MAI Basic Four®
MAI PC-Link
User Guide

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PREFACE

The MAI PC-LINK User Guide provides information for transferring files to and from MAI Basic Four and PC systems, as well as instructions to run the MAI PC-LINK programs.

The major topics covered in this manual are:

Section 1	Introduction
Section 2	Getting Started Using MAI PC-Link
Section 3	Terminal Emulation
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WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications, as temporarily permitted by regulation. It has not been tested for compliance with the limits for Class A Computing Devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause inter-ference, in which case the User at his own expense will be required to take whatever measures that may be required to correct the interference.

SECTION 1

INTRODUCTION

WELCOME TO MAI PC-LINK

We are pleased that you have selected MAI PC-LINK as your DS-500 personal computer (PC) to Basic Four minicomputer link. We trust you will find that it is the most user friendly and powerful product of its type and that it will aid you in becoming more productive and cost effective.

WHAT YOU CAN EXPECT TO DO WITH MAI PC-LINK

One of MAI PC-LINK's principal features is to provide you with standard MAI BASIC FOUR 7270 VDT or EVDT terminal emulation. That is, your PC micro coupled with a licensed copy of MAI PC-LINK will provide you with the ability to simulate the operation and use of a standard VDT or EVDT. But that's not all. MAI PC-LINK will allow you to transfer files and reports from your host BASIC FOUR minicomputer to your PC and reformat them into a number of popular PC micro formats such as those used by Lotus 1-2-3*, dBase II*, Multimate*, Wordstar* and Multiplan*. You can select a whole file or you may choose to receive only the lines and fields that are of interest to you. MAI PC-LINK will do the rest.

Now you can use data from your BASIC FOUR to do "what-if" calculations on your favorite spreadsheet, or to create a database for your automated mailing list program. MAI PC-LINK can also send PC micro files to your host BASIC FOUR to update files or to share your data with other users. The possibilities are limited only by your imagination.

*Refer to Appendix F for Trademark Information for these products.

NOTES

SECTION 2

GETTING STARTED USING MAI PC-LINK

HARDWARE REQUIREMENTS

To use MAI PC-LINK, certain hardware is required as a minimum. You are required to have:

- An IBM* Personal Computer/XT/AT, Compaq* or another IBM Personal Computer compatible computer with at least 256K of memory and at least one floppy disk drive.
- MS/PC DOS 2.0, or greater.
- Either the IBM Monochrome Display or the IBM Color Graphics Display or equivalent.
- An IBM or equivalent asynchronous communications interface card. MAI PC-LINK uses either communications port #1 (COM1:) or #2 (COM2:).
- A parallel or serial printer connected to the Personal Computer (not required if "local printing" is not required).
- A cable to connect the Personal Computer to the BASIC FOUR computer or a modem for remote connection (refer to Section 2 "GETTING CONNECTED" for specific connection requirements).
- An MAI BASIC FOUR minicomputer (MAI 2000, MPX 8000, or 1300 series) running Level 3.7 or higher operating system.

* Refer to Appendix F for trademark information for these products.

HOW TO USE THIS MANUAL

In writing this manual we tried to introduce each feature of MAI PC-LINK as a separate section. However, in an effort to reduce redundancy, cross references will be made. We have also included several appendices which provide summary or additional information:

Appendix A - A glossary of common computer and communication terms.

Appendix B - A summary of the command menus available in MAI PC-LINK along with a brief description of their use.

Appendix C - Information on copy protection and how it affects your use of MAI PC-LINK.

Appendix D - A list and description of the files included on your master MAI PC-LINK diskette.

Appendix E - Tips on how various application packages can use the data files reformatted by MAI PC-LINK.

Appendix F - Trademarks.

Appendix G - Limitations.

Appendix H - Help with set-up problems.

Appendix I - Basic Four Terminal Control Mnemonics recognized by MAI PC-LINK.

MAI PC-LINK INSTALLATION, UNINSTALLATION

MAI PC-LINK programs are provided on floppy diskette which you may transfer and install (1) onto your hard disk into a directory, or (2) to another floppy diskette using the following installation procedures. The complete set of MAI PC-LINK programs can then be uninstalled back to floppy by executing the uninstall procedures if you wish to use MAI PC-LINK

on a different personal computer or reformat your hard disk.

MAI PC-LINK Installation

You cannot run MAI PC-LINK from the MASTER DISK. You can only run MAI PC-LINK from a working copy created by the installation procedure. The following options are open to you:

Option 1: You can install MAI PC-LINK from the MASTER DISK to either (i) a hard disk or (ii) a formatted, double-sided, double density floppy diskette. Once installed, no further installs are left until you perform an uninstall (Option 2).

Option 2: You can uninstall MAI PC-LINK from the working copy created via Option 1 above, back to the same MASTER DISK it was created from. Once uninstalled, you can install it again (refer to Option 1).

Each of the above options is elaborated upon in detail below.

Installing MAI PC-LINK onto a Hard Disk

You can install MAI PC-LINK onto your personal computer's hard disk and into a subdirectory. Additionally, you can uninstall MAI PC-LINK from your hard disk, if you want to install MAI PC-LINK onto a different hard disk, or if you need to reformat your hard disk.

Installation is a simple process performed through a series of prompts. The following procedure guides you through the process of installing MAI PC-LINK onto your hard disk. In the following description (CR) represents pressing your RETURN key.

1. Insert your original MAI PC-LINK distribution diskette into drive A:.

2. Make the A drive the default drive. This may be done by typing:

   A:(CR)

3. Start the installation program by typing:

   INSTALL(CR)

4. The program will then display the following message and prompt:

   MAI PC-LINK Install/UNinstall Procedure

   Enter letter for media to be installed to or Uninstalled from

   Use H for hard disk or F for floppy disk=__

   Press H(CR) to select hard disk.

5. The program will then display the following message and prompt:

   MAI PC-LINK Diskette Installation (2.0.3)

   Diskettes MUST NOT have a write protect tab

   Please enter DRIVE letter, and hit return (--)

   Product diskette refers to the original product package diskette

   Product Diskette Drive (Input)= _____

   The last line of the above message is asking you for the drive where the Distribution Diskette can be found. This will normally be A(CR).

6. You will then be prompted with the following message:

   Hard Disk Drive (Output)= _____

This will typically be drive C(CR).

7. The screen will then display the following message:

    Verify Product Diskette in Drive _____

    Hit RETURN (-) to continue.

    The copy protection program will then verify that you have the original distribution diskette in the drive indicated. After verification has been completed successfully, the following message will be displayed:

    MAI PC-LINK maximum install count is 0001
    After this install, 0000 install(s) will be available

    Enter Y to continue or N to quit, then hit RETURN -(--)

    Press Y(CR) to continue with installation or press N(CR) to discontinue.

8. The screen will then display the following message:

    Processing, please wait...

    While this message is displayed, the computer is installing the protected version of MAI PC-LINK onto your hard disk. This process may take a minute, so be patient and DO NOT interrupt the transferral procedure. After the program has been installed, the screen will display the following message:

    MAI PC-LINK has been successfully installed

This message indicates a successful installation of MAI PC-LINK onto your hard disk. If any error conditions were encountered, an appropriate error message will be displayed. Please note the content of the error message, and contact your dealer for technical assistance.

Installing MAI PC-LINK onto a Floppy Diskette

You should install MAI PC-LINK onto a floppy diskette if your personal computer is equipped for a floppy diskette(s). You should always run from the working copy that you create by doing this type of install and store your original MASTER DISK in a safe place for backup.

You also may uninstall MAI PC-LINK from that floppy disk. This is important if you start to experience hardware types of problems with that working copy.

Installation is a simple process performed through a series of prompts. The following procedure guides you through the process of installing MAI PC-LINK to a blank, formatted (360K) double-sided, double density floppy diskette. (CR) represents pressing your RETURN key.

1. Insert your original MAI PC-LINK distribution diskette into drive A:

2. Make the A drive the default drive. This may be done by typing:

   A:(CR)

3. Start the installation program by typing:

   INSTALL(CR)

4. The program will then display the following message and prompt:

MAI PC-LINK INSTALL/UNinstall Procedure

Enter letter for media to be installed to
or UNinstalled from

Use H for hard disk, or F for floppy disk= ___

Press F(CR) to select floppy disk.

5. The program will then display the following message and prompt:

MAI PC-LINK Diskette Installation(2.03)

Diskettes MUST NOT have a write protect tab

Please enter DRIVE letter, and hit return (--)

Product diskette refers to the original product package diskette

Product Diskette Drive (Input) =____

The last line of the above message is asking you for the drive where the Distribution Diskette can be found. This will normally be A(CR).

6. You will then be prompted with the following message:

Target Diskette refers to the diskette created by Install...this diskette must be formatted

Target Diskette Drive(Output) = ____

This will typically be drive B(CR).

7. The screen will then display the following message:

    Verify Product Diskette in Drive ____

    Hit RETURN (__) to continue.

    The copy protection program will then verify that you have the original distribution diskette in the drive indicated. After verification has been completed successfully the following message will be displayed:

    MAI PC-LINK maximum install count is 0001

    After this install, 0000 install(s) will be available

    Enter Y to continue or N to quit, then hit RETURN (--)

    Press Y(CR) to continue with installation or press N(CR) to discontinue.

8. The screen will then display the following message:

    Processing, please wait...

    While this message is displayed, the computer is installing the protected version of MAI PC-LINK onto your floppy disk. This process may take a minute, so be patient and DO NOT interrupt the transferral procedure. After the program has been installed the screen will display the following message:

    MAI PC-LINK has been successfully installed

This message indicates a successful installation of MAI PC-LINK onto the floppy disk. If any error conditions are encountered, an appropriate error message will be displayed. Please note the content of the error message, and contact your dealer for technical assistance.

Uninstalling MAI PC-LINK

There may be times when you want to uninstall MAI PC-LINK from your hard or floppy disk. With this version of MAI PC-LINK, you are allowed to install and uninstall as many times as you like. However, you may only have MAI PC-LINK installed onto one hard disk OR one floppy diskette at any time.

After performing an install to a hard disk, your original diskette is still executable. But you are not allowed to install on any other floppy or hard disks until you uninstall MAI PC-LINK from that hard disk.

After performing an install to a floppy disk, your original diskette is still executable. But you are not allowed to install on any other floppy or hard disks until you uninstall MAI PC-LINK from that floppy disk.

Uninstalling steps are as follows:

1. If you are uninstalling from hard disk, ensure you are in the directory that MAI PC-LINK was originally installed in.

2. Insert the original distribution diskette into drive A:.

3. Make the A drive the default drive (see install procedures).

4. Start the UNinstall procedure by typing:

   INSTALL/U(cr)

The /U tells the INSTALL program that this is to be an Uninstall operation.

The procedures and screens will be according to the Installation procedure previously described. At the end of UNinstalling, you will have an install count of 0001 and will be able to install again.

Transferring MAI PC-LINK Support Files

It is important to notice that running the installation program does NOT transfer any of MAI PC-LINK support programs or files to the target disk. It is still necessary to copy these files to your hard disk. We have included a "batch" file on the MASTER disk call TRANS.BAT which will transfer all the appropriate files for you. To use this program, ensure that you are in the correct directory on your target disk. Place the original MAI PC-LINK MASTER diskette in drive A. Make drive A your default drive and type in the following:

TRANS A C(cr) (typical hard disk)

TRANS A B(cr) (typical floppy disk)

The corresponding "batch" file on the HOST PROGRAMS disk is called TRANSH.BAT. Place the HOST PROGRAMS disk in drive A and type the following:

TRANSH A C(CR) (typical hard disk)

TRANSH A B(CR) (typical floppy disk)

Perform these two procedures to transfer the necessary files to your hard disk.

Special Concerns for the IBM AT* (or Compatibles)

High Density Diskettes

Users who are installing a floppy working copy must use a formatted, double-sided, double density disk-

* Refer to Appendix F for trademark information for this product.

ette as the target disk. The messages, "Install terminated Error Code 6100 or 8304" will be displayed if the target diskette is high capacity (1.2 Mb).

High Density Drives

Any floppy disk that was previously made by or written to, using a high capacity drive, may be unusable on a normal capacity disk drive. Therefore, if the distribution disk will be used to install on machines with regular drives, run INSTALL from the low density drive. If the working copy is to be used on regular drives in addition to high density drives, make the working copy in a low density drive. If the IBM AT has only one low density drive, use it for a one drive install specifying that drive letter for both Product and Target disks.

DOS BACKUP AND RESTORE (HARD DISK)

Files which are critical to the operation of MAI PC-LINK have been marked as read-only. Therefore, if the hard disk is not to be reformatted, users may perform a DOS BACKUP and RESTORE without damaging the protected programs or support files by specifying RESTORE /P. The /P option will cause DOS to prompt you before trying to RESTORE read-only files. You SHOULD NOT restore any MAI PC-LINK files that are marked as read-only.

If you plan on reformatting your hard disk then you MUST UNinstall MAI PC-LINK from the hard disk before reformatting. Failure to do this, even if you have performed a complete DOS BACKUP, will result in the loss of your hard disk install, and you will have to operate MAI PC-LINK from your original distribution master.

GETTING CONNECTED

MAI PC-LINK can connect your PC micro to your host BASIC FOUR mini in two ways. The first (and simplest) method is often referred to as a direct link. That is, the PC and the host are connected directly by a cable. The second option is usually referred

to as remote connection. Here communication can be done using the telephone lines. Each mode of connection is described in detail in the following sections.

Using a Direct Connection to the Host

If your micro and your host computers are to be located in the same building, you may use a direct link. MAI PC-LINK requires the Personal Computer to be connected to the MAI BASIC FOUR computer through the PC asynchronous communications port #1 or port #2 (port #1 is the default). The IBM asynchronous communication card (or equivalent) has a male-type DB-25 connector. The terminal ports on the back of the BASIC FOUR have female-type connectors. Therefore, to directly connect the PC to BASIC FOUR, you have two options:

1. Use a standard BASIC FOUR cable from the BASIC FOUR computer to your work location. This cable will have male-type connectors on both ends, so it will not plug directly in the Personal Computer. You will need a short adapter cable with female-type DB-25 connectors at each end. If you are going to assemble this cable yourself, you will need two female DB-25 connectors and about one to two feet of cable with at least four leads in it. The connectors are assembled to the cable as follows:

	Female Connector Pin		Female Connector Pin	
Plug into cable from from Basic Four computer	1	-------	1	Plug into Personal Computer Asynchronous Comm port
	2	-------	2	
	3	-------	3	
	7	-------	7	

The other pins on the connectors are not used.

If you are going to buy this cable, specify a "one to two foot long DB-25 cable assembly with female connectors at each end, wired 1,2,3,7 with no crossovers".

2. Use a custom cable directly from the BASIC FOUR computer to your work location. In this case, you will need a four-lead cable with a male DB-25 connector at one end and a female DB-25 connector at the other end, long enough to reach from the BASIC FOUR computer to your work location. It should be wired as follows:

	Male Connector Pin		Female Connector Pin	
Plug into cable from from Basic Four computer	1	-------	1	Plug into Personal Computer Asynchronous Comm port
	2	-------	2	
	3	-------	3	
	7	-------	7	

Using a Remote Connection to Your Host

(If you will be connecting your PC directly to the BASIC FOUR, you can skip ahead to the section on starting MAI PC-LINK.)

If you wish to link with the host BASIC FOUR at a remote location, you may do so by communicating over a telephone line. A modem will be required at each end. Due to the standard hardware setup used by the BASIC FOUR minis and the PC micros, the modems must be of the asynchronous type. Either acoustic or direct wire modems may be used, but the modems must be capable of handling 1 start bit, 7 data bits, 1 stop bit and 1 parity bit. Any standard baud rate may be used, but the modems at each end must match the baud rate set up on the BASIC FOUR. Some of the modems that will work are listed below:

1. Hayes or Hayes compatible
2. Racal Vadic .....3451 PA
   (direct line, auto dial)
3. Racal Vadic .....3451 P
   (direct line, manual dial)
4. Racal Vadic 3455
   (direct line, manual dial)
5. Anderson Jacobsen .....1234 A
   (acoustic, manual dial)

Using an Acoustic Coupler Modem

If you wish to use an acoustic modem for your link session, you must first connect it to the serial port on your PC (refer to the modem owners manual for details). Next, start MAI PC-LINK (refer to the next section) on your PC and enter the Configuration menu. Set the baud rate to match the setting of the modem and BASIC FOUR (e.g., if your modem is set to work at a baud rate of 1200, set MAI BASIC FOUR to communicate at 1200 baud - refer to Section 8). MAI PC-LINK is now ready to start remote communications session, so exit the Configuration menu and enter Terminal Emulation mode. (Refer to Section 3 for details). Dial the desired number on your telephone and wait for an answer. A distinct high pitched whine indicates a modem on the other end is ready to connect. Immediately plug the phone headset into the rubber cups on the modem and wait for an indication of a connection (most modems have a light that goes on when a connection is made). Your link session can now begin.

When you have finished your link session and wish to hang up the modem, you may either remove the telephone handset from the rubber cups and hang it up as usual, or you may step out of Terminal Emulation mode (by pressing ESC) and select the Hang Up option in the menu. This causes MAI PC-LINK to lower DTR so that the modem will think that the PC is not ready. Note that if this method is used, you must ensure that your modem supports it. Some modems have switches that either force the modem to listen for DTR or ignore it. Check that the connect indicator is OFF when this method is used.

Using a Direct Line Modem

If you plan to use a direct line modem, it must first be connected to the PC serial port (refer to the owners' manual for the modem for details). Also ensure that the modem telephone jack is plugged into the wall socket. Next, start MAI PC-LINK (refer to the next section) on your PC and step into the Configuration menu. Set the communications parameters to the desired state (e.g., if your modem is set to work at 1200 baud then set MAI PC-LINK to communicate at 1200 baud). If your modem supports auto-dialing and/or auto answer and it requires an initialization string to set it up, select Modem, then Initialization from the menu and enter the desired string when prompted. If your modem requires a dial prefix for auto-dialing, select Dial Prefix and enter the desired string when requested. Both of these user-definable strings support special characters if required (refer to Section 8 for Configuration setup).

Example: To enter Control E you may enter either

\E

Or

\005 - the backslash must be followed by 3 decimal digits.

Finally, you may enter the default telephone number by selecting Number on the menu and entering the number as requested. If your modem requires a special hang-up sequence, select Hang Up and enter the sequence. Note: read the modem owners' manual to determine which strings are required and which characters are allowable.

When this has been completed, you may start your link session by exiting the Configuration menu and selecting the Terminal option. If you wish to use the autodial feature, select the Dial option. MAI PC-LINK will use the autodial feature of the modem to connect to the remote host. If a connection is made, the modem connection indicator should go on. Refer to Section 8 for further details.

STARTING MAI PC-LINK

MAI PC-LINK may be started from either a floppy drive or a hard disk, depending on your preference. The only requirements are that:

1. The drive that is to run MAI PC-LINK is the default drive and MAI PC-LINK is in the default directory on that drive;
2. And, for floppy systems, the original MAI PC-LINK diskette is in one of the drives during startup to verify that it is a licensed copy.

MAI PC-LINK does not need to be connected to your host BASIC FOUR in order to run, although in that case a link session cannot be attempted until a connection is installed. To start MAI PC-LINK, type PCLINK. After a brief pause a logo will appear. Press any key to advance to the main command menu (see Figure 2-1). You are now in Command Mode. In Command Mode, MAI PC-LINK is controlled through a

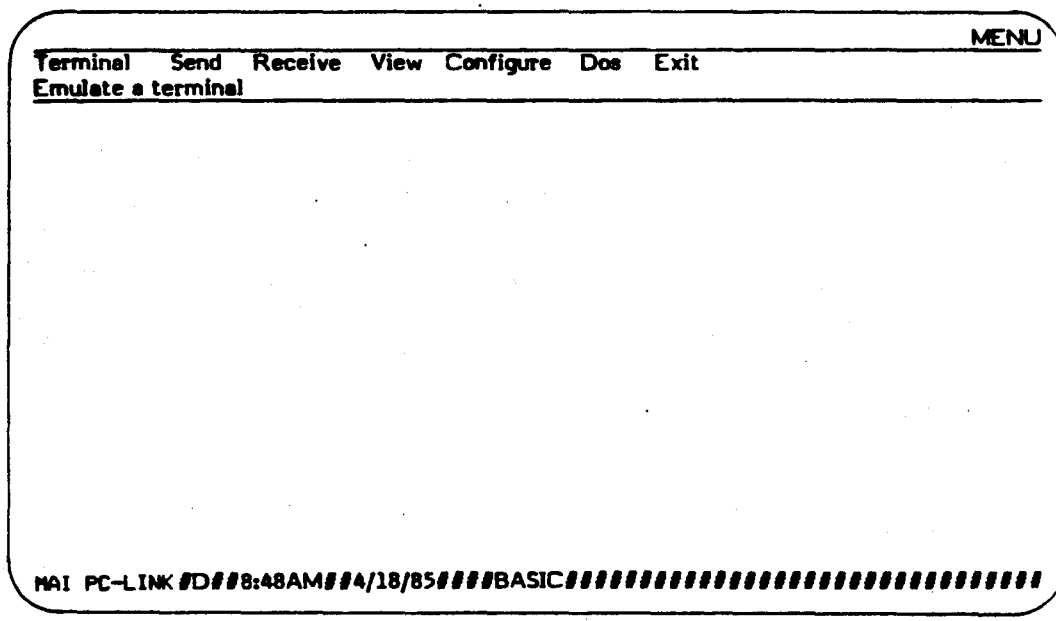

Figure 2-1. The Main Menu

series of menus with a user interface similar to Lotus 1-2-3. A menu item can either be selected by typing its first letter or by moving the cursor using the left and right arrow keys and then pressing "ENTER" (note that numeric lock key must be off to use the cursor keys). To return to a previous menu, press the ESC key (or select "Quit" if it is available). At any time in Command Mode, help text is available by pressing the F1 (Help) key.

The Help System

The help system is identical in format to that used by Lotus 1-2-3. It may be accessed by pressing the F1 (Help) key while in Command mode or (Shift-F1) in Terminal Emulation mode. A help screen related to the current menu is displayed. If more help is desired, any of the highlighted fields in the help screen can be selected with the Personal Computer arrow keys. Pressing ENTER will provide more help on that item. Press ESC to return to Command mode. Press backspace to back up to the previous help screen.

SECTION 3

TERMINAL EMULATION

MAI PC-LINK allows you to replace an MAI BASIC FOUR Terminal with an IBM PC (or close compatible), giving it access to any program on the BASIC FOUR minicomputer. The PC connects to a normal BASIC FOUR output channel via the same cable as is used by an MAI 7270 Terminal and operates up to a data rate of 9600 bits per second. No special hardware is required other than possibly an adapter cable to make the connectors compatible (refer to Section 2 for more information on the connection procedures).

In addition to emulation of an MAI 7270 Terminal, features of MAI PC-LINK include:

- A printer connected to the Personal Computer can print data sent from the BASIC FOUR to the local printer (slave printing).
- An image of the current terminal screen can be either printed or recorded to a file.
- A record of all activities can be either printed or recorded to a file.
- Over 50 pages of on-line help screens are available by pressing SHIFT-F1 (Help) function key. The help provided is sensitive to the current requirements of the user.
- The bottom line on the screen is used to display the status of the terminal including caps lock, number lock, local printer echo, the time and date, and other pertinent information.

Before using MAI PC-LINK Terminal Emulation, review the default options listed in the Configure menu. Refer to Section 7 for full details. Options that will most likely need your attention are:

- The correct communications port on the PC: Defaults to port one but can be reset to port two with the Configuration menu.

- The default data disk drive/directory: Initially assumed to be drive/directory A:, but should be changed to the usual location of data disks on your system. On a Personal Computer with two floppy drives, this would probably be B:. On an IBM XT, it would probably be C:.

- The baud rate: Initially set at 9,600 as on a normal direct-connect Terminal. If you are using a modem it will probably need to be reset to 300 or 1200.

- The MAI Basic Four system type: MAI PC-LINK has been optimized for the various types of BASIC FOUR computers and will perform best when set to the appropriate type.

- Printer characteristics: If you will be using the List (ALT-L) option to print BASIC FOUR screen data on the Personal computer printer, or are doing local printing.

STARTING TERMINAL EMULATION

After the Personal Computer is connected to the BASIC FOUR and MAI PC-LINK is running, you should verify correct operation of the Personal Computer and MAI PC-LINK by communicating with the BASIC FOUR while in Terminal Emulation mode. Place the keyboard template that you received with MAI PC-LINK above your keyboard as a guide to the locations of the special BASIC FOUR control keys and function keys. Select Terminal mode from the MAI PC-LINK main menu by typing "T". The Emulation Control Menu will appear (see Figure 3-1). Select Emulation by typing "E". The screen will clear except for the status line at the bottom of the screen. The Personal Computer now functions as an MAI VDT terminal. Press ENTER and you should receive a response from the BASIC FOUR. This could be the usual prompt character, or if a program is currently

running on the terminal port that you are connected to, you should receive the normal response from that program.

If you get any other response, press the ESC key on the IBM PC keyboard. The BASIC FOUR should respond with one or more lines of information on the screen, and then the prompt symbol >.

If neither of these steps has been successful, turn to Appendix H - SETUP PROBLEMS.

KEYBOARD USAGE

Because the PC keyboard is different from the BASIC FOUR keyboard, different keys on the PC represent the various BASIC FOUR function keys. A keyboard overlay is available to help specify keyboard usage in Emulation mode.

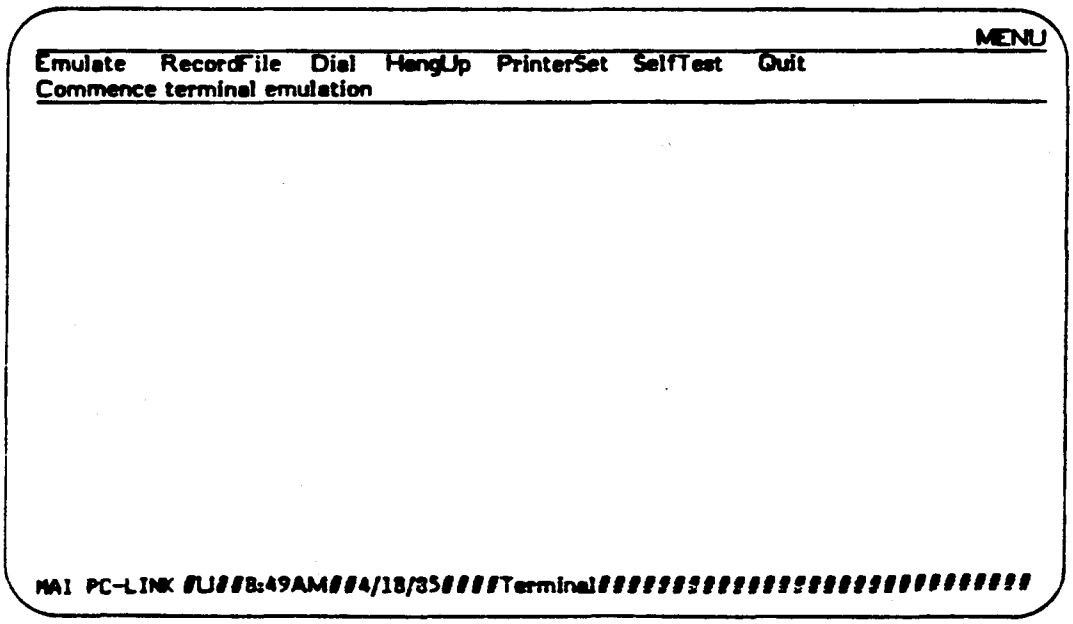

Figure 3-1. The Emulation Menu

The following Basic Four keys correspond to the following PC keys:

Basic Four Key	PC Key
CTL-I	F1 or +
CTL-II	F2 or -
CTL-III	F3 or Scroll Lock
CTL-IV	F4 or Num Lock

Function Keys

F1 - F9	Alt 1 - Alt 9
F10	Alt 0 (zero)
F11	Alt -
F12	Alt =
F13	Alt <----
F14	Alt Num Lock
F15 - F23	Ctrl 1 - Ctrl 9
F24	Ctrl 0 (zero)
F25	Ctrl -
F26	Ctrl =
F27	Ctrl <----
F28	Ctrl Num Lock
BREAK	Ctrl Scroll lock

The following special keys are also available:

PC Key	Function
Shift - F1	Emulation Help Screen. To return to Emulation Mode, press ESC.
F5	Start print capture. When this key is pressed, any data printed to the 'slave printer' attached to this terminal will be appended to the current Record File. The default record file is called PCLINK.REC, but this can be changed using the Record File option in the Terminal menu.
F6	Stop print capture.

PC Key	Function
F7	Screen snapshot to printer. Writes an image of the current emulation screen to the current list device.
F8	Screen snapshot to disk. Appends an image of the current emulation screen to the record file.
F9	Clear screen.
F10 or ALT-X	Return to command mode.
ALT-R	Toggle recording to disk. When Record is enabled, all information that is displayed on the emulation screen is also appended to the record file on the disk. You can tell that recording is enabled by a blinking "Record" in the status line. The default record file is called PCLINK.REC, but this can be changed using the Record File option in the Terminal menu. Note that if the Basic Four is sending screen formatting characters during recording, you will not get a perfect representation of the screen in the record file.
ALT-L	Toggle listing on printer. When List is enabled, all information from the emulation screen is also written to the current list device. You can verify that listing is enabled by a blinking "List" in the status line.

NOTES

SECTION 4

FILE TRANSFER

INSTALLATION OF TRANSFER PROGRAMS ON THE BASIC FOUR

The commands that send and receive data between the Basic Four and Personal Computers require the presence of two programs on the Basic Four in the files SEND and RECV. These programs are distributed on the MAI-PC LINK diskette and can be installed onto the Basic Four by using the Install option in the Configure menu. The steps are as follows:

1. If your Basic Four is a 1300 series (210, 310, 410, 510, 610, or 730) use the BASIC FOUR utility program to create the program files "SEND" and "RECV". These should be program files with a length of 20 pages.

   This step will be unnecessary on 8000 and 2000 series systems.

2. Start MAI PC-LINK, enter Emulation mode and sign on to the BASIC FOUR in BASIC command mode.

   If you are on an 8000 series or 2000 system, after logging on, type 'BASIC' to enter BASIC mode.

   You should see the > prompt.

3. Press the F10 key to return to Command mode and press the ESC key to return to the main MAI PC-LINK menu.

4. Type "C" to select the Configure menu and then "I" to select the Install option.

5. Enter the Local File name as "RECV.HST" (for Basic Four 2000 systems, the file name is RECV2000.HST). If your data drive is different from the drive where the HOST PROGRAM disk is located, then you must pre-append a drive letter to the local file name (e.g., if your HOST PROGRAM disk drive is in drive A:, then enter "A:RECV.HST" as your Local File name).

6. Enter the Host File name as "RECV". Be sure to use upper case letters if your host program has been created in upper case.

7. After a short pause, you will see an accelerating number as the number of lines are transferred.

8. If the installation has been completed successfully, a message indicating this will be posted at the bottom of the screen, or you will be informed of transmission errors if they occurred.

9. Repeat steps 5 through 8 for the hostfile "SEND" and the Personal Computer file "SEND.HST" (SEND2000.HST for the Basic Four 2000).

10. You are now ready to use the Send and Receive options.

SENDING PC DATA FILES TO THE BASIC FOUR

The current version of MAI PC-LINK supports sending (uploading) ASCII files from the Personal Computer disk to Serial, Indexed or Direct files on the Basic Four. The Personal Computer file must contain lines of text or ASCII data, terminated by a carriage return or carriage return/linefeed characters. This is the type of file that can be produced by text editors such as IBM's EDLIN and Personal Editor, as well as by many other software packages including word processors and spreadsheets. With Send, an entire file in this format can be automatically

transferred line by line into a Basic Four file. The lines in the original file correspond to lines or records in the transferred file. Note that before this feature can be used, the program "SEND" must be installed on the Basic Four as described above.

Sending to DIRECT files - it is possible to send to DIRECT files on the Basic Four from Plain and Delimited formats. (MAI PC-LINK formats: PLN, PRN, DAT, TXT). In other words, the file to be sent must have commas as field separators and may or may not have quotation marks around text fields.

John Smith, S1000, 123 West 12th, 324-8951, 123

or

"John Smith", "S1000", "123 West 12th", "324-8951", 123

are examples of record types that may be sent.

If you enter the host file type as DIRECT, you will be asked for the field number to be used as the key. In the example above, if S1000 is to be the key, you would enter 2 as the key field. The key field will default to 1 if no value is entered.

If a direct file already exists on the Basic Four, records will be added to it. If a key is sent which already exists in the file, THE OLD RECORD WILL BE OVERWRITTEN.

Automatic file creation - if a named hostfile does not exist on the Basic Four, it will be created automatically. If the file already exists it will be overwritten (SERIAL or INDEXED files) or records will be added to it (DIRECT files). Program files will be automatically created at installation time. If a program already exists on the Basic Four with the same name, it will be overwritten.

Note:

Automatic file creation is NOT available for Basic Four operating system levels 4.2A and lower. For these O/S levels, files must be created through the Basic Four Utilities before data can be sent to them.

In order to protect DIRECT files from unauthorized usage, a security system has been included on your MAI PC-LINK host programs diskette.

THE PROGRAM "SAFE.HST" MUST BE INSTALLED AND RUN ON THE BASIC FOUR BEFORE SENDING DATA TO DIRECT FILES. If the DIRECT file information is not set up, you will be unable to send information to Basic Four DIRECT files from the PC or receive information from DIRECT files.

On 1300 series Basic Four (210, 310, 410, 510, 610, and 730), the program file "SAFE", 15 pages long, must be created using the Basic Four utility program(Install SAFE2000.HST on the 2000).

To install the security program, start MAI PC-LINK by typing PCLINK. From the main menu press (C)ONFIGURE (I)NSTALL. Enter the PC file name as SAFE.HST (remember to pre-append a drive or directory if the program is not on the default drive, e.g. B:SAFE.HST). Enter the host file name as SAFE. You will then see an increasing count of line numbers being transferred to the Basic Four. Any errors or re-tries will be displayed.

Once the installation procedure has been successfully completed, exit the CONFIGURE menu by pressing ESCAPE, then enter (T)ERMINAL (E)MULATE. (On 8000 and 2000 systems, enter BASIC mode.)

Type RUN "SAFE". The first time you run this program you will be asked if you wish to create the 2 files "ACCESS" and "PASSWD" required for the security system. On operating system levels 4.2B or higher, the program will automatically create the

files for you. On levels 4.2A and lower, you must create the files manually through the Basic Four utility CREATE.

The files are defined as follows:

Filename	Type	Keysize	No. of Records	Record Size
PASSWD	DIRECT	3	30	50
ACCESS	DIRECT	45	100	445

You will see a menu of the following selections:

A) ADD FILE TO ACCESS LIST
R) REMOVE FILE FROM ACCESS LIST
D) DISPLAY ACCESS LIST
Q) QUIT

To add valid accessible file names to the system, select A (add file to access list). Enter the exact names of the DIRECT files to which users may have access, and select R (Read only), W (Write only) or B (Read and Write). A selection of Read means that the system users will be able to receive data from the specified file to the PC, but will be unable to send data to it. A selection of Write means that the system users will only be able to send data to the file. A selection of Both means that the users will be able to both send data and receive data from the specified file. Take care when assigning Read/Write status to files - if a DIRECT file already exists on the Basic Four, and data is being sent to it, existing records can be overwritten.

The named files need not exist on the Basic Four in order to be added to the list. Including a nonexistent temporary file name will give users the opportunity to practice DIRECT file creation.

To remove valid DIRECT filenames from the system, select R (REMOVE file from access list).

To display valid DIRECT filenames, select D (DISPLAY access list). You will be shown a list of the file names which have been entered into the system, along with the access codes assigned to them.

To exit from the SAFE program, type Q.

To transfer a file to the Basic Four, follow these steps:

1. Enter Terminal Emulation mode and check that you are in command mode on the Basic Four. The prompt should be >.

2. Use F10 to return to the MAI PC-LINK menus, and select Send from the main menu (see figure 4-1).

3. Select the HostFile entry from the Send menu by typing "H" and "N", and enter the name of the Basic Four file that is to receive the data. The name can be up to 42 characters long including path name. On 8000 or 2000 series computers, you may pre-append a path name or accept the default as

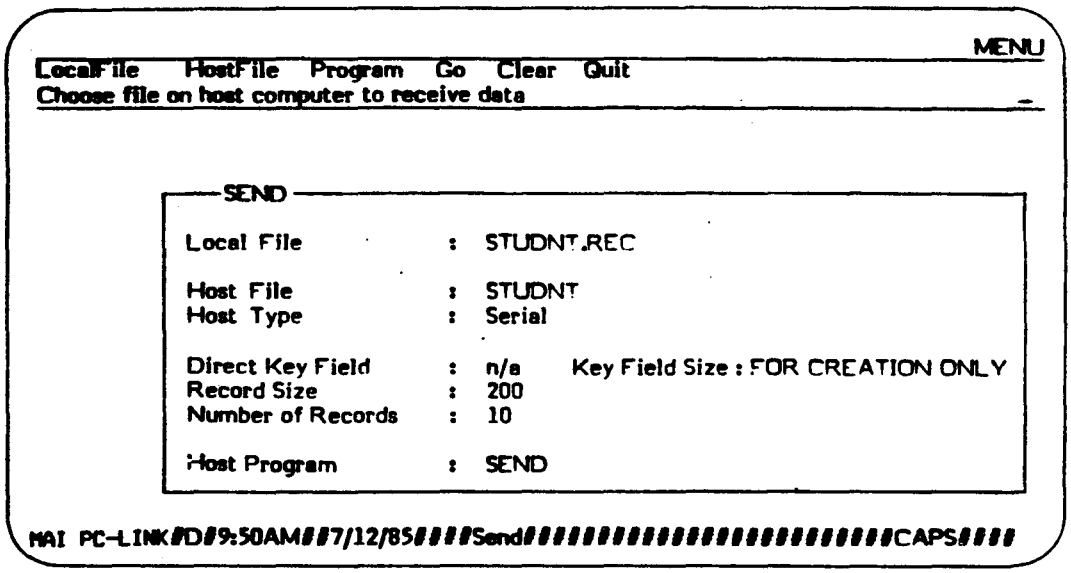

Figure 4-1. A Sample Send Screen

set up in the Configure menu. For systems running Basic Four operating system levels 4.2A or lower, the Basic Four data file must already exist and must be large enough before the transfer takes place. If necessary it can be created with the Basic Four utility program.

4. Select (T)ype and then choose the type of file you will be sending to on the Host (DIRECT, SERIAL, INDEXED or STRING). If you select DIRECT, you will be asked for the field number to be used as the key. The key field will default to 1.

5. If the file does not already exist on the Basic Four, you may enter file specifications so that MAI PC-LINK can automatically create your files (operating system levels 4.2B and higher). Select (C)reate (R)ecord Size and enter the size of the records (in bytes) to the created (1 - 512). Next, select (N)umber of Records and enter the maximum number of records to be allocated for the file (1-32,767). Remember to leave room for possible expansion. If you are creating a DIRECT file, you must also select (K)eysize and enter the size in bytes of the key field (2-56).

6. Select the Local File name by typing "L" and enter the name of the Personal Computer file to be sent to the Basic Four. If the file is not on the default data disk, then the drive letter should also be entered as part of the file name. Note that if the file is on the default data disk, it can be selected from the displayed directory using the arrow keys to highlight the file name and then pressing "ENTER".

7. Start the data transfer by typing "G" for Go. If the named host file does not exist, an attempt will be made to create it. If any necessary information is missing (i.e.

Record Size or number of Records), an error message will be displayed.

Also, if a file already exists, and an attempt is made to create it by entering file information, an error message will be displayed and the existing file will not be recreated.

After a delay of several seconds, lines of the file will be seen being displayed as they are sent, along with a line count.

8. If there is an error in the transfer process, an error message will be seen in the status line accompanied by a single beep.

9. Upon completion of a successful transfer, a beep is sounded and a message indicating success is displayed.

A sample file has been provided on the distribution disk for testing file transfer. Refer to Section 8 "SAMPLE SEND, RECEIVE AND VIEW SESSIONS" to practice this file transfer.

RECEIVING BASIC FOUR DATA FILES

MAI PC-LINK currently supports transfer of ASCII data files from the BASIC FOUR. To receive files, the Basic program RECV.HST included on the master MAI PC-LINK diskette must be installed on the BASIC FOUR as RECV (see beginning of this section for installation procedures).

You may also select automatic data reformatting into:

- o Lotus Worksheet format (WKS)
- o Lotus Import format (PRN)
- o dBase II and dBASE III delimited format (PRN)
- o PC Basic sequential file format (TXT)
- o Visicalc format (DAT)
- o Multiplan format (SLK)
- o Multimate internal format (document or merge) (DOC)
- o Fixed format (which places data from fields left justified in columns) (FIX)
- o Plain format, which receives lines from data files unchanged with commas as field separators (PLN)

When the Receive option is selected from the main menu, a Receive control menu is displayed along with a series of windows showing the currently selected file receive options (see Figure 4-2). The information displayed on this screen for a given data transfer can be saved in a disk file to use again. This information is called a Data Transfer Procedure.

The components of a Data Transfer Procedure include:

1. DESCRIPTIVE INFORMATION:

   - o Procedure Name - up to 8 characters. Used as name of the file to store the transfer procedure setup information. The file extension is automatically given as "PRC".
   - o Procedure Description - up to 60 characters of text describing purpose of procedure (optional).

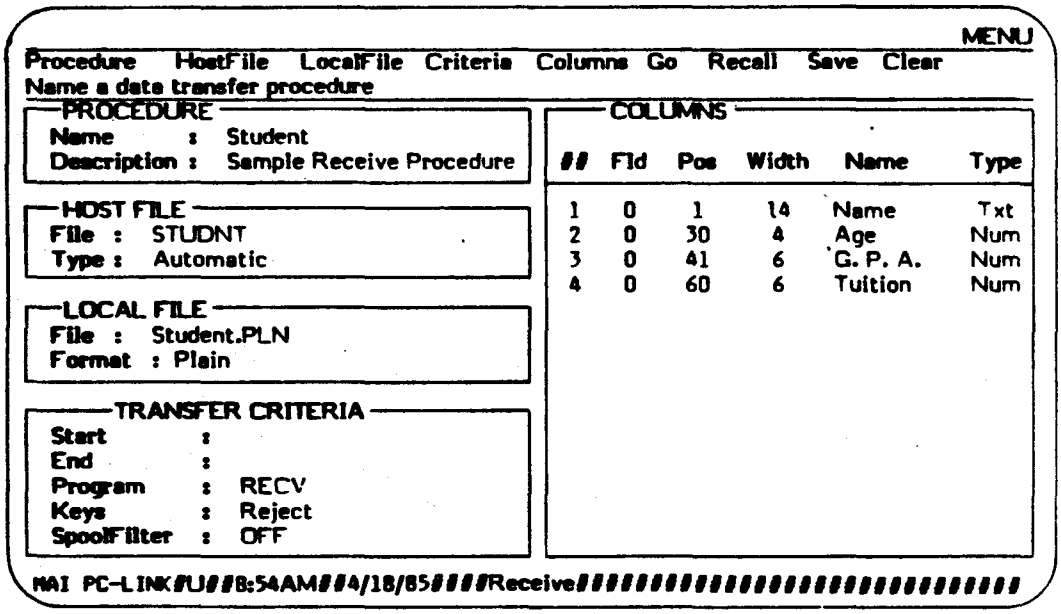

Figure 4-2. A Sample Receive Screen

2. HOST FILE INFORMATION:

- o File - file on BASIC FOUR containing desired data; up to 42 characters with pathname if applicable.

- o Type - host file type (Direct, Indexed, Serial, String); automatically displayed after transfer is activated with GO; at other times the type is "Automatic". If a Direct file is being received, the security system ("SAFE.HST") must have been installed and the Host filename must have been entered into the access list.

3. LOCAL FILE INFORMATION:

- o File - file to receive data from host computer; up to 8 characters long; file name extension automatically supplied based on format.

- o Format - format to use for data written to Personal Computer file; formats include Lotus Import, Lotus Worksheet, DIF, SYLK, DBase II, delimited, Plain (format same as host file),

Fixed (fixed width columns); note that some formats require Columns specifications as described below.

4. TRANSFER CRITERIA

- Start of Range - first record to transfer from a file. For indexed files, this would be an index; for direct files, this would be a text key; and for serial files it would be a line number.
- End of Range - index number, text key, or line number of last record to transfer from file; all records outside this range are rejected.

- Transfer Keys switch - enables or disables whether the keys of a direct file are to be transferred as the first field in each line of transferred data. (Direct files only).

- Program - the name of the program installed on the host computer which allows the PC to receive files. (The default program name is "RECV".)

- Spool Filter switch - enables or disables use of special filter for serial files containing printer control mnemonics.

5. COLUMNS (FIELDS) SPECIFICATIONS:

This part of a Transfer Procedure is used if only part of each transferred line or record is to be written to the Personal Computer file. It also allows specific control over whether fields are to be formatted as text or numeric data. In the case of serial files, it is used to select the parts of each line that are to be captured and formatted. Note that a set of columnn specifications are applied to each line or record of data transferred. Lines with specified numeric fields that do not contain valid numeric data are completely rejected. The parts of a columnn specification include:

- o Field - for Serial files this is always 0; and for Direct or Indexed files this specifies the field number in the record to be extracted (field numbers exceeding the number in the current record are rejected).
- o Position - the position within the field of the first character you wish to access.

- o Width - the number of characters in the field that you wish to retrieve.

Note:

To retrieve all characters in a field, enter Position 0 and Width 0.

- o Name - an optional descriptive field name of up to 12 characters; used for documentation purposes only.

- o Type - field type; can be Numeric or Text;

- o Insert - Insert one blank line below the current line.

- o Delete - Delete the current line.

- o Move - Move the current (source) line. Specify the destination line by using the up and down arrow keys.

The Up and Down arrow keys are used to move the field edit cursor up and down in the columns edit window. To add a new field, move the cursor below the current last field. The window scrolls to allow more fields if necessary.

There are many options in Receive. The following describes simple receive procedures. A simple file receive is done as follows:

1. Enter Terminal Emulation mode and check that you are in command mode on the Basic Four. The prompt should be >.

2. Use F10 to return to the MAI PC-LINK command mode and select Receive from the main menu.

3. Select the HostFile option from the Receive menu. Then enter the name of the desired Serial, Direct, Indexed or String file on the Basic Four.

4. Select the Local File option from the Receive menu. Then enter the name of the Personal Computer file that is to receive the data from the Basic Four.

5. If desired, enter the Format that is to be used in writing the Personal Computer file.

6. If necessary, enter the columns specifications by selecting Columns.

7. Select any other desired options from the Criteria menu.

8. If desired, save the Transfer Procedure you have just defined using the Save option.

9. Return to the main Receive menu and select Go.

10. The data transfer will start, with the transferred lines and a count being displayed in a window at the bottom of the Receive screen.

11. Note that if any essential information is omitted from the Transfer Procedure, you will be prompted for it when you give the Go command. This feature can be used with partially defined procedures that are saved for future use. Information such as the HostFile name, Personal Computer File name or Format can be omitted, which will cause the user to be prompted for them at run time. This allows complex information such as columnn/field specifications to be

defined and saved for re-use, but ensures that the user must enter all pertinent data when the procedure is run.

Two sample transfer control procedures have been provided with MAI PC-LINK. See Section 8 "SAMPLE SEND, RECEIVE AND VIEW SESSIONS" for practice with these procedures.

NOTES

SECTION 5

SELECTING AND REFORMATTING DATA WITH "VIEW"

MAI PC-LINK provides the ability to view, select and reformat the data from a file using the View option in the main menu (see Figure 5-1). View is designed to work with data in fixed position columns such as are produced in many types of computer reports, such as those that would be captured for local printing. It allows the user to load a Personal Computer file into MAI PC-LINK for viewing and then "paint" the columns and rows on the screen that contain the desired data. Then the selected data can be written to another file in numerous Personal Computer formats. The column selection specifications can also be saved as the basis for column selections in a receive control procedure.

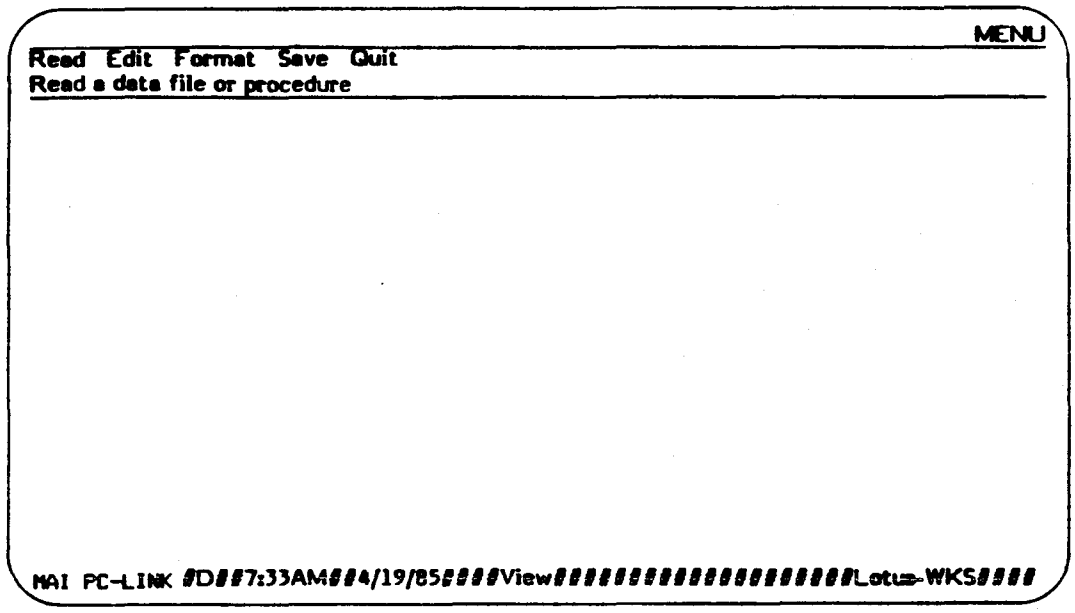

Figure 5-1. The View Menu

To use View, type "V" at the main menu to display the View menu. Then select the desired Personal Computer file using Read from the View menu, and then Data from the Read menu. Type in the name of the file and press "ENTER". The file will be displayed in the viewing window. You are automatically returned to the View menu; now select Edit. The Columns Ruler will appear in the viewing screen, and the data selection commands will be displayed at the top of the screen. The Ruler can be moved over the display with the Personal Computer arrow keys.

To designate a column for selection, type either "T" or "N" over it. Use "T" for columns to be formatted as text and "N" for columns to be formatted as numbers. As you type, the letters will appear in the columns ruler. For example, a typical report with selected columns might be as shown in Figure 5-2.

The Ruler is defined to: select the NAME column and format it as Text and select the AGE, GPA and Tuition columns and format them as Numeric.

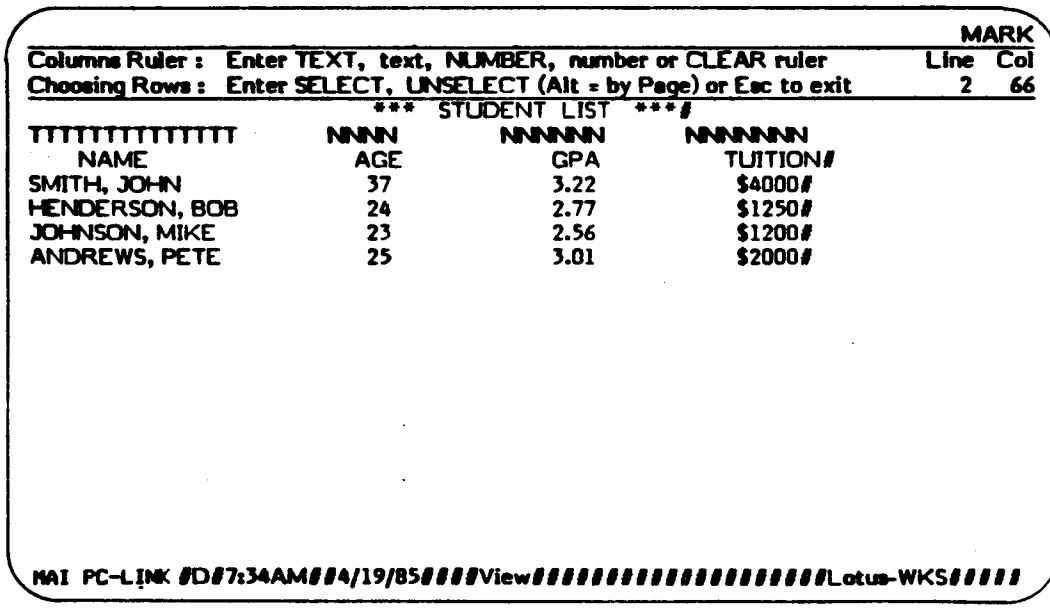

Figure 5-2. A Sample View Screen

After selecting the columns you can select the desired rows using the "S" key. Each time you type "S", the ruler steps down one line and the previous line occupied by the ruler is highlighted. Only data in the highlighted lines will be written to the disk when Save Data is selected. To Unselect lines, move the Ruler to them with the arrow keys and press "U". Each time you type "U", the line underneath the Ruler is unhighlighted. If necessary, the screen will scroll over a large data file like a window.

When the desired areas are highlighted they can be written to the disk in a selected format. To choose the format, select Format from the View menu and choose the desired format from the Format menu. To save the formatted data to the Personal Computer disk, select Save from the View menu, and then select Data from the Save menu. Enter the name of the file to receive the data and press "ENTER". The data will be written to the disk.

The selected columns can be saved for later use, or for use in a transfer procedure, by using the Save/Ruler command sequence from the View menu. A ruler can be restored using the Read/Ruler sequence from the View menu.

Note that when fields are to be formatted as numeric, the "$", "%" and "," characters are ignored. Also, numbers in brackets such as "(1500)" are converted into negative numbers such as "-1500" to be compatible with spread-sheets.

Sample data files have been provided on the distribution diskette for use with VIEW. Refer to Section 8, "SAMPLE SEND, RECEIVE AND VIEW SESSIONS."

SECTION 6

USING DOS COMMANDS AND RUNNING OTHER PROGRAMS FROM MAI PC-LINK

Version 2.3 of MAI PC-LINK has the ability to remain resident in memory while you return to DOS or run another program. This feature gives you the added flexibility of not having to exit from MAI PC-LINK while you execute DOS commands or run other programs.

EXECUTING DOS COMMANDS FROM MAI PC-LINK

You may use this option by selecting DOS in the top menu and then selecting Commands. The only requirement is that the file COMMAND.COM is either in the default directory or can be found in the DOS path. If MAI-PC LINK cannot find this file, execution will be terminated and MAI PC-LINK will again appear on the screen. If the file COMMAND.COM is found, then MAI PC-LINK is terminated (but remains resident in memory) and DOS is reinstated. By typing EXIT at any time in DOS, you may return to MAI PC-LINK.

EXECUTING OTHER PROGRAMS FROM MAI PC-LINK

MAI PC-LINK gives you the ability to load and run other programs while it terminates and remains resident. You may use this option by selecting DOS in the top level command menu and then selecting Execute. You will then be prompted to enter the program to run (must have an .EXE or .COM extension) and then the "argument" for the program, if any. For example, suppose you want to run an editor called EDIT, and that the name of the file you want to edit is TESTFILE. Normally it would be run from PC DOS with the command EDIT TESTFILE. To run it from MAI PC-LINK, you would enter the program name as EDIT and the "argument" as TESTFILE.

MAI PC-LINK should be able to run almost any kind of .EXE or .COM program provided your PC has adequate memory and that the program does not affect the communications port.

NOTES

SECTION 7

SUMMARY OF MAI PC-LINK CONFIGURATION SETTINGS

MAI PC-LINK provides you with the ability to customize the default configurations used in the program. By selecting Configure in the top menu you are given the option of changing:

- o Communication parameters
- o PC internal defaults
- o Basic Four defaults
- o Foreground and background screen colors
- o Modem setup
- o Printer setup

and saving these settings for future use. In the following sections we will outline how to select and save the settings that you want (Figure 7-1 shows an example of a typical configuration screen).

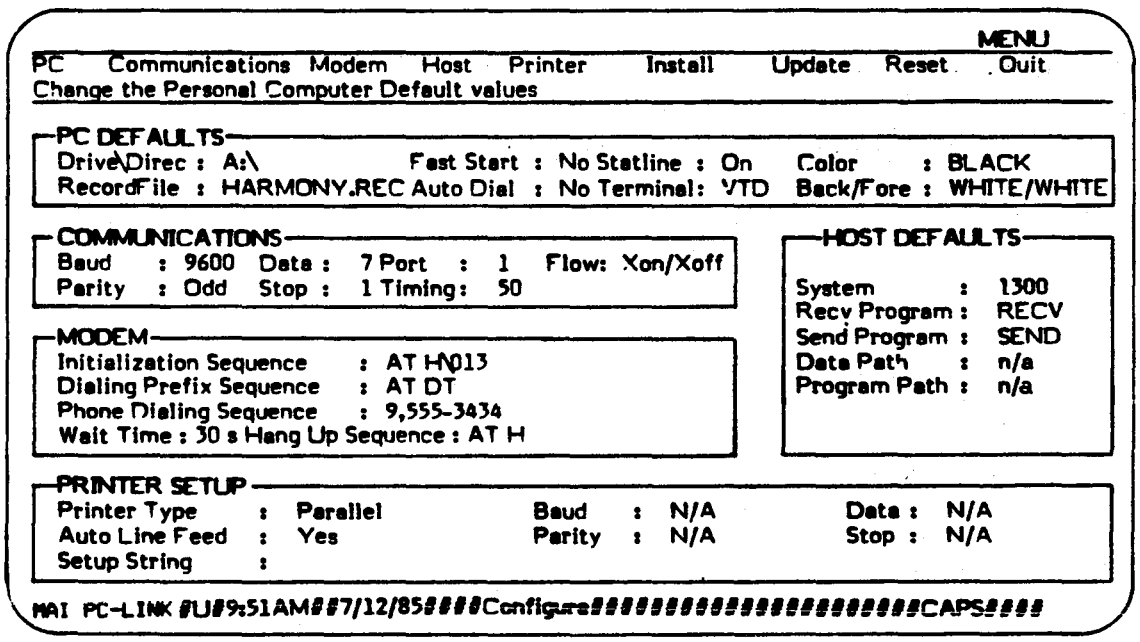

Figure 7-1. A Sample Configuration Screen

COMMUNICATIONS SETTINGS

To change the communications settings, select the Communications option and then choose the setting you wish to change. The timing factor allows you to alter the length of time the PC will wait for responses from the Basic Four. If you experience transmission errors, try increasing this number.

PC DEFAULTS

MAI PC-LINK uses six internal default settings. They are as follows:

1. Drive/Directory - Specifies the default drive and directory to be used for selecting and retrieving PC files.

2. Record File - Names the files to be appended to when recording the emulation session to disk.

3. FastStart - If yes, MAI PC-LINK will go immediately to terminal emulation upon loading.

4. AutoDial - If yes, MAI PC-LINK will automatically dial the modem number upon loading.

5. StatusLine - If no, MAI PC-LINK will not display the status line normally located at the bottom of the screen.

6. Terminal - Selects the type of MAI terminal to be emulated.

7. Color - If you have a color screen or if you have a black and white screen and wish to experiment with different intensities, you may do so by selecting the Color option and choosing the desired foreground, background and screen colors.

Any one of these may be changed to meet your requirements.

HOST DEFAULTS

The host defaults are:

1. System - Selects the type of Basic Four system being used.

2. Receive - Selects the program residing on the Basic Four which allows files to be received onto the PC.

3. Send - Selects the program residing on the Basic Four which allows files to be sent to the Basic Four.

4. Paths - Select any pathnames to be used for 2000 and 8000 series systems.

MODEM SETUP

MAI PC-LINK provides you with the ability to initialize your modem, send out the dialing prefix sequence and then automatically dial the phone number desired.

As in outputting the printer setup string, you can send special characters to the modem by first entering a backslash, followed by 3 digits, e.g. enter \010 to enter a decimal 10. (Refer to Section 2 for further details on using an autodial modem with MAI PC-LINK).

You may also specify a pause in any of the strings by entering a '~' which results in a pause of 1 second, - e.g. to wait for the modem to respond to the strings output to it.

The modem options are:

1. Initialization - Some modems require an initialization sequence for setup. You may send special unprintable characters by

entering a backslash followed by three digits. This string is not terminated by a carriage return.

2. Prefix - Most modems require a dial prefix to tell them to get ready to accept a telephone number to dial. You may send special unprintable characters by entering a backslash followed by three digits. This string is not terminated by a carriage return when output to the modem.

3. Number - This is the number that the modem is to dial. Special characters may be entered as above. This string is terminated by a carriage return when output to the modem.

4. Hang Up - This is the sequence required by the modem to disconnect. Special characters may be entered as above.

5. Wait Period - Time for MAI PC-LINK to wait or the modem to make a connection with another modem.

PRINTER SETUP

MAI PC-LINK allows you to select the specifications for the printer you will be using.

The options are:

1. Printer Type - Both serial and parallel prints are supported. Note that if you specify a serial printer, you must have at least two serial ports to be able to print. If COM1: is to be used as a link for the host, then COM2: will be used for serial printing (and vice versa). For serial printers, the baud rate, data, parity, and stop bits are all user-definable (not required for parallel printers).

2. AutoLineFeed - You may specify if your printer is to receive a line feed after every carriage return. If the printer appears to be double spacing, then turn auto line feed OFF. If the printer keeps printing on the same line, then turn auto line feed ON.

3. SetupString - You may wish to initialize the printer to a desired state by outputting a setup string. For example, on the Epson FX100*, decimal 15 will set the printing to condensed print mode. To do this in MAI PC- LINK, type \015 (a backslash followed by three digits). You may also create a string like this \027\015 (Esc 15).

UPDATE

If selected, will update MAI PC-LINK default configuration settings file, DEFAULTS.CNF, to the currently active settings.

RESET

If selected will reset MAI PC-LINK's current active configuration settings from the file DEFAULTS.CNF.

* Refer to Appendix F for trademark information for this product.

SECTION 8

SAMPLE SEND, RECEIVE AND VIEW SESSIONS

Several sample files are included on your distribution disk for you to practice SEND and RECEIVE procedures.

- STUDENT.REC: A short file containing student records which can be sent to the Basic Four and then received.
- STUDENT.RUL: A VIEW ruler for use with STUDENT.REC.
- STUDENT.PRC: A RECEIVE procedure for use with STUDENT.REC.
- MKDIR.HST: A Basic Four program which can be installed on the Basic Four and then RUN to create a direct file called DIRECT.
- PEOPLE.PRC: A RECEIVE procedure for use with the DIRECT file created on the Basic Four.

SEND

To practice sending a file from the PC to the Basic Four, be sure that you have first installed the SEND program on the Basic Four (refer to Section 4).

1. Start MAI PC-LINK by typing PCLINK. From the main menu enter (T)ERMINAL (E)MULATION.
2. Enter BASIC COMMAND mode (you should see the > prompt).

3. Press F10 to return to MAI PC-LINK and press (Q)UIT to return to the main menu. Select the (S)END option.

4. Enter the (L)OCAL file name as STUDENT.REC. Remember to pre-append a drive or directory if this file is not on MAI PC-LINK's default drive.

5. Enter the (H)OST file (N)AME as STUDNT. Be sure to use upper case letters if the file was created on the Basic Four in upper case. Enter the file (T)YPE as Indexed.

6. Select (C)reate and enter the number of records as 10 and the RecordSize as 200.

7. Start the transfer with (G)O. The file STUDNT will be created on the Basic Four and records from STUDENT.REC will be sent to it.

The SEND examples below demonstrate various situations:

EXAMPLE 1: An INDEXED file "TEST" exists on the Basic Four. To send data to it, enter the PC file name and the host file name. No other information is required. The existing "TEST" data, if any, will be overwritten.

EXAMPLE 2: Information is to be sent to a new INDEXED file on the Basic Four. Enter the PC file name, the host file name, the record size and the number of records.

The file will be created on the Basic Four according to your specifications and data will be sent to it.

If the file already exists, an error message will be displayed.

EXAMPLE 3: Information is to be sent to a new DIRECT file on the Basic Four. Enter the PC filename, the host filename, the key field, key size, record size and the number of records. All of this information is REQUIRED to properly create the new file. After the file has been created, records will be sent to it using the specified field as the key. If the file already exists, an error message will be displayed.

RECEIVE

To practice receiving a file from the Basic Four to the PC, be sure that you have first installed the RECV program on the Basic Four. From the main menu, enter (T)ERMINAL (E)MULATION.

1. Start MAI PC-LINK by typing PCLINK.

2. On operating system levels 4.2A and lower, use the Basic Four utility program to create the following files:

NAME	TYPE	SIZE	KEY SIZE	RECORD SIZE
DIRECT	Direct	10 records	20 char	200 char
MKDIR	program	10 pages	----	----

When the files have been successfully created, enter BASIC COMMAND mode. You should see the > prompt.

3. Press F10 to return to MAI PC-LINK and press (Q)UIT to return to the main menu. Enter (C)ONFIGURE (I)NSTALL. The PC program is called MKDIR.HST. Remember to preappend a drive or directory if this program is not on MAI PC-LINK's default drive as displayed on the screen. The Basic Four program is called MKDIR. Don't forget to use upper case letters if the program was created as upper case. When you have entered the filenames, you will see the

program lines being transferred. When the transfer has been successful, press ESC to return to MAI PC-LINK main menu.

4. Enter (T)ERMINAL (E)MULATE mode and type RUN "MKDIR". This creates a direct file called "DIRECT" which you can use to learn the file receive process. This file has 9 records of 6 fields each. Once the file has been created, press F10 to return to MAI PC-LINK.

5. You can now try receiving the file DIRECT in a variety of formats with the (R)ECEIVE option of the main menu. Here are several examples:

   a) Receiving an entire file in PLAIN format:

      - Enter the (H)OSTFILE name as "DIRECT"
      - Enter the (L)OCALFILE name as "DIRECT"
      - Start the transfer with (G)O.
      - A file called DIRECT.PLN will be written to your default data disk with the fields separated by commas.

   b) Receiving selected fields in Lotus Import format:

      - Select (R)ECALL from the receive menu and select the procedure PEOPLE from the displayed disk directory.
      - A complete Transfer Control Procedure will be recalled from the disk and displayed in the Receive definition windows.

- The procedure can be activated with the (G)O command from the main Receive menu.

- When activated, this procedure will transfer the entire file from the Basic Four to the PC in Lotus Import format.

c) Experiment with deleting and/or moving some of the transferred fields (columns) using the (R)ECEIVE (C)OLUMNS menu. Each time you select (G)O from the main Receive menu, a file will be transferred according to the specifications displayed in the COLUMNS window.

d) Try changing the format of the PC file created during a transfer using the (R)ECEIVE (L)OCAL FILE (F)ORMAT menu. Each time you select (G)O from the main receive menu, a file will be created in the format indicated in the LOCALFILE window.

e) Try receiving a selected range of keys from the Hostfile using the (R)ECEIVE (C)RITERIA (R)ANGE menu. Enter "GRAHAM" as the start key and "LINCOLN" as the last key to transfer. When you activate this procedure with (G)O from the main menu, only records with keys that are alphabetically between the selected key values will be transferred.

6. If you have transferred the STUDENT.REC file to the Basic Four (using SEND above), you may use the procedure STUDENT to receive it back to the PC.

VIEW

If you wish to practice with the VIEW ruler, enter the (V)IEW option. Select (R)EAD (D)ata, then enter the filename STUDENT.REC. You will see the file on the screen. Now select (R)EAD (R)ULER, then enter the ruler name STUDENT. Select (E)DIT and you will see a sample ruler appear on the screen. This ruler can be used to (S)ELECT certain records to be written into various formats. This ruler can also be used to set up a Receive procedure by selecting (C)OLUMNS (R)ECALL from the RECEIVE menu.

NOTES

APPENDIX A

DEFINITION OF TERMS

Acoustic Coupler	An electromechanical piece of equipment that has two rubber cups that allow insertion of a telephone handset. The acoustic coupler translates computer signals into audio signals that can be used by a telephone line.
ASCII	Acronym for American Standard for Computer Information Interchange. The standard defines that each numeric byte corresponds to a specific character, for example, the letter "A" corresponds to the computer decimal "65".
Asynchronous	A method of communicating data between computers that does not require that the information be sent in packets and at a constant pace. Asynchronous communication is relatively easy to implement but less efficient than synchronous communication. It is also the most widely used method on most personal computer links.
Auto Answer	A modem feature that detects an incoming phone call and answers automatically.
Auto Dial	A modem feature that initiates phone calls using touch-tone or pulse dialing.

Baud	Approximately the speed at which the computer can transmit and receive data in bits per second on its serial port. It is actually the modulation rate or number of times the carrier signal is modulated per second.
Boot	A hardware (or cold) boot would require turning on and off the computer. A software (or warm) boot would require restarting the operating system (e.g., Control + Alt + Del on the PC results in a reloading of the operating system).
Carrier	Continuous frequency upon which signals may be superimposed. The digitized data is transformed into the continuous frequency by the modem for communication over the phone line.
Control Characters	Used by the communication equipment to control data transmission. The control character is actually embedded within the data stream being transmitted.
CTS	Clear To Send, pin 5 on RS-232 connector.
Data Bit	The smallest unit in data processing. Each bit can assume only a zero or one value. By grouping the bits, various coding schemes can be used to identify letters, numbers, and symbols.
DB 25	Standard 25 pin connector.

DCE	Data Circuit Equipment. Modems and other communication equipments are DCE's. They are used primarily as the interpreter and controller between computer-to-computer, computer-to-terminal, and computer-to-peripheral communications equipment. A modem is generally set up to be DCE.
Disk Drive	The hardware that can do read/write operations on a floppy disk or a fixed disk.
Download	To send a file or information from a larger or remote computer to a smaller or local one.
DOS	Disk Operating System. A type of operating system used by many PC manufacturers to manage the computer resources (i.e., CPU, disk drives, printer, keyboard, CRT, and internal memory, etc.).
DTE	Data Terminal Equipment. The hardware that is connected to a modem or other communications equipment for receiving and transmitting from/to a remote computer. A PC is generally set up to be DTE.
DCD	Data Carrier Detect, pin 8 on RS-232 connector.
DSR	Data Set Ready, pin 6 on RS-232 connector.
DTR	Data Terminal Ready, pin 20 on RS-232 connector.
Emulation	The imitation of terminal operations for the purpose of communicating with a host computer.

Full Duplex	Simultaneous bidirectional transmission of data between two points.
Host	The primary computer that is accessed by other computers for information, computing power, and other computer resources.
Half Duplex	Two-way transmission of data between two points; however, only one point is allowed to transmit at a time.
Local Connection	A direct connection between computers using a cable rather than a communications link and modem.
Modem	Modulate/demodulate. The communication equipment used by each computer that enables communication over a telephone line.
Null Modem	Cable connection of a terminal to a host computer using RS-232 connectors. Pin 2 (transmit pin) on the host must be connected to pin 3 (receive pin) on the terminal, and vice versa. On Basic Four terminals, Pins 4 and 5 are jumpered, as are pins 6 and 20.
On-Line	The local computer or terminal has established ongoing communication with the host computer.
Parity	A method to detect possible errors in the data received during data transmission. In this method, a bit is added to keep the sum of the bits in a byte, either Even or Odd, before the data is transmitted. When

	the receiver gets the byte it will check the parity bit to verify successful transmission.
Parallel Port	The parallel port is a connector in the PC for a parallel printer or other peripherals that use parallel I/O. Data is transmitted 8 bits (1 byte) at a time.
Path	A DOS command that searches directories for a specific command or batch file after it searches the working directory; e.g. PATH ((d:)pathname)(;)(;(d:) pathname)....)
Remote	A controller that connects to its host mainframe via a modem or other data link, as opposed to a local controller which is wired directly to the mainframe.
RD	Received Data, pin 3 on RS-232 connector.
RI	Ring Indicator, pin 22 on RS-232 connector.
RTS	Request To Send, pin 4 on RS-232 connector.
Start Bit	The method to signal the modem that the following transmission is normal data. Used in asynchronous communications to tell the receiver that the following bits are data bits.
Serial Port	The serial port is a connector on the PC for peripherals or devices that used serial I/O. Can be used for serial printers and asynchronous or synchronous communications.

Session	A non-stop work session between the user and the terminal.
SG	Signal Ground, pin 7 on RS-232 connector.
Stop Bit	The method to signal the modem the end of a block of data being transmitted.
Synchronous	A method of communicating data between computers that requires that data be sent in packets and at a contant pace.
RS-232	An industry-standard method of serial (asynchronous) communication which specifies voltage levels and signal characteristics. Devices are interconnected via standard 25-pin connectors.
TD	Transmitted Data, pin 2 on RS-232 connector.
Protocol	A set of rules for how information is exchanged over a computer network.
Upload	To send a file or information from a smaller computer to a larger computer.

APPENDIX B

MAIN COMMAND MENU FOR MAI PC-LINK

The MAI PC-LINK main menu option commands are explained in the following paragraphs. A page reference where applicable is provided for any subsequent sub-menus or instructions contained elsewhere in this manual.

COMMAND	USE	PAGE REFERENCE
Terminal	Selects terminal emulation control menus.	3-2
Send	Selects menus to control sending Personal Computer files to the host computer.	4-2
Receive	Selects menus to control receiving Host computer data onto the Personal Computer.	4-8
View	Visual PC File reformatter.	5-1
Configure	Selects menus to change configuration of MAI PC-LINK including communications parameters, printer setup, modem control, system defaults and installation of BASIC FOUR programs located on Personal Computer disk.	7-1

COMMAND	USE	PAGE REFERENCE
DOS	Keeps the MAI PC-LINK program resident in memory while executing DOS commands or loading and running another program.	
Exit	Exits from MAI PC-LINK to DOS.	

The use of the sub-menus selected by these commands is described in the following sections.

TERMINAL EMULATION MENU

This menu is selected by the Terminal command on the main menu.

COMMAND	USE	PAGE REFERENCE
Emulate	Enters terminal emulation mode (you can exit from this mode with the F10 key).	3-1
Record File	Changes name of Personal Computer disk file into which Recorded or Screen Snapshot information is written.	B-18
Printer Set	Sends the printer set-up string to the local printer. The set-up string is set with the Configure menu.	B-20
Dial	Sends a dialing sequence to an auto-dial modem. The dialing sequence is set with the Configure menu.	B-18
Hang Up	Hangs up the modem.	B-21
Self Test	Puts the serial port into Self Test mode. If Self Test is enabled, all characters typed during Emulation will be echoed back to the screen, allowing verification that the serial port is functioning correctly. Note that terminal emulation is not possible when Self Test is ON.	
Quit	Exits to MAI PC-LINK main menu.	

SEND MENU

This menu is selected by the Send command on the main menu. Note that to use Send for data file transfer, the program SEND must have been installed on the host computer as described in the installation instructions.

The current version of MAI PC-LINK supports the transfer of ASCII files on the Personal Computer into BASIC FOUR serial and indexed files. Future versions will support transfer from other Personal Computer formats into other types of BASIC FOUR files.

COMMAND	USE	PAGE REFERENCE
Local File	Enters the name of the local (Personal Computer)file to be sent to host computer. The file is assumed to be on the default data drive/directory (set by Configure; initially drive A) unless another drive is given in the file name.	4-10
Host File		
Name	Enters the name of the host (Basic Four) file to receive data. For 8000 and 2000 series systems, the file is assumed to be in the default host data path unless another path is given. To print on the Basic Four line printer, enter "LP". The printer must be available and on-line.	4-10
Type	Type of file on the Basic Four DIRECT, SERIAL, INDEXED or STRING (2000 systems). This value will default to SERIAL.	4-10

COMMAND	USE	PAGE REFERENCE
Key Field	Not required for Serial, Indexed or String files. For DIRECT files, the field number is to be used as the key. Defaults to 1.	
Create		
Key Size	Not required for Serial, Indexed or String files. Not required if the file already exists on the Basic Four. If a new DIRECT file is to be created, this defines the size of the key. (Value must be 2-56).	
Record Size	Not required if the file already exists on the Basic Four. If the host file is to be created, this defines the length of the records in the file. (Value must be 1-512).	
Number	Not required if the file already exists on the Basic Four. If the host file is to be created, this defines the maximum number of records in the file. Remember to leave room for expansion. (Value must be 1-32767).	
Program	Names the program on the Basic Four that is to be activated to receive data from the Personal Computer. This is usually the standard MAI PC-LINK program SEND; for special purposes, the user can supply another program that uses standard MAI PC-LINK protocols.	

SEND MENU (continued)

COMMAND	USE	PAGE REFERENCE
Go	Starts file transfer from Personal Computer to Host computer. The lines of data transferred will be seen in a window in the lower half of the Personal Computer screen.	
Quit	Exits to MAI PC-LINK main menu.	

RECEIVE MENU

This series of menus is selected by the Receive command on the main menu. Note that to use Receive, the program "RECV" must have been installed on the host computer as described in the installation instructions. MAI PC-LINK supports the transfer of data from Serial, Direct or Indexed files onto the Personal Computer in a range of formats. Data can be selectively transferred by specifying a file key range or file index range, and the desired field numbers and their formats (either numeric or text).

COMMAND	USE	PAGE REFERENCE
Procedure		
Name	Enters name of transfer procedure (up to 8 characters). Also used as the file name if the procedure is saved on the Personal Computer disk.	4-9
Descript	Enters a description (up to 60 characters long) of the file transfer procedure; helpful when identifying for recall procedures which have been saved for future use.	4-9
Host File	Enters the name of the host (Basic Four) file to be sent to the Personal Computer. For 2000 and 8000 series systems, the file is assumed to be in the host data path unless another path is given.	4-10
Type	Automatically displayed after transfer as Direct, Indexed, Serial or String, if activated by GO; other times the type is "Automatic." If a Direct file is being received, Host filename must have been properly entered.	4-10

COMMAND	USE	PAGE REFERENCE
Local File		
Format	Selects a menu allowing choice of Personal formats for data received. Options include formats readable by Lotus 1-2-3, Multiplan, etc. See page reference at right for more details.	4-10
Criteria		
Range Start	Specifies starting Line Number (Serial files), Index (Indexed files) or Key (Direct files). Records preceding this location are not downloaded.	4-11
Range End	Specifies the last Line Number, Index or Key to be transferred. Records after this location in the file are not downloaded.	4-11
Range Quit	Exits to Criteria menu.	
Range Program	Names the program on the Basic Four that is to be activated to prepare and send the data to the Personal Computer. This is usually the standard MAI PC-LINK program "RECV", but for special purposes the user can supply another program that uses standard MAI PC-LINK protocols.	4-11
Range Keys		
Reject	Does not download keys from Direct files.	

COMMAND	USE	PAGE REFERENCE
Range Keys (continued)		
Include	Downloads keys from Direct files, and appends them to the beginning of the data line as the first field.	
SpoolFilter		4-11
On	Used to receive serial files which contain printer control mnemonics. Files may be Basic Four spooler files or other files which contain printer control.	
Off	Used to receive normal text files.	
Columns		4-11
Edit	Activates the Columns (fields) selection menu and window.	
Recall	Recall a columns ruler as defined in the View system.	
Go	Starts file transfer from Host computer to Personal Computer. The lines of data transferred will be seen in a window in the lower half of the Personal Computer screen. Field separators, if any, are shown as small bright box.	
Recall	Recalls a previously saved transfer procedure for later use.	

COMMAND	USE	PAGE REFERENCE
Go (continued)		
Clear	Resets the current transfer procedure to the default values for all options.	
Quit	Exits to MAI PC-LINK Main menu.	

RECEIVE COLUMNS EDIT MENU

Columns (fields) Specifications:

This part of a Transfer Procedure is used if only part of each transferred line or record is to be written to the Personal Computer file. It also allows specific control over whether fields are to be formatted as text or numeric data. In the case of serial files, it is used to select the parts of each line that are to be captured and formatted. Note that a set of column specifications are applied to each line or record of data transferred. Lines with specified numeric fields that do not contain valid numeric data are completely rejected.

Up and Down arrow keys are used to move the field edit cursor up and down in the columns edit window. To add a new field, more the cursor below the current last field. The window scrolls to allow more fields if necessary.

COMMAND	USE	PAGE REFERENCE
Field	The number of the field that you wish to access. For serial files this is always 0; for Direct and Indexed files this indicates the field number within the record from which data is to be extracted. For a Direct or Indexed file the first field in each record is normally field #1. However, if keys are also being downloaded (selected by the Receive Criteria Keys Include option) then the key of each record becomes field #1 and the first real field becomes field #2.	4-12

COMMAND	USE	PAGE REFERENCE
Position Width	Position and Width define which part of the field width you wish to transfer. Position specifies the position within the field of the first character you wish to access, and Width specifies how many characters to include. For example, assume a simple Basic Four file containing 3 lines of one field each: GL0001 GL9807 GL0503 Since the 'GL' is repeated, you decide to transfer only the numeric portion of the field. Your column definition would look like: Field 1 — Position 3 — Width 4 In other words, you wish to retrieve information from field 1 starting in position 3 of the field, and taking 4 characters. Using this column definition, the PC would receive: 0001 9807 0503 **Note:** In order to retrieve an entire field specify a Position of 0 and a Width of 0.	4-12

COMMAND	USE	PAGE REFERENCE
	Position and Width must both contain zeros or both contain non-zero numbers. Otherwise an error will occur.	
	A field will be ignored if you attempt to access a field that does not exist (e.g., a file contains 5 fields and you ask for field 7), or if you attempt to access a position within a field that does not exist (e.g., a field contains 3 characters and you attempt to start at position 8 of that field. However, the difficulty may be overcome by specifying an original field length longer than necessary.	
Name	An optional description field name of up to 16 characters; used for documentation purposes only.	4-12
Type	Field type; can be Numeric or Text.	4-12
Insert	Insert one blank line below the current line.	4-12
Delete	Delete the current line.	4-12
Move	Move the current (source) line. Specify the destination line by using the up and down arrow keys.	4-12

VIEW MENU

This menu is selected by the View option from the main menu. It allows viewing selection and reformatting of data from a downloaded file that has been written to the Personal Computer disk.

COMMAND	USE	PAGE REFERENCE
Read		
Data	Enters the name of the Personal Computer datafile that is to be processed and causes it to be loaded into MAI PC-LINK.	5-2
Ruler	Enters the name of a previously saved data selection ruler to be used on the current data file.	5-3
Edit	Enters edit/data selection mode. Activates the Columns Ruler and causes the selection options to be displayed at the top of the screen.	5-2
Format	Selects a menu allowing a choice of Personal Computer file formats for selected data. Options include Lotus 1-2-3, Multiplan, etc.	5-3
Save		
Data	Enters the name of a Personal Computer file into which the selected, formatted output data is to be written, and causes the data to be written to the file.	5-3

COMMAND	USE	PAGE REFERENCE
Save (continued)		
Ruler	Enters the name of a Personal Computer file into which the currently defined column definitions will be saved for later use.	5-3
Quit	Exits to MAI PC-LINK main menu.	

CONFIGURE MENU

This series of menus is selected by the Configure command on the main menu. Configure allows you to set up the printer, communications, modem and systems defaults used by MAI PC-LINK. You may customize MAI PC-LINK to your specific hardware and peripherals and save this configuration to use instead of the MAI PC-LINK defaults.

COMMAND	USE
Communications	Defines the communications link.
Baud	Sets the baud rate (data transfer rate) for communicating with the host computer.
300...19200	Indicates the speed in bits per second.
Parity	Sets the type of parity checking to be done.
None	No parity checking.
Odd	Parity is odd (standard MAI VDT).
Even	Parity is even.
Data	Sets the number of data bits for communications.
5,6,7,8	Indicates the number of bits to be used for data.
Stop	Sets the number of stop bits for communications.
1,2	Indicates the number of bits to be used as end of character markers.

COMMAND	USE
Comm-Port	Sets the number of the communications port used by MAI PC-LINK in conversation with host computer.
One	Specifies COM1: as the communications port.
Two	Specifies COM2: as the communications port.
Timing	Defines the speed of data transfer (1..200). The default timing factor is 50. If the BASIC FOUR system is slow, this factor may be increased so that the PC will wait longer for responses from the Basic Four. You may experiment with the Timing factor to find the optimum transfer rate for your system under various conditions.
Flow Control	Controls the flow of data from the Basic Four to the PC.
None	No flow control is used.
Xon-Xoff	Xon-Xoff protocol is used. This is the standard Basic Four VDT setting.
DTR	Lowers DTR to control data flow. MAY NOT BE USED WITH A MODEM.
Both	Both DTR and Xon-Xoff protocols are used. MAY NOT BE USED WITH A MODEM.
	Note that when using a modem, DTR flow control may cause the modem to hang up; either Xon-Xoff or no flow control should be used.

COMMAND	USE
PC	Sets up the system defaults for MAI PC-LINK:
Drive/Directory	Defines the data drive/directory where MAI PC-LINK will look and store all files that you use. This can be temporarily overridden during the entry of a file name by pre-appending a drive specification to a file name. Note: The configuration file must always be in the current default drive (or current sub-directory for DOS 2.0).
RecordFile	Defines the file on the data drive/directory (see Drive/Directory above) to which data is sent during Record mode (Alt-R) or screen snapshot (FI) while in Terminal Emulation. If you specify the name of an existing RecordFile and choose to replace it, then it will be emptied. Otherwise all data is appended to the end of existing RecordFiles.
FastStart	If this is set to YES, when MAI PC-LINK is started the next time, you will proceed directly into Terminal Emulation mode. If this is changed, the configurations must be Updated in order for the change to take effect.
AutoDial	If this is set to YES, when MAI PC-LINK is started the next time, you will automatically dial the ModemNumber and then proceed to Terminal Emulation mode. If this is changed, the configurations must be Updated in order for the change to take effect.

COMMAND	USE
Statline	If this is set to Yes, then the status line will be displayed at the bottom of the screen.
Terminal	Changes the type of terminal being emulated.
VDT	Emulates a VDT type of terminal.
EVDT	Emulates an EVDT type of terminal.
Color	
Screen	Selects the screen colors.
Background	Selects the desired background color.
Foreground	Selects the desired foreground color.
Host	
System	Selects the type of Basic Four computer being linked.
Receive	Defines the program installed on the host computer which prepares and transfers data to the Personal Computer. The default name is "RECV". For 2000 and 8000 series systems, the default program path is assumed unless another path is given.
Send	Defines the program installed on the host computer which receives data from the Personal Computer. The default name is "SEND". For 2000 and 8000 series systems, the default program path is assumed unless another path is given.

COMMAND	USE
Host (continued)	
Paths	
Program	Sets the default program pathname for 2000 and 8000 series systems.
Data	Sets the default data pathname for 2000 and 8000 series systems.
Printer	
Parallel	Select to use a parallel printer.
Serial	Select to use a serial printer (note that 2 serial ports are required, one for MAI PC-LINK communication, and one for the printer).
Baud	Select serial printer parameters.
AutoLF	If this set to YES, the printer is in a mode where it automatically inserts a line feed after every carriage return.
Setup	Enters a printer control string (e.g. to compress print). You may send unprintable control characters in the following format: \nnn where nnn is a 3-digit decimal ASCII character code (e.g., to send an ESC to the printer, enter: \027).

COMMAND	USE
Modem	
Initialization	Enters the modem initialization string required (if any). You may send unprintable control characters in the following format: \nnn where nnn is a 3-digit decimal number. You can also enter the character '~' to pause for one second.
Prefix	Enters the modem dial prefix. You may send unprintable control characters in the following format: \nnn where nnn is a 3-digit number. You can also enter the character '~' to pause for one second.
Number	Enters the phone number to be dialed, e.g., 112 604 688 8271. You can also enter the character '~' to pause for one second and enter an unprintable string.
Hang Up	Enters the Hang Up sequence. You may send unprintable control characters in the following format: \nnn where nnn is a 3-digit number. Can also enter the character '~' to pause for one second.
Wait Time	Time for MAI PC-LINK to wait for modem connect.

CONFIGURE MENU (continued)

COMMAND	USE
Update	Updates the configuration file on the DOS current directory (not data drive) with the present setup. This will be a permanent change so you will be prompted as to whether you want to Cancel or Replace this command.
Reset	Resets your current configuration setup to the version stored in your configurations file on the Personal Computer disk. This will destroy all temporary changes that have been made.

FORMAT MENU

This menu allows the selection of a format that will be used to write transferred data to the Personal Computer disk.

COMMAND	USE
Worksheet	Selects a format loadable into LOTUS 1-2-3. Column widths must be defined using the Receive Columns option. File name extension is "WKS".
Import	
Lotus	Selects a format loadable into Lotus 1-2-3 using its "Import Numbers" command. File name extension is "PRN".
dBase II/III	Selects a format loadable into dBase II or dBase III using its "APPEND DELIMITED" option. File name extension is "TXT".
IBM Basic	Selects a format readable by Personal Computer Basic using its READ command for sequential files. Extension is "DAT".
DIF	Selects Software Arts' DIF format. File is directly loadable into Visicalc as well as many other software packages. Extension is "DIF".
SYLK	Selects Microsoft's Symbolic Link format. File is directly loadable into Multiplan and many other software packages. Extension is "SLK".

FORMAT MENU (continued)

COMMAND	USE
Multimate	Selects a format loadable into Multimate. Either document or merge format is available. Extension is "DOC".
Fixed	Selects MAI PC-LINK Fixed which writes data into fixed width columns. Column widths must be defined using the Receive Columns option. Extension is "FIX".
Plain	Selects MAI PC-LINK Plain format. Serial files are received line by line unchanged. Direct and indexed files are received record by record with commas inserted between the fields. Extension is "PLN".

DATA ENTRY AND EDIT

The same method is used for the entry and editing of all data in MAI PC-LINK (Edit mode). In this mode, a prompt is displayed at the top of the screen along with further descriptive information on the following line. Default data may be displayed on the entry line. If the default data is the data you want, press "ENTER" to accept it. To blank the default value and start again, press ESC. To quit data entry, press ESC a second time. Keys available in Edit mode are:

Keys	Use
Left/Right arrow keys	Move edit cursor left or right in the data line.
Home/End keys	Move the cursor to the beginning or end of the edit line.
Escape key	Press once to blank the data line; press again to escape from Edit mode.
Backspace key	Deletes character to left of cursor and moves cursor left one space.
Letter/number/ character keys	Normal data entry.Characters are inserted into the data line at the cursor position. Other characters are pushed right. Data scrolls to the right if necessary for large data items.
Enter key	Accepts currently displayed data and exits from Edit mode.

PERSONAL COMPUTER FILE SELECTION

MAI PC-LINK uses an enhanced method of file selection based on the format used by Lotus 1-2-3. Three methods of file selection are provided:

1. In many cases there will be a default file name that you will want to select with the "ENTER" key.

2. By pressing the space bar, you will be provided with a file directory from which you can select a file by highlighting.

3. You can type in a file name as in normal edit mode.

4. You can type in a wildcard file name to display a list of files from which the desired one can be selected. For example, if you enter 's*.*', all files starting with 's' will be displayed.

If you have previously recalled a file of that type during this run of MAI PC- LINK, then this will be your default file name. If there is a default, then it will be displayed and you will be required to either hit "ENTER" (which means select this file again) or press the space bar (which means get directory assistance). Directory assistance gives you a list of all of the relevant files on the default data drive/directory. You will now be in file directory selection mode, where you may move around the list of filenames with the cursor keys and the "Home" and "End" keys to highlight a filename. If the file that you want is listed on the screen, simply move the highlighting cursor on top of it and hit "ENTER" to select. You may enter a file name by typing any alphanumeric character, which will immediately place you into Edit mode in defining a file name entry. You may optionally type in DOS file directory mask (with '*'s and/or '?') as the filename entry and this will give you additional

directory assistance (this could be useful if you are using a hard disk with a large number of directory entries). You may also specify another drive for MAI PC-LINK to search for your current file (this works for additional directory assistance as well, e.g., "A:" by itself as a filename entry will give you the entire A: Drive directory list.

Press the "ESC" key to quit at any time or F1 (Help) for on-line help.

APPENDIX C

INFORMATION ON COPY PROTECTION

MAI PC-LINK diskettes are copy-protected, using a method which is designed to minimize any inconvenience to users resulting from copy protection. With this copy protection method:

- unlimited backup of programs is possible;
- programs can be run from a hard disk;
- no operating system modifications or specific hardware are necessary.

Replacement Diskette

It is very unlikely that you can damage the master diskette so badly that you cannot run MAI PC-LINK from a backup disk as described below. However, should this occur, contact your MAI Basic Four dealer for a replacement copy.

USING PROTECTED PROGRAMS

1. Protected programs will only execute properly if the MAI PC-LINK diskette is available when the protected file is run. A: drive is searched to determine if the proper MAI PC-LINK diskette is available. If the diskette is not found, the B: drive is then searched. If the proper diskette is there, the program continues normal execution. If the proper diskette cannot be located, the user is simply returned to the operating system.

2. Protected program files may be copied to backup or archive diskettes with the DOS COPY command. (Use of DISKCOPY will result in a read error on the master diskette). These backup copies will not execute unless

they are re-copied onto the MAI PC-LINK diskette they were copied from, or the original MAI PC-LINK diskette is in the system as described above.

3. To use MAI PC-LINK protected program files on a hard disk system, simply transfer the files to the hard disk. When starting MAI PC-LINK, make sure the original diskette is available as described above. If the original is found, the program will continue execution from the hard disk drive.

4. No modification is made to your operating system or BIOS (Basic Input/Output System). The protection system does not limit you to specific hardware configurations.

5. If you experience soft errors, restore the files using the DOS COPY command from the backup copy created above. This process will eliminate most soft errors. In the unusual event that these errors should persist and disk space permits, rename PCLINK.EXE to UNUSED.BAD and transfer the backup copy of the PCLINK.EXE file back to a different area of the original MAI PC-LINK.

6. If the above procedures do not clear disk errors, you may continue to utilize protected program files from a backup diskette. The only requirement is that the original MAI PC-LINK diskette must be available in a disk drive as described above.

APPENDIX D

MAI PC-LINK DISKETTE CONTENTS

When you receive your authorized copy of MAI PC-LINK, the following files should be contained on your distribution diskette:

FILENAME	DESCRIPTION
PCLINK.EXE	MAI PC-LINK main program file.
PCLINK.IDF	Used by the installation procedure.
PCLINK.HLP INDEX.HLP	These are your MAI PC-LINK help system files which reside on your DOS default drive during execution of MAI PC-LINK for the on-screen help facility to be available.
DEFAULTS.CNF	The configuration default file used by MAI PC-LINK to record your current custom setup.
INSTALL.COM	Your hard disk install/uninstall programs.
SEND.HST RECV.HST SEND2000.HST RECV2000.HST	The Basic Four programs which must be installed on the host with the Install program command before advanced Send and Receive will work. For Basic Four series 2000, the appropriate files XXXX2000.XXX must be used.

FILENAME	DESCRIPTION
SAFE.HST SAFE2000.HST	The direct file security program required for access to Basic Four DIRECT files.
MKDIR.HST	A BASIC program which will create a sample Direct file on the Basic Four host.
STUDENT.REC STUDENT.PRC	A sample student data file that will aid you in learning how to use Send, Receive and View commands.
STUDENT.RUL	A sample ruler for practice with View and Receive.
PEOPLE.PRC	A sample Receive procedure definition for use with the DIRECT file created with MKDIR.
TRANSH.BAT	A file transfer program for use in transferring MAI PC-LINK host programs and sample data files to your hard disk.

APPENDIX E

USING MAI PC-LINK REFORMATTED DATA

Data may be reformatted during a Receive data transfer or by selecting data with the columns ruler in View. Reformatted data may then be used in various spreadsheets, word processors, data bases and integrated software packages available for microcomputers. The following descriptions indicate how to complete the transfer of data into these other programs with reference to the ways in which a number of programs import external data (this is documented poorly for most software packages).

1. Worksheet: To load your Lotus 1-2-3 formatted data created by the MAI PC-LINK Worksheet format option, use the 1-2-3 /File Retrieve command. Initially Lotus will display a list of possible files from which to import data. If your file is not listed, then you should check that Lotus' default data drive (defined with the /Worksheet Global Default Directory command) is the one on which your file resides.

2. Lotus: To load Lotus 1-2-3 formatted data created by the MAI PC-LINK Import Lotus format option, use the 1-2-3 /File Import Numbers command. Initially Lotus will display a list of possible files from which to import data. If your file is not listed, then you should check that Lotus' default data drive (defined with the /Worksheet Global Default Directory command) is the one on which your file resides.

   It is important to note that the Lotus Import command will write its import data over top of any information whose cells are required to contain the incoming data (formulae included). You may optionally

set global protection to ENABLE with the /Worksheet Global Protect Enable command, which will not allow you to write over any cells marked as protected by the /Range Protect command. See your Lotus 1-2-3 manual for more details on using the command mentioned.

3. dBase: In order to access your dBase II formatted data created by the MAI PC-LINK Import dBase format option, you must first create a dBase data file with fields corresponding to the size, type and position of the data that was reformatted. This may mean that you must create a temporary file in which to import the data and then update your master database with a simple dBase program or a series of commands (see the dBase COPY command). The following example imports data from the file "STUDENT.TXT" (created by MAI PC-LINK) into the dBase file "STUD.DBF":

```
.USE STUD
.APPEND FROM STUDENT DELIMITED
```

4. DIF: DIF (Data Interchange Format) is a standard symbolic format that allows transfer between many different programs on microcomputers. Visicalc is probably the most widely known of the popular programs that support this format, and so the example importation of data given is directed to the Visicalc user. Visicalc users may load in DIF files (created by MAI PC-LINK) by using the following command sequence:

```
/Storage # Load (filename) Columns
```

where (filename) is the name of the DIF formatted file. Visicalc has no way of protecting formulae that might be overwritten by this data import, so be careful that there is enough space allocated for the incoming data.

5. IBM PC Basic: You may use data in IBM Basic by selecting MAI PC-LINK Import IBM-Basic format. To access this data from a Basic language program, use a program with a similar algorithm to the following example:

```
10 OPEN #1, "STUDENT.DAT"
20 IF EOF (1) THEN GOTO 99
30 INPUT #1,A,B,C$
30 PRINT A,B,C$
50 GOTO 20
60 END
```

This example program reads in an import file line by line, allocates the data to variables A, B and C$, and then prints them out. In this example file, there are two numeric items followed by one text item on each line (record). It is important to make sure that the fields (variables assigned to the various fields) are in the correct order and are of the right type. Note that all files created by MAI PC-LINK in Basic import format have the ".DAT" file extension.

6. SYLK: SYLK (Symbolic Link Format) is another industry standard interface data format supported by many popular software packages. Microsoft's Multiplan as well as a number of other Microsoft products are the most popular examples of a series of programs that use this format. Multiplan does not allow you to directly import SYLK format into a spreadsheet, but instead you must create an external link relationship to the SYLK worksheet in order to extract data from it. You may load an entire SYLK file into Multiplan as your workfile by using the following command sequences:

```
Transfer Options Symbolic

Transfer Load (filename)
```

where (filename) is the name of your SYLK file. All SYLK files created by MAI PC-LINK have the extension ".SLK" which must be manually appended to the filename request in Multiplan. For more information concerning the formation of external links and other features concerning Multiplan, please consult the corresponding sections in the Multiplan manual.

7. MULTIMATE: To load Multimate formatted data created by the MAI PC-LINK Multimate Document or Merge format option, choose Function 1 (Edit an old document) from the Multimate main menu. Initially Multimate will display a list of possible files from which to load data. If your file is not listed, check to see that Multimate's default data drive (accessed through Other Utilities Menu/Drive Defaults) is the one on which your file resides.

APPENDIX F

TRADEMARKS

Lotus 1-2-3	is a trademark of Lotus Development Corporation.
dBase II	is a trademark of Ashton-Tate.
Multimate	is a trademark of Softword Systems.
Multiplan	is a trademark of Microsoft Ltd.
Visicalc	is a trademark of Software Arts Ltd.
IBM	is a trademark of International Business Machines, Inc.
Compaq	is a trademark of Compaq Computer Corporation.
Columbia	is a trademark of Columbia Data Products, Inc.
Corona	is a trademark of Cordata, Inc.
Epson	is a trademark of Epson Corporation.

APPENDIX G

LIMITATIONS

Listed below are some of the current limitations on MAI PC-LINK Version 2.3.

File Transfer	Transferred records must be no longer than 750 characters.
View (Visual Data Reformatter)	There is currently a limitation to the size of the data file to be loaded. If a file is too big, it will be truncated to fit into memory. The maximum length of data lines that can be loaded into View is 512 characters. Longer lines will be truncated.

NOTES

APPENDIX H

SETUP PROBLEMS

A. If you are communicating through a modem, you may encounter one of the following problems:

1. MAI PC-LINK cannot communicate with modem.

   Possible Causes:

   - o MAI PC-LINK baud rate is set incorrectly.
   - o Modem is not connected to the serial port.
   - o If more than one serial port is present, the wrong serial port is connected.
   - o The serial port is not IBM PC compatible.
   - o The cable linking the PC to the modem is wired incorrectly.
   - o Modem is not of the correct type.

2. MAI PC-LINK cannot automatically dial the modem.

   Possible Causes:

   - o Modem is not an autodial modem.
   - o MAI PC-LINK baud rate is set incorrectly.
   - o Modem is not connected to the serial port.
   - o Wrong serial port selected.
   - o The serial port is not IBM PC compatible.

- o The cable linking the PC to the modem is wired incorrectly.

- o The modem initialization, dial prefix or number strings may be incorrect.

- o Modem is not of the right type.

3. MAI PC-LINK will not hang up the modem after a successful call was made.

   Possible Causes:

   - o Modem is ignoring the PC's DTR line (some modems are switch selectable for DTR).

4. MAI PC-LINK connects to the remote modem, but cannot communicate with the Basic Four.

   Possible Causes:

   - o The cable connecting the remote modem to the Basic Four is incorrectly wired.

   - o The Basic Four port is incorrectly configured (continue reading).

B. If you have problems starting emulation:

1. The port to which your Personal Computer is connected may not be enabled. To determine if it is enabled, perform the following:

   a. Determine the number of the port that you are connected to on the BASIC FOUR. You can do this either by looking at the back of the BASIC FOUR for the 'channel' number that your cable is plugged into, or by asking the system manager.

   b. On another BASIC FOUR terminal, run the system utility program.

      - o For 1300 Series: from the '>' prompt, type RUN "**" and press RETURN key.

- o For 8000 Series: from the "!" prompt, type UTILITY or from the '>' prompt, type !UTILITY.

- o For 2000 Series: from the Command Interpreter prompt, type "menu".

  (If you are unsure about the use of the UTILITY programs, refer to your MAI BASIC FOUR System User Guide.)

- o Select "SYSTEM" and on the next menu select "Display Memory/Device Usage" or "TASKS".

- o You will receive a display of status of the system, including which terminal control tasks are enabled.

c. You will see a display which indicates the number of 256-byte 'pages' of memory that are allocated to each task. Also indicated is the number of pages of memory that are not currently being used.

- o If your port (task) is listed on the screen, and it has memory allocated to it, then it is enabled. There must be some other problem. In this case, you should proceed to the next item below.

- o If your port (task) does not appear at all on the screen, then your operating system is not configured to allow that task to be enabled. In this case, you will have to call MAI to reconfigure your operating system.

- o If your port (task) is listed on the screen, but it does not have memory allocated to it, then it is not enabled. In this case, you should proceed to the following paragraph for the necessary steps to enable it.

d. On 1300 series, to start a terminal control task, you must use the system control terminal (the one plugged into port 0). On the system control terminal, in command mode, type a command in the following syntax:

START P,"TN"

Where:

- P is the number of pages of memory to assign to your terminal (make sure that there are enough pages of free memory available in any one memory bank, or you will receive from the BASIC FOUR an error message number 33 -Insufficient Memory Capacity).

- N is the number of the port that your Personal Computer is connected to.

For example:

START 10,"T5"

will start Task 5 with 10 pages of memory assigned to it.

e. If you receive error messages in response to this command, you may have one of these problems:

o Your BASIC FOUR operating system may not be configured to allow this port to be enabled as described above. You can tell that this is the problem if your task number does not appear at all on the system status screen described above. If this is the case, you will have to ask MAI to reconfigure your operating system.

o You may have made a mistake in the amount of available memory.

- You may not have typed the command in upper case letters.

2. If the above still does not work, then the port to which you are connected may not be set to 9600 Baud, or it may not be connected inside the Basic Four computer. The best way to check if this is the problem is to connect the Personal Computer to a port that is known to work with a normal BASIC FOUR terminal. If the Personal Computer works with this port but not with the one that you are trying to enable, then your port probably has a hardware problem. You should ask an MAI service representative to check that your port is connected internally, and it is set at a rate of 9600 baud.

3. If you are using a Columbia* or Corona* Personal Computer, then you may have to switch lines 2 and 3 of the DB 25 connector plugged into the Personal Computer. This may also be necessary for some other non-standard Asynchronous communication cards plugged into a Personal Computer.

4. The Personal Computer asynchronous port may not be operational or may be switched to the wrong port address (switch selectable on some expansion boards). Try the self test mode that is available in the Terminal menu. This makes the currently selected serial port echo characters back directly to MAI PC-LINK. Enter emulation mode and type a normal character, like 'K'. If the 'K' is not echoed back to the screen, then something is wrong with the serial card. Note that some serial cards are not truly IBM PC compatible and require that certain pins, e.g. DSR (data set ready) be held high.

* Refer to Appendix F for trademark information for these products.

If none of the preceding steps is successful, call the dealer from whom you purchased MAI PC-LINK for assistance.

NOTES

APPENDIX I

BASIC FOUR TERMINAL CONTROL MNEMONICS RECOGNIZED BY MAI PC-LINK

MNEMONIC	MNEMONIC NAME	RESULTING ACTION
@(x)	Horizontal Position	Display next data at absolute horizontal position defined by x.
@(x,y)	Horizontal and Vertical Position	Display next data at position x of vertical line y.
'BS'	Backspace	Moves the cursor back one space, erasing the previous character.
'CE'	Clear Screen To End of Page	Clears the screen from the cursor to the end of the page.
'CF'	Clear Foreground	Replaces Foreground Characters with spaces.
'CH'	Cursor Home	Positions the Cursor at Home and Sets Foreground Mode.
'CL'	Clear Line	Replaces all characters between the Cursor and the end of line with blanks.
'CR'	Carriage Return	Cursor Drops one line; moves to position 0.
'CS'	Clear Screen	Clears all characters from the video screen, positions the cursor to home, and sets mode to Foreground.

MNEMONIC	MNEMONIC NAME	RESULTING ACTION
'DC'	Delete Character	Deletes the character at cursor and shifts characters to the right of the cursor one position to the left. Writes a space in the last position of the line or field. Starts Foreground if Background was in effect.
'ES'	ESCAPE	Sends an ESC to the terminal which treats it as a lead in code. The next character defines an action code for the VDT.
'IC'	Insert Character	Moves all characters at and to the right of the cursor one space right. The next character output or input occurs at the space at the cursor position. Resets mode to foreground.
'LD'	Line Delete	Removes line where the cursor is positioned; rolls all lines below it up one line; inserts a blank line at the bottom of the screen and sets the mode to foreground.
'LF'	Line Feed	Outputs a line feed/ carriage return.

MNEMONIC	MNEMONIC NAME	RESULTING ACTION
'LI'	Line Insert	Inserts a blank line at cursor position; rolls all lines below it down, deletes the bottom line on the screen and sets Foreground mode.
'PS'	Start Protect Mode	Begins display protection. Prevents cursor from entering a previously protected position, and prevents screen scrolling.
'PE'	End Protect	Cancels °PS', ending the protection mode.
'RB'	Ring Bell	Causes beep on VDT.
'RC'	Read Cursor	Provides current cursor position coordinates. Should be used with or followed by an INPUT directive. Echo is suppressed for the remainder of the INPUT directive and is restored afterward.
'SB'	Start Background	Begin Background mode. Marks Background characters as protectable, though does not begin protection.
'SF'	Start Foreground	Begin Foreground mode.
'TR'	Transmit Screen	Sends data from screen to the input variable.

APPENDIX J

QUICK START PROCEDURES

This outline is designed for the experienced PC and Basic Four user. If you have not had much exposure to a Personal Computer or a Basic Four, or if you encounter difficulties, see the appropriate User Guide pages.

GETTING CONNECTED

To run MAI PC-LINK, the asynchronous port of the PC should be connected to the Basic Four with a standard MAI cable. A female-female adapter cable will be needed to allow the cable to be plugged into the PC. The Basic Four port should be configured and enabled as it would be for a standard VDT or EVDT.

STARTING MAI PC-LINK SESSION

To start MAI PC-LINK, type MAI PC-LINK.

The program will run from a hard disk or a working copy floppy diskette as long as the INSTALL program has been used. (Refer to Section 2 for Installation/Uninstallation Procedures).

MAI PC-LINK's menu system design allows you to select an item from a menu, either type the first letter of your selection, or use the left/right arrow keys to move the cursor to your selection (shown by highlighting) and press ENTER. To exit from a menu, press ESC or select (Q)uit or (E)xit when available. MAI PC-LINK's on-line HELP system can be accessed by pressing F1 (shift-F1 while in emulation mode).

Enter C)ONFIGURE and check to see that the default settings apply to your system. Settings most likely to require attention are:

Communications Port	If you are not using COM1
Terminal	If you wish to emulate an EVDT
Host System	If you are connected to a 2000 or 8000 series computer

If you are communicating through a modem, it will be necessary to change the Communications Baud rate and to enter the Modem dialing sequence.

Once MAI PC-LINK has been configured to your requirements, you may wish to save the new settings by selecting U)DATE.

To check that you are communicating with the Basic Four, exit from the Configuration menu and select (T)ERMINAL. If you are using a modem, select D)IAL.

Select E)MULATE. You will see a blank screen with a status line at the bottom. Pressing ESC should elicit the normal terminal response for your system. You may now use the PC as you would an MAI terminal. See page 14 of the User Guide for function and motor bar key usage on the PC keyboard.

Pressing F10 will return you to the main MAI PC-LINK menu.

FILE TRANSFER

Installation

In order to transfer files to and from the Basic Four, the programs "SEND" and "RECV" must be installed on the Basic Four. To transfer to and from DIRECT files on the Basic Four, the program "SAFE" must also be installed on the Basic Four.

On 2000 and 1300 series computers, these programs must first be created with a length of 20 pages each.

Select C)ONFIGURE I)NSTALL. To install SEND, enter the PC file name SEND.HST (SEND2000.HST for the Basic Four 2000). Then enter the host file name SEND. When the file has been transferred, repeat the procedure for RECV and SAFE.

SEND

To send a data file to the Basic Four, the file must have first been created. The required entries for a SEND procedure are the Host filename and the Local filename.

RECEIVE

Files may be received to the PC in various formats and using various criteria. The required entries are Host filename, Local filename and Local file format.

APPENDIX K

PC ERROR MESSAGES

****
This is an alphabetical list of the error messages displayed by the PC-Link program from the PC end. The list does not include error messages generated by the host program.
****

"Bad Format"

Reason: This message should not appear in PC-Link; if it does, a corrupt PC-Link program file is indicated.

Action: Contact your MAI Basic Four representative for further instructions.

"Can't do Record and Capture at the same time"

Reason: In Emulation, Record to Disk (ALT-R) and Print Capture were selected at the same time. This cannot be done.

Action: Toggle off one of the two functions.

"Can't edit strings longer than nn characters"

Reason: When prompted for a string of characters, a string was entered that contains too many characters to be used for that particular purpose.

Action: Enter a smaller character string.

"Can't open Communications Port"

Reason: PC-Link was unable to access the Comm-Port specified in the Configure screen.

Action: Check to see that there is an asynchronous board in the PC and refer to its manual to ensure that it is properly configured for the address of either COM1 or COM2. If there is more than one such board in the PC, make doubly sure that they are not configured for the same COM Port address.

"Cannot prepare host computer to receive program"

Reason: During a host program installation, the appropriate responses were not received from the host computer when PC-Link attempted to clear the workspace on the host. This is caused either by not receiving the response in time or by receiving an incorrect response.

Action: Prior to starting any install procedure, if you go into Emulation, ensure that you are in Command Mode with the BASIC promopt ">" displayed (and there are no active GOSUBS, etc.) If this was not the problem, then try increasing the Timing Factor in the Configure screen. If the problem still exists, contact your MAI Basic Four representative.

"Character Verification Error"

Reason: During the transmission of characters to the host, a character was not echoed back properly to the PC. There is some interference in the communication line.

Action: Check for possible causes of electrical interference, and try again a short time later.

"Config file write error"

Reason: PC-Link was unable to Update the Configuration file. This is usually a hardware problem (drive door open, not enough room on disk, bad disk, etc.).

Action: Ensure there is enough space on the disk to store the Configuration file. If there is, exit from PC-Link and use the DOS CHKDSK utility to verify the integrity of the disk.

"Config file read error"

Reason: PC-Link was unable to read the Configuration file. This is usually a hardware problem (drive door open, not enough room on disk, bad disk, etc.).

Action: Ensure that the Configuration file is there (DEFAULTS.CNF). If it is, exit from PC-Link and use the DOS CHKDSK utility to verify the integrity of the disk.

"Configuration file size error - using default values"

Reason: PC-Link was unable to use the Configuration file. This is usually due to upgrading to a newer release of PC-Link and leaving the old configuration file there.

Action: The values displayed on the Configure screen will be default values internal to the PC-Link program. You should check them and update them if necessary before attempting Emulation or file transfers.

"Could not reset host computer"

Reason: The appropriate responses were not received from the host computer when PC-Link attempted to clear the workspace on the host. This is caused either by not receiving the response in time or by receiving an incorrect response.

Action: Prior to starting any SEND, RECV, or Install procedure, if you go into Emulation, ensure that you are in Command Mode with the BASIC prompt ">" displayed. If this was the case when the error was reported, then try increasing the Timing factor in the Configure screen. If this still does not work, contact your dealer.

"Could not send character"

Reason: In Emulation, PC-Link could not output the particular character for the key being pressed. This indicates a communication link problem.

Action: Check all cable connections. Check the asynchronous communications board.

"Could not send control data to host"

Reason: The appropriate responses were not received from the host computer when PC-Link attempted to inform the applicable host program (SEND or RECV) of the descriptive parameters of the file transfer. The host program may be corrupted or communciation may have been garbled by interference. This error is also generated by not receiving the response in time or by receiving an incorrect response.

Action: Try increasing the Timing factor in the Configure screen. If this does not work, compare the applicable host program line by line with the original version supplied on the Host Programs diskette, to see if any lines have become damaged in any way. If there are damaged lines, use the Configure/Install option and reinstall the program from the Host Programs disk to the host.

"Create file through Terminal Emulation"

Reason: PC-Link was unable to automatically create the data file.

Action: Use the Business BASIC utility to create the file prior to the transfer.

"Currently unsupported output format"

Reason: This message should not appear in PC-Link. If it does, a corrupt PC-Link program file is indicated.

Action: Contact your MAI Basic Four dealer for further instructions.

"Cursor Positioning Stack Overflow"
"Cursor Positioning Stack Underflow"

Reason: These messages should not appear in PC-Link. If it does, a corrupt PC-Link program file is indicated.

Action: Contact your MAI Basic Four dealer for further instructions.

"Desired Help information is not available"

Reason: You are at a menu or a screen in PC-Link for which there is not a context-sensitive link.

Action: Change to a different menu, call up HELP, and use the Help Index to select a HELP screen appropriate for your need.

"Did not receive acknowledgement from Host"

Reason: PC-Link attempted several times to send information to the host and failed to receive an acknowledgement each time. There is some breakdown in communication. Possible causes include: hardware failure, not being at the BASIC Command Mode prompt when initiating a file transfer, or a very busy host (Timing Factor too low).

Action: Try again with the Timing factor increased. Most often this will take care of the problem. Check all cable connections, etc. If initiating a file transfer, check to see that there are no active GOSUBS by typing DELETE at the BASIC prompt. If there are active GOSUBS, use the END command to deactivate them.

"Disk file is empty or nondisplayable format"

Reason: An attempt was made to load into the View window a PC file that was empty or was not in an ASCII text type format.

Action: Check the file in question for these characteristics.

"Disk full writing record file"

Reason: In Emulation, during either a Record to Disk (ALT-R) or a screen Snapshot to Disk (F8), the disk receiving the Record-File named in the Configure screen has become full.

Action: Use a floppy disk with more space on it or erase some files that are present.

"Error defining function key"
"Error in re-defining key"

Reason: During Emulation of an EVDT, if an invalid escape sequence for defining or re-defining one of the function keys is received by PC-Link from the host, PC-Link will display one or both of these messages. The sequence may have become damaged in transmission from the host, or the host may be sending an invalid sequence.

Action: Try it several times (checking cable connections and checking for electrical interference). If this does not work, find out the exact escape sequence being sent by the host.

"Error in communicating with modem"

Reason: The response expected from the modem was not received for some reason. This could be due to 1) a control sequence entered in one of the modem settings in the Configure screen, not recognized by the modem; 2) electrical interference trashing the communication lines; or 3) a hardware problem in the modem itself or in external modem cases, within the serial board in the PC connected to the modem.

Action: Retry the action. If there is still an error, check all connections, try to eliminate sources of electrical interference, and check the modem/serial boards for damage.

"Error in releasing lineselected"
"Error in releasing linelength"
"Error in release line"

Reason: These are serious PC hardware errors relating to the dynamic use of memory.

Action: Exit from PC-Link, re-boot your PC, and perform the same function again. If the error occurs again, exit from PC-Link and use your PC's System Diagnostics program(s) to check the PC.

"Error in running DOS command or program"

Reason: PC-Link could not execute the DOS application properly. Another message may accompany this message to indicate the detailed reason.

Action: Refer to the accompanying message and take action based on it.

"Error in starting Host program"

Reason: When PC-Link attempted to RUN the applicable host program (SEND), the appropriate responses were not received from the host computer. The host program may be corrupted, or communication may have been garbled by interference. This error is also generated by not receiving the response in time or by receiving an incorrect response.

Action: Try increasing the Timing factor in the Configure screen. If this does not work, compare the applicable host program line by line with the original version supplied on the Host Programs diskette, to see if any lines have become damaged in any way. If there are damaged lines, use the Configure/Install option and reinstall the program from the Host Programs disk to the host.

"Error in Setting Output Transparency"

Reason: These messages may occur in previous releases of PC-Link.

Action: Contact your MAI Basic Four dealer.

"Error in transmission"

Reason: During a SEND, an error was reported by the host, or communication has broken down. An accompanying error message will give more information related to this error.

Action: Take action depending on accompanying error message. If all cable connections, etc. seem OK, try again.

"Error reading Procedure file"

Reason: When Recalling a previously saved SEND procedure, an error in reading that procedure file from the PC disk has occurred. This is a hardware oriented type of problem (drive door open, corrupt file or bad disk).

Action: If the disk is bad or the file is corrupt, then the procedure file is lost and it will have to be re-entered. Do not continue to use a disk that is bad, as the potential is great for loss of more information.

"Error writing file. Transmission ended"

Reason: During a RECV, a problem occurred when the PC was trying to write to the destination Drive/Directory. This is usually hardware related, such as a floppy drive door being left open or a disk error.

Action: Exit from PC-Link. Use the DOS CHKDSK utility to see if the disk is OK, or insert a new disk.

"Failed to confirm after 5 tries"

Reason: PC-Link attempted several times to RECV information from the host and failed each time. There is a breakdown in communication, possibly caused by hardware failure, electrical interference, or very busy host (Timing Factor too low). This message is usually followed by another message indicating termination of the transfer.

Action: Try again with the Timing factor increased. This will usually resolve the problem. Check all cable connections, etc.

"Failed to send End of File to Host"

Reason: The End of File marker sent to the host was not responded to as expected. The destination HostFile may not be large enough, or communication may have broken down.

Action: Check the size of the host file. Enlarge it by a small amount and try again. Check all cable connections.

"Fields must be defined for Fixed/Worksheet formats"

Reason: Go was selected in a RECV procedure into a PC file format of Fixed or of Worksheet, without specifying at least one field in the Field section of the Receive screen.

Action: At the Receive menu, select the Fields option and enter the field information for the data you wish to transfer.

"File does not exist"

Reason: The LocalFile name entered in a SEND procedure does not exist on the PC in the current Drive/Directory (or full pathname if entered).

Action: Ensure that you are referring to the correct Drive and Directory and that a file with the name entered in the LocalFile setting exists.

"File transfer terminated by operator"

Reason: The ESC key on the PC was pressed during the file transfer.

Action: Restart the transfer if you wish.

"File transmission aborted"

Reason: The ESC key on the PC was pressed during the file transfer.

Action: Restart the transfer if you wish.

"File Type not detected"

Reason: At the start of a RECV, PC-Link has checked for the presence of the HostFile on the host computer. PC-Link either cannot find the file, or the descriptive information about the file was not communicated properly to the PC.

Action: Check all cable connections, etc. Ensure that the file exists on the host; remember that the host file name is case sensitive.

"Help not available"

Reason: The F1 key was pressed to activate HELP. But the HELP files PCLINK.HLP and PCLINKDX.HLP were not available in the current Drive/Directory.

Action: Copy the HELP files into the current Drive/Directory if you wish to use HELP there.

"Host Data filename is too long"

Reason: The HostFile name entered in a SEND or RECV procedure is too long (greater than 42 characters in length) when appended to the Data/Path setting, as entered in the Configure screen.

Action: Re-enter using a shorter Path and/or HostFile name.

"Host Error handler failed"

Reason: During a RECV, an error was reported by the host and picked up by PC-Link. However, the usual descriptive information about the error was not received by PC-Link from the host.

Action: Try again with the Timing factor increased. It may have been as simple as interference during communication, in which case a repeated attempt may prove successful. Or, it may be something more serious occurring at either end of the link (but most likely at the host end). See if it occurs during a RECV of other files. You can also check for corruption in the host program (RECV).

"Host Error - Error handler failed"

Reason: An error was reported by the host and picked up by PC-Link. However, the usual descriptive information about the error was not received by PC-Link from the host.

Action: Try again with the Timing factor increased. It may have been as simple as interference during communication, in which case a repeated attempt may prove successful. Or, it may be something more serious occurring at either end of the link (but most likely at the host end). See if it occurs using other files. You can also check for corruption in the host program involved.

"Host file does not exist or is too small"

Reason: During host program installation, the destination program file was not present or was created without enough room for all the program lines to fit. This message is usually followed by another message indicating failure of the install.

Action: Erase the destination program file; create one with at least as much space as is indicated in the User Guide for that particular program file.

"Host Program name is too long"

Reason: The Program name entered in a RECV procedure is too long (it is greater than 42 characters in length) when appended to the Program/Path setting, as entered in the Configure screen.

Action: Re-enter using a shorter Path and/or HostFile name.

"Host program failed to start"

Reason: When PC-Link attempted to RUN the applicable host program (RECV), the appropriate responses were not received from the host computer. The host program may be corrupted, or communication may have been garbled by interference. This error is also generated by not receiving the response in time or by receiving an incorrect response.

Action: Try increasing the Timing factor in the Configure screen. If this does not work, compare the applicable host program line by line with the original version supplied on the Host Programs diskette, to see if any lines have become damaged in any way. If there are damaged lines, use the Configure/Install option and reinstall the program from the Host Programs disk to the host.

"Input file has not been specified"

Reason: In View, a function was selected that requires a file to be loaded into the View window first.

Action: Select the Data option, and load the input file you wish to reformat.

"Insufficient disk space"

Reason: During a RECV, the current Drive/ Directory has run out of room.

Action: Use a floppy diskette with more space available, or terminate the transfer.

"Insufficient disk space - File is not usable"

Reason: During the writing of the output file in View, the end of the available disk space was reached.

Action: Change disks or change Drive/Directory and retry.

"Insufficient information for creation of file on Host"

Reason: During a SEND procedure using automatic data file creation, not all information required to create the data file on the host computer was entered.

Action: Enter the missing information and retry.

"Insufficient Memory"

Reason: PC-Link requires additional PC memory for records to be loaded up into the View window. There is not enough memory on the PC left to load the file in its entirety.

Action: Make more memory available, or break the input file into smaller pieces.

"Insufficient memory - File truncated"

Reason: PC-Link requires additional PC memory for records to be loaded up into the View window, and there is not enough memory left on the PC to load the file in its entirety.

Action: Make more memory available, or break the input file into smaller pieces.

"Invalid Baud rate"

Reason: An invalid baud rate has somehow been incorporated in the LocalPrinter setting in the Configuration. This indicates that there is corruption in either the Configuration file (DEFAULTS.CNF) or in the PC-Link program.

Action: Exit from PC-Link and start again. Update the Configuration file; if the error continues, contact your MAI Basic Four dealer for assistance.

"Invalid drive/directory in defaults"

Reason: During startup, PC-Link checks the availability of the default Drive/Directory on the PC that is entered in the Configuration file (DEFAULTS.CNF). As shipped, this entry contains "A:\". Therefore, if you have installed PC-Link and are running it for the first time on a drive other than drive A, you will get this warning.

Action: Go into the Configure menu and ensure the Drive/Directory is where you want it to be (typically "C:\" followed by the directory name where you have installed PC-Link, if you are on a hard disk). Then select the Update option and select Replace if prompted. The next time you start PC-Link, it will not give you the same message.

"Memory Allocation Error"

Reason: These are serious PC hardware errors relating to the dynamic use of memory.

Action: Exit from PC-Link, re-boot your PC, and perform the same function again. If the error occurs again, exit from PC-Link and use your PC's System Diagnostics program(s) to check the PC.

"Modem appears to still be connected"

Reason: After a Hangup has been attempted, this is a warning that the control signals coming back from the modem to the PC indicate the local modem is still connected to the remote modem.

Action: If repeated attempts still result in the display of this warning, turn the modem off and on. This will definitely break the connection.

"Name too long"

Reason: A Host/Data/Path or Host/Program/Path with a length of greater than 42 characters (including Program name if applicable) was entered in the Configure screen.

Action: Enter a shorter Path name.

"Not enough space on the disk to store file"

Reason: PC-Link has checked the space available on the PC's default drive and has determined that the file to be RECVed will not fit there.

Action: Clear some space on the drive, use a floppy diskette with more space available, or change the destination drive of the file transfer.

"No dial sequence has been entered"

Reason: An attempt has been made to Dial via modem when there is no dialing sequence entered in the Configure screen.

Action: Enter the information necessary in the Modem section of the Configure menu.

"No files found of type xxxxxx.xxx"

Reason: When prompted for a PC filename, no file on the PC in the current Drive/Directory exists matching the name that was entered.

Action: Enter a new name or change the Drive/Directory setting.

"No file has been specified"

Reason: No output filename was specified when the prompt for one was displayed.

Action: Enter a filename.

"No disk space available"

Reason: A function requiring new space on a disk on the PC has been used, and a search of the disk indicates that there is no room left on that disk.

Action: Insert a new disk and try again.

"Not enough memory to use View"

Reason: PC-Link requires more PC random access memory to store records loaded into the View window, and there is not enough available.

Action: You may have other programs "memory resident" on the PC that can be terminated, releasing memory for use. If these function key definitions are critical to you, you may want to consider obtaining more memory for your PC.

"Not enough space on the disk to store file"

Reason: View has estimated the size of the output data file and has determined that there is not enough room on the destination disk to store the file.

Action: Change disks or change Drive/Directory and retry.

"Out of memory defining keys"

Reason: PC-Link requires more PC random access memory to store additional function key definitions, and there is not enough available.

Action: You may have some other programs "memory resident" on the PC that can be terminated, releasing memory for use. If these function key definitions are critical to you, you may want to consider obtaining more memory for your PC.

"Path names not required on 13XX series"

Reason: These options are for use if your host computer is either a 2000 series or a 7000, 8000, or 9000 series.

Action: Do not enter anything in this option.

"PC Filename, Host Filename and Program required"

Reason: Go was selected in a SEND procedure before all three of the above required pieces of information were entered.

Action: Enter the missing information and retry.

"PC Filename, Host Filename, Host Program name required"

Reason: Go was selected in a RECV procedure before all three of the above required pieces of information were entered.

Action: Enter the missing information and retry.

"Please enter terminal mode and LOG OFF"

Reason: You have not logged off the host system prior to exiting from PC-Link.

Action: You must log off. If this still fails, contact your MAI Basic Four dealer.

"Printing terminated after three errors"

Reason: During Slave Printing, if PC-Link has trapped three errors from the printer, it assesses that there is not enough confidence in the printer link to continue.

Action: Check all cables and eliminate possible sources of electrical interference.

"Print line truncated at 200 characters"

Reason: During a RECV of a serial (spool) file with SpoolFilter on, a line exceeded 200 characters in length and has been truncated.

Action: Ensure that no record in the serial (spool) file is longer than 200 characters.

"Program installation unsuccessful"

Reason: During host program installation, there was some failure, or the install was terminated by the user pressing the ESC key. This message is usually preceded by another message indicating the cause of the failure of the install.

Action: Refer to the accompanying message and take corresponding action.

"Records truncated at nnn characters"

Reason: During a RECV, one or more records exceeded the maximum receivable record length. Those records will be truncated in the LocalFile on the PC.

Action: Ensure that no record to be received exceeds the maximum record length.

"Size error - old Version - Procedure must be re-entered"

Reason: When Recalling a previously saved SEND procedure, the procedure file is a different size than that used by the current version of PC-Link. This occurs when you have received an update but are trying to use the old procedure files.

Action: The procedure will have to be re-entered.

"There is no selected data to save"

Reason: In View, you must have selected at least one record to save to the output file.

Action: Use the S key or ALT-S key combination to select records to be included in the output file.

"This file exists also -- request terminated"

Reason: When the prompt for NewName filename entry was given, this second file also existed on the PC.

Action: Re-select the function and enter a name that does not exist, or select Replace to overwrite the old file.

"Timeout on character receive"

Reason: During a RECV, no character was received from the host within a reasonable amount of time, when one should have been received. If this occurs, PC-Link assumes the communication link has broken down somehow.

Action: If all cable connections etc. seem OK, increase the Timing factor and try again.

"Timeout on checksum receive"

Reason: During a RECV, error checking information was not received by PC-Link from the host. There may have been a breakdown in communication (probably hardware oriented) or in versions of PC-Link up to 2.35. The particular combination of host computer, operating system level, and how heavily loaded the host is, may have produced an unusually slow response from the host. This latter case has only appeared in some 13XX series and has been rectified in PC-Link Version 1.00.

Action: Ensure that the communication link is still active by checking all cables, etc. and by going into Emulation and seeing if you still get a response. If all seems OK, try again with the Timing factor increased.

"Too many files to show - truncating directory"

Reason: When using the file selector utility, the current Drive/Directory contains too many entries to fit on the screen.

Action: Enter a wildcard when prompted for the filename (i.e. *.PLN), or enter the filename itself if you know it.

"Too many help screens"

Reason: This message should not appear in PC-Link. If it does, a corrupt PC-Link program file is indicated.

Action: It is necessary to contact your MAI Basic Four dealer for further instructions.

"Transmission error. File transmission ended."

Reason: PC-Link attempted several times to RECV information from the host and failed each time. There is some breakdown in communication. Possible causes include: hardware failure, electrical interference, very busy host (Timing Factor too low). This message is usually accompanied by another, more informative message.

Action: Try again with the Timing factor increased. Most often this will take care of the problem. Check all cable connections, etc.

"Unable to calculate size of PC file"

Reason: During host program installation, PC-Link was unable to calculate the size of the program file on the PC (host programs disk). This is usually indicative of a hardware problem: drive door open, corrupt file or bad disk.

Action: Exit PC-Link and use the DOS CHKDSK utility to ensure disk integrity.

"Unable to create program file on Host"

Reason: During host program installation, for some reason PC-Link was unable to automatically create the program file on the host.

Action: Try increasing the Timing Factor and reattempt. If this fails, use the Business BASIC utility to create the program files prior to the Install. Program file parameters are given in the User Guide.

"Unable to find file command.com"

Reason: COMMAND.COM must be located on the default Drive/Directory to use the DOS selection in PC-Link.

Action: Copy COMMAND.COM to the default Drive/Directory.

"Unable to open com port"

Reason: PC-Link was unable to access the Comm-Port specified in the Configure screen.

Action: Check to see that there is an asynchron-ous communications board in the PC; refer to its manual to ensure that it is properly configured for the address of either COM1 or COM2. If there is more than one such board in the PC, make sure that they are not configured for the same COM port address.

"Unable to open appended file xxxxxxxx.xxx"

Reason: When the selection for Append was made, PC-Link was unable to open this file. This implies a bad file or another type of hardware error on the PC.

Action: Insert a new disk and try again.

"Unable to open input file xxxxxxxx.xxx"

Reason: The input file cannot be opened by PC-Link. The file may not exist, it may be corrupt, or the disk may be bad.

Action: Check for the file's existence in the Drive/Directory being accessed. If it is there, exit PC-Link and use the DOS CHKDSK utility to verify the integrity of the disk.

"Unable to open replaced output file xxxxxxxx.xxx"

Reason: When the selection for Replace was made, PC-Link was unable to open this file. This implies a full disk or another type of hardware error on the PC.

Or

Reason: When the prompt for NewName filename entry was given, PC-Link was unable to open this second file. This implies a full disk or another type of hardware error on the PC.

Action: Insert a new disk and try again.

"Unable to open output file xxxxxxxx.xxx"

Reason: When an output filename entry was made, PC-Link was unable to open this file. This implies the file does not exist or is bad.

Action: Check for the file's existence in the Drive/Directory being accessed. If it is there, exit PC-Link and use the DOS CHKDSK utility to verify the integrity of the disk.

"Unable to re-open com port"

Reason: After completing the DOS application, PC-Link attempted to re-establish communications with the host and failed for some reason.

Action: Check the cables, serial board, etc.

"Unable to start host program: XXXX"

Reason: When PC-Link attempted to LOAD the applicable host program (SEND or RECV) into the workspace on the host, the appropriate responses were not received from the host computer. The host program may not be present on the host computer (or in the designated path on the 2000 or 8000 type Basic Four host systems). This error is also generated by not receiving the response in time or by receiving an incorrect response.

Action: Ensure that the applicable host program is available to be LOADed. If this was the case when the error was reported, then try increasing the Timing factor in the Configure screen. If this still does not work, contact your dealer.

"Unlicensed Host Computer"
"Unlicensed Terminal Port"

Reason: These messages may occur in very old releases of PC-Link.

Action: Contact your MAI Basic Four dealer immediately for further instructions.

"Warning: Printer not ready - output ignored"

Reason: PC-Link has determined from the state of the communication link to the LocalPrinter that the printer is not available to receive data from the PC.

Action: Check all cable connections. Ensure that the printer is turned on and is "On-Line". If you are not going to use the LocalPrinter during the PC-Link session, then ignore the message and continue.

NOTES