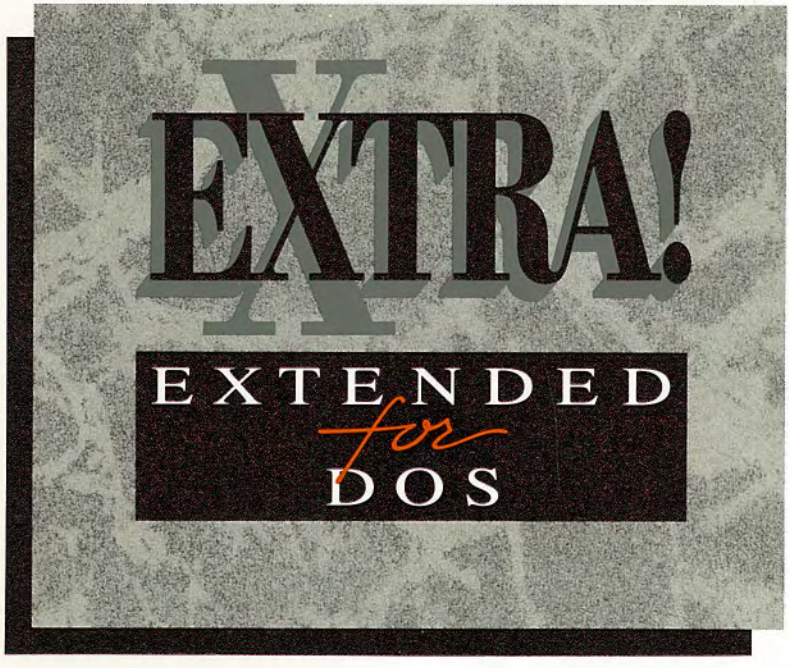

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USER'S MANUAL

Attachmate

Extra! Extended For DOS

User's Manual

Release 2.0

Technical Support: 1-800-888-1187

Manual #821-01255

Second Edition: April, 1990

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This manual was written by Celine Aston, Nathan M. Keyes, and Steven Nelson. Graphics were designed by Kay Ashton.

TAB KEY

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Introducing Extra! Extended

Welcome to *EXTRA! Extended,* a software program that lets your PC or PS/2 communicate with an IBM mainframe computer. With *EXTRA!*, the PC performs "terminal emulation," meaning that the PC acts like an IBM "3270" mainframe terminal.

EXTRA! gives you the best of both worlds. It offers access to powerful mainframe applications and data bases, as well as access to the local processing power of a PC. And you can easily switch back and forth between the PC and the mainframe with just a few simple keystrokes. *EXTRA!* is both highly-functional and reliable, without requiring tremendous amounts of PC memory.

Extra! Extended's Features

EXTRA! Extended provides you with a powerful arsenal of features: it offers multiple sessions, windows, and printer emulation; and it allows you to transfer files between your PC and the mainframe. It also uses far less PC memory than its competitors. These features and others are described in more detail below.

Multiple Sessions

With *EXTRA!*'s Multiple Sessions, you can run up to four mainframe sessions at the same time, and switch between them with a few simple keystrokes. In addition to four mainframe sessions, *EXTRA!* provides a PC session and two notepad windows. You can run a PC program in the PC session while continuing to work in a mainframe session. The notepad windows let you edit, save, and copy notepad data to both the PC and mainframe sessions for quick storage and reference.

Multiple sessions let you get more work done in less time. For instance, you can enter data in one mainframe session, while transferring files in another. However, you probably won't need all four mainframe sessions and two notepads at the same time. *EXTRA!* allows you to determine the number and type of sessions you want to use, and allocates only the PC memory necessary for the selected sessions.

Windowing

EXTRA! also provides "Windowing." This feature lets you display any combination of mainframe, notepad and PC sessions at the same time on the PC screen. And with *EXTRA!'s* window management utilities, you can adjust the color, size and position of the seven available windows. Windows are excellent for working with multiple applications. For example, you can copy data between windows, or monitor file transfer in one window while reviewing a mainframe database in another window.

Printer Emulation

With Printer Emulation, you can print mainframe data on a local PC printer, saving you the time, expense and inconvenience of using a mainframe printer. *EXTRA!* supports a wide range of PC printers, including low-cost printers for simple output or high-quality laser printers for more sophisticated or faster output. And *EXTRA!* helps meet budget requirements by supporting shared LAN printers.

EXTRA! also offers a print-to-disk feature, allowing a mainframe print job to be routed to a PC disk. The data can then be used in other PC applications or printed off-line, significantly reducing mainframe connect time. Multiple sessions are especially useful for printer emulation, since mainframe data can be printed while you continue working in another session.

File Transfer

EXTRA! provides three ways to transfer files between your PC and the mainframe:

- **Host-Supported File Transfer** - *EXTRA!* lets you transfer files to and from the mainframe using IBM's mainframe-based Send/Receive (IND$FILE) program. Send/Receive offers high-speed transfer of both text and binary files, as well as excellent error correction. *EXTRA!* supports Send/Receive in TSO, CMS, and CICS operating environments.

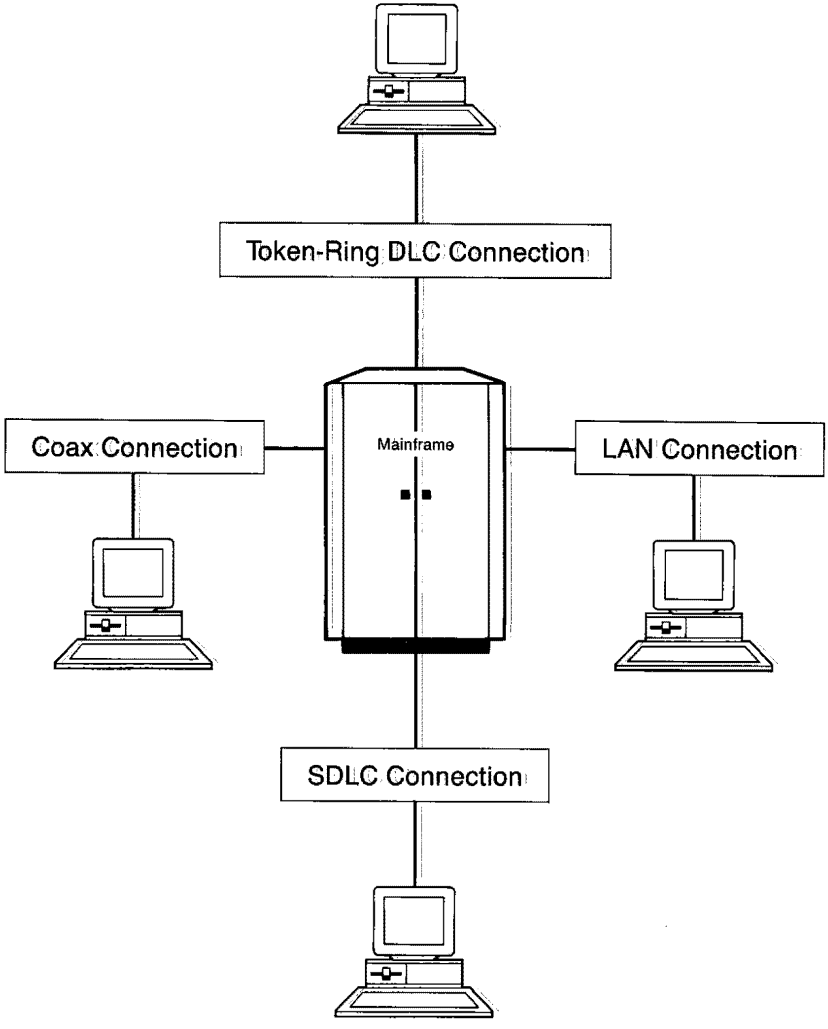
- **Personal Services/CICS File Transfer** - This option lets you transfer text and binary files with IBM's Personal Services/CICS. Unlike host-supported file transfer, it does not work with IND$FILE Send/Receive, an IBM program. Instead, PS/CICS works with another IBM program called Transfer (DISOSS) to transfer files.

- **Editor-Supported File Transfer** - This option lets you transfer text files using host-based TSO and CMS editors. This method does not require special mainframe software, and it can run in the mainframe session while your PC session runs PC applications.

With Host-Supported and Editor-Supported File Transfer methods, *EXTRA!* provides an easy-to-use file transfer interface that allows you to transfer files in the background. Transferring in the background means that you can initiate a file transfer from your PC session, and continue working on your PC application while the file transfers between the mainframe and the PC. You don't need to load and unload PC applications, or wait for the file transfer to complete. PS/CICS also features an optional "background DISOSS file transfer" that lets you transfer files in the background.

Flexible Connection Methods

EXTRA! can communicate with the mainframe in a variety of ways; the method is up to you. It can be customized to communicate with the mainframe via a coax adapter, an SDLC adapter, a Local Area Network adapter, or a Token-ring Interface Coupler (TIC). *EXTRA!* supports Attachmate, IBM and IRMA coax adapters, and Attachmate and IBM SDLC adapters. These connections are shown in the diagram below:



Display Ability

EXTRA! provides a wide array of display screen features, including support for both color and monochrome screens. With some adapters, you can even view screens larger than the standard PC display (24 rows by 80 columns), so you won't need to pan and scroll. Regardless of the screen size, *EXTRA!* delivers a flicker-free display with crisp, legible characters.

Mouse Support

EXTRA! provides mouse-support in both PC and mainframe sessions. In *EXTRA!'s* mainframe sessions, you can move your host cursor to any mainframe field simply by moving your mouse pointer to the field and clicking. *EXTRA!* also provides light pen support in the mainframe sessions, as well as light pen emulation with a mouse. You can use *EXTRA!* with Microsoft, IBM, or Logitech mice, or any Microsoft-compatible mouse.

Keyboard Support

Since most offices use a variety of PC keyboards, *EXTRA!* supports most standard PC keyboards and offers pre-defined keyboard layouts from IBM, IRMA, Keytronic, Nokia, and Attachmate. With these layouts, you can upgrade to *EXTRA!* and continue using your current keyboard layout.

You can change your keyboard selection through Attachmate's customization program. *EXTRA!* provides a variety of templates for multiple layouts, should you decide to create a custom keyboard.

Mainframe Graphics

EXTRA! provides a PC graphics program which brings flicker-free, mainframe graphics to your PC. *The Host Graphics Option* emulates IBM's 3179-G, 3192-G, and 3279 S3G terminals. This program is available as an option to *EXTRA! Extended.*

Low Memory

If your system is short on memory, *EXTRA!* provides two features that lower the amount of memory that *EXTRA!* uses: Low Memory (LM) and EMS (Expanded Memory Specification).

- If you do not use any of *EXTRA!'s* advanced features, you can save memory by configuring *EXTRA!* for Low Memory (LM). LM is a low memory version of *EXTRA!* that retains its most-frequently used features. It saves memory by not taking up additional RAM for features that are not used. Some of the features not available when your PC is configured for LM include mainframe graphics, printer emulation, notepad windows, copy data, screen capture, and help.

- EMS (Expanded Memory Specification) lets you reduce the amount of memory that *EXTRA!* uses by storing infrequently-used program modules in PC memory. *EMS* requires a LIM 4.0-compatible memory adapter, such as Intel's *Above Board*, and an EMS 4.0 Driver. For more information about EMS, refer to Chapter 9 of the *Setup and Reference Manual*.

Talking EXTRA!

Because *EXTRA!* fully supports voice synthesizer products from Computer Conversations, Inc., *EXTRA!* is now accessible to the visually impaired. Users can hear any keystrokes they enter, as well as any characters that appear on the screen. To use this feature, *EXTRA!* must be teamed up with voice synthesizer hardware and Verbal Operating System software from Computer Conversations, Inc.

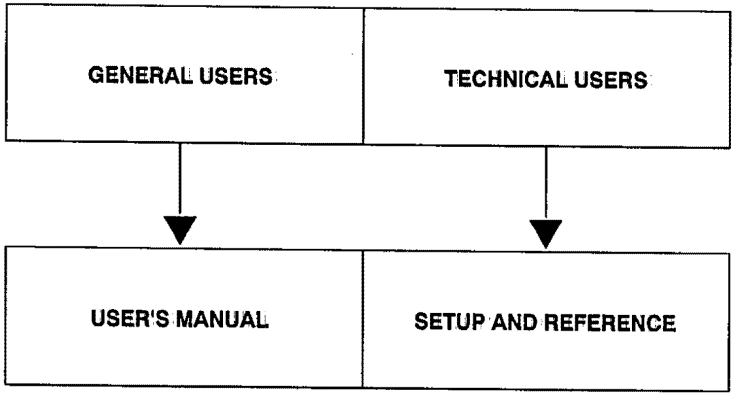
About This Manual

The *EXTRA! Extended User's Manual* explains how to use *EXTRA!* to access the mainframe, how to transfer files to and from the mainframe, and how to print mainframe files using your PC printer. To learn how to install and set up *EXTRA!*, refer to the *EXTRA! Extended Setup and Reference Manual* which is included in your *EXTRA!* package. Your documentation is complimented by the Information Utility Files which provide late-breaking updates to the product. These files are explained later in this section of the manual.

Who Should Read This Manual?

This manual is written for newcomers to *EXTRA!* and micro-to-mainframe communications. To best use the *User's Manual*, you should be familiar with Personal Computers and have a basic understanding of how 3270 terminal emulation works. If you are not familiar with 3270 terminal emulation, refer to Chapter 1, "Understanding Terminal Emulation."

If you are responsible for installing and customizing *EXTRA!*, you should refer to the *Setup and Reference Manual*.



Manual Standards

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

Throughout this manual, user input is presented in *italicized* type. Keystrokes are presented in brackets, such as [F1]. Below is an example of a user input command.

copy a:.* b:* [Enter]

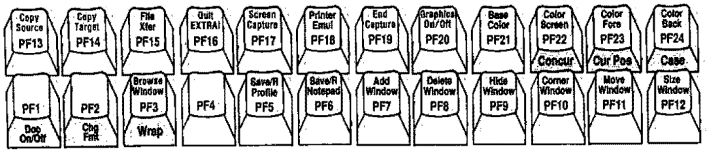
Menu prompts appear in quotes, for example, "Is the Destination a Fixed Disk Drive? (Y or N):"

Mouse and Keyboard Instructions

While *EXTRA!* can be used with either a mouse or a keyboard, there are some procedures in this manual that are specific to either a mouse or a keyboard. Instructions that are mouse-specific are identified by a mouse icon, as shown here. Likewise, instructions that are keyboard-specific are identified by a keyboard icon.

Large Keyboards

If you've worked with mainframes in the past, you may be using an IBM 122-key keyboard, which is equivalent to a 3270 terminal keyboard. Keys on this type of keyboard are called Workstation Control keys or "PF" keys, and are represented in **bold type** throughout this manual. For example, **WsCtrl PF16**.



Sample Workstation Control keys

Definitions

In the *EXTRA! Extended* documentation, you also will find definition boxes defining words that may be unfamiliar to you, as shown here. Additional terms are defined in the documentation's Glossary, located at the back of each manual.

> ***Field.*** *A field is a related group of characters, representing some unit of information such as a name or address etc.*

Your Extra! Extended Package

The following items are included in your *EXTRA! Extended* package:

- *EXTRA! Extended* Diskettes.
- The *EXTRA! Extended User's Manual* - This manual is aimed at general users who will be using *EXTRA!* for everyday tasks. If you are responsible for setting up your *EXTRA!* software, refer to the *Setup and Reference Manual* described below.
- The *EXTRA! Extended Setup and Reference Manual* - The reference manual is aimed at technical users, such as System Administrators, who are responsible for installing and customizing *EXTRA!* It provides a thorough overview on micro-to-mainframe connectivity, and explains how to install and set up *EXTRA!*, and how to troubleshoot any problems that may arise.
- The Quick Reference Card - This card provides a concise guide to *EXTRA!*'s commands and keystrokes.

- Keyboard Templates - *EXTRA!* supports all major terminal keyboards. These templates show you how to use your PC keyboard in the same ways that you would use a 3270 terminal keyboard. Together, the templates and your PC keyboard allow you to smoothly carry out mainframe commands.

- Product Support Registration Card - By completing this card and returning it to Attachmate, you become enrolled in Attachmate's Customer Support program. It also allows us to keep you abreast of any changes that occur to the product.

- Documentation Feedback Card - Attachmate is committed to providing high-quality documentation for its products. To achieve this goal, we need your ideas on how we can improve our documentation. By filling out this card, you can provide us with this input, allowing us to add your suggestions to future editions of the documentation.

For More Information

Most of the information you need to set up and use *EXTRA!* can be found in either this manual or the *EXTRA! Extended Setup and Reference Manual.* There are, however, other sources of information which you may find helpful: You can access the HELP program by pressing [Ctrl/Alt] [H] from within *EXTRA!*, or refer to the Quick Reference Card.

To obtain late-breaking information about the current release of *EXTRA!*, you can read the *EXTRA!* INFO files, which are explained in the next section. If you still can't find the information that you need, feel free to call Attachmate's Technical Support department at 1-800-888-1187.

At the end of this introduction, we've included a list of additional reading materials that you may find helpful.

The INFO File

An Information Utility File is provided on the *EXTRA!* Program Diskette. The INFO File contains information about updates to *EXTRA!* that are not included in the manuals.

Viewing the INFO File

To view the INFO file, type at the DOS prompt:

info [Enter]

If using a Floppy Disk System, make sure that the *EXTRA!* Program Diskette is in the default drive before typing *info*. If using a Fixed Disk System, make sure that the files on the *EXTRA!* Program Diskette have been copied into your current subdirectory before typing *info*.

To select a specific INFO file topic, simply position the cursor next to the desired topic and press [Enter]. The Utility will display the selected file one page at a time. Use the [PgDn] and [Home] keys to page through the file. Pressing [Esc] returns you to the Info Utility's Main Menu or to the DOS prompt.

Printing the INFO File

You can obtain a printed copy of the file page being displayed by pressing [Shift][PrtSc].

If you would like to have a printed copy of an entire INFO file, follow these steps:

1. From the Information Utility's Main Menu, note the name of the INFO file that you would like to print.

2. Exit the Information Utility by pressing [Esc].

3. At the DOS prompt, type the following:

copy b:filename.inf lpt1: [Enter]

-OR-

print b:filename.inf [Enter]

Where *b* is the letter of the drive containing the INFO file; *filename* is the name of the INFO file displayed in the Information Utility's directory, and *lpt1:* represents the port for which the printer is configured. On some systems it may be necessary to substitute *lpt2:*, *com1:*, or *com2:* for *lpt1:*.

Additional Reading

The following publications can help you learn more about the operation of your personal computer, 3270 emulation, and host communication peripherals.

- IBM 3270 Information Display System 3274 Control Unit Description and Programmer's Guide, IBM Publication GA23-0061.
- IBM 3270-Information Display System Data Stream Programmer's Reference, IBM Publication GA23-0059.
- 3278 Display Station Operator's Guide, IBM Publication GA27-2890.
- IBM 3287 Printer Operator's Guide, IBM Publication GA27-3230-1.
- IBM PC Guide to Operations, IBM Publication 6025000.
- DOS 3.3 Disk Operating System Reference, IBM Publication.
- IBM 3270 Personal Computer Control Program Guide, IBM Publication SA23-0221.
- IBM HLLAPI Programming Guide (59 x 9959).
- Programmer's Toolkit Reference Manual, Volumes I and II, Attachmate Publication.

1 Understanding Terminal Emulation

This chapter explains the basic concepts behind 3270 terminal emulation. By reading this chapter, you'll learn what terminal emulation means, and what is required in order for terminal emulation to occur. You'll also learn about sessions, windows, layouts, and multiple sessions. Learning about these concepts will help you to successfully use *EXTRA!* to access the mainframe, transfer files, and print mainframe data.

If you already have a good understanding of this information, feel free to skip to Chapter 2, "Using EXTRA! Extended."

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Discussion: What is Terminal Emulation?

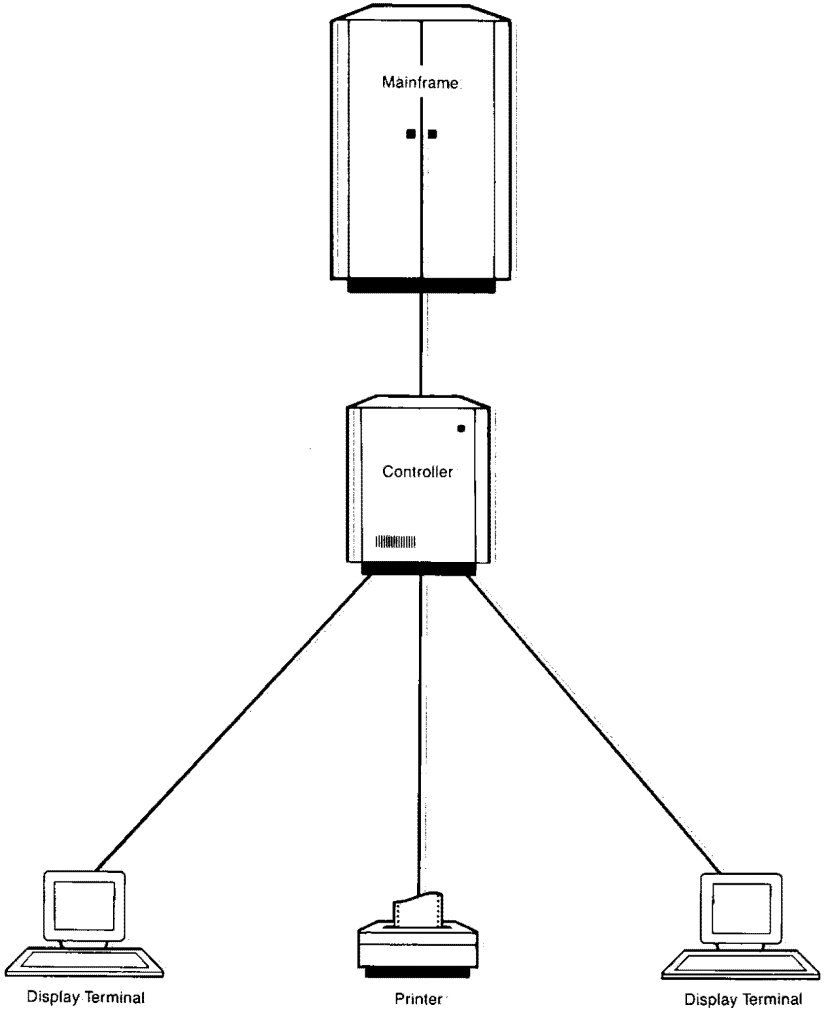
Basically, 3270 terminal emulation allows your PC to act like an IBM 3270 terminal. The PC can exchange information with the mainframe, just like a 3270 terminal.

The 3270 is the predominant terminal used to access IBM mainframe computers. Introduced by IBM in 1972, it has become the industry standard, even with non-IBM vendors. In the past few years, it's become quite popular to emulate these devices on a PC through the use of hardware and software, such as Attachmate's *EXTRA! Extended.*

PCs have become more popular because they are more versatile than terminals. While many terminals are inexpensive, they are limited in function since they rely on the mainframe for processing. A PC performing terminal emulation, however, adds a new dimension to data processing by combining the muscle of a mainframe with the local processing ability of a PC. For example, a retail store can use a PC in "stand-alone mode" to record sales transactions and to produce weekly sales and inventory reports. The same PC could then be used in "terminal emulation" mode to access the company's mainframe database for pricing and inventory information, and for uploading weekly reports to the mainframe. With terminal emulation, you get access to the mainframe's programs and databases, in addition to the local computing power of a PC.

The 3270 System

The term "3270" actually refers to a family of products that fall into three basic categories: Display terminals, printers and control units. These components, which are discussed below, make up the 3270 system. With *EXTRA!*, your PC can emulate the display terminals in this system, giving your PC access to mainframe applications and data. And your PC's printer can emulate mainframe printers, allowing you to print mainframe files directly off the mainframe.



Display Terminals

Display terminals connect to a control unit (described on the next page). There are several variations of display terminals 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 like the 3179-G, the 3192-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, 24 lines by 80 columns. The Model 3 is 32 by 80; the Model 4 is 43 by 80; and the Model 5 is 27 lines by 132 columns.

Printers

Like display terminals, printers also attach to the controller. The 3287 printer can accept data directly from the mainframe. Or it can accept data from the user of a display terminal who selects the "Print" or "Local Copy" command, as long as their 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 that support additional type styles and sizes, special margin control, color, graphics, etc.

Control Units

The control unit, or controller, connects display terminals and printers to the mainframe. The controller is used to maximize the efficiency of the link to the mainframe by combining and sequencing the messages of multiple devices. It can usually control up to 32 terminals or printers that are connected by coax cabling. And each device can be up to 5,000 feet away from the controller.

The Mainframe

The mainframe contains the applications and databases used by your organization, along with a special "Access Method" that manages locally-connected controllers. Usually this access method is VTAM (Virtual Telecommunications Access Method), which manages the entire mainframe network. It contains all of the terminal information, as well as information about every other device that has access to that mainframe.

Extra! Session Windows and Layouts

When your PC accesses the mainframe and its applications through *EXTRA!*, it establishes a connection. This connection is often referred to as a "session" or "mainframe session." If your PC is accessing a PC application, it is called a "PC session" or "DOS session."

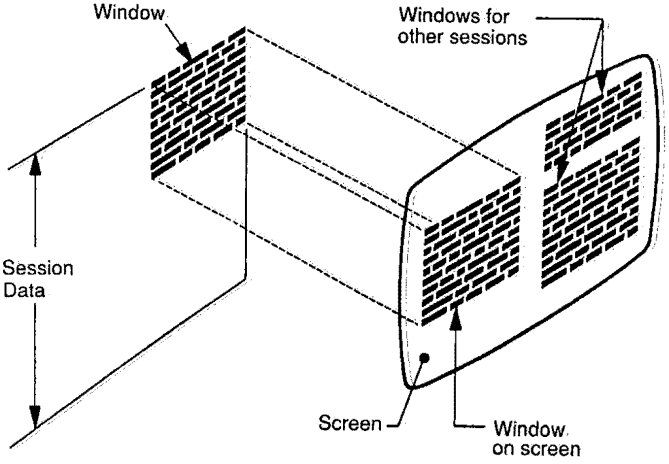
With *EXTRA!*, your PC can access four different mainframe applications and one PC application all at the same time. *EXTRA!* also lets you access two notepad windows. A "notepad" is an electronic scratch pad that lets you create, edit and save information for later use. Notepad data can be edited, saved, and copied to both PC and mainframe sessions.

Multiple Sessions

Multiple sessions let you run up to four mainframe sessions at the same time, switching between them with a few simple keystrokes. With multiple sessions, 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 review a mainframe-database file in another session, all while you're running an application in your PC session. With multiple sessions, you don't need to take a break each time you transfer a file. Simply start the file transfer, then jump to another session and continue working while the file transfers in the background.

What is a Window?

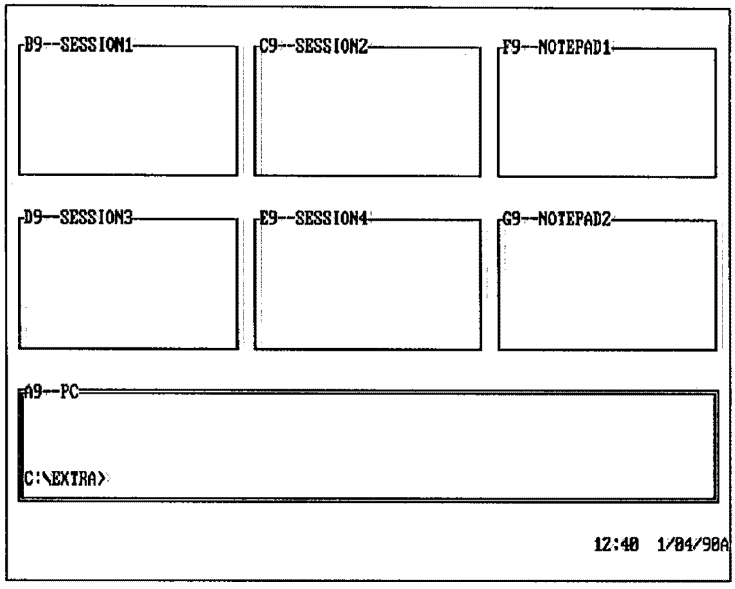
Once a session has been established, data can move from either PC to mainframe or mainframe to PC. The data then can be viewed through a "window" on your PC screen, which can vary in size from as small as eight characters to as large as your PC screen. With *EXTRA!*, any combination of mainframe and PC session windows can be displayed at the same time on the PC screen. You can adjust the color, size, and position of the seven available windows. Larger windows, such as a spreadsheet, can be viewed by panning and scrolling with your arrow keys.



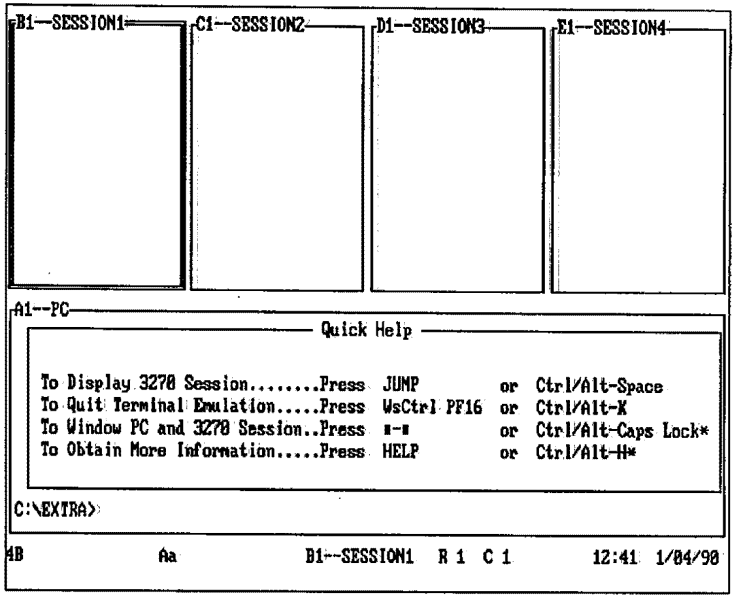
Session Data can be viewed through windows.

About Screen Layouts

As explained in the section above, a window is an area on your PC screen that lets you "view" part or all of the data within a mainframe or PC session. The arrangement of windows on the screen is called the "screen layout." There are ten different Screen Layouts available through *EXTRA!*, two of which are displayed below. For more information about Screen Layouts, refer to the *EXTRA! Extended Setup and Reference Manual*.



A screen layout with all seven windows open



A screen layout with four mainframe and one PC window open

What's Ahead?

Now that you have a basic understanding of how 3270 emulation works, you're ready to begin using *EXTRA! Extended.* Turn to Chapter 2, "Using EXTRA! Extended," to get started.

If you would like to learn more about 3270 micro-to-mainframe connectivity, turn to the first chapter of the *EXTRA! Extended Setup and Reference Manual*, "An Overview of 3270 Communications."

2 Using Extra! Extended

This chapter explains how to use *EXTRA! Extended* for 3270 terminal emulation and other tasks. By the time you complete this chapter, you'll know how to accomplish the following:

- Bring up *EXTRA!*'s main menu.
- Establish a session with the mainframe, then "jump" to another.
- Use *EXTRA!*'s Help program.
- Capture a screen.
- Copy data from one session to another.
- Exit *EXTRA!* and return to your PC's DOS prompt.

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Discussion: What You Need To Get Started

Before you can use *EXTRA! Extended*, you need to make sure that you have an IBM PC or compatible, that it has enough memory for *EXTRA!* (at least 256K), and that *EXTRA!* has been installed and customized on your PC. If *EXTRA!* has been installed and set up by your company's System Administrator, they need to provide you with the following information:

- Where is the *EXTRA!* software located? On your hard drive or on a floppy diskette?

- What type of "connection" does your PC have to the mainframe? Coax, Local Area Network (LAN), Token Ring (DLC/DFT), or Remote Modem/SDLC? If you are connected via Local Area Network (LAN) or Remote Modem, the startup screens shown in this chapter may look different from what you see on your screen. Appendix A, "LAN and SDLC Startup Conditions," describes these screens.

- What keyboard template do you need for your keyboard? These templates show you where the 3270-terminal keys are located on your PC keyboard, so you can carry out mainframe commands.

- Has your System Administrator configured *EXTRA!* for Low Memory (LM)? LM is very useful when your PC has limited memory. When you are configured for LM, you have access to *EXTRA!*'s most-commonly used features, but you do not have access to these features: printer emulation, "windowing" PC and mainframe sessions, screen capture, copy data, notepad windows, mainframe graphics, and viewing APL characters.

If you are the one who is responsible for installing and customizing *EXTRA!*, refer to your *EXTRA! Extended Setup and Reference Manual*. The *Setup and Reference Manual* also provides detailed information about types of connections and keyboard mapping.

This chapter begins by explaining how to bring up *EXTRA!*'s first menu. From this menu, you are given a quick tour of *EXTRA!*, and shown its basic features. You then will be provided with a more detailed tour. Once you understand these features, you'll be ready to effectively use *EXTRA!*

Bringing Up Extra!'s Main Menu

Before you start using *EXTRA!*, you should make certain that the program has been installed and configured on your PC. You also must know where your software is located, on your hard drive or on a floppy diskette. If you're not sure, ask your System Administrator.

Hard Disk Systems

1 Activate the hard disk subdirectory where your *EXTRA!* files are stored. To activate your *EXTRA!* subdirectory, type the following after the DOS prompt:

cd xxxxx [Enter]

where *xxxxx* is the name of the subdirectory that contains your *EXTRA!* files.

2 At the subdirectory's DOS prompt, type:

extra [Enter]

To run *EXTRA!*, you may need to type a name other than *extra* after the DOS prompt since your System Administrator can select another Startup Name during configuration.

Floppy Disk Systems

1 Place your DOS diskette (version 3.0 or later) into Drive A then reboot [Ctrl/Alt/Del] the system so that the DOS prompt appears.

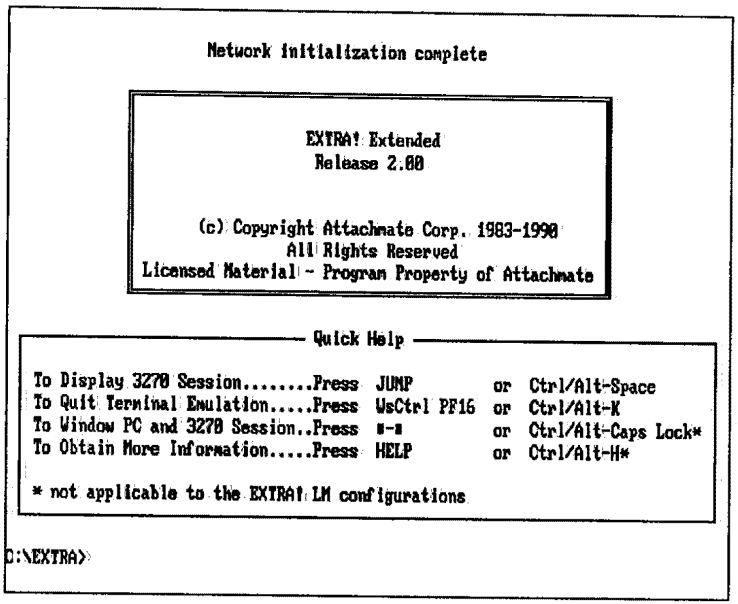
2 Once DOS is loaded, remove the DOS diskette from Drive A and place the *EXTRA!* Program Diskette into either Drive A or B. Make that drive the active drive by typing its letter (A or B) and a colon after the DOS prompt, and pressing [Enter]. For example, to make A the active drive, type the following after the DOS prompt:

a: [Enter]

3 To load *EXTRA!*, type the following after the DOS prompt:

extra [Enter]

As the software loads, your PC will display a screen with the *EXTRA! Extended* logo. After the logo, you will see the Startup Screen as shown below:



A Quick Tour of Extra!

In this section, you'll be given a quick tour of *EXTRA!*'s basic functions. These functions include jumping from one session to another, "windowing" both a PC session and a mainframe session at the same time, enlarging a session window, jumping into *EXTRA!*'s Help program, and quitting *EXTRA!* This exercise will not provide you with detailed instructions on how to use the product, but will give you a "taste" of what the software can do. Each of these functions will be explained in more thorough detail later on in this chapter.

✍ Before beginning any of these exercises, make certain that the startup PC screen is displayed in full-screen mode, as shown on the previous page. ([Ctrl/Alt] [CapsLock])

Jumping from Session to Session

This first exercise teaches you how to jump from your PC session to a mainframe session and back.

1. From the main menu, press [Ctrl/Alt] [Spacebar] or **Jump** if you have a large 122-key keyboard. You now should be in your mainframe session. This mainframe session is acting exactly like a 3270 terminal.

2. To get back to the PC session, press [Ctrl/Alt] [Spacebar] or **Jump** again.

You're now ready for the second exercise, "Windowing and Enlarging Sessions."

Windowing and Enlarging Sessions

This exercise teaches you how to view more than one session window at the same time, as well as how to enlarge a session window to full-screen mode.

1. From the main menu, press [Ctrl/Alt] [CapsLock] or **WsCtrl ▌-▌**. You now should see both the PC session (with its DOS prompt) and a mainframe session at the same time.

2. To enlarge the PC session again, press [Ctrl/Alt] [CapsLock] or **WsCtrl ▌-▌** once more.

You're now ready for the third exercise, "Using Help."

Using Help

This exercise teaches you how to access *EXTRA!*'s "Quick Help" program. For more detailed instructions on how to use the Help program, see "To Obtain More Information" later on in this chapter.

1. From *EXTRA!*'s main menu, press [Ctrl/Alt] [H] or **Help** if you have a large keyboard. You now should see the "Main Help Panel." While this screen provides you with a crossroad of options, do not select any of them except [Esc]. These options are discussed later on in the chapter.

2. To get back to *EXTRA!*'s main menu, press [Esc].

You're now ready for the last exercise, "Quitting Extra!"

Quitting Extra!

This exercise teaches you how to exit *EXTRA!* from inside either a PC session or a mainframe session. This command removes *EXTRA!* from your PC's memory, and returns you to the DOS prompt.

1. From the main menu, press [Ctrl/Alt] [K] or **WsCtrl PF16** if you have a large keyboard.

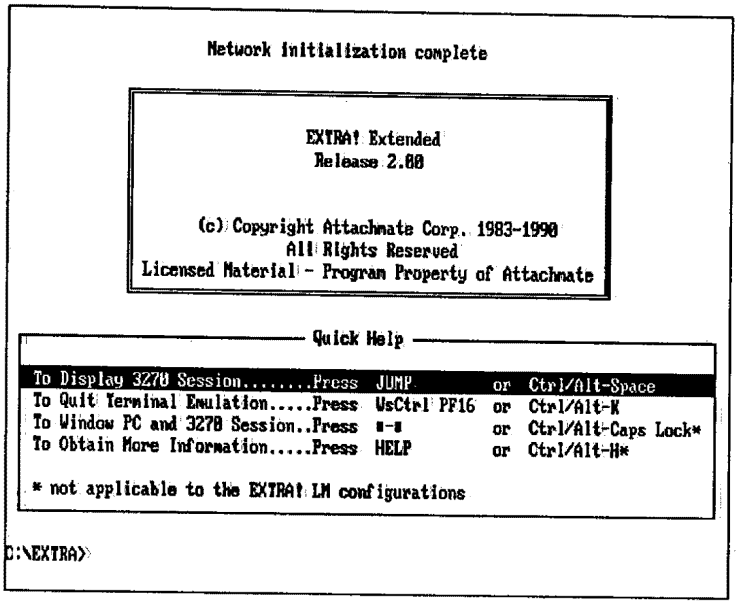
2. The following prompt will appear at the bottom of the screen: "Do you wish to remove the terminal emulator? Enter Y or N." Type [Y]. You now should be at your PC's DOS prompt.

3. To reload *EXTRA!*, type *extra* after the DOS prompt and press [Enter].

You now are ready to learn more detailed information about each of these functions.

The Grand Tour of Extra!

This section explores in more detail each of the options that appear on *EXTRA!*'s main menu, shown below.



To Display a 3270 Session

As explained in the "Quick Tour of Extra!," you can jump between the PC session and the first mainframe session by pressing [Ctrl/Alt] [Spacebar] or **Jump**. This same command also lets you jump to the second, third, and fourth mainframe sessions.

Before attempting to jump to these sessions, make sure that your screen layout allows you to access these sessions. (If you cannot access more than one session, try selecting Screen Layout 1 through [Ctrl/Alt] [1].) If you select layout 1, your PC session and the four mainframe sessions will be displayed on the screen. To access each of these sessions, press [Ctrl/Alt] [Spacebar] or **Jump**. Each time you select these keystrokes, you will advance to the next session in the sequence until you return to the PC session.

EXTRA! gives each of these sessions a default short name and long name, which are shown in the table below. You may want to check with your System Administrator to see if these default names were changed during *EXTRA!*'s set-up process, and how many sessions your system is configured for.

Session Type	Default Short Name	Default Long Name
PC Session	A	PC
Host Session	B	SESSION1
Host Session	C	SESSION2
Host Session	D	SESSION3
Host Session	E	SESSION4
Notepad Session	F	NOTEPAD1
Notepad Session	G	NOTEPAD2

This feature is not available if you are configured for *EXTRA!*'s Low Memory (LM) option.

The screen layout numbers given in this chapter refer to the default layouts that initially come with the product. Your System Administrator may have made changes to these layouts. For more information on screen layouts, refer to chapter 6 of the *Setup and Reference manual*.

The Jump Command

While the [Ctrl/Alt] [Spacebar] command works well for accessing sessions A or B, it can be time consuming when accessing other sessions. *EXTRA!* therefore provides a shortcut for accessing sessions, letting you jump directly to a specific session. This command is shown below:

[Ctrl/Alt] [J] [*n*] or **WsCtrl** *n*

where *n* represents the short name of the session you want to access (A through G).

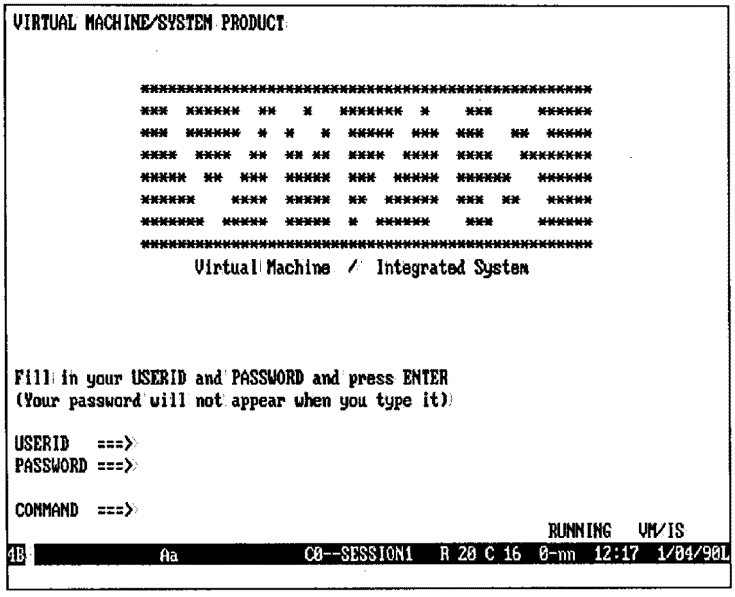
With this command, you can jump to any session window. You can verify that you have jumped to the right session window by looking at the window's border, which displays its short and long name in the top left corner. The window's short and long name will not appear if it is in full-screen or "enlarged" mode. To return the window to "windowed" mode, press [Ctrl/Alt] [CapsLock].

The Operator Information Area (OIA), located at the bottom of your screen, also displays the session window's short and long name, along with other session information. The OIA is discussed in more detail in the next section.

The Operator Information Area

The Operator Information Area (OIA) provides you with important information about the status of your mainframe session and the application that is running in it. This information includes the short and long name of your session, system messages, the location of your cursor, the status of your printer, etc.

The OIA is located on the last line of your screen, as shown below, and is modeled after the OIA that appears on all 3270 terminals.



4B represents Readiness. This message tells you if you have successfully connected to the mainframe.

Aa represents the Case Mode. This message tells you if you're in upper case, lower case, or upper/lower case.

C represents the Window Short Name, explained above.

0 represents the Window Layout Number. This message tells you what screen layout number was selected. (Screen Layouts are explained in "To Window PC and 3270 Sessions.")

SESSION1 represents the Window Long Name, as explained above.

R 20 C 16 represents the Cursor Location. This message tells you the current row and column location of the cursor within the window.

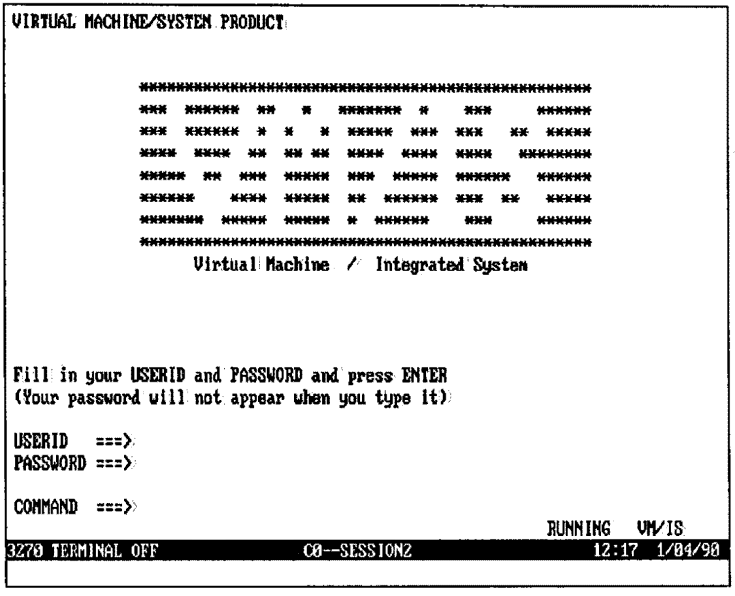
0-nn represents the Printer Status. This message tells you the current status of your 3270 printing operation. (See Chapter 3 for more information about printing.)

12:17 represents the current Time, in 24-hour time.

1/04/90 represents the current Date.

L represents the Scroll Lock Status. To toggle or switch between Scroll Lock on and Scroll Lock off, press [Ctrl]/[Alt] [L].

Turning a Session ON and OFF



If the OIA in your session window displays the message "3270 TERMINAL OFF," it means that your mainframe session has not been turned on, and is not communicating with the mainframe. To turn the session ON, jump to its window and press the keystrokes shown below:

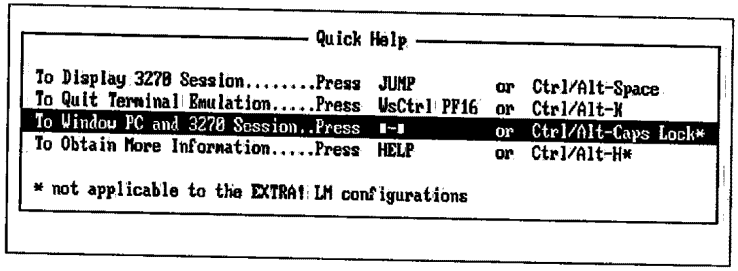
[Ctrl/Alt] [O] or **WsCtrl Reset**

If you are using a LAN connection, sessions are turned on and off individually. If you are using any other type of connection, the session ON/OFF command will turn all mainframe sessions on or off.

The 3270 TERMINAL OFF message will disappear after selecting these keys. These same keystrokes also will turn a session OFF, which ends communication between the session and the mainframe. Your System Administrator can customize *EXTRA!* so that all terminal sessions will be turned ON or OFF at startup. The default option is "ON" at startup.

If you have questions about the OIA and its messages, refer to Chapter 7 of the *EXTRA! Extended Setup and Reference Manual* or contact your System Administrator.

To Window PC and 3270 Sessions

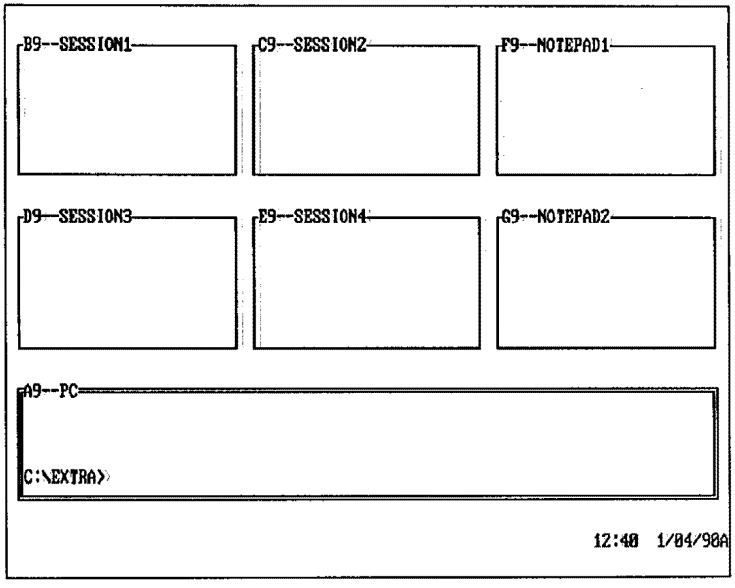


The windowing feature is not available if you are configured for EXTRA!'s Low Memory (LM) option.

Once you know how to jump to session windows and determine their status through the OIA, you're ready to learn some of the more advanced "windowing" commands. These commands will let you display several windows on your screen at the same time, "browse" around each of the windows with your arrow keys, enlarge a window then shrink it down again, and change the case of the characters on the screen.

About Screen Layouts

As explained in Chapter 1, "Understanding Terminal Emulation," a window is an area on your PC screen that lets you "view" part or all of the data within a mainframe or PC session. The arrangement of windows on the screen is called the "screen layout," as shown in the sample below:



A screen layout with all seven windows open

You can display ten different Screen Layouts using *EXTRA!* Each time you press the keystrokes shown below, the next screen layout will appear on your screen:

[Ctrl/Alt] [Tab] or **WsCtrl ChgSc**

Each of these Screen Layouts is identified by a number (0 through 9), which appears in the OIA. If you would like to display a specific screen layout, *EXTRA!* provides a shortcut which is shown below:

[Ctrl/Alt] [*x*] or **WsCtrl** *x*

where *x* represents the number of the layout that you would like to view (0-9).

When viewing a screen layout, you will notice that one of the windows is surrounded by double lines. These lines identify the window as the "active session" which contains the cursor. For more information about Screen Layouts, refer to the "Designing Screen Layouts" chapter of the *EXTRA! Extended Setup and Reference Manual*.

Enlarging a Window

Any of the windows that appear in the screen layout can be enlarged to fill the entire screen. To enlarge a window, jump to the window that will be enlarged and select the keystrokes shown below:

[Ctrl/Alt] [CapsLock] or **WsCtrl** **[-]**

To "shrink" the window down to its original size, use these same keystrokes.

Browsing Through a Window

This feature is keyboard specific; you cannot scroll down into a "windowed" mainframe window with a mouse.

If you would like to view the contents of a window without enlarging it, you can use *EXTRA!*'s browse feature to scroll down into the window and browse around. To use the browse feature, press the keys shown below:

[Ctrl/Alt] [B] [W] or **WsCtrl PF3**

These and other "windowing" commands are provided on the Quick Reference Card which is included in your *EXTRA!* package.

You then can use your keyboard's arrow keys to move around in the window. To turn off the Browse feature, press the key shown below:

[Esc] or **WsCtrl**

Changing Character Case and Base Color

In addition to letting you enlarge and browse a window, *EXTRA!* also lets you change the case of all the characters in a mainframe window and change the window's base color.

EXTRA! presents all mainframe session characters in upper and lower case. To change the characters to upper case only, press the keys shown below:

[Ctrl/Alt] [C] [A] or **WsCtrl Alt/PF24**

These same keystrokes will return your window to upper and lower case, and is equivalent to the Aa case switch on a 3270 terminal. The OIA displays the currently-selected character case.

If you are using a color PC monitor, *EXTRA!* also lets you change the base color of a mainframe session window by pressing the keys shown below:

[Ctrl/Alt] [B] [C] or **WsCtrl PF21**

This keystroke sequence is equivalent to the base color switch on a 3270 terminal.

Changing the Cursor Style

With *EXTRA!*, you also can change the style of the cursor in a mainframe session from the default underline cursor to a blinking block.

To change the cursor, press [Ctrl/Alt] [C] [C]. These same keystrokes return you to the default cursor style.

Avoiding Window Overwrite

With *EXTRA!*, you can display all of your mainframe, PC, and Notepad sessions simultaneously. Each of these sessions will operate independently of each other, so you can enter information into one session while other sessions are transferring files and printing mainframe data.

At times, however, it's not practical to have all of your session windows operating simultaneously. For example, many PC applications, such as a number of word processing and spreadsheet programs, write directly to the PC screen, ignoring *EXTRA!*'s window boundaries. These programs, therefore, "overwrite" the screen. *EXTRA!* provides two ways of avoiding a "window overwrite" situation, depending on whether you currently are in the PC window or a mainframe window.

PC Window Method: If you are running a PC application that may overwrite the screen, you can make sure that other windows on your screen layout will not be overwritten by enlarging the PC window before loading your PC application. You can enlarge the window by using *EXTRA!*'s Enlarge feature: [Ctrl/Alt] [CapsLock] or **WsCtrl -**

Mainframe Window Method: If you are running a "screen-overwrite" PC application in your PC session and you have jumped over to a mainframe session, you may not be able to view your mainframe session window. In order to view the window, you either must unload the overwriting PC program or use *EXTRA!*'s "Concurrent-PC" option.

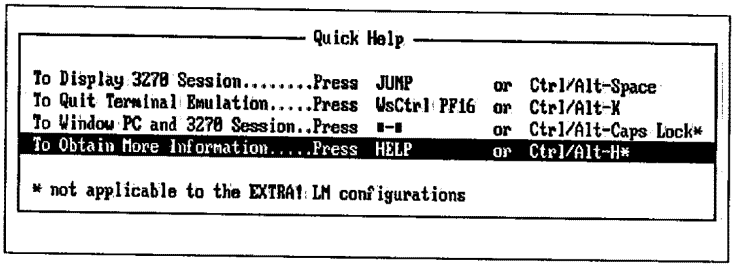
"Concurrent-PC" prevents the PC application from interfering with the mainframe window by temporarily suspending the PC application. The PC application will not run until you jump to the PC window and enlarge it using *EXTRA!*'s Enlarge feature. To set *EXTRA!*'s "Concurrent-PC" feature to PC Session "OFF," use the command shown below:

[Ctrl/Alt][U] or **WsCtrl Alt/PF22**

If you have a LAN connection, turning "Concurrent-PC" to OFF can disconnect your workstation communication.

This same command turns "Concurrent-PC" On. *EXTRA!* automatically sets "Concurrent-PC" to On, however your System Administrator can change the default to Off through *EXTRA!*'s Customization program. You can use *EXTRA!*'s Help program to find out if "Concurrent-PC" is set to On or Off by pressing [Ctrl/Alt][H] or **Help**, then [W]. *EXTRA!*'s Help program is explained in more detail in the next section.

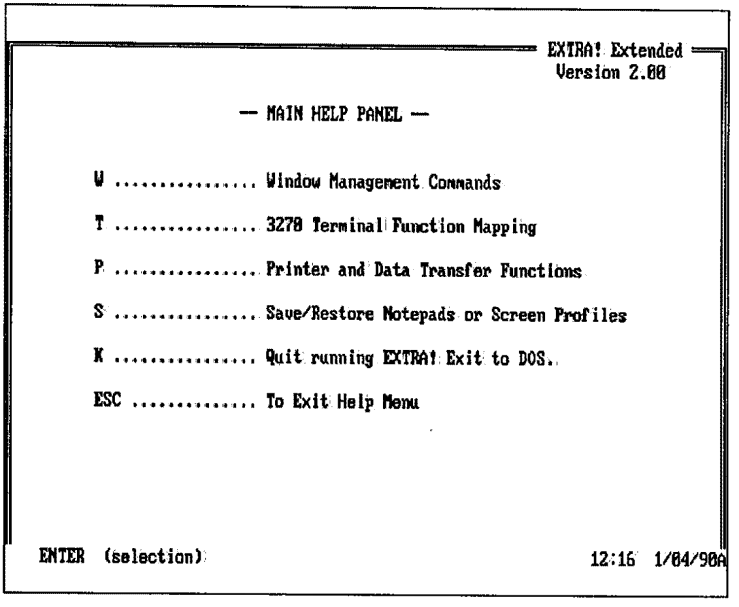
To Obtain More Information



This feature is not available if you are configured for *EXTRA!*'s Low Memory (LM) option.

EXTRA! is equipped with an on-line Help program. This program provides you with instant help whenever you need it. If you're in a PC session or a mainframe session, you always can get Help by pressing [Ctrl/Alt][H] or **Help**.

After pressing [Ctrl/Alt][H] or **Help**, the following menu will appear:



With *EXTRA!*, commands can be carried out either from within the Help program (Ctrl/Alt Spacebar for example), or from outside Help.

When the menu appears, decide what category you would like to explore, then select the appropriate key. From the submenu that may appear, press the key for the function that you want carried out.

Exiting Help

You can exit the HELP program and return to your PC or mainframe session at any time by pressing: [Esc] or **Help**.

To Quit Terminal Emulation

```
                    Quick Help

To Display 3270 Session.....Press  JUMP        or  Ctrl/Alt-Space
To Quit Terminal Emulation.....Press  WsCtrl PF16  or  Ctrl/Alt-K
To Window PC and 3270 Session..Press  ■-■       or  Ctrl/Alt-Caps Lock*
To Obtain More Information.....Press  HELP      or  Ctrl/Alt-H*

* not applicable to the EXTRA! LM configurations
```

As explained in the "Quick Tour of Extra!," you can quit *EXTRA!* at any time by pressing the following keys:

[Ctrl/Alt] [K] or **WsCtrl PF16**

After selecting these keys, the following prompt will appear at the bottom of the screen: "Do you wish to remove the terminal emulator? Enter Y or N." Type [Y]. You now should be at your PC's DOS prompt.

Before quitting *EXTRA!*, be sure to log off of all mainframe applications.

This command totally removes your *EXTRA!* software from your PC's memory. To reload *EXTRA!*, type *extra* after the DOS prompt and press [Enter].

Unloading Portions of EXTRA!

If you would like to run a memory-intensive PC program and *EXTRA!*, but have found that your PC does not have enough memory to support both programs, you may want to use *EXTRA!*'s UNLOAD feature. The UNLOAD feature lets you unload all but the most-essential program files that make up your *EXTRA! Extended* software. Unloading these non-essential files will provide your PC with additional memory.

For more information on the UNLOAD feature and "unloading" non-essential files, refer to Chapter 9 of the *EXTRA! Extended Setup and Reference Manual*, "Memory Saving Options and Features."

Extra!'s Additional Features

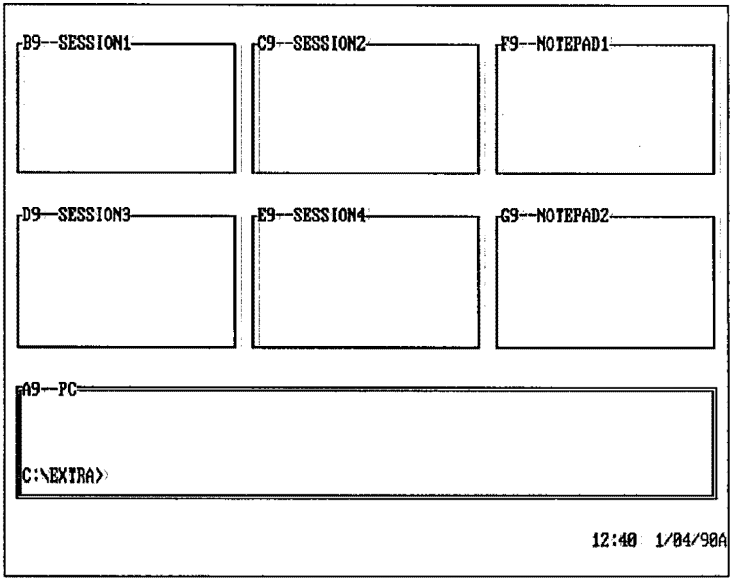
Now that each of the options that appear on *EXTRA!*'s main menu have been explained, you may want to learn about *EXTRA!*'s supplemental features. These features include the following: *EXTRA!*'s Notepad Windows, which provide two "notepads" for writing text with a line editor; *EXTRA!*'s Screen Capture feature, which lets you take a "snapshot" picture of a session window and save or print the snapshot; and *EXTRA!*'s Copy Data feature, which lets you move information around within a window or move it from one session window to another. These features are explained in more detail in this section.

Notepad Windows

This feature is not available if you are configured for *EXTRA!'s* Low Memory (LM) option.

In addition to the four mainframe windows and the PC window, *EXTRA!* also provides two notepad windows. These windows can be viewed, as shown below, by pressing the following keys:

[Ctrl/Alt] [9] or WsCtrl 9



The notepads have full-screen line editors that let you write a one-page note (up to twenty-four, 80-character lines in length). To begin writing on your "notepad," jump to one of your notepad windows and start typing, using the editing commands shown on the following page. After you are finished writing, you can save the page as a disk file, and reload the file at a later time.

You can edit the text in your notepad windows using the following commands:

Edit Keys	Function
[Home]	Moves cursor "home" (row 1, column 1).
[End]	Moves cursor to the end of the "page" (row 24, column 80).
[Arrow]	Moves cursor one character space, in any direction.
[Del]	Deletes character at cursor.
[Ins]	This key "toggles" between Insert Mode and Overwrite Mode. In Insert, it lets you add characters. In Overwrite, it lets you type over existing characters.
[Backspace]	Backspaces and deletes characters.
[F2]	Clears screen and brings cursor "home."
[Enter]	Jumps cursor to a new line.

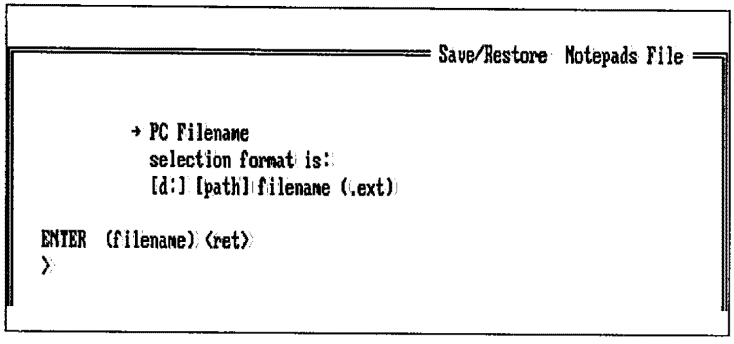
Saving and Retrieving Notepad Files

To save the contents of your notepad window to a disk file, or retrieve the file from a disk, use *EXTRA!*'s Save/Restore Notepad feature by pressing the following keys:

[Ctrl/Alt][X][N] or **WsCtrl PF6**

You then will be asked if you'd like to save the window [S] or retrieve a notepad window file [R] from your diskette. Press [S] if you are saving a file, or [R] if you are loading a file.

EXTRA! will ask you to specify a filename, as shown in the menu below.



Although you can add Notepad information to the end of an existing file (Continue option), only the first 1920 characters of the file can be displayed in the Notepad window.

Type a filename after the prompt, with its disk drive and file extension (optional), then press [Enter]. Your notepad window will be saved if you selected [S], or it will be restored to your window, if you selected [R].

Screen Capture

EXTRA!'s Screen Capture feature lets you take a "snapshot" picture of a text window session. The snapshot then can be saved as a disk file or printed on your PC printer. With Screen Capture, you can even save the contents of several windows into one file.

This feature is not available if you are configured for *EXTRA!*'s Low Memory (LM) option.

To capture a non-text image, such as a graphic, use *EXTRA!*'s graphic option program, *Host Graphics Option*. You cannot capture a graphic image with *EXTRA!*'s Screen Capture feature.

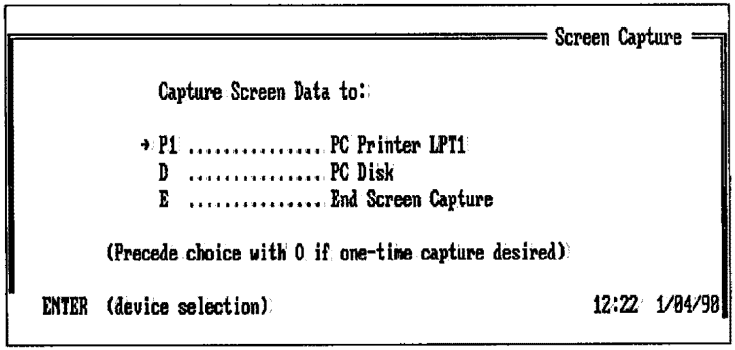
Screen Capture also provides a one-time option. This option captures the contents of one screen, then automatically turns off screen capture.

The contents of a notepad window cannot be saved with Screen Capture. Follow the instructions for Saving and Retrieving Notepad Files.

To begin using the Screen Capture feature, jump to the session window that you want to capture, be it a mainframe window or your PC window. Once you are at the window you want to capture, press the keys shown below:

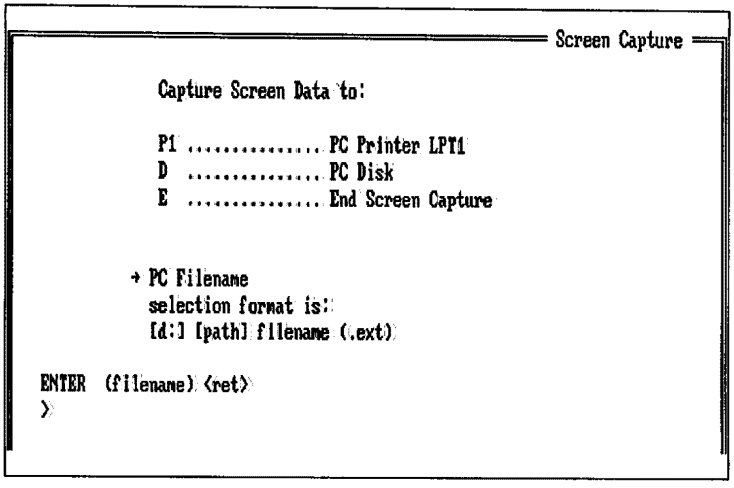
[Ctrl/Alt][S][C] or **WsCtrl PF17**

The following menu will appear at the bottom of your screen:



Saving The Screen

1 If you would like to capture a window and save it to a disk, select [D] from the menu. This command will add a prompt to the menu shown below. If you only plan to capture one image (one-time capture), precede your selection with an [O].



2 The menu will ask for a disk drive, filename and extension. (The drive and extension are optional.) For example, assume you would like to save the text from windows A, B, and C into an a: drive file named "sales3.txt" In this case, you would type the following file name "a:sales3.txt" and press [Enter].

3 Press (unshifted) [PrtSc] to capture the information using a standard keyboard; press (unshifted) [Print] to capture the information using a 122-key keyboard. If you are using an Enhanced Keyboard, press [Alt] [Scroll Lock].

You also can capture the contents of several windows. For example, jump to window A and press [PrtSc]. Then jump to window B and press [PrtSc] again. Each time you press [PrtSc], you'll notice the light on your disk drive flashing to indicate the image is being captured. Finally jump to window C and press [PrtSc] again.

If you do not press [Ctrl/Alt][E][C] or **WsCtrl PF19** to end Screen Capture and close the current file, the text will not be captured. The text also may be added to a previously-saved screen capture file.

4 Once the desired text has been captured, you will need to close the file. Press [Ctrl/Alt][E][C] or **WsCtrl PF19** to close the file. To save text to another file, reactivate the Screen Capture Menu with [Ctrl/Alt][S][C] or **WsCtrl PF17**.

Displaying A Saved Screen

1 To display the window that you have saved using Screen Capture, simply jump to the PC window and use the DOS "type" command to display the screen capture file. For example: *type a:sales3.txt*

Printing The Screen

1 If you would like to print a copy of your session window, select [P] from the Screen Capture menu. If one-time capture is desired, precede your selection with an [O].

2 Each time that you press [PrtSc], the text on the screen will be directed to the PC printer on port LPT1.

3 To end Screen Capture, use the "End" function by pressing the following keys:

[Ctrl/Alt][E][C] or **WsCtrl PF19**

Or, you can select option "E" off the Screen Capture menu.

Whenever Screen Capture is turned on ([Ctrl/Alt][S][C] or **WsCtrl PF17**), pressing the [PrtSc] key causes window data to be sent to your printer or disk file, as you have designated.

Copy Data

This feature is not available if you are configured for *EXTRA!*'s Low Memory (LM) option.

EXTRA!'s Copy Data feature lets you copy blocks of information from one session window to another. For example, you could use this feature to copy sales figures from a mainframe database to a sales report that you're writing in another window. Before the information can be moved, however, it must be tagged or identified as "movable." A destination or target window also must be specified.

Copy Data provides you with two methods of copying data from one window to another:

- Method #1: You can tag the information to be copied first, then specify either a PC, notepad, or mainframe window as the destination.

- Method #2: You can specify your destination first, then jump to the window containing the data to be copied, where you initiate the command. (This second method can only be used if the destination is a mainframe or notepad window. The destination cannot be a PC window.)

Each of these methods is explained in more detail on the next few pages.

Method #1: Tagging the Source Window Before Copying

To specify what area you would like to move, follow these steps:

1 Jump to the window that contains the text which you wish to copy. Press [Ctrl/Alt][C][D] or **WsCtrl Copy** to begin using *EXTRA!*'s Copy Data feature. The following prompt will appear: "COPY: select as [S]ource/[T]arget or **Jump** (A-Z), [Esc] - Quit."

2 Type [S] or **PF13** to identify the window containing the text to be copied (the source window).

3 Position the cursor at the beginning of the block to be copied and press [M] or **CrSel**. The marked character will be highlighted. Now move the cursor to the end of the block of text to be copied. Press [M] or **CrSel** to mark the end of the block. You'll notice the entire block is now highlighted.

4 The following prompt will appear: "SOURCE DEFINED [J]ump (A-Z) and select [T]arget." Jump to the window where you want to move the block of highlighted text.

If you are copying to a mainframe window, refer to the first section below for further instructions. If you are copying to a PC window, refer to the second section.

Copying to a Mainframe Window

1 If you are not already there, jump to the mainframe window where you want to move the block of highlighted text. To tag the window as your destination, type [T] for target or **PF14**.

2 Move the cursor to where you want the text to begin and type [M] or **CrSel**. You will see the following prompt: "Source and Target Defined, [C]-Copy, [ESC]-Quit."

3 Select [C] for Copy. Any text that does not fit within the defined window area will be lost.

Copying to a PC Window

1 If you are not already there, jump to the PC window where you want to send a copy of the highlighted text. To tag the window as your destination, type [T] for target or **PF14**.

2 You will see the following prompt: "SOURCE and TARGET defined, [C]-copy, [L]-auto <CR>, [ESC] to quit." Type [L].

3 This selection advances you to the following prompt: "COPY with Auto <CR> by [F]ield <CR> or [L]ine <CR>."

4 Type [L] if you want to place a carriage return at the end of each copied line. Type [F] if you want a carriage return to be placed after each field.

Field. A field is a related group of characters, representing some unit of information such as a name or address etc.

5 When the text is copied, it will be placed in the PC window.

Method #2: Tagging the Destination Window Before Copying

1 Press [Ctrl/Alt][C][D] or **WsCtrl Copy** to begin using Copy Data. The following prompt will appear: "COPY: [S]ource/[T]arget or [J]ump (A-Z)."

2 If you are not already there, jump to the mainframe window where you want to move the block of highlighted text. To tag the window as your destination, type [T] for target or **PF14**.

✍ Target blocks can be defined only in mainframe windows. They cannot be defined in a PC window.

3 Position the cursor at the beginning (the upper left corner) of the target block and press [M] or **CrSel**. The marked character will be highlighted. Now move the cursor to the end of the target block (the lower right corner) and press [M] or **CrSel** to mark the end. You'll notice the entire target block is now highlighted.

4 The following prompt will appear: "TARGET DEFINED [J]ump (A-Z) and select [S]ource."

Jump to the window that contains the text you want to copy. Type [S] or **PF13** to identify the window as the source window.

5 Position the cursor at the beginning of the block to be copied and press [M] or **CrSel**. Press [C] or **WsCtrl Enter** to copy the text from the source window to the target window.

Copy Data Notes

- Before using *EXTRA!*'s Copy Data feature, you should consider how an application running in a destination window will treat the incoming data. This consideration applies to either of the two Copy Data methods. For example, when copying data into the PC window running Lotus 123®, the data will be placed on the edit line, even though you place the cursor elsewhere on the screen.

- Similarly, when copying to the mainframe window, be aware that Copy Data will move the copied data to wherever you place the cursor. If the cursor is placed in a "protected field," the data being copied will be lost.

Displaying and Printing APL Characters

APL (A Programming Language) is a general purpose programming language that is used by programmers to develop problem solving and data analysis applications. To display APL characters in a mainframe window, make sure that you are not configured for *EXTRA!*'s Low Memory (LM) option and that *EXTRA!* has been configured for APL. You then must put the session window into "graphics mode" by pressing [Ctrl/Alt] [G]. Next, press [Alt/Backspace] to display the characters.

Printing APL Characters

PRINTG.EXE can only be used with the following graphics printers: IBM Color Jetprinter (IBM 3852 Model 2) or IBM Graphics Printer.

To capture and print files containing APL characters, follow the instructions below:

1. Type *CAPTURE* after your PC window's DOS prompt and press [Enter].

2. Following the instructions provided on page 2-28, use *EXTRA!*'s Screen Capture feature to save the APL file to disk.

3. Once the file containing your APL characters has been saved, return to your PC window's DOS prompt and type *PRINTG* [Enter]. After selecting a printer, your APL file should begin to print.

For more information about A Programming Language (APL), refer to your APL documentation.

3 Printing

This chapter explains how to use *EXTRA! Extended* to print mainframe or PC files on your PC or shared-LAN printer. *EXTRA!* accomplishes this through Printer Emulation: a feature that allows your PC printer to act just like a 3287 mainframe printer.

Chances are the distance from your desk to your PC printer is a lot shorter than the distance to your mainframe printer. With Printer Emulation, you can use the time you once spent running back and forth to the mainframe printer for more important tasks.

This chapter begins with an overview that explains the basics of Printer Emulation. It then explains what you need to know before getting started, how to use *EXTRA!*'s Printer Emulation feature, and how to check on and end your print job.

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Discussion: What is Printer Emulation?

This feature is not available if you are configured for *EXTRA!'s* Low Memory (LM) option.

Printer Emulation allows a PC printer to emulate or act like a mainframe printer. With *EXTRA!*, mainframe files and data can be sent to a local PC printer, which saves the time, expense and inconvenience of using a mainframe printer. *EXTRA!* supports a wide range of PC printers, including low-cost printers for simple output or high-quality laser printers for more complicated output. *EXTRA!* also supports shared printers, such as those that are used on a Local Area Network (LAN).

EXTRA!'s Printer Emulation feature also lets you print to disk, allowing a mainframe print job to be saved to a PC disk. The data then can be used in other PC applications or printed when your PC is not on-line to the mainframe, reducing mainframe connection costs. And Printer Emulation perfectly compliments the use of multiple sessions, allowing you to continue working in a PC or mainframe session while another session uses printer emulation to print mainframe files.

When you use Printer Emulation, it will reside in one of your mainframe sessions, turning it into a "printer session." There are two basic types of printer sessions:

Logical Unit Type 3: This type of printer session lets you print mainframe files, but only supports basic formatting commands such as the following: upper and lower case characters, carriage returns, line feeds, and form feeds.

Logical Unit Type 1: This type of printer session is the more flexible of the two since it supports more-complex formatting commands such as tabs, margins, underlining, bold, italics, etc. The preferred type of printer session is LU1, not only because it is more flexible, but because it uses less mainframe formatting time than an LU3 session. If you are using a Postscript printer, such as the Apple Laserwriter, your printer session must be configured for LU1.

Now that you know the basics of Printer Emulation, you're ready to get started.

What You Need To Get Started

Before you can begin using *EXTRA!* for Printer Emulation, you need to make sure that *EXTRA!* has been customized for Printer Emulation. If *EXTRA!* has been installed and customized by your System Administrator, he or she needs to provide you with the following information:

- Which of the four mainframe sessions has been set aside to perform Printer Emulation? This session must be changed from a "terminal" to a "printer" through *EXTRA!*'s Customization program.

- What type of printer session do you have, an LU1 or an LU3? This information is needed in order to check on the status of your print job. The printer session type is selected through *EXTRA!*'s Customization program, which is described in Chapter 3 of the *Setup and Reference manual*. If you are using a Postscript printer, such as the Apple Laserwriter, your printer session must be configured for LU1. (LU1 is not available if you are configured for CUT mode.)

- Has the printer session been customized for your printer and routed to your printer's location?

- Is the file that you would like to print residing in one of your mainframe session windows?

- Are you configured for *EXTRA!'s* Low Memory (LM) option, or is your connection to the mainframe using DFT/Non-SNA protocol? Printer Emulation is not available if you are configured for either of these.

Once you have the answers to these questions, you'll be ready to use *EXTRA!* for Printer Emulation. If you are the one who is responsible for customizing *EXTRA!* for Printer Emulation, refer to your *EXTRA! Extended Setup and Reference Manual* for instructions.

Using Printer Emulation

To the mainframe, your printer session looks just like a mainframe printer. The printer can appear to be either "off" or "on" to the mainframe. If the OIA at the bottom of your printer session displays the "READY" message, as shown in step 2 below, the printer session is turned on. If the OIA displays an "OFFLINE" message, the printer session is turned off. The steps below explain how to turn the printer session on, and how to get started using *EXTRA!*'s printer emulation feature.

1. From *EXTRA!*'s main menu, jump to the session that has been set aside for printer emulation.

2. The OIA at the bottom of your screen will display either of these two messages:

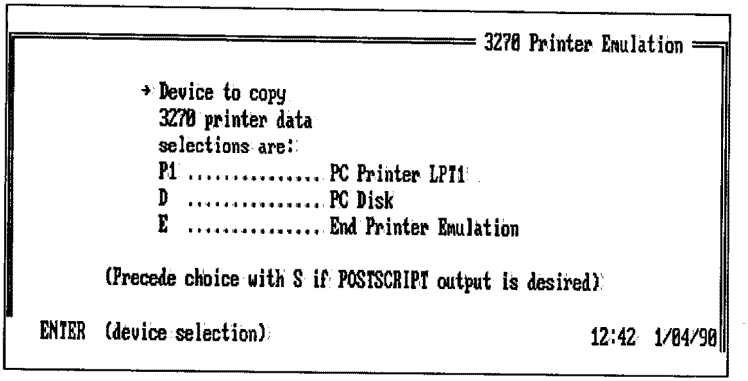
   4B■ 3287 PRINTER EMULATION - READY TIME DATE

   4B? 3287 PRINTER EMULATION - OFFLINE TIME DATE

3 After either of these messages appear, press the following keys:

[Ctrl/Alt][P][E] or **WsCtrl PF18**

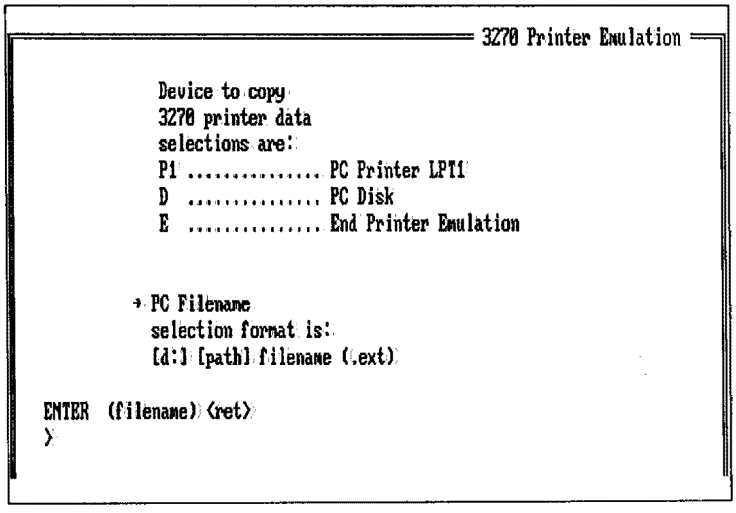
The following menu will appear:



4 At this point, you need to specify where you would like to send your file: to a Printer or Disk. By sending the file to your printer, you can quickly receive a hard copy of your mainframe file. By sending the file to disk, you are not spending as much time on-line to the mainframe. This option lets you retrieve the file at a later time in your PC session to edit and print off-line using the DOS print command.

Once you have determined a destination for your file, type either [P] or [D] and press [Enter]. (If you are sending your file to a Postscript printer, press [S]/[P] [Enter].)

5 If you typed [D] after the prompt, the following prompt will be added to the menu, as shown below.



Provide a filename as shown below (with its drive and file extension, if necessary):

C: filename (.ext) [Enter]

6 Once you have specified a destination, jump to the active mainframe window that contains the file you would like to print.

7 At the active window, type the mainframe application's "PRINT" command. For example:

spool prt rscsv2 [Enter]

tag dev prt lu1r4334 [Enter]

print filename.ext [Enter]

These commands are examples of typical mainframe print commands. They may not be the actual commands that you should use. Refer to your mainframe application's documentation for the exact print commands.

After following the previous steps, your file should either begin printing or be saved to disk.

Checking on Your Print Job

If your mainframe session is configured for either LU1 or LU3 mode, you can easily check on the status of your print job by examining the Operator Information Area (OIA) of your window. This method is discussed in the next section.

The Operator Information Area

The Operator Information Area (OIA) provides information about the status of your print job through several messages. These messages are displayed below:

4B▌ 3287 PRINTER EMULATION - READY TIME DATE

When a connection to a mainframe program has been successfully established, the message shown above will appear at the bottom of your screen.

After receiving the above message, type in your mainframe's PRINT command as discussed in Steps 6 and 7 above. As the mainframe data is sent to your printer, the following message should appear in the OIA:

4B▌ 3287 PRINTER EMULATION - PRINTING CHAR COUNT:XXXXXXX TIME DATE

The "*CHAR COUNT:XXXXXXX*" field lets you know how many characters have been sent to your printer from the mainframe.

After your mainframe file is finished printing, the OIA will display the "*READY*" message shown above. You can either send another mainframe file, or stop printer emulation. Ending Printer Emulation is discussed in the next section.

All of the characters that appear within the Operator Information Area are explained in the "Understanding Mainframe Messages" chapter of your *EXTRA! Extended Setup and Reference Manual.*

Ending Printer Emulation

If you are using Printer Emulation to send a mainframe file to your PC printer, you cannot send a PC file to the PC printer until after you have finished using Printer Emulation and jumped back to your PC session.

To stop using Printer Emulation, enter the following keystrokes:

[Ctrl/Alt][E][P] or **WsCtrl Alt/PF19**

Or, if you prefer, you can access the Printer Emulation Menu by pressing [Ctrl/Alt][P][E]. At the Printer Emulation Menu, select option [E] for End Printer Emulation. After ending Printer Emulation, the "OFFLINE" message will appear in the OIA.

Other Features

In addition to Printer Emulation's basic features, which allow mainframe files to be sent to both a local PC printer and a PC disk, *EXTRA!* also provides the features described in the sections below.

Using Screen Capture With Printer Emulation

EXTRA! allows you to use its screen capture feature with Printer Emulation, without having to turn off printer emulation. Screen Capture, which lets you take a snapshot picture of your screen and send it to either your printer or a disk, is discussed in more detail in Chapter 2, "Using Extra! Extended" *EXTRA!* also lets you use the DOS Print Screen command with printer emulation turned on. Both of these features should be used in between mainframe print jobs.

Support for PA1/PA2 Keys

EXTRA! supports Program Attention (PA) keys which can be used during printer emulation. This feature is valid for LU1 mode only. The PA keys send commands to the mainframe, which vary depending on the mainframe application that you're using. For example, you can use PA keys to tell a program to reprint a job or to reprint a portion of a job.

For more information about *EXTRA!*'s Printer Emulation feature, refer to the *EXTRA! Extended Setup and Reference Manual* or the documentation that accompanied your IBM 3287 printer.

4 Using Host-Based File Transfer

This chapter shows you how to transfer both text and binary files from the PC to the mainframe and from the mainframe to the PC. The method of file transfer described in this chapter is called "Host-Based" because *EXTRA! Extended* communicates with mainframe programs such as IBM's IND$FILE (Send/Receive) or IBM's PS/CICS (Transfer) to accomplish the file transfer task.

Since *EXTRA! Extended* communicates with either of these programs, this chapter explains how to transfer files using both IND$FILE Send/Receive and PS/CICS Transfer. It also tells you what you need to get started and provides you with some examples.

In addition to Host-Based File Transfer, *EXTRA!* also offers Editor-Based File Transfer, which does not require special mainframe software. You can decide which method of file transfer is best for you from the discussion presented in this chapter.

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Discussion: What You Need to Know

Before you begin using the file transfer instructions provided in this chapter, you need to know which system software is running on your mainframe computer. One of the systems, described below, must be resident on the mainframe before you can use *EXTRA!*'s Host-Based File Transfer. Your log-on window should tell you whether you are using TSO, CMS, or CICS. Consult your System Administrator if you're not sure which system your mainframe is using.

- **MVS/TSO:** This stands for Multiple Virtual Storage/Time Sharing Option. TSO is an interactive mainframe system that resides under the MVS operating system. This system works with IBM's TSO IND$FILE program (#5665-311), which is explained in the next section.

- **VM/CMS:** This stands for Virtual Machine/Conversational Monitor System. CMS is an interactive mainframe system that resides under the VM operating system. This system works with IBM's CMS IND$FILE program (#5664-281), which is explained in the next section.

- **Send/Receive CICS:** Send/Receive CICS (Customer Information Control System) is an interactive mainframe system that allows you to transfer files in the CICS operating environment using IBM's Send/Receive program. This system works with IBM's CICS IND$FILE program (#5798-DQH).

- **PS/CICS:** PS/CICS (Personal Services/Customer Information Control System) also resides in the CICS operating environment. However, unlike the methods discussed above, it does not work with IND$FILE Send/Receive, an IBM program. Instead, PS/CICS works with another IBM program called Transfer (DISOSS) to transfer files. PS/CICS is an IBM mainframe program available for the MVS (#5665-330) and VSE (#5666-318) operating systems.

Which File Transfer Method?

For everyday file transfer, Attachmate suggests using Host-Based File Transfer over Editor-Based File Transfer, which is explained in Chapter 5. Of course, if you don't have the appropriate software on your mainframe, you will need to use Editor-Based File Transfer.

Keep in mind though, that editor-based transfer is limited to text files, while host-based allows transfer of both text and binary files. If you're not sure which type of files you're working with (binary or text), ask your System Administrator.

> ***Host and Host-Based.*** *The words Host and Mainframe are often interchangeable. Host-Based refers to a program or process that is based in or runs from the mainframe computer.*

If you decide to transfer files using the Host-Based method, you also need to decide if you want to transfer files in the background or in the foreground.

Background File Transfer is easier to use than Foreground File Transfer, since it provides you with a set of menus to guide you through the file transfer. It also lets you send a file to the mainframe (or receive one) without monopolizing your PC session. After the file transfer has begun, you can continue working with your PC application and check on the status of the file transfer at any time.

The drawbacks to using Background File Transfer are that it uses more memory (up to 22K more) than Foreground File Transfer, and that *EXTRA!* must be configured for Background File Transfer before it can be used. To configure *EXTRA!* for Background File Transfer, select Background File Transfer from the Configurator's "Startup" menu.

With Foreground File Transfer, you must type a specific command after the DOS prompt, making sure to follow the correct syntax. Your PC session will not be available again until after the file transfer is finished. The Foreground File Transfer method is not available when using editor-based transfer.

EXTRA! lets you transfer two files simultaneously by running a Background File Transfer in one session and a Foreground File Transfer in another. However, only one Background File Transfer can take place at a time, and only one Foreground File Transfer can take place at a time.

Instructions explaining how to transfer files using both the Background and Foreground methods are presented later on in this chapter.

About IND$FILE and Send/Receive

This section briefly explains IBM's IND$FILE Send/Receive programs. You should understand this information before attempting to transfer files, either in the background or in the foreground. IND$FILE is a mainframe program, while SEND and RECEIVE are PC programs that communicate with IND$FILE. When referring to this type of file transfer, IND$FILE and Send/Receive are often interchangeable terms.

There are three types of file transfers available through IND$FILE Send/Receive: VM/CMS, MVS/TSO and Send/Receive CICS. If the mainframe uses the VM operating system, you would use VM/CMS; if the mainframe uses the MVS operating system, you would use MVS/TSO; and if the mainframe uses the CICS operating system, you would use Send/Receive CICS.

This chapter provides instructions for transferring files with each of these systems.

Structured Fields vs. Buffered Transfer Mode

IBM's Send/Receive program allows files to be sent in either buffered mode or in a structured field format. If *EXTRA!* detects Extended Data Stream on the mainframe, it runs file transfer in structured field mode. If not, *EXTRA!* runs in buffered mode.

Buffered mode transfers data using the standard 3270 data stream, which has a limited set of characters and has to be translated twice during the transfer. Because of these properties, buffered mode is slower than structured fields.

Using structured fields greatly reduces the overhead necessary for binary file transfer, so files transfer faster.

To learn more about DFT mode, refer to the *Extra! Extended Setup and Reference Manual.*

While structured fields are supported in all environments that run *EXTRA!*, you must be in DFT mode to run it, and the mainframe must be configured for Extended Data Stream.

Even though *EXTRA!* will automatically select the correct method for Send and Receive, there may be some circumstances when you'll want to override *EXTRA!*'s choice. To indicate that you want buffered mode, select the *-B* option from the appropriate Background File Transfer menu. Select the *-S* option if you want to use structured fields. If using the Foreground File Transfer method, be sure to include either a *-B* (buffered) or a *-S* (structured) option in the file transfer command line. These options are discussed in more detail later in the chapter.

Using Large Packet Sizes

If you can transfer files using Structured Fields, you may be able to use large packet sizes to increase the speed of your Foreground or Background file transfer. A packet size is the size of the data unit transferred in a structured-field file transfer. Using larger packet sizes increases the speed of the file transfer because more data is transferred in each packet, so fewer packets need to be transferred.

The default size is 2 kilobytes (K). By choosing 4K, 8K, or 32K instead, you can nearly double the speed of the file transfer. However, in order to use large packet sizes, your PC requires more memory and you must be using recent versions of IND$FILE, VTAM, and controller software. Check with your System Administrator to see if you can use large packet sizes to increase the speed of your file transfers.

Large packet sizes may cause problems with slower SDLC links.

Has the Name of IND$FILE Been Changed?

If the IND$FILE program has been installed on the mainframe using a name other than IND$FILE, you must tell *EXTRA!* its new name. Consult your System Administrator for the proper install name and the procedure to use to give *EXTRA!* the new name.

You may include the following command in your AUTOEXEC.BAT file, or you may give the command at the DOS prompt, before or after you have started *EXTRA!*.

set ind$file=xxxxx

where *xxxxx* is the name of the file.

Refer to your DOS manual for more information about the AUTOEXEC.BAT file and the SET command.

Background Host File Transfer

When you are using EMS and are configured for Background File Transfer, you may want to use the smallest available packet size (2K). This reduces the amount of conventional memory required to just 3K.

As explained at the beginning of this chapter, Background File Transfer has several advantages: It's easier to use since it provides you with a set of simple menus; and it lets you send a file to the mainframe (or receive one) without monopolizing your PC session. Background File Transfer, however, does use more memory (up to 22K more) than Foreground File Transfer.

Before you can begin using the Background File Transfer method to transfer files to and from the mainframe, check with your System Administrator to be sure *EXTRA!* has been configured for Background File Transfer. This option is available through the Configurator's "Startup" menu. For more information about configuring *EXTRA!*, refer to Chapter 3 of the *Extra! Extended Setup and Reference Manual*.

The SEND command transfers a file from your PC to the mainframe, and the RECEIVE command transfers a file from the mainframe to the PC.

This section explains how to transfer files in the background using the IND$FILE and Send/Receive programs. These instructions apply to both VM/CMS and MVS/TSO, since the same menus appear for both. They do not apply to IBM's Send/Receive CICS program, which is discussed later in this chapter.

About Transferring in CMS

In order to transfer files in CMS, you must be in CMS command mode. This is also called a native CMS session. You cannot be in any other mainframe subsystem. When you are in native CMS, you usually see a prompt saying "Ready".

You also must turn off unsolicited CMS messages. These messages may interrupt the transfer process unless you respond to them.

Turn off the messages by entering the following command on the command line of your CMS session:

set msg off [Enter]

To turn the messages back on after the file has been transferred, enter on the command line:

set msg on [Enter]

About Transferring in TSO

In order to transfer files in TSO, you must be in TSO command mode. This is also called a native TSO session. You cannot be in ISPF or any other subsystem. When you are in native TSO, you usually see a prompt saying "Ready". If you have any questions about TSO and file transfer, consult your System Administrator.

Sending from a PC to a Mainframe

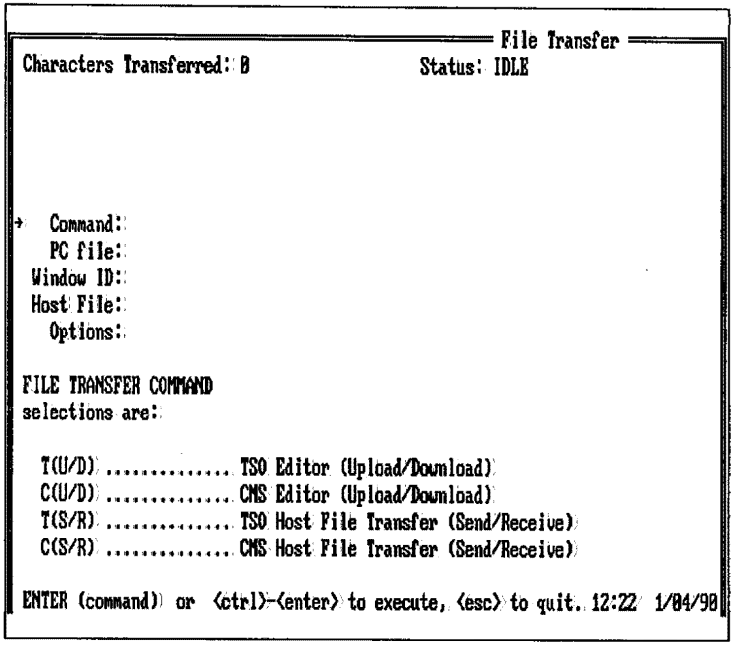
To transfer a file from your PC session to the mainframe, follow the steps below:

1 Establish a CMS or TSO session in any of the mainframe windows (A-Z). Make sure that you are in the correct mode.

2 Jump to any window and press the keys shown below:

[Ctrl/Alt] [F] [T] or **WsCtrl PF15**

The Background File Transfer menu will appear, as shown below.

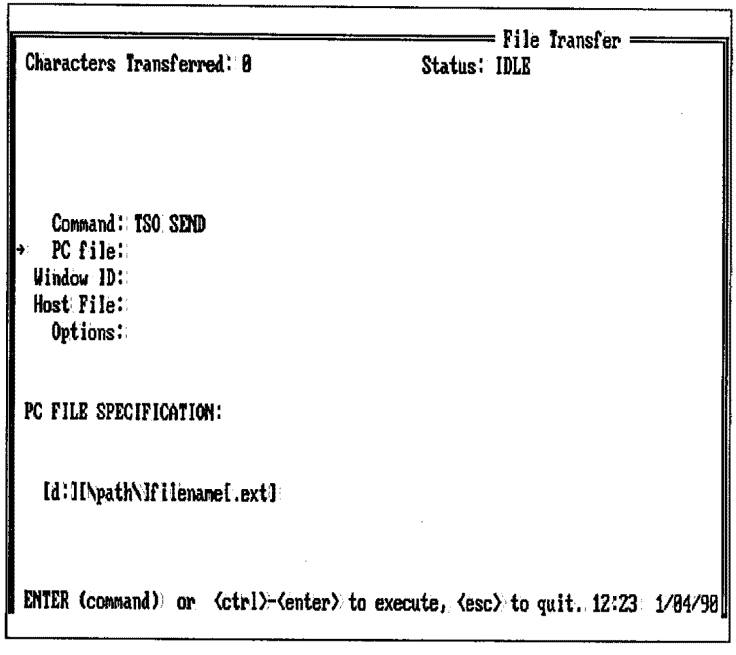


3 At the "Command:" prompt, type one of the following file transfer commands and press [Enter].

TS for TSO Send
CS for CMS Send

The field will automatically be updated to reflect the full name of the file transfer.

4 After pressing [Enter], you will advance to the "PC File Specification:" prompt, as shown below. Type the name of the PC file that you would like to send to the mainframe, including the disk drive and path where the file is located, the filename, and its extension, if any, and press [Enter].



5 After typing the filename, you will be asked for the window short name of the mainframe session where your PC file will be sent (A - Z). After typing the short name, press [Enter].

6 After you have entered the window short name, you need to give your PC file either a CMS File Name or a TSO Data Set Name, depending on your mainframe environment. The mainframe will store your file under this name.

For CMS, use the format shown below:

filename filetype [filemode]

where:

filename is a name that identifies the file being transferred to the mainframe. This parameter is required.

filetype is a filename extension that identifies the contents of the file, for example *data* or *text*. This parameter is required.

[filemode] is an optional parameter that tells CMS the name of the mainframe minidisk where you want the file to be stored. This parameter defaults to the "A" minidisk.

For example, a typical CMS filename would appear as follows:

pcdoc text A

The parameters shown should be separated by blank spaces.

Filename and *filetype* are limited to eight characters each. Valid characters include all alphanumeric characters (a-z, 0-9); letters are shifted to uppercase. You may also use five special characters ($, #, @, +, and _) unless they are defined as terminal control characters within your CMS profile. Do not use a hyphen within your filename. The hyphen is a restricted character.

For TSO, use the format shown below:

[']datasetname[(member)]['][/pw]*

where:

datasetname is a name that identifies the file being transferred to the mainframe. This parameter is required.

[(member)] is required if the dataset is a partitioned dataset. Otherwise, it is not allowed. Your System Administrator may require you to save your file within a partitioned data set.

[/pw] is the write-password of the existing TSO dataset, if it is write-password-protected. This parameter is ignored if the dataset is not write-protected.

For example, a typical TSO Data Set Filename would appear as follows:

file1.data(member2)/mypass

If the *datasetname* of the file does not begin with your userid, you must specify a "fully-qualified datasetname" and enclose the entire *datasetname* and *(member)* in apostrophes, as shown below. If the *datasetname* begins with your userid, you may omit both the userid and the apostrophes. To enter a fully-qualified *datasetname* with apostrophes, use the format shown below:

'highnode.name.type[(member)]'[/pw]

TSO calls a file a *dataset*. The name of this file is a *datasetname*. The *datasetname* is limited to 44 characters. *Member* and *pw* are limited to 8 characters each.

Valid characters include all alphanumeric characters (a-z, 0-9); letters are shifted to uppercase. You may also use three special characters ($, #, and @). Do not start any node of the *datasetname* (userid, name, or type) with a number (0-9).

7 Once you have entered the mainframe filename, you will advance to the "Options:" prompt. Type any of the options shown below, and press [Enter].

For CMS Send:

append ascii crlf lrecl n recfm{f/v} -B -S -n /D

For TSO Send:

append ascii crlf lrecl(n) blksize(n)
recfm({f/u/v}) -B -S -n space(quantity[,extent])
[{avblock(value)/tracks/cylinders}]

The options are defined in "Send Options for VM/CMS" and "Send Options For MVS/TSO" in this chapter.

8 All of the fields on the screen should be filled in. If you would like to change any of the fields before sending the file, simply [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes.

To start the file transfer, press the keys shown below:

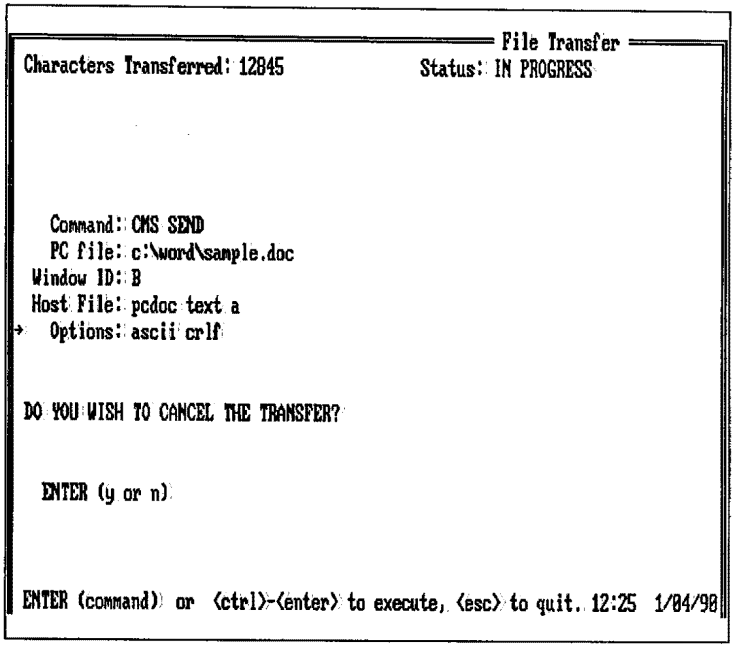
[Ctrl]/[Enter]

9 After you press [Ctrl]/[Enter], the Background File Transfer screen will disappear. You can jump to any window, and you can perform other activities in any window except the mainframe session where your PC file is being transferred. Do not type into it or your entries will interfere with the communication between the mainframe and the PC.

You can check on the status of the file transfer at any time, or cancel the file transfer, by pressing these keys:

[Ctrl/Alt] [F] [T]

The file transfer screen will return, as shown below, displaying the status of your file transfer operation and the number of characters that have been transferred. It also will ask you if you would like to cancel the transfer. To cancel the transfer, type [Y] after the prompt. Type [N] or [Esc] if you would like the file transfer to continue.



The "Status:" field can contain any of the following messages:

IDLE	This message appears before a file transfer activity has begun. The number of characters transferred will be 0.
IN PROGRESS	The file transfer is in progress. You can determine how much of the file has been transferred by the "Characters Transferred:" field.
COMPLETE	The file transfer is complete. The "Characters Transferred:" field shows the total number of characters that were transferred.
ABENDED	The file transfer ended abnormally. The "Characters Transferred:" field shows the total number of characters that were transferred before it encountered a problem, and you will see an error message.

After the file has been transferred, you can initiate a new file transfer operation by repeating steps 1 through 9. The fields on the screen still will contain the entries from your last file transfer operation. To change the fields, [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes so that the old entry is removed and the new entry is recorded.

Receiving from a Mainframe Session to a PC

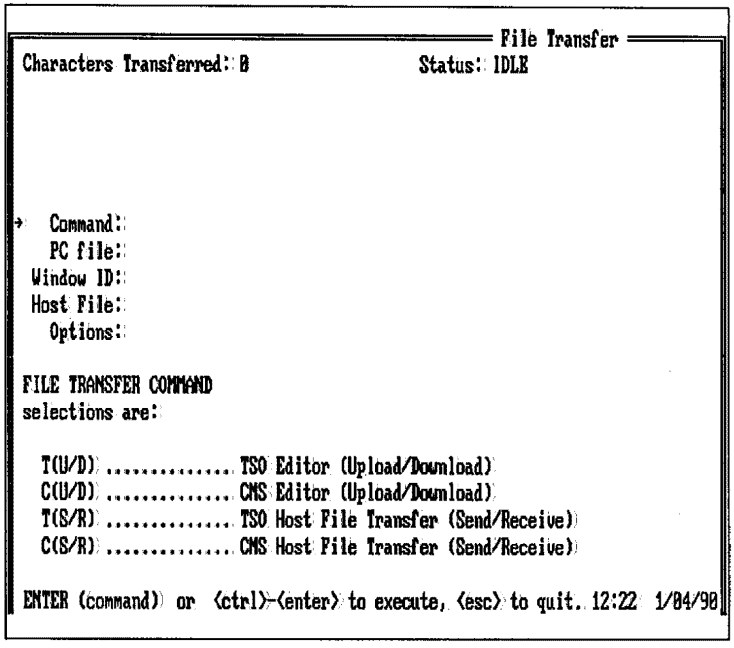
To transfer a file from the mainframe to your PC session, follow the steps below:

1. Establish a CMS or TSO session in any of the mainframe windows (A-Z). Make sure that you are in the correct mode (CMS command mode or TSO command mode).

2. Jump to any window and press the keys shown below:

   [Ctrl/Alt] [F] [T] or **WsCtrl PF15**

   The Background File Transfer menu will appear, as shown below.



3 At the "File Transfer Command:" prompt, type one of the following file transfer commands and press [Enter].

TR for TSO Receive
CR for CMS Receive

The field will automatically be updated to reflect the full name of the file transfer.

4 After pressing [Enter], you will advance to the "PC File Specification:" prompt. Create a PC filename for the mainframe file being received. Be sure to include the disk drive and path name where the file will be stored, a filename, and an extension, which is optional. Press [Enter] after creating the filename.

5 You then will be asked for the short name of the mainframe session where the mainframe file is residing (A - Z). After typing the short name, press [Enter].

6 After you have entered the window short name, you will be asked for the mainframe filename of the file being downloaded to your PC session. Enter either a CMS File Name or a TSO Data Set Name, depending on your mainframe environment.

For CMS, use the format shown below:

filename filetype [filemode]

where:

filename is a name that identifies the file being transferred to the PC session. This parameter is required.

filetype is a filename extension that identifies the contents of the file. For example *data* or *text*. This parameter is required.

[filemode] is an optional parameter that tells CMS the name of the mainframe minidisk where the file is located. This parameter defaults to the "A" minidisk.

For example, a typical CMS filename would appear as follows:

pcdoc text A

The parameters shown should be separated by blank spaces.

Filename and *filetype* are limited to eight characters each. Valid characters include all alphanumeric characters (a-z, 0-9); letters are shifted to uppercase. You may also use five special characters ($, #, @, +, and _) unless they are defined as terminal control characters within your CMS profile. Do not use a hyphen within your filename. The hyphen is a restricted character.

For TSO, use the format shown below:

['']datasetname[(member)][''][/pw]

where:

datasetname is a name that identifies the file being transferred from the mainframe. This parameter is required.

[(member)] is required if the dataset is a partitioned dataset. Otherwise, it is not allowed. Your System Administrator may require you to save your file within a partitioned data set.

TSO calls a file a *dataset*. The name of this file is a *datasetname*. The *datasetname* is limited to 44 characters. *Member* and *pw* are limited to 8 characters each.

[/pw] is the read-password of the existing TSO dataset, if it is read-password-protected. This parameter is ignored if the dataset is not read-protected.

For example, a typical TSO Data Set Filename would appear as follows:

file1.data(member2)/mypass

If the *datasetname* of the file does not begin with your userid, you must specify a "fully-qualified datasetname" and enclose the entire *datasetname* and *(member)* in apostrophes, as shown below. If the *datasetname* begins with your userid, you may omit both the userid and the apostrophes. To enter a fully-qualified *datasetname* with apostrophes, use the format shown below:

'highnode.name.type[(member)]'[/pw]

7 Once you have entered the mainframe filename, you will advance to the "Options:" prompt. Type in any of the options shown below, and press [Enter].

For CMS Receive:

append ascii crlf

For TSO Receive:

append ascii crlf

Each of these options are described in the "Receive Options for VM/CMS" and "Receive Options For MVS/TSO" sections of this chapter.

8 All of the fields on the screen should be filled in (the options field can remain blank if no options were selected). If you want to change any of the fields before starting the file transfer, simply [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes.

To start the file transfer, press the keys shown below:

[Ctrl]/[Enter]

9 After you press [Ctrl]/[Enter], the Background File Transfer screen will disappear. You can jump to any window, and you can perform other activities in any window except the mainframe session where your PC file is being transferred. Do not type into it or your entries will interfere with the communication between the mainframe and the PC.

You can check on the status of the file transfer from any session and at any time, or you may cancel the file transfer, by pressing the keys shown below:

[Ctrl/Alt] [F] [T]

The file transfer screen will return, displaying the status of your file transfer operation and the number of characters that have been transferred. It also will ask you if you would like to cancel the transfer. To cancel the transfer, type [Y] after the prompt. Type [N] or [Esc] if you would like the file transfer to continue.

The "Status:" field can contain any of the following messages:

IDLE	This message appears before a file transfer activity has begun. The number of characters transferred will be 0.
IN PROGRESS	The file transfer is in progress. You can determine how much of the file has been transferred by the "Characters Transferred:" field.
COMPLETE	The file transfer is complete. The "Characters Transferred:" field shows the total number of characters that were transferred.
ABENDED	The file transfer ended abnormally. The "Characters Transferred:" field shows the total number of characters that were transferred before it encountered a problem. The menu will give you an error message.

After the file has been transferred, you can initiate a new file transfer operation by repeating Steps 1 through 9. The fields on the screen still will contain the entries from your last file transfer operation. To change the fields, [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes so that the old entry is removed and the new entry is recorded.

To Cancel a Background File Transfer

If you have not yet sent the file with the [Ctrl]/[Enter] command, you can exit the Background File Transfer menu by pressing [Esc]. To cancel the file transfer after pressing [Ctrl]/[Enter], follow the steps provided in Step 9.

Background File Transfer Notes

The combined number of characters entered in the "PC File:", "Window ID:", "Host File:" and "Options:" fields cannot exceed 63 characters. The hyphen character cannot appear in any of these fields, except for the "Options:" field.

EXTRA! lets you transfer two files simultaneously by running a Background File Transfer in one mainframe session and a Foreground File Transfer in another. However, only one Background File Transfer can take place at a time, and only one Foreground File Transfer can take place at a time.

Foreground File Transfer with CMS

This section explains how to transfer files in the foreground with CMS. Unlike Background File Transfer, Foreground File Transfer does not provide menus to guide you through the file transfer process. You must type a specific command after the DOS prompt, making sure to follow the correct syntax. In addition, your PC session will not be available again until after the file transfer is finished. However, it does use less memory (up to 22K) than Background File Transfer and *EXTRA!* does not need to be specially configured for Foreground File Transfer before it can be used.

The SEND command transfers a file from your PC to the mainframe. The RECEIVE command transfers a file from the mainframe to the PC. Each command is discussed separately and in more detail later in this section.

The syntax (format) of the CMS SEND command is:

[a:]send [d:][path]filename[.ext] [w:] fn ft [fm] [(options]

Do not use a filename with a hyphen (-). The hyphen is a restricted character.

The syntax of the CMS RECEIVE command is:

[a:]receive [d:][path]filename[.ext] [w:] fn ft [fm] [(options]

After typing the appropriate command, press [Enter].

Standards, Command Terms, and Options

This section explains commonly-used CMS command terms and options, and provides examples of the commands.

For transferring text files, there are two recommended options: ascii and crlf. These options ensure that your file will be readable on the PC or the mainframe.

Here are the standards used in the command syntax:

- Brackets [ ] indicate optional parameters. You do not enter the brackets themselves.
- Enter periods, colons, and parentheses as shown. When they appear in brackets, enter them only if you are using the accompanying options.
- A left parenthesis in the command line indicates that options follow.

About Transferring in CMS

In order to transfer files in CMS, you must be in CMS command mode. This is also called a native CMS session. You cannot be in any other mainframe subsystem. When you are in native CMS, you usually see a prompt saying "Ready".

Sending from a PC to a CMS Mainframe Session

Before you can send files from the PC to a CMS mainframe session, you must turn off unsolicited CMS messages. These messages may interrupt the transfer process unless you respond to them.

Turn off the messages by entering the following command on the command line of your CMS session:

set msg off [Enter]

After you have finished transferring files, you can turn the messages back on by entering the following command line:

set msg on [Enter]

To transfer a file from your PC to a CMS mainframe session:

1. Establish a CMS session in one of the mainframe windows (A-Z). You must be in CMS command mode (that is, native CMS).

2. Jump to your PC window.

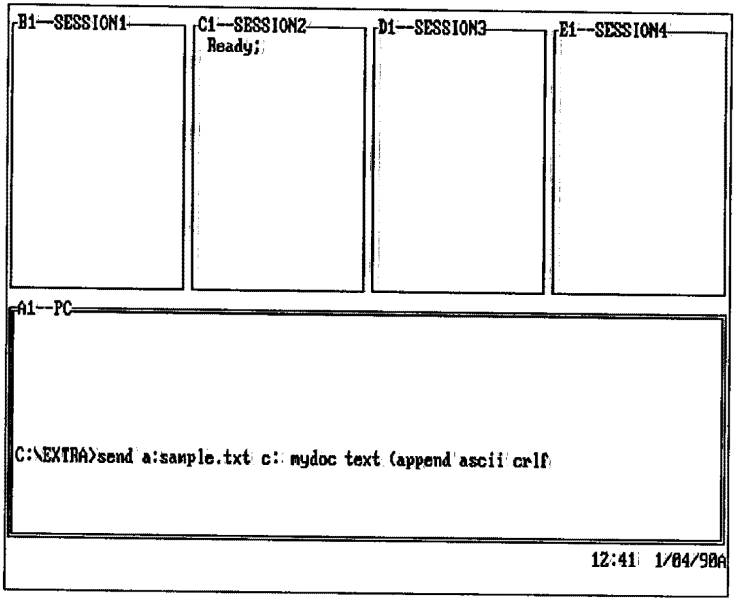
3. To send your file to the mainframe, use the following format. These parameters are defined later in this section:

   [a:]send [d:][path]filename[.ext] [w:] fn ft [fm] [(options]

✍ CMS will not accept a filename with a period. You must have a space in order for the filename to be recognized.

Here's an example. The file is being sent from the PC's Drive A to the mainframe session in window C. The PC filename is *sample.txt*; the CMS filename is *mydoc*; the CMS filetype is *text*.

The Ready prompt in window C indicates that you are in CMS command mode. (If "Ready" does not appear in the window, use full-screen mode to verify that it is there.) Notice that there are three options included with the command in this example:



4 After typing the command line, press [Enter]. File transfer starts immediately. Messages are displayed to inform you of the progress of the file transfer.

You can use other windows while the transfer takes place, but do not enter anything into the PC window or the file transfer mainframe window until the file transfer is complete.

The SEND Command Line Defined

If SEND.COM is not in the current drive and subdirectory, DOS may use the "send" command of a different installed application, rather than *EXTRA!'s* SEND command.

[a:]	Is a disk drive specifier that indicates where the SEND.COM file resides. It is not needed if the SEND.COM is in the current drive and subdirectory.
SEND	Is the command that you use to start file transfer to the mainframe.
[d:]	Is an optional drive specifier for the PC file to be sent. If not specified, the current drive and subdirectory are used.
[path]	Is the directory path of the PC file to be sent. If not specified, the current DOS directory is used.
filename	Is the PC filename to be sent.
[.ext]	Is the PC filename extension, if any. If the PC filename has an extension, you must include it in this command.
[w:]	Is the mainframe window in which you have established the CMS session. If not specified, the first mainframe session window is assumed.
fn	Is a name that identifies the file being transferred to the mainframe. This parameter is required.
ft	Is an extension to the filename that identifies the contents of the file, for example *data* or *text*. This parameter is required.

[fm] Is an optional parameter that tells CMS the name of the mainframe minidisk where you want the file to be stored. This parameter defaults to the "A" minidisk.

Options begin with a left parenthesis.

[(options] Are described on the following pages.

SEND Options for CMS

The CMS SEND command syntax includes the following options (options must begin with a left parenthesis):

If *append* is not used when the CMS filename already exists on the mainframe, the existing file will be replaced by the uploaded file.

append Lets you append the uploaded file to the end of an existing CMS file. The *append* option is ignored if the specified CMS file does not exits.

ascii Specifies that files stored in ASCII on the PC be converted to EBCDIC during before transfer. The *ascii* option is recommended if the file is to be readable on the mainframe.

crlf Specifies that carriage return/line feed character-pairs present in the PC file should be deleted before being stored on the mainframe. Usually, alphanumeric data on the PC contains a *crlf* character pair at the end of each line to denote the end of each record. Deleting these character pairs using the *crlf* option lets you read the mainframe version of the file more easily.

	lrecl n	Specifies the logical record length of the mainframe file, where *n* is the number of characters in each record. PC records longer than *n* will be split into multiple mainframe records. If *lrecl* is omitted, the default is 80 for new files. For existing files, *lrecl* is ignored.
	recfm f	Specifies that the mainframe file will contain fixed-length records. Records are padded with space characters if they are shorter than that specified with *lrecl* or the default length. This is the default for new files unless *crlf* is specified.
Use of the *recfm v* option without the *crlf* option is recommended when padding of mainframe records or deletion of trailing spaces must not occur.	*recfm v*	Specifies that the file will contain variable length records. This is the default for new files when *crlf* is specified.
	-B	Use this option only if it is necessary not to use Structured Fields.
	-S	Specifies structured field file transfer. It is only valid in the DFT environment. It is required only once for a bisync-connected controller where the mainframe has not sent a Query prior to using SEND.
A larger packet size transmits data more quickly than a smaller size, but it requires more PC memory and recent versions of IND$FILE and Controller software, and it may cause problems in slower SDLC links.	*-2, -4, -8, -32*	One of these options can be used if you are using Structured Field file transfer. This option specifies the packet size, in kilobytes, of the information being transmitted. The default packet size is 2K.
	/D	With this option, your send command line waits 10 seconds before it is sent to the host. This option is helpful if you want to send a file to the mainframe, but the mainframe is not ready to receive the file.

Receiving from a CMS Mainframe Session to a PC

To transfer a file from the mainframe to your PC:

1. Establish a CMS session in any of the mainframe windows (A-Z). The session must be in CMS command mode (that is, native CMS).

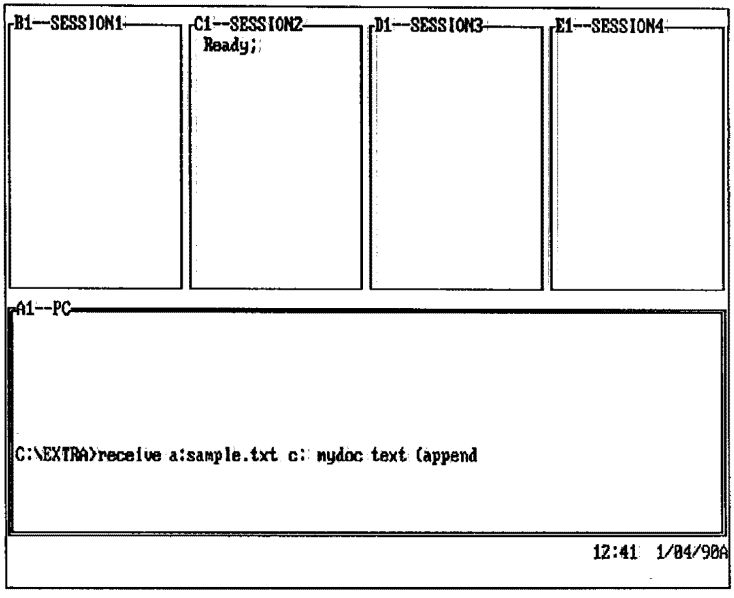
2. Jump to the PC window.

3. At the DOS prompt, enter the following command: (These parameters are defined later in this section)

   [a:]receive [d:][path]filename[.ext][w:] fn ft [fm][(options]

   Here's an example. The file is being sent from the mainframe in window C to the PC's Drive A. The CMS filename is *mydoc*; the CMS filetype is *text*. When *EXTRA!* receives the file, it will write it to the file *sample.txt*.

   The Ready prompt in window C indicates that you are in CMS command mode. (If "Ready" does not appear in the window, use full-screen mode to verify that it is there.) Notice that there is one option included with the command in this example:



4 After typing the command line, press [Enter]. File transfer starts immediately after you enter the RECEIVE command. Messages are displayed to inform you of the progress of the file transfer.

You can use other windows while the transfer takes place but do not enter anything into the PC window or the file transfer mainframe window until the file transfer is complete.

The RECEIVE Command Line Defined

If RECEIVE.COM is not in the current drive and subdirectory, DOS may use the "receive" command of a different installed application, rather than *EXTRA!*'s RECEIVE command.

[a:]	Is an optional disk drive specifier that indicates where the RECEIVE.COM file resides. Not needed if the RECEIVE.COM file is in the current drive and subdirectory.
RECEIVE	Is the command that you use to start file transfer from the mainframe.
[d:]	Is an optional drive specifier for the PC file to be received. If not specified, the current drive and subdirectory are used.
[path]	Is the directory path of the PC file to be received. If not specified, the current DOS directory is used.
filename	Is the PC filename to be received.
[.ext]	Is the PC filename extension, if any. If the PC filename has an extension, you must include it in this command.
[w:]	Is the mainframe window in which you have established the CMS session. If not specified, the first mainframe window is assumed.
fn	Is a name that identifies the mainframe file being transferred to the PC session. This parameter is required.
ft	Is an extension to the filename that identifies the contents of the mainframe file. For example data or text. This parameter is required.

[fm] Is an optional parameter that tells CMS the name of the mainframe minidisk where the file is located. This parameter defaults to the "A" minidisk.

Options begin with a left parenthesis.

[(options] Are described on the following pages.

RECEIVE Options for CMS

The CMS RECEIVE command syntax includes the following options (left parenthesis in syntax is required):

If *append* is not specified and the specified PC file already exists, the received file will replace the existing PC file.

append Specifies that the received file is to be appended to the end of an existing PC file.

ascii Specifies that the EBCDIC-stored mainframe file be converted to ASCII before transfer. The *ascii* option is recommended if a text file is to be readable on the PC.

crlf Specifies that trailing spaces in the mainframe file records are to be deleted and that carriage return/line feed character pairs are to be inserted at the end of each record. *Crlf* mode is recommended if the file is to be readable on the PC.

-B Use this option only if it is necessary to not use Structured Fields.

	-S	Specifies Structured Field File Transfer. This option is only valid in the DFT environment. It is required only once for a bisync-connected controller when the mainframe has not sent a Query prior to using RECEIVE.
A larger packet size transmits data quicker than a smaller size, but it requires more PC memory and recent versions of IND$FILE and Controller software, and it may cause problems with slower SDLC links.	*-2, -4, -8, -32*	One of these options can be used if you are using Structured Field file transfer. This option specifies the packet size, in kilobytes, of the information being transmitted. The default packet size is 2K.

Foreground File Transfer with MVS/TSO

This section explains how to transfer files in the foreground with TSO. Unlike Background File Transfer, Foreground File Transfer does not provide menus to guide you through the file transfer process. You must type a specific command after the DOS prompt, making sure to follow the correct syntax.

The SEND command transfers a file from your PC to the mainframe. The RECEIVE command transfers a file from the mainframe to the PC. Each command is discussed separately and in more detail later in this section.

The syntax (format) of the TSO SEND command is:

[a:]send [d:][path]fn[.ext] [w:] ['']dsn[(mbr)]['][/pw] [options]

The syntax of the TSO RECEIVE command is:

[a:]receive [d:][path]fn[.ext] [w:] ['']dsn[(mbr)]['][/pw] [options]

After typing your command line, press [Enter].

Standards, Command Terms, and Options

This section explains commonly-used TSO command terms and options, and provides examples of the commands.

For transferring text files, there are two recommended options: ASCII and CRLF. These options ensure that your file will be readable on the PC or the mainframe.

Here are the standards used in the command syntax:

- Brackets [ ] surround optional parameters. Do not enter the brackets themselves.
- Enter commas, periods, colons, and parentheses as shown. When they appear in brackets, they are entered only if the accompanying options are used.

The specific parameters associated with the TSO SEND and RECEIVE commands are described in the following pages.

About Transferring in TSO

In order to transfer files in TSO, you must be in TSO command mode. This is also called a native TSO session. You cannot be in ISPF or any other subsystem. When you are in native TSO, you see a prompt saying "Ready". If you have any questions about TSO and file transfer, consult your System Administrator.

Sending from a PC to a TSO Mainframe Session

To transfer a file from your PC to a TSO mainframe session:

1. Establish a TSO session in any of the mainframe windows (A-Z). You must be in TSO command mode (that is, not in ISPF or other subsystem but in native TSO).

2. Jump to your PC window.

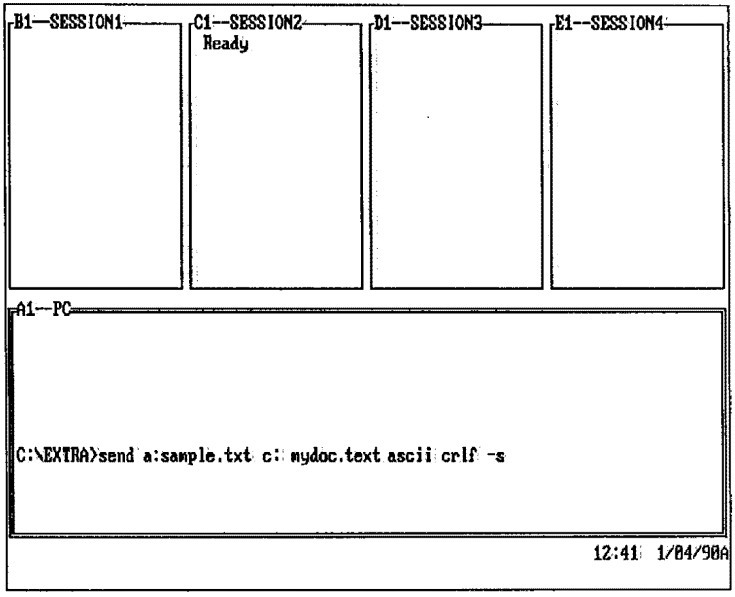
3. At the DOS prompt, type your command line using the following format. These parameters are defined later in this section.

[a:]SEND [d:][path]fn[.ext] [w:] ['']dsn[(mbr)]['][/pw] [options]

TSO requires a period between the mainframe filename (dataset name) and its extension (if an extension is used).

Here's an example. A file is being sent from Drive A in the PC to the mainframe in window C. The PC filename is *sample.txt*. The TSO datasetname is *mydoc.text*.

The Ready prompt in window C indicates that you are in TSO command mode. (If "Ready" does not appear in the window, use full-screen mode to verify that it is there.) Notice that there are three options (*ascii, crlf, -s*) included with the command in this example:



4 Press [Enter] after typing the command line. File transfer starts immediately after the SEND command has been entered. Messages are displayed to inform you of the progress of the file transfer.

You can use other windows while the transfer takes place but do not enter anything into the PC window or the file transfer mainframe window until the file transfer is complete.

The SEND Command Line Defined

If SEND.COM is not in the current drive and subdirectory, DOS may use the "send" command of a different installed application, rather than *EXTRA!'s* SEND command.

[a:]	Is a disk drive specifier that indicates where the SEND.COM file resides. It is not needed if the SEND.COM is in the current drive and subdirectory.
SEND	Is the command that you use to start file transfer to the mainframe.
[d:]	Is an optional drive specifier for the PC file to be sent. If not specified, the current drive and subdirectory are used.
[path]	Is the directory path of the PC file to be sent. If not specified, the current DOS directory is used.
filename	Is the PC filename to be sent.
[.ext]	Is the PC filename extension, if any. If the PC filename has an extension, you must include it in this command.
[w:]	Is the mainframe window in which you have established the TSO session. If not specified, the first mainframe window is assumed.
dsn	Is the TSO dataset name you assign to the file when you send it to the mainframe. This parameter is required.
[(member)]	Is required if the dataset is a partitioned dataset. Otherwise, it is not allowed. Your System Administrator may require you to save your file within a partitioned dataset.

[/pw] Is the write-password of the existing TSO dataset, if it is write-password-protected. This parameter is ignored if the dataset is not write-protected.

For example, a typical TSO Data Set Filename would appear as follows:

file1.data(member2)/mypass

[options] Are described on the following pages.

If the *datasetname* of the file does not begin with your userid, you must specify a "fully-qualified datasetname" and enclose *datasetname* and *(member)* in apostrophes as shown in the format below. If the *datasetname* begins with your userid, you may omit both the userid and the apostrophes.

'highnode.name.type[(member)]'[/pw]

SEND Options for TSO

The TSO SEND command syntax includes these options:

If you do not use *append* and the TSO dataset name already exists on the mainframe, the existing file will be replaced by the uploaded file. You may not use *append* for members of a partitioned dataset.

append Lets you append the uploaded file to the end of an existing TSO file. The *append* option is ignored if the specified TSO dataset does not exist. *append* is not allowed if the TSO dataset is a partitioned dataset.

ascii Specifies that files stored in ASCII on the PC be converted to EBCDIC during transfer to the mainframe. Usually, alphanumeric files are stored in ASCII on the PC and EBCDIC on the mainframe. The ASCII option is recommended if you want the file to be readable on the mainframe.

crlf

Specifies that carriage return/line feed character pairs present in the PC file are to be deleted from the mainframe file. Text data in the PC files commonly have a *crlf* character pair at the end of each line to denote the end of each record. Removing these character pairs with the *crlf* option makes the files readable on the mainframe.

lrecl(n)

Specifies the Logical Record Length of the mainframe file, where *n* is the number of characters in each record. Set-length PC records longer than *n* and variable-length records longer than *n-4* will be split into multiple mainframe records. If you omit *lrecl*, the default is 80 for new files. For existing files, *lrecl* is ignored.

blksize(n)

Specifies the block size of the mainframe dataset, where *n* is the length in bytes of a data block. If you are appending or replacing a dataset, *blksize* is ignored.

recfm(f)

Specifies that the mainframe file will contain fixed-length records. Records are padded with space characters if they are shorter than that specified with *lrecl* or the default length. This is the default for new files unless *crlf* is specified.

For existing files, the *recfm* option is ignored.

recfm(u)

Specifies that the mainframe file will contain records of undefined length.

It is recommended that you use the *recfm(v)* option without the *crlf* option when you must avoid padding of mainframe records or deletion of trailing spaces. For example, binary (program) files contain variable length records.

recfm(v)

Specifies that the mainframe file will contain records of variable length. This is the default for new files when *crlf* is specified.

-B

Use this option only if it is necessary not to use Structured Fields.

-S

Specifies Structured Field File Transfer. This option is only valid in the DFT environment. It is required only once for a bisync-connected controller where the mainframe has not sent a Query prior to using SEND.

-2, -4, -8, -32

One of these options can be used if you are using Structured Field file transfer. This option specifies the packet size, in kilobytes, of the information being transmitted. The default packet size is 2K.

A larger packet size transmits data quicker than a smaller size, but it requires more PC memory and recent versions of IND$FILE and Controller software, and it may cause problems in slower SDLC links.

space

Specifies the amount of space you want to be allocated for a new dataset. If you use *space*, use the following syntax:

space(quantity[,extent]) [avblock(value) or *tracks* or *cylinders]*

For example:

space (20,10) tracks

If you do not specify one of the options following *extent), avblock(value), tracks,* or *cylinders,* the default is *avblock(blksize).* The *space* option is ignored for existing datasets.

Consult your System Administrator for more information and for the *space* option to use.

Receiving from a TSO Mainframe Session to a PC

To receive a file from a TSO mainframe session to your PC:

1. Establish a TSO session in one of the mainframe windows (A-Z). You must be in TSO command mode (that is, not in ISPF or any other subsystem but in native TSO).

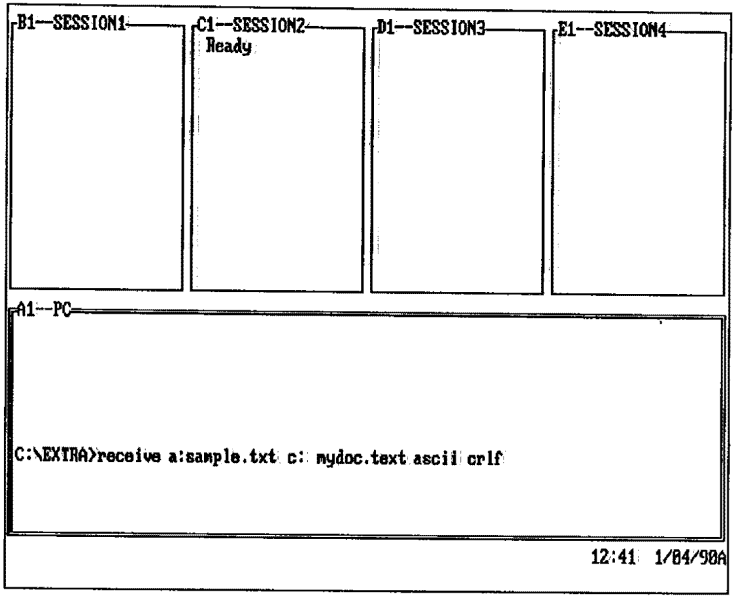
2. Jump to the PC window.

3. At the DOS prompt, type your command line using the following format. These parameters are defined later in this section:

   [a:]receive [d:][path]fn[.ext] [w:] ['']dsn[(mbr)]['][/pw] [options]

   Here's an example. The file is being sent from the mainframe in window C to Drive A in the PC. The PC filename is *sample.txt*. The TSO dataset name is *mydoc.text*.

The Ready prompt in window C indicates that you are in TSO command mode. (If "Ready" does not appear in the window, use full-screen mode to verify that it is there.) Notice that there are two options (*ascii* and *crlf*) included with the command in this example:



4 Press [Enter] after typing your command line.

File transfer starts immediately after the RECEIVE command has been entered. Messages are displayed to inform you of the progress of the file transfer.

You can use other windows while the transfer takes place but do not enter anything into the PC window or the file transfer mainframe window until the file transfer is complete.

The RECEIVE Command Line Defined

If RECEIVE.COM is not in the current drive and subdirectory, DOS may use the "receive" command of a different installed application, rather than *EXTRA!'s* RECEIVE command.

[a:]	Is an optional disk drive specifier that indicates where the RECEIVE.COM file resides. Not needed if the RECEIVE.COM file is in the current drive and subdirectory.
RECEIVE	Is the command that you use to start file transfer from the mainframe.
[d:]	Is an optional drive specifier for the PC file to be received. If not specified, the current drive and subdirectory are used.
[path]	Is the directory path of the PC file to be received. If not specified, the current DOS directory is used.
filename	Is the PC filename you want to receive.
[.ext]	Is the PC filename extension, if any. If the PC filename has an extension, you must include it in this command.
[w:]	Is the mainframe window in which you have established the TSO session. If not specified, the first session window is assumed.
dsn	Is the mainframe filename (dataset name) of the file being transferred. This parameter is required.
[(member)]	Is required if the dataset is a partitioned dataset. Otherwise, it is not allowed. Your System Administrator may require you to save your file within a partitioned dataset.

[/pw] Is the read-password of the existing TSO dataset, if it is read-password-protected. This parameter is ignored if the dataset is not read-protected.

For example, a typical TSO Data Set Filename would appear as follows:

file1.data(member2)/mypass

[options] Are described on the following pages.

If the *datasetname* of the file does not begin with your userid, you must specify a "fully-qualified datasetname" and enclose the entire *datasetname* and *(member)* in apostrophes, as shown below. If the *datasetname* begins with your userid, you may omit both the userid and the apostrophes. To enter a fully-qualified *datasetname* with apostrophes, use the format shown below:

'highnode.name.type[(member)]'[/pw]

RECEIVE Options for TSO

The TSO RECEIVE command syntax includes the following options:

If *append* is not specified and the specified PC file already exists, the received file will replace the existing PC file.

append Specifies that the received file is to be appended to the end of an existing PC file.

ascii Specifies that the EBCDIC-stored mainframe file be converted to ASCII before transfer. The *ascii* option is recommended if you want the file to be readable on the PC.

crlf	Specifies that trailing spaces in the mainframe file records are to be deleted and that carriage return/line feed character pairs are to be inserted at the end of each record. *Crlf* mode is recommended if you want the file to be readable on the PC.
-B	Use this option only if it is necessary not to use Structured Fields.
-S	Specifies Structured Field File Transfer. This option is only valid in the DFT environment. It is required only once for a bisync-connected controller where the mainframe has not sent a Query prior to using RECEIVE.
-2, -4, -8, -32	One of these options can be used if you are using Structured Field file transfer. This option specifies the packet size, in kilobytes, of the information being transmitted. The default packet size is 2K.

A larger packet size transmits data more quickly than a smaller size, but it requires more PC memory, and recent versions of IND$FILE and Controller software, and it may cause problems in slower SDLC links.

Foreground File Transfer with Send/Receive CICS

To transfer files using the PS/CICS (DISOSS) file transfer method, please refer ahead to "How to Transfer Files with PS/CICS" in this chapter.

This section explains how to transfer files in the foreground using IBM's Send/Receive program in the CICS environment. Unlike Background File Transfer, Foreground File Transfer does not provide menus to guide you through the file transfer process. You must type a specific command after the DOS prompt, making sure to follow the correct syntax, which is shown in this section.

The SEND command transfers a file from your PC to the mainframe. The RECEIVE command transfers a file from the mainframe to the PC. Each command is discussed separately and in more detail later in this section.

Do not use a filename with a hyphen (-). The hyphen is a restricted character.

The syntax (format) of the CICS SEND command is:

[a:]send [d:][path]PCfilename[.ext] [w:] host filename [(options]

The syntax of the CICS RECEIVE command is:

[a:]receive [d:][path]PCfilename[.ext] [w:] host filename [(options]

After typing the appropriate command, press [Enter].

Standards, Command Terms, and Options

This section explains commonly-used CICS command terms and options and provides examples of the commands.

For transferring text files, there are two recommended options: *ascii* and *crlf*. These options ensure that your file will be readable on the PC or the mainframe.

Here are the standards used in the command syntax:

- Brackets [ ] indicate optional parameters. You do not enter the brackets themselves.

- Enter periods, colons, and parentheses as shown. When they appear in brackets, enter them only if you are using the accompanying options.

- A left parenthesis indicates that options follow.

Sending From a PC to a CICS Mainframe Session

1. Establish a CICS session in one of the mainframe windows (A-Z). You must be in CICS command mode.

2. Jump to your PC window.

3. To send your file to the mainframe, use the following syntax. These parameters are defined later in this section:

   [a:]send [d:][path]filename[.ext] [w:] host filename [(options]

4. After typing the command line, press [Enter].

   File transfer starts immediately. Messages are displayed to inform you of the progress of the file transfer.

   You can use other windows while the transfer takes place, but do not enter anything into the PC window or the file transfer mainframe window until the file transfer is complete.

The Send Command Line Defined

If SEND.COM is not in the current drive and subdirectory, DOS may use the "send" command of a different installed application, rather than *EXTRA!'s* SEND command.

[a:]	Is a disk drive specifier that indicates where the SEND.COM file resides. It is not needed if the SEND.COM is in the current drive and subdirectory.
SEND	Is the command that you use to start file transfer to the mainframe.
[d:]	Is an optional drive specifier for the location of the PC file to be sent. If not specified, the current drive and subdirectory are used.
[path]	Is the directory path of the PC file to be sent. If not specified, the current DOS directory is used.
filename	Is the PC filename to be sent.
[.ext]	Is the PC filename extension, if any.
[w:]	Is the mainframe window in which you have established the CICS session. If not specified, the first mainframe session window is assumed.
host filename	Is the mainframe filename where data is to be sent.

Options begin with a left parenthesis.

[(options]	Are described later in this chapter in "Common Send And Receive Options For CICS."

Receiving from a CICS Mainframe Session to Your PC

1. Establish a CICS session in any of the mainframe windows (A-Z). The session must be in CICS command mode.

2. Jump to the PC window.

3. Enter the following command line at the DOS prompt. These parameters are defined later in this section:

   [a:]receive [d:][path]filename[.ext] [w:] host filename [(options]

4. After typing the command line, press [Enter].

   File transfer starts immediately. Messages are displayed to inform you of the progress of the file transfer.

   You can use other windows while the transfer takes place, but do not enter anything into the PC window or the file transfer mainframe window until the file transfer is complete.

The Receive Command Line Defined

If RECEIVE.COM is not in the current drive and subdirectory, DOS may use the "receive" command of a different installed application, rather than *EXTRA!'s* RECEIVE command.

[a:]	Is an optional disk drive specifier that indicates where the RECEIVE.COM file resides. This is not needed if the RECEIVE.COM file is in the current drive and subdirectory.
RECEIVE	Is the command that you use to start file transfer from the mainframe.
[d:]	Is an optional drive specifier for the PC file to be received. If not specified, the current drive and subdirectory are used.
[path]	Is the directory path of the PC file to be received. If not specified, the current DOS directory is used.
filename	Is the PC filename to be received.
[.ext]	Is the PC filename extension, if any.
[w:]	Is the mainframe window in which you have established the CICS session. If not specified, the first mainframe window is assumed.
host filename	Is the name of the file to be retrieved from the mainframe transfer file.

Options begin with a left parenthesis.

[(options]	Are described on the following pages.

Common SEND And RECEIVE Options For CICS

Some of these options may not apply to your version of CICS. Refer to your mainframe documentation for details.

The following section lists options used by both SEND and RECEIVE. Options that are unique to one environment are noted next to the option. (Options must begin with a left parenthesis.)

If *append* is not used, the receiving file will be replaced by the downloading CICS file.

append (Receive only) — Lets you append the downloaded file to the end of an existing PC file.

ascii — Data is translated from ASCII to EBCDIC with the SEND option, and from EBCDIC to ASCII with the RECEIVE option. The *ascii* option is recommended if the file is to be readable on the mainframe and PC.

binary — The data in the file to be sent or received is binary data. That is, data that is not readable. It is sent "as is" without any translation.

blank (Receive only) — This option specifies that trailing blanks are not to be deleted.

crlf (Send only) — Specifies that carriage return/line feed character pairs present in the PC file should be deleted before being stored on the mainframe. Usually, alphanumeric data on the PC contains a *crlf* character pair at the end of each line to denote the end of each record. Deleting these character pairs using the *crlf* option lets you read the mainframe version of the file more easily.

crlf (Receive only) — Specifies that trailing spaces in the mainframe file records are to be deleted and that carriage return/line feed character pairs are to be inserted at the end of each record. *crlf* mode is recommended if the file is to be readable on the PC.

DCDF=dcdfname — Specifies the Data Conversion Descriptor File (DCDF) if field-level data conversion is to be performed during file transfer. DCDF must be present in the Host Transfer File and must be owned by the user issuing the SEND or RECEIVE.

DELETE (Receive only) — Once you receive a file owned by you, it is deleted from the host transfer file after it has been copied to the PC file. Delete is the default for files owned by you. (Files received from other users with the FROM= option are never deleted.)

FOR=USIDN (Send only) — This option allows you to share a file with up to eight users. It can only be accessed by users who are logged on to CICS with a user ID specified in the *USIDN* parameter.

FROM=USID (Receive only) — Retrieves a file that was stored as a public file or that another user shared with you. *USID* is the CICS/DOS/VS ID of the person who owns the file.

HTF — The file is stored in/received from the host transfer file. (*HTF*, rather than *TS*, is the default.)

KEEP (Receive only) — Specify *KEEP* if you do not want the file to be deleted.

NOCRLF	The PC file to be sent or received does not consist of logical records. No deletion or insertion of *crlf* character pairs will be performed. Each block becomes one record in the host file with SEND. With RECEIVE the blocks are concatenated into a single string of data.
NOREPLACE (Send only)	*NOREPLACE* indicates that if a file with the same name already exists, it is not to be replaced by the new file. (*NOREPLACE*, rather than *REPLACE*, is the default.)
NLS=nn	Select the language in which the file transfer messages sent to the PC session are to be displayed. *nn* is the suffix of the message module (INWPMS*nn*).
PRIVATE (Send only)	Indicates that this is a private file accessible only by the originator.
PUBLIC (Send only)	Specify public if you wish to make the file available to everyone on the system.
REPLACE	Specify replace if you want to replace an existing file.
TS	The file is stored in/received from a CICS temporary storage queue.
-B	Use this option only if it is necessary to not use Structured Fields.
-S	Specifies Structured Field File Transfer. This option is only valid in the DFT environment. It is required only once for a bisync-connected controller where the mainframe has not sent a Query prior to using SEND or RECEIVE.

/D (Send only)	With this option, your send command line waits 10 seconds before it is sent to the host. This option is helpful if you want to send a file to the mainframe, but the mainframe is not ready to receive the file.

How to Transfer Files with PS/CICS

This section explains how to transfer files to and from the mainframe using PS/CICS. PS/CICS stands for Personal Services/Customer Information Control System (formerly known as PS/370). Unlike MVS/TSO or VM/CMS, it does not work with IND$FILE Send/Receive, an IBM program.

Instead, PS/CICS works with an IBM PC program called Transfer (DISOSS) to transfer files. Through its menu-driven program, you can transfer files between the PC and the mainframe.

The Transfer program must be loaded before *EXTRA!* can transfer files with PS/CICS. This section describes the different ways to load Transfer and also explains how to start file transfer with PS/CICS.

What's Required for File Transfer with PS/CICS

Before you try to run file transfer with PS/CICS, make sure the following conditions are met:

- **PS/CICS resident:** Make sure that PS/CICS is resident on your mainframe computer.
- **Terminals on DISOSS network:** Make sure the terminals doing the sending and receiving are active on the DISOSS network. If you are not sure, ask your System Administrator.

- **Load Transfer:** The Transfer program must be loaded. Loading Transfer is described in more detail in the next section.

- **Choose defaults:** You must choose the proper defaults within PS/CICS. Make sure you understand the options available and the type of file you are transferring before using the transfer command. Consult your PS/CICS documentation or your System Administrator for more information.

- **DFT mode:** You must be in DFT mode.

- **Extended Data Stream:** Make sure that your System Administrator has configured your mainframe session for Extended Data Stream and for Structured Field Processing "Enabled."

Setting Up the Transfer Program

There are two ways to set up the Transfer program: It can be automatically loaded or manually loaded. To set up Transfer so that it automatically loads, select "Transfer" from within the *EXTRA!* Configurator. To manually load Transfer, simply type the transfer command line after your PC Session's DOS prompt. (Both of these processes are explained in more detail later in this section.)

When Transfer is automatically loaded, your files are transferred in "background mode," which means that your PC session can be freed up to run other programs and tackle other tasks, besides transferring files.

When Transfer is manually loaded, your files can be transferred either in either "background mode" or in "foreground mode." Foreground mode means your PC session is in use and cannot be used for other tasks. If you prefer "background mode," simply add a */r* to the end of the command line that you type after the prompt.

Automatically Loading Transfer

To set up Transfer so that it automatically loads when you startup *EXTRA!*, follow the instructions below:

1. Exit from *EXTRA!*.
2. Refer to Chapter 3 of the *Extra! Extended Setup and Reference Manual* to display the Configurator's "Startup" menu. From that menu, select "Transfer."
3. Select a mainframe session where the "Transfer" will occur. Next time you start *EXTRA!*, it will automatically load Transfer into the mainframe session that you specify.
4. Once loaded, simply jump to the appropriate window and start the file transfer with PS/CICS.

Transfer is described in more detail in Chapter 3 of the *Extra! Extended Setup and Reference Manual*.

If *EXTRA!* is not set up to automatically load Transfer, you must load it manually. Manually loading *EXTRA!* for file transfer is described in the next section.

Manually Loading Transfer

Use the following instructions to manually load (i.e., load from the DOS prompt) the Transfer program.

1 Jump to your PC window.

2 Make sure you are in the DOS subdirectory that contains the *EXTRA!* program. If the program is on a diskette, insert it in Drive A, and make sure that drive is the current drive.

If the *EXTRA!* program is on your hard disk, make sure you are in the hard disk directory that contains your *EXTRA!* files. (For example, *c:\extra*)

If you prefer "background mode," simply add a */r* to the end of the command line. For example:

transfer x /r [Enter]

3 At the DOS prompt, type the Transfer command and the letter (short name) of the mainframe session where PS/CICS will be running. For example:

transfer x [Enter]

where *x* is the short name of the mainframe session.

The Transfer program is now loaded and you are ready to tell PS/CICS to transfer files between your PC session and the mainframe session. After Transfer is loaded, you will see a message in your PC session indicating the file transfer program is waiting for work.

4 Jump to the mainframe window and log onto PS/CICS.

Transfer occupies approximately 13K of your PC memory.

5 After starting PS/CICS, make any necessary changes in the defaults. If necessary, enlarge the mainframe window.

> **IMPORTANT:** Startup on PS/CICS can vary widely depending on your operating environment. Consult your System Administrator for specific PS/CICS startup information and for instructions on accessing the PS/CICS Import/Export menu.

6 Import or export a document as desired.

Exporting Files from PS/CICS to Your PC

You can take a document that is in your PS/CICS file cabinet or in-basket and export it to your PC. Once the file is loaded on your PC disk, you can use any PC software available to work directly with the file.

You can export the following:

- Editable documents and notes
- Image documents
- RF (Revisable Format) text documents
- FF (Final Form) text documents
- PC file documents

You cannot export references to external documents or messages.

When you export an editable document or a note, it becomes an FF text document. It remains in FF text when you transfer it back to PS/CICS. For more information on FF text and RF text documents, refer to your PS/CICS documentation.

To export a document from PS/CICS to your PC, you need to know:

- The name of the document you are exporting
- The destination drive
- The path name
- The file name and extension you want it to have after it is transferred to your PC

Importing Files from Your PC to PS/CICS

When you import files from your PC to your PS/CICS file cabinet you can send them to other PS/CICS users or store them in the DISOSS library.

To import a file from your PC to PS/CICS, you need to know:

- Which PC disk drive the file is on
- The PC filename and extension
- The filename you want it to have in PS/CICS

For more information, refer to your PS/CICS documentation.

File Transfer Status and Error Messages

If Transfer is loaded in the Foreground, during a file transfer, messages will appear in the PC window. The messages indicate the number of characters transmitted, errors, etc.

If Transfer is loaded with the "/r" option, type the following to display the status of the transfer:

[Ctrl/Alt] [Z] [T]

When an error occurs, the transfer is usually stopped and the mainframe session is returned to the READY mode. Certain types of errors can be detected by using DOS batch files to detect an "Error Level." For more information, refer to your DOS manual. If possible, correct the errors and restart the transfer.

Support for the DOS Path Command

EXTRA!'s path command feature allows you to run *EXTRA!* from any DOS directory on the PC, simply by typing *extra*. The path command tells DOS to search specified directories for commands or batch files that were not found by a search of the current directory.

Support for the path command means you can transfer files to and from the mainframe, regardless of the current directory. For example, you may be in the "Sales" directory. Instead of changing to the *EXTRA!* directory, you can simply type the foreground file transfer command at the DOS prompt to initiate a file transfer. The files will then be sent from, or received into, the current directory.

EXTRA!'s support for the DOS Path Command is limited to DOS 3.0 and above.

The following is an example of a path command that you or your System Administrator can put in your PC's AUTOEXEC.BAT file.

path=c:\;c:\dos;c:\sales;c:\extra

The example path statement above instructs DOS to search the root directory, then the DOS directory, then the sales directory, and finally the *extra* directory for the executable command or batch file entered at the DOS prompt.

5 Using Editor-Based File Transfer

This chapter explains how to use *EXTRA! Extended's* Editor-Based File Transfer feature. This method of file transfer is called "Editor-Based" because it works with mainframe line-editing software (TSO and CMS) to transfer text files between your PC and the mainframe. Essentially, it acts like a very fast typist working at a 3270 terminal.

The advantage to using this type of file transfer over host-based file transfer is that it doesn't require additional mainframe software to transfer text files. The disadvantage is that you cannot transfer binary files, such as spread sheets, graphics and some word processing documents, using this method. It also is slower and lacks the error-correction routines of host-based file transfer programs.

For information about host-based file transfer methods, refer to Chapter 4.

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Discussion: CMS and TSO File Transfer

There are two types of Editor-Based File Transfer: Conversational Monitor System (CMS) File Transfer and Time Sharing Option (TSO) File Transfer.

Both CMS (CMS XEDIT) and TSO (TSO EDIT) are mainframe applications that let you edit text files under the mainframe's operating system. CMS is used with the VM operating system, and TSO is used with the MVS operating system. To determine what operating system your mainframe uses, ask your System Administrator.

In addition to editing text files, CMS and TSO can be used to transfer files between mainframe sessions. To do this, CMS and TSO must be used with *EXTRA!* and its Editor File Transfer feature. This feature provides an easy-to-use file transfer interface that allows you to transfer files in the background. Transferring in the background means that you can jump from a PC session to a mainframe session, initiate a file transfer, then return to the PC session to continue working while the file transfers. You don't need to load and unload PC applications, or wait for the file transfer to complete. Background File Transfer is explained in more detail in Chapter 4.

Before you can begin transferring files to and from the mainframe, check with your System Administrator to be sure *EXTRA!* has been configured for Editor File Transfer (in Background File Transfer). This option is available through the configurator's "Startup" menu. For more information about configuring *EXTRA!*, refer to the *Setup and Reference Manual*.

This chapter explains how to use both TSO and CMS to transfer files between sessions. The following terms are used in this chapter: "upload" and "send," which mean moving a file from the PC to the mainframe, and "download" and "receive," which mean moving a file from the mainframe to the PC.

About TSO File Transfer

If your mainframe session uses the MVS operating system, you can use the mainframe editor, TSO EDIT, to transfer a text file between the mainframe and your PC. However, you must be in TSO command mode (also called a native TSO session). You cannot be in any other TSO subsystem, such as ISPF. When you are in native TSO, you see the Ready prompt. If you have any questions about TSO and file transfer, consult your System Administrator.

About CMS File Transfer

If your mainframe session uses the VM operating system, you can use the mainframe editor, CMS XEDIT, to transfer a text file between the mainframe and your PC. However, you must be in CMS command mode (also called a native CMS session). You cannot be in any other mainframe subsystem. When you are in native CMS, you usually see the Ready prompt.

In addition to being in CMS command mode, you also must turn off all unsolicited CMS messages. These messages may interrupt the transfer process unless you respond to them.

Turn off the messages by entering the following command on the command line of your CMS session:

set msg off [Enter]

To turn the messages back on, enter on the command line:

set msg on [Enter]

Before You Begin

Before using *EXTRA!*'s CMS File Transfer, you must create a file that contains the lines of data shown below. To create this file, jump to a CMS mainframe session and go into XEDIT mode. If you are not sure how to start up and use the editor, refer to your CMS documentation or ask your System Administrator.

In XEDIT, create a file with the filename *attachma xedit*. This file must contain the following lines of data:

```
SET SCALE OFF
SET NUMBER ON
SET CURLINE ON 3
SET CMDLINE BOTTOM
SET NULLS ON
SET PF7 FORWARD
SET PF8 TOP
SET PF9 FILE
SET PF10 BOTTOM
SET PF11 POWER
SET CASE MIXED
SET LINEND ON
SET RECFM V
```

XEDIT uses this file when transferring files between the mainframe and the PC.

TSO and CMS File Upload

To transfer a file from the PC to the mainframe using Editor File Transfer, follow the steps below. These instructions apply to both VM/CMS and MVS/TSO, since the same menus appear for both.

1 Jump to a mainframe session and establish either a CMS or TSO session. Make sure that you are in the correct mode.

If *EXTRA!* has been configured exclusively for Editor File Transfer, the Host File Transfer options will not appear on the menu as shown here.

2 Press the keys shown below. Note that these keys can be pressed from either a PC or mainframe window.

[Ctrl/Alt][F][T] or **WsCtrl PF15**

The menu below will appear on your screen:

```
                                                    File Transfer
Characters Transferred: 0                    Status: IDLE




→  Command:
   PC file:
 Window ID:
 Host File:
   Options:

FILE TRANSFER COMMAND
selections are:

  T(U/D) ..... TSO Editor (Upload/Download)
  C(U/D) ..... CMS Editor (Upload/Download)
  T(S/R) ..... TSO Host File Transfer (Send/Receive)
  C(S/R) ..... CMS Host File Transfer (Send/Receive)

ENTER (command) or <ctrl>-<enter> to execute, <esc> to quit. 12:22  1/04/98
```

3 At the "Command:" prompt, type one of the following:

TU [Enter]

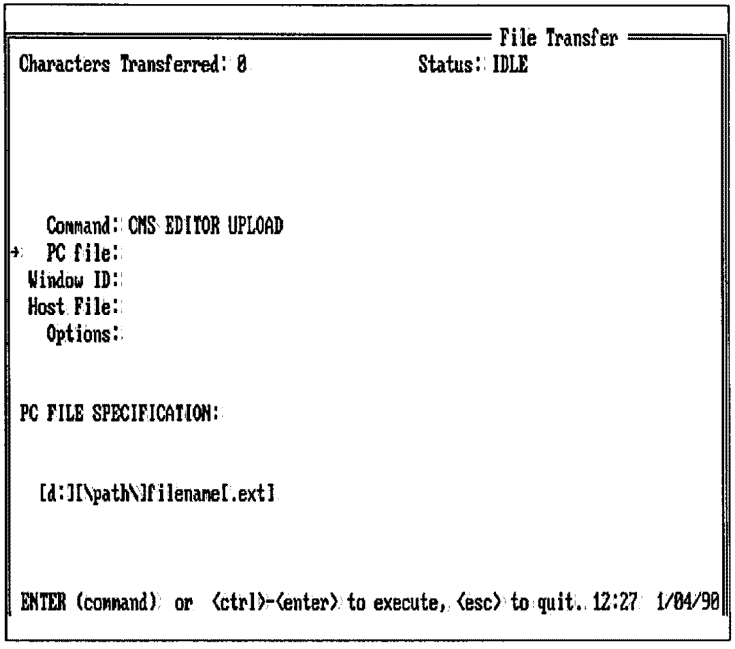
or

CU [Enter]

The command field automatically will be updated to reflect the full name of the file transfer: TSO EDITOR UPLOAD or CMS EDITOR UPLOAD.

✍ If the PC file that you are uploading is located in your current disk drive and directory (path), you only need to type the name of the PC file with its extensions.

4 The cursor will advance to the "PC File Specification" prompt, as shown below. Type the name of the PC file that you would like to upload to the mainframe, including the disk drive and path where the file is located, the filename, and its extension, if any. For example: *c:\sales\myfile.doc*. Press [Enter] after typing the filename.



5 After typing the filename, you will be asked for the window name of the mainframe session where your PC file will be sent (A - Z). After typing the short name, press [Enter].

6 After you have entered the session name, you need to give your PC file either a TSO Data Set Name or a CMS File Name, depending on your mainframe environment. The mainframe will store your file under this name.

For TSO, use the format shown below:

datasetname [(member)] [/pw]

where:

datasetname is a name that identifies the file being transferred to the mainframe. This parameter is required.

[(member)] is required if dataset is a partitioned dataset. Otherwise, it is not allowed. Your System Administrator may require you to save your file within a partitioned data set.

[/pw] is the write-password of the existing TSO dataset, if it is write-password-protected. This parameter is ignored if the dataset is not write-protected.

TSO calls a file a *dataset*. The name of this file is a *datasetname*. The *datasetname* is limited to 44 characters. *Member* and *pw* are limited to 8 characters each.

Valid characters include all alphanumeric characters (a-z, 0-9); letters are shifted to uppercase. You may also use three special characters ($, #, and @). Do not start any node of the *datasetname* (userid, name, or type) with a number (0-9).

For example, a typical TSO Data Set Filename would appear as follows:

file1.data(member2)/mypass

If the *datasetname* of the file does not begin with your userid, you must specify a "fully-qualified datasetname" and enclose the entire *datasetname* and *(member)* in apostrophes, as shown below. If the *datasetname* begins with your userid, you may omit both the userid and the apostrophes. To enter a fully-qualified *datasetname* with apostrophes, use the format shown below:

'highnode.name.type[(member)]'[/pw]

For CMS, use the format shown below:

filename filetype [filemode]

where:

The parameters shown should be separated by blank spaces.

filename is a name that identifies the file being transferred to the mainframe. This parameter is required.

Filename and *filetype* are limited to eight characters each. Valid characters include all alphanumeric characters (a-z, 0-9); letters are shifted to uppercase. You may also use five special characters ($, #, @, +, and _) unless they are defined as terminal control characters within your CMS profile. Do not use a hyphen within your filename. The hyphen is a restricted character.

filetype is an extension to the filename that identifies the contents of the file. For example *data* or *text*. This parameter is required.

[filemode] is an optional parameter that tells CMS the name of the mainframe minidisk where you want the file to be stored. This parameter defaults to the "A" minidisk.

For example, a typical CMS Filename would appear as follows:

pcdoc text A

7 All of the fields on the screen should be filled, except the "Options" field. This field will remain blank because no options are available with Editor File Transfer. If you would like to change any of the fields before uploading the file, simply [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes.

To start the file transfer, press the keys shown below:

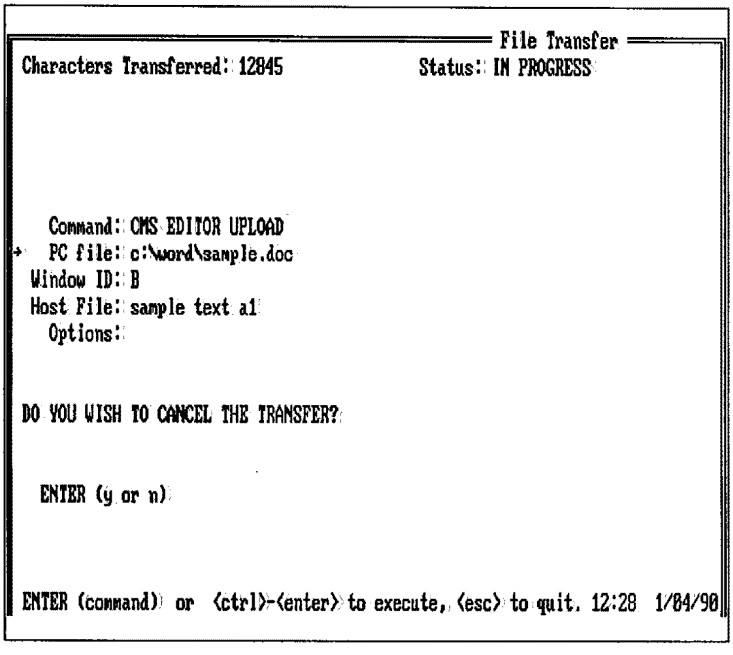
[Ctrl]/[Enter]

8 After pressing [Ctrl]/[Enter], the File Transfer screen will disappear. You can jump to any window, except the mainframe session window where your PC file is being transferred, and perform other activities.

You can check on the status of the file transfer at any time, or cancel the file transfer, by pressing the keys shown below:

[Ctrl/Alt] [F] [T]

The file transfer screen will return, as shown below, displaying the status of your file transfer operation and the number of characters that have been transferred. It also will ask you if you would like to cancel the transfer. To cancel the transfer, type [Y] after the prompt and press [Enter]. Type [N] or [Esc] if you would like the file transfer to continue.



The "Status:" field can contain any of the following messages:

IDLE	This message appears before a file transfer activity has begun. The number of characters transferred will be 0.
IN PROGRESS	The file transfer is in progress. You can determine how much of the file has been transferred by the "Characters Transferred:" field.
COMPLETE	The file transfer is complete. The "Characters Transferred:" field shows the total number of characters that were transferred.
ABENDED	The file transfer ended abnormally. The "Characters Transferred:" field shows the total number of characters that were transferred before it encountered a problem. An error message will appear on the screen.

9 After the file has been transferred, you can initiate a new file transfer operation by repeating steps 1 through 8. The fields on the screen still will contain the entries from your last file transfer operation. To change the contents of a field, [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes so that the old entry is removed and the new entry is recorded.

TSO and CMS File Download

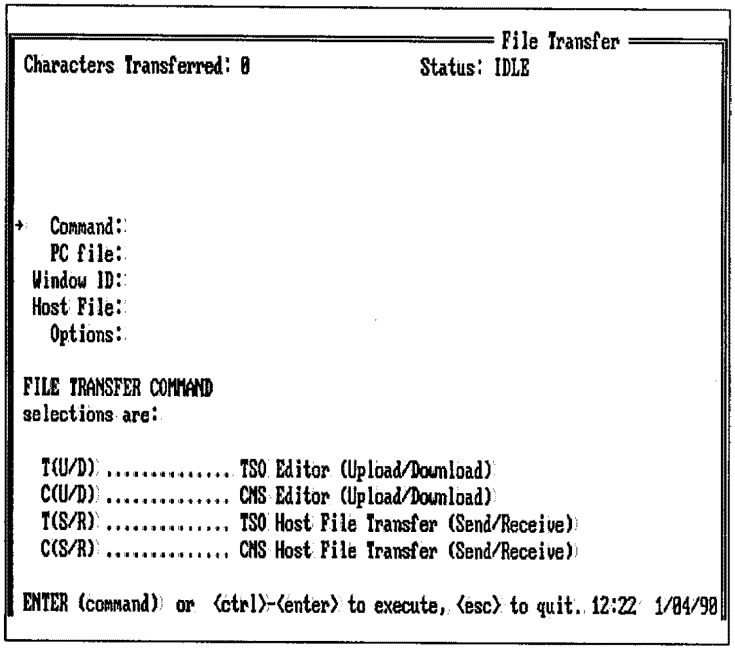
To transfer a file from the mainframe to your PC session, follow the steps below. These instructions apply to both VM/CMS and MVS/TSO, since the same menus appear for both.

1 Establish a CMS or TSO session in any of the mainframe windows (A-Z). Make sure that you are in the correct mode.

2 Press the keys shown below. Note that these keys can be pressed from either a PC or mainframe window.

[Ctrl/Alt] [F] [T] or **WsCtrl PF15**

The File Transfer menu will appear, as shown below.



3 At the "Command:" prompt, type one of the following lines:

TD [Enter]

or

CD [Enter]

The command field automatically will be updated to reflect the full name of the file transfer: TSO EDITOR DOWNLOAD or CMS EDITOR DOWNLOAD.

4 Create a PC filename for the mainframe file being downloaded. Be sure to include the disk drive and path name where the file will be stored, a filename, and any extensions. For example: *c:\sales\myfile.doc*. Press [Enter] after typing the filename.

5 After typing the filename, you will be asked for the short name of the mainframe session where the mainframe file is residing (A - Z). After typing the window short name, press [Enter].

6 After you have entered the window short name, you will be asked for the mainframe filename of the file being downloaded to your PC session. Enter either a CMS File Name or a TSO Data Set Name, depending on your mainframe environment.

For TSO, use the format shown below:

[']datasetname[(member)]['][/pw]*

where:

TSO calls a file a *dataset*. The name of this file is a *datasetname*. The *datasetname* is limited to 44 characters. *Member* and *pw* are limited to 8 characters each.

datasetname is a name that identifies the file being transferred from the mainframe. This parameter is required.

[(member)] is required if the dataset is in a partitioned dataset. Otherwise, it is not allowed. Your System Administrator may require you to save your file within a partitioned data set.

[/pw] is the read-password of the existing TSO dataset, if it is read-password-protected. This parameter is ignored if the dataset is not read-protected.

For example, a typical TSO Data Set Filename would appear as follows:

file1.data(member2)/mypass

If the *datasetname* of the file does not begin with your userid, you must specify a "fully-qualified datasetname" and enclose the entire *datasetname* and *(member)* in apostrophes, as shown below. If the *datasetname* begins with your userid, you may omit both the userid and the apostrophes. To enter a fully-qualified *datasetname* with apostrophes, use the format shown below:

'highnode.name.type[(member)]'[/pw]*

For CMS, use the format shown below:

filename filetype [filemode]

where:

✍ The parameters shown should be separated by blank spaces.

filename is a name that identifies the file being transferred to the PC session. This parameter is required.

Filename and *filetype* are limited to eight characters each. Valid characters include all alphanumeric characters (a-z, 0-9); letters are shifted to uppercase. You may also use five special characters ($, #, @, +, and _) unless they are defined as terminal control characters within your CMS profile. Do not use a hyphen within your filename. The hyphen is a restricted character.

filetype is an extension to the filename that identifies the contents of the file. For example *data* or *text*. This parameter is required.

[filemode] is an optional parameter that tells CMS the name of the mainframe minidisk where the file is located. This parameter defaults to the "A" minidisk.

For example, a typical CMS File Name would appear as follows:

pcdoc text A

7 All of the fields on the screen should be filled, except the "Options" field. This field will remain blank because no options are available with Editor File Transfer. If you would like to change any of the fields before downloading the file, simply [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes.

To start the file transfer, press the keys shown below:

[Ctrl]/[Enter]

8 After pressing [Ctrl]/[Enter], the File Transfer screen will disappear. You can jump to any window, except the mainframe session that contains the file being downloaded, and perform other activities.

You can check on the status of the file transfer at any time, or cancel the file transfer, by pressing the keys shown below:

[Ctrl/Alt] [F] [T]

The file transfer screen will return, displaying the status of your file transfer operation and the number of characters that have been transferred. It also will ask you if you would like to cancel the transfer. To cancel the transfer, type [Y] after the prompt and press [Enter]. Type [N] or [Esc] if you would like the file transfer to continue.

The "Status:" field can contain any of the following messages:

IDLE	This message appears before a file transfer activity has begun. The number of characters transferred will be 0.
IN PROGRESS	The file transfer is in progress. You can determine how much of the file has been transferred by the "Characters Transferred:" field.
COMPLETE	The file transfer is complete. The "Characters Transferred:" field shows the total number of characters that were transferred.

ABENDED — The file transfer ended abnormally. The "Characters Transferred:" field shows the total number of characters that were transferred before it encountered a problem. An error message will appear on the screen.

9 After the file has been transferred, you can initiate a new file transfer operation by repeating steps 1 through 8. The fields on the screen still will contain the entries from your last file transfer operation. To change the contents of a field, [Tab] to the field and update the entry. Be sure to press [Enter] after making any changes so that the old entry is removed and the new entry is recorded.

To Cancel Editor File Transfer

If you have not yet sent the file with the [Ctrl]/[Enter] command, you can exit the File Transfer menu by pressing [Esc]. To cancel the file transfer after pressing [Ctrl]/[Enter], follow the instructions provided in step 8, shown previously.

File Transfer Tips

- *EXTRA!* lets you transfer two files simultaneously by running a Background File Transfer in one session and a Foreground File Transfer in another. You cannot, however, run two Background File Transfers simultaneously. (Foreground File Transfer is only applicable to Host File Transfer since Editor File Transfer does not allow you to transfer files in the foreground.) Both Background and Foreground File Transfer are explained at the beginning of Chapter 4.

- Do not type anything into the mainframe window which is engaged in a file transfer unless you are responding to a specific system message. Typing into this window can cause the file transfer to fail.

- For best results, the file size of the data being transferred should be less than 100K. Files greater than 100K take a long time to transfer. The line length should be less than 255 columns in CMS or 252 columns in TSO while uploading, and 245 columns while downloading. If your file is larger than 100K, you may want to use IBM's IND$FILE Send/Receive program, which *EXTRA!* fully supports. This method of file transfer is explained in Chapter 4.

- TSO and CMS use an editor to upload and download files in much the same way that you would send a file. After you have entered a host filename, *EXTRA!* instructs the editor to create a new mainframe text file. The program then places the editor in input mode and transmits the data from the PC file to the mainframe as lines of input. When the last PC line has been transmitted, the file is saved and the editor exits.

When downloading, *EXTRA!* calls the editor and instructs it to list the mainframe file in a mainframe window. The program then reads this information from the screen and places it in the PC file. When all of the data in the mainframe file has been displayed, *EXTRA!* stops using the editor and closes the PC file.

- Your text file is sent to the mainframe as a large record. TSO limits the record length to 251 characters, therefore records longer than 251 characters will be split, with the characters after 251 forming a new record. For some file types, TSO may limit the record length to 80 characters, causing the record splits to occur after every 80 characters.

> *Record. A record is a related group of fields and a field is a related group of characters, such as your name or social security number.*

- If you specify a CMS filename that already exists on the mainframe, your PC file will be appended or added to the end of the existing CMS file.

To learn about other file transfer methods, refer to Chapter 4, "Using Host-Based File Transfer."

Appendix A
LAN and SDLC Startup Conditions

This appendix describes some of the screens you will see if you are connected to the mainframe through any of the methods shown below:

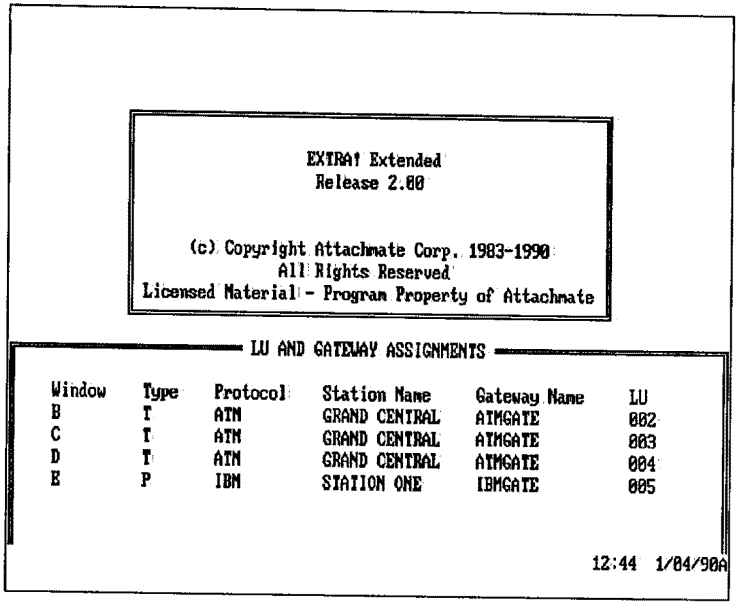
- LAN (local area network) using a gateway connection
- Remote connection with SDLC (synchronous data link control)
- Remote connection with Autolink/SDLC

If your PC is connected through any of these methods, read this appendix, then return to Chapter 2 to learn how to use all of *EXTRA! Extended*'s features. If you have a coax or direct token-ring (also called DLC/DFT) connection to the mainframe, go directly to Chapter 2. And if you're not sure what type of connection you have, ask your System Administrator.

Startup with a LAN Connection

If your PC has a LAN (Local Area Network) connection, it means that several PCs in your office are linked together on a network, and the network is connected to the mainframe.

To start *EXTRA! Extended* on a LAN PC, follow the instructions provided in Chapter 2, "Using Extra! Extended." After starting *EXTRA!*, you can check on the status of your four mainframe sessions by pressing [Ctrl/Alt][Z][L]. These keystrokes cause the following menu to appear:



Here are descriptions of the fields on this screen:

Window: Provides the short name of the mainframe session window.

Type: Identifies the type of session, either a [T] for terminal or a [P] for printer.

Protocol: Tells whether a mainframe session is communicating with the mainframe through an IBM or Attachmate (ATM) protocol.

Station Name: The name of the workstation (PC/Terminal) accessing the mainframe.

Gateway Name: The name of the gateway that the session is using to communicate with the mainframe. A gateway basically is a PC that emulates a 3X74 Controller.

LU: Provides the address or Logical Unit (LU) that the gateway uses to identify the mainframe session.

After viewing the "LU and Gateway Assignments" screen, you can return to your previous screen by pressing any key. If you would like to jump to a new session, press the following keys:

[Ctrl/Alt] [Spacebar] or **Jump**

Selecting a New Resource

When *EXTRA!* was configured, the "Keyboard Override" option may have been selected. This option can be selected from the Configurator's "Connection" menu. Keyboard Override allows you to change resources at startup.

When you start up, you may want to access a resource that is different from the one assigned to you. This is especially helpful if your assigned resource is busy. For example, let's say that you're customized for the resource "sales," but that resource is not available at the moment. You can select a new resource, "inventory," and run an inventory application while waiting for "sales" to become available.

To select a new resource, follow the steps below:

1 Check to see if your mainframe session is turned off. The Operator Information Area, located at the bottom of your screen, displays the "Terminal Session Off" message if your session is turned off.

If your PC is connected via LAN, you can turn mainframe sessions on and off individually.

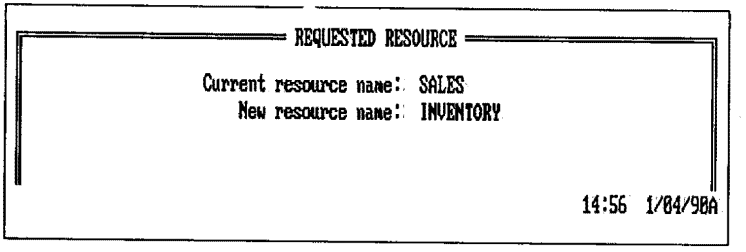
However, if you have a remote SDLC connection, the "off" command turns all your mainframe sessions off and disconnects the PC from the mainframe. When you use the same command to turn them back on, you must reestablish the connections with the same procedure you used when you started *EXTRA!*.

2 If your mainframe session is on, use the session "on" and "off" command, shown below, to turn the session off:

[Ctrl/Alt] [O] or **WsCtrl Reset**

The session "on" and "off" command is discussed in more detail in Chapter 2.

3 After the session is turned off, press [Ctrl/Alt] [O] or **WsCtrl Reset** once again to display a screen like the sample below:



4 At this screen, you can either type the name of a new resource and press [Enter], or press [Enter] by itself to keep your current resource.

Remote Connection with SDLC

SDLC (synchronous data link control) is an adapter that fits inside your PC. It allows your PC to communicate with a remote mainframe through phone lines using an external modem. With an SDLC connection, a modem dials your desired mainframe, allowing your PC to access the mainframe. This type of connection is different from a Autolink/SDLC connection. Autolink is an SDLC adapter that has a modem and automatic dialer on-board. It, too, fits into your PC. The procedures for using an Autolink/SDLC connection are described on page A-7.

Using Extra! with an SDLC Connection

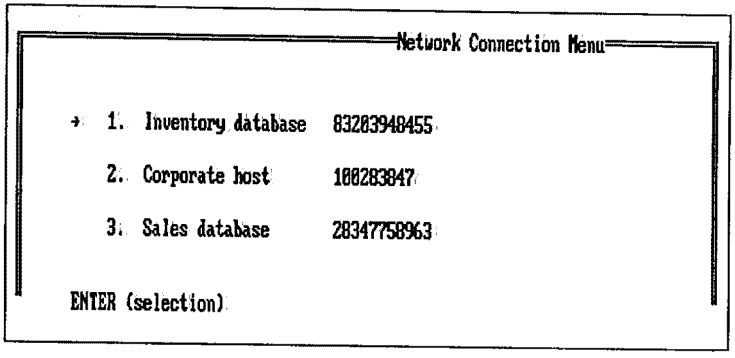
To start *EXTRA!* with an SDLC connection, make sure that *EXTRA!* is configured for SDLC, and that your PC meets all the requirements of your remote host (mainframe). You should be using an external dial-up synchronous modem. Consult your System Administrator if you have any questions.

Once your PC is properly configured, you can begin using *EXTRA!* by following the steps below:

1 Type *extra* after your PC's DOS prompt and press [Enter]. If you're not in a mainframe session, jump to one by pressing the following keys:

[Ctrl/Alt][Spacebar] or **Jump**

2 The Network Connection Menu, shown below, contains the names and telephone numbers of the mainframes your System Administrator has selected. If you see this menu after starting *EXTRA!*, decide which mainframe telephone number you want, then skip to Step 4.



3 If you do not see the Network Connection Menu, turn the mainframe session "on" by pressing:

[Ctrl/Alt][O] or **WsCtrl Reset**

Once the Network Connection Menu appears, select the mainframe telephone number you want.

With an SDLC connection, the session "on" command turns all of your mainframe sessions on, not just your current active session. You will need to reestablish the connection by following the same procedures as when you started *EXTRA!*.

4 Switch the modem setting to "Talk," and dial the number as shown in the menu.

5 The mainframe modem will generate a tone. When you hear the tone, switch the modem setting to "Data." Now hang up your handset and press [Esc].

6 From the mainframe session, you can begin using your "3270 terminal."

Remote Connection with Autolink/SDLC

Autolink is an integrated SDLC adapter that includes a modem and automatic dialer on a card that fits inside your PC.

Before you can begin using *EXTRA!* with this type of connection, make sure that *EXTRA!* is configured for Autolink/SDLC and that your PC meets all the requirements of your remote host (mainframe). Consult your System Administrator if you have any questions.

For Autolink to function, your terminal must be turned on automatically when *EXTRA!* starts up. (Refer to "Terminal On/Off" in the next section.)

Using Extra! with an Autolink/ SDLC Connection

EXTRA! offers several Autolink/SDLC options: Terminal On/Off, Auto-Dial/Disconnect, and Keyboard Override. The condition of your system at startup and the actions you take to dial-up depend on which combination of these options your System Administrator selected during customization.

Terminal On/Off: This option is selected on the Configurator's "Startup" menu. It controls whether or not the terminal is turned on automatically when *EXTRA!* is loaded. If you use more than one mainframe session, it is recommended that you choose Terminal Off; otherwise every time you start *EXTRA!*, the first number on the Network Connection Menu will be automatically dialed.

If *EXTRA!* is not configured for Terminal On, the setting of the Auto-Dial/Disconnect option has no affect on Autolink.

Auto-Dial/Disconnect: This is a Setup Modem option on the Configurator's "Connection" menu. It is chosen when modem parameters are selected for your Autolink/SDLC connection.

If Y (yes) is selected and your system is configured for Terminal On, the gateway or PC automatically establishes communications with the mainframe when your session request is initiated. It also re-establishes communications if the line goes down.

If N (no) is selected, the gateway or stand-alone will not automatically connect and disconnect communications with the mainframe.

Keyboard Override: This is a Setup Communications option on the Configurator's "Connection" menu. The default selection for this option is N (no).

The Keyboard Override does not apply if your terminal is on at startup and you are configured for Auto-Dial/Disconnect.

Under Conditions 2 and 3 described below, you establish a connection by selecting a phone number from the Network Connection Menu. If the Keyboard Override option is set to Y (yes), you can change the phone numbers on the Network Connection Menu or use a number that is not on the menu.

If Keyboard Override is not selected, you may select any of the phone numbers on the Network Connection Menu.

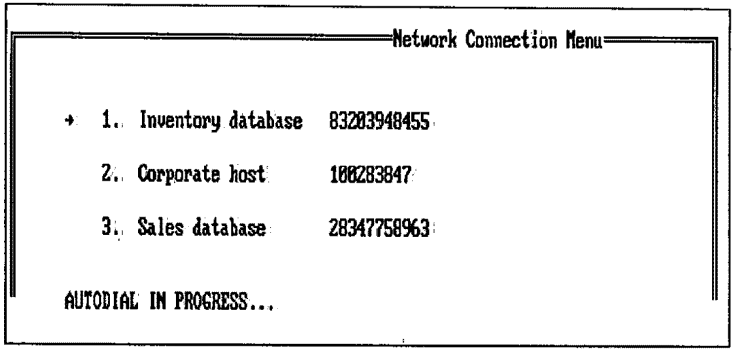
The condition of your system when you start *EXTRA!* depends on your configuration. To establish a connection, refer to the instructions for your system's startup condition, as described in the pages that follow.

- **Condition 1: Terminal On - Auto-Dial/Disconnect On**

Once your connection has completed (or failed), you can disconnect and change the phone number, if necessary, by turning a terminal off, and back on, then selecting the appropriate name from the menu.

When *EXTRA!* starts, the first mainframe telephone number (#1 on your Network Connection Menu) is dialed automatically. You do not need to take any action.

The Network Connection Menu appears, as shown below, and the message "AUTODIAL IN PROGRESS..." displays as the connection is being established.



- **Condition 2: Terminal On - Auto-Dial/Disconnect Off**

At startup, the Network Connection Menu appears. At the bottom of the menu you see the message: "ENTER (selection)."

Select and enter the number (1, 2, or 3) of the appropriate name on the menu.

If you selected Keyboard Override in customization, you can enter a mainframe telephone number not listed on the menu or you can change a listed number. Follow the instructions that appear on the screen.

- **Condition 3: Terminal Off (Auto-Dial/Disconnect On or Off)**

  Jump to a mainframe session window by pressing:

  [Ctrl/Alt][Spacebar] or **Jump**

  Turn the terminal on by pressing:

  [Ctrl/Alt][O] or **WsCtrl Reset**

  The Network Connection Menu appears. At the bottom of the menu you see the message: "ENTER (selection)."

  Select and enter the number (1, 2, or 3) of the appropriate name on the menu.

  If you selected Keyboard Override in customization, you can enter a mainframe number not listed on the menu or you can change a listed number. Follow the instructions that appear on the screen.

The table below summarizes the conditions described above:

	Terminal	AutoDial	Action
1	On	On	None. Number dialed automatically.
2	On	Off	Enter selection. Number is then dialed.
3	Off	On or Off	Go to mainframe window. Turn on terminal. Enter selection. Number is then dialed.

Error Messages in SDLC or Autolink/SDLC

You may encounter an error message while trying to make a connection using SDLC or Autolink/SDLC. A typical message would be "ERROR 42 BUSY SIGNAL" or "ERROR 4E NO ANSWER."

Error codes 40-59: If you receive an error code in this range, try to make the connection again. If you still can't make the connection, consult your System Administrator.

Other error codes: If you receive any other error code, consult your System Administrator.

Glossary

Adapter. A hardware device or "board" that is located within your PC and gives your PC additional capabilities, such as the ability to communicate with a controller, mainframe or other device.

Algorithm. A statement of the steps to be followed in performing a task or solving a problem. In a computer program, the steps of an algorithm are specified in a specific computer language.

Alt key. Key on 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.

Application program. The instructions to a computer to accomplish processing tasks for a user.

API. Application Program Interface. 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.

ASCII. American Standard Code for Information Interchange. A 7-bit code, developed by the American National Standards Institute committee, for the exchange of information between communication devices. ASCII is used primarily in asynchronous communications.

Asynchronous. 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 or 3270 emulation.

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 data that has accumulated over time. (Compare *interactive*).

Baud. A unit of measurement that indicates the electrical change from 0 to 1 across an electrical interface. 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 information that has been stored in the computer in a binary format. Binary is a notation system based on the number 2; it uses only two integers, 0 and 1. Typical binary files include spreadsheets, graphics, some word-processing documents, or a file that has a .COM or .EXE extension.

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 currently 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 8 bits whose sequence represents one character.

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 37XX Communications Controller.

Character. A single unit of meaningful data, such as letters and numbers.

CICS. Communications Information Control System. A mainframe database application that offers limited relational functions but quick response time.

Circuit. A communications path between two points.

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*).

Communication link. See *Data link.*

Compatible. Pertaining to computers on which the same computer programs can run without appreciable alteration.

Concurrency. Enables PC programs to run concurrent with 3270 mainframe functions even if the PC window is not selected.

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 host processor on a network.

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, file transfer and printer emulation.

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.*

Data communications. The transmission of data over electronic communication links between a computer system and a number of terminals at some distance away from the computer.

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. The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

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.*

Dedicated lines. Private circuits between two or more stations, switches, or subscribers.

Default. A value that is used when nothing is specified by the user.

DFT. See *Distributed Function Terminal.*

Diagnostics. Special software routines that identify malfunctions.

Dialup. Access to a switched network, usually through a dial or push-button telephone.

DISOSS. See *Distributed Office Support System.*

Distributed Functional Terminal (DFT). (1) An operational mode that allows multiple concurrent logical terminal sessions. Contrast with *Control Unit Terminal (CUT).* (2) A hardware/software protocol used to communicate between a terminal and a 3X74 control unit.

Distributed Office Support System (DISOSS). An IBM mainframe-based system for the translation, exchange, and routing of 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 interchanged 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 programs that enables a personal computer to organize and use information on diskettes or fixed disks, including application programs.

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).

Downloading. Transferring a file from a mainframe to an IBM PC.

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.*

EMS. See *Expanded Memory Specification.*

Emulation. The process of imitating the functions of another system.

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.

Expanded Memory Specification (EMS). A specification developed by Lotus, Intel, and Microsoft that allows DOS applications, such as *EXTRA! Extended,* to use memory normally not available.

Extended Attribute Byte (EAB). Allows 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. In DOS, an optional parameter that, if used, immediately follows a filename. It consists of a period and 1-3 characters.

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. Fields are defined using either text data paths or tree data paths.

File. A collection of related data that is stored and retrieved by an assigned name.

Filename, DOS. In DOS, that portion of the file name that precedes the extension. This form is only for syntax descriptions.

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 screens 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.

Floppy disk. A removable disk (diskette) with a magnetized surface layer on which data can be stored by magnetic recording.

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.

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.

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 communicating elements to verify that communication has been established.

Hardware. The equipment, as opposed to the programming, 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 Basic, Cobol and other high level languages. HLLAPI allows PC programs to communicate directly with the mainframe.

Host. The computer that provides processing capabilities for terminals and other devices attached to it.

Host computer. The primary and controlling computer in a network; usually provides services such as computation, data base access, and advanced programming function. Sometimes referred to as a host processor or mainframe. In the IBM environment, the host is usually an S/370, 9370, 4300, or 30XX series of computer.

Host graphics. Graphics images generated on an IBM mainframe computer and displayed or printed on a 3270 terminal.

IBM. International Business Machines Corporation.

Information utility files. Contain information regarding Program updates and extended features, detailed technical data, troubleshooting, and other general and valuable information relating to *EXTRA! Connectivity Software* and its environment.

Input device. A physical device 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 or inquiry. (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 3270 emulation system supplied by Digital Communications Associates, Inc.

Keyboard. An input device consisting of various keys that allow the user to input data, control cursor and pointer locations, and control the dialog between the user and the workstation.

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.

Line speed. The maximum transmission rate over a communications channel, usually expressed in bits per second.

Link. A circuit or transmission path, including all equipment between a sender and a receiver on a network.

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.

Logoff. A command for ending a mainframe session.

Logon. A command for beginning a mainframe session.

Mainframe. See *Host computer.*

Megabyte (MB). One million bytes.

Menu. A displayed list of items from which a user can make a selection.

Micro-mainframe link. A package specifically designed to accomplish communication between a PC and a mainframe computer.

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. More than one SNA session with an IBM mainframe, used to access multiple mainframe applications from a single terminal or PC.

Multiple Virtual Storage (MVS). The actual name is OS/VS2-MVS. It is the primary operating system for large IBM and IBM-compatible computers.

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 customer) or shared (for the use of many customers).

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 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.

Node. Any device such as a computer, terminal, or peripheral that is connected to a communications network.

Notepad window. An electronic "scratch pad" that provides 1,920 bytes of on-line text data which can be viewed, entered, saved or edited on PC. Can be stored or retrieved from PC disk at any time.

OIA. See *Operator Information Area.*

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 25th line of all 3270 terminals, reserved as a status line, displays information in text and symbols about the status of the terminal and the application that is running.

Operator information line. A line on your personal computer or workstation screen used to display messages and status information. This information is normally displayed on the last line on the screen.

Packet size. The size of data units, in kilobytes, used in Structured Field file transfer.

Parallel transmission. A method of information transfer whereby the bits composing a character are sent over a number of wires at the same time. This form of transmission is faster than serial transmission. (Compare *serial transmission).*

Path. A DOS command used to access files found in subdirectories on a hard disk. This command tells DOS to search specified directories for commands or batch files that were not found by a search of the current directory.

Peer-to-peer communications. The ability of intelligent devices to communicate directly with one another without relying on the mainframe.

Physical Unit (PU). A term used in the SNA environment to identify the addresses for printers, terminals, PCs, and other devices on the network.

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.

Polling. A method of controlling the sequence of transmission 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.

Port. A point of exit or entry for a data channel in a network, usually found on the *front end processor.* The point at which devices can be connected to computers or networks for transmitting or receiving data.

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 not 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. A function of the 3270 Control Program that allows a printer attached to the PC or a local area network to appear to the mainframe as a 3287 printer.

Program. A file containing a set of instructions conforming to a particular programming language syntax.

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 that will enable the effective exchange of information between them.

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/CICS. Stands for Personal Services/Customer Information Control System. PS/CICS is a method of transferring files between a mainframe and a PC using IBM's Distributed Office Support System (DISOSS).

PS/PC. A PC-resident program used to perform office automation tasks under DISOSS.

Query. The action of searching data for desired information.

Queue. A line or list formed by items waiting to be processed.

Record. A collection of fields treated as a unit.

Requester. The program that relays a request to another computer through the Server-Requester Programming Interface (SRPI). (Contrast with *Server*.)

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.

Screen capture. Enables a "snapshot" of an entire window screen. Can save screen images to disk or print on PC printer.

Screen print. Screen print allows the contents of the screen that is currently displaying to be printed at the PC printer.

SDLC. See *Synchronous Data Link Control.*

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 over a single wire. (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.

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.

Shared Address. A portion of memory used in reserve DOS.

SNA. See *System Network Architecture.*

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.

Structured Field. A field is a related group of characters, representing some unit of information, such as a person's name or social security number. A field usually contains several characters but can consist of a single character. A structured field requires certain information to be placed in the field. A structured field also refers to a packet of information used to transfer data to and from the host.

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 communications that operates within SNA. A discipline for managing synchronous, code-transparent serial-by-bit information transfer over a link connection. (Compare with *Binary Synchronous Communications.*)

Synchronous transmission. A transmission scheme or 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.

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 can be multiplexed into 24 individual channels of 64Kb each.

Text File. A file that contains alphanumeric text in a readable format, as opposed to numeric text which is not readable. A typical text file would be a word-processing file.

Token Interface Coupler (TIC). A high-speed interface that links a mainframe to a token ring network.

Token-Ring. A network with a ring topology that passes tokens from station to station.

TOKREUI. (Token-Ring Extended User Interface) DLC hardware drivers for the token-ring cards.

TSO. Time Sharing Option. An interactive mainframe system that resides under the MVS operating system. Provides editing and file management functions.

TTY Teletype. A standard file format for ASCII, asynchronous communications, based upon early Teletype devices.

Uploading. Transferring a file from the PC to the 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.

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 (50 miles or more) and may include packet-switching, public data, and value-added networks.

Window. A defined area on the PC display which is used to present a PC session, a mainframe session, or a Notepad.

Window layouts. Allows set-up of start-up window configurations. It includes the ability to color screens, move windows, size windows, etc.

Workstation. A single-user computer system designed for multiple active functions, such as word processing and mainframe access.

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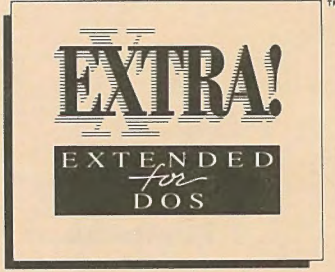

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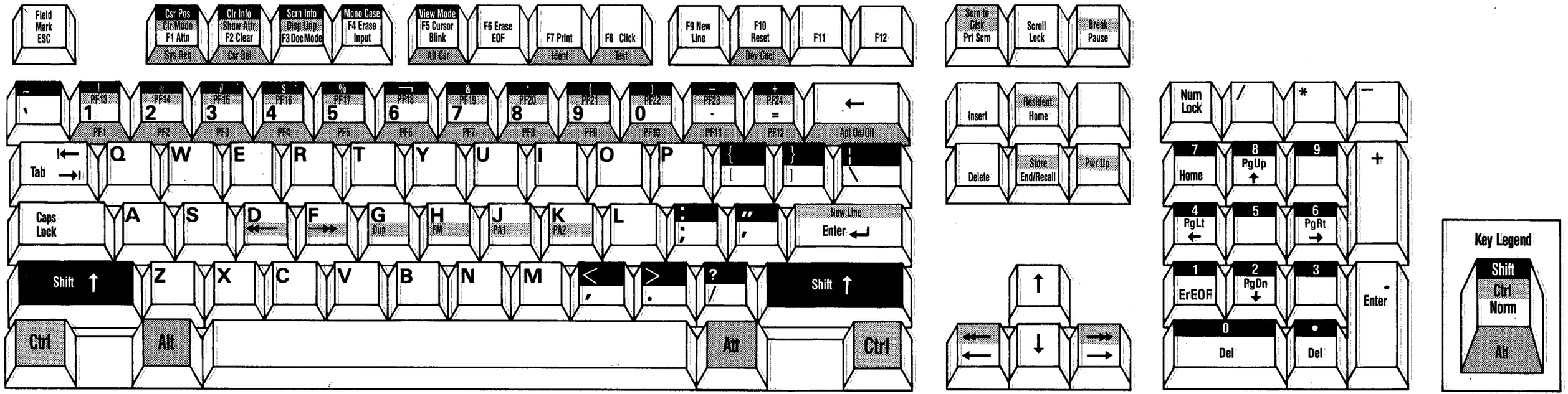

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