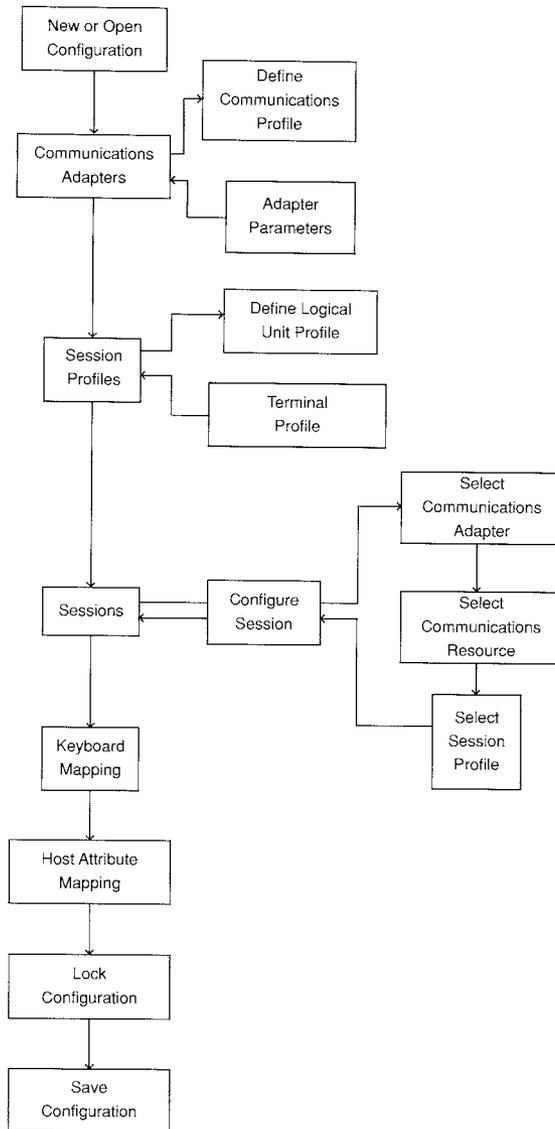
*The above diagram shows the order that the configuration
process follows through its menu and dialog boxes.*

Before You Begin

Before configuring *EXTRA! for Windows*, make sure *EXTRA!* has been installed on your machine. You also need to know the following: how to use Windows, what kind of adapter is in your PC, what directory your *EXTRA!*

> *Resource.*
> *A mainframe resource, often called a "logical unit," is any unit that you can communicate with: a port on a control unit, a pool of ports, or a terminal.*

files are stored in, how your PC is connected to the mainframe, and what mainframe resources are available. Knowing this information will make the configuration go more smoothly and quickly.

Getting Started

To begin configuring *EXTRA!*, you must be in the EXTRA! Executive window. All the configuration features fall under the File and Configure menus in this window.

1   Start Windows from the DOS prompt. The Program Manager appears on your screen.

2   Open the *EXTRA! for Windows* Program Group, either by double-clicking on it (if you have a mouse) or by selecting it and pressing [Enter].

3   Select and run the EXTRA! Executive icon, either by double-clicking on it or by selecting it and pressing [Enter]. The EXTRA! Executive window appears on your screen.

The title bar of the EXTRA! Executive displays the name of the EXTRA! configuration file (usually with the extension .EWC) that is active. If you've made a change to the configuration, the title bar will display an asterisk (*) to the right of the filename, alerting you that you may want to save the configuration.

A Guide to Configuring EXTRA!

The following table shows what tasks are involved in configuring *EXTRA!* and what commands to choose to carry out those tasks. You may find this table particularly useful if you are using one of *EXTRA!*'s default configurations and want to make changes to only selected parts of the existing configuration. The default configurations are discussed in the next section.

If you want to:	Then select:
Add or change an adapter: name, type, or settings	Configure menu— Communications Adapters...
Add or change a session profile: name, LU type, printer, terminal model, or EABs	Configure menu— Session Profiles...
Add or change configured sessions: names, connection, resource, or profile	Configure menu— Sessions...
Change the keyboard: type or mapping	Configure menu— Keyboard Mapping...
Change 3270 host colors	Configure menu— Host Attribute Mapping...
Lock this configuration	Configure menu— Lock Configuration...
Save this configuration	File menu— Save Configuration...

The Default Configuration

EXTRA! has a default configuration that is automatically installed during the installation process, described in Chapter 2. This default configuration allows you to start up EXTRA! without going through all of the configuration steps. During the installation process, you are prompted to make necessary changes to customize the default settings to fit your system. If you need assistance with the default configurations, refer to the appropriate section(s) within this chapter.

Creating a New Config- uration

If you're configuring the system for the first time, you'll want to go through the commands in the order they appear on the Configure menu. You must define at least one communications adapter and one session profile before you can configure any sessions.

> EXTRA! comes with a default configuration, as explained in the previous section. You may want to modify this file to meet your specific system needs, rather than create a new configuration.

1   Select "New Configuration..." from the File menu to create a new, empty configuration file.

2   Go to the next section in this chapter, "The Configure Menu."

Changing a Configuration

If you've configured EXTRA! previously (or are using a default configuration) and you want to change certain items in the configuration, you need to choose only those items you want to change.

> The configuration process follows the order given in this chapter. For example, you must set up a communications adapter before you can connect a session to it.

If you have already been running EXTRA! and you want to create a new configuration, or change or open an existing configuration, you have to shut down all your sessions and close the current configuration by selecting "Close Configuration" from the File menu in the EXTRA! Executive.

1   Select "Close Configuration..." from the File menu.

2 Select "Open Configuration..." from the File menu. Highlight the name of the configuration file you want to change, then choose "OK."

3 Go to the next section in this chapter, "The Configure Menu."

> **IMPORTANT:** It is recommended that you save your configuration several times as you create it. Any changes that haven't been saved will be lost if you select "Revert Configuration," or in the case of power loss or computer reboot.

The Configure Menu

The menu that you use when you set up *EXTRA!* is the Configure menu, shown below. Each menu item is a command that leads to a dialog box, or series of dialog boxes, that help you set up *EXTRA!* to run correctly with your system. After you finish configuring *EXTRA!*, you can lock and save the configuration file.
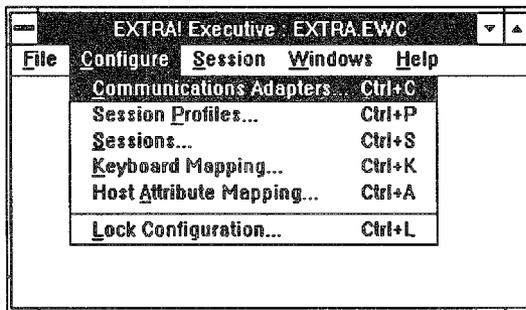
The following paragraphs describe the commands on the Configure menu.

Communications Adapters: This item allows you to define the connection adapter type (coax, NETBIOS LAN, or token-ring DLC) and settings that you will be using to communicate with the mainframe.

Session Profiles: This item allows you to create session profiles, which are definitions of how a session will emulate a mainframe terminal or mainframe printer. The parameters you set under this command include the type of terminal or printer and the terminal screen model.

Sessions: This item allows you to configure your individual mainframe and printer sessions by selecting session profiles, communication adapters, and mainframe resources, all of which you define in "Communications Adapters" and "Session Profiles."

Keyboard Mapping: This item allows you to indicate the keyboard that your PC uses.

Host Attribute Mapping: This item allows you to select how you want your PC monitor to display mainframe text colors and styles (normal, blinking, reverse video, and underlined).

Lock Configuration: This item allows you to lock the configuration items so that other users cannot change them later; it also allows you to unlock these items. By locking the configuration, only someone with the password can change the settings.

The Configure menu is arranged to lead you in a logical order through the configuration. Each item on the menu leads to one or more dialog boxes that let you select various options such as communications adapters, terminal models, and session names.

Some options in the dialog boxes are fixed, such as the terminal models and their characteristics. Others are defined by the mainframe you are using, such as adapter resources. Some options are open for you to define, such as the names of session profiles.

Communications Adapters

This command allows you to select the type of communications adapter your PC has and to set the parameters of that adapter. If you have any questions about your adapter, see your System Administrator or the manuals that came with your adapter.

You cannot connect using both coax CUT and coax DFT on the same coax adapter.

If your PC has access to enough memory and all four communications adapters— coax CUT, coax DFT, NETBIOS LAN, and token-ring DLC—you can connect to all four adapters at the same time. Just configure a number of sessions for each adapter. For example, you could configure session A for coax CUT, sessions B through E for coax DFT, sessions F through I for NETBIOS LAN, and sessions J through Z for token-ring DLC.

You have to go through the steps shown in "Defining an Adapter" for each adapter you are using.

Connection Types

There are three types of connections available for connecting *EXTRA!* to your mainframe: coax (CUT or DFT), NETBIOS LAN, and token-ring DLC. Below is a brief description of each connection type, starting with the coax connection. Follow the instructions below to select your connection type and parameters.

Coax Connection

This connection allows you to run *EXTRA!* as a coax-attached workstation connected to one of the following coax adapters: Attachmate 3-N-1, Attachmate 3270 Coax Adapter, Attachmate Advanced 3270 Adapter, Attachmate Advanced 3270 Adapter/2, IBM 3278/79 Emulation Adapter, IBM Advanced 3278/79 Emulation Adapter, and the IBM 3270 Connection.

NETBIOS LAN Connection

📝 If you are running NETBIOS and Windows/386 version 2.xx, or version 3.0 in Standard Mode, you need to load the NETBIOS Interface utility, NETINTFC.COM, before running Windows.

This connection allows you to run *EXTRA!* on a local area network (LAN). You must have NETBIOS loaded on your PC workstation and your gateway for *EXTRA!* to run, and *EXTRA!* must communicate with the mainframe through an IBM or Attachmate Gateway. Install and customize the gateway(s) before selecting this option. See Appendix B for more information about the interface utilities.

Token-Ring DLC Connection

With this option your PC can communicate over a token-ring network to a Token-Ring Interface Coupler (TIC) in a 3174 controller, 37X5 front-end processor, or 9370 mainframe. No coax connection is required. Either TOKREUI.COM, DXMT0MOD.SYS, or a compatible DLC device driver must be installed on your PC and the *EXTRA!* DLC interface (DLCINTFC.EXE) must be loaded before you start Windows. See Appendix B for more information about the interface utilities.

Read Chapter 1, "An Overview of 3270 Connectivity," for more information about each of the connection types. Your System Administrator will know what type of connection your system has.

3-11

Defining an Adapter

When you define a communications adapter, you must also set certain parameters specific to your adapter and system. To define a communications adapter and its settings, follow the instructions below.

1   Select "Communications Adapters..." from the Configure menu. Your screen displays the Communications Adapters dialog box, shown below.

```
╔══════════════════════════════════════╗
║        COMMUNICATIONS ADAPTERS         ║
║                                        ║
║   Connectivity:                        ║
║   ┌──────────────────────────────────┐ ║
║   │ Coax CUT Connectivity            │ ║
║   │ Coax DFT Connectivity            │ ║
║   │ DLC PU DFT Connectivity          │ ║
║   │ NetBIOS DFT Connectivity         │ ║
║   │                                  │ ║
║   │                                  │ ║
║   └──────────────────────────────────┘ ║
║                                        ║
║   ┌────────┐  ┌────────┐  ┌─────────┐ ║
║   │ Add... │  │ Edit...│  │ Delete  │ ║
║   └────────┘  └────────┘  └─────────┘ ║
║   ┌────────┐                           ║
║   │   OK   │                           ║
║   └────────┘                           ║
╚══════════════════════════════════════╝
```
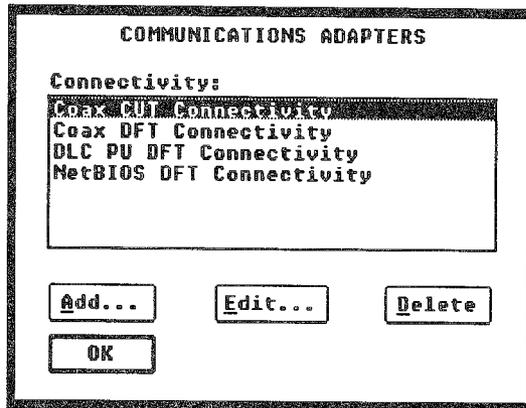
If this is a new configuration, this list box will be empty. If some adapter names have already been defined or you're using the default configuration, you will see some adapter names in the list box. From the Communications Adapters dialog box, you can edit or delete existing adapter definitions, and add new ones.

Adding an Adapter Definition

Follow the instructions below to add a new adapter definition.

1   In the Communications Adapters dialog box, select "Add..." The Define Communications Profile dialog box, shown below, is displayed on the screen.

```
        DEFINE COMMUNICATIONS PROFILE

   Profile Name:

   ┌──────────────────────────────────────┐
   │                                        │
   └──────────────────────────────────────┘
   Connectivity:
   ┌──────────────────────────────────────┐
   │ coaxcut.cdd                            │
   │ coaxdft.cdd                            │
   │ dlc.cdd                                │
   │ netbios.cdd                            │
   └──────────────────────────────────────┘

   ┌──────────────┐          ┌──────────────┐
   │      OK       │          │    Cancel    │
   └──────────────┘          └──────────────┘
```
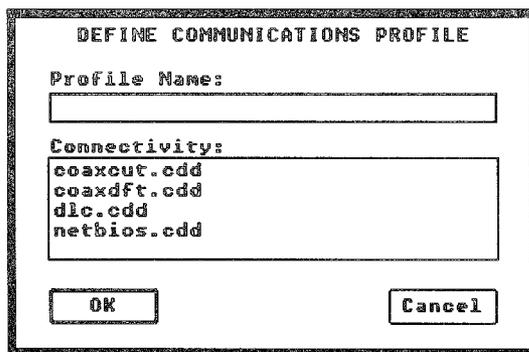
This dialog box has a list box that contains names of each communications method that *EXTRA!* supports: coax CUT (Coax—Single Session), coax DFT (Coax—Multiple Session), NETBIOS LAN (NETBIOS Gateway), and token-ring DLC (Token-Ring LAN).

2   Select the communications method that is appropriate to your adapter. Each adapter definition must have a unique name. If you have more than one adapter of the same type, you must name them differently, perhaps adding a "2" after one of the names.

3   Select "OK." The Adapter Parameters dialog box that corresponds to the connection you selected is displayed on the screen.

If your connection type is coax, go to the next section, "Coax Adapter Parameters." If your connection type is NETBIOS LAN, go to page 3-17, "NETBIOS LAN Parameters." If your connection type is a token-ring DLC, go to page 3-22, "Token-Ring DLC Parameters."

Editing an Adapter Definition

If you want to edit an existing adapter definition, select the adapter name then select "Edit..." or you can double-click on the adapter name. Selecting "Edit..." takes you directly to the appropriate Adapter Parameters dialog box, where you can choose the necessary parameters to edit.

Deleting an Adapter Definition

If you want to delete an adapter definition, it must have no sessions configured to use it. You can select a different adapter definition in the Configure Sessions dialog box for each session that is linked to the adapter definition you want to delete. Then, in the Communications Adapter dialog box, select the adapter name and select "Delete."

Setting Adapter Parameters

When you add or edit a communications device, you go to an Adapter Parameters dialog box. This dialog box varies depending upon the type of connection you selected. See the following sections for the one that suits your adapter.

Coax Adapter Parameters

See Chapter 1 for the definition of CUT and DFT mode.

In the Define Communications Profile dialog box, you selected a coax device from the list box. *EXTRA!* supports both DFT and CUT. Your 3270 control unit may support CUT only, or both DFT and CUT; see your System

Administrator to find out which your system supports if you don't know. Be aware that CUT mode allows you to have only one mainframe session at a time. DFT allows five sessions.

Follow the instructions below to set coax adapter parameters.

1   Select "OK" in the Define Communications Profile dialog box. The Coax Adapter Parameters dialog box, either "Coax CUT" or "Coax DFT," is displayed on the screen.

In this dialog box, described on the next page, you can check or set adapter parameters. Selecting a coax adapter definition in the Communications Adapters dialog box and then selecting "Edit" will also lead you to this dialog box.

```
╔═══════════════════════════════════════════════╗
║           COAX CUT ADAPTER PARAMETERS           ║
║                                                 ║
║  Adapter Type:                                  ║
║  ┌───────────────────────────────────────────┐ ║
║  │ Attachmate 3270 Coax Adapter            │ ↑ │ ║
║  │ Attachmate 3-N-1 Coax Adapter           │   │ ║
║  │ Attachmate Advanced 3270 Adapter (PC/AT)│   │ ║
║  │ Attachmate Advanced 3270 Adapter (PS/2) │   │ ║
║  │ IBM 3278/79 Emulation Adapter           │   │ ║
║  │ IBM Advanced 3278/79 Emulation Adapter  │ ↓ │ ║
║  └───────────────────────────────────────────┘ ║
║  ┌─I/O Port Address:─┐   Memory Address:        ║
║  │  ⦿ 2D0  ○ 6D0     │   ┌──────────────────┐   ║
║  │  ○ AD0  ○ ED0     │   │ CE00             │   ║
║  └───────────────────┘   └──────────────────┘   ║
║                                                 ║
║    ┌──────────┐              ┌──────────┐       ║
║    │    OK    │              │  Cancel  │       ║
║    └──────────┘              └──────────┘       ║
╚═══════════════════════════════════════════════╝
```

2   Select the adapter type that your system uses. The following is a list of supported coax adapters:

   ●   Attachmate 3-N-1
   ●   Attachmate 3270 Coax Adapter
   ●   Attachmate Advanced 3270 Adapter

- Attachmate Advanced 3270 Adapter/2 (for the PS/2)
- IBM 3278/79 Emulation Adapter
- IBM Advanced 3278/79 Emulation Adapter
- IBM 3270 Connection (for the PS/2)

3   Select the correct communication setting options.

The settings all have defaults. If your system's settings are different, you should change those in the dialog box. If you haven't made changes to your system settings, or if you don't know what settings to use, you will probably want to use the defaults or talk to your System Administrator.

I/O Port Address: (Default 2D0) This field specifies the starting address of the adapter's I/O registers, which are used by the communications device drivers to control the operation of the adapter. The list is determined by your system's requirements.

Memory Address: (Default CE00) This field specifies the memory segment address where the adapter's random access memory (RAM) is mapped into the PC's address space, if any. The list is determined by your adapter's requirements.

4   When you are satisfied with the settings, select "OK" to exit the Coax Adapter Parameters dialog box. Select "OK" again to exit the Communications Adapter dialog box.

You have done a lot of work; you may want to save it. See "Save Configuration" at the end of this chapter for instructions.

You have now finished defining the coax adapter. The next step is to specify mainframe and printer session profiles. Go to the next section, "Session Profiles."

NETBIOS LAN (Gateway) Parameters

EXTRA! provides a flexible PC workstation that can be configured to communicate with IBM and Attachmate Gateways. A session can be defined as an Attachmate workstation or as an IBM (Version 3.0 or later) workstation. The same PC can communicate using Attachmate or IBM gateway protocol, allowing mainframe access across multiple gateways.

The Attachmate Workstation can communicate with up to four 3270 gateway programs simultaneously. Each session can be configured according to the type of gateway being used. See the *EXTRA! Gateway Option Installation and Customization Manual* for details.

The two types of workstations are Attachmate and IBM (PC 3270 Version 2 or 3).

NETBIOS: To use *EXTRA!* with a LAN, your PC workstation and gateway must both be running NETBIOS. Most networks are NETBIOS-compatible and have some executable file or device driver to run NETBIOS. See Chapter 2, "Installing EXTRA! for Windows," for information on installing and running *EXTRA!* with NETBIOS.

Follow the instructions below to specify a NETBIOS LAN connection.

In the Define Communications Profile dialog box, you selected the NETBIOS LAN device from the list box.

1   Select "OK." The NETBIOS Adapter Parameters dialog box, described on the following pages, is displayed on your screen.

```
┌─────────────────────────────────────┐
│                                       │
│   NETBIOS ADAPTER PARAMETERS          │
│                                       │
│   User Name:                          │
│   ┌─────────────────────────────┐     │
│   │                             │     │
│   └─────────────────────────────┘     │
│                                       │
│   Adapter:                            │
│   ┌─────────────────────────────┐     │
│   │ ⦿ Primary   ○ Alternate     │     │
│   └─────────────────────────────┘     │
│   Resources:                          │
│   ┌─────────────────────────────┐     │
│   │ [--Undefined--]             │     │
│   │ [--Undefined--]             │     │
│   │ [--Undefined--]             │     │
│   │ [--Undefined--]             │     │
│   └─────────────────────────────┘     │
│                                       │
│   ┌────────┐          ┌────────┐      │
│   │ Copy   │          │ Edit.. │      │
│   └────────┘          └────────┘      │
│   ┌────────┐          ┌────────┐      │
│   │ Paste  │          │ Reset  │      │
│   └────────┘          └────────┘      │
│   ┌─────────────────────────────┐     │
│   │     Named Gateways >>       │     │
│   └─────────────────────────────┘     │
│   ┌────────┐          ┌────────┐      │
│   │   OK   │          │ Cancel │      │
│   └────────┘          └────────┘      │
│                                       │
└─────────────────────────────────────┘
```

In this dialog box, you can check or set adapter para-
meters. Selecting a NETBIOS LAN adapter definition
in the Communications Adapters dialog box and then
selecting "Edit" will also lead you to this dialog box.

2   Set adapter parameters.

> Do not use an asterisk (*) in your user name or *EXTRA!* will produce an error when you try to open a session. Use only letters, numbers, and blanks.

User Name: You can use your local LAN workstation
name if you have one, or some arbitrary, unique name.
This field is blank until you enter a name. This name
(1-15 characters long) must be unique to the Network
Station since it identifies the station to the gateway and
the LAN. If the name is not unique (there is another
workstation using the same name), *EXTRA!* will detect
a conflict and be unable to open the session.

Adapter: (Default Primary) Each workstation can have up to two LAN cards installed. One adapter card should be set to Primary. If you have a second adapter card, it should be set to Alternate. If you have just one card, leave it set to Primary. This distinction is made via switch settings on the LAN adapter.

Resources: The resources in this box are undefined the first time you configure *EXTRA!* After you set up some mainframe resources, the list box shows which ones you can connect to using this adapter.

Resources are "logical units" or pools of logical units; each resource in this dialog box represents a single, separate mainframe connection. Define a resource for each NETBIOS session you want to have active. All resources you define may have identical names if you are connecting them to the same pool. Or they may have different names to allow you access to other logical units or pools. Because NETBIOS adapters can support four mainframe sessions, you may want to define all four resources here.

3   To set up a new resource, select an undefined resource, then select "Edit..." The Resource Parameters dialog box, shown on the next page, appears on your screen. When you finish defining the resource, select "OK."

In the Resource Parameters dialog box you can set up options for a mainframe resource. The resources you define here are the resources you will link to sessions later in the configuration process.

```
┌────────────────────────────────────────┐
│          RESOURCE PARAMETERS             │
│                                          │
│   Name:  [══Undefined══]                 │
│                                          │
│  ┌─Station Type─┐ ┌─LU Type──┐           │
│  │ ◉ Attachmate │ │ ◉ Terminal│          │
│  │ ○ IBM        │ │ ○ Printer │          │
│  └──────────────┘ └───────────┘          │
│                                          │
│    □ Keyboard Override                    │
│                                          │
│    ┌────────┐          ┌────────┐        │
│    │   OK   │          │ Cancel │        │
│    └────────┘          └────────┘        │
└────────────────────────────────────────┘
```

For an IBM Station Type, the "Name" must correspond to one of the names defined at the IBM gateway.

Name: This is the name of the resource—usually a port or pool—that the session will connect to. It must be the same name that the gateway uses for that resource. See your LAN Administrator for available resource names.

Station Type: (Default Attachmate Workstation) Use this option to specify which workstation type *EXTRA!* uses to communicate with the gateway. If the gateway is an IBM 3270 Emulation Program gateway, then the Station Type must be IBM.

LU Type: (Default Terminal) If your station type is IBM, then you need to specify if a resource is a Terminal or a Printer.

Keyboard Override: (Default Off) Selecting this option will cause you to be prompted to enter a different resource each time you open a session using this resource. This option applies only to Attachmate Workstations (see Station Type, above).

Once you've set up one resource, you can copy its settings to other resources by using the following instructions. Select the resource that you've set parameters for. Select "Copy" to copy its parameters. Select another resource, then select "Paste." The

parameters copy to the selected resource. You can then "Paste" the same parameters to other resources without using "Copy" again. To remove any changes you make to a resource, select the resource then select "Reset" before you select "OK."

4   If you want to name the accessible gateways, then select "Named Gateways." The dialog box opens wider to allow you space to name up to 6 gateways, as shown below.
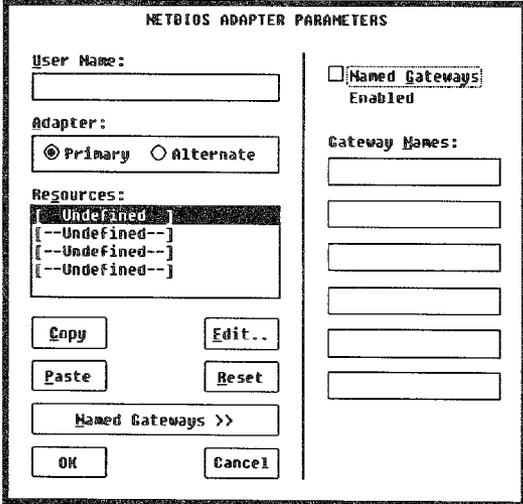
```
┌──────────────────────────────────────────────────────────┐
│                NETBIOS ADAPTER PARAMETERS                  │
│                                                            │
│  User Name:                                                │
│  ┌──────────────────────────┐    □ Named Gateways         │
│  └──────────────────────────┘      Enabled                 │
│                                                            │
│  Adapter:                         Gateway Names:           │
│  ┌──────────────────────────┐    ┌──────────────────────┐ │
│  │ ⦿ Primary  ○ Alternate   │    └──────────────────────┘ │
│  └──────────────────────────┘                             │
│                                   ┌──────────────────────┐ │
│  Resources:                       └──────────────────────┘ │
│  ┌──────────────────────────┐                             │
│  │ [  Undefined   ]         │    ┌──────────────────────┐ │
│  │ [--Undefined--]          │    └──────────────────────┘ │
│  │ [--Undefined--]          │                             │
│  │ [--Undefined--]          │    ┌──────────────────────┐ │
│  └──────────────────────────┘    └──────────────────────┘ │
│                                                            │
│  ┌─────────┐     ┌─────────┐     ┌──────────────────────┐ │
│  │  Copy   │     │  Edit.. │     └──────────────────────┘ │
│  └─────────┘     └─────────┘                             │
│  ┌─────────┐     ┌─────────┐     ┌──────────────────────┐ │
│  │  Paste  │     │  Reset  │     └──────────────────────┘ │
│  └─────────┘     └─────────┘                             │
│  ┌────────────────────────────┐                          │
│  │    Named Gateways >>        │                          │
│  └────────────────────────────┘                          │
│  ┌─────────┐     ┌─────────┐                              │
│  │   OK    │     │ Cancel  │                              │
│  └─────────┘     └─────────┘                              │
└──────────────────────────────────────────────────────────┘
```

"Named Gateways" is an optional parameter you can set for a NETBIOS connection type. Usually, when *EXTRA!* looks for a resource to connect a session to, it sends out a request for that resource to all gateways at once. The first gateway to respond connects to the session. Try using *EXTRA!* this way first, without naming any gateways. If you have problems getting a connection, then reconfigure with named gateways.

Setting Up EXTRA!

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With "Named Gateways", you can configure the names of the gateways that the user will have access to. This parameter is particularly useful in NETBIOS LAN environments where there are one or more LAN bridges between the user's workstation and the mainframe. If "Named Gateway" is turned on, then *EXTRA!* will establish a connection with each gateway defined in the list, one at a time, until it finds the requested resource or runs out of gateways without finding the resource.

You must know the names of the gateways that have the desired resources so that you can enter the correct names. If the gateway that provides the resource is not the first gateway in the list, getting a connection to a later gateway will take longer.

5   When you are satisfied with the settings, select "OK" to exit the NETBIOS Adapter Parameters dialog box. Select "OK" again to exit the Communications Adapter dialog box.

You have done a lot of work; you may want to save it. See "Save Configuration" at the end of this chapter for instructions.

You are finished defining a NETBIOS LAN connection. You're next step is to specify mainframe terminal and printer session profiles. Go to the next section, "Session Profiles."

Token-Ring (DLC) Parameters

Before you attempt to configure direct token-ring connections on your network, it's important that you understand the basic concepts and terminology used when discussing token-ring communication. Direct token-ring communication uses a unique protocol called DLC (Data Link Control), which handles the exchange of information between devices on a token-ring network. Devices such as PCs, controllers, front-end processors (FEP), and mainframes are connected to the token-ring with network adapters called token-ring adapters or TICs (Token-Ring Interface Couplers).

If you need more information about token-ring connections and PCs, or if you haven't installed a token-ring network yet, read Appendix E, "Token-Ring Networks." This appendix contains information about token-ring networks, token-ring workstation installation, and hardware drivers. If you already have a token-ring network set up, follow the instructions below to specify a token-ring DLC connection.

In the Define Communications Profile dialog box, you selected the token-ring DLC connection from the list box.

1   Select "OK" in the Define Communications Profile dialog box. The Token-Ring DLC Adapter Parameters dialog box, shown below, is displayed on your screen.

In this dialog box, you can check or set adapter parameters. Selecting a token-ring DLC adapter definition in the Communications Adapters dialog box and then selecting "Edit" will also lead you to this dialog box.

```
┌──────────────────────────────────────────────────┐
│        TOKEN-RING DLC ADAPTER PARAMETERS            │
│  ┌Parameters──────────────────────────────────┐   │
│   Physical Unit ID:        [01700000]             │
│   DLC Destination Address: [400000000001]         │
│   LAN Adapter Number:      [0]                    │
│   DLC Service Access Point: [04]                  │
│                                                    │
│  ┌I-Frame Size─────────────────────────────────┐  │
│   ⦿ 265   ○ 521   ○ 1033   ○ 2042  ○ 3964        │
│   ○ Custom I-Frame Size: [          ]             │
│                                                    │
│  ☒ End with REQDISCONTACT (REQDSC)                │
│  ☐ IBM PC/3270 Gateway Connection                 │
│  ┌──────────┐                      ┌──────────┐   │
│  │    OK    │                      │  Cancel  │   │
│  └──────────┘                      └──────────┘   │
└──────────────────────────────────────────────────┘
```

2   Select the correct communication setting options. The settings all have defaults; if your system's settings are different, you should change those in this dialog box.

3   When you are satisfied with the settings, select "OK" to exit the Token-Ring DLC Adapter Parameters dialog box. Select "OK" again to exit the Communications Adapter dialog box.

The following describes each option listed in the Token-Ring DLC Adapter Parameters dialog box.

Your mainframe personnel will determine whether a PUID is necessary.

Physical Unit ID: This ID is the number assigned to the token-ring workstation. The ID number can be up to eight characters long. If your controller is channel-attached, you don't need to enter a physical unit identification (PUID). The PUID is a combination of two numbers: the ID Block and the ID Number.

It is important that you select the correct numbers in each of the following fields. Incorrect entries can cause problems to you and other users.

DLC Destination Address: In this field, enter a 12-digit number which represents the destination address of the TIC on your controller, FEP, or mainframe. The address, also called the Locally Administered Address (LAA), can be obtained from your System Administrator or mainframe personnel. If the field contains an address that is not accurate, backspace over the current address and replace it with the new, correct address.

LAN Adapter Number: (Default 0) Each workstation can have up to two token-ring cards installed. Each card is set to either 0 (primary) or 1 (alternate). This distinction is made via switch settings on the token-ring adapter.

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DLC Service Access Point: (Default 04) This option specifies the Service Access Point (SAP) supported by the TIC. The SAP number must be a multiple of four in hexadecimal (i.e., 04, 08, 0C, 10, etc.). The SAP number at the workstation must match the SAP configuration at the mainframe. See your System Administrator for more information about the SAP number.

I-Frame Size: (Default 265 bytes) This option lets you choose how large each packet of data will be as it is transmitted between the PC and the mainframe. Each of these packets is called an Information Frame (I-Frame). Select an I-Frame size that is consistent with your PC's token-ring card and the I-Frame size specified on the mainframe network. Ask the mainframe System Administrator for help in determining the correct I-Frame size. If none of the numbers exactly matches the mainframe I-Frame size, select "Custom I-Frame Size" and type in your desired I-Frame size.

End with REQDISCONTACT (REQDSC): (Default On) Use this option if your mainframe has been configured for "End with REQDISCONTACT" and you want to shut down your DLC workstation in an orderly fashion. If you don't choose this option, you may encounter problems when you try to reactivate the link.

You are finished defining a token-ring DLC connection. You are now ready to specify mainframe and printer session profiles.

Session Profiles

A session profile describes the way your PC emulates a 3270 mainframe terminal or a mainframe printer. For a mainframe terminal session, a profile includes the terminal model, what mode the session emulates, and whether the session uses extended attribute bytes. For a printer session, the profile specifies that the session is a printer rather than a terminal. Each profile has a user-defined name, which is how you identify the profile when you apply it to a session. Each profile may be shared by several sessions.

Creating a Profile

When creating a mainframe or printer session profile, you select the emulation options and name the profile. To create a session profile, follow the instructions below.

1   Select "Session Profiles..." from the Configure menu. The screen displays the Session Profiles dialog box, shown below.

```
┌─────────────────────────────────────────┐
│            SESSION PROFILES              │
│                                          │
│  Profiles:                               │
│  ┌───────────────────────────────────┐ ▲│
│  │ DFT Model 2 Session               │  │
│  │ DFT Model 2EAB Session            │  │
│  │ DFT Model 3 Session               │ ─│
│  │ DFT Model 3EAB Session            │  │
│  │ DFT Model 4 Session               │  │
│  │ DFT Model 4EAB Session            │  │
│  │ DFT Model 5 Session               │ ▼│
│  └───────────────────────────────────┘  │
│                                          │
│   ┌────────┐  ┌────────┐  ┌──────────┐  │
│   │ Add... │  │ Edit...│  │  Delete  │  │
│   └────────┘  └────────┘  └──────────┘  │
│   ┌────────┐                            │
│   │   OK   │                            │
│   └────────┘                            │
└─────────────────────────────────────────┘
```
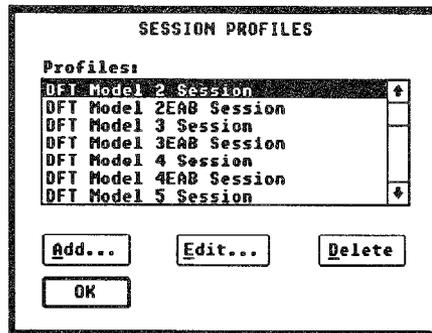
If this is a new configuration, this list box will be empty. If some profiles have already been defined or you're using the default configuration, you will see some profile names in the list box. From this dialog box you can add new profiles, and edit or delete existing ones.

2   Select "Add..." The screen displays the Define Logical
Unit Profile dialog box where you name the profile and
choose what mode the session will emulate: CUT or
DFT (for a mainframe session), or Printer (for a printer
session).

```
┌─────────────────────────────────────────────┐
│  ┌───────────────────────────────────────┐   │
│  │      DEFINE LOGICAL UNIT PROFILE       │   │
│  │  Profile Name:                         │   │
│  │  ┌──────────────────────────────────┐  │   │
│  │  │ I                                │  │   │
│  │  └──────────────────────────────────┘  │   │
│  │  Logical Unit:                         │   │
│  │  ┌──────────────────────────────────┐  │   │
│  │  │ cut_lu2.lul                      │  │   │
│  │  │ dft_lu2.lul                      │  │   │
│  │  │ dft_lup.lul                      │  │   │
│  │  │                                  │  │   │
│  │  └──────────────────────────────────┘  │   │
│  │  ┌──────────┐         ┌──────────┐     │   │
│  │  │    OK    │         │  Cancel  │     │   │
│  │  └──────────┘         └──────────┘     │   │
│  └───────────────────────────────────────┘   │
└─────────────────────────────────────────────┘
```
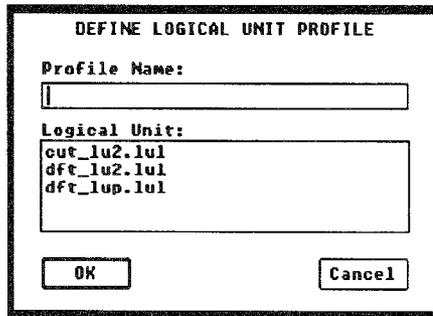
If you have a coax CUT adapter, you must use the CUT
profile (cut_lu2.lul); the DFT profile (dft_lu2.lul) won't
work with your adapter. For NETBIOS LAN, token-
ring DLC, and coax DFT adapters, use the DFT profile.
And for printers, use the DFT printer profile
(dft_lup.lul).

3   Select the driver you want to use.

4   Enter a name in the "Profile Name" box to reflect the
profile's options. Each session profile is identified by a
unique, user-defined name. To identify the profile
easily, make the name reflect the options you select.
For example, if you are setting up a CUT mode Model 2
terminal emulation using EABs, you might call the pro-
file "CUT Model 2 w/ EABs."

5   Select "OK." If you are setting up a printer session
profile, go to page 3-29, to the paragraph right after step
8. If you are setting up a mainframe session profile,
continue with the instructions below.

The screen displays a Terminal Profile dialog box that
reads either "DFT Terminal Profile" or "CUT Terminal
Profile," depending on which driver you selected.

```
┌─────────────────────────────────────┐
│          CUT TERMINAL PROFILE        │
│                                      │
│   ┌─Terminal Model──────────────┐    │
│   │ ◉ Model 2 (24 X 80)         │    │
│   │ ○ Model 3 (32 X 80)         │    │
│   │ ○ Model 4 (43 X 80)         │    │
│   │ ○ Model 5 (27 X 132)        │    │
│   │ ○                           │    │
│   └─────────────────────────────┘    │
│                                      │
│   ☐ Extended Attributes (EABs)       │
│   ┌──────────┐      ┌──────────┐     │
│   │    OK    │      │  Cancel  │     │
│   └──────────┘      └──────────┘     │
└─────────────────────────────────────┘
```
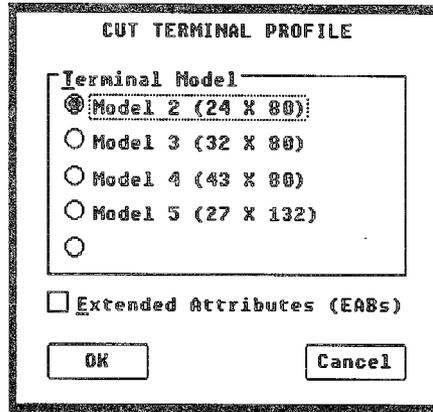
In this dialog box you select a terminal model and other
options. You can also get to this dialog box by selecting
a profile name in the Session Profiles dialog box then
selecting "Edit."

6   Select the terminal model that this type of session will
emulate.

EXTRA! supports all four standard IBM terminal
models: models 2, 3, 4, and 5.

7   Select "Extended Attributes (EABs)" if appropriate.

Extended Attribute Bytes (EABs) are what give your PC
monitor the capability to emulate the full capacity of the
mainframe screen, including all text colors and high-
lighting. You must use this option to make full use of
"Host Attribute Mapping" and to use Structured Fields
during file transfers. If you won't be using these
features, you don't need EABs.

8   Select "OK" to confirm the settings, exit the Terminal
     Profile dialog box, and return to the Session Profiles
     dialog box. Or, you can select "Cancel" to cancel any
     changes you made.

You can add as many profiles as you want by following
these instructions. When you have finished adding or
editing profiles, select "OK" to return to the EXTRA!
Executive window.

You are now ready to configure printer and mainframe
sessions with the profiles you've created.

Sessions

Selecting "Sessions..." from the Configure menu takes you to
the Sessions dialog box. Through this dialog box you can
add, edit, and delete mainframe and printer sessions. Selec-
ting either "Add" or "Edit" takes you to the Configure
Session dialog box, where you can configure up to 26 differ-
ent sessions. All of these sessions can potentially run
simultaneously.

In the Configure Session dialog box, you give a unique short
name and long name (used by *EXTRA!* to identify sessions)
to each session. You can select an adapter and resource for
each session to use and select a profile from the session
profiles you created earlier.

Setting Up EXTRA!

Adding and Editing Sessions

You can add to the list of sessions until you have the maximum number of sessions: you can have 1 terminal session using a coax CUT adapter (no printer sessions), 5 sessions (terminal, printer, or mixed) using a coax DFT adapter, 4 sessions with a NETBIOS LAN adapter, and up to 26 sessions with a token-ring DLC adapter. *EXTRA!* allows a maximum of 26 sessions, using a combination of the above adapters, but memory usually limits the number you can actually have open at the same time. You can have as many printer sessions as you want, up to the maximum number of sessions, but you need a mainframe terminal session open to print from.

If you're editing a session, select the session name in the Sessions dialog box list box and follow the instructions that you need.

1   Select "Sessions..." from the Configure menu. The Sessions dialog box is displayed on the screen.

```
┌──────────────────────────────────────┐
│             SESSIONS                  │
│                                       │
│  Session Name:                        │
│  ┌────────────────────────────────┐  │
│  │ N NetBIOS0                     │  │
│  │ O NetBIOS1                     │  │
│  │ P NetBIOS2                     │  │
│  │ Q NetBIOS3                     │  │
│  │                                │  │
│  │                                │  │
│  │                                │  │
│  │                                │  │
│  └────────────────────────────────┘  │
│                                       │
│  ┌──────┐  ┌───────┐  ┌────────┐      │
│  │ Add..│  │ Edit..│  │ Delete │      │
│  └──────┘  └───────┘  └────────┘      │
│     ┌────────┐                        │
│     │   OK   │                        │
│     └────────┘                        │
└──────────────────────────────────────┘
```
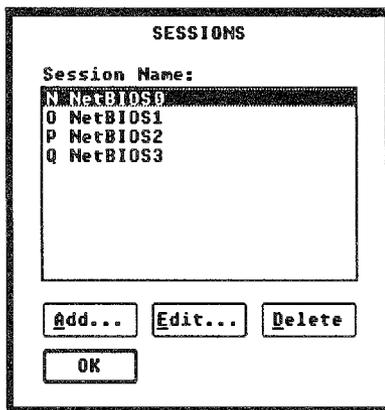
If this is a new configuration, this list box will be empty. If some sessions have already been configured or you're using the default configuration, you will see some sessions in the list box. As you add mainframe or printer sessions, the list box will show the short and long names of all sessions which have been configured.

Repeat the steps below and in the following sections for each session you want to configure.

2   Select "Add" if you want to add a new session, or select a session name then select "Edit" if you want to change an existing session. The Configure Session dialog box, shown below, is displayed on the screen.

```
┌──────────────────────────────────────────────────┐
│                 CONFIGURE SESSION                  │
│                                                    │
│  Short name:  [C]              Long name: [CoaxDFT0]│
│    [Comm. Adapter...]   Coax DFT Connectivity      │
│    [Comm. Resource...]  Coax DFT Connection 0      │
│    [Session Profile...] DFT Model 2EAB Session     │
│                                                    │
│    [  OK  ]                          [Cancel]      │
└──────────────────────────────────────────────────┘
```

Each configured session must have 5 parts: session short name, session long name, communications adapter, communications resource, and session profile. In the Configure Session dialog box, you have to fill in each part before you can exit the dialog box with "OK" and you must go through the last three parts in order. For example, you cannot select a communications resource before an adapter, and any profile you choose before you select a resource will disappear, requiring you to re-select it after the resource.

Setting Up EXTRA!

Naming a Session

Each session must have a short name and a long name that *EXTRA!* uses to identify it. The short name must be a single alphabetic character (A through Z), but the long name can be up to eight characters long, in a combination of letters and numbers.

1   When you first open the dialog box, "Short name" is highlighted. Type the letter of the short name in the text box. The short name must be unique to each session—*EXTRA!* will give you an error if you try to create a duplicate name. After you enter a short name, the cursor jumps to "Long name."

2   Type a long name, up to eight characters long, in the "Long name" text box.

When creating a long name for a session, always begin the name with an alphabetic character (A-Z). The rest of the name may be composed of any combination of letters and numbers.

Selecting an Adapter

You must have already defined at least one communications adapter before you can select an adapter in this dialog box. If you haven't done so, then go through the "Communications Adapters" section earlier in this chapter. If you have more than one communications adapter, you can set up a number of sessions using each adapter.

1   Select "Comm. Adapter..." The screen displays the Select Communications Adapter dialog box.

```
 ┌─────────────────────────────────────┐
 │  SELECT COMMUNICATIONS ADAPTER       │
 │ ┌─────────────────────────────────┐ │
 │ │ Coax CUT Connectivity           │ │
 │ │ Coax DFT Connectivity           │ │
 │ │ DLC PU DFT Connectivity         │ │
 │ │ NetBIOS DFT Connectivity        │ │
 │ │                                 │ │
 │ │                                 │ │
 │ └─────────────────────────────────┘ │
 │                                      │
 │   ┌─────────┐      ┌─────────┐       │
 │   │   OK    │      │ Cancel  │       │
 │   └─────────┘      └─────────┘       │
 └─────────────────────────────────────┘
```
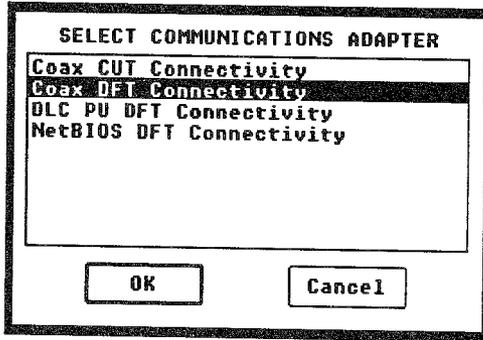
2   Select the adapter definition you want to use, then
     select "OK." You return to the Configure Session dialog
     box and the name of the adapter definition you chose is
     displayed to the right of "Comm. Adapter..."

Selecting an Adapter Resource

A communications resource is anything your PC can receive
data from: a gateway or resource manager, or the port on a
mainframe controller. When you configure a session, you
have to select a resource for your PC to communicate with
during that session. The resources available are determined
by the adapter and the gateway or controller.

You must select an
adapter before you can select
a resource.

1   Select "Comm. Resource..." The screen displays the
     Select Communications Resource dialog box, shown
     below. The dialog box on your screen may contain
     different resources than the one in the example.
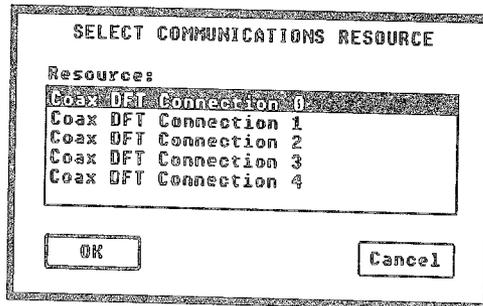
```
 ┌─────────────────────────────────────┐
 │    SELECT COMMUNICATIONS RESOURCE    │
 │                                      │
 │  Resource:                           │
 │ ┌─────────────────────────────────┐ │
 │ │ Coax DFT Connection 0           │ │
 │ │ Coax DFT Connection 1           │ │
 │ │ Coax DFT Connection 2           │ │
 │ │ Coax DFT Connection 3           │ │
 │ │ Coax DFT Connection 4           │ │
 │ └─────────────────────────────────┘ │
 │                                      │
 │  ┌─────────┐         ┌─────────┐     │
 │  │   OK    │         │ Cancel  │     │
 │  └─────────┘         └─────────┘     │
 └─────────────────────────────────────┘
```

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The Select Communications Resource dialog box
contains a list box displaying the maximum number of
connections possible for the connection type. If you are
using a coax connection, the list displays 1 resource if
CUT, 5 if DFT. If you are using a NETBIOS LAN
connection, this list displays 4 resources. If you are
using a token-ring DLC connection, this list displays
254 possible resources.

2   Select a resource, then select "OK." You return to the
     Configure Session dialog box and the adapter resource
     you selected appears to the right of "Comm. Resource..."

Selecting a Session Profile

As explained earlier in this chapter, a session profile
provides specific information about your mainframe and
printer sessions. In that same section, you created profiles
for mainframe and printer sessions. Now you can use those
profiles to configure sessions.

1   Select "Session Profile..." from the Configure Session
     dialog box. The screen displays the Select Session
     Profile dialog box, shown below, where you select
     session profiles.

```
┌─────────────────────────────────────────┐
│          SELECT SESSION PROFILE          │
│ ▓DFT Model 2 Session▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ │
│ DFT Model 2EAB Session                   │
│ DFT Model 3 Session                      │
│ DFT Model 3EAB Session                   │
│ DFT Model 4 Session                      │
│ DFT Model 4EAB Session                   │
│ DFT Model 5 Session                      │
│ DFT Model 5EAB Session                   │
│                                          │
│      ┌──────────┐      ┌──────────┐      │
│      │    OK    │      │  Cancel  │      │
│      └──────────┘      └──────────┘      │
└─────────────────────────────────────────┘
```
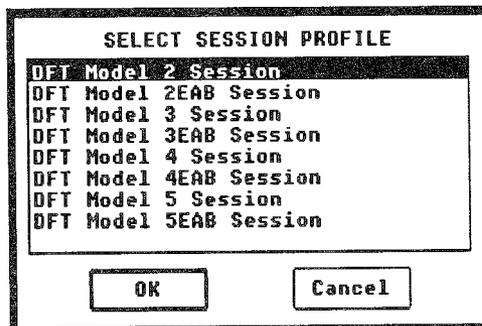
2   Select a session profile, then select "OK." You return to the Configure Session dialog box and the name of the session profile you selected appears to the right of "Session Profile..."

3   Select "OK" to close the Configure Session dialog box and return to the Sessions dialog box.

You have done a lot of work; you may want to save it. See "Save Configuration" at the end of this chapter for instructions.

You've finished configuring this session. You can configure more sessions, following the same instructions, or you can go to "Keyboard Mapping." If you are satisfied with the session settings, select "OK" to close the Configure Session dialog box and return to the EXTRA! Executive window.

You are now ready to specify the keyboard type and mapping that your PC uses.

Keyboard Mapping

This command allows you to select the type of keyboard you are using and which type of mapping to use: Attachmate, IBM, or IRMA. Follow the instructions below to select a keyboard.

Selecting a Keyboard

EXTRA! supports two keyboards: the original 84-key IBM-AT keyboard and the Enhanced AT 101-key keyboard. *EXTRA!* supports Attachmate, IBM, and IRMA keyboard mapping. See the keyboard maps that came with this manual, or Appendix D, "Keyboard Maps and Tables" for how the 3270 keys are mapped to your PC's keyboard.

1   Select "Keyboard Mapping..." from the Configure menu. The screen displays the Keyboard Type dialog box, shown on the next page.

```
┌─────────────────────────────────────┐
│          KEYBOARD TYPE              │
│                                      │
│  ┌Type────────────────────────────┐ │
│  │ ○ Original AT - 84 Key         │ │
│  │ ● Enhanced AT - 101 Key        │ │
│  │ ○ Large 3270 - 122 key         │ │
│  └────────────────────────────────┘ │
│  ┌Mapping─────────────────────────┐ │
│  │ ● Attachmate                   │ │
│  │ ○ IBM                          │ │
│  │ ○ IRMA E78                     │ │
│  └────────────────────────────────┘ │
│                                      │
│  ┌──────────┐      ┌──────────┐     │
│  │    OK    │      │  Cancel  │     │
│  └──────────┘      └──────────┘     │
└─────────────────────────────────────┘
```
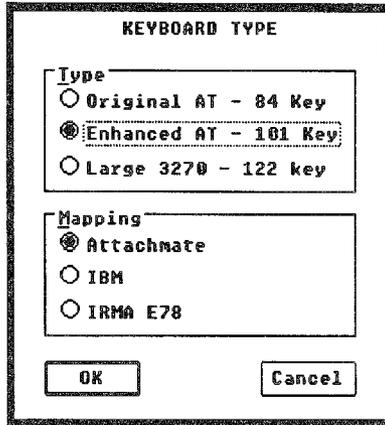
Original AT: (Default On) This is the standard
mapping for 84-key PC/XT/AT keyboards with 10
function keys on the left side.

Enhanced AT: This is the mapping for IBM Enhanced
101-key keyboard with twelve function keys across the
top of the keyboard and two [Ctrl] keys at the bottom.

2   Select the keyboard type.

3   Select the mapping (Attachmate, IBM, or IRMA) that
    you are using, then select "OK." You return to the
    EXTRA! Executive window. If you need more informa-
    tion about keyboard mapping, see Appendix D or the
    keyboard maps that came with *EXTRA!*

You are now finished selecting a keyboard. You are ready to
choose the way your screen displays various types and
colors of text from the mainframe. These settings are called
Host Attribute Mapping.

Host Attribute Mapping

This item allows you to select how various mainframe text styles and colors and their backgrounds appear on your screen. The text styles you can configure are normal text, blinking, reverse video, and underlined. There are seven text colors, plus a default, that you can configure.

Setting Text Style Colors

Each of these text styles and colors are what the mainframe sends to your terminal. When you configure the colors, you choose how you want your PC screen to display the information it receives from the mainframe. If you want your default normal screen text to be purple, then you can set it to purple. If you want the screen background for that text to be blue, you can select that. Blinking text doesn't display as such, but you can choose a different text and background color so that you know it's supposed to be blinking.

Follow the instructions below if you want to configure Host Attribute Mapping.

1   Select "Host Attribute Mapping..." from the Configuration menu. The screen displays the Host Attribute Mapping dialog box, shown below.
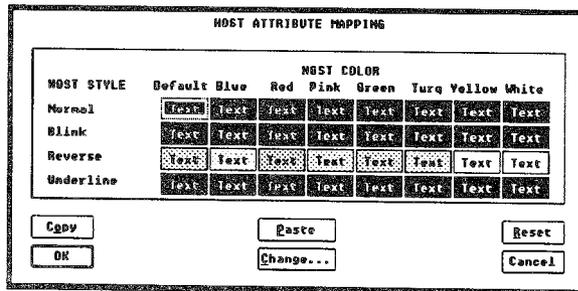
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On the left of the box is a column of mainframe text styles ("Host Style"): normal, blink, reverse, and under-line. The columns to the right of the text styles ("Host Color") are colors that the mainframe sends. You can set the text and background colors by selecting "Change." If you select "Reset," the settings reset to the default settings (the original colors and attributes).

To select blocks in this dialog box, such as Blue Blink, click on or move the cursor to that block.

2   Select a color block that you want to change.

3   Select "Change." The screen displays the Color Attributes dialog box, shown below.
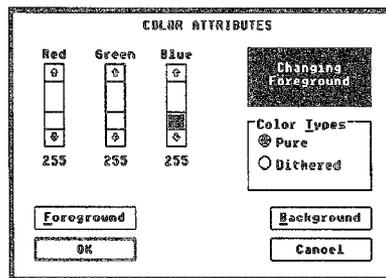
4   Select "Foreground" to change the text color, or "Background" to change the session background color. The text in the color box lets you know whether you're changing the color of the foreground (text) or the background.

This color model works differently from the one you may be familiar with. You have three primary colors (red, blue, and green); to make yellow you have to choose equal amounts of red and green, and no blue.

Experiment with the scroll bars to get the color you want. The color shows in the box to the right of the scroll bars and as you make changes on the bars, the color changes in the box.

There are two Color Types options in this dialog box: "Pure" and "Dithered." The Pure option allows the selection of whole amounts of the primary colors only: no red or all red, no green or all green, etc. You can combine the primary colors to make other pure colors.

Dithered, on the other hand, allows the selection of any amount of the primary colors. The Dithered option makes it easier for a System Administrator to configure colors for a group of systems that have varying capabilities. The color box approximates these colors using a pattern, but the colors will appear differently in the session window than in the color box.

Foreground text colors come in pure colors only.

If you have a display that can show a wide range of colors, then the background colors will appear as the closest pure color to the color shown, rather than patterned.

5 When you are satisfied with the colors, select "OK." You return to the Host Attribute Mapping dialog box.

If you want exactly the same combination of text and background colors in more than one block, you can set up colors for one block, then use the Copy and Paste functions to copy those colors to other blocks.

Notice that the highlighted color block has changed to show the colors you selected. You can follow the above instructions to change any and all of the color blocks.

6 When you finish, select "OK" to return to the EXTRA! Executive window.

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You are now finished with the configuration. You are now ready to lock the configuration settings so that no one can change them.

Lock Configuration

This item allows you to lock all or part of the configuration so that other users cannot change the configuration or create a new configuration. To change the configuration, a user will need the correct password to unlock the locked items.

Locking a Configuration

After configuring the system, you may want to lock the settings so that other users cannot change them. When you lock the configuration, you have the option of locking the whole configuration or only selected items. You can also lock the configuration process such that another user cannot create a new configuration file.

If you're going to lock the configuration, lock it ***before*** *you save it so that the lock and password information will be saved with the file.*

The Lock Configuration dialog box contains a padlock icon in the upper left corner. When the configuration you are working with is unlocked, the arm of the padlock is open and the middle command button at the bottom of the dialog box reads "Lock." When the configuration is locked, the padlock arm is closed, all the items are grayed, and the middle command button reads "Unlock."

To lock a configuration, follow the instructions below.

1   Select "Lock Configuration..." from the Configure menu. The screen displays the Lock Configuration dialog box, shown on the next page. Notice that the padlock icon in the dialog box is open. To lock any of the items, select the ones you want. To lock the whole configuration, select all the items.

```
┌─────────────────────────────────────┐
│  ⌐🔓   LOCK CONFIGURATION            │
│ ┌─Lock Options──────────────────┐   │
│ │  ☐ :Configuration Creation:    │   │
│ │  ☐ Communications Adapters     │   │
│ │  ☐ Session Profiles            │   │
│ │  ☐ Session Assignments         │   │
│ │  ☐ Keyboard Type               │   │
│ │  ☐ Host Attribute Mapping      │   │
│ │  ☐ Trace Data Parameters       │   │
│ └────────────────────────────────┘   │
│                                       │
│   [  OK  ]  [ Lock... ]  [ Cancel ]   │
└─────────────────────────────────────┘
```
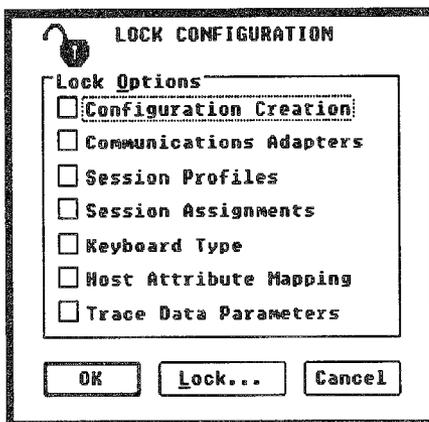
The first option in this box, "Configuration Creation,"
allows you to lock the configuration process so that
other users cannot create new configurations. The
following items relate to the commands in the
Configure menu.

> IMPORTANT: The last item in the dialog box, Trace
> Data Parameters, is not part of the configuration.
> You can read more about this item in Appendix B,
> "Tracing and Other Utilities." Trace Data Parameters
> can be used to view data that is passed by and
> through *EXTRA!*, such as the user's password for
> logging onto the mainframe. Because "Trace Data"
> has this capability, it is highly recommended that
> you lock this item so that users cannot use it.

You can use the other options to lock all or some of the
items on the Configure menu. Any item that you leave
unlocked another user will have access to and be able to
change.

2   Select the option or options you want to lock, then
     select "Lock." The Locking Password dialog box
     appears on the screen.

```
┌─────────────────────────────────────┐
│░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░│
│    ┌───────────────────────────┐    │
│    │    LOCKING PASSWORD        │    │
│    │                            │    │
│    │  Enter:     ┌───────────┐  │    │
│    │             │           │  │    │
│    │             └───────────┘  │    │
│    │  ┌─────────┐   ┌─────────┐ │    │
│    │  │   OK    │   │ Cancel  │ │    │
│    │  └─────────┘   └─────────┘ │    │
│    └───────────────────────────┘    │
│░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░│
└─────────────────────────────────────┘
```
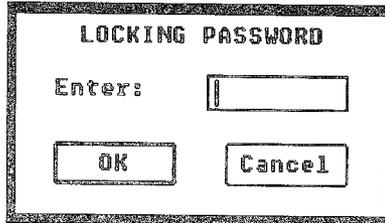
     To lock a configuration, you must enter a password. A
     password can be up to eight letters long. Any time you
     want to change the configuration, you will have to
     know the password.

     ┌───┐
     │ IMPORTANT: Remember your password! If you │
     │ forget your password, you won't be able to unlock │
     │ and change the configuration; you will have to │
     │ delete the configuration file and start a new │
     │ configuration in order to set new configuration │
     │ parameters.   │
     └───┘

3   Type a password in the "Enter:" box, then select "OK."
     You will be prompted to re-enter the password to
     ensure that it's correct.

     The password doesn't show on the screen as you type it.

4   Re-enter the password and select "OK." You return to
     the Lock Configuration dialog box; the padlock icon is
     closed and the middle command button reads "Unlock."
     Now no one can change any of the locked items without
     the password.

Unlocking a Configuration

If you want to change a configuration, or a part that's locked, you first have to unlock that part you want to change. To do that you need to know the password.

To unlock a configuration, follow the instructions below.

1   Select "Lock Configuration" from the Configure menu. The Lock Configuration dialog box appears on the screen; the padlock is closed and all the items are grayed.

```
┌──────────────────────────────────┐
│  🔒   LOCK CONFIGURATION          │
│ ┌─Lock Options──────────────────┐ │
│ │ ☒ Configuration Creation      │ │
│ │ ☒ Communications Adapters     │ │
│ │ ☒ Session Profiles            │ │
│ │ ☒ Session Assignments         │ │
│ │ ☒ Keyboard Type               │ │
│ │ ☒ Host Attribute Mapping      │ │
│ │ ☒ Trace Data Parameters       │ │
│ └───────────────────────────────┘ │
│                                    │
│  ┌──────┐ ┌─────────┐ ┌────────┐  │
│  │  OK  │ │ Unlock..│ │ Cancel │  │
│  └──────┘ └─────────┘ └────────┘  │
└──────────────────────────────────┘
```
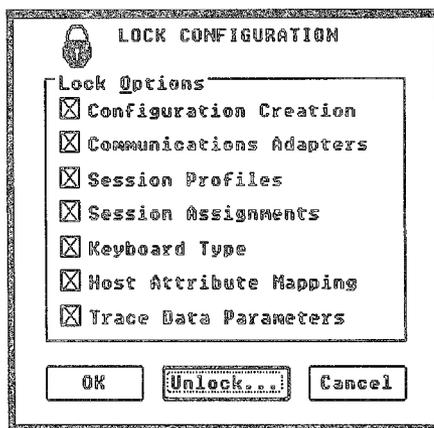
2   Select "Unlock." The Locking Password dialog box appears on the screen.

3   Type the correct password in the "Enter:" text box and select "OK." You return to the Lock Configuration dialog box. The padlock is open, the items are active, and the middle command button reads "Lock."

4   Select the items you want to change. You must remove the checks from the check boxes to gain access to those items.

Now you can change the configuration or options. Once you've changed them, you can relock them by selecting the items again, then selecting "Lock."

When you have locked the configuration items, select "OK" to exit the dialog box. You return to the EXTRA! Executive window. You are now ready to save the configuration.

Saving a Configuration

After you have finished the configuration (and locked it if you like), you must save the configuration so that EXTRA! can use it in the future.

1   Select the "File" menu.

2   If you are saving an existing configuration, select "Save Configuration..." The file will be saved (it may take a minute or so).

When using "Save Configuration As" and saving to an existing filename you run the risk of overwriting a configuration you may want to save. Make sure you select the correct filename to save over if you use this option.

If you are saving a new configuration or want to save your changes to a different file, select "Save Configuration As..." A dialog box comes up. You can save to an existing filename by selecting it, or you can type a new filename in the text box. Configuration files must all have EWC as their extension if they are to appear in the list box. Selecting "Save Configuration As..." also takes a bit longer to save than "Save Configuration..."

3   Select "OK." EXTRA! saves your changes or creates a new configuration file. EXTRA! also creates a sub-directory with a name similar to this file and places in the subdirectory all the associated files that the

configuration file requires. See the next section for information on copying and deleting these files.

The configuration file is what *EXTRA!* uses when it runs mainframe sessions. If you delete this file, *EXTRA!* won't have any instructions for running mainframe sessions and you will have to create a new configuration. If you forget your password, you will have to delete the file and create a new configuration if you want to make changes.

Copying Configuration Files

Now that you have configured one PC, you probably have to configure several more. Rather than going through the whole configuration process each time you install another copy of *EXTRA!*, you can copy the configuration files from this configuration onto a diskette and then copy them onto all other PCs that require the same configuration.

When you create a configuration, *EXTRA!* creates several files besides the EWC file. These files have the extensions ACB and LCB. *EXTRA!* creates a subdirectory and gives it the same filename as the configuration file plus the extension EWD; *EXTRA!* puts all these ACB and LCB files into this subdirectory. So, whenever you copy or delete a configuration file, make sure you copy or delete the associated files in the correct subdirectory.

To copy a configuration file, follow the instructions below.

1   Open the File Manager and move to the directory containing your *EXTRA! for Windows* files.

2   Put a formatted diskette in your A: or B: drive.

3   Make sure you are in the directory the *EXTRA!* files are
     in. Select the *EXTRA!* configuration file you want to
     copy; the name may be something like EXTRA.EWC,
     depending upon what default configuration you
     selected in installation, or it may have been renamed
     (see the previous section, "Save Configuration").

4   Select "Copy" from the File menu, and type the disk
     drive designation (A: or B:) in the "To:" text box. Then
     select "OK." The configuration file copies to your disk.

5   Open the subdirectory that is named for the configura-
     tion file you are copying—the subdirectory name is the
     name of the configuration file plus the extension EWD.
     Select all the files in that directory.

6   Select "Copy" from the File menu, and type the disk
     drive designation (A: or B:) in the "To:" text box. Then
     select "OK." All the configuration files copy to your
     disk.

Now you can take these files and copy them onto other PCs.
When you copy these files onto another PC, remember to
put the main configuration file (the EWC file) in the same
directory as EXTRA!.EXE (in the main *EXTRA!* directory).
Then create a subdirectory named after the configuration
file, including the .EWD extension, and copy all the ACB and
LCB files into that subdirectory.

Conclusion

In this chapter, you learned how to configure *EXTRA! for Windows* for your environment. You learned how to set all the necessary options and parameters for your printer and mainframe sessions.

Now that you have finished configuring *EXTRA!*, the next step is to set up screen layouts. Screen layouts save the arrangement and preferences of mainframe and printer windows on your PC screen. The next chapter, "Designing Screen Layouts," leads you through the process of creating and using screen layouts.

4 Designing
Screen Layouts

With *EXTRA!*'s Screen Layout feature, you can personalize your PC screen so that it contains just the *EXTRA!* windows that you use most often. You no longer have to start from scratch each time you run *EXTRA!*, opening the windows you most often use and closing the ones you never use. This feature lets you easily capture up to ten different screen designs that can be instantly recreated with a couple of keystrokes or mouse clicks.

With screen layouts, you can open your mainframe and printer sessions and place them in specific locations on the screen. Then you can save the layout for later use. A screen layout also saves each session's connection and any preferences you select.

This chapter begins by providing a review of how to move windows around on your screen. It then explains how to design a layout that best suits your needs, and how to save the layout so that it can be used at a later time.

Table of Contents

Discussion: What are Screen Layouts?

Screen layout refers to the way in which *EXTRA!*'s windows are arranged on the screen. Screen layouts are helpful because they enable you to display many sessions automatically so that you don't have to open them one at a time. Depending on your work needs, you can select from among ten different screen layouts that you design with *EXTRA! for Windows*.

Screen layouts also include the session connection and the preferences that were set for each window. You can set up several sessions, complete with preferred fonts, automatic font and window sizing, and attached SmartPad, and save all this information in a layout, saving you from having to reset all these options every time you start *EXTRA!*

No matter how many mainframe and printer sessions you may need, *EXTRA!* can meet that need. In fact, you can design a screen layout to display up to 26 sessions at one time, provided you have enough memory and are working in a token-ring DLC environment. If you are connected to the mainframe through NETBIOS LAN, you can have as many as four sessions, and with a coax DFT connection you can display up to five.

With *EXTRA! for Windows* you can choose to arrange your layout so that your windows are side-by-side, overlapping, or icons, allowing you easy access to all your sessions without having to open and close them unnecessarily.

> *Icon.* An icon is a graphic symbol representing an object. In this case, it represents an open application, running in memory, that has been minimized.

Getting Started

This section provides a brief review of how to move around in the Windows environment. It is assumed that you have worked with Windows-based applications in the past. For more detailed instructions on how to use Windows, refer to the Microsoft Windows User's Guide. If you already have a good understanding of this material and do not need a review, jump ahead to the section, "Creating a Screen Layout."

This section does not provide instructions for making selections with a keyboard. These commands can be found in the "Learning Windows" section of the Microsoft Windows User's Guide.

Reducing a Session to an Icon

With *EXTRA!* you can reduce a session so that it appears at the bottom of your screen as an icon. When you want to access that session again, simply restore it as a window.

To reduce the active window to an icon using a mouse, do the following:

1   Click on the Minimize box.

The window is now reduced to an icon at the bottom of the screen, and the window that was immediately behind the window that you just reduced is now the active window.

> *Minimize box.*
> *The minimize box contains a downward-pointing arrow, and is located in the upper right corner of the window.*

Restoring an Icon to a Window

Let's say that you are now ready to restore a session, making the icon a window.

To restore an icon to a window using a mouse, do the following:

1   Place the pointer on the icon you wish to restore and double-click.

    If you want the icon to become a window that takes up the whole screen, place the pointer on the icon you wish to maximize and click once to open the icon's control menu. Then click on "Maximize."

Changing a Window's Size

In the course of working on a task, you may find that you want to change the size of a window. To do so you will want to select the window so that it is the active window on the screen, and then carry out the commands that enable you to make the active window either larger or smaller.

To resize a window using a mouse, do the following:

📝 You can make any session the active window by selecting that session from the <u>W</u>indows menu of the EXTRA! Executive or any Emulator window.

1   If the window you want to resize is not the active window, click anywhere on the desired window with the mouse. The window will come to the "front" of the screen and become the active window.

2   Place the pointer on one of the window's borders. The pointer becomes a two-headed arrow.

3   Drag the border into the desired position, and release the mouse button.

📝 A side border can only move horizontally, and a top or bottom border can only move vertically.

4   If you want to size both the width and the height of the window at the same time, point to the corner where two adjacent sides meet and hold down the mouse button.

The pointer becomes a two-headed arrow.

5   Drag the corner of the box into whatever position you want, then release the mouse button.

Moving a Window

There may be any number of reasons why you might want to move a window. For instance, you may be typing a letter in a PC application based upon information from a mainframe session. Such a task would make it necessary for you to see both windows at the same time. You can move a window to another part of the screen so its information is visible, and yet it isn't in the way of the window you want to work in.

To move a window using a mouse, do the following:

1   If the window you want to move is not the active window, click anywhere on the desired window with the mouse. The window will come to the "front" of the screen and become the active window.

You can make any session the active window by selecting that session from the Windows menu of the EXTRA! Executive or any Emulator window.

2   Place the pointer anywhere on the title bar and hold down the mouse button.

3   Drag the window into the desired position and release the mouse button. As you drag the mouse, you will see the outline of the window moving with the pointer.

This concludes the overview for using Windows. In the following sections, you will learn how to design screen layouts by arranging, saving, and loading them.

Creating Screen Layouts

By using "Screen Layouts..." in the Session menu, you can create your own screen layouts to meet your work demands.

📝 You can access the "Screen Layouts..." command in the Session menu of both the EXTRA! Executive window and all mainframe windows, as well as in the control menu of the EXTRA! Executive window.

This section assumes that you have already installed and configured *EXTRA!* on your computer. This section also assumes that you know how to get *EXTRA!* running. If you do not know how to run the product, please refer to Chapter 2 of the *User's Manual*, "Using EXTRA! for Windows."

📝 All screen layouts also include the EXTRA! Executive window. Because you don't need to use it much if at all, you may want to reduce it to an icon in your layouts.

The process of creating a new screen layout involves two main tasks: arranging the layout and selecting session options; and saving the layout. These tasks are explained in more detail in the next two sections of this chapter.

In short, you simply open the number of mainframe terminal and printer windows that you want to have in your layout, and arrange them on your screen. Then select each session's connection and preferences, as well as the SmartPads you want to open. Once the layout is arranged and the options are set, save the layout—the options and session connections will be saved with the window arrangement. You can then design and save another screen layout. With *EXTRA!*'s Screen Layout feature, you can save up to ten layouts.

📝 Some or all of the windows can be reduced to icons.

Arranging a Screen Layout

The steps on the following pages explain how to design a screen layout. Before beginning, make certain that you've started Windows and that the *EXTRA! for Windows* Program Group is displayed on your screen.

Opening a Mainframe Session

After starting Windows, you're ready to bring up a mainframe session and begin using *EXTRA!* But before you can begin, you should make certain that the program is available. If you cannot locate the *EXTRA! for Windows* Program Group, which contains the *EXTRA!* applications, consult your System Administrator; *EXTRA!* might not be loaded on your PC.

The following steps explain how to bring up a mainframe session from the *EXTRA! for Windows* Program Group.

1   Open the *EXTRA! for Windows* Program Group.

2   Select and open the EXTRA! Emulator icon. The Emulator window opens up, then a list of the mainframe sessions that are available appears, as shown in the picture below. You'll also see the EXTRA! Executive icon at the bottom of the screen.

```
        OPEN SESSION

   Sessions:
   C   CoaxDFT0        ↑
   D   CoaxDFT1
   E   CoaxDFT2
   F   CoaxDFT3
   G   CoaxDFT4
   I   IBMCUT00        ↓

        OK       Cancel
```

3   Select one of the available mainframe sessions. After making your selection, the session's short and long names will appear in the title bar of the EXTRA! Emulator window.

Once you are connected to the mainframe, you should see your mainframe system's logon screen. (It may take a minute to appear.) If you do not see a status line or Operator Information Area (OIA) at the bottom of your screen, scroll down in your session window. The OIA is explained in more detail in Chapter 5, "Understanding Mainframe Messages."

Opening Additional Mainframe Sessions

📝 These steps also can be used to open up a single mainframe session from the EXTRA! Executive window.

The previous section explains how to open up a single mainframe session. To open up additional mainframe sessions, either repeat steps 1 through 3 above, or follow the steps below:

1 Jump to the EXTRA! Executive window, if you are not already there.

📝 You can also select "New Terminal Session" from the EXTRA! Executive icon's control menu.

2 Select "Session..." from the EXTRA! Executive's menu bar. Then select "New Terminal Session," as shown on the next page. A terminal window opens, then a list of the mainframe sessions that are available appears.

3 Select one of the available mainframe sessions. After making your selection, the session's short and long names appear in the title bar.

4 Repeat steps 2 through 4 until you have opened the number of sessions you want.

EXTRA! Executive - EXTRA EWC

File   Configure   Session   Windows   Help

New Terminal Session
New Printer Session
Screen Layouts...

5   Arrange your layout by moving and resizing the
     EXTRA! mainframe windows on your screen—even
     making some or all of them into icons. Once the
     mainframe windows are arranged to your liking, you
     can set the session preferences.

Mainframe Session Preferences

The Preferences menu in the main-
frame session window contains
several commands that affect the
look of the window: fonts, upper
and lower case, and automatic font

*Font. A font is a set of
characters, all of which have
the same type style and
attributes.*

sizing. The Preferences menu also contains commands to
show and load a SmartPad (see Chapter 2 in the *User's
Manual* for more information about the SmartPad). Any of
the options that you set will be saved with the screen layout.
Any SmartPad that you attach to a mainframe window will
also be saved in the screen layout that contains that window.

For more information
and instructions on using the
commands in the mainframe
Preferences menu, see
Chapter 2 of the *User's
Manual.*

Say you selected "Upper Case" and a 12-point font in one
mainframe session, turned on "Automatic Font Sizing" in
another session, and selected a 5-point font in another
session. Then you saved the screen layout. Each of these
sessions would retain their separate preferences in this
screen layout. An illustration of the Preferences menu with
descriptions of the commands follows.

```
┌──────────────────────────────────────────────────┐
│ ▬        EXTRA! (not connected)            ▼ ▲    │
│ File  Edit  Preferences  Session  Macro  Windows  Help │
│              ┌────────────────────────────┐        │
│              │ Fonts...                    │        │
│              │ Automatic Font Sizing       │        │
│              │ Next Larger Font    Ctrl+L  │        │
│              │ Next Smaller Font   Ctrl+S  │        │
│              ├────────────────────────────┤        │
│              │ Upper Case                  │        │
│              │ ✓Hotspots                   │        │
│              ├────────────────────────────┤        │
│              │ Show SmartPad       Ctrl+P  │        │
│              │ SmartPad Manager...         │        │
│              └────────────────────────────┘        │
│                                                    │
│                                                    │
└──────────────────────────────────────────────────┘
```
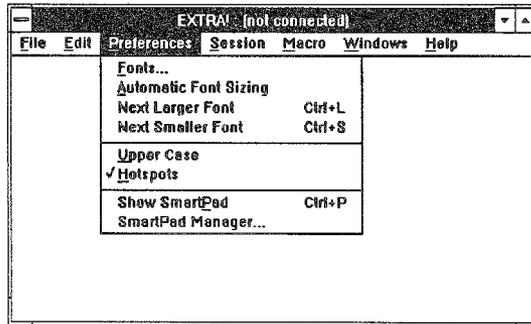
Fonts: This command lets you select the typeface and point size of the screen font you see in the mainframe session. There are several styles and sizes to choose from.

Automatic Font Sizing: This toggle automatically selects the largest font that will make the mainframe session completely fit in the window size you choose.

Upper Case: This toggle makes all characters in the main-frame session screen UPPER CASE when it is on and mixed Upper and lower case when off.

HotSpots: Turning this toggle on allows you to use the mouse to select PF keys in your mainframe applications.

To learn how to use SmartPad, read Chapter 2 of the User's Manual.

Show SmartPad: When this toggle is on, the screen displays the SmartPad that is currently attached to the mainframe session. When the toggle is off, the SmartPad disappears.

SmartPad Manager: This command leads to a dialog box where you can select or delete a SmartPad.

Opening A Printer Session

A printer session allows you to print mainframe information to your local PC printer. You can open and save printer session windows in a layout along with mainframe session windows. This section explains how to open up one or more printer sessions to be saved in a screen layout.

1   From the *EXTRA! for Windows* Program Group, select and open the EXTRA! Printer icon. An empty printer window opens and a list of the printer sessions that are available appears.
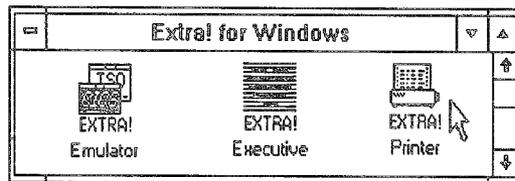
2   Select one of the printer sessions. Once it opens, the session's short and long names will appear in the title bar.

3   If you want to open any more printer sessions, repeat step 1 or jump to the EXTRA! Executive window. Select "New Printer Session" from the Executive's Session menu. Then repeat step 2.

4   Arrange the printer sessions on the screen—you can even make them into icons if you wish. You cannot change the size of printer windows, other than minimizing or maximizing them.

For information about Printer Preferences, see Chapter 3, "Printing," in the User's Manual.

5   Select the printer preferences you want from the Preferences menu.

After you have arranged all your windows and selected preferences, your screen might look something like one of the examples shown below and on the next page:
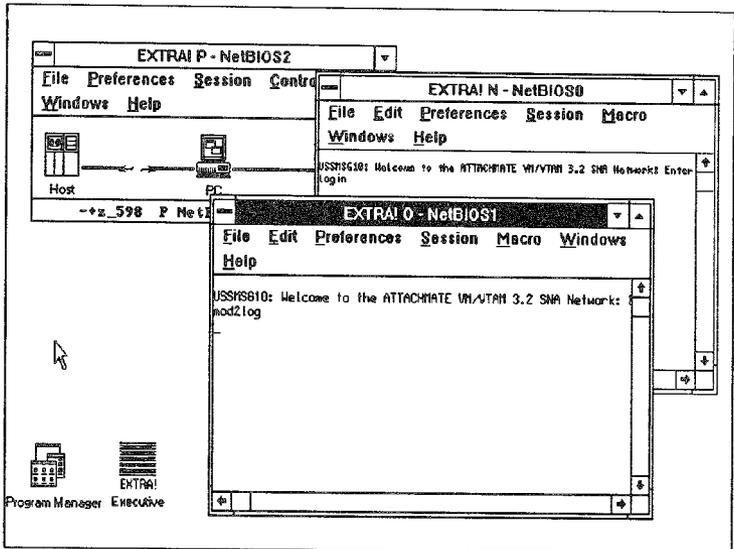
This screen layout shows 2 mainframe sessions and 1 printer session open, as well as the EXTRA! Executive icon.
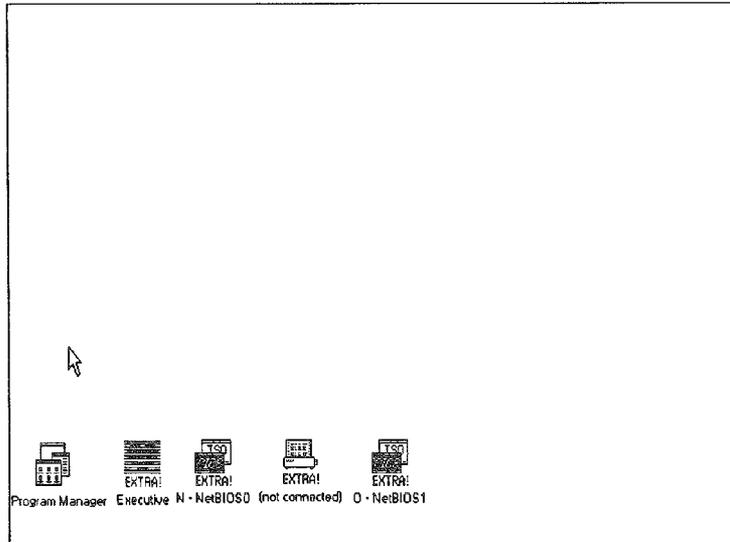
This screen layout displays 2 mainframe sessions, 1 printer session, and the EXTRA! Executive window, all as icons.

Saving a Screen Layout

Once you have arranged your screen layout, you will want to save it.

To save a screen layout, do the following:

1   In the active EXTRA! window, select "Screen Layouts..." from the Session menu. If your layout contains only icons, select "Screen Layouts..." from the control menu in the EXTRA! Executive icon. The Screen Layouts dialog box, shown on the next page, appears.

```
┌─────────────────────────────────────┐
│           SCREEN LAYOUTS             │
│  ┌─Layouts──────────────────────────┐│
│  │ ○ Layout 0        ○ Layout 5     ││
│  │ ○ Layout 1        ○ Layout 6     ││
│  │ ◉ Layout 2        ○ Layout 7     ││
│  │ ○ Layout 3        ○ Layout 8     ││
│  │ ○ Layout 4        ○ Layout 9     ││
│  └──────────────────────────────────┘│
│   Current Layout:   Layout Preview:  │
│   ┌──────────┐      ┌───┬──────┐     │
│   │          │      │   │      │     │
│   │          │      │   │      │     │
│   │          │      └───┴──────┘     │
│   │          │           0           │
│   └──────────┘                       │
│   [ Save ]     [ Load ]   [ Cancel ] │
└─────────────────────────────────────┘
```
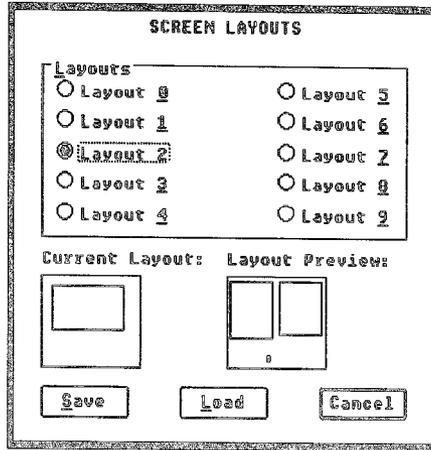
"Current Layout" displays the layout that was last loaded, and "Layout Preview" displays the layout whose number is presently highlighted. Selecting "Save" will save the layout on your screen to the selected layout file.

When you select a layout number that has not previously stored a layout, the "Layout Preview" box reads "Empty." If no layout has been loaded yet, "Current Layout" displays "Empty."

2   At the top of the dialog box is a list of ten layout numbers. Select the layout number under which you want to save the layout.

3   Select "Save." *EXTRA!* has now saved the layout, assigned it the layout number you gave it, and stored it on disk.

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Creating a Default Layout

The default layout is the layout which appears when you select and open the EXTRA! Executive icon. The default layout is Layout 0. When you create and save a layout, *EXTRA!* stores it in a file with the extension EWL, which is located in your *EXTRA!* directory. For example, the default layout is stored in the file LAYOUT00.EWL.

To save a screen layout as the default, do the following:

1   Create a screen layout, as explained earlier in this chapter. You are ready to save this layout as your default screen layout.

2   From an active *EXTRA!* window, select "Screen Layouts..." from the Session menu. The Screen Layouts dialog box will appear.

```
┌─────────────────────────────────┐
│          SCREEN LAYOUTS         │
│ ┌Layouts──────────────────────┐ │
│ │ ◉ Layout 0      ○ Layout 5  │ │
│ │ ○ Layout 1      ○ Layout 6  │ │
│ │ ○ Layout 2      ○ Layout 7  │ │
│ │ ○ Layout 3      ○ Layout 8  │ │
│ │ ○ Layout 4      ○ Layout 9  │ │
│ └─────────────────────────────┘ │
│ Current Layout:  Layout Preview: │
│ ┌──────┐        ┌──────┐         │
│ │      │        │      │         │
│ └──────┘        └──────┘         │
│  [ Save ]   [ Load ]  [ Cancel ] │
└─────────────────────────────────┘
```
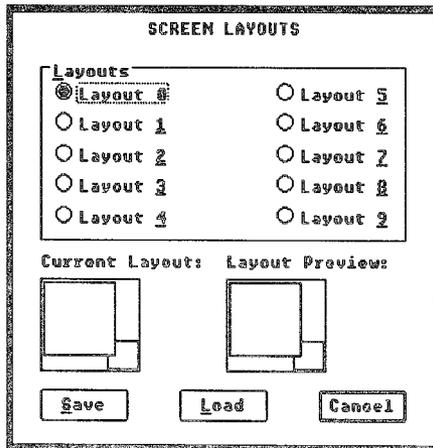
"Layout 0" is the number for the default layout.

3   Select "Layout 0," as shown on the previous page. If you have previously saved a Layout 0, it will be overwritten by the layout you are now saving. Be sure that by selecting this layout you aren't erasing one that you have already made and would like to keep.

4   Select "Save." *EXTRA!* has now saved the layout, assigning it the default name "Layout 0."

Loading a Screen Layout

Once you have designed a number of screen layouts, you can load any layout that you need, depending on what you want to accomplish with your sessions. You can load a screen layout by selecting the "Screen Layouts..." command and then indicating which layout you wish to load.

To load a screen layout, follow the steps below:

You can load a screen layout from any *EXTRA!* window. The "Screen Layouts..." command is located in the Session menu; in the EXTRA! Executive window, this command is also in the control menu.

1   Select "Screen Layouts..." from the Session menu of the active *EXTRA!* window.

2   In the Screen Layout dialog box, select the screen layout number that you wish to use. Under "Layout Preview," you will see a diagram of the layout.

3   Select "Load." *EXTRA!* will then load the screen layout you selected.

If the layout currently on your screen has sessions that don't fit the layout you are loading, *EXTRA!* asks if you want to close those sessions or not before loading the new layout.

Caution: If you are transferring a file and you load another screen layout, you might end your file transfer prematurely. It is recommended that you do not load a screen layout during a file transfer.

Short Cut for Loading Screen Layouts

You can use this short cut to load a screen layout if you already know what layout you want. When you create and save a layout, *EXTRA!* makes a file with the extension EWL, which is located in your *EXTRA! for Windows* directory. After you create layouts, you can see the layout files using the File Manager, as shown below (all screen layout files have the extension "EWL").
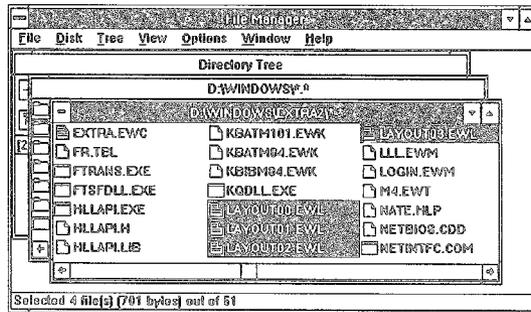
You cannot start up a screen layout from the Program Group if *EXTRA!* is already running. Use the "Screen Layouts" command instead.

You can make any of the existing screen layouts into Program Group items for the *EXTRA! for Windows* Program Group. Then, if you want to start *EXTRA!* using a particular screen layout, you can open the screen layout icon, rather than one of the *EXTRA!* application icons.

To make a screen layout into a Program Group icon, follow the instructions below.

1   Open the *EXTRA! for Windows* Program Group.

2   From the Program Manager menu, select "New" from the File menu. Then select "Program Item" and "OK" in the New dialog box.

3 The next dialog box asks for a description of the item, which it will use as the icon name, and asks for a command line for running the item. In the "Description" box, type in the name of the layout, such as Layout 2. Then in the "Command Line" box, type the filename. For example, for Layout 2, you would type LAYOUT02.EWL in the "Command Line" box.

4 To get an icon for the item, select "Change Icon." In the *EXTRA! for Windows* Program Group, the layouts will have the same icons as the Executive, with the name you entered in the "Description" below the icon. When you are finished, select "OK."

If you want to load the default screen layout, select and open the EXTRA! Executive from the *EXTRA! for Windows* Program Group.

Notice that your new item has been added to the Program Group, as shown in the picture below. You can start up *EXTRA!* using that layout anytime by selecting and opening that icon.

4-19
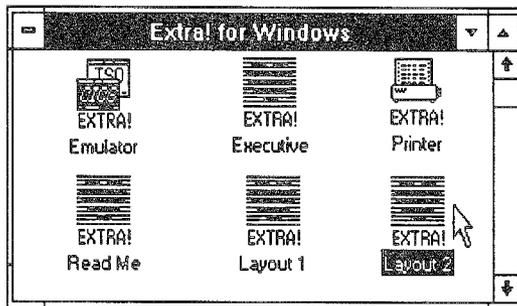
Conclusion

In this chapter, you learned how to arrange *EXTRA!*
windows on your PC screen and how to save these
arrangements as layouts. You also learned that these screen
layouts can save the preferences associated with each
window.

The next chapter, "Understanding Mainframe Messages,"
introduces you to the Operator Information Area (OIA), and
the messages it sends regarding the status of your main-
frame sessions. These messages range from informing you
of mainframe errors to simply telling you the time of day.

5 Understanding
Mainframe Messages

Near the bottom of your mainframe session window you'll find a status line called the Operator Information Area (OIA). *EXTRA!* uses the OIA to provide you with a variety of information about the mainframe session, information which appears as symbols and codes in the OIA. Understanding these messages gives you valuable information about the status of your session.

This chapter explains the different kinds of messages found in the OIA and the definition of each message.

Table of Contents

Discussion: Reading the OIA

The Operator Information Area (OIA) is divided into 13 fields; each field provides important information about the status of your mainframe session and the application that is running in it. This information includes the short and long names of your session, system messages, the location of your cursor, the status of your printer, and other status information. *EXTRA!* models its OIA after the OIA that appears on all 3270 terminals.

> ✍ The OIA might not be visible when you initially open a mainframe session. To view the OIA, maximize the mainframe window, or scroll down the window until the OIA comes into view.

The OIA, located on the 25th line of your screen, is shown below. You will find explanations on the following page for the OIA messages shown below.

Operator Information Area

```
EXTRA! N - NetBIOS0                              ▼ ▲
File  Edit  Preferences  Session  Macro  Windows  Help
VIRTUAL MACHINE/SYSTEM PRODUCT




        ##################################################
        ###  ######  ##  #   #######  ##     ###    ####
        ###  ######  #  #  #  #####  ##    ##  ##  ###  ##
        ####  ####  ##  ##  ##  ####  ####   #####  ###  ##
        #####  ##  ###  #####  ###  #######  ###    ####
        #######   ####  #####  ##  #####  ##   ##  #######
        #######  #####  #####  #  #######   ###  #######
        ##################################################
              Attachmate Corporation   VM/SP Release 6




    Fill in your USERID and PASSWORD and press ENTER
    (Your password will not appear when you type it)
    USERID   ===> _
    PASSWORD ===>

    COMMAND  ===>
                                              RUNNING   VMSPREL6
  4B     X ()     Aa -+z_598  ^   N 0 NetBIOS0   R 20 C 16  ■-■02   8:25  2/20/91
```

Message	What the Message Means
4B▊	Represents Condition of the Connection. This message says that this session has successfully connected to the mainframe.
X ()	Represents Busy with Request. This message indicates that the mainframe is busy processing input.
Aa	Represents the Case Mode. This message tells you if you're in upper case or upper/lower case.
-+z_598	Represents Condition of Communications. This message is stating that there is currently no connection to an Attachmate Gateway.
^	Represents Insert Status Mode. This message means that the session is in the insert mode.
N	The session short name.
3	Represents what screen layout was selected. For more information about screen layouts, refer to Chapter 4, "Designing Screen Layouts."
NetBios0	The session long name.
R 23 C 1	Represents the cursor location. This message tells you the current row and column location of the cursor within the window.
▊▄▊02	Represents the Printer Status. This message indicates you are attached to printer 02.
13:09	The current time, in 24-hour time.
3/3/90	The current date.

As you can see from this table, these 12 messages are separated into categories. Each category has its own position—or field location—on the OIA. See the next page for an illustration showing the above messages on an OIA.

The Fields of the OIA

The Operation Information Area below has been divided into 13 fields. It is followed by a table listing each field and its cursor location on the OIA.

✎ The readiness and reminder messages which appear in this OIA would not appear together in an actual OIA. They are displayed together here for the sake of illustration.
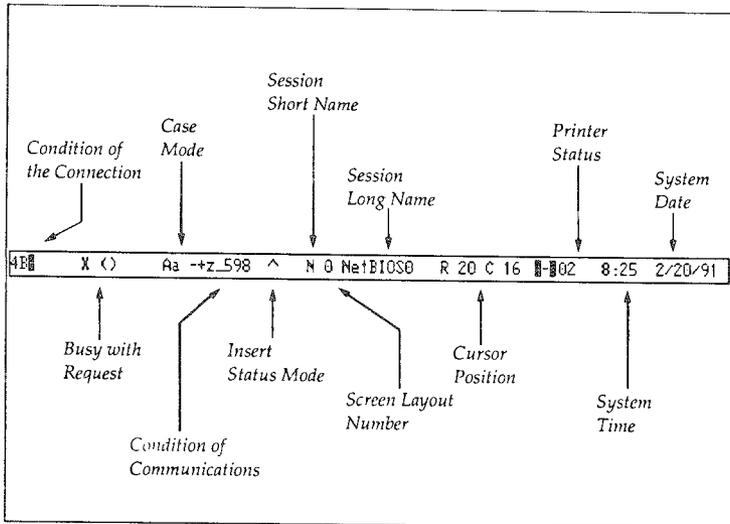
Name of Field	Field Location in Columns
Condition of the Connection	1 through 7
Busy with Request	9 through 17
Case Mode	18 and 19
Condition of Communications	21 through 27
Insert Status Mode	31
Session Short Name	34
Screen Layout Number	36
Session Long Name	38 through 45

OIA Fields Continued

Name of Field	Field Location in Columns
Cursor Location	49 through 58
Printer Status	60 through 64
System Time	66 through 70
System Date	72 through 79

Moving On

Now that the general information about the OIA has been covered, the rest of this chapter will be devoted to the messages that the OIA displays. The following sections contain tables that list the messages, their meanings, and the course of action to take in the event of an error.

Two sections have two tables: the general message displayed, and the specific error codes. For example, a general type of message might be XØnnn, where nnn represents a number. You could look on one message table to find what type of message XØ represents, then on the appropriate code table to find the information for the message number nnn. The tables are given in the order listed below.

> Condition of the Connection Messages
> Busy with Request Messages
> > Machine Check Codes
> > Program Check Codes
> Case Mode Messages
> Condition of Communications Messages
> > Communication Check Codes
> Insert Mode Messages
> Printer Status Messages

3270 Mainframe Messages

The table below and those on the following pages show you the 3270 mainframe messages which appear in the OIA. The messages are shown in ANSI character display, which is the display used by Windows. Error codes for each table follow that table.

Condition of the Connection

The table below displays the messages that you can receive in columns 1-7 of the OIA and what the messages mean.

Display	Message	Meaning
ANSI	?	Unowned. Your terminal is connected to the mainframe system but is not connected to an application or to the system operator (control program).
ANSI	4	Indicates a connection to either a 3274 or 3174 controller.
ANSI	6	Signifies a connection to a 3276 controller.
ANSI	A	The 'A' symbol appears in remote systems that use a BSC protocol. It is turned on upon receiving the following commands: Write, Erase/Write, Erase All Unprotected, Copy, Read Modified, and Read Buffer.

Display	Message	Meaning
ANSI	B	This symbol appears in systems that use an SNA protocol. It is turned on by completing an ACTPU/ACTLU command sequence, and is turned off by executing DACTPU or DACTLU.
ANSI	N	Represents a connection to an integrated adapter.
ANSI	Ø	This message indicates that your terminal is connected to the system operator (SNA SSCP).
ANSI	S	Indicates a connection to a 3174 controller in CUT mode.
ANSI		Your terminal is connected to a mainframe application program.
ANSI	TEST	The terminal is in the test mode.

Busy with Request Messages

The table below displays the messages that you can receive in columns 9-17 of the OIA, then tells you what the messages mean.

Display	Message	Meaning
ANSI	X Ønnn	**Machine Check.** Your system unit is not working properly. To understand the meaning of the error code (nnn) located within this message, refer to the "Machine Checks" table on page 5-11. Press [Reset]/[Esc] to continue. If the problem persists, contact the System Administrator.
ANSI	X PROGnnn	**Program Check.** The controller detected a programming error in the mainframe data. To understand the meaning of the error code (nnn) located within this message, refer to the "Program Check Codes" table on pages 5-12 through 5-17. Press [Reset] to continue. If the problem persists, contact the System Administrator.
ANSI	X ()	The session is busy processing input. Wait.
ANSI	X <ᴼ>	Go Elsewhere. You tried to enter in a protected field. Press [Reset]/[Esc] to clear.
ANSI	X ?+	The operation you attempted was not accepted. Make sure your request is valid, then press [Reset]/[Esc] and try again.

Display	Message	Meaning
ANSI	X º#?	Incorrect printer ID number. Press [Reset]/[Esc] to clear.
ANSI	X ºNUM	Only numeric data is permitted in this field. Press [Reset]/[Esc] to clear.
ANSI	X ºX	The function you requested is not available. Press [Reset]/[Esc] to clear.
ANSI	X OØ>	Operator message not accepted. A message from the control operator was received and rejected. Press [Reset]/[Esc] to clear.
ANSI	X SYS	System lock. The host has locked your keyboard. Look for a message. Press [Reset]/[Esc] to clear.
ANSI	X –f	The function you requested is not authorized. Press [Reset]/[Esc] to clear.
ANSI	X –s	The symbol key is not available. Press [Reset]/[Esc] to clear.

Machine Check Codes

These codes belong to the Busy with Request message
X Ønnn. The *nnn* part of the message is replaced by one of
the error codes in the following table.

Error Code	Description and Probable Cause	Action to Take
204, 207, 208, 211	Device check; (parity error) PC or coax cable.	POR device. Check coax connections.
209	Command failure. CU to PC coax.	POR device. Check coax connections.
240, 242, 243	PC device failure.	POR device.
591	Configuration error. (SNA and non-SNA).	There is a mismatch between the PC and 3274.
620	PC device failure.	Press [Reset]. Retry operation.
630 to 640	3274 Control Unit failure.	Press [Reset] and retry. Report the problem to the System Administrator.
650 to 699	PC device failure.	POR device, then retry. Report the problem to the System Administrator.
999	NETBIOS name conflict or network hardware error.	Change network workstation name; check cable and connections.

Program Check Codes

These codes belong to the Busy with Request message
X PROG*nnn*. The *nnn* part of the message is replaced by one
of the error codes in the following table.

The *nnn* part of the message begins with either a 4 or a 7:
messages with a code of 4*nn* are CUT mode errors; messages
with a code of 7*nn* are DFT mode errors.

"---" means the
error does not appear in
CUT mode.

Error Code	Description and Probable Cause	Action to Take
CUT DFT		
--- 701	Category not supported BIND RU.	Press [Reset] and try again. If the problem persists, contact your System Administrator.
410 702	RU > 1,536 bytes received.	See above.
413 703	Function not supported.	See above.
423 704	Format-indicator bit not allowed.	See above.
430 705	Sequence number error. The control unit generates this error when you change from DFT to CUT and then to DFT again. Redial host, or reset controller if possible.	See above.
431 706	Chaining error.	See above.
432 707	Bracket state error.	See above.
433 708	Data traffic reset state.	See above.
434 709	HDX error.	See above.

Error Code		Description and Probable Cause	Action to Take
CUT	**DFT**		
440	**711**	Session limit exceeded.	Press [Reset] and try again. If the problem persists, contact your System Administrator.
441	**712**	Bracket bid reject.	See above.
444	**713**	Session already bound.	See above.
---	**714**	No LU-LU session.	See above.
---	**715**	LU not active.	See above.
---	**716**	Not enough bytes in BIND RU.	See above.
450	**717**	Invalid support level.	See above.
451	**718**	Invalid PLU protocol.	See above.
452	**719**	Invalid SLU protocol.	See above.
453	**720**	Invalid common protocol.	See above.
---	**721**	Less than 62-byte RU length specified.	See above.
455	**723**	Invalid LU type.	See above.
454	**724**	Invalid screen size.	See above.
457	**725**	Cryptography not supported.	See above.
498	**726**	Negative SNA response from the mainframe.	See above.

Error Code		Description and Probable Cause	Action to Take
CUT	DFT		
499	727	SNA exception response	Press [Reset] and try again. If the problem persists, contact your System Administrator. problem.
---	728	An RM/RMA/RB command or a Read Partition SF type with EB and/or without CD.	See above.
---	729	A Read-Partition SF type was received in retry state. A read buffer command was received in normal state, and partition 0 does not exist.	See above.
401	750	Invalid command was received.	Ensure that *EXTRA!* is configured for the correct LUs. Enable EABs. Press [Reset] and try again. If problem persists, contact your System Administrator.
---	751	SFE, MR, or SA order was received with invalid character set value.	See above.
402	752	Invalid address was received following an order. MF order was addressed to a non-field attribute location.	See above.

5-14

Error Code		Description and Probable Cause	Action to Take

CUT DFT

403	753	Data follows a RM RB, or EAU command. RA order was received with an invalid character. GE order was received with an invalid character. SFE, MF, or SA order was received with an invalid attribute.	Ensure that *EXTRA!* is configured for the correct LUs. Enable EABs. Press [Reset] and try again. If problem persists, contact your System Administrator.
404	754	Data stream ended before all required bytes were received. (Required to complete a command.)	See above.
470	755	Invalid order was received. EOs or sub-control code was received while configured for non-EAB.	Press [Reset] and try again. If the problem persists, contact your System Administrator.
471	756	Invalid structured field. Structured field type not supported.	See above.
---	757	Load-PC SF has invalid PS alias. Load-PS SF is not supported.	See above.
---	758	Set reply mode. SF was received in invalid mode.	See above.

Error Code		Description and Probable Cause	Action to Take
CUT	DFT		
---	759	Read-partition SF is not the last SF. SF type is incomplete. SF length is invalid. SF length of 0000 was received but not last SF. A load-PS SF length error. Set-reply mode SF has field/ext. field mode and data following.	Press [Reset] and try again. If the problem persists, contact your System Administrator.
---	760	Erase/Reset Area SF reserved fields are not zero. Set-reply-mode SF attribute type is reserved.	See above.
---	765	Load-PS SF has invalid load start point. Load-PS has invalid code point of X 'FF'.	See above.
---	761	SF-type ID is invalid, not created, or nonzero is in implicit partition state. Query PID not X 'FF'. 3270 command was received in explicit partition state and PIB 0 does not exist.	See above.
---	762	Create-Partition SF has parameter error. Set-window-origin SF has parameter error.	See above.
---	763	Create-Partition SF caused a window to overlap. Create Partition SF was rejected because of insufficient resources.	See above.

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Error Code	Description and Probable Cause	Action to Take
	CUT DFT	
--- 764	Load PS SF was addressed; PS is invalid. Load-PS SF extension; invalid color bits.	Press [Reset] and try again. If the problem persists, contact your System Administrator.
--- 766	Load-PS SF has incomplete PS cell data. Load-PS has invalid end flag for type 2 PS. Load-PS has invalid type 2 header (end flag not encountered and not end of data).	See above.
--- 767	Create-Partition SF has invalid address mode. Create Partition SF has bit 0-3 of byte 4 not zero.	See above.
--- 768	Load-PS SF extension is invalid.	See above.
--- 769	Load-PS SF extension is invalid.	See above.
--- 770	Structured field type has start print in WCC, but not last structured field.	See above.
--- 771	Invalid command is in structured field.	See above.
--- 772	Resources requested are temporarily unavailable. Set Attribute, Modify Field, Start Field Extended; PSA-PSF was requested, but PS not allocated to the LT. Load-PS; PS is not allocated to the LT.	Press [Reset] and try again. If the problem persists, contact your System Administrator.

Case Mode Messages

The table below displays the messages that you can receive in columns 18-19 of the OIA and what the messages mean.

Display	Message	Meaning
ANSI	A	All characters are displayed in UPPER CASE mode.
ANSI	Aa	Characters are displayed in both UPPER and lower case mode.

Condition of Communications Messages

The table below displays the message that you can receive in columns 21-37 of the OIA and what it means.

Display	Message	Meaning
ANSI	-+z_5nn	Communication Check. This serves as a reminder that you have a communication error. For the 5nn, refer to the "Communication Check Codes" table on the next page.

Communication Check Codes

These codes belong to the Condition of Communications message -+z_5nn. The 5nn part of the message is replaced by one of the error codes in the following table.

Error Code	Description and Probable Cause
501	The Data Set Ready (DSR) was dropped, indicating a broken or lost connection. Redial the phone call; someone may have simply picked up the phone receiver, which can break the connection.
502	The Clear To Send (CTS) connection is not present, which may indicate a broken modem or cable. Check the modem and cable for possible damage and try again. If the problem persists, contact the System Administrator.
504	You probably lost the Carrier Detect connection, causing you to lose the phone call. Redial.
505	It is normal to receive this code while your PC is making a connection with the mainframe, indicating that the mainframe does not yet acknowledge your unit. If this code persists, you likely have a configuration mismatch. Make sure your PUID corresponds to the mainframe's definitions of your unit. Consult the System Administrator.
510	The Physical Unit is not active. The Physical Unit Address (PUADD) probably has been incorrectly specified. In DLC it is likely the host address has also not been specified. Consult the System Administrator.
518	The SNA segment was received with improper sequencing. Try the operation again. If the condition persists, consult the System Administrator.

Error Code	Description and Probable Cause
519	Count exceeded. Your message extended beyond the allowable length. Try the operation again. If the condition persists, consult the System Administrator.
521	Idle timeout. There has been no activity on line for the past 25 seconds. This most likely indicates the mainframe is down. Consult the System Administrator.
528	A number of issues can cause this condition. The 3274 may be defined incorrectly to the mainframe or there is an intermittent error at the PC or the Mainframe. The Physical Unit (PU) is down. Most likely the mainframe is down. Consult the System Administrator.
529	The 3274 has lost the connection with the mainframe. The cause is probably the modem or cable. Check the modem and cable for possible damage and try again. With a DLC connection, it may be the LAN is down; there could be a problem with the network adapter. Consult the System Administrator.
530	Write timeout; loss of clear to send (CTS). This likely indicates a broken modem or cable. Check the modem and cable for possible damage and try again. If the problem persists, contact the System Administrator.
586	"Received data failure." You might have a problem with your network adapter. Check your network adapter and refer to the documentation for the adapter.
587	"Fatal DLC error detected." You have a communication problem originating most likely in the network adapter. Check your network adapter and refer to the documentation for the adapter.

Error Code	Description and Probable Cause
588	"Unable to initialize token-ring adapter." You most likely are missing an adapter driver in your CONFIG.SYS, or the driver appears in the wrong order. Check the CONFIG.SYS file. If the problem persists, call Attachmate Technical Support at 1-800-388-3270.
589	"Unable to open Service Access Point (SAP)." Your SAP parameters may be incorrect or missing. Check the CONFIG.SYS file. If the problem persists, call Attachmate Technical Support at 1-800-388-3270.
590	"Unable to open token-ring adapter." Can also apply to coax connections. You most likely are missing an adapter driver in your CONFIG.SYS, or the driver appears in the wrong order. Check the CONFIG.SYS file. If you have a coax connection, this message means the connection with the control unit has been dropped. Check the coax card cable and controller for connection problems. If the problem persists, call Attachmate Technical Support at 1-800-388-3270.
597	The gateway has stopped communicating with the workstation, indicating that the gateway is probably down. Consult the System Administrator, or call Attachmate Technical Support at 1-800-388-3270.
598	Gateway (Attachmate protocol) has not responded to the workstation. You may have an incorrect network station name, host resource name, or associated PC to Gateway identification problem. Consult the System Administrator, or call Attachmate Technical Support at 1-800-388-3270.
599	Gateway (IBM protocol) has not called the workstation. You may have an incorrect network station name, host resource name, or associated PC to Gateway identification problem. Consult the System Administrator, or call Attachmate Technical Support at 1-800-388-3270.

Insert Mode Status Messages

The table below displays the message that you can receive in column 31 of the OIA and what the message means.

Display	Message	Meaning
ANSI	^	When this symbol appears in column 31, it indicates that you are currently in the insert mode.

Printer Status

The table below displays the messages that you can receive in columns 60-64 of the OIA and what the messages mean. In all the messages, the letters *nn* would be replaced by actual numbers on your OIA. They represent a number that identifies the printer you are using.

Display	Message	Meaning
ANSI	▓–▓*nn*	The system acknowledges that you are attached to a printer, identified by the number *nn*.
ANSI	▓–¤*nn*	The printer failed while printing your job. Press [DevCncl] to clear.
ANSI	▓–*nn*	The printer is printing your job.
ANSI	X ▓–∅	Printer not working. Press [Alt]/[Esc], then select another printer.
ANSI	X ▓–¤()	Your job is printing.

Display	Message	Meaning
ANSI	X ▇–▇()	The printer assigned to your terminal is currently busy.
ANSI	X ▇–▇()()	The printer is currently very busy.

Conclusion

In this chapter, the Operator Information Area (OIA) was described and explained. The fields of the OIA were identified and their messages and error codes were explained.

In the next chapter, "Troubleshooting," you will find information that will help you diagnose problems you might encounter when using *EXTRA!* In addition, "Troubleshooting" will suggest possible causes for the problem and how to solve it.

6 Troubleshooting

This chapter is designed to help you understand and solve problems that sometimes occur while using *EXTRA! for Windows*. This chapter is divided into two parts:

●	General Troubleshooting: This section describes some of the System Problems, Connection Problems (Coax, LAN, and Token-Ring DLC), and File Transfer Problems that you might run into.

●	Error Messages: This section introduces you to *EXTRA!*'s Message Services, and describes some of the error messages (Coax, NETBIOS LAN, and Session Manager messages) you may see displayed in the Message Services window. For help with error messages in the Operator Information Area (OIA), see Chapter 5, "Understanding Mainframe Messages."

This chapter is designed to be used as a quick reference. If you are unable to find the answer to a problem, call Attachmate's Technical Support at 1-800-388-3270.

Table of Contents

Discussion: Problem Solving

Occasionally you may encounter problems when loading *EXTRA!*, or while you are using the program. Most of the time, these problems can be easily solved by performing a few simple steps, as outlined on the following pages. If the problem still persists after trying these solutions, or your problem is not described in this section or elsewhere in the documentation, call Attachmate's Technical Support at 1-800-388-3270.

EXTRA! also has a special feature called Message Services. It displays system messages from *EXTRA!* and also enters the messages and associated information into a log file. You can use this file to track errors and to assist you or Attachmate's Technical Support with troubleshooting.

General Troubleshooting

This section describes problems that you might encounter while using *EXTRA!* and what action(s) you can take to eliminate them. These problems are divided into the following groups: System Problems, Connection Problems, and File Transfer Problems. If your particular problem is not listed here, refer to the appropriate chapter in this manual, or other technical documentation to solve the problem.

System Problems

This section covers general system problems that are not related to a specific connection type or to a specific feature such as file transfer. The following problems are discussed in this section.

- DOS will not load when your PC is turned on

- Windows cannot find *EXTRA!*'s Program Group

- System locks or you unexpectedly exit Windows

- Automatic font sizing does not work

- Undefined System Problems

DOS will not load when your PC is turned on

Most often, this problem is caused by an I/O or memory conflict between the supplied adapter and another PC expansion board, or a hardware problem with the supplied adapter.

Action

1   Review the installation procedure for your adapter.

2   Reseat the adapter in the expansion slot.

3   Run the supplied diagnostic programs for the adapter, making sure all the diagnostics pass. (For running the diagnostic program, refer to the instructions supplied with your adapter.)

4   Remove all the nonessential PC expansion boards from your PC. They may be conflicting with the I/O or memory addresses.

5   Press [Ctrl]/[Alt]/[Del] to load DOS again. Removing the nonessential boards should solve the problem. If you still have problems, contact your System Administrator for assistance.

Windows cannot find EXTRA!'s Program Group

Sometimes, when you are loading Windows, it will tell you that it cannot find *EXTRA!*'s Program Group. This problem usually occurs because the wrong path to your *EXTRA!* files was specified during installation.

During installation, *EXTRA!*'s Install program automatically creates a program group and adds its path to Windows' PROGMAN.INI file. PROGMAN.INI is the file that Windows uses to keep track of all its program groups. If a program group's path is not correct in this file, Windows will not be able to find the program group and an error message will be displayed on your screen.

Action

1   Load Windows and click on OK when the error message appears.

2   Using Windows' File Manager, open the PROGMAN.INI file. You can find it in the directory that contains your Windows files.

3   Check the file to make sure that the path to EXTRA!.GRP is correct. It should be the same as the path to your *EXTRA!* files.

4   Type in the correct path if it's either incorrect or missing. If you are adding the path, it can be located anywhere in the file.

5   Save the file and exit Windows.

6   Load Windows again. The error message should not appear. If it does, contact your System Administrator for help.

System locks or you unexpectedly exit Windows

Several things can cause unexplained system problems: terminate-and-stay-resident (TSR) programs, other adapter cards, etc. Below are several steps you can follow to fix the problem. If you try restarting Windows and *EXTRA!* after each step, you should be able to figure out what exactly is causing the problem.

Action

1   Remove all TSR programs from your AUTOEXEC.BAT and any other ".BAT" file you use before starting Windows.

2   Remove all unnecessary adapter cards from the PC.

If you're using expanded memory with Windows, follow steps 3-5 below.

3   Start Windows using the /L option (shown below) to decrease the page frame size.

IF USING. . .	THEN TYPE. . .
Windows 3.0	*win/L+64 [Enter]*
Windows version 2.xx	*win386/L64 [Enter]*

4   Start Windows using the /N option to shut off expanded memory support.

IF USING. . .	THEN TYPE. . .
Windows 3.0	*win/N [Enter]*
Windows version 2.xx	*win386/N [Enter]*

5   Check the "EMMpageframe" size.

IF USING. . .	THEN . . .
Windows 3.0 (enhanced mode only)	Look in your SYS.INI file. Using any text editor, open the file and scroll down to the section that begins with [386ENH]. After you've found the section, look for a line that reads "emmpageframe=". Is the starting address correct? (Check with your adapter manual for the correct number.) If the number is incorrect, fix it, save the file, and restart Windows.
Windows/386 version 2.xx	Look in the WIN.INI file. Using any text editor, open the file and scroll down to the section that begins with [win386]. After you've found the section, look for a line that reads "emmpageframe=". Is the starting address correct? (Check with your adapter manual for the correct number.) If the number is incorrect, fix it, save the file, and restart Windows.

Automatic font sizing does not work

Automatic Font Sizing lets *EXTRA!* automatically select a character size so that the entire 3270 screen fits into your mainframe session window. If you are having problems with this feature, check the items listed below.

Action

1   Check to see that both ATM fonts (ATM 3270 and ATM FULL) are loaded on your PC. With the mainframe session still open, pull down the Preferences menu and select "Fonts. . ." Both ATM fonts should be listed in the dialog box on your screen.

IF. . .	THEN. . .
Both fonts are not there.	Jump to step 3.
Both fonts are there.	Look in your WIN.INI file and delete all references to the ATM fonts. They will be listed in the [Font] section of the file. Make sure you save the file after you delete the references.

2   Close your session and return to Windows. Once in
        Windows, go into the Main Program Group and open
        the Control Panel icon.

3   Open the Fonts icon located in the Control Panel
        window.

4   Select "Add." When you select "Add," a dialog box will
        appear where you can specify which file you want to
        add to your WIN.INI file. Only add one file at a time.

5   In the dialog box, look for the ATM fonts in your
        EXTRA! directory.

6   With the font you want to add highlighted, select "OK."
        If you need to add a second font, repeat steps 4 through
        6.

7   Select "OK" again to close the Fonts icon.

8   Close the Control Panel window.

9   Open the File Manager icon.

10   Look in your WIN.INI file and make sure that neither of
        the fonts are listed twice. If one of the fonts is listed
        twice, delete one of the lines.

11   Exit Windows, then load it again.

12   Open another *EXTRA!* mainframe session and see if
        both automatic font and automatic window sizing
        work. If they don't, contact your System Administrator
        for assistance.

Undefined System Problems

If you are having a problem with *EXTRA!* and cannot
determine its source, here are a few items you can check
before you contact your System Administrator.

Action

1   Delete the configuration you've been using and create a
    new one. If the configuration files are corrupted, you
    may experience unpredictable results when running
    EXTRA!

    The name of the file you are using is displayed in the
    title bar of the *EXTRA!* Executive window. The file can
    be found in the directory where all your *EXTRA!* files
    are. In addition to that file, there's a directory there that
    must also be deleted. Except for its extension (.EWD),
    its name is the same as the file you need to delete. For
    example, the directory MONDAY.EWD should be
    deleted along with the configuration file named
    MONDAY.EWC.

2   Configure *EXTRA!* again.

3   In Windows' WIN.INI file, make sure there is a block
    similar to the one shown below.

    [extra!]
    startup=extra.ewc
    directory=d:\ppp\extrawin

    Where *d:\ppp* is the path to your *EXTRA!* files.

4   In your AUTOEXEC.BAT file, make sure that both *EXTRA!* and Windows are in your path statement.

5   Try running *EXTRA!* again. If the problem still exists, contact your System Administrator for assistance.

Coax Connection Problems

This section covers problems that might arise when you are connected to the mainframe via a Coax CUT or Coax DFT connection. The following problems are discussed in this section.

● Mainframe session does not operate correctly

● You can open one mainframe session but not another

● Mainframe session does not communicate with the controller

Mainframe session does not operate correctly

This problem occurs if there is a configuration mismatch between the mainframe session and the mainframe, or if there is a problem with the adapter or cable. This can be verified if the terminal session does not respond when turned on, and a 4, 6, or S is displayed in the first column of the Operator Information Area (OIA).

Action

1   Check to see if a machine check condition (X[0] nnn) is displayed in columns 9-17 of the OIA. If so, there is most likely a problem with the adapter or cable. To make certain, connect the controller port and cable to other devices to check operation.

2   Check to see if a program or communication check condition (XPROGnnn or -+z_5nn) is displayed in columns 9-17 of the OIA. If so, there is more likely an error in the configuration of *EXTRA!*, or the *EXTRA!* program files have been corrupted. First make certain that the *EXTRA!* configuration matches the mainframe configuration. Then if the configurations match, delete all the *EXTRA!* files and install *EXTRA!* again. If the problem occurs again, contact your System Administrator for assistance.

You can open one mainframe session but not another

If you can't open more than one mainframe session, the problem might be caused by your mainframe's configuration. If you are trying to run multiple sessions, your mainframe must have more

> *Logical Unit. A logical unit, also called a mainframe resource, is any device that you can communicate with: a port on a control unit, a pool of ports, or a terminal.*

than one LU (Logical Unit) defined for the port that you are using. Even if you've configured *EXTRA!* for multiple sessions, you will not be able to open more than one session when only one LU is defined by the mainframe.

Action

Contact your System Administrator and find out how many LUs have been defined for the port you are using. Tell your administrator that you need one LU defined for each session you want to open.

Mainframe session does not communicate with the controller

This problem occurs when there is a mismatch between *EXTRA!* and the controller, or when there are hardware problems.

Action

1   Make sure the mainframe session is on. Pull down the Session menu and see if "Power On" is grayed. If it is, the mainframe session is on. Go ahead and jump to step 3.

2   If the session is off, turn it on by selecting "Power On." If you turn it on and there is still no response from the mainframe, look at the first column in the Operator Information Area (OIA) and check to see if a 4, 6, or S is displayed. If none of these characters are displayed, the terminal is still not communicating with the controller.

3   Run diagnostic tests on your adapter. Make certain that the adapter is installed correctly and that the adapter type, memory location, and I/O address match the selections made in the configuration. Refer to the adapter's documentation for adapter type information.

4   Verify that the PC is connected correctly for communicating with the mainframe and check the connection for hardware problems.

5   Move the communication adapter card to the PC bus slot nearest the power supply.

6   Make sure there are no error messages displayed when *EXTRA!* is loaded.

7   Check to see if a program or communication check
     condition (XPROGnnn or -+z_5nn) is displayed in
     columns 9-17 of the OIA. If so, there is likely to be an
     error in the configuration of *EXTRA!*, or the *EXTRA!*
     program files have been corrupted. First make certain
     that the *EXTRA!* configuration matches the mainframe
     configuration. Then if the configurations match, delete
     all the *EXTRA!* files and install *EXTRA!* again. If the
     error still occurs, contact your System Administrator for
     assistance.

**NETBIOS
LAN
Connection
Problems**

This section covers problems that might arise when you are
using a NETBIOS LAN connection. The following problems
are discussed in this section.

⊚   Mainframe session does not operate correctly

⊚   Attachmate Gateway does not respond: error code 598
     or 599

⊚   You can open one mainframe session but not another

Mainframe session does not operate correctly

This problem occurs if there is a configuration mismatch
between the mainframe session and the mainframe, or if
there is a problem with the adapter or cable. This can be
verified if the terminal session does not respond when
turned on, and a 4, 6, or S is displayed in the first column of
the Operator Information Area (OIA).

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Action

1   Check to see if a machine check condition (X[0] nnn) is
     displayed in columns 9-17 of the OIA. If so, there is
     most likely a problem with the adapter or cable. To
     make certain, connect the controller port and cable to
     other devices to check operation.

2   Check to see if a program or communication check
     condition (XPROGnnn or -+z_5nn) is displayed in
     columns 9-17 of the OIA. If so, there is likely to be an
     error in the configuration of *EXTRA!,* or the *EXTRA!*
     program files have been corrupted. First make certain
     that the *EXTRA!* configuration matches the mainframe
     configuration. Then if the configurations match, delete
     all the *EXTRA!* files and install *EXTRA!* again. If the
     error still occurs, contact your System Administrator for
     assistance.

Attachmate Gateway does not respond: error code 598 or 599

When a 598 or 599 error code is displayed in the OIA, the
gateway on your network might not be responding to your
PC. Error code 598 is displayed when there is an identifica-
tion problem between a gateway using Attachmate protocols
and a workstation on the network. Error code 599 is
displayed when there is an identification problem between a
gateway using IBM protocols and a workstation on the
network.

Action

1   Make sure you are running NETBIOS on the gateway and on your PC.

2   Make sure that the gateway is on-line.

3   Make sure that *EXTRA!* is configured correctly.

FOR ERROR CODE...	MAKE SURE...
598	That *EXTRA!* is configured for an Attachmate Station Type ("Station Type" is located in the Resource Parameters dialog box). Also, make sure that *EXTRA!* and the gateway are configured for the exact same User Name and Resource Name. Both these options are case-sensitive.
599	That *EXTRA!* is configured for an IBM Station Type ("Station Type" is located in the Resource Parameters dialog box). Also, make sure that *EXTRA!* and the gateway are configured for the exact same User Name, and that at least one of the Resource Names specified in *EXTRA!*'s configuration matches the Station Name on the gateway. Both User Name and Resource Name are case-sensitive.

4   Make sure that the network has enough NETBIOS SESSIONS and COMMANDS. Contact your System Administrator if you have questions about these NETBIOS parameters.

You can open one mainframe session but not another

If you can only open one mainframe session, *EXTRA!* might not be configured for multiple sessions. When configuring *EXTRA!* for a NETBIOS LAN connection, you need to define all four resources, even if you are only using a pool of resources. If you don't, you'll get one of the following error codes—598, 4, or 4B—when you try to open the second session. The error code will be displayed in the OIA.

Action

1   Close any mainframe session that is open.

2   From the EXTRA! Executive window, select "Communications Adapter. . ." from the Configure menu.

3   Highlight NETBIOS DFT Connectivity.

4   Select "Edit."

5   Check how many resources are defined. All four resources should be defined.

6   Define any Resource that is not defined.

7   If you had to define any of the resources, save the new configuration and try to open your mainframe sessions again.

    If you still get errors when you open the second session, or, if all four resources were already defined, contact your System Administrator for assistance.

Token-Ring DLC Connection Problems

This section covers problems that might arise when you are using a DLC connection on either a direct token-ring or a token-ring LAN network.

Before you try any of these troubleshooting procedures, check to see if the DLCINTFC interface was loaded on your PC when you tried to use *EXTRA!* It must be loaded before Windows is loaded. (For information on loading DLCINTFC, refer to Appendix B in this manual.) The following problems are discussed in this section.

● Mainframe session does not operate correctly

● Cannot connect to an IBM 3270 Personal Communications Gateway

● Cannot connect to the mainframe: error code 588

Mainframe session does not operate correctly: error 510, 4, 4B, 6 or S

This problem occurs if there is a configuration mismatch between the mainframe session and the mainframe, or if there is a problem with the adapter or cable. This can be verified if the mainframe session does not respond when turned on, and a 510, 4, 4B, 6, or S is displayed in the first column of the Operator Information Area (OIA).

Action

1 Check to see if a machine check condition (X[0] nnn) is displayed in columns 9-17 of the OIA. If so, there is most likely a problem with the adapter or cable. To make certain, connect the controller port and cable to other devices to check operation.

2 Check to see if a program or communication check condition (XPROGnnn or -+z_5nn) is displayed in columns 9-17 of the OIA. If so, there is more likely an error in the configuration of *EXTRA!* Make certain that the PUID (Physical Unit Identification), I-frame size, and Destination Address specified in *EXTRA!*'s configuration matches the mainframe's configuration.

3 If you are using IBM's PC LAN Support NETBIOS driver (DXMT0MOD.SYS), add the following two parameters to the CONFIG.SYS file:

   EST=2 ES=2

4 Try to open a session again. If the error still occurs, contact your System Administrator and ask if they can toggle the physical unit between active and inactive.

5 If you still get errors, contact your System Administrator for assistance.

Cannot connect to an IBM 3270 Personal Communications Gateway

The IBM 3270 Personal Communications Gateway cannot be used unless the correct interface and connection type are specified.

Action

1   Make sure that the DLCINTFC interface is loaded before you go into Windows. For instructions on loading DLCINTFC.EXE, refer to Appendix B, "Tracing and Other Utilities."

2   Make sure that you have configured *EXTRA!* for a Token-Ring DLC connection.

3   Make sure that you have configured *EXTRA!* for an IBM Station Type ("Station Type" is located in the Resource Parameters dialog box).

4   Make sure that you have configured *EXTRA!* for the correct PUID. When using a DLC connection, the PUID determines which LUs are available.

Cannot connect to the mainframe: error code 588

When you are running *EXTRA!* with a direct token-ring connection or on a token-ring LAN, you may experience problems connecting to the mainframe or controller. You may see a "588" error message in the Operator Information Area (OIA) (see Chapter 5, "Understanding Mainframe Messages," for more information on the OIA). These problems occur because some communications adapters compete for memory addresses (or interrupt vectors) in the PC that are already used by other adapters or programs, particularly Windows/386.

Action

Configure the network software driver to reside in a different, and unused, memory address, as described on the next page. The procedures you follow depend on what hardware and software you have. Follow the instructions in order, reading them thoroughly to see if they apply to your situation. See your LAN Administrator for assistance.

Token-Ring Networks

If you are running a token-ring network, follow this procedure.

There are two ways to set memory addresses with a token-ring network. Use only one of the following instructions.

1   In your CONFIG.SYS file, enter a line as follows:

   device=dxmc0mod.sys ,c800

                 - OR -

   If you are using TOKREUI.COM with the token-ring network, type the following line either at the DOS prompt or in a batch file that will run before you start Windows:

   tokreui ,c800

Windows and LANs

If you are using Windows/386 version 2.xx or Windows 3.0
and your mainframe connection is through a LAN, follow
the procedure below.

1   In the same directory where you start NET3.COM,
     create a text file in DOS and call it SHELL.CFG.

2   On the first and only line of the file type the following:

     TASK MODE=0

3   In Windows, modify one of the following files. Then
     restart Windows to gain access to these changes.

IF USING. . .	THEN. . .
Windows 3.0	In your SYS.INI file, enter the following line under the [386enh] section. *EMMEXCLUDE=mmmmm-mmmm* Where *mmmmm-mmmm* is the adapter's memory location on your PC.
Windows/386 version 2.xx	In your WIN.INI file, enter the following line under the [win386] section. *EMMpageframe=0d000*

File Transfer Problems

This section covers problems that you may encounter when trying to transfer a file between the mainframe and your PC. The following problems are discussed in this section.

● File Transfer is cancelled because of invalid TSO options

● PC file is overwritten by a mainframe file during a transfer

---

File Transfer is cancelled because of invalid TSO options

This problem can occur when you are either sending or receiving a file under TSO (a mainframe operating system). If your file transfer is cancelled and an "Invalid Options" error message appears in the File Transfer Status window, you need to clear the LRECL (Logical Record Length) option. This problem occurs when the LRECL of a partitioned dataset (set by the mainframe) is different from the LRECL set by *EXTRA!* (For a description of LRECL and its defaults, refer to Chapter 3 of your *EXTRA! for Windows User's Manual.*)

Action

1 Go into the File Transfer dialog box and select "Options. . ."

2 Select Logical Record Length (LRCEL) and delete any value you have entered. Do not set it to "0." You must clear this option of any value.

3 Transfer the file again. If the transfer is cancelled again, contact your System Administrator for assistance.

PC file is overwritten by a mainframe file during a transfer

This occurs when the "Append to existing file" option is not selected in the File Transfer dialog box and the PC filename already exists.

Action

1   Make sure "Append to existing file" is selected. This option is located in the File Transfer dialog box

2   Make sure the correct directory path is specified in the PC filename dialog box.

3   Try to transfer the file again. If the PC file is overwritten again, contact your System Administrator for assistance.

Error Messages

Error messages are handled by *EXTRA!*'s Message Services. The following sections describe what Message Services does, how you can use it, and several messages that could appear in the Message Services window.

Message Services

If *EXTRA!* has a problem, it uses its Message Services to displays an error message in the upper right corner of your screen. The window that displays the message is called the Message Services window.

The EXTRA! Message Services window has a control menu and a File menu. The File menu, shown and described later, allows you to limit the size of the message log file, to name that file, and to view messages in that file.

The error messages you see in the Message Services window will have four fields: Who, What, Why, and What To Do. In this chapter, the major headings come from the What field, which lists the module of *EXTRA!* that recorded the error. The Why field is the actual error message; the messages are presented in this section as minor headings in alphabetical order. The What To Do field is given under "Action."

In this chapter, you will see some messages that have text enclosed in brackets, for example, <session short name>. This text represents a variable in the message. In the actual messages, the variable will be replaced by what it suggests. In the case of the above example, the variable would be replaced by a single character that refers to the short name of a specified mainframe session, such as A or D. Another variable you will see in this chapter is #nnnnn. This variable represents a number, such as an error number.

The Message Window

The *EXTRA!* Message Services window displays system and error messages to the user. The example below shows a sample message window. The information in the message fields are explained in a later section, "The Log File."

```
┌─────────────────────────────────────────────────────┐
│ ═  ▓▓▓▓▓▓▓▓▓▓ EXTRA! Message Services: XLog ▓▓▓▓▓ ▼ ▲ │
├─────────────────────────────────────────────────────┤
│ File                                                  │
├─────────────────────────────────────────────────────┤
│ Who: 36 IN EXLU2 69/17/90 11:04:11                    │
│ What: D:\EXTRAWIN\TRMINL.EXE                           │
│ Why: Could not open session.                          │
│ What to do: Check Extra! log for previous error(s), or│
│ retry operation with more available memory.           │
│                                                       │
└─────────────────────────────────────────────────────┘
```

The message window contains information about the error and messages to the user. The information in the window shows where in *EXTRA!* the message is coming from, what the problem is, and what the user should know or do. The information in the first two lines is system-oriented. The user message line ("What to do") will tell you what steps you need to take, if necessary, or what the problem is in plain language. All the information from this window goes into the log file.

Sometimes, *EXTRA!* will generate several messages for one error condition. When this happens, *EXTRA!* will display one message and store the others in a Log file that you can view using Messages Services. When a message appears on the screen, the number in the "What" line of the message indicates the message's sequence position in the Log file. In the example above, the message is number 36 in the file.

Viewing the Messages

You can view individual messages in the log file using the Message Services _File menu (see the following steps for instructions). To view the log file as a whole, see "The Log File" later in this chapter.
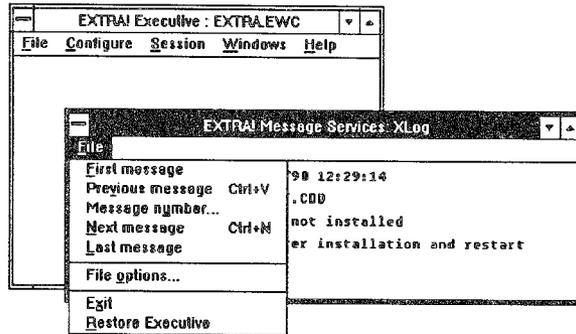
The File menu in the EXTRA! Message Services window.

1 In the EXTRA! Executive window, select "Message Services" from the _File menu. The EXTRA! Message Services window appears on the screen. Notice that the title bar displays the title of the log file (XLOG is the default filename).

2 In the EXTRA! Messages Services window, select "First Message" from the _File menu. The first message in the log file will display in the window. If there are no messages in the file or if the first message is being displayed, First Message is grayed.

3 Select "Next Message" from the _File menu. The next message in the log file displays in the window. (This will be message #2 if you followed step 2, above.) If there are no messages in the file or if the last message is being displayed, Next Message is grayed.

4   Select "Previous Message" from the File menu. The
     message just before the currently displayed message
     will appear in the EXTRA! Messages Services window.
     If there are no messages in the file or if the first message
     is being displayed, Previous Message is grayed.

5   Select "Message Number" from the File menu. A dialog
     box appears, showing you the range of available
     numbers and prompting you to enter a number. Type
     the number of the message you want to view in this box
     and select "OK." If you select an incorrect number, the
     cursor returns to the number text box. If there is a
     message of the sequence number you entered, then it
     appears in the Message Services window. If there are
     no messages in the file, Message Number is grayed.

6   Select "Last Message" from the File menu. The last
     message in the log file appears in the Message Services
     window. If there are no messages in the file or if the
     last message is being displayed, Last Message is grayed.

Setting the Log File Parameters

EXTRA!'s Message Services allow you to set a filename and size for the message log file. The default name for the file is XLOG. The default size is 100K. To change the name or the size, see the following instructions.

1   In the EXTRA! Executive window, select "Message Services" from the File menu. The EXTRA! Messages Services window appears on the screen.

2   Select "File Options" from the File menu. The Message Services File Options dialog box, shown below, appears on the screen.
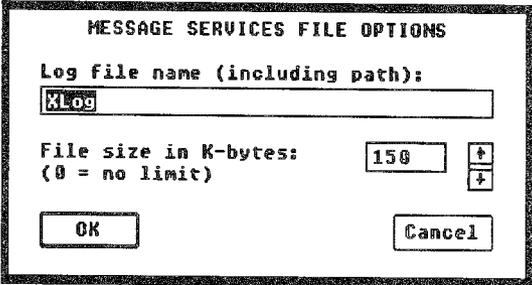
```
┌──────────────────────────────────────────┐
│         MESSAGE SERVICES FILE OPTIONS      │
│                                            │
│   Log file name (including path):          │
│   ┌──────────────────────────────────────┐ │
│   │ XLog                                 │ │
│   └──────────────────────────────────────┘ │
│                                            │
│   File size in K-bytes:      ┌─────┐  ┌─┐  │
│   (0 = no limit)             │ 150 │  │↑│  │
│                              └─────┘  │↓│  │
│                                       └─┘  │
│   ┌──────────────┐        ┌──────────────┐ │
│   │      OK      │        │    Cancel    │ │
│   └──────────────┘        └──────────────┘ │
└──────────────────────────────────────────┘
```

3   Enter a new filename, if desired, in the "Log file name" text box.

4   Enter a different file size in the "File size" text box; or you can use the scroll arrows to change the size. Setting the size to "0" (zero) will put no size limit on the file: the file can get as big as necessary.

You may want to put a limit on the size because the file could potentially take up too much space on your hard disk.

5   When you are finished with any changes, select "OK."

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The Log File   Message Services creates a file of the messages. This file, called a " log file," contains all the information from message windows. When a message window opens on the screen, the message is entered ("logged") into the log file and the message total in the file is updated. The size of the file and the filename can be set by the user. Users can view messages in this file using the Message Services File menu commands.

The log file is useful for tracking errors and system messages and for troubleshooting. If you call Attachmate's Technical Support for help with a problem, have the log file handy. The information in the log file will allow Attachmate's Technical Support people to help you more quickly

On the next page is a sample message. See the following paragraphs for a description and explanation of the information in the message.


```
Number    Type      Source    Date              Time

─                    EXTRA! Message Services: XLog          ▼ ▲
File
Who:  36  IM EXLU2 09/17/90 11:04:11
What:  D:\EXTRAWIN\TRMINL.EXE
Why:  Could not open session.
What to do: Check Extra! log for previous error(s), or
retry operation with more available memory.
```
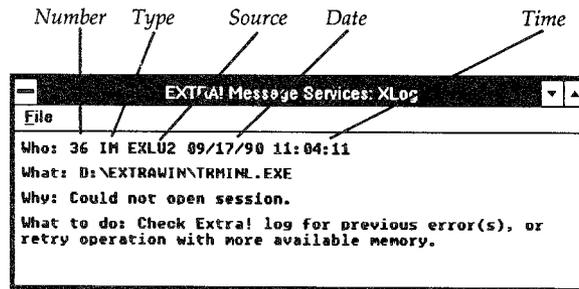
The parts of the first line of the message (Who:) are
described below. In the example on the previous page, this
line reads as follows:

36 IM EXLU2 09/17/90 11:04:11

Number

The first number on the first line of the message is that
message's sequence number. The first message is number 1,
etc. The example on previous page is message number 36 in
the log file.

Type

This item shows the type of message. There are three types
of messages: response, which gives information to the user
and requires that the user respond in some way;
informational, which gives information to the user but
doesn't require a response; and non-modal, which may or
may not come up in a window. The log file has codes for
these three message types. AM stands for Application
Modal, the response-required message. IM stands for
Information Modal, the informational message. And NM
stands for Non-Modal. All messages write to the log file,
even if they don't display on the screen.

Source

This item shows where in *EXTRA!* the message came from.
In the above example, the source is EXLU2, a module of
EXTRA! The source is useful to the Attachmate Technical
Support person who might be helping you with
troubleshooting.

Date and Time

These items tell the date and time when the message occurred.

Disk File

The second line (What:) shows the disk file of the *EXTRA!* module that noted the error. In the example, the file that the error originated from or was noted by is "D:\EXTRAWIN\TRMINL.EXE."

Error

The third line (Why:) shows the system error or exception that the source returned to Message Services. In the example, the error reads "Could not open session."

Action

The fourth line (What to do:) shows the message that *EXTRA!* sends to the user explaining what action(s) to take, if any, to fix the problem. In the example, the action to take begins "Check Extra! log for previous error(s),...."

Coax Connection Messages

The following messages may be displayed in the Message Services window when you are using a coax DFT connection with *EXTRA!* The "What" field of the message window will contain "Coax DFT Communications Driver."

The Coax Adapter is not installed. Confirm adapter installation and restart.

This message is displayed if the Communications Driver cannot locate the adapter at connection time.

Action

Make sure all network adapters, cables, and connectors are properly installed and operational. If you are unable to correct this condition, contact your Network Coordinator.

Waiting for Control Unit response. Confirm connection to Control Unit.

This message is displayed at connection time if the adapter is present and operative, but the communications driver finds itself waiting for more than 15 seconds for the first command from the Control Unit.

Action

Make sure all network adapters, cables, and connectors are properly installed and operational. If you are unable to correct this condition, contact your Network Coordinator.

NETBIOS LAN Connection Messages

The following messages may be displayed in the Message Services window when you are loading *EXTRA!* on a NETBIOS network station, or at any time while *EXTRA!* is running on a NETBIOS network. The "What" field of the message window will contain "NETBIOS Communications Driver."

Adapter Malfunction.
Check your network adapter and cable and reboot.

This error normally causes all network communications to cease. This message is displayed when a malfunction occurs in the local area network adapter, the network cable, or any other network hardware.

Action

Make sure all network adapters, cables, and connectors are properly installed and operational. If you still can not locate the problem, run the diagnostic programs supplied with your local area network. If you are unable to correct this condition, contact your Network Coordinator.

Duplicate Name in Local Name Table. Specify a name other than <Workstation name>.

This message indicates that the specified LAN Workstation name is already being used by another NETBIOS application using the same network adapter card.

Action

Configure *EXTRA!* again using a different LAN Workstation name. See Chapter 3 of this manual, "Setting Up EXTRA! for Windows."

Illegal Name - Cannot Specify a '*' in Column 1. Use the configurator to change the name <Workstation name>.

The name specified can't be used as a workstation name because of the asterisk.

Action

Configure *EXTRA!* again, changing the LAN Workstation name to one without an asterisk (*) as the first character. See Chapter 3 of this manual, "Setting Up EXTRA! for Windows."

Insufficient number of NetBIOS commands available to run.
Restart NetBIOS allowing for more commands and restart Extra!

Not enough NETBIOS resources on your adapter are available to allow an *EXTRA!* mainframe session to run.

Action

Some NETBIOS implementations allow the number of various NETBIOS resources to be configured. If possible, configure NETBIOS again, allowing for more NETBIOS control blocks. If this is not possible, load less NETBIOS applications prior to running *EXTRA!*

Local Name Table Full.
Remove a NetBIOS application or increase the size of the name table.

Not enough NETBIOS resources on your adapter are available to allow an *EXTRA!* mainframe session to open.

Action

Some NETBIOS implementations allow the number of various NETBIOS resources to be configured. If possible, configure NETBIOS again, allowing for more name resources. If this is not possible, load less NETBIOS applications prior to running *EXTRA!*

Name Conflict - Two or More Users of the Name <Workstation name>.
Use the configurator to change the name <Workstation name>.

The name specified is being used by another adapter card or user on the network.

Action

Configure *EXTRA!* again, using a different LAN Workstation name. See Chapter 3 of this manual, "Setting Up EXTRA! for Windows."

Name In Use on Remote Adapter.
Use the configurator to change the name <Workstation name>.

The name specified is being used by another adapter card or user on the network.

Action

Configure *EXTRA!* again, using a different LAN Workstation name. See Chapter 3 of this manual, "Setting Up EXTRA! for Windows."

NetBIOS Adapter Number Incorrect. Reconfigure with correct adapter number and reload Extra!

The LAN adapter you select when you configure *EXTRA!* can be either primary (0) or secondary (1). The adapter number specified during configuration was incorrect.

Action

Reconfigure *EXTRA!* using the correct adapter number. See Chapter 3 of this manual, "Setting Up EXTRA! for Windows."

Network BIOS not found. Load NetBIOS and then reload Extra!

EXTRA! could not locate the NETBIOS communications interface.

Action

1   Exit Windows.

2   Load NETBIOS.

3   If Windows/386 is NOT being used, skip to step 6.

4   Change to the directory containing the *EXTRA!* files.

5   To load NETINTFC.COM, the NETBIOS interface
     program, type the following:

     netintfc [Enter]

6   Start Windows, then run *EXTRA!*

7   If you are unable to correct the problem, contact your
     System Administrator for assistance.

Network Error - Failed to Delete Name. Reset the adapter or reboot prior to restarting Extra!

An unexpected error occurred while closing a session.
Starting an *EXTRA!* session may cause unexpected errors.

Action

1   Close Windows.

2   Reboot computer.

3   Restart Windows and run *EXTRA!*

Not enough NetBIOS resources to start session.
Turn off all Attachmate sessions or any IBM session.

This error occurs only when using *EXTRA! for Windows* with Windows/386. When this message comes up it means that not enough NETBIOS resources exist in the Windows/386 environment to start the *EXTRA!* session. Because Windows/386 allows only two NETBIOS resources, you have to use the NETBIOS interface to have access to all of your adapter's NETBIOS resources.

Action

You can have access to all the available NETBIOS resources if you load the NETBIOS interface program in your AUTOEXEC.BAT file or the batch file you use to start Windows. If you use your AUTOEXEC.BAT file to load the interface program, have it load *after* NETBIOS loads.

1   Close all existing sessions.

2   Exit Windows/386.

3   Change to the directory containing the *EXTRA!* files.

4   To load NETINTFC.COM, the NETBIOS interface program, type the following:

    netintfc [Enter]

5   Start Windows/386, then run *EXTRA!*

Unusual Network Condition.
Check your network adapter and cable and reboot.

This message means the network has found an error condition it does not understand.

Action

If this message is displayed frequently, follow the instructions for the error message "Adapter Malfunction."

Sessions Manager Messages

The following message may be displayed in the Message Services window when you are trying to load *EXTRA!* The "What" field of the message window will contain "Sessions Manager."

Unable to Load Extra! for Windows
Missing Configuration Item
[Extra!]Directory=C:\Extrawin

This error message indicates that the WIN.INI file was not modified during installation and that Windows cannot find the correct directory for the *EXTRA!* files.

Action

The *EXTRA!* installation program cannot modify the WIN.INI file unless the Windows directory is specified in your AUTOEXEC.BAT file. If the Windows directory is not in your AUTOEXEC.BAT file, you can clear this error in two ways. You can add the directory to your AUTOEXEC.BAT file, in which case you'll need to reboot your PC and install *EXTRA!* once more, or you can add the following lines to your WIN.INI file yourself.

Make sure the Directory= command specifies the path to your EXTRA! files.

[Extra!]
Directory=C:\WINDOWS\EXTRAWIN
Startup=EXTRA.EWC

You can modify the WIN.INI file using any text editor, such as Windows Notepad or Write.

Conclusion

This chapter covered some of the problems and error messages that you might encounter when using *EXTRA!* If you could not find the information you needed in this chapter, contact Attachmate's Technical Support at 1-800-388-3270.

Appendix A
For More Information

Other than your *EXTRA! for Windows User's Manual* and *Reference Manual*, there are additional sources where you can find valuable information on how to set up and use *EXTRA!*

EXTRA!'s on-line Help (discussed on the following pages) is your most important additional source of information. It contains valuable information that supplements what is in your user's and reference manuals.

In addition to Help, there are other sources that you may find helpful. One of these sources is *EXTRA!*'s README file. It contains late-breaking information about the current release of *EXTRA!* Peruse the README file if you can't find the information you need in the manuals or the on-line Help. If you still can't find the information that you need, feel free to call Attachmate's Technical Support at 1-800-388-3270.

At the end of this appendix, we've also included a list of additional reading materials that you may find helpful.

On-Line Help

EXTRA! for Windows has an on-line Help system that allows you to access information while you are using *EXTRA!* With the information on-line, you'll be able to save time because you can access information instantly while you are using *EXTRA!*

EXTRA!'s Help menu is very similar to the Help menu you have been using with Windows 3.00. It contains topics on the different commands *EXTRA!* uses, maps of the keyboards *EXTRA!* supports, procedures that you might need to use *EXTRA!*, and information on troubleshooting. You can find information on these topics by searching for a "keyword," or you can browse through information using "browse sequences." More than likely, you'll use a "keyword" to get to specific information, and then use "browse" to find any related information. (Both these procedures are discussed later.) However, when you have an *EXTRA!* window active, the [F1] key that you usually use to call Windows' help does not work because of the way *EXTRA!* maps your keyboard for 3270 emulation.

Using Help

You can bring up the Help window from any of *EXTRA!*'s open, active windows. Starting from your active window, pull down the Help menu (shown on the next page) and select one of the topics listed in the help menu. One of the topics, "Using Help," is the same on-line help aid found in your Windows Help menu. Because both systems are compatible, you can use this information to help you understand *EXTRA!*'s Help, just as you did with Windows' Help.
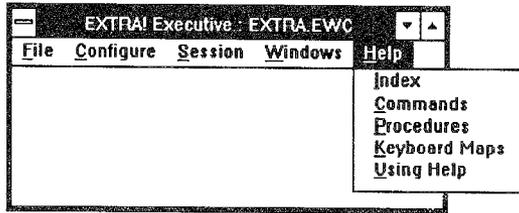
Here is a list of all the topics in the Help menu. Until you are familiar with how the help system is organized, "Index" will be your best bet for locating the information you need.

Index   This index contains the overall perspective of how *EXTRA!*'s Help is organized. If you are not sure where the information you need is, the Index will guide you to the right spot.

Commands   This topic contains a list of all the commands you might need while using *EXTRA!* Each command is listed under its menu.

Procedures   This topic contains the step-by-step instructions you might need to use *EXTRA!*

Keyboard Maps   This topic contains maps of all the keyboards that EXTRA! supports.

Using Help   This topic teaches you how to use *EXTRA!*'s on-line Help. It is the same help aid that appears in Windows' Help.

Finding Information Fast

To find information fast, use Help's keyword search feature. Using this feature is similar to searching through the index of your *User's Manual*.

Here is how to do a Keyword search.

1   Select "Index" from the Help menu.

2   Select "Search" to open the Search window.

3   From here, you have two ways to find a keyword. You can scroll through the "Search For. . ." list for an existing keyword, or you can enter your own. When you enter your own keyword, keep your eyes on the list as you type. Help will search through its list while you are typing, updating itself after every letter you enter.

4   Select one of the related topics displayed in the lower portion of the window. These topics will take you directly to the information you need.

Key Phrases (Underlined Text)

When using Help, you'll notice that some of the key phrases are underlined. These phrases are used as jump-off points to more information. Those phrases with a solid underline will lead you to related topics when you click on them. Those phrases with a dotted underline will bring up a pop-up definition window. The pop-up definition window will stay on your screen until you release your mouse button.

**Getting Out
of Help**

Once you are in the Help window, you can exit by simply clicking twice on the Control menu in the upper left corner of the window. (If you don't have a mouse, select Close from the Control Menu.) This will take you out of the Help window and back to the active *EXTRA!* window.

The README File

An information file, called README!.TXT, is provided on *EXTRA!*'s program diskettes. It contains information that was not available at the time the manuals went to print.

Once *EXTRA!* is loaded, you'll see the EXTRA! README icon (shown below) in *EXTRA!*'s Program Group. Simply open this icon to view the README file (README!.TXT).
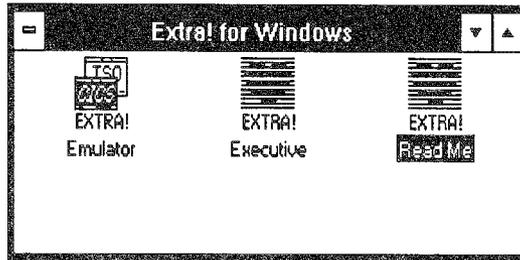
Printing the README! File

You can obtain a printed copy of the file using Notepad's "Print" command. But before getting started, make sure the README! file is displayed on your screen, and that you can print to a local printer from Windows.

When you're ready to print, select "Print" from the Notepad's File menu. The file will be sent to the printer Windows is connected to.

Supplemental Reading

The following publications can help you learn more about the operation of your personal computer, Microsoft Windows, 3270 emulation, and host communication peripherals.

- EXTRA! for Windows Reference Manual, Attachmate Publication.

- Microsoft Windows User's Guide, Microsoft Corporation Publication.

- Using Microsoft Windows/386, Microsoft Corporation Publication.

- IBM 3270 Information Display System 3274 Control Unit Description and Programmer's Guide, IBM Publication.

- IBM 3270-Information Display System Data Stream Programmer's Reference, IBM Publication.

- 3278 Display Station Operator's Guide, IBM Publication.

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- IBM PC Guide to Operations, IBM Publication.

- DOS 3.3 Disk Operating System Reference, IBM Publication.

- IBM 3270 Personal Computer Control Program Guide, IBM Publication.

- IBM HLLAPI Programming Guide, IBM Publication.

- HLLAPI for Windows Programmer's Manual, Attachmate Publication.

Appendix B
Tracing and Other
Utilities

This appendix provides information about the *EXTRA! for Windows* trace utility. You also will find important utilities to use when running *EXTRA!* with a token-ring DLC network or with a NETBIOS network and Windows/386.

The Trace Utility

Whenever you open a session and interact with the mainframe, whether you are typing your name or transferring a large file, a great deal of activity takes place behind the scenes. Likewise, the mainframe's responses to your input also involve a lot of unseen activity. The trace utility records such activity, which you can later review in hexadecimal and ASCII code. And by designating a filename other than the default, you can save the trace session for reference later on.

You will find the trace utility helpful in the event that you need to debug your system, or simply want to review the activity taking place between *EXTRA!* and the mainframe. This utility also enables Attachmate Technical Support to better help you if you need their assistance.

Kinds of Trace Services

EXTRA! for Windows supports three kinds of trace services: File Transfer, HLLAPI, and Sessions Manager trace services. This appendix will cover tracing for File Transfer and the Sessions Manager. For information on tracing HLLAPI activity, consult the *HLLAPI for Windows Programmer's Manual*.

The Sessions Manager is a dynamic-link library in *EXTRA!*, managing the data traffic flowing between the higher and lower elements of the *EXTRA!* software. File Transfer tracing falls under the realm of the Sessions Manager, but you can have *EXTRA!* trace only file transfers without all the other Sessions Manager activity. See Chapter 3 of the *User's Manual* if you want information about tracing a single file transfer.

An Overview of Trace Services

Before you read on, it is important that you have some understanding of the trace service's organization and terminology. This section provides an overview of how the trace utility works.

A trace session records the activity between *EXTRA!* and the mainframe from the time you turn trace on to the time that you turn trace off. While *EXTRA!* is tracing, each transaction with the mainframe is recorded as a trace summary line in the trace summary window, as shown below. The trace summary line tells you the trace source, the time the transaction occurred, whether the transaction was a call or a return, and what kind of transaction took place.

> *A Trace Summary Line consists of some overhead information plus the data string detailing the activity that took place.*

📝 The term "trace session" involves a duration of time, and does not refer to a connection with the mainframe.

A Trace Summary Line

```
━  ▬        EXTRA! API Trace Services: APITrace        ▼ ▲
   Trace
   SESS_MGR TASK  09:04:01.56 Ret   SXSETSTA.C(232):  ↑
   SESS_MGR TASK  09:04:34.51 Call  SXINIT.C(178):
   SESS_MGR TASK  09:04:35.23 Ret   SXINIT.C(241):
   SESS_MGR TASK  09:04:49.29 Call  SXGETSTA.C(210):
   SESS_MGR TASK  09:04:49.95 Ret   SXGETSTA.C(223):
   SESS_MGR TASK  09:04:50.00 Call  SXGETSTA.C(210):
   SESS_MGR TASK  09:04:50.00 Ret   SXGETSTA.C(223):
   SESS_MGR TASK  09:04:50.00 Call  SXGETADD.C(205):
   SESS_MGR TASK  09:04:50.39 Ret   SXGETADD.C(218):
   SESS_MGR TASK  09:04:50.44 Call  SXGETADD.C(205):
   SESS_MGR TASK  09:04:50.44 Ret   SXGETADD.C(218):
   SESS_MGR TASK  09:04:50.44 Call  SXGETADD.C(205):
   SESS_MGR TASK  09:04:50.44 Ret   SXGETADD.C(218):
   SESS_MGR TASK  09:04:50.50 Call  SXGETADD.C(205):  ↓
```

The Trace Summary Window

📝 Because the trace data window can contain sensitive information, such as passwords, accessing the trace data window is a lockable feature in the Configure menu, and can be unlocked with a password.

After turning a trace session off, you can open the trace summary window to review the trace summary lines of your trace session. You can then select and open a specific trace

summary line to get detailed information about that
particular transaction. This information is in hexadecimal
and ASCII form, and appears in what is called a data
window. You will find more information about the trace
data window on page B-15.

Trace Status in the EXTRA! Executive

The EXTRA! Executive window displays the status of trace
services. The table below shows you the three modes of
trace services and the status message that accompanies each
mode.

When Trace is...	The Trace Status Line Displays...
Off	nothing
On	API Tracing: *X byte Buffer API Tracing: X byte Element
In Review mode	API Tracing: X byte Buffer

* X denotes a number

The screen below shows how the trace status displays when
trace services is on.
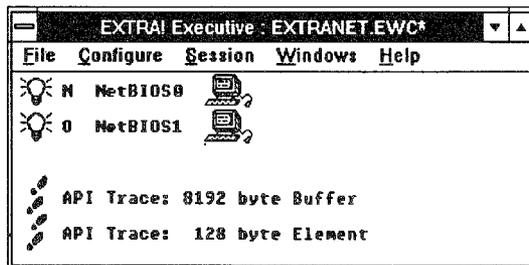
Configuring a Trace Session

Before you begin to trace your activity in *EXTRA!*, you may want to alter the default settings for the trace services. If you know that the default settings are sufficient for your trace needs, feel free to skip to the section, "Turning Trace Services On."

Briefly, configuring a trace session involves four options:

- Setting the trace path and filename

- Setting the size for the trace buffer

- Setting the size of the binary file

- Setting the size for the trace element

These four options, which are all located in the Trace Buffer Options dialog box, are explained on the following pages.

Setting the Trace Path and Filename

The Trace Services window displays the name of the disk file that the trace data will be saved to in the title bar.

The trace filename designates where on your hard drive the trace session will be written to if the trace session exceeds the amount of available space in the trace buffer. If you wish to save your trace session for future reference, you will need to designate a path and filename before you begin a trace session. Otherwise, the default file called APITRACE, will overwrite your existing trace session once you begin a new trace session.

Note that the APITRACE default file does not include a path or an extension. This is a volatile file that is set aside for the purpose of storing the most recent trace session. If you begin a trace session using the default filename, you will, of course, be able to review the trace session once you turn the

trace off and select the review option. But you will not be able to save the trace session, since it has already been written to the default filename. Once you turn the trace service back on, the default file will erase all previous trace sessions to make room for the new trace session.

To assign a path and filename to a trace session, do the following:

1   If the trace summary window is not currently open, select "API Trace Services..." from the File menu of the EXTRA! Executive. The API Trace Services window will appear.

2   Select "API Buffer Options..." from the Trace menu. The dialog box shown below will appear.

```
┌─────────────────────────────────────────────────┐
│              API TRACE BUFFER OPTIONS             │
│                                                   │
│   Binary file name (including path):              │
│   ┌───────────────────────────────────────────┐  │
│   │ APITrace                                    │  │
│   └───────────────────────────────────────────┘  │
│                                                   │
│   Maximum file size in K-bytes:      ┌─────┐  ┌──┐│
│   (0 = no limit)                     │ 150 │  │▲▼││
│                                      └─────┘  └──┘│
│   Trace buffer size in 8K blocks:    ┌─────┐  ┌──┐│
│   (1 - 8)                            │ 2   │  │▲▼││
│                                      └─────┘  └──┘│
│   Element size in 128-byte blocks:   ┌─────┐  ┌──┐│
│   (1 - 64)                           │ 2   │  │▲▼││
│                                      └─────┘  └──┘│
│   ┌──────────┐              ┌──────────┐          │
│   │    OK    │              │  Cancel  │          │
│   └──────────┘              └──────────┘          │
└─────────────────────────────────────────────────┘
```

3   In the filename text box, type the desired path and filename.

4   After typing in your path and filename, select "OK."

Setting the Size for the Trace Buffer

The trace buffer is an amount of Random Access Memory (RAM) set aside for storing the data recorded by the trace session. You can have a trace buffer ranging from one to eight blocks, each block containing eight kilobytes of memory. The smallest your trace buffer can be (one block) is eight kilobytes, while the largest buffer (eight blocks) is 64 kilobytes. The default size of the trace buffer is one block. When the trace session exceeds the buffer size, the older data of the trace session is spilled into the trace file.

When trace is on, the EXTRA! Executive window displays how many bytes you allocated for the trace buffer (and the trace element), as you can see in the following example.

```
┌─────────────────────────────────────────────────┐
│ ─    EXTRA! Executive : EXTRANET.EWC*      ▼  ▲   │
│  File   Configure   Session   Windows   Help      │
│  ☼ N    NetBIOS0    🖳                             │
│  ☼ 0    NetBIOS1    🖳                             │
│                                                   │
│   ⸜  API Trace:  8192 byte Buffer                 │
│   ⸜  API Trace:   128 byte Element                │
│                                                   │
└─────────────────────────────────────────────────┘
```
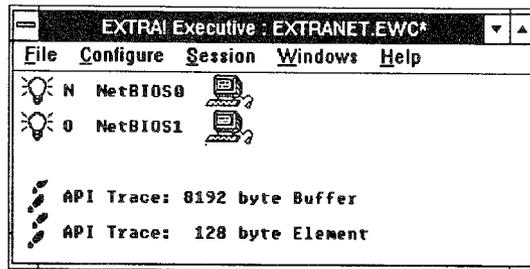
The line "API Tracing: 8192 byte Buffer" tells you that the size of the trace buffer is one 8K block. "API Tracing: 128 byte Element" tells you that the size of the trace element is one 128-byte block.

To set the size of the trace buffer, do the following:

1   Select "API Trace Services..." from the File menu of the EXTRA! Executive window. The API Trace Services window appears.

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2   Select "API Buffer Options..." from the Trace menu. The dialog box shown below will appear.

```
┌─────────────────────────────────────────┐
│           API TRACE BUFFER OPTIONS        │
│                                           │
│   Binary file name (including path):      │
│   ┌─────────────────────────────────────┐ │
│   │APITrace                             │ │
│   └─────────────────────────────────────┘ │
│                                           │
│   Maximum file size in K-bytes:    ┌─────┐ ┌┬┐│
│   (0 = no limit)                   │150  │ └┴┘│
│                                    └─────┘    │
│   Trace buffer size in 8K blocks:  ┌─────┐ ┌┬┐│
│   (1 - 8)                          │2    │ └┴┘│
│                                    └─────┘    │
│   Element size in 128-byte blocks: ┌─────┐ ┌┬┐│
│   (1 - 64)                         │2    │ └┴┘│
│                                    └─────┘    │
│   ┌──────────┐            ┌──────────┐        │
│   │    OK    │            │  Cancel  │        │
│   └──────────┘            └──────────┘        │
└─────────────────────────────────────────┘
```

3   Place the cursor in the "Trace buffer size" box and type a number (from 1 to 8) to designate how many 8K blocks of RAM you wish to have in the buffer.

4   After choosing a buffer size, select "OK."

Setting the Size of the Binary File

You can limit the size of your trace file—or choose to make it unlimited—by designating a value for the binary file size. The default value is 0 (zero), making the file size unlimited. The minimum value for the binary file is 100K. Data in the trace file is stored in binary form, which is why it is called the binary file. Your binary file will not exceed the size which you assign it. If the size of the trace session exceeds the amount you designate, the file will remove the oldest data in the trace session to make room for the newest data.

To assign a size to your binary (trace) file, do the following:

1   If the trace summary window is not currently open, select "API Trace Services..." from the File menu of the EXTRA! Executive. The API Trace Services window will appear.

2   Select "API Buffer Options..." from the Trace menu. The dialog box shown below will appear.

```
         API TRACE BUFFER OPTIONS

 Binary file name (including path):
 APITrace

 Maximum file size in K-bytes:        150    ▲
 (0 = no limit)                              ▼

 Trace buffer size in 8K blocks:      2      ▲
 (1 - 8)                                     ▼

 Element size in 128-byte blocks:     2      ▲
 (1 - 64)                                    ▼

   OK                               Cancel
```
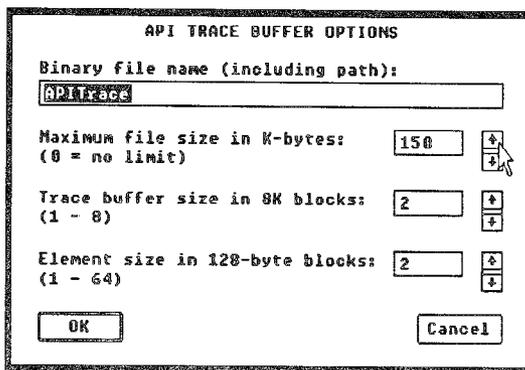
3   Place the cursor in the box labelled "Maximum file size" and type a number to designate the maximum amount of kilobytes you wish to have in the trace file. The minimum is 100K.

4   After choosing a binary file size, select "OK."

The trace element is composed of two items: the trace summary line, which is defined on page B-3, and its hexadecimal and ASCII code. You can view the code of a trace summary line by double-clicking on the trace summary line, which opens the trace data window.

Some transactions are more complex than others, requiring more code to carry them out. By changing the trace element size, you can affect how completely *EXTRA!* traces a transaction. If most transactions only require one 128-byte block of code, then the trace utility will fully trace most transactions.

However, there is a trade off when setting the trace element size, since this size is constant. Let's say you set the trace element for two 128 byte blocks (256 bytes). Even if a transaction involves only 96 bytes of meaningful information, that transaction will still be stored in 256 bytes of memory. Therefore, you will want to consider how large you think your most common trace elements will be so that you won't use excess memory on empty data.

When setting the size of the trace element, you should also be mindful of the maximum number of trace elements you expect your buffer to hold. For instance, if you set the trace element for two 128 byte blocks (256 bytes), and assigned to your buffer size one 8K block of memory, your buffer will hold 32 individual trace elements. On the other hand, if you set the trace element for just one 128 byte block, then the same buffer could hold 64 individual trace elements. The default value for the trace element size is one 128-byte block. You can assign up to 64 blocks to the trace element.

To assign a size to your trace element, do the following:

To set the API buffer options, Trace Services must be off.

1   If the trace summary window is not currently open, select "API Trace Services..." from the File menu of the EXTRA! Executive. The API Trace Services window will appear.

2   Select "API Buffer Options..." from the Trace menu. The dialog box shown below will appear.

If you have a mouse, you can also click on the scroll bar to the right of the box until the desired number appears in the box.
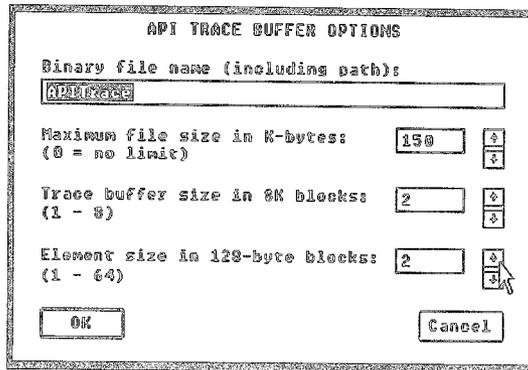
3   Place the cursor in the "Element size" box and type a number (from 1 to 64) to designate the number of 128-byte blocks you wish to have for the trace element.

4   Select "OK."

Running a Trace Session

Now that you have a basic understanding of what Trace Services is and how it's configured, you can move on to running a trace session. A trace session involves three tasks:

- Turning trace on

- Turning trace off (after some *EXTRA!* activity)

- Reviewing the trace session

Turning Trace Services On

Having configured the tracing utility with the settings you want, you are ready to turn Trace Services on.

To turn trace on, do the following:

1   If the trace summary window is not currently open, select "API Trace Services..." from the File menu of the EXTRA! Executive. The API Trace Services window will appear.

2   Pull down the Trace menu and select "API Trace." A check appears next to the command.

3   Pull down the Trace menu and select either "File Transfer," "Sessions Manager," or both, so that a check appears to the left of the selection.

The trace service will now keep track of all your *EXTRA!* and mainframe activity, or just file transfer activity. If you wish, you can leave the trace summary window open while you use *EXTRA!* Be aware, however, that your PC will slow down somewhat because it is having to send trace output to the screen as well as to the buffer—in addition to running *EXTRA!*

Turning Trace Services Off

Once you have finished the transactions you wanted to trace, you are ready to end the tracing session by turning the tracing service off.

To turn tracing off, do the following:

1   If the trace summary window is not currently open, select "API Trace Services..." from the File menu of the EXTRA! Executive window.

2   Select "API Trace." The check next to the command disappears.

The tracing utility has now been turned off and the trace summary window cleared. Your trace session has not been erased; it is in the trace disk file and can be viewed using the review command.

Reviewing a Trace Session

Having turned the trace utility off, you can now review the trace session by following the steps below.

1   If the trace summary window is not currently open, select "API Trace Services..." from the File menu of the EXTRA! Executive. The API Trace Services window will appear.

2   Select "Review API Tracing" from the Trace menu.

Your trace session will appear in the trace summary window. You can use the scroll bars to move through the list of trace summary lines, or use the [PgDn] key to see the trace summary lines one window-view at a time.

Reviewing a Trace Session Saved to a Different Filename

There may be times when you will want to review a trace session that you saved to a different file other than the default *APITRACE*.

To review a trace session that you saved to a different filename, do the following:

1   Select "API Buffer Options..." from the Trace menu, and type the desired filename in the binary filename text box.

2   Review the trace, as explained on page B-13.

Be aware that any future trace sessions will be stored in the file that you named in the API Buffer Options dialog box; any previous trace session in that file will be erased to make room for a new trace session the next time you turn on Trace Services.

If you want to preserve the contents of a trace file after reviewing it, do the following:

1   Select "API Buffer Options..." from the Trace menu.

2   Type a different filename in the binary filename text box and select "OK."

The file that you just reviewed has been closed, and *EXTRA!* will now direct any future trace sessions to the new filename that you just designated in the API Buffer Options dialog box.

A trace summary line can be opened only with a mouse. If you are unable to open a trace summary line, the data window option is locked in the Configure menu of the EXTRA! Executive window. Consult your System Administrator for access to the trace data window.

You may wish to find out more information about a particular trace summary line by viewing the data associated with it. You can do so by opening the trace summary line, as explained in the steps below.

1 Double-click on the trace summary line you want to open. Your screen will look very similar to the one below.

Trace Data Window

Trace Summary Window
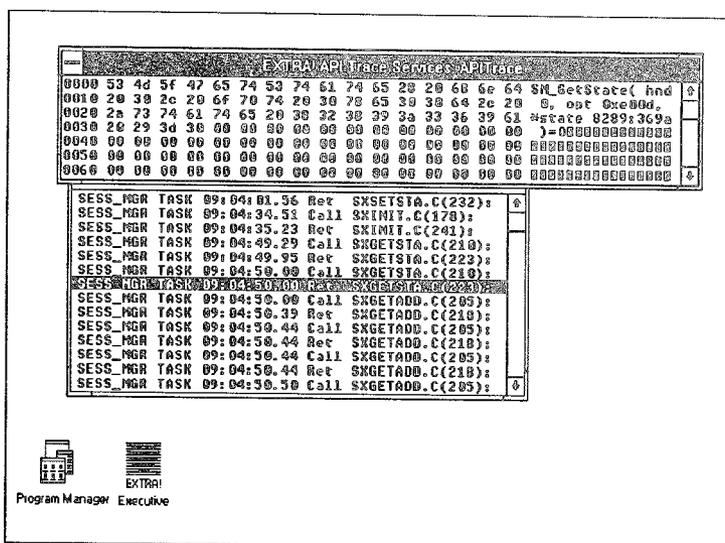
```
EXTRA! API Trace Services - API Trace
0000 53 4d 5f 47 65 74 53 74 61 74 65 20 28 68 6e 64   SM_GetState( hnd
0010 20 30 2c 20 6f 70 74 20 30 78 65 30 30 64 2c 20    0, opt 0xe00d,
0020 2a 73 74 61 74 65 20 30 32 38 39 3a 33 36 39 61   *state 0289:369a
0030 20 29 3d 30 30 00 00 00 00 00 00 00 00 00 00 00    )=00
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
SESS_MGR  TASK  09:04:01.36  Ret   SXSETSTA.C(232);
SESS_MGR  TASK  09:04:34.51  Call  SXINIT.C(178);
SESS_MGR  TASK  09:04:35.23  Ret   SXINIT.C(241);
SESS_MGR  TASK  09:04:49.29  Call  SXGETSTA.C(210);
SESS_MGR  TASK  09:04:49.95  Ret   SXGETSTA.C(223);
SESS_MGR  TASK  09:04:50.00  Call  SXGETSTA.C(210);
SESS_MGR  TASK  09:04:50.00  Ret   SXGETSTA.C(223);
SESS_MGR  TASK  09:04:50.00  Call  SXGETADD.C(205);
SESS_MGR  TASK  09:04:50.39  Ret   SXGETADD.C(218);
SESS_MGR  TASK  09:04:50.44  Call  SXGETADD.C(205);
SESS_MGR  TASK  09:04:50.44  Ret   SXGETADD.C(218);
SESS_MGR  TASK  09:04:50.44  Call  SXGETADD.C(205);
SESS_MGR  TASK  09:04:50.44  Ret   SXGETADD.C(218);
SESS_MGR  TASK  09:04:50.50  Call  SXGETADD.C(205);
```

Program Manager   EXTRA! Executive

Double-clicking on a trace summary line (highlighted in black) opens a trace data window. In this window you can see the summary line's data, which is shown in hexadecimal code on the left and ASCII code on the right.

Interface Utilities

Windows does not fully support all connectivity interfaces. As a result, there are two types of connectivity that require you to load an interface before running Windows. These two connectivity types are token-ring (DLC) and (when you are running Windows/386) NETBIOS. If you have both connection types, then you will need to load both interfaces.

The DLCINTFC Interface

If you are using a token-ring (DLC) connection, you will need to run the interface DLCINTFC.EXE before running Windows. This interface is included in your *EXTRA! for Windows* software. You must first load this interface because Windows does not directly support the DLC communication protocol. As a result, without this interface DLC is not able to make certain calls within Windows that are critical to running *EXTRA!* in the token-ring DLC environment.

Buffer Pool Parameters

The default parameter for DLCINTFC.EXE is /S.

All DLC calls need a buffer pool for storing data going to and coming from the network. You can allocate a small, medium, or large buffer pool for DLCINTFC.EXE by adding one of these parameters to the DLCINTFC command line:

/S /M or /L

For example,

DLCINTFC /M [Enter]

It is to your advantage to use as small a buffer pool as possible, since a larger pool, though it sets aside a lot of memory for DLC, takes away potential storage space from everything else, including *EXTRA!*

You may need to use a large (/L) buffer pool if one of the two scenarios below applies to your PC environment:

● You intend to run a large number of sessions with *EXTRA!*

● You have a computer with a 16 megabits/sec. token-ring card.

Gateways typically require a large buffer pool. Most users can get along fine on a small buffer, while high demand users may need a medium buffer pool size. When settling on a buffer pool size, try using the small (/S) buffer pool first. If *EXTRA!* malfunctions, change the pool to medium (/M). If you still have problems running *EXTRA!*, switch to the large (/L) buffer pool.

I-Frame Size

An I-Frame (Information Frame) is a packet of data that is transmitted between a PC and a mainframe computer using a DLC connection. In *EXTRA! for Windows*, you can select the size of the I-Frame during the configuration. You can also select the I-Frame size using the DLC interface, to minimize the memory requirement. The syntax for the I-Frame size option is as follows:

DLCINTFC /I=nnn [Enter]

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where /I= is the option and *nnn* is the I-Frame size in bytes. The default size is 2042 bytes. *EXTRA!* will interpret any number less than or equal to 265 as 265; entering any other number (for example, 521, 1033, 2042, etc.) will set the I-Frame size equal to the entered number. It is recommended that you use standard I-Frame sizes with this option (265, 521, 1033, 2042, 3964).

If you have selected a larger I-Frame number within the *EXTRA!* configuration than those set using DLCINTFC, you will get an error message when you try to open a session saying it cannot be opened. Because of this fact, if you use the /I=*nnn* option with DLCINTFC, the size set must be equal to or larger than the I-Frame Size option in the configuration file for *EXTRA!* to be able to run.

Loading the DLCINTFC.EXE Interface

To load the interface, do the following:

The default buffer pool size is /S. If you intend to use the small pool, you do not need to include the /S parameter.

1   At the DOS prompt, change to the directory that contains your *EXTRA! for Windows* application files.

2   At the DOS prompt, type the interface command followed by a space and the buffer pool parameter. If you choose the small buffer pool, this is what you should type:

    DLCINTFC [Enter]

For example, to set buffer pool and I-Frame sizes, you would type something like the following:

    DLCINTFC /M /I=521 [Enter]

You can now load Windows and run *EXTRA!*

Unloading the DLCINTFC.EXE Interface

Since DLCINTFC.EXE runs independent of Windows, it remains loaded after you have exited Windows. To unload the interface after using *EXTRA!* and Windows, at the DOS prompt, type:

DLCINTFC /U [Enter]

You have now unloaded the DLCINTFC.EXE interface.

The NETINTFC Interface

If you are on a NETBIOS network, are running Windows/386, and wish to communicate with the mainframe via a NETBIOS Gateway, you will need to run NETINTFC.COM before running Windows. Just like DLCINTFC.EXE, this interface is included in your *EXTRA! for Windows* software. You must load this interface because Windows/386 is not fully compatible with the NETBIOS communication protocol. Without NETINTFC.COM, there is a limit to the number of NETBIOS transactions that can take place reliably. If you do not use this interface, your sessions with *EXTRA!* may end prematurely.

If you are running Windows/286 or Windows 3.0, you do not need to run the interface.

NETBIOS Buffers

The NETBIOS interface uses buffers for transmitting and receiving data; you can set the number of these buffers using an option on the command line. The syntax for this option appears below:

NETINTFC /B=nn [Enter]

where */B=* is the option, and *nn* specifies the number of transmit and receive buffers that should be used. The default is 8. This number will need to be increased if two or

more NETBIOS LAN Adapter are being used at the same
time. The number should be 8 for the first adapter and
between 5 and 8 for each additional adapter. For example, if
you were running 3 separate NETBIOS adapters, then the
following command line would be required to load
NETINTFC:

> *NETINTFC /B=18* [Enter]

Loading the NETINTFC.COM Interface

To load the interface, do the following:

1   In DOS, change to the directory that contains your
    EXTRA! for Windows application files.

2   At the DOS prompt type:

> *NETINTFC* [Enter]
>   or
> *NETINTFC /B=nn* [Enter]

You can now load Windows and run *EXTRA!*

Unloading the NETINTFC.COM Interface

Since NETINTFC.COM runs independent of Windows, it
remains loaded after you have exited Windows. To unload
the interface after using *EXTRA!* and Windows, at the DOS
prompt, type:

> *NETINTFC /U* [Enter]

You have now unloaded the NETINTFC.COM interface.

Appendix C

3270 Function Keys

This appendix lists and describes the 3270 function keys, also known as workstation control or WsCtrl keys. To find out how these keys have been mapped on your keyboard, refer to your supplied keyboard templates or Appendix D of this manual.

You can also use these keys with SmartPad, described in Chapter 2 of the *User's Manual*.

3270 Function Keys

3270 Key	Function
Attn	Signals the mainframe. Operable under SNA only.
Backspace	Moves the cursor one space to the left, or wraps back to the previous line.
Clear	Clears the active 3270 display to null and positions the cursor at home. Signals the mainframe, except while in test mode or when communicating with the system operator.
Cursor Movement Keys	Arrow keys control the up/down/left/right movement of the cursor. When the cursor is in the right-most column, the right arrow key causes the cursor to wrap to the next row. When the cursor is in the left-most column, the left arrow key causes the cursor to wrap to last position in the previous row. The [Alt] key pressed simultaneously with the left or right arrow causes the cursor to move two locations at a time instead of one.
Delete	Erases the character at the cursor position and causes all characters from the cursor to the end of the field to shift left one position.
Dup	Duplicates an operation throughout the rest of the field in which the operation occurs. Displayed as an asterisk (*).
Enter	Sends all input data to the mainframe.
Erase EOF	Erases an unprotected input field from the cursor to the end of the field. The cursor does not move.
ErInp	Erases all unprotected fields in the active window and moves the cursor to the first input position on the display.

3270 Key	Function
Field Mark	Provides a way to inform a program that the end of a field has occurred. Displayed as a semicolon (;).
Home	Moves the cursor to the first input location on the display.
Ident	Signals that the next two numbers will be the printer ID code. Displays current ID code.
Insert	Sets the keyboard to insert mode so that characters will be entered at the cursor position and all characters from the cursor to the end of the field will shift right.
New Line	Moves the cursor to the first input location of the next unprotected line.
PA1 - PA3 and PF1 - PF24	Program Attention keys and Program Function keys send unique signals to the mainframe program. The subsequent operation is program dependent.
Print	Sends data from the active mainframe window to a printer attached to the control unit (local copy).
Reset	Causes recovery from most "Do Not Enter" conditions. Also terminates insert mode and printer ID.
SysRq	Changes the Logical Unit (LU) ownership in an SNA environment. In BSC, it sends test request message to the mainframe system.
Tab	Moves the cursor to the first input location of the next unprotected field.
Tab left	Moves the cursor to the first input location of the previous unprotected field.

3270 Key	Function
Test	If *EXTRA!* is communicating via a coax adapter, the test key causes the control unit to put the terminal window into test mode. The test key is only supported in CUT mode. From test mode, the controller can run several problem diagnosis tests. When a program is communicating via a LAN, this key does not operate.

Appendix D
Keyboard
Maps And Tables

This appendix provides keyboard templates that you can
use when you're running a mainframe session. These
templates show where each 3270 terminal key is located on
your PC. There are three templates for a PC/AT Standard
84-key keyboard and three templates for the IBM Enhanced
101-key keyboard. In addition to each template, there is a
table that lists the 3270 keys (also called workstation control
or WsCtrl keys) and their equivalent PC keys.

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PC/AT Standard Keyboard Mappings

In this section you'll find the keyboard templates and tables for the PC/AT Standard keyboard. Each template is mapped according to the conventions of different emulation software

> *PC/AT Standard Keyboard.*
> *A PC/AT Standard keyboard is an 84-key keyboard with ten function keys (F1 - F10) grouped together on the left side of the board.*

packages. Use the template that is mapped for the software you are most familiar with. For example, if you're familiar with Attachmate's software, use the Attachmate-mapped template; if you're familiar with IBM's software, use the IBM-mapped template.

The tables and maps listed below are in this section.

- Table and map for an Attachmate-mapped PC/AT Standard Keyboard

- Table and map for an IBM-mapped PC/AT Standard Keyboard

- Table and map for an IRMA-mapped PC/AT Standard Keyboard

Table of keys for an Attachmate-mapped PC/AT Standard Keyboard

With this mapping, some of the key combinations that use the top row of keys with the [Alt] key are unavailable as menu keys because they are used as 3270 function keys.

3270 Keys	PC Keys
Alpha, Numeric keys	Same
¬	^
¢	[
|	]
Backspace	Same
Tab, Back Tab	Same
Shift, Alt, Ctrl	Same
Enter, Spacebar	Same
Cap Lock	Same
PF1 - PF10	[Alt]/[1 - 0] (Top Row of Keys)
PF11	[Alt]/[-]
PF12	[Alt]/[=]
PF13 - PF24	[Alt]/[Q -]] (Second Row of Keys)
Attn (Attention)	[F1]
Sys Req (System request)	[Alt]/[F1]
Clear	[F2]
Dup	[F3]
PA1	[Alt]/[F3]
Field Mark	[F4]
PA2	[Alt]/[F4]
Chg Fmt	[F5]
Doc	[Alt]/[F5]
Erase EOF	[F6]
PA3	[Alt]/[F6] (Operates in DFT Mode Only)
CrSel (Cursor Select)	[F7]
Wrap	[Alt]/[F7]
Erase Input	[Alt]/[F8]
Print Screen	[F9]
Ident (Local printer ID)	[Alt]/[F9]
Test	[Alt]/[F10]
Keypad	
0-9	[Shift]/[0 - 9]
Cursor Controls (←↑→↓)	Same
Hot Key (CUT mode only)	[Alt]/[Insert]
Home	Same
Reset	[Esc]
Dev Cncl	[Alt]/[Esc]
CrPos (Cursor Position)	[Alt]/[8]
Num Lock, Scrll Lock	Same
PrintSc (Print Screen)	Same
*-+	Same
New Line	[1]
â	[0]
-a-	[.]
-aaa-	[Alt]/[.]
Fast Cursor Left	[Alt]/[1]
Fast Cursor Right	[Alt]/[3]
Dev Cncl	[Alt]/[Esc]
PF7	[9] (keypad)
PF8	[3] (keypad)

D-4

Attachmate Map for a PC/AT Standard Keyboard

👉 With this mapping, some of the key combinations that use the top row of keys with the [Alt] key are unavailable as menu keys because they are used as 3270 function keys.

Key Legend

Shift
Ctrl
Norm
Alt

Product Code #8310587

Attachmate™ Connectivity Software™

Attachmate Map - PC/AT Standard Keyboard

NOTE: Doc, ChgFmt, Wrap, CurPos and Delete Word (⌐⌐⌐) are available only for CUT Entry Assist.

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Table of keys for an IBM-mapped PC/AT Standard Keyboard

With this mapping, some of the key combinations that use the top row of keys with the [Alt] key are unavailable as menu keys because they are used as 3270 function keys.

3270 Keys	PC Keys
Alpha, Numeric keys	Same
¬	^
¢	[
[	]
Backspace	Same
Tab, Back Tab	Same
Shift, Alt, Ctrl, Spacebar	Same
New Line	[Enter]
Cap Lock	Same
PF1 - PF10	[F1 - F10]
PF11	[Shift]/[F9]
PF12	[Shift]/[F10]
PF13 - PF24	[Alt]/[1 - =] (Second Row of Keys)
Attn (Attention)	[Alt]/[F1]
Sys Req (System request)	[Ctrl]/[F1]
Clear	[Alt]/[F2]
CrSel (Cursor Select)	[Alt]/[F3]
Erase Input	[Ctrl]/[F4]
ChFmt	[Alt]/[F5]
Erase EOF	[Alt]/[F6]
Print Screen	[Alt]/[F7]
Ident (Local printer ID)	[Ctrl]/[F7]
Test	[Ctrl]/[F8]
Wrap	[Alt]/[F9]
Reset	[Alt]/[F10]
Dev Cncl	[Ctrl]/[F10]
Keypad	
0-9	[Shift]/[0 - 9]
Cursor Controls (← ↑ → ↓)	Same
Hot Key (CUT mode only)	[Alt]/[Insert]
Home	Same
Doc	[Alt]/[Home]
Num Lock, Scrll Lock	Same
Field Mark	[Scroll Lock]
Dup	[Shift]/[Scroll Lock]
CrPos (Cursor Position)	[Alt]/[8]
Enter	[*]
PA1	9
PA2	[-]
PA3	3
-	[Shift]/[-]
Enter	[+]

IBM Map for a PC/AT Standard Keyboard
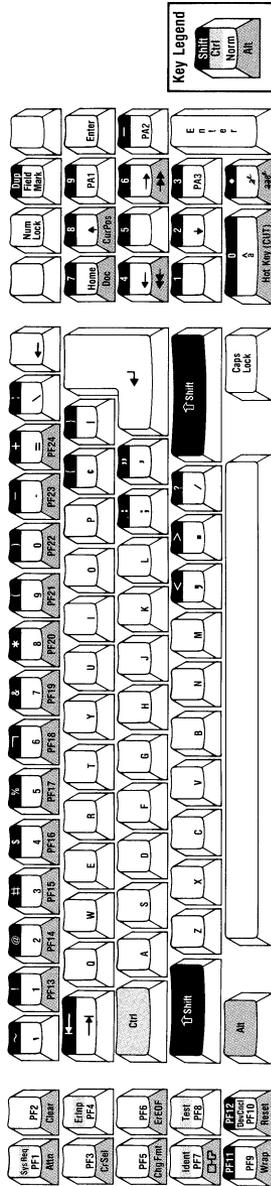
IBM Map - PC/AT Standard Keyboard

NOTE: Doc, ChgFmt, Wrap, CurPos and Delete Word (**Del**) are available only for CUT Entry Assist.

Attachmate Connectivity Software™

Key Legend

Product Code #8310566

Table of keys for an IRMA-mapped PC/AT Standard Keyboard

With this mapping, some of the key combinations that use the top row of keys with the [Alt] key are unavailable as menu keys because they are used as 3270 function keys.

3270 Keys	PC Keys
Alpha, Numeric keys	Same
¬	^
¢	[
|	]
Backspace	Same
Tab, Back Tab	Same
Shift, Alt, Ctrl	Same
Enter, Spacebar	Same
New Line	[Ctrl]/[Enter]
Cap Lock	Same
PF1 - PF10	[Alt]/[1 - 0] (Top Row of Keys)
PF11	[Alt]/[-]
PF12	[Alt]/[=]
PF13 - PF22	[Ctrl]/[1 - 0] (Top Row of Keys)
PF23	[Ctrl]/[-]
PF24	[Ctrl]/[=]
Fast Cursor Left	[Ctrl]/[D]
Fast Cursor Right	[Ctrl]/[F]
Dup	[Ctrl]/[G]
Field Mark	[Ctrl]/[H]
PA1	[Ctrl]/[J]
PA2	[Ctrl]/[K]
Attn (Attention)	[F1]
CrPos (Cursor Position)	[Shift]/[F1]
Sys Req (System request)	[Alt]/[F1]
Clear	[F2]
CrSel (Cursor Select)	[Alt]/[F2]
ChFmt	[F3]
Doc	[Alt]/[F3]
Erase Input	[F4]
Erase EOF	[F6]
Print Screen	[F7]
Ident (Local printer ID)	[Alt]/[F7]
New Line	[F9]
Wrap	[Alt]/[F9]
Reset	[F10]
Dev Cncl	[Alt]/[F10]
Keypad	
0-9	[Shift]/[0 - 9]
Cursor Controls (← ↑ → ↓)	Same
Hot Key (CUT mode only)	[Alt]/[Insert]
Home	Same
Num Lock, Scrll Lock	Same
*-+	Same
Capture	[Alt]/[*]
.	[Ins]
-.-	[Del]
-...-	[Alt]/[.]

IRMA Map for a PC/AT Standard Keyboard

With this mapping, some of the key combinations that use the top row of keys with the [Alt] key are unavailable as menu keys because they are used as 3270 function keys.

Connectivity Software™

IRMA Map - PC/AT Standard Keyboard

NOTES: PF13 - PF24 are unavailable if any session is configured for APL.
Doc, ChgFmt, Wrap, CurPos and Delete Word (Del) are available only for CUT Entry Assist.

Product Code #631-01865

Appendixes

IBM Enhanced Keyboard Mappings

In this section you'll find the keyboard templates and tables for the IBM Enhanced keyboard. Each template is mapped according to the conventions of different emulation software

> *IBM Enhanced Keyboard.*
> *An IBM Enhanced keyboard is a 101-key keyboard with twelve function keys (F1 - F12) running along the top of the board.*

packages. Use the template that is mapped for the software you are most familiar with. For example, if you're familiar with Attachmate's software, use the Attachmate-mapped template; if you're familiar with IBM's software, use the IBM-mapped template.

The tables and maps listed below are in this section.

- Table and map for an Attachmate-mapped IBM Enhanced Keyboard

- Table and map for an IBM-mapped IBM Enhanced Keyboard

- Table and map for an IRMA-mapped IBM Enhanced Keyboard

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Table of keys for an Attachmate-mapped IBM Enhanced Keyboard

3270 Keys	PC Keys
Alpha, Numeric keys	Same
¬	^
¢	[
|	]
Backspace	Same
Tab, Back Tab	Same
Shift, Alt, Left Ctrl	Same
New Line	[Right Ctrl]
Enter, Spacebar	Same
Cap Lock	Same
PF1 - PF12	[F1 - F12]
PF13 - PF24	[Shift]/[F1-12]
Reset	[Esc]
Attn	[Shift Esc]
Dev Cncl	[Alt]/[Esc]
Doc OnOff	[Alt]/[F1]
Wrap	[Alt]/[F2]
ChgFmt	[Alt]/[F3]
Cur Pos (Cursor Position)	[Alt]/[F10]
Sys Req (System request)	[Alt]/[F11]
PRTID (Local printer ID)	[Alt]/[F12]
3270 Print	[Ctrl]/[F12]
Crsor Selct (Cursor Select)	[Scroll Lock]
Clear	[Pause]
Test	[Alt]/[Pause]
Dup	[Shift]/[Insert]
Home	Same
Field Mark	[Shift]/[Home]
PA1	[Page Up]
PA2	[Page Down]
PA3	[Shift]/[Page Down]
Erase EOF	[End]
Erase Input	[Alt]/[End]
Cursor Controls (← ↑ → ↓)	Same
Keypad	
0-9	[Shift]/[0 - 9]
Num Lock	Same
*-÷	Same
Home	Same
ErEOF	[End]
â	[Shift]/[Ins]
-a-	[Shift]/[Del]
-aaa-	[Alt]/[Del]
Fast Cursor Left	[Alt]/[←]
Fast Cursor Right	[Alt]/[→]

Attachmate Map for an IBM Enhanced Keyboard

Attachmate Map - IBM Enhanced Keyboard

NOTE: **Doc, ChgFmt, Wrap, CurPos** and Delete Word (**del**) are available only for **CUT** Entry Assist.

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Table of keys for an IBM-mapped IBM Enhanced Keyboard

3270 Keys	PC Keys
Alpha, Numeric keys	Same
¬	^
¢	[
	]
Backspace	Same
Tab, Back Tab	Same
Shift, Alt, Left Ctrl, Spacebar	Same
New Line	[Enter]
Enter	[Right Ctrl]
Cap Lock	Same
PF1 - PF12	[F1 - F12]
PF13 - PF24	[Shift]/[F1-12]
Reset	[Esc]
Attn	[Shift Esc]
Dev Cncl	[Alt]/[Esc]
Doc OnOff	[Alt]/[F1]
Wrap	[Alt]/[F2]
Chg Fmt	[Alt]/[F3]
Cur Pos (Cursor Position)	[Alt]/[F10]
Sys Req (System request)	[Alt]/[F11]
PRTID (Local printer ID)	[Alt]/[F12]
3270 Print	[Ctrl]/[F12]
Crsor Selct (Cursor Select)	[Scroll Lock]
Clear	[Pause]
Test	[Alt]/[Pause]
Dup	[Shift]/[Insert]
Home	Same
Field Mark	[Shift]/[Home]
PA1	[Page Up]
PA2	[Page Down]
PA3	[Shift]/[Page Down]
Erase EOF	[End]
Er Inp	[Alt]/[End]
Cursor Controls (←↑→↓)	Same
å	[Ins]
-a-	[Del]
-aaa-	[Alt]/[Del]
Fast Cursor Left	[Alt]/[←]
Fast Cursor Right	[Alt]/[→]
Keypad	
0-9	Shift [0 - 9]
Num Lock	Same
*-+	Same
Home	Same
ErEOF	[End]

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IBM Map for an IBM Enhanced Keyboard

IBM Map - IBM Enhanced Keyboard

NOTE: **Doc**, **ChgFmt**, **Wrap**, **CurPos** and Delete Word (**aaª**) are available only for **CUT** Entry Assist.

Table of keys for an IRMA-mapped IBM Enhanced Keyboard

3270 Keys	PC Keys
Alpha, Numeric keys	Same
¬	^
¢	[
¦	]
Backspace	Same
Tab, Back Tab	Same
Shift, Alt, Ctrl	Same
Enter, Spacebar	Same
Cap Lock	Same
PF1 - PF10	[Alt]/[1 - 10]
PF11	[Alt]/[-]
PF12	[Alt]/[=]
PF13 - PF22	[Ctrl]/[1-10]
PF23	[Ctrl]/[-]
PF24	[Ctrl]/[=]
Field Mark	[Esc]
Attn	[F1]
CurPos (Cursor Position)	[Shift]/[F1]
Clear	[F2]
Crsor Selct (Cursor Select)	[Alt]/[F2]
Doc OnOff	[F3]
Chg Fmt	[Alt]/[F3]
Er Inp (Erase Input)	[F4]
Er EOF	[F6]
Print	[F7]
PRTID (Local printer ID)	[Alt]/[F7]
Test	[Alt]/[F8]
New Line	[F9]
Wrap	[Alt]/[F9]
Reset	[F10]
Dev Chcl	[Alt]/[F10]
3270 Print	[Ctrl]/[F12]
Dup	[Ctrl]/[G]
Field Mark	[Ctrl]/[H]
PA1	[Ctrl]/[J]
PA2	[Ctrl]/[K]
Home	Same
Cursor Controls (←↑→↓)	Same
a	[Ins]
-a-	[Del]
-aaa-	[Alt]/[Del]
Fast Cursor Left	[Alt]/[←]
Fast Cursor Right	[Alt]/[→]
Keypad	
0-9	[Shift]/[0 - 9]
Num Lock	Same
*-+	Same
Home	Same

IRMA Map for an IBM Enhanced Keyboard
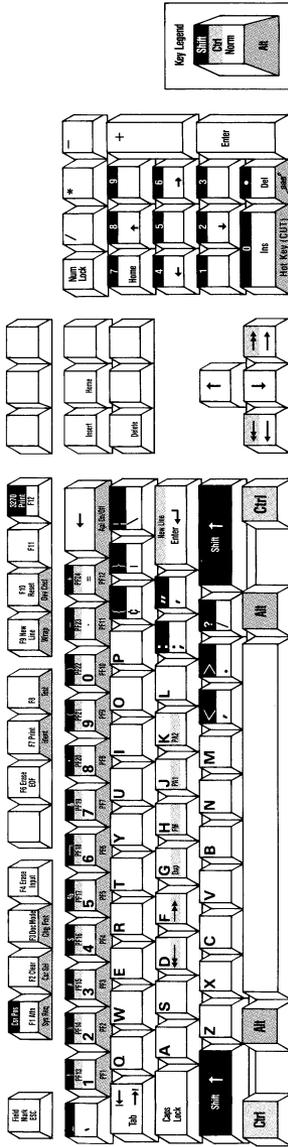
IRMA Map - Enhanced Keyboard

Attachmate Connectivity Software™

Product Code #831-01865

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Appendix E

Token-Ring Networks

Before you attempt to install direct token-ring workstations on your network, it's important that you understand the basic concepts and terminology used when discussing token-ring communication. Direct token-ring communication uses a unique protocol called DLC (Data Link Control), which handles the exchange of information between devices on a token-ring network. Devices such as workstations, controllers, front end processors (FEP), and mainframes are connected to the token-ring with network adapters called Token-Ring Adapters or TICs (Token-Ring Interface Couplers).

Token-Ring Connections

Token-ring adapters are the building blocks of direct token-ring communication, because they provide the interface between devices on the token-ring. Token-ring adapters are installed in PC workstations and mainframe communications devices such as 3174 Cluster Controllers, 37XX Front End Processors, or 9370 Mainframes. Data is directed to the correct device on the token-ring by the address specified for the token-ring adapter.

One of the advantages of the direct token-ring connection is that the workstation can communicate directly with the controller, front end processor, or mainframe on a token-ring network. No coax or SDLC connection to the mainframe is required. As such, a direct token-ring workstation offers high-speed transmission over the token-ring network. Currently capable of operating at speeds up to 16 Megabits per second, a direct token-ring-attached workstation is roughly comparable in speed to a workstation connected to a channel-attached controller.

Three separate token-ring configurations are displayed on the following pages. Note that these represent only a few of the possible token-ring configurations.
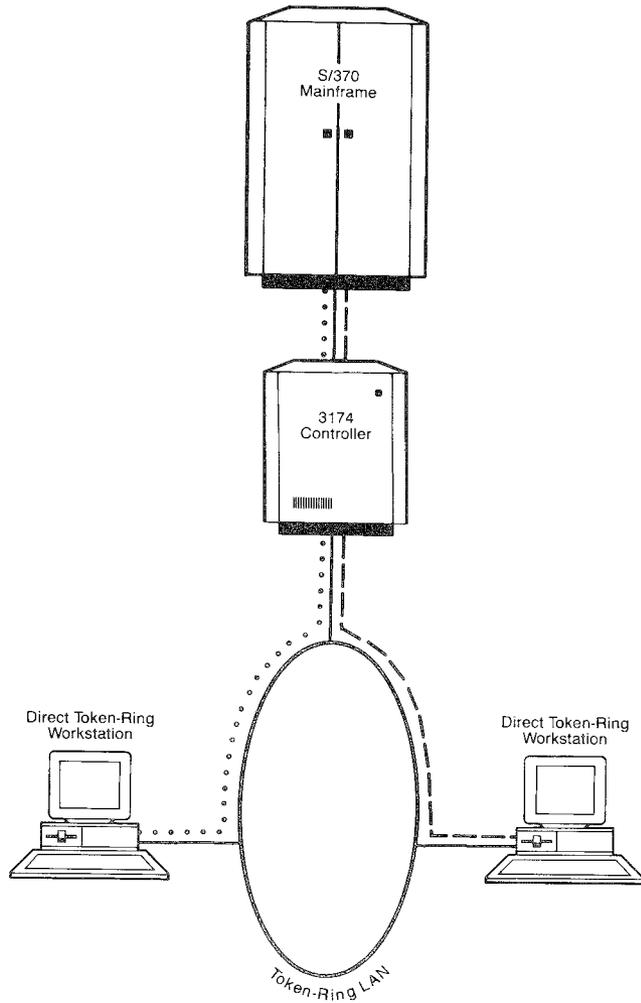
Direct token-ring workstations can be connected to the mainframe through a 3174 Controller.
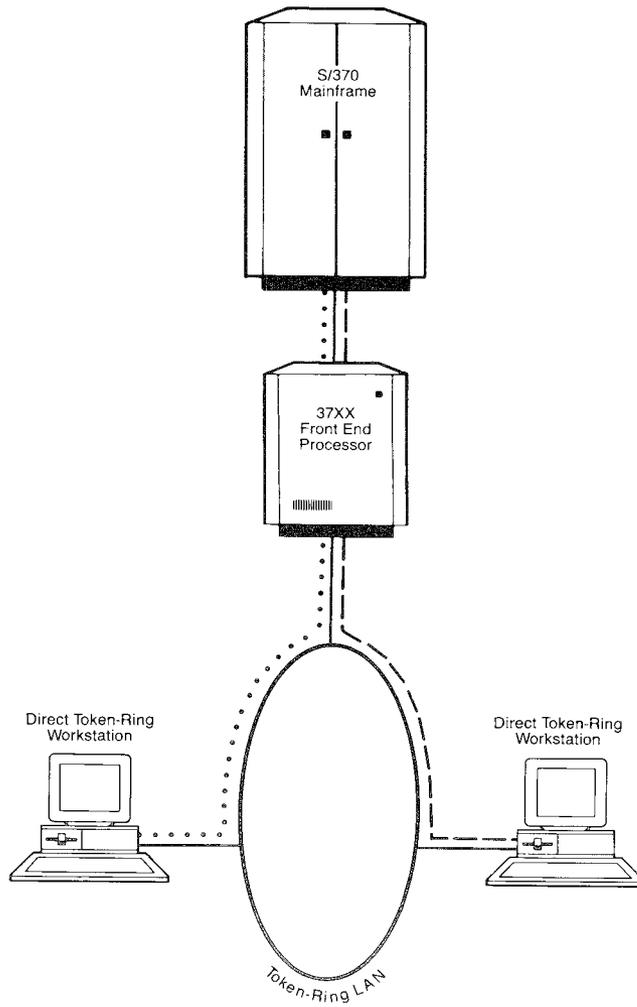
Direct token-ring workstations can be connected to the mainframe through a 37XX Front End Processor.

9370
Mainframe

T
I
C

Direct Token-Ring
Workstation

Direct Token-Ring
Workstation
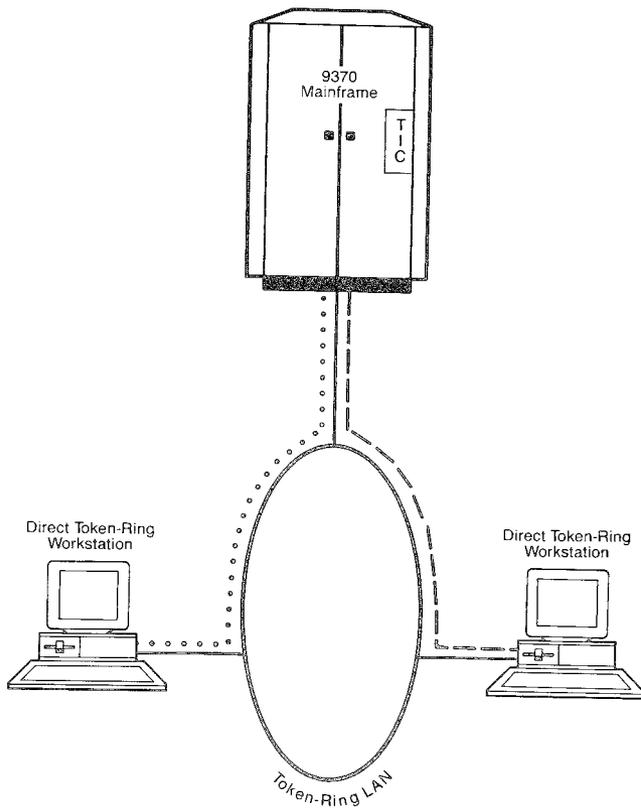
Token-Ring LAN

Direct token-ring workstations can be connected directly to a 9370 mainframe.

How a Device on a Token-Ring Network is Identified

Every device on the token-ring network, whether it's a PC workstation, controller, or mainframe, must be identified through a unique network address or ID. There are two methods for determining the address. One method is to use the address that is "burned into" the token-ring adapter by the manufacturer. This is called the Universally Administered Address (UAA).

Locally Administered Address (LAA)

An optional method is to assign a Locally Administered Address (LAA) to the network adapter. An LAA is a software-created address which overrides the "burned-in" address. The use of an LAA is often the most desirable method, since it allows you to replace a faulty network adapter in a device without reconfiguring mainframe communication parameters.

To avoid confusion in our documentation, we call the adapter's address an LAA. The LAA is a twelve-digit alphanumeric number, normally starting with 4000. Before assigning LAAs, consult your mainframe personnel for the proper addressing scheme.

Destination Address

The Destination Address is the LAA of the device to which data will be sent. For example, if you were configuring *EXTRA!* at a workstation, the destination device would be the LAA of the controller, FEP, or mainframe. If you were configuring a controller, the destination address would be the LAAs of the workstations to which data will be sent.

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Physical Unit ID (PUID)

Normally an eight-digit number, the PUID is an SNA parameter that identifies the workstation to VTAM (Virtual Telecommunications Access Method) and therefore, determines the capabilities of the workstation as a 3270 device. PUIDs are assigned by mainframe personnel. Each PUID will have an LU (logical unit) configuration (i.e., number of LUs, terminal or printer model numbers, EAB support, etc.). Because PUIDs are optional in some environments, your mainframe personnel may or may not utilize PUIDs.

Service Access Point (SAP)

SAPs are supported by the network adapter of the mainframe communication device. The SAP number must be a multiple of four in hexadecimal (4, 8, C, 10, etc.). For *EXTRA!*, the default is "4." The SAP number at the workstation must match the SAP configuration at the mainframe.

I-Frame Size

The size of the Information Frame (I-Frame) tells *EXTRA!* how large each segment of data will be as it passes between the workstation and mainframe. More data can be sent in a single transmission with a larger I-Frame than with a smaller I-Frame size. The size, however, must correspond with your workstation's token-ring card and the I-Frame size specified at the mainframe end.

The following page demonstrates how LAAs are used to identify each DLC workstation on the network.
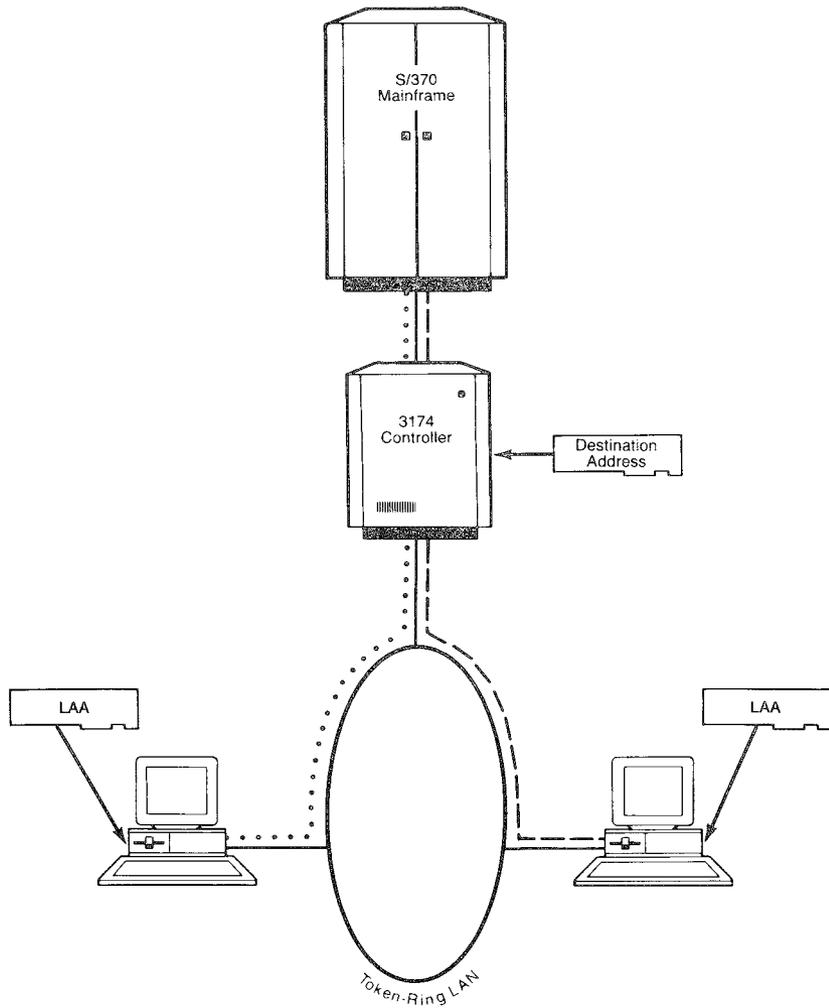
Direct token-ring workstations are identified through LAAs.
The destination address you enter at the workstation
identifies the LAA of the mainframe communications device.

Installing Direct Token-Ring Workstations

1   To implement direct token-ring communications on your token-ring network, you must first install token-ring cards in the workstations.

2   Once the token-ring cards have been installed, assign the LAAs to your workstations. If necessary, refer back to "How a Device on a Token-Ring Network is Identified."

3   On a piece of paper write down the LAA. Submit the information to your mainframe system personnel.

✏ Deciding the number of LUs, model type, EABs, etc., will require the combined efforts of the workstation administrator and the mainframe system personnel.

4   The mainframe system personnel will reconfigure the network for your workstations and provide the necessary information to configure *EXTRA! for Windows* (i.e., the destination address and the optional PUID).

Once *EXTRA!* has been configured as a direct token-ring workstation, Attachmate recommends you modify the CONFIG.SYS file or the AUTOEXEC.BAT file to load the LAA.

Loading the LAA

If you chose to use the "burned-in" UAA to identify your token-ring adapters, no modifications are required. However, if you choose to assign LAAs you will need to load the address with the adapter's hardware driver.

Hardware Drivers

There are two hardware drivers that are compatible with *EXTRA! for Windows*: IBM's TOKREUI (supplied with IBM's Token-Ring Adapter) and IBM's LAN Support Program.

Loading an LAA with IBM's TOKREUI

If you have chosen to use the "burned-in" UAA to identify your adapter, no modifications are required. If you chose to assign LAAs, however, you will need to modify the workstation's AUTOEXEC.BAT file.

To assign an LAA for a workstation, enter one of the following lines in your workstation's AUTOEXEC.BAT file.

To assign an LAA to your workstation's primary token-ring adapter, type the following:

tokreui LAA

(where LAA represents the locally administered address). For example, *tokreui 400000000001*.

For your secondary adapter, type the following:

tokreui,, LAA

(where LAA represents the locally administered address). For example, *tokreui ,, 400000000001*.

Loading an LAA with IBM's LAN Support Program

If you chose to use the "burned-in" UAA to identify your adapters, no modifications are required. However, if you chose to assign LAAs you will need to modify the workstation's CONFIG.SYS file.

To assign an LAA for a workstation, enter one of the following sets of lines in your workstation's CONFIG.SYS file.

For the primary token-ring adapter, enter the following:

device=dxma0mod.sys
device=dxmc0mod.sys LAA

(where LAA represents the locally administered address). For example, *device=dxmc0mod.sys 400000000001*.

For a secondary token-ring adapter, enter the following:

device=dxma0mod.sys
device=dxmc0mod.sys,,LAA

(where LAA represents the locally administered address). For example, *device=dxmc0mod.sys ,, 400000000001*.

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Appendix F
Display Information

*E*XTRA! is a fully Windows-based application that
supports all the display hardware and software that
Windows supports. This appendix mentions some of the
displays supported by Windows. For more detailed
information concerning the terminal displays supported by
Windows, consult your Windows documentation
(particularly the device compatibility list), or contact a
Microsoft product support representative.

Display Adapters

EXTRA! for Windows is compatible with virtually all EGA
and VGA displays—along with Hercules and high
resolution, non-standard displays—so long as the device
driver for the display is resident in the appropriate directory.
Though Microsoft Windows does not supply device drivers
for all types of displays, the manufacturer of a display
adapter usually does. If you are uncertain whether you have
the appropriate driver to support your display adapter,
contact the manufacturer of your adapter.

If you are planning to buy a display adapter, you will want
to take into consideration the number of mainframe sessions
you intend on using with *EXTRA!* The more windows you
use, the more display resolution you'll need to create the
windows clearly on the screen. For instance, if you intend to
have many sessions, you might consider an Extended
Function EGA, or a VGA. You'll also want to make sure that
the adapter is compatible with your monitor.

EXTRA! for Windows does not support CGA displays.

Terminal Model Support and Fonts

EXTRA! is capable of displaying terminal models 2, 3, 4, and
5. If you use a medium resolution display, such as an EGA
or VGA, the field size of some larger terminal models (such
as model 5) makes it necessary to use the scroll bars to view
hidden parts of the display field. The only way to view a
larger terminal model without scrolling is to select a font and
size that would display the screen in its entirety.

There is, of course, a trade off when you select a smaller font for your display. For although the font may enable the session to display the model's entire field, the font size can make the text difficult to read.

EXTRA! allows you to use any fixed-width, Windows-supported font to enhance the display of your different screen models. For specific instructions on how to install Windows-supported fonts, consult your Microsoft Windows documentation or contact a Microsoft product support representative.

The 3270 Display Buffer Code Set

The 3270 Display Buffer Code Set is shown on the following pages. You will find this set helpful if you are writing an API application.

Before you attempt to use the 3270 Display Buffer Code Set, it's important that you understand the relationship between three different display codes: EBCDIC, 3270 Display Code, and ASCII.

To oversimplify, the mainframe transmits data using EBCDIC code. The data is then translated for the terminal session into 3270 Display Code. Part of the 3270 Display Code is used to define attributes for a character or set of characters (underlined, blinking, color), while most of the code actually represents the characters which are displayed on the terminal session display.

While a terminal session uses the 3270 Display Code, a PC application uses ASCII. Therefore, whenever data is transferred to a PC application from the mainframe or from a terminal session, it must first be translated to ASCII.

A simple example might help clarify the situation. Let's assume a file is sent from the mainframe to a terminal session. The information is transmitted in EBCDIC format. When it reaches one of your windowed terminal sessions, it's translated into 3270 Display Code by *EXTRA!*

Now let's further assume that you wish to copy data from the windowed terminal session to the Clipboard. When you copy data from the session to the Clipboard, *EXTRA!* translates the 3270 Display Code into ASCII, the code used by the PC.

Table for the 3270 Display Buffer Code Set

00 - NULL	20 - 0	40 - à
01 - EM	21 - 1	41 - è
02 - FF	22 - 2	42 - ì
03 - NL	23 - 3	43 - ò
04 - STP	24 - 4	44 - ù
05 - CR	25 - 5	45 -
06 -	26 - 6	46 - õ
07 -	27 - 7	47 - ÿ
08 - >	28 - 8	48 - á
0A - [	2A - ß	4A - é
0B -]	2B -	4B - ì
0C -)	2C - #	4C - ò
0D - (	2D - @	4D - ù
0E - }	2E - %	4E - ü
0F - {	2F - _	4F - ç
10 - Space	30 - &	50 - ä
11 - =	31 - -	51 - ë
12 - '	32 - .	52 - ï
13 - "	33 - ,	53 - ö
14 - /	34 - :	54 - ü
15 - \	35 - +	55 - â
16 - |	36 - ¬	56 - ê
17 - |	37 - Macron	57 - î
18 - ?	38 - °	58 - ô
19 - !	39 - ˇ	59 - û
1A - $	3A - ^	5A - á
1B - ¢	3B - ~	5B - é
1C - £	3C - ¨	5C - í
1D - ¥	3D - `	5D - ó
1E - P$_t$	3E - ´	5E - ú
1F -	3F - δ	5F - ñ

A Macron is a horizontal bar over a character.

0A - [	5B - é	A2 - C
0B -]	5C - í	A3 - D
0C -)	5D - ó	A4 - E
0D - (	5E - ú	A5 - F
0E - }	5F - ñ	A6 - G
0F - {	6A - E	A7 - H
1A - $	6B - I	A8 - I
1B - ¢	6C - O	A9 - J
1C - £	6D - U	AA - K
1D - ¥	6E - Y	AB - L
1E - P₁	6F - C	AC - M
1F -	7A - Á	AD - N
2A - ß	7B - É	AE - O
2B -	7C - Í	AF - P
2C - #	7D - Ó	B0 - Q
2D - @	7E - Ú	B1 - R
2E - %	7F - Ñ	B2 - S
2F - _	8A - k	B3 - T
3A - ^	8B - l	B4 - U
3B - ˜	8C - m	B5 - V
3C - ¨	8D - n	B6 - W
3D - `	8E - o	B7 - X
3E - ´	8F - p	B8 - Y
3F - δ	9A - æ	B9 - Z
4A - é	9B - ø	BA - Æ
4B - ì	9C - å	BB - Φ
4C - ò	9D - ç	BC - Å
4D - ù	9E - Field Mark	BD - C
4E - ü	9F - Dup	BE - ;
4F - ç	A0 - A	BF - ×
5A - á	A1 - B	

Values in the range C0-FF are used to display special symbols in the OIA, and represent Field Attributes in the remainder of the buffer.

Field attribute bytes are bit-mapped as follows:

Bits	Contents
7, 6	11 = field attribute
5	0 = unprotected field
	1 = protected field
4	0 = alphanumeric field
	1 = numeric field
3, 2	00 = normal display / not selector pen detectable
	01 = normal display / selector pen detectable
	10 = intensified display / selector pen detectable
	11 = nondisplay
1	reserved
0	0 = unmodified field
	1 = modified field

An Extended Attribute Byte (EAB) follows each 3270 display character and field attribute, only in EAB-formatted display buffers. In non-EAB buffers, the display characters and field attributes are contiguous bytes.

Extended Field and Character Attributes are bit-mapped as follows:

Bits	Contents
7, 6	**Extended Highlighting** 00 = Revert 01 = Blink 10 = Reverse Video 11 = Underline
5, 4, 3	**Character Color** 000 = Revert 001 = Blue 010 = Red 011 = Pink 100 = Green 101 = Turquoise 110 = Yellow 111 = White
2, 1, 0	**Character Generator (Programmed Symbol) Set Selection** 000 = Revert 001 = APL 010 = PS 2 011 = PS 3 100 = PS 4 101 = PS 5 110 = PS 6 111 = PS 7

Appendix G
A Tour of EXTRA!

This appendix will help you become familiar with your *EXTRA! for Windows* software. On the next page, you will find some guidelines that will help you get the most out of this appendix. Then we will lead you menu by menu, dialog box by dialog box, through *EXTRA!*

Before You Go Any Farther...

This tour will help you to see how *EXTRA!*'s menus and dialog boxes relate to one another. To ensure your understanding of this appendix, you should familiarize yourself with these guidelines.

- Each separate menu or dialog box in this appendix is called an illustration.

- As a Windows convention, whenever an ellipsis (...) follows a command in a menu (such as "Fonts..."), you know that the command leads to a dialog box.

- In an illustration where a command with an ellipsis is highlighted, you know that the next illustration is the result of having selected that command.

- A downward-pointing arrow between illustrations means those illustrations are directly related to each other. You can get to the related window or dialog box by selecting the highlighted menu command, dialog box option, or command button shown. If there is not a downward-pointing arrow between illustrations, the illustrations are not directly related to one another.

- For some menus, it takes many illustrations to lead you through that menu's associated dialog boxes.

- In a menu where nothing is highlighted—neither the menu title nor any of the commands—the illustration is emphasizing those commands which have no ellipses. The definitions of such commands are located to the right of the illustration.

The Menus of the EXTRA! Executive Window

The EXTRA! Executive window contains five menus, and each menu has several commands. Also, in addition to it's standard commands, the control menu in the EXTRA! Executive window contains two commands specific to *EXTRA!*.

# Commands of the Control Menu
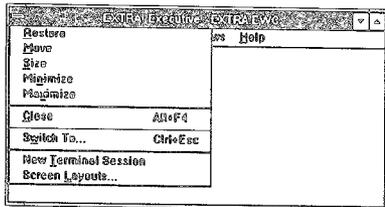
New Terminal Session. Brings up an empty terminal window on the screen.
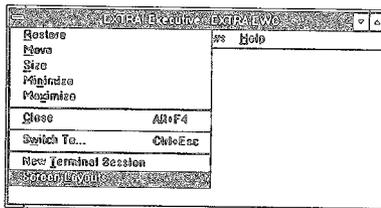
Selecting Screen Layouts... leads the user to the Screen Layouts dialog box. From this box you can save a newly designed layout or load an existing layout.
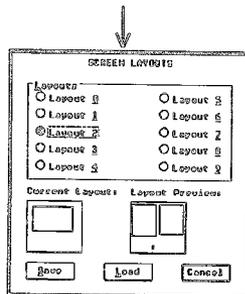
Commands of the File Menu
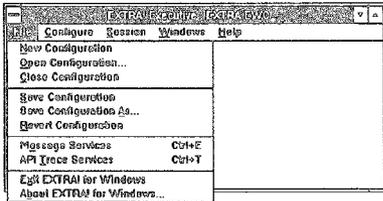
New Configuration. Creates a blank, unnamed configuration file for creating a configuration.

Open Configuration. Opens an existing configuration file; after selecting this command, the user selects a file from a list box in the dialog box.

Close Configuration. Closes the open configuration file.

Save Configuration. Saves the open configuration file. This feature only applies to configurations that already have a file name.

Selecting **Save Configuration As...** allows you to give a filename to a configuration that has no name. It also saves the currently open configuration file to the name the user specifies in the dialog box.

Revert Configuration. This ignores any changes made to the currently open configuration that haven't been saved and restores the last saved version of the configuration.
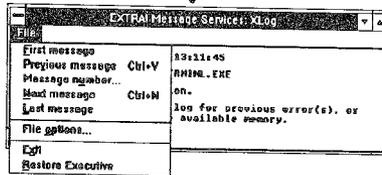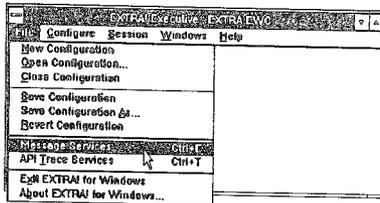
Selecting Me̲ssage Services... brings up the Message Services window, where you can set options for the error log file and view messages in the file.

First message. This option brings up the first message, if any, in the message log file.

Previous message. This option brings up the message, if any, in the message log file just before the message currently displayed in the Message Services window.

Selecting Message nu̲mber... allows you to select a particular message number in the message log file.

Next message. This option brings up the message, if any, in the message log file just after the message currently displayed in the Message Services window.

Last message. This option brings up the last message in the message log file.

Exit. This option closes Message Services.

Restore Executive. This option makes the EXTRA! Executive window the current window.
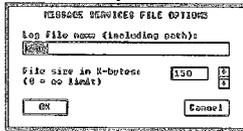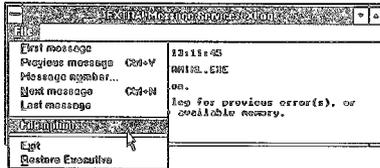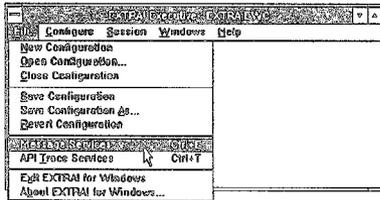
Selecting File options... leads the user to the Message Services File Options dialog box, where the user can specify the name and maximum size of the error log file.

EXTRA! Executive - EXTRA EVO

File Configure Session Windows Help

New Configuration
Open Configuration...
Close Configuration

Save Configuration
Save Configuration As...
Revert Configuration

Message Services   Ctrl+E
API Trace Services   Ctrl+T

Exit EXTRA! for Windows
About EXTRA! for Windows...

EXTRA! API Trace Services - API Trace

Trace

API Trace

File Transfer
HLLAPI for Windows
√ Sessions Manager

Review API Trace
API Buffer Options...

Exit
Restore Executive

Selecting API Trace Services... enables the user to trace the activity of the sessions manager and the HLLAPI application. This menu selection leads to the API Trace Services dialog box, which has only one menu, the Trace menu.

API Trace. This toggle begins a trace session when on (checked).

File Transfer. This toggle starts tracing all file transfers when on (checked).

HLLAPI for Windows. Selecting this toggle starts tracing for HLLAPI.

Sessions Manager. Selecting this toggle starts tracing for the Sessions Manager.

Review API Trace. Can be used only when tracing services are off. This toggle allows the user to review the contents of the most recent tracing session.

Exit. Closes the tracing services window.

Restore Executive. This option makes the EXTRA! Executive window the current window.
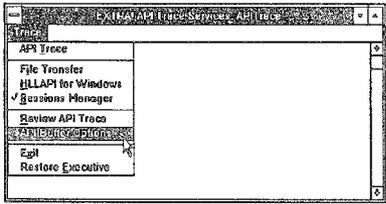
Selecting API Buffer Options... from the Trace Menu allows the user to adjust the tracing buffer, a portion of memory set aside for storing the trace data.
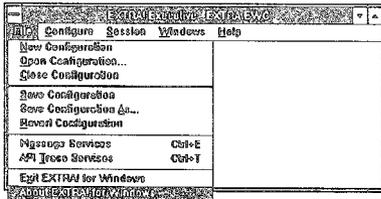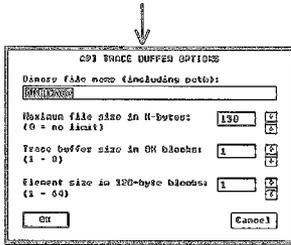
Selecting About EXTRA! for Windows... from the File menu provides information regarding *EXTRA!'s* copyright and version.

Commands of the Configure Menu
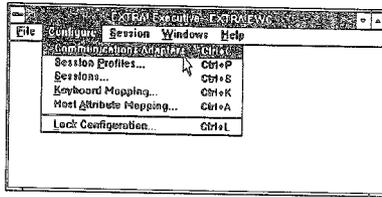
Selecting Communications Adapters... allows the user to select or change the settings that the user will be using to communicate with the mainframe, and to set or change the connection adapter type (coax, NETBIOS LAN, or token-ring DLC).
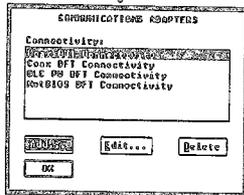
Selecting Add... leads the user to the Define Communications Profile dialog box, where the user selects and names the appropriate driver for the connection that the user is adding.
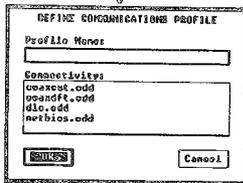
Selecting OK leads the user to the Adapter Parameters dialog box. This example displays the dialog box for a coax DFT adapter. There are similar Adapter Parameter dialog boxes for coax CUT, NETBIOS, and token-ring DLC connections.
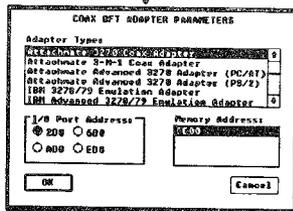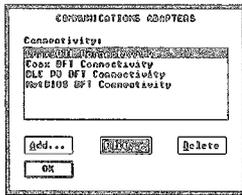
Selecting Edit... from the Communications Adapters dialog box leads the user, depending on the type of connection, to one of three dialog boxes...
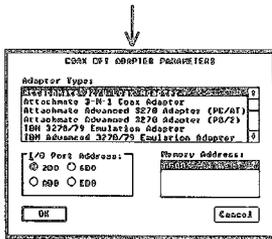
The Coax Adapter Parameters dialog box...
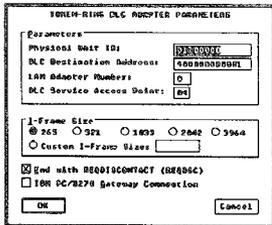
Or

The Token-Ring DLC Adapter Parameters dialog box...

Or

The NETBIOS Adapter Parameters
dialog box.

Selecting Edit... in the NETBIOS dialog
box leads the user to the Resource
Parameters dialog box, which applies
only to NETBIOS connections.

Selecting Named Gateways in the
NETBIOS Adapter Parameters dialog
box expands the dialog box, allowing up
to 6 gateways to be named.
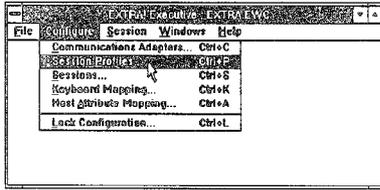
Selecting Session Profiles... allows the user to select terminal models, EABs, and startup options to use with mainframe and printer sessions. This option leads to the Session Profiles dialog box, where you can add, edit, or delete an option.

Selecting Add... from the Session Profiles dialog box leads the user to the Define Logical Unit Profile dialog box where the user can define and name a profile for a printer session or a mainframe session.
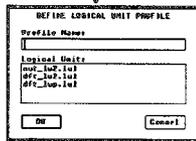
Selecting a terminal Logical Unit and then OK from the Define Logical Unit Profile dialog box leads the user to the Terminal Profile dialog box, where the user can specify the terminal model and select extended attributes.
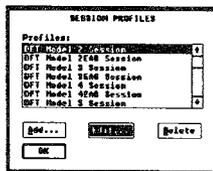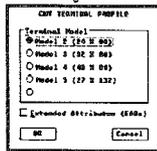
Selecting Edit... from the Session Profiles dialog box leads to the Terminal Profile dialog box, where the user can select a terminal profile for the highlighted mainframe session profile.

EXTRA! Executive - EXTRA.EWC

File Configure Session Windows Help

Communications Adapters...   Ctrl+C
Session Profiles...   Ctrl+P
Sessions...   Ctrl+S
Keyboard Mapping...   Ctrl+K
Host Attribute Mapping...   Ctrl+A
Lock Configuration...   Ctrl+L
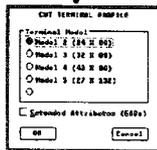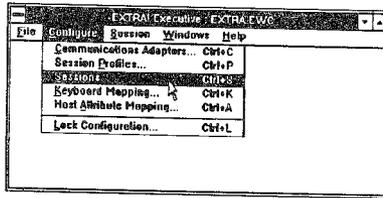
Selecting Sessions... from the Configure menu leads the user to the Sessions dialog box.

SESSIONS

Session Names
C CoaxDFT0
B CoaxDFT1
E CoaxDFT2
F CoaxDFT3
G CoaxDFT4
I IBMCUT00
M NetBIOS0
O NetBIOS1
R NetBIOS2
S NetBIOS3

Add...   Edit...   Delete

OK
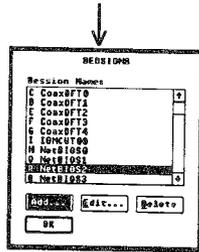
Selecting Add... leads the user to the Configure Session dialog box. From this box, the user can set the short and long names for the session, as well as select the adapter type, the kind of connection, and the session profile.

CONFIGURE SESSION

Short name: Long name: CoaxDFT0
Comm. Adapter...   Coax DFT Connectivity
Comm. Resource...   Coax DFT Connection 0
Session Profile...   DFT Model 2E00 Session

OK   Cancel

SELECT COMMUNICATIONS ADAPTER

Coax CUT Connectivity
Coax DFT Connectivity
DLC PU DFT Connectivity
NetBIOS DFT Connectivity

OK   Cancel
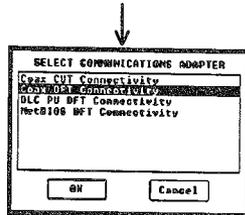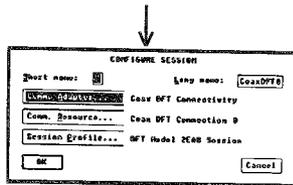
Selecting Comm. Adapter... from the Configure Session dialog box leads the user to the Select Communications Adapter dialog box, where the user can select an adapter definition for the session.

G-13

Selecting Comm. Resource... from the Configure Session dialog box leads to the Select Communications Resource dialog box, where the user can select the connection resource for the session.

Selecting Session Profile... from the Configure Session dialog box leads the user to the Select Session Profile dialog box, where the user can select a session profile created earlier.
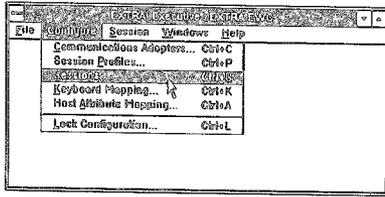
You may recall that the dialog boxes on pages G-12 through G-14 came by selecting Add... from the Sessions dialog box. Selecting Edit... also leads to the previous dialog boxes, starting with the Configure Session dialog box which first appears on page G-13.
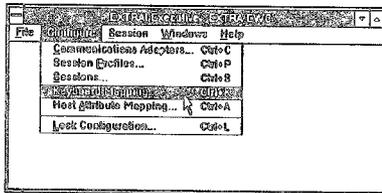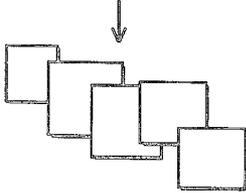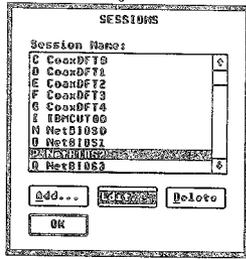
Selecting Keyboard Mapping... allows the user to indicate the type of keyboard appropriate for the user's PC.
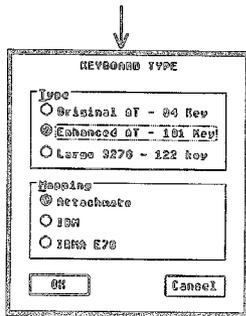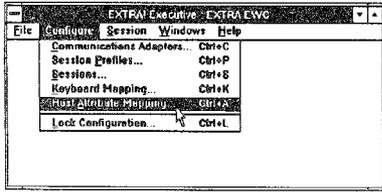
Selecting **Host Attribute Mapping...** allows the user to select how the PC monitor will display mainframe session text colors and styles (highlighted, blinking, reverse video, or underlined).
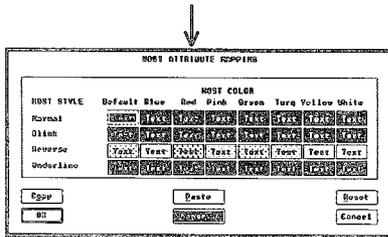
Selecting **Change...** from the Host Attribute Mapping dialog box leads to the Color Attributes dialog box, where you can determine the color for foreground (text) and background. Notice that when setting foreground color, only pure colors can be chosen. When setting background color, you can select either pure or dithered color.
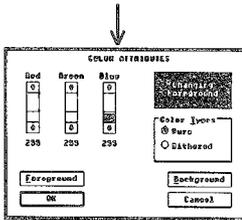
Or
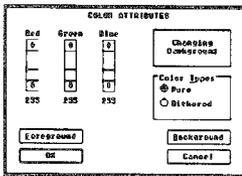
Selecting **Foreground** in the Color Attributes dialog box allows you to set a color for the text of a session.

Selecting **Background** in the Color Attributes dialog box allows you to set a color for the background of a session.

EXTRA! Executive - EXTRA! EW...

File Configure Session Windows Help

Communications Adapters... Ctrl+C
Session Profiles... Ctrl+P
Sessions... Ctrl+S
Keyboard Mapping... Ctrl+K
Host Attribute Mapping... Ctrl+A
Lock Configuration... Ctrl+L

LOCK CONFIGURATION

Lock Options
☐ Configuration Creation
☐ Communications Adapters
☐ Session Profiles
☐ Session Assignments
☐ Keyboard Type
☐ Host Attribute Mapping
☐ Trace Data Parameters

[OK] [Lock...] [Cancel]

LOCKING PASSWORD

Enter: ▓▓▓▓▓▓

[OK] [Cancel]

LOCKING PASSWORD

Verify: ▓▓▓▓▓▓

[OK] [Cancel]

LOCK CONFIGURATION

Lock Options
☒ Configuration Creation
☒ Communications Adapters
☒ Session Profiles
☒ Session Assignments
☒ Keyboard Type
☒ Host Attribute Mapping
☒ Trace Data Parameters

[OK] [Unlock...] [Cancel]

Selecting **Lock Configuration...** allows the user to lock the configuration options so that other users cannot change them later. By using a password, only someone with the password can change settings.
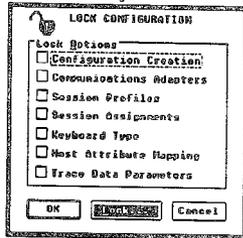
Within the Lock Configuration dialog box, the user can check the items she or he wishes to lock. Selecting Lock... leads to the Locking Password dialog box.
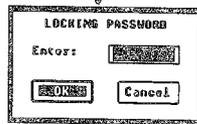
After the user has entered a password (which appears in the text box as a black block) and has selected OK, *EXTRA!* prompts the user to re-enter the password to verify the user's choice.
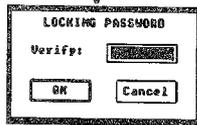
Selecting OK after re-entering the password returns the user to the Lock Configuration dialog box. Note that the lock icon is now closed, indicating that the checked items are now locked, and the center command button at the bottom of the screen reads "Unlock."
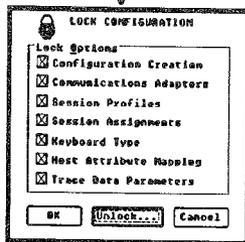
Selecting **Unlock** would lead the user again to the Locking Password dialog box, where he or she would enter their password to unlock some or all of the options.

Commands of the Session Menu
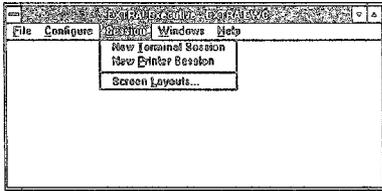
Selecting New Terminal Session brings up a new terminal window, where the user can open a mainframe session.

Selecting New Printer Session brings up a new printer window, where the user can open a printer session.
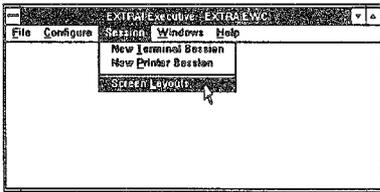
Selecting Screen Layouts... leads the user to the Screen Layouts dialog box. From this box you can save a newly designed layout or load an existing layout.
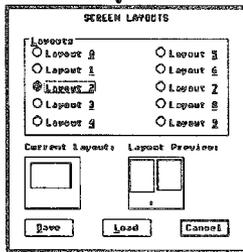
Commands of the Windows Menu

The Windows menu allows the user to jump to any of the currently available sessions, whether they are windows or icons. The user can also easily access the EXTRA! Executive window from the Windows menu.
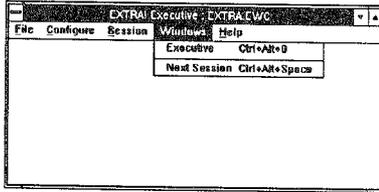
Executive. Makes the EXTRA! Executive window the active window, no matter where it was located previously.

Next Session. Makes the next window in the layout the active window, according to the order in which the windows were initially opened.

List of Sessions. Lists the sessions that are currently opened, enabling the user to move directly to a particular session.

The Menus of the EXTRA! Emulator Window

The EXTRA! Emulator window contains six menus, and each menu has several commands, which are described in the following sections. Feel free to refer back to the guidelines for this visual tour of *EXTRA!*, located on page G-2.

Commands of the File Menu
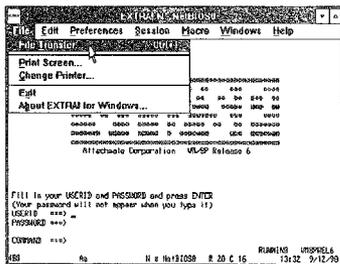
Selecting File Transfer... allows the user to transfer a file to or from the mainframe, using a series of dialog boxes to specify the details of the transfer.
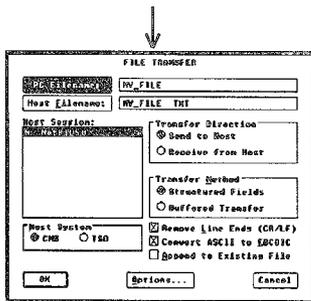
File Transfer dialog box. Provides specifications for sending or receiving a file to or from the mainframe.
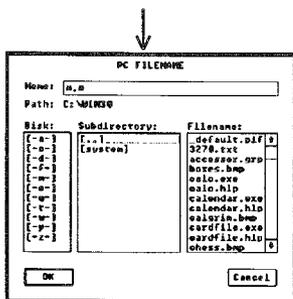
Selecting **PC Filename** leads the user to the PC Filename dialog box, which enables the user to specify the PC file that will participate in the file transfer.

```
                  FILE TRANSFER
   [ PC Filename:   [_____]
   [Host Filename:] [_____]
   Host Session:     ┌─Transfer Direction─┐
   [MAINFRAME    ]   │ ⊙ Send to Host      │
   [             ]   │ ○ Receive From Host │
   [             ]   └────────────────────┘
   [             ]   ┌─Transfer Method─────┐
   [             ]   │ ⊙ Structured Fields │
   ┌─Host System─┐   │ ○ Buffered Transfer │
   │ ⊙ CMS  ○ TSO│   └────────────────────┘
   └─────────────┘   ☒ Remove Line Ends (CR/LF)
                     ☒ Convert ASCII to EBCDIC
   [   OK   ]  [Options...]  ☐ Append to Existing File
                                        [Cancel]
```

Selecting Host Filename: leads the user to the Host Parameters dialog box, which enables the user to specify the mainframe file that will participate in the file transfer.

```
   ╔═══════════════════════════╗
   ║ CMS HOST FILE PARAMETERS  ║
   ║                           ║
   ║  File Name:  [MY_FILE]    ║
   ║  File Type:  [TXT    ]    ║
   ║  File Mode:  [       ]    ║
   ║                           ║
   ║   [  OK  ]   [ Cancel ]   ║
   ╚═══════════════════════════╝
```

If the user's mainframe runs in a CMS environment (notice the Host System option button), selecting Host Filename: from the File Transfer dialog box will lead the user to this dialog box.

Or

```
   ╔═══════════════════════════╗
   ║ TSO HOST FILE PARAMETERS  ║
   ║                           ║
   ║  Dataset Name: [MY_FILE]  ║
   ║  Member:       [member2]  ║
   ║  Password:     [mypass ]  ║
   ║                           ║
   ║   [  OK  ]   [ Cancel ]   ║
   ╚═══════════════════════════╝
```

If the user's mainframe runs in a TSO environment, selecting Host Filename: from the File Transfer dialog box will lead the user to this dialog box.

FILE TRANSFER

PC Filename: MV_FILE
Host Filename: MV_FILE TXT

Host Sessions

Transfer Direction
◉ Send to Host
○ Receive from Host

Transfer Method
◉ Structured Fields
○ Buffered Transfer

Host System
◉ CMS ○ TSO

☒ Remove Line Ends (CR/LF)
☒ Convert ASCII to EBCDIC
☐ Append to Existing File

[OK] [Options...] [Cancel]

Selecting Options... from the File Transfer dialog box leads the user to the File Transfer Options dialog box, which provides options regarding the size of the buffers and the record format.

File Transfer Send Options

Logical Record Length (LRECL): 80
Block Size (BLKSIZE):

Disk Space Allocation
Initially Allocate:
On Overflow:

Buffer Size
○ 2K ○ 6K
○ 4K ○ 32K

Record Format (RECFM)
◉ Default ○ Fixed
○ Variable ○ Undefined

Allocate Disk Space
◉ Tracks
○ Cylinders
○ AVBLOCKS, Size:

[OK] [Cancel]

If the user is uploading (sending) a file to the mainframe ("**Send to Host**"), selecting Options... from the File Transfer dialog box will lead the user to the File Transfer Send Options dialog box.

Or

File Transfer Receive Options

Logical Record Length (LRECL):
Block Size (BLKSIZE):

Disk Space Allocation
Initially Allocate:
On Overflow:

Buffer Size
◉ 2K ○ 6K
○ 4K ○ 32K

Record Format (RECFM)
○ Default ○ Fixed
○ Variable ○ Undefined

Allocate Disk Space
◉ Tracks
○ Cylinders
○ AVBLOCKS, Size:

[OK] [Cancel]

If the user is downloading a file to the PC ("**Receive from Host**"), selecting Options... from the File Transfer dialog box will lead the user to the File Transfer Receive Options dialog box.
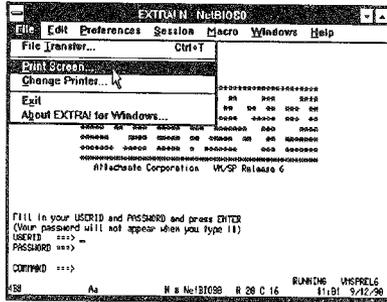
Selecting **Print Screen...** allows the user to print all or a portion of a mainframe screen. This command leads to the Print Screen dialog box where the user selects the number of copies he or she wants to print to a local printer, and whether to print in draft mode or not.
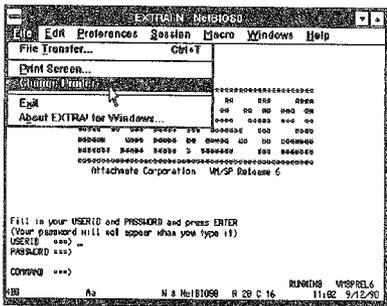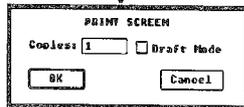
Selecting **Change Printer...** leads the user to the Change Printer dialog box where the user can select a printer for printing the mainframe screen.

```
 ─  EXTRA! File Transfer: N   ▼
C:\WIN30\3270.TXT
TEST
0 bytes transferred
```
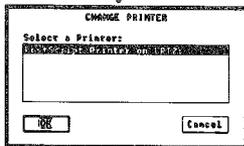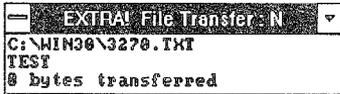
Once the file transfer is in process, the File Transfer window appears on your screen. The window shows the name of the PC file, the name of the Host file, and how many bytes have transferred.

```
  Restore
   Move
   Size
   Minimize
   Maximize
  ───────────────────────────
   Trace file transfer
   Abort file transfer  Alt+F4
  ───────────────────────────
   Switch To...        Ctrl+Esc
 ─  EXTRA! File Transfer: N   ▼
C:\WIN30\3270.TXT
TEST
0 bytes transferred
```
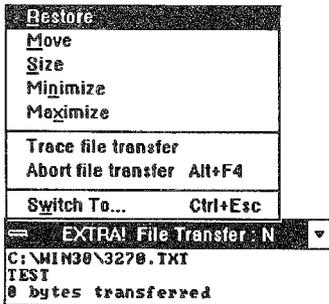
The window's control menu lets the user select the usual control menu commands, plus the following commands.

Trace file transfer starts a trace of the transfer.

Abort file transfer ends the transfer.

Commands of the Edit Menu
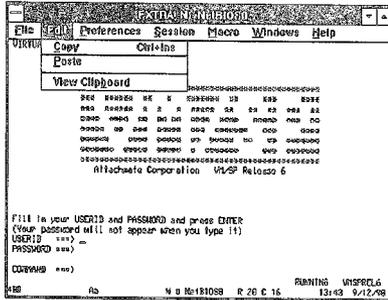
Copy. Copies the highlighted portion of the screen and places it on the clipboard.

Paste. Copies the contents of the clipboard and places those contents into the terminal buffer at the current cursor position.

View Clipboard. Causes a window to appear that contains the contents of the clipboard.

Commands of the Preferences Menu
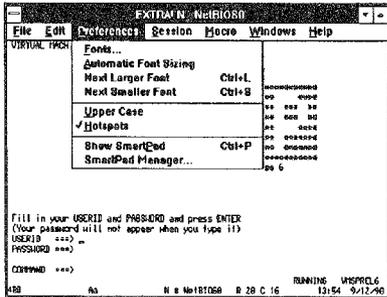
Automatic Font Sizing. Causes the font to adjust automatically to the largest size that will still fit the entire mainframe session within the window.

Next Larger Font. Changes the session text to the next larger available size in the selected typeface. Turns off Automatic Font Sizing.

Next Smaller Font. Changes the session text to the next smaller available size in the selected typeface. Turns off Automatic Font Sizing.

Upper Case. This toggle allows you to make all text in that particular mainframe session appear in either upper case or mixed upper and lower case.

HotSpots. Turning this toggle on allows you to select PF keys with the mouse.
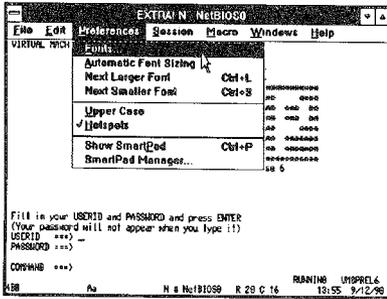
Selecting <u>F</u>onts... allows the user to change the kind and size of font displayed on the screen.
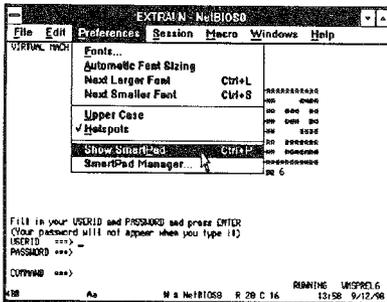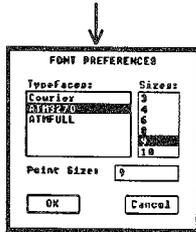
Selecting **Show Smart<u>P</u>ad** displays the currently selected SmartPad on the screen, making it available for use. The SmartPad can only be used with a mouse.
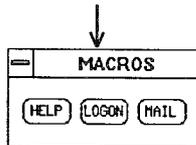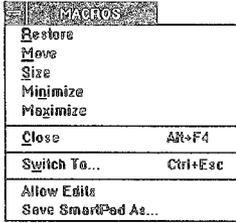
The SmartPad control menu has two added commands: Allow Edits and Save SmartPad As... Selecting Save SmartPad As... allows the user to name the saved SmartPad.
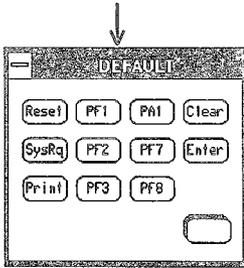
Selecting Allow Edits adds a "new keys" icon to the lower right corner of the SmartPad. Dragging this icon onto the pad creates a new, blank key and opens the Create SmartPad Key dialog box, allowing the user to add a function or macro to the pad.
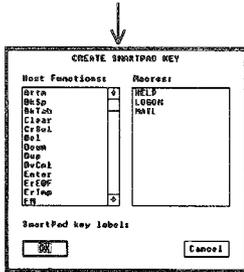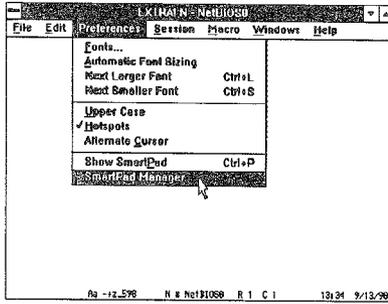
Selecting SmartPad Manager... from the Preferences menu displays a dialog box where the user can select or delete a SmartPad. Note that two SmartPads have quotes around them: "All Keys" and "Original Default." These two SmartPads cannot be changed or deleted.
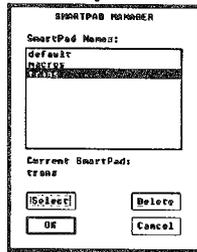
Commands of the Session Menu
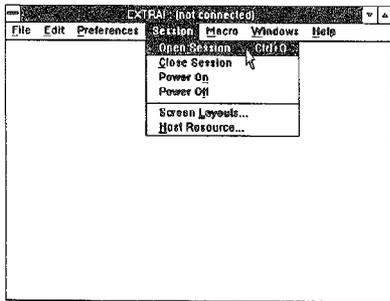
Selecting Open Session... leads the user to the Open Session dialog box, allowing the user to choose which session to open from a list of currently unopened sessions.
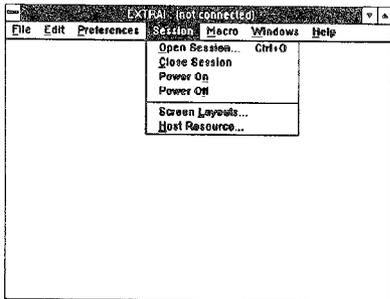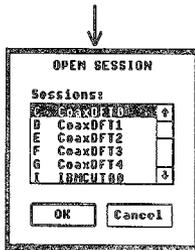
Close Session. Shuts down the current session and closes the window.

Power On. Makes a mainframe session go from inactive to active. The log-on screen of the mainframe will appear in the session window when the user selects "Power On."

Power Off. Makes the mainframe session go from active to inactive. The window then becomes blank, displaying the color or shade indicated in the Windows control panel for "Application Workspace."
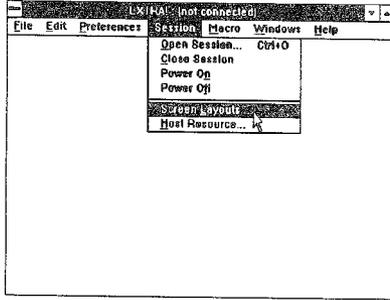
Selecting Screen Layouts... leads the user to the Screen Layouts dialog box. From this box the user can save a newly designed layout or load an existing layout.
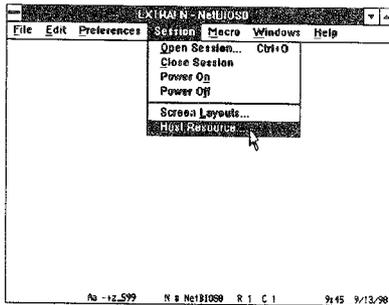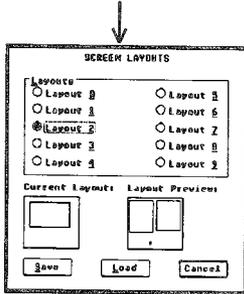
Selecting Host Resource... leads to a dialog box that shows the session short and long names, the name of the adapter profile the session is using, the resource and Gateway names of the connection (if the connection is NETBIOS), and the name of the session profile the session is using. In this example, the profile names were created to reflect the options of the profiles.
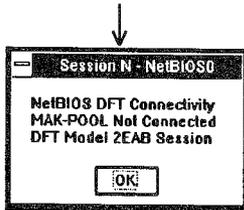
Commands of the Macro Menu

The Macro menu allows the user to record keystrokes for later playback, reducing repetitive tasks. The user can also record the initial cursor position in the macro, when the initial cursor position affects the execution of the macro.
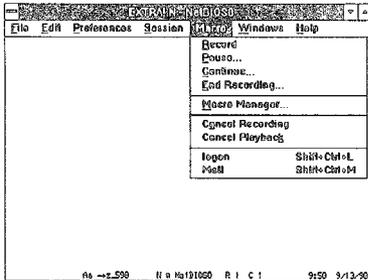
Record. Begins recording keystrokes for the macro.

Cancel Recording. Stops recording a macro.

Cancel Play**b**ack. Stops the macro from continuing.
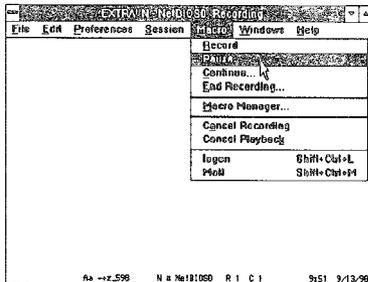
Pause... Temporarily stops the recording, useful for when the user must enter keystrokes, such as a userid or password. Brings up a dialog box allowing the user to select how to end the pause.
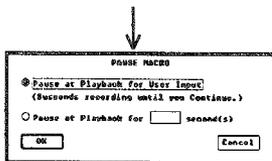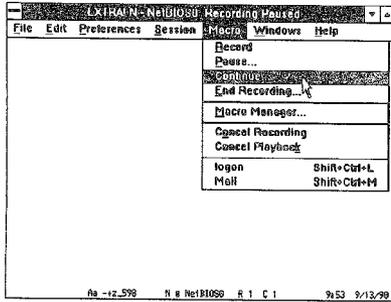
Selecting Continue... after having
paused the recording leads to the
Continue Macro Recording dialog box
where you can select whether the macro
should prompt the user at the pause
and, if so, create a prompt.
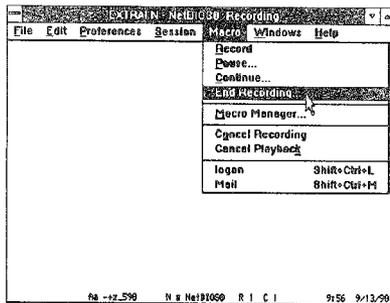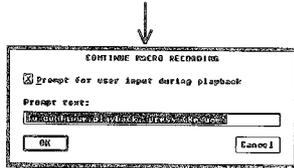
Selecting End Recording... leads to the
Set Macro Attributes dialog box. Here
you name the macro and enter a
description of what the macro does.
You can also select whether the macro
will show in the Macro menu and give it
an accelerator key for easy access.
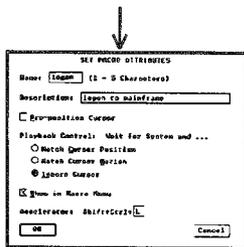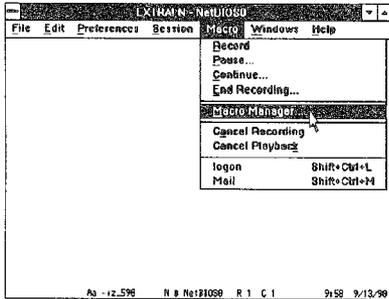
Selecting Macro Manager... leads to the Edit or Play Macros dialog box. Here you can view what macros are available and select macros, such as "logon" and "Mail," for playing, editing, or deleting.
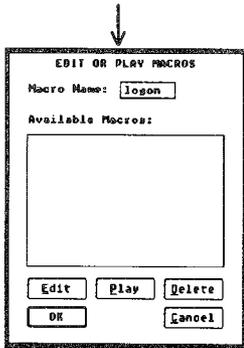
Commands of the Windows Menu
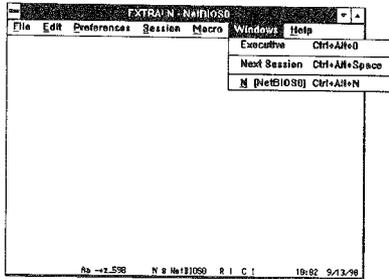
Executive. Makes the EXTRA! Executive window the active window, no matter where it was located previously.

Next Session. Makes the next window in the layout the active window, according to the order in which the windows were initially opened.

List of Sessions. Lists the sessions that are currently opened, enabling the user to move directly to a particular window.

The Menus of the EXTRA! Printer Window

The EXTRA! Printer window contains five menus, and each menu has several commands, described in the following sections. If necessary, refer back to the guidelines for this appendix, located on page G-2. For a description of the icons inside the printer window, refer to page G-44.

Commands of the File Menu
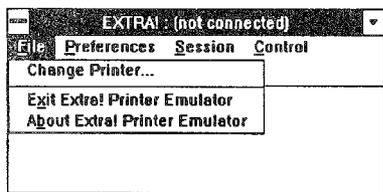
Change Printer... Allows you to select a printer or print to a file.

Exit EXTRA! Printer Emulator. Shuts down the EXTRA! Printer. Do not select this command if you are printing.

About EXTRA! Printer Emulator. Displays a box with the version and copyright information about *EXTRA!*'s Printer Emulator application.

Commands of the Preferences Menu
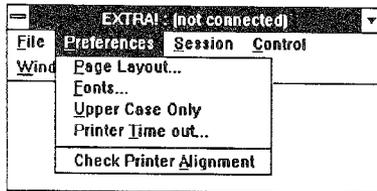
Upper Case Only. Prints all text in UPPER CASE letters.
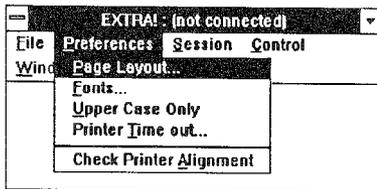
Page Layout... This command displays the Print Page Layout dialog box, which lets you select the dimensions, margins, and line spacing of the printed page.

EXTRA! : (not connected)

File **Preferences** Session Control

Wind   Page Layout...
       Fonts...
       Upper Case Only
       Printer Time out...

       Check Printer Alignment

↓

FONT PREFERENCES

Typefaces: Sizes:

Courier   **10**
Courier

Point Size: [10]

[OK]   [Cancel]
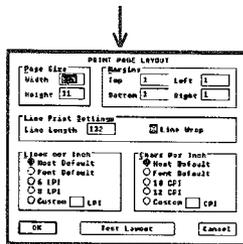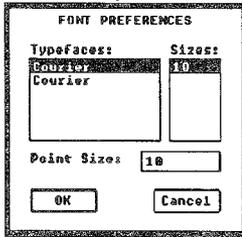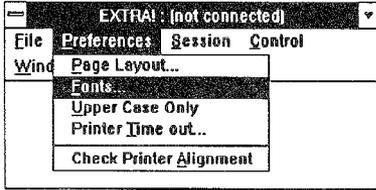
Fonts... This command displays the Fonts dialog box, which lets you select a printer font and size that you want to use with your print job.

EXTRA! : (not connected)

File **Preferences** Session Control

Wind   Page Layout...
       Fonts...
       Upper Case Only
       Printer Time out...

       Check Printer Alignment

↓

PRINT JOB TIMEOUT
The printer will time out in [5] minutes
[OK] [Cancel]
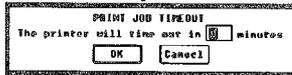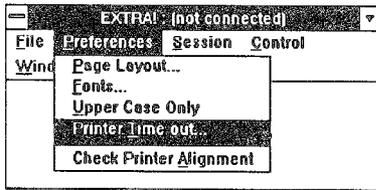
Printer Time Out... Opens the Print Job Timeout dialog box where you can enter the number of minutes that the printer should wait before deciding that the print job is finished.
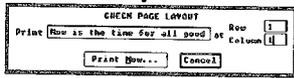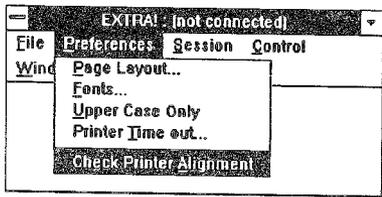
Check Printer Alignment... takes you to the Check Layout dialog box, where you can print a test page to check the printer settings you entered.

Commands of the Session Menu
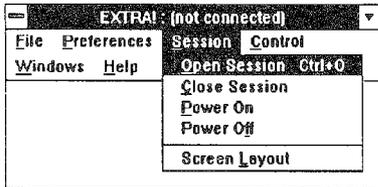
Open Session... Displays the Open Session dialog box where you can select a printer session connection.
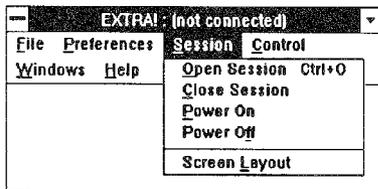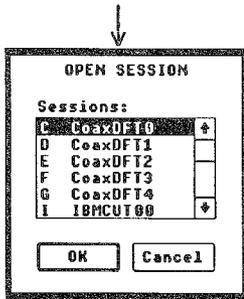
Close Session. Ends the printer session's connection with the mainframe, but leaves the printer window open.

Power On. Turns on the power of a connected printer session, much like turning on the switch of a mainframe terminal.

Power Off. Turns off the power of a connected printer session, but keeps the mainframe connection.
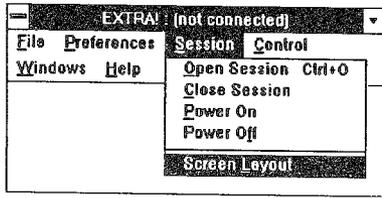
Selecting **Screen Layout...** leads the user to the Screen Layouts dialog box. From this box you can save a newly designed layout or load an existing layout.

Commands of the Control Menu

EXTRA! (not connected)	▼
File Preferences Session **Control**	
Windows Help	Hold Print
	PA 1
	PA 2
	Cancel Print
	Form Feed
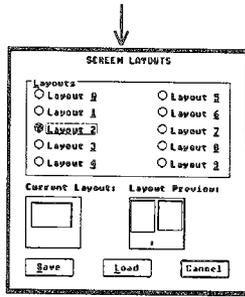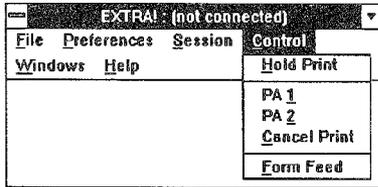
Hold Print. Toggles the printer session between on-line and off-line. You must select this command before you can use any of the others in this menu.

PA 1 and **PA 2.** These two commands are specific to the mainframe application you're using; they may reprint the job, or print just a page, etc. You must select "Hold Print" before selecting either of these commands.

Cancel Print. Cancels the current print job. You must select "Hold Print" before selecting this command.

Form feed. Ejects the current sheet of paper from the printer, complete with whatever has been printed on it so far. You must select "Hold Print" before selecting this command.

Commands of the Windows Menu
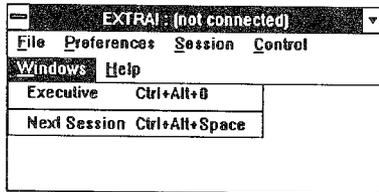
```
━━ ▓▓▓▓▓▓ EXTRA! : (not connected) ▓▓▓▓▓▓ ▼
File   Preferences   Session   Control
▓Windows▓ Help
  Executive      Ctrl+Alt+0
  Next Session  Ctrl+Alt+Space

```

Executive. Makes the EXTRA! Executive window the active window, no matter where it was located previously.

Next Session. Makes the next window in the layout the active window, according to the order in which the windows were initially opened.

List of Sessions. Lists the sessions that are currently opened, enabling the user to move directly to a particular window.

The Printer Window

File Preferences Session Control Windows Help

PC   Printer

4D   D DLCPrtr1   51D
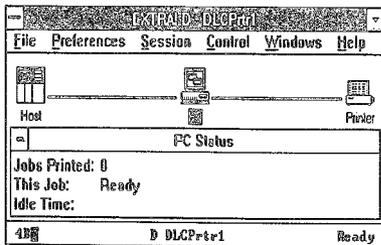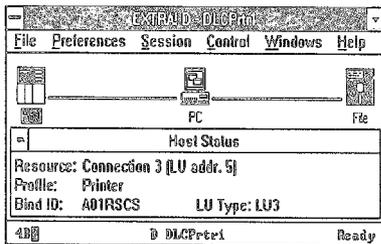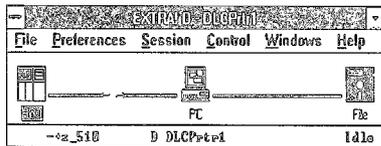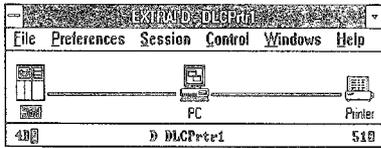
Printer window. The printer window shows icons that represent the mainframe, the PC, and either a PC printer or a disk, depending upon which you are printing to. The two pictures to the left show the printer and the disk. By double-clicking on the icons, you can get the following status boxes.

File Preferences Session Control Windows Help

PC   File

—◁z_51D   D DLCPrtr1   Idle

File Preferences Session Control Windows Help

PC   File

Host Status

Resource: Connection 3 (LU addr. 5)
Profile: Printer
Bind ID: A01RSCS   LU Type: LU3

4D   D DLCPrtr1   Ready

Host Status: This status box displays information about the mainframe session, such as the LU you are connected to, the mainframe application ID, and the type of printer connection.

File Preferences Session Control Windows Help

Host   Printer

PC Status

Jobs Printed: 0
This Job: Ready
Idle Time:

4B   D DLCPrtr1   Ready

PC Status: This box displays information about the print job, such as the number of jobs printed and the amount of time since the mainframe last sent data.
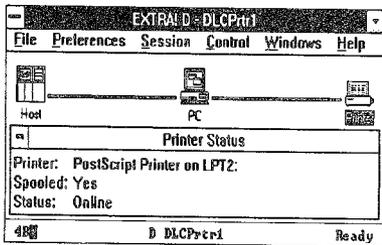
Printer Status: If you are printing to a local PC printer, this box displays information about the printer, such as the name and port of the PC printer, and the status of the printer.
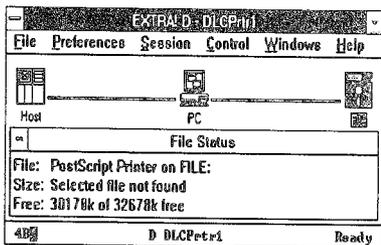
File Status: If you are printing to a file, this box displays information about the file, such as the name and path of the file, the size of the file, and the remaining space on the disk.

G-45

Appendix H:
An Overview of
3270 Connectivity

This appendix discusses the general concepts of 3270 communications and briefly describes the major components of a 3270 network. The appendix then covers the various methods by which PCs and PS/2s can be connected to a mainframe. Finally, the appendix highlights some advanced 3270 connectivity features, then shows you how to put these features to work in your company to create a more productive environment.

Discussion: The 3270 Network

The term "3270" refers to a family of products that fall into three basic categories: display terminals, printers, and control units. These components connect to the mainframe as shown in the figure on the next page. In the past few years, it's become quite popular to emulate these devices within the PC through the use of hardware and software.

Within the 3270 world, emulation is the ability of one device to perform the functions of another device. For example, with the proper hardware and software, your PC can perform the functions of a 3270 terminal or a 3270 control unit. To fully appreciate and understand 3270 connectivity, however, it's important to know a little about the 3270 network and the devices that are being emulated.
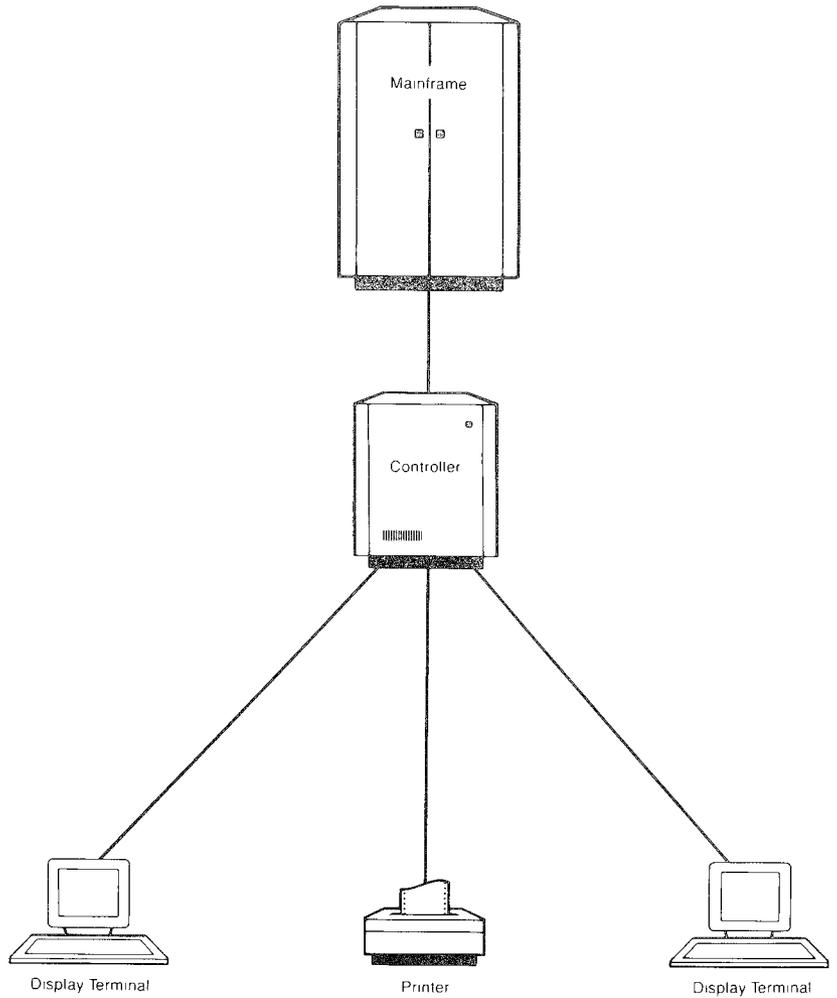
Display terminals, printers, control units, and mainframes are the major components of a 3270 network.

Mainframes (30XX, 43XX, 9370)

The mainframe computer contains the applications and data used by your organization, along with a special "Access Method" that manages locally-connected control units and front end processors (described below). Usually this access method is VTAM (Virtual Telecommunications Access Method), which manages the entire mainframe network. It contains all of the terminal information that is within the Network Control Program (NCP) on the front end processor, as well as information about every other device that has access to that mainframe.

When adding a micro-mainframe link, it's often necessary to notify mainframe personnel so that the necessary changes can be made to VTAM and the NCP.

Front End Processors (37X5)

A front end processor (FEP, or Communications Processor) manages the modem links that connect remote devices to the mainframe. The FEP runs a Network Control Program (NCP) that contains information about devices connected to the network, and controls the flow of information to and from the mainframe.

Some smaller mainframe systems have integrated systems to manage a small number of modem links and may not require a front end processor.

Control Units (3174, 3274)

A control unit (also called a controller or cluster control unit) connects 3270 display terminals and printers to the main-frame. The control unit maximizes the efficiency of the link to the mainframe by combining and sequencing the messages of multiple devices. It can usually control up to 32 coax-connected devices, and each device can be up to 5,000 feet away from the control unit.

The control unit can connect to the mainframe in three basic configurations: it can be "locally channel-connected" to the high-speed data channel of the mainframe; it can be "remotely-connected" using synchronous modems into the front end processor; and it can be "token-ring connected," with the LAN attached to either a front end processor, another control unit, or directly into a 9370 mainframe.

The 3174 control unit replaces the older 3274 model, and is the only model capable of a token-ring connection.

Printers (3286, 3287)

Like display terminals, printers also attach to the control unit using 3270 coax cable. The 3287 printer can accept data directly from the mainframe, or from the user of a display terminal who selects the "Print" or "Local Copy" command, as long as the terminal is attached to the same control unit.

Within the 3287 printer family, models range from those with very basic print functions to more sophisticated machines with additional type styles and sizes, special margin control, color, graphics, etc.

Display Terminals (3178, 3179, 3278, 3279)

Display terminals connect to the 3X74 control unit via a high-speed coaxial cable (called 3270 coax). There are several variations of displays to accommodate different screen sizes and color combinations. In general, 3178 and 3278 terminals offer a monochrome display, while 3179 and 3279 terminals offer color displays (3178 and 3179 are newer models). Some special models, such as the 3179-G and the 3279-S3G, also support mainframe graphic images.

Within each category, different screen sizes are offered. The Model 2 offers the same size display as a standard PC—25 lines by 80 columns. The Model 3 is 33 by 80; Model 4 is 44 by 80; and Model 5 is 28 lines by 132 columns.

There are other terminals like the 3194 and 3290 displays
that offer specialized features such as multi-protocol or
multi-session support.

Types of Micro-Mainframe Connections

The basic 3270 architecture remains intact when the PC is
used to emulate the functions of a display terminal, printer,
or control unit. No changes to the mainframe application or
the data network should be required when the PC is substi-
tuted for the real 3270 device, except to take advantage of
extended functions.

There are three basic ways *EXTRA!* connects a PC worksta-
tion to the mainframe: Coax, NETBIOS LAN, or Direct
Token-Ring (DLC). Each carries different advantages and
disadvantages, so any one or all three may be appropriate
for your organization.

Coax

The majority of the micro-mainframe links in place today use a 3270 coax connection between the PC and a 3X74 control unit. Its popularity is due, in part, to its ease of installation. In many cases, the PC can be up and running simply by being plugged into an available coax port on the 3X74. All that's required is a coax adapter that plugs into the PC and some type of 3270 connectivity software.

Another connection that supports coax communication is twisted pair. Twisted-pair wire is telephone wire and can be used to carry signals between a terminal and a controller. One of the advantages of twisted pair is that the cable is smaller: when cabling an entire building with coax cable, the bundles become very large and expensive. Most buildings are already cabled with inexpensive telephone wire. The disadvantage of twisted pair is that it cannot connect over as great a distance as coax: coax cable can carry signals for up to 5000 feet; twisted-pair cable has a practical limit of about 700 feet, which is sufficient for most applications. All that's necessary to convert a coax connection to twisted pair is either a balun or IBM's new Twisted-Pair-Coax (TPC) connector at both ends of the connection. Attachmate's Advanced 3270 Adapter and Advanced 3270 Adapter/2 also support twisted-pair cable and have a built-in balun so all you need to do is plug the twisted-pair cable directly into the adapter.

It's important to make the distinction between hardware and software. While the hardware is necessary for the physical connection, nearly all terminal emulation functions take place in the software. Depending on the software that's loaded, it's quite common for the same adapter to support "bare-bones" emulation or extended 3270 functions.

With the proper software and a coax adapter, the PC or PS/2 can appear to the 3X74 as any coax-attached device.
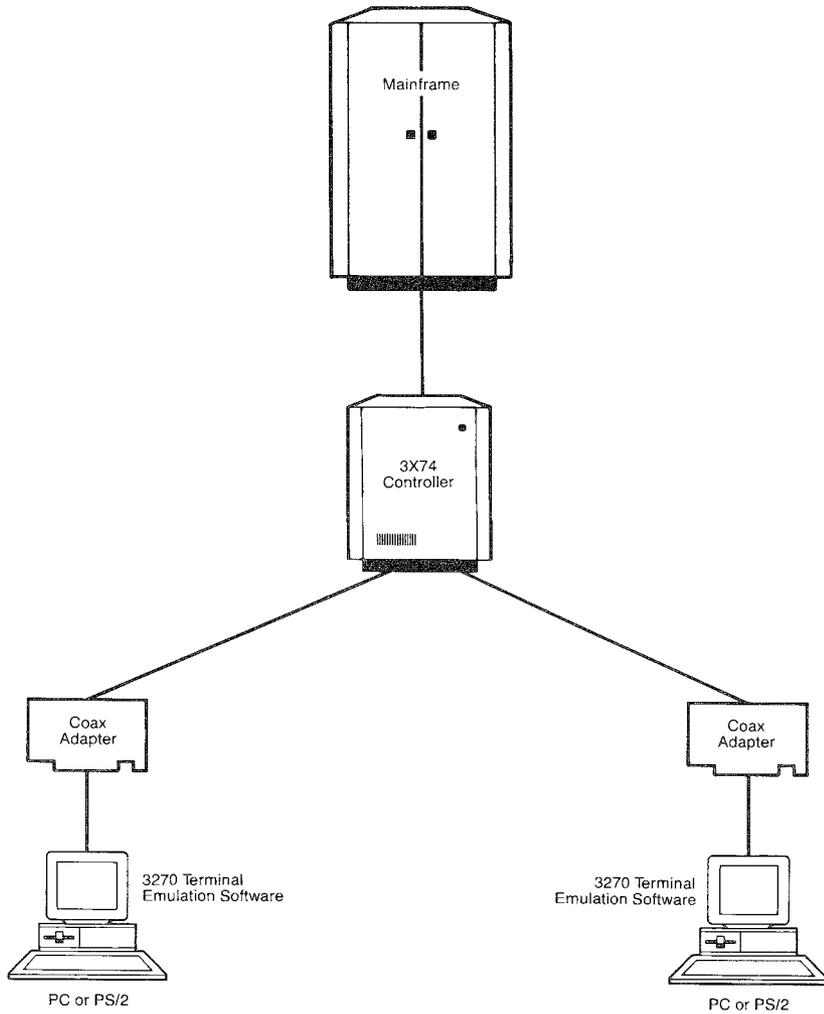
The 3270 coax connection links a PC or PS/2 to a 3X74 control unit.

LAN with a Gateway

The second connection method provides micro-mainframe access over a Local Area Network (LAN), with the LAN attached to the mainframe via a PC Gateway. With this configuration, one of the PCs on the LAN is connected to the mainframe and performs the functions of a 3X74 control unit. This PC workstation, which manages mainframe resources for the LAN, is called a *Gateway*.

Both NETBIOS-compatible and Token-Ring LANs can connect through a gateway. Each PC on the LAN that has access to the mainframe runs *Workstation* software. This software provides all of the terminal emulation functions, much like those found with

> *Gateway.*
> *A device that uses protocol conversion to connect dissimilar communications systems. The gateway provides the translation between protocols, such as between a LAN and a mainframe.*

3270 coax emulation. The only hardware necessary is a LAN adapter, usually provided by the LAN manufacturer. The workstation software communicates across the LAN with the PC gateway, and eventually with the mainframe.

The physical connection between the gateway workstation and the mainframe may be made with a coax adapter, an SDLC adapter with a synchronous modem, or a direct DLC connection to an IBM Token-Ring Interface Coupler (TIC) (see next section for information about DLC and TICs). The gateway station provides all the necessary functions for it to appear as a real 3X74 with multiple devices attached, and can potentially support the same number of terminal devices.

An example of a PC gateway connection is shown on the following page.

Mainframe

LAN
Gateway
PC or PS/2

Local Area Network

Workstation

Workstation

Printer
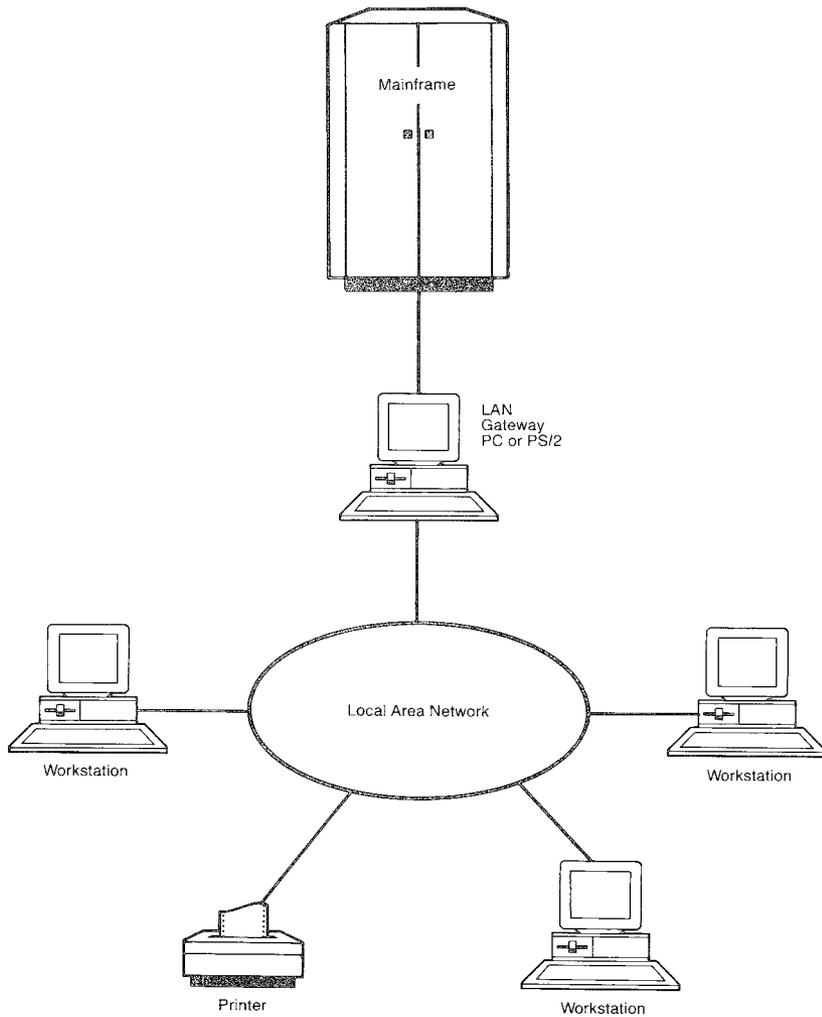
Workstation

With the gateway, the PC workstation is connected to the mainframe and performs the functions of a 3X74 control unit.

Direct Token-Ring (DLC)

The third and most recent connection method is known as Direct Token-Ring (DLC). The Direct Token-Ring Connection relies on the IBM Token-Ring Interface Coupler (TIC), a high-speed interface card that links a mainframe to a token-ring network. Ordered as a plug-in module from IBM, the TIC can be installed in a 3720, 3725, 3745 Front End Processor, in a 3174 Control Unit, and in a 9370 mainframe.

The main advantage of the TIC connection is speed. Before the TIC, the most common way to link a LAN to a mainframe was through an SDLC modem link. Compared to the speed of the LAN and the speed of the

> *SDLC.*
> *Synchronous Data Link Control. An IBM protocol for synchronous communications that operates within IBM's System Network Architecture.*

mainframe, an SDLC link is slow. With the TIC, however, the link speed becomes about the same as the token-ring network—4 or 16 million bps.

Another advantage is that you don't have to use a second communication cable. Using a token-ring DLC connection, the PC communicates with the mainframe over the same wire as it communicates with the LAN.

Communicating Through the TIC

There are two basic approaches for setting up communications between a token-ring LAN-connected PC and the mainframe. The first approach uses an intermediate "resource manager," which is another name for a gateway. Using this method, only the gateway station is directly attached to the mainframe and all other PCs communicate through the gateway. See the previous section for

information about gateways. The second approach uses direct addressing, where each PC can be addressed and controlled directly from the mainframe. This approach uses a protocol called Data Link Control (DLC), which handles communication between devices on a token-ring network.

Direct addressing provides the best performance between the LAN PC and the mainframe, achieving faster file transfer and better overall response time. In some environments, companies may find that higher performance of the direct connection, especially for file transfer, is worth the added cost.

However, there are a few drawbacks. For example, each PC must be explicitly defined at the mainframe as an SNA Physical Unit Type 2. Since each PC must be defined at the mainframe, it's necessary to involve mainframe systems personnel each time a new user is added to the LAN.

Direct addressing also requires that each PC be polled by the mainframe. Polling means that the mainframe must continually ask each PC if there is any new data available. Polling places a heavy processing load on the mainframe or the FEP and may mandate a larger front end processor. This continual polling also creates increased traffic on the LAN.

An example of a direct addressing configuration is shown on the following page. Direct addressing achieves very high transfer rates, but places a greater burden on mainframe resources. In the following diagram, the dotted line represents a token-ring DLC connection; the dashed line represents a LAN gateway connection.

S/370
Mainframe

37XX
Front End
Processor

Direct Token-Ring
Workstation

LAN Gateway
PC or PS/2
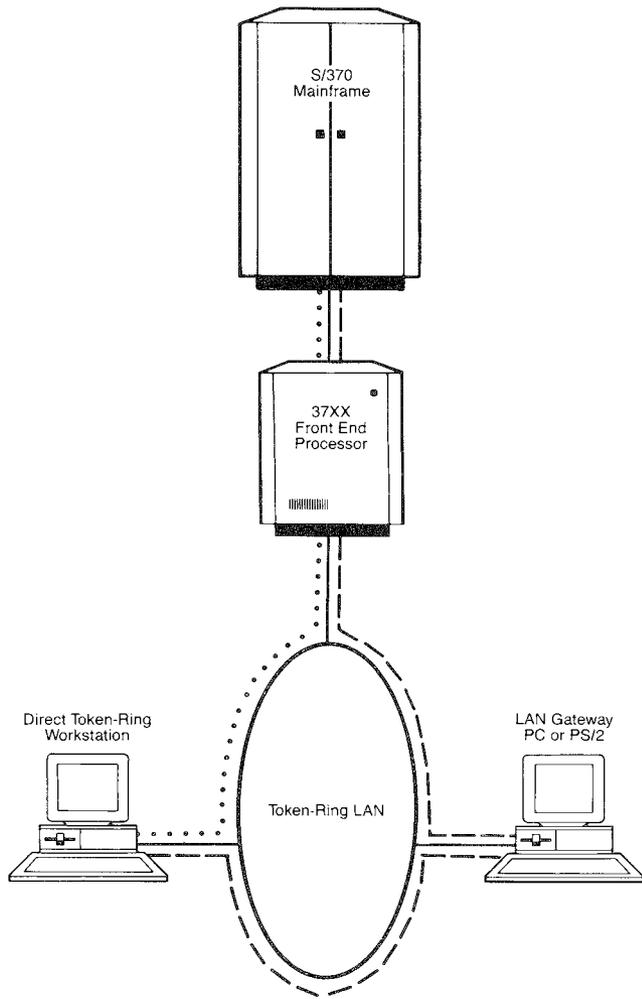
Token-Ring LAN

*This token-ring workstation can communicate with the
mainframe both as a LAN workstation and as a token-ring
DLC workstation.*

The Advantage of DFT Over CUT

There are two basic modes of terminal emulation for the PC and the PS/2: CUT and DFT. Earlier systems used Control Unit Terminal (CUT) mode, based upon the original non-intelligent 3278 display terminals. When using CUT mode, all the terminal control lies in the 3X74 control unit. Each character entered by the user is sent to the control unit and placed in a special screen buffer, then returned to the terminal for display on the screen. CUT mode requires no intelligence within the terminal, but is limited to just one mainframe session.

The newer Distributed Function Terminal (DFT) mode overcomes many of the restrictions associated with CUT mode. DFT distributes many of the control unit's functions to the terminal, thus allowing the PC's intelligence to be used for advanced features not available with CUT. For example, DFT offers multiple mainframe sessions, instead of just one. It also supports improved file transfer. *EXTRA!* offers both CUT and DFT mode.

EXTRA! for Windows and 3270 Connectivity

EXTRA! combines the power of Attachmate's connectivity software with the flexible interface of Microsoft Windows. Using *EXTRA!*, your PC can communicate with and operate as a variety of 3270 devices, without losing the power and functions of the PC or PS/2.

EXTRA! offers a powerful set of tools that can dramatically improve the way your company does business. With Microsoft Windows and tools such as file transfer, you can get more work done in less time. In the following sections, we'll discuss *EXTRA!*'s advanced features, then show you how these features can be used in your company to create a more productive environment.

The Bottom Line: Get More Work Done in Less Time

If you've ever wished there were more than one of you, or that you had more time each day to do your work, then *EXTRA! for Windows* is for you. Because you can run multiple mainframe sessions along with Windows PC applications, you can perform a variety of tasks at the same time.

For example, you can send a file to the mainframe in one session and receive a file from the mainframe in another session —all while typing a letter with your PC's word processor. With multiple sessions, you don't need to take a coffee break each time you transfer a file. Simply start the file transfer, then move to another session and continue working while the file transfer occurs in the background.

Microsoft Windows lets you display many sessions and applications on the screen at the same time. It's especially useful when working with multiple mainframe sessions. For example, you can review a customer's sales history from the mainframe database in one window, while in another window you can enter an order for the customer using a mainframe application such as CICS.

EXTRA! can be configured for up to 26 mainframe sessions, depending on the adapter(s) and PC memory available. Because *EXTRA!* is a Microsoft Windows application, a variety of other Windows-based PC applications can be run concurrently with the mainframe sessions. And *EXTRA!*'s window sizes, locations, and colors can be changed to meet the needs of individual users.

H-15

File Transfer   *EXTRA!* offers a quick and efficient way to transfer files
between the PC and the mainframe. *EXTRA!'s* file transfer
feature offers high-speed transfer of both text and binary
files using IBM's Send/Receive (IND$FILE), and supports
both buffered mode and structured fields transfers.

Glossary

Active window. The window where the user is currently performing actions.

Advanced Program to Program Communications (APPC). A set of protocols designed by IBM that enable application programs to interact directly with each other on a peer-to-peer basis (rather than having to go through the mainframe), even when the programs are on separate and remote processors.

Advanced Peer-to-Peer Networking (APPN). An IBM application that allows users to establish sessions with remote applications without knowing the location of the application.

Alt key. A key on the PC keyboard that has no function when used alone, but is used to modify the function of another key. It is often used to control special 3270 functions such as terminal off/on, help, etc. The Alt key is also used to select menus in windows.

API. See *Application Program Interface.*

APPC. See *Advanced Program to Program Communications.*

APPN. See *Advanced Peer-to-Peer Networking.*

Application program. A program that performs specific tasks, such as a word processor or a database.

Application Program Interface (API). A programming interface to the 3270 emulation program that allows a PC application program to simulate the keystrokes of a human operator and communicate directly with the mainframe.

Arrow. The pointer that appears on your screen. It responds to your mouse and moves as your mouse moves across a flat surface.

ASCII. American Standard Code for Information Interchange. An 8-bit code, developed by the American National Standards Institute committee, for the exchange of information between communication devices.

Asynchronous transmission. A transmission scheme that uses *start/stop* bits to define a character and separate it from other characters. (Compare *synchronous transmission*.)

AUTOEXEC.BAT. A special batch file that is executed automatically when the PC is turned on or rebooted. It can be used to automatically start application programs.

Backup diskette. A diskette containing information copied from a fixed disk or from another diskette. It is used in case the original information becomes unusable.

Batch. The processing of a group of data that was entered previously. (Compare *interactive*.)

Batch file. A file containing one or more lines of DOS commands that will execute, usually in order, after the name of the batch file has been entered. Batch files all have the extension .BAT in their filenames.

Baud. A unit of measurement that indicates the electrical change from 0 to 1 across an electrical interface. How fast a modem can change it's tone to indicate a bit. Baud is a term often misused in describing data transmission rate, which should more accurately be expressed in bits per second (bps).

Binary file. A file that contains ASCII control characters and/or extended characters, which cannot be displayed on the screen. Codes in the file give instructions to the computer to perform commands, format text, etc. Many word processing document files are binary files due to the formatting codes. A text file, on the other hand, is meant to be read by the user—it displays regular ASCII characters (a, b, c, 1, 2, 3).

Bisynchronous (Bisync, BSC, or binary synchronous communication). A character-oriented, half-duplex data communications protocol. Bisync is the older of IBM's two transmission schemes for its mainframe computers and is gradually being replaced by SNA/SDLC.

Bit. Short for "binary digit." The smallest unit of information expressed in digital form as "0" or "1."

Block. A sequence of characters or bytes transmitted as a unit.

Boot. To load the operating system software (DOS) into a PC. When a PC is turned on with DOS in one of the disk drives, the PC automatically searches for, finds, and loads the disk operating system (DOS). When a prompt (A:, B:, or C:) appears, the operating system has been booted or loaded.

bps (bits per second). A measurement of data transmission speed.

Buffer. A storage medium used for holding data until that data can be transmitted to another device.

Byte. A group of 7 or 8 bits whose sequence represents one character (a letter, digit, symbol).

Channel. A path for the transmission of information. On a mainframe, the channel is a high-speed interface to communications devices such as a 3X74 control unit or a 3X75 communications controller.

Character. A single unit of meaningful data, such as a letter or a number.

CICS (Communications Information Control System). A mainframe database application that offers limited relational functions but quick response time.

Check box. A small square box that appears in a dialog box and can be turned on or off. These generally appear in dialog boxes where you can set multiple options.

Circuit. A communications path between two points.

Click. Quickly pressing and releasing a mouse button.

Clipboard. A storage area for holding text and data for copying or moving.

Cluster. Several pieces of data terminal equipment, usually personal computers or intelligent terminals, arranged in close proximity to enable cabling between them. A grouping of terminals or processors connected to a common computer or communication device, such as a 3X74 control unit.

CMS (Conversational Monitor System). An interactive mainframe system than resides under the VM operating system. Provides editing and file management functions.

Coax adapter. A circuit board that provides a 3270 interface between a device, such as a PC or a controller, and a coaxial cable.

Coaxial cable. A transmission cable with one central conductor within an outer conductor of copper tubing that acts as an insulator. Used for connecting 3270 terminals and processors for high-speed communication purposes, and offering high immunity to electrical interference and a low incidence of errors.

Code. A set of rules that determine how characters may be represented. (See *ASCII* and *EBCDIC.*)

Command button. A large oval button that appears in dialog boxes. The Cancel button cancels the command and the OK button carries out the command.

Communications adapter. A circuit board that provides an interface between a device (such as a PC) and a data link.

Communication link. See *Data link.*

Compatible. Pertaining to computers on which the same computer programs can run.

Configuration. The selection of various options to customize a software program for use in a specific environment.

Configuration file. A DOS file that specifies the characteristics of a system or subsystem.

CONFIG.SYS. The PC startup configuration file.

Controller. A device, such as a 3X74 control unit, that acts as the electrical and logical interface between several display terminals and/or printers and the mainframe processor on a network.

Control menu. The menu, appearing as a small box, to the left of the title bar. It appears in all Windows-based applications and is used to let you move, close, and change the size of windows.

Control panel. This window appears after running the Control Panel icon from the Program Manager. This program allows you to configure Microsoft Windows.

Control program. The set of functions in the 3270 emulation program that maintains communications with the mainframe and allows other functions such as window management and file transfer to occur.

Control Unit Terminal (CUT). A 3X74 operational mode, designed for non-intelligent terminals, that allows one mainframe session.

Cooperative processing. Processing that allows two applications to communicate on a peer basis.

CMS router. A program running under VM/SP that uses the Server-Requester Programming Interface (SRPI) to route requests from the PC to the corresponding server on the mainframe. The CMS router is part of the CMSSERV command processor in VM/SP Release 4.

Current drive. The disk drive the PC is currently accessing.

CUT. See *Control Unit Terminal.*

Cyclic Redundancy Check (CRC). An error-checking scheme included in a packet before transmission and checked by the receiver.

Data communications. The transmission of data over electronic communication links between two physically separated computing devices (terminals, printers, etc.).

Data Communications Equipment (DCE). Equipment, such as a modem or controller, that provides the functions required to establish, maintain, and terminate connections, conversions, and coding for communications between *data terminal equipment (DTE)*.

Data compression. The process of reducing the length of records or data by eliminating gaps and redundancy.

Data link. The equipment and rules (protocols) used for sending and receiving data.

Data Link Control (DLC). The native protocol of the IBM token-ring card.

Data set. A set of data treated as a unit.

Dataset. In TSO, this term refers to a file.

Datasetname. The first part of a dataset's name. The other parts are *member* and *password*.

Data stream. All the data transmitted over a communication facility during a single operation.

Data Terminal Equipment (DTE). Any device, such as a computer, terminal or printer, that acts as an origin of, or a destination for, data.

Data transformation. The translation of file formats from one file structure to another in order to achieve logical interconnection across a network.

DCA. See *Document Control Architecture*.

DCE. See *Data Communications Equipment.*

Dedicated lines. Private telephone circuits between two or more stations, switches, or subscribers.

Default. A value that is automatically used by the system when no overriding value is specified by the user.

Destination drive. The locally administered address of the token-ring interface coupler (TIC).

DFT. See *Distributed Function Terminal.*

Diagnostics. Special software routines that identify malfunctions.

Dialog box. A rectangular box that appears when a Windows application needs further information or is providing information.

Dialup. Access to a switched telephone network, usually through a dial or push-button phone.

DISOSS. See *Distributed Office Support System.*

Distributed Data Management (DDM). An IBM application that supports remote file access across an SNA network.

Distributed Function Terminal (DFT). (1) An operational mode that allows more than one logical terminal sessions to run simultaneously. Contrast with *Control Unit Terminal (CUT).* (2) A hardware/software protocol used to communicate between a terminal and a 3274 control unit.

Distributed Office Support System (DISOSS). An IBM mainframe-based system for translating, exchanging, and routing information. DISOSS is based on a store-and-forward technique.

Document Control Architecture (DCA). An IBM application that defines the form and content of office systems documents that are transferred through an SNA network.

Document interchange. The ability to transfer documents in both final and editable form over the network, regardless of the word processors used.

Document Interchange Architecture (DIA). An IBM application that defines the way in which requests and documents can be transferred through an SNA network.

DOS (Disk Operating System). A group of system programs that enables a personal computer to organize and use information on diskettes or fixed disks.

DOS prompt. A letter, followed by the > character, displayed by DOS to indicate that it is ready to process commands from the standard input device (usually the keyboard).

Double-click. Quickly pressing and releasing a mouse button twice.

Downloading. Transferring a file from a mainframe to an IBM PC or PC-compatible computer.

Drag. Pressing the mouse button and holding it down while moving the mouse until the arrow is at the desired location, then releasing.

Drive specification. In DOS, the letter-colon pair that specifies a drive.

DTE. See *Data Terminal Equipment*.

Dumb terminal. A terminal connected to a mainframe that can send and receive information but has no processing capabilities of its own.

Duplex. A two-way transmission system, synonymous with full-duplex, in which information can be carried in both directions simultaneously.

EAB. See *Extended Attribute Byte.*

EBCDIC. See *Extended Binary-Coded Decimal Interchange Code.*

ECF. See *Enhanced Connectivity Facilities.*

EEHLLAPI. Entry Emulator High Level Language Application Program Interface. A limited subset of the IBM HLLAPI program that is included with the IBM PC 3270 Emulation Program, Entry Level.

Emulation. The process of imitating with the intent to equal or exceed.

Emulator window. The window that contains a mainframe session. This window opens when you run the EXTRA! Emulator.

Enhanced Connectivity Facilities (ECF). A set of programs for interconnecting IBM Personal Computers and IBM System/370 mainframe computers operating with the MVS/XA or VM/SP environment.

Enter. To send information to the computer by pressing the Enter key.

Error control. The process of monitoring data transmissions to detect and correct errors.

Extended Attribute Byte (EAB). Allows a PC to support 3270 Extended Attributes: highlighting, reverse image, blinking, and seven colors.

Extended Binary-Coded-Decimal Interchange Code (EBCDIC). An 8-bit data transmission code developed by IBM and used primarily for synchronous communications in IBM mainframe and compatible systems. EBCDIC is the standard code for large IBM systems.

Extension. An optional DOS parameter that, if used, immediately follows a filename. It consists of a period and 1-3 characters.

EXTRA! Emulator. An application in *EXTRA!* that emulates a 3270 terminal, allowing a user access to mainframe applications.

EXTRA! Executive. The application that controls all other *EXTRA!* applications.

EXTRA! Printer. An application in *EXTRA!* that emulates a mainframe printer, allowing a user to print mainframe data on a local PC printer.

EXTRA!'s on-line Help. A feature that offers information and instructions for using *EXTRA!*

FEP. See *Front End Processor*.

Field. (1) An area in a record or panel used to contain a particular category of data. (2) The smallest component of a record that can be referred to by a name. (3) An area in a structured file defined in the form used to enter and display data.

File. A collection of related data that is stored and retrieved by an assigned name.

File Manager. A windows tool that allows you to view your files and directories.

Filename, DOS. In DOS, that portion of the file name that precedes the extension (this definition is used only for syntax descriptions). *Filename* also refers to the whole name of the file, including the extension.

Filename, VM/SP. The first part of a three-part label for naming files on VM/SP. It can be up to eight characters long and include letters, numbers, and some special characters.

File transfer. The movement of a complete set of data from one computer to another, usually accomplished by dividing a file into a series of data blocks which are then reassembled at the receiving end.

Filetype, VM/SP. The second part of a three-part label for naming files on VM/SP. It can be up to eight characters long and include letters, numbers, and some special characters.

Fixed disk. A flat, circular, nonremovable plate with a magnetized surface layer on which data can be stored by magnetic recording, also called a hard disk.

Fixed-width font. A font where each character takes up the same amount of space.

Floppy disk. A removeable disk (diskette) with a magnetized surface layer on which data can be stored by magnetic recording.

Font. A set of characters with a certain type style and attributes.

Format. (1) A defined arrangement of such things as characters, fields, and lines, usually used for displays, printouts, or

files. (2) The pattern which determines how data is recorded.

Front end processor (FEP). A special purpose processor programmed to offload the mainframe of communications functions such as message handling, code conversion, and error control.

Full-duplex. A two-way transmission system in which information can be carried in both directions simultaneously.

Full-screen. Describes a standard DOS application that takes up the entire screen when it is run with Windows.

Function keys. (1) Keys that request actions but may not display or print characters. Included are the keys that normally produce a printed character, but when used with another key produce a function instead. (2) On 3270 PC and System/370 keyboards, these are program function keys.

Gateway. A device that uses *protocol conversion* to connect dissimilar communications systems. The gateway provides the translation from one set of protocols to another, such as a local area network to a mainframe.

Graphics adapter card. An adapter installed into a PC which processes graphics, enabling the PC to display graphic text and images.

Grayed. Describes an option that appears in a menu or dialog box but it cannot be selected. These selections appear in gray type.

Half-duplex. A sequential, two-way transmission of data in which information can be transmitted in both directions, but only one direction at a time. (Compare *full-duplex*).

Handshaking. Preliminary signal transfer between commu-
nicating elements to verify that communication has been
established.

Hardware. The physical equipment, as opposed to the soft-
ware, of a computer system.

Hexadecimal. Pertaining to a system of numbers to the base
sixteen; hexadecimal digits range from 0-9 and A (ten)
through F (fifteen).

High Level Language Application Program Interface
(HLLAPI). Provides a high-level interface to the 3270
control program for PC applications written in C, Pascal, and
other high level languages. HLLAPI allows PC programs to
communicate directly with the mainframe.

Highlight. To select text, using the keyboard or the mouse,
so that the text is displayed in reverse video.

Host. See *Mainframe*.

Host computer. The primary and controlling computer in a
network; usually provides services such as computation,
data base access, and advanced programming functions.
Sometimes referred to as a host processor or mainframe. In
the IBM environment, the host is usually an S/370, 4300, or
30XX series computer. See also *Mainframe*.

Host graphics. Graphics images generated on an IBM main-
frame computer and displayed on a 3270 terminal.

HotSpots. Program Function (PF) keys in a mainframe
session that you can execute by clicking on with the mouse.
HotSpots can be enabled and disabled in an EXTRA!
Emulator window.

IBM. International Business Machines Corporation.

Icon. A graphic symbol that represents an object. That object may be a Windows application that is running in memory, or it can be a PC printer, or it can be a mainframe. You can enlarge an application icon to a window when you want to use the application. Other types of icons allow you access to information about the objects they represent.

Input device. A physical device, such as a keyboard or a mouse, used to provide data to a computer.

Intelligent terminal. A terminal or workstation with a built-in processor capable of sending, receiving, processing, and storing data. (Compare *dumb terminal.*)

Interactive. A condition in which an end user has an open channel to a computer system, permitting an immediate response to a request, inquiry, or command. (Compare *batch.*)

Interface. The boundary between two systems or devices or the logical connection at which two systems can interconnect. Also, a device that provides a logical connection between different transmission systems or equipment.

IRMA. A basic non-standard 3270 emulation system supplied by Digital Communications Associates, Inc.

Jump. To move to a mainframe session.

Keyboard. An input device consisting of various keys that allow the user to input data, control cursor and pointer locations, and to control the dialog between the user and the computer.

Keyboard maps. Diagrams of the keyboards supported by *EXTRA!* The templates show the locations on the keyboard for the different 3270 keys.

Keyboard templates. See *Keyboard Maps.*

Kilobyte (KB). 1,024 bytes (in common usage, a thousand bytes).

Leased line. A private communications line leased or rented from a common carrier, such as AT&T or MCI. (See *Dedicated line.*)

Line speed. The maximum transmission rate over a communications channel, usually expressed in bits per second (bps).

Link. A circuit or transmission path, including all equipment between a sender and a receiver on a network.

List box. A box within a dialog box that lists all items that a command could affect. The list box may have a scroll bar if there are additional selections that do not fit in the box and may be viewed by scrolling.

Local. Pertaining to a device directly connected to your system without the use of a communication line.

Local area network (LAN). A collection of many computers in one area connected with wire and usually equipped with some sort of peripherals that the computers share; a communications network within a limited physical area such as an office building or manufacturing plant. The three basic components of a LAN are the cards that plug into the computer to connect it to the network; cabling and network-control hardware; and software.

Logical Unit (LU). The port, or network addressable entity, through which users gain access to SNA and communicate with one another. Also called a resource or mainframe resource.

Logical Unit 6.2 (LU 6.2). Often used synonymously with *APPC*, LU 6.2 is an IBM protocol for the peer-to-peer communication of devices on an SNA network.

Logoff. A command for ending a mainframe session.

Logon. A command for beginning a mainframe session.

Macro. A series of keystrokes that have been recorded and given a name so that they can be replayed at will using shortcut keys.

Mainframe. The computer that provides processing capabilities for terminals and other attached devices.

Mainframe session. A terminal emulator session that has an open mainframe connection.

Maximize box. This box, located to the right of the title bar and containing an upward-pointing arrow, enlarges a window to its maximum size when clicked on by a mouse.

Megabyte (MB). Approximately one million bytes; 1024 Kilobytes.

Menu. A displayed list of items, also called commands, from which a user can make a selection.

Menu bar. This bar contains the names of the command menus in an application.

Micro-mainframe link. A package specifically designed to accomplish communication between a PC and a mainframe computer.

Minimize box. This box, located to the right of the title bar and containing a downward-pointing arrow, shrinks a window down to an icon when clicked on by a mouse.

Modem. A device that modulates and demodulates signals transmitted over a network. It converts computer data (digital) into audio signals for transmission across telephone lines.

Modulation. In data communications, the conversion of a digital signal to an analog signal.

Multiple sessions. Two or more open mainframe sessions running simultaneously; used to access multiple mainframe applications from a single terminal or PC.

Multiplexer. A device which combines several data channels by interweaving the data for transmission over one high-speed channel.

Multidrop. A term used to indicate systems in which several points are served by the same circuit.

NETBIOS. Network Basic Input/Output System. Software developed by IBM that provides the interface between the PC's operating system, the I/O bus, and the local area network. Since its design, NETBIOS has become a de facto standard.

Network. A computer communications system linking a series of computer elements. A system of interconnected computing devices that can communicate and share resources. Networks may be private (for use by one company) or shared (for the use of many companies).

Network Addressable Unit (NAU). Either a user or a device on an SNA network that has access to a variety of services. NAUs include *logical units* and *physical units*.

Network Interface Unit (NIU). A micro-based device that acts as a physical connection between the user's node and the communications medium and facilitates implementation of the network software.

Network management. Software and hardware that enable a manager to perform certain administrative, security, and accounting functions in managing the network: reconfigure the network topology, download software, monitor network performance, maintain departmental billing, and diagnose and troubleshoot problems.

Network server. A node on a local area network (LAN) that is configured to share its resources (typically disk storage) with the other PCs on the LAN.

Network station. A 3270 workstation on a local area network (LAN) that must use a *gateway* to communicate with a System/370, 30XX or any other IBM mainframe.

NIU. See *Network Interface Unit*.

Node. Any device such as a computer, terminal, or peripheral that is connected to a communications network.

Noise. Random signals occurring on a communications line (as a result of natural disturbances or system components) that degrade the performance of the line.

OIA. See *Operator Information Area*.

On-line help. Information and instructions about an application that you have access to while that application is running; information in electronic form, rather than printed form.

Operating system. Software that controls the running of a computer system; in addition, an operating system can provide services such as resource allocation, scheduling, input/output control, and data management.

Operator Information Area (OIA). The bottom line of all 3270 terminals, reserved as a status line, that displays information in text and symbols about the status of the terminal and the application that is running.

Option button. A small round button that appears in a dialog box, usually one of several alternative options.

Parallel interface. A connection or port that permits *parallel transmission* of data (typically to a printer).

Parallel transmission. A method of information transfer in which all the bits comprising a character are sent simultaneously. (Compare *serial transmission*).

Parity. A communications error-detection scheme in which an error-checking bit is added to the end of each byte, transmitted, and then verified at the receiving end for limited error checking.

Path. A list of directories. The command files of these directories are accessible from any directory. When a command that exists in a directory in the path is entered, DOS looks in the current directory and all directories in the path until it finds the command; DOS then executes it. The path is set using the path statement (also called the path command).

Path statement. A DOS command used to see or set the Path. Often set in the AUTOEXEC.BAT file.

Peer-to-peer communications. The ability of intelligent devices to communicate directly with one another without relying on the mainframe.

PF keys. PF (Program Function) keys are keys that tell a mainframe application to carry out some action. Like the Function keys (F1-F10) on a PC, they carry out actions specific to each application.

Physical Unit (PU). A term used in the SNA environment to identify the addresses for printers, terminals, PCs, and other devices on the network.

Physical Unit 2.1 (PU 2.1). An IBM protocol that facilitates cooperative processing by supporting multiple "conversations" within a single session.

Physical Unit ID (PUID). An eight-digit number that is an SNA parameter that identifies the workstation to VTAM and determines the capabilities of the workstation as a 3270 device.

Plug compatible. In microcomputers, a term used to signify that a card or board of one computer is compatible with, or will fit, the I/O bus of another computer.

Point. A unit of measurement that is used to specify the size of a typeface.

Point-to-point. A network configuration connecting only two nodes.

Polling. A method of controlling the sequence of communication from multiple devices on a network, whereby the controller requests or invites individual terminals to transmit data. Polling enables the controller to manage the transmission of data from multiple devices in an orderly manner.

Pool. A collection of items where each item can be used by only one user at a time. For example, a pool of ports is a set of mainframe communication ports that can be connected to by sessions. Once a session has connected to a port, the port is no longer available in the pool until the connection is broken.

Port. A point of exit or entry for a data channel in a network, usually found on the *front end processor* or the *controller*. The point at which devices can be connected to computers or networks for transmitting or receiving data.

Preferences. Options and parameters that determine how a mainframe or printer session is going to look or act. For example, mainframe session preferences include screen fonts, automatic window sizing, and automatic font sizing; printer session preferences include printer fonts, page layout, and printer time-out time.

Presentation space. In the 3270 environment, a region in computer memory (either mainframe, or PC) that can be displayed, in whole or part, in a window on the screen. For example, a spreadsheet consisting of 4,096 rows and 4,096 columns is a presentation space that cannot be viewed in its entirety on one screen. However, it can be viewed in sequence, part-by-part. Sometimes presentation space is used synonymously with session, although not all presentation spaces are sessions (technically, some internal components are presentation spaces).

Printer emulation. Acting like a printer; *EXTRA!* emulates a mainframe printer and allows you to print mainframe data to a local PC printer.

Printer Emulator. See *EXTRA! Printer*.

Printer window. The window where printer emulation takes place: the EXTRA! Printer window.

Program. A file containing a set of instructions conforming to a particular programming language syntax.

Program group. A collection of related program item icons that represent Windows applications.

Program group item. An application in a program group, represented by an icon. Running the icon starts up the application.

Program Manager. The main Windows application which manages all other Windows applications and the running of Windows itself.

Proprietary. A term used to denote a system developed and supported by one particular vendor.

Protocol. The set of rules or conventions that define the responsibilities and functions of computing devices. These rules enable computing devices to exchange information effectively.

Protocol conversion. The process of translating protocols from one computer system to another so that the two different systems can communicate.

PS/370. A mainframe-resident program used to perform office automation tasks under DISOSS.

PS/PC. A PC-resident program used to perform office auto-mation tasks under DISOSS.

PUID. See *Physical Unit ID*.

Query. The action of posing a question to a program; for example, searching data for desired information.

Queue. A line or list formed by items waiting to be processed.

Real mode. A Windows operating mode that provides maximum compatibility with applications written for Windows version 2.xx.

Record. A collection of fields treated as a unit.

Reminders. Messages appearing in columns 21 through 27 of the OIA, reminding you of the current communication status.

Remote Job Entry (RJE). A system of data communications in which data is processed off-line and transmitted as a batch to another system.

Request to send. A command that causes the modem to activate the carrier signal.

Requester. The program that relays a request to another computer through the Server-Requester Programming Inter-face (SRPI). Contrast with *Server*.

Resource. See *Logical Unit (LU)*.

Resource manager. See *Gateway*.

Response time. The amount of time elapsed between the generation of an inquiry at a communications terminal and receipt of a response at the terminal. Includes transmission time, processing time, and contention time between system components.

Router. Provides a Server-Requester Programming Interface (SRPI), a request interface for requesters, and a reply interface for servers.

RS-232-C. An *EIA* standard for a common connection used in attaching microcomputers to peripherals. The RS-232-C is a 25-pin connector that provides low transmission speeds (up to 19.2 Kb/s) and is the cable standard used for serial communications.

SAP. See *Service Address Protocol*.

Screen capture. Creates a "snapshot" of an entire window screen. Can save screen images to disk or print on PC printer.

Screen layouts. The way session windows are laid out on the screen, as well as the preferences selected in that window. A screen layout can be designed and saved, then loaded at a later time to reestablish a screen setup.

Screen model. A numeric identification defining the width and height of a screen display in terms of rows and columns.

Screen print. Allows the contents of the screen that is currently displayed to be printed at the PC printer.

Scroll bars. Horizontal and vertical bars that allow a user to view additional information in a window or dialog box.

SDLC. See *Synchronous Data Link Control*.

Select. To indicate an item, such as a menu, command, or option.

Serial interface. A connection or port that permits *serial transmission* of data.

Serial transmission. A method of information transfer whereby the bits comprising a character are sent one at a time. (Compare *parallel transmission*).

Server. A processor that provides a particular service to the network, such as a communication server, file or disk server, and printer server.

Server, LAN. See *Network Server*.

Server-Requester Programming Interface (SRPI). (1) A protocol between Requesters and Servers when using Enhanced Connectivity Facilities (ECF). (2) A programming interface used by requester and server programs to communicate with the PC or mainframe routers.

Service Address Protocol (SAP). This is used to serve numerous protocols.

Session. A series of conversations or interactions that take place between two SNA *Logical Units* such as a mainframe application and a 3270 display terminal. Also see *Mainframe Session*.

Session profile. A set of parameters that describe the way a mainframe session emulates a 3270 device—what terminal model, whether the session powers on when it opens, etc.— and what type of device it emulates.

Shared address. A portion of memory used in reserve DOS.

Shielded. A term used to describe a cable or wire that is insulated against interference, using a grounded, metallic shield.

Shortcut keys. Key sequences that provide a shortcut for selecting a command.

SNA. See *System Network Architecture.*

SNA Distribution Services (SNADS). An IBM application within SNA that provides store and forward capabilities and allows for asynchronous transmission among users in an office automation environment.

Software. Programs, procedures, rules, and any associated documentation pertaining to the operation of a computer system. Contrast with *Hardware.*

SRPI. See *Server-Requester Programming Interface.*

Start/stop. The first/last bit or element carried in the asynchronous transmission of a character to either synchronize the receiver or return the circuit to the at-rest position.

Switched line. A communications link for which the physical path can vary depending on the use of the line.

Synchronous Data Link Control (SDLC). An IBM protocol for synchronous communication that operates within SNA. A discipline for managing synchronous, code-transparent serial-by-bit information transfer over a link connection. (Compare *Binary Synchronous Communications.*)

Synchronous transmission. A mode of transmitting data whereby the data is sent as blocks of characters with controls at the beginning and end of each block that ensure constant timing, or synchronization. (Compare *asynchronous transmission.*)

System Network Architecture (SNA). An IBM proprietary plan for the design of a wide area network that includes specifications for communication protocols and session management.

Syntax. The rules for the construction of a command or program.

T-1. A technology providing high-speed transmission over long-distance, leased lines (although also available over satellite, microwave, and fiber). T-1 lines, used to transmit voice and data, operate at 1.544 Mb/s and are multiplexed into 24 individual channels of 64Kb each.

Terminal emulation. Imitating the functions of a 3270 terminal, usually using a combination of hardware and software.

Terminal window. The window where terminal emulation takes place. Also known as a mainframe session window or an Emulator window.

Text box. An area in a dialog box where text must be typed because more information is needed to carry out a command.

Time Sharing Option (TSO). An interactive mainframe system that resides under the MVS operating system. Provides editing and file management functions.

Title bar. A horizontal bar at the top of a window that displays the name of the application or file in that window.

Token-Ring Interface Coupler (TIC). A high-speed interface that links a mainframe to a token-ring network.

Token-ring network. A network with a ring topology that passes tokens from station to station.

TOKREUI (Token-Ring Extended User Interface). DLC hardware drivers for token-ring cards.

TSO. See *Time Sharing Option (TSO)*.

TTY Teletype. A standard file format for ASCII, asynchronous communications, based upon early Teletype devices.

Twisted pair. Insulated 18-22 gauge wire, e.g., telephone cables. Sometimes used for local area networks. Also used to carry coax communications in some environments.

Uploading. Transferring a file from a PC to a mainframe.

User. Anyone who requires the services of a computer system.

Variable. A name used to represent a data item with a value that can change while the program is running.

Virtual disk. A disk that appears to belong to an individual user but in fact is shared or available to all users on a network.

Virtual memory. A portion of your PC's memory that can be used by more than one application. Each application's data is continually swapped in and out of virtual memory.

VM. Virtual Machine. A mainframe operating system that provides time-sharing functions for several users, but appears to each user as a fully dedicated computer system.

VM/CMS. See *CMS*.

Wide Area Network (WAN). Any network that covers a large geographic area (5 miles or more) and may include packet-switching, public data, and value-added networks.

Glossary

Window. A rectangular area on the screen for viewing an application. Every window may have a title bar, menu bar, and scroll bars.

Windows Application. An application that was designed especially for Windows and uses Windows' features such as menus and dialog boxes.

Windows Help. The on-line help feature for Windows.

Work area. The area in a window that displays the contents of a file, such as a document or drawing. It is sometimes called the client area.

Workstation. A single-user computer system designed for multiple active functions, such as word processing and mainframe access.

WsCtrl key. Workstation control keys are located on 3270 terminal keyboards. Like the function keys on a PC keyboard, they are used for special functions.

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EXTRA!
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Quick
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Starting EXTRA! for Windows

From the EXTRA! for Windows Program Group:

To:	Do the Following:
Open the EXTRA! Executive Window	Select and open the EXTRA! Executive icon (Double-click)
Open an EXTRA! Emulator Window	Select and open the EXTRA! Emulator icon (Double-click) or Select and open the EXTRA! Executive icon Select Session + New Terminal Session

Using EXTRA!'s On-Line Help

From any of EXTRA!'s open windows:

To:	Do the Following:
Use EXTRA!'s on-line Help	Select Help + Using Help

Opening and Closing a Mainframe Session

From an EXTRA! Emulator window:

To:	Select:
Open a Session	Session + Open Session
Close a Session	Logoff mainframe Session + Close Session

Opening and Closing a Mainframe Session Continued

From an EXTRA! Emulator window:

To:	Select:
Power Up a Session	Session + Power On
Power Down a Session	Session + Power Off

Moving Between Windows

From an EXTRA! Emulator or EXTRA! Executive window:

To:	Select:
Move Between Mainframe Sessions	Windows + Next Session or Windows + Session Short Name (A - Z)
Move From a Mainframe Session **To the EXTRA! Executive Window**	Windows + Executive

Changing a Screen's Appearance

From an EXTRA! Emulator window:

To:	Do the Following:
Load a Screen Layout	Select Session + Screen Layouts + Layout x + Load
Save a New Screen Layout	Design a new screen layout Select Session + Screen Layouts + Layout x + Save

Changing a Screen's Appearance Continued

From an EXTRA! Emulator window:

To:	Do the Following:
Change the Session Typeface	Select Preferences + Fonts Select a font style and size Select OK
Change the Case of Characters	Select Preferences + Upper Case
Change the Size of Characters	Select Preferences + Next Larger Font or Next Smaller Font
Change Font to Make 3270 Screen Automatically Fit in Window	Select Preferences + Automatic Font Sizing
Make Window Size Fit Entire 3270 Screen	Select Preferences + Automatic Window Sizing

From the EXTRA! Executive window:

To:	Do the Following:
Load a Screen Layout	Select Session + Screen Layouts + Layout x + Load
Save a New Screen Layout	Design a new screen layout Select Session + Screen Layouts + Layout x + Save
Save a Screen Layout with All Windows as Icons	Make all windows into icons Select the EXTRA! Executive icon + Select Screen Layouts + + Layout x + Save

Changing a Screen's Appearance Continued

From the EXTRA! for Windows Program Group:

To:	Do the Following:
Start EXTRA! using a Default Screen Layout	Select and open the EXTRA! Executive icon (Double-click)

From the Windows File Manager:

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To:	Do the Following:
Start EXTRA! using a Specific Screen Layout	Move to the EXTRA! directory Select and open the .EWL file that contains your layout (Double-click)

Transferring Files and Printing Screens

From an EXTRA! Emulator window:

To:	Select:
Send a Mainframe File To the PC	File + File Transfer + Receive from Host
Send a PC File to the Mainframe	File + File Transfer + Send to Host
Select Send-to-Host Options	File + File Transfer + Options
Print a Mainframe Screen	File + Print Screen + OK
Print Part of a Mainframe Screen	Highlight an area of the screen File + Print Screen + OK

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Transferring Files and Printing Screens Continued

From an EXTRA! Emulator window:

To:	Do the Following:
Copy Blocks of Text	Highlight text to be copied Select Edit + Copy Jump to destination window Highlight area to paste text Select Edit + Paste

Printing from a Mainframe Application

From the EXTRA! for Windows Program Group:

To:	Do the Following:
Open a Printer Session	Select and open the EXTRA! Printer icon (Double-click) or Select and open the EXTRA! Executive icon Select Session + New Printer Session

From an EXTRA! Printer window:

To:	Do the Following:
Print	Open a printer session Jump to a mainframe session Use the mainframe application's print command

Quitting EXTRA! for Windows

To:	Do the Following:
Close a Session	From an EXTRA! Emulator window, Logoff Mainframe Select <u>S</u>ession + <u>C</u>lose
Quit EXTRA!	Jump to the EXTRA! Executive window Select <u>C</u>lose from the control menu

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	1	2	3	4	5	
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   Was all the information in the manual where you expected to find it? Was any information in an unexpected place? If so, please explain.

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   _____
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	1	2	3	4	5	
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