Data Communications Products

AST-3780™
AST-3780/A™

AST® RESEARCH INC.

User's Manual

AST-3780™
and
AST-3780/A™
IBM 3780 Emulation
for the
IBM PC, XT, AT, Personal System/2 and
Other IBM-Compatible Machines

User's Manual
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INTRODUCING AST-3780

AST-3780 and AST-3780A are remote job entry (RJE) station emulators that enable you to transfer data from an IBM PC, PC XT, PC AT, Personal System/2 (or compatible) to any computer system supporting a binary synchronous (BISYNC) communication interface. This gives you the ability to transfer information between a personal computer and a mainframe computer system (host).

The AST-3780 emulation software is designed for use with the PC, XT, AT, and PS/2 Model 30. AST-3780A is designed for use with the PS/2 Models 50, 60, and 80.

NOTE

Unless otherwise noted, the term AST-3780 used throughout this manual refers to *both* AST-3780 and AST-3780A.

Features

The AST-3780 enables you to:

- Transmit data to and receive data from a host.
- Emulate a wide variety of standard IBM RJE terminals including the 3780, 2780, 2770, and 3741.
- Automatically translate between ASCII and EBCDIC values.
- Exchange of binary-coded files in transparent (column binary) mode.
- Modify all data to match the type of equipment.

- Perform all printer forms control functions.
- Choose either interactive operation through the system keyboard and screen menus, or batch (unattended) operation.
- Include a configuration program allowing for easy parameter selection.
- Support high speed data transfer (up to 19.2K baud).
- Automatically check all messages for errors in data transmission or reception, and correct without operator intervention.
- Allow keyboard control of the display data rate.

Hardware Overview

The CC-432 or CC-432A adapter board plugs into any available option slot in the system unit. If you are using a PC, XT, AT, or the PS/2 Model 30, install the CC-432 board. If you are using a PS/2 Model 50, 60, or 80, install the CC-432A board. (If you are unsure whether you have the CC-432 or CC-432A board, look at the printing on the lower left side of the board. Both boards are clearly identified.)

The CC-432 board uses one of four I/O address ranges: 0300h-030Fh, 0320h-032Fh, 0340h-034Fh, and 0360h-036Fh. The system may *not* contain any other device which uses these addresses.

Using AST-3780 or AST-3780A, a PC, PS/2, or compatible can communicate with the following systems.

- IBM Systems 34, 38, and Series/1.
- IBM Systems 360, 370, and 4300.
- IBM 2770, 2780 and 3780 Terminals.
- DEC System 20, PDP-10, PDP-11, or VAX systems.

Software Overview

The AST-3780 program consists of two complementary subprograms: IP (interactive), the keyboard-driven interactive version; and the CMDP (command processor), the file-drive batch version. Both of these versions use the parameter file, EMDAT.PRM which is on the system diskette. This file contains parameters you can modify through the CFG3780 (or CFG3780A for AST-3780A) configuration program to meet your own system requirements.

Once installed on your personal computer, AST-3780 software runs under the control of either MS-DOS or PC-DOS (which is not supplied with the program). This is the only extra software you require.

The host can run any of the IBM-supported spooling programs including Power and JES under any of the major operating systems (MVS, VM, OS and so on). Alternatively, you can create your own program for the host using a high-level language such as RPG or CICS.

General System Overview

AST-3780 software in conjunction with the CC-432/432A board enables you to connect your personal computer with a host in a number of configurations. These configurations and their requirements are discussed briefly below.

To link your local terminal and the host, you must first add a modem (modulator-demodulator). The modem is a device which converts computer signals (digital) into audio signals (analog) so that they can be transmitted across a phone line. Only use synchronous modems which supply clock signals. The transfer rate (baud rate) is determined by the modem. (You can usually vary this baud rate by setting the modem to the speed you prefer.)

Once the modem is attached, connect the terminal to the host using some of the following configurations.

Local Connections Using the Null Modem

The CC-432A adapter board includes a null modem. This means you can configure the adapter to allow communication to the host computer for short distances (up to 25 feet) without the need for a modem.

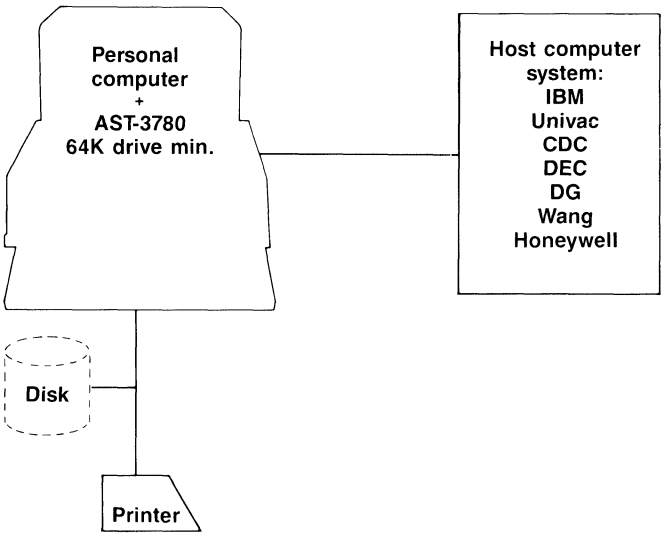

Figure 1. Local Connection Using Null Modem.

Local Connection Using Limited Distance Modem

You can use a limited distance modem (or synchronous line driver) to connect RS-232 devices over a much greater length of cable than a null modem, but it is still typically limited to less than a mile.

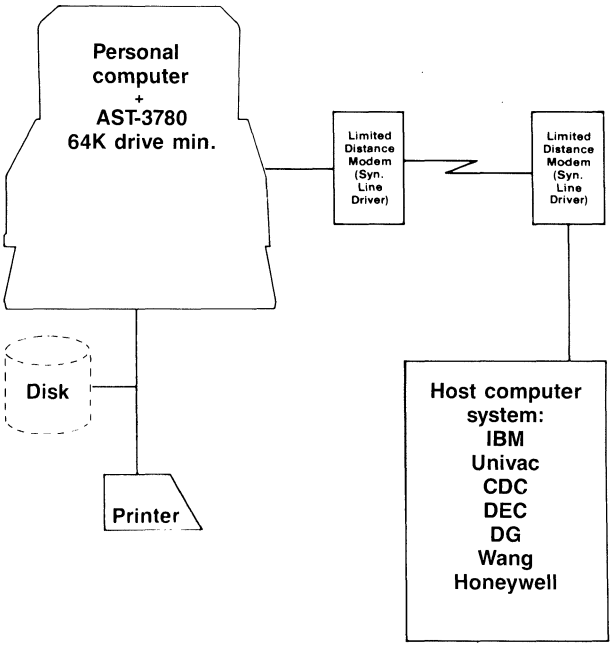

Figure 2. Local Connection Using a Limited Distance Modem.

Remote Connection Using a Modem

If you are planning to use a modem to connect a remote host over standard (voice-grade) telephone lines, you have a choice of many different kinds of modems. They range in speeds, with a top rate of 9600 baud. AST-3780 operates with any standard synchronous modem.

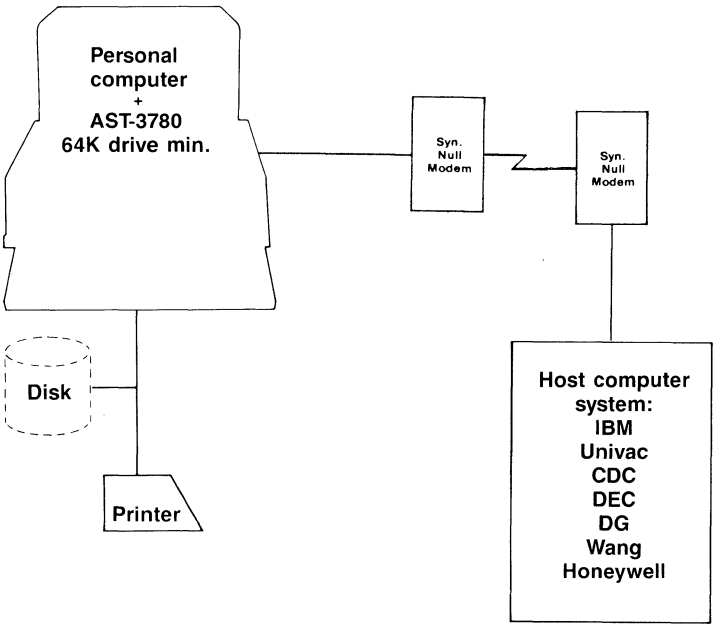

Figure 3. Remote Connection Using a Modem.

NOTES

ABOUT THIS MANUAL

To Get Started Quickly with AST-3780

This section provides a general overview to help you understand how to use this manual and where to look for specific information. In addition, you will find a format notation guide and short library of related documents.

The AST-3780 program is flexible enough to be used with a large variety of host systems. All you need to know is the terminal type and basic communication parameters for the host system.

How to Find What You're Looking For

For An Explanation of the AST-3780 Environment:
Section 1 provides you with information on the kinds of environments the AST-3780 fits into. This includes the software and hardware configurations for which the AST-3780 was designed.

For Installing the AST-3780 Software:
See section 2.

For Configuring the AST-3780 Software:
See section 3.

For Operating Your Computer During Emulation:
Section 4 explains how to use the AST-3780 emulation software to run your computer in the interactive (keyboard-driven) mode.

Section 5 explains how to use the AST-3780 emulation software to run your computer in command processor (batch-driven) mode.

For Configuration and Troubleshooting Reference:
The Appendices provide you with a quick reference guide to hardware configuration, and a troubleshooting reference.

Format Notation

The following format notation is used throughout this manual:

- *Uppercase characters* indicate items (such as commands) you enter as shown. You may enter either upper- and lowercase letters.
- *Lowercase lettes* represent parameters you define. These parameters must satisfy the conditions of the command description.
- *Boldface* indicates information you enter.
- *Braces* ({}) enclosing lowercase words or letter represent information you must supply.
- *Square brackets* ([]) indicate an optional item. Do not enter the bracket.
- *Angle brackets* (< >) tell you to press a key. For example, <**Esc**> instructs you to press the "Esc" key. Do not press the "Enter" key unless you are told to do so.
- *Hyphens between keys* to press the keys simultaneously. For example, <**Ctrl**>-<**Alt**>-<**Del**> tells you to hold down the "Ctrl" and "Alt" keys while pressing the "Del" key.
- A leading zero (0) and a trailing "h" indicates a hexadecimal number (for example, 0207h).

There are also several conventions used throughout this manual.

- *AST-3780* refers to both the AST-3780 and AST-3780A versions of the emulator program, except where specifically indicated.

- *CC-432* refers to both the CC-432 and CC-432A board except where specifically indicated.

Related Documentation

This manual does not instruct you in the intricacies of data communications. If you want to learn more about the protocols and complexities of communications, try the following publications:

For the IBM PC:

- *General Information - Binary Synchronous Communications*.

- *Component Description: IBM 2780 Data Transmission Terminal*, (original specification of the 2780).

- *Component Description: IBM 3780 Data Communication Terminal*, (original specification of the 3780).

For the Digital Equipment Corporation (DEC) mainframe host:

- McNamara, John E., *Technical Aspects of Data Communication*.

For Host Subsystems:

Job Entry Subsystem 2 (JES2):

- *System Programming Library: JES2 Installation, Initialization, and Tuning,* SC23-0046

Job Entry Subsystem 3 (JES3):

- *JES3, Licensed Program 5740-XYN, Installation Planning & Tuning,* SC23-0046

VSE/POWER RJE:

- *SVSE/POWER Licensed Program 5666-273, Remote Job Entry User's Guide,* SH12-5328.

- *VSE/POWER, Licensed Program 5666-273, Installation and Operations Guide,* SH12-5329

VM/370 Remote Spooling Control System:

- *VM/370 RSCS Networking Programmer's Reference & Operations,* SH24-5005.

Customer Information Control System (CICS/VS):

- *CICS/VS General Information,* GC33-0155.

- *CICS/VS System Programmer's Reference Manual,* GC33-0156

PART I. GETTING STARTED

1. Before You Begin
2. Installing the AST-3780 Software
3. AST-3780 Software Configuration

BEFORE YOU BEGIN 1

This section provides you with information you need to know before you can create a reference copy of the system diskette and install the CC-432 adapter board. Figure 1-1 shows the steps you must follow.

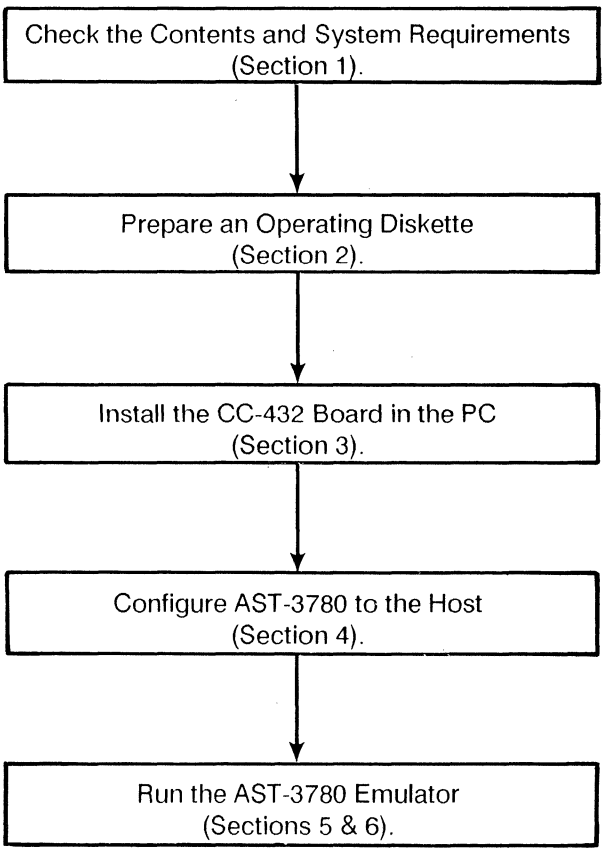

Figure 1-1. Installation Overview.

1.1 Checking the Contents

Besides this manual, (AST part number 000667-001), the AST-3780 package should contain these items:

- CC-432 or CC-432A board.
- AST-3780 or AST-3780A system diskette. (The 3780 diskette is a 5.25-inch diskette; the 3780A is a 3.5-inch diskette.)
- *CC-432 Advanced Communications Board User's Manual* (AST part number 000140-001) or *CC-432A Advanced Communications Board User's Manual* (AST part number 000658-001).

Unpack the contents and retain the package. If you must return either software or hardware, use the original container to ship it back.

1.2 Compatibility and System Requirements

You must have the following hardware and software to use the AST-3780.

1.2.1 Hardware

For AST-3780:

- IBM PC, XT, AT, or PS/2 Model 30 and compatibles (with at least 128 KB of memory and one diskette drive).
- CC-432 card.
- Monochrome or color display.
- One modem (external only) for both the PC and host.
- One cable with twin DB-25 connectors.

For AST-3780A:

- IBM PS/2 Model 50, 60, or 80 (with at least 128 KB of memory and one diskette drive).
- CC-432A card.
- Monochrome or color display.
- One modem (external only).
- One cable with twin DB-25 connectors.

You can also include a printer in your system. An AST-3780 will support the Epson printer, but to utilize fully the communication power of this product, the printer should be a high-speed device. Parallel and serial interface devices are both supported.

1.2.2 Software

All AST-3780 and AST-3780A programs -- IP, CMDP, and configurator -- run on either MS-DOS or PC-DOS (version 2.0 or later).

1.3 Host System Software

The host can run any of the IBM-supported spooling programs including POWER and JES under any of the major operating systems (MVT, VM, OS, and so on). You also have the option to custom-program the host using a high-level language like RPG or CICS.

INSTALLING AST-3780 SOFTWARE 2

Before you can install the CC-432 adapter board, you must first install your AST-3780 software. This involves copying the master diskette to a back-up diskette, then installing the program from the back-up diskette to the computer. This process differs depending on whether you use a diskette or hard disk drive to run your program. Both cases are discussed here.

2.1 Floppy Diskette Drive Installation

If you plan to operate your AST-3780 software from diskettes, refer to the following section for instructions on creating a back-up diskette.

2.1.1 Making a Back-Up Diskette

As a general rule you should use your original AST-3780 system diskette as little as possible. Always make a back-up copy. In this way you avoid the possibility of damaging your only copy.

Because the PC systems used for AST-3780 emulation use a 5.25-inch diskette and the PS/2 systems used for AST-3780A emulation use a 3.5-inch diskette, it is necessary to explain both formats.

PC, XT, and AT

Follow the steps below to make your 5.25-inch back-up diskette. Before you begin, make sure you have at least one blank, formatted diskette on which to make the backup. (For information on how to format a diskette, see the FORMAT command in your *DOS Manual*.)

STEP 1
Boot the system with the DOS diskette: This should be a working copy of DOS and not the original master diskette.

STEP 2
Copy the AST-3780 Program Diskette to your back-up diskette: Once the DOS prompt appears on your screen, use the COPY command to copy all the files on the AST-3780 program diskette to your backup. (Refer to your *DOS Manual* if you are not sure about the COPY command.) The following files should be copied:

File	Description
CFG3780.EXE	Configurator program
IP.EXE	Interactive emulator program
CMDP.EXE	Batch emulator program
EMDAT.PRM	Configuration parameters file
EMSCRN.FRM	Configuration Screen driver file

STEP 3
Store your program diskette: Once you have made a back-up diskette, store the original AST-3780 program diskette in a safe place and use your back-up copy.

You are now ready to install the CC-432 adapter. For instructions on doing this, refer to the *CC-432 User's Manual*.

PS/2 Systems

Before you can install your CC-432A, you need to make a working copy of your AST-3780 program diskette. To do so, you need the following:

- PS/2 Model 50, 60, or 80 reference diskette (included with your PS/2 computer).
- One blank, high-density 3.5-inch diskette (which will become your working reference diskette and your Emulation working diskette).

Follow these steps in order:

STEP 1
Write-protect your original program diskette: To protect your AST-3780 program diskette from being accidentally overwritten, slide up the write-protect tab on the back of the diskette, as shown in Figure 2-1.

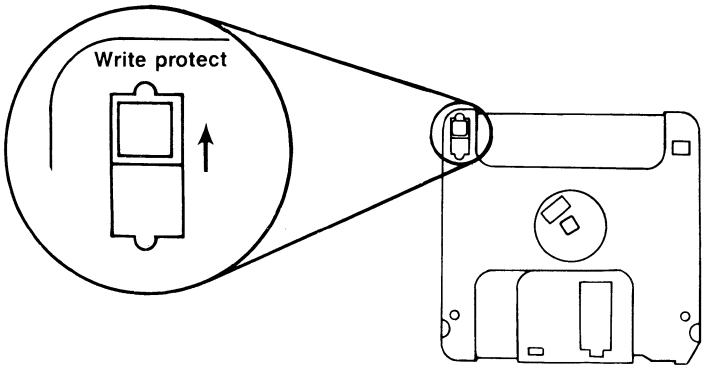

Figure 2-1. Write Protecting a Diskette.

STEP 2
Start up your system: Boot your computer.

STEP 3
Back up the AST-3780 program diskette to a blank diskette (this is the working copy of your reference diskette): At the DOS prompt, type this command:

```
DISKCOPY A: B: <Enter>
```

The following prompt appears:

```
Insert SOURCE diskette in drive A:

Press any key when ready . . .
```

Follow these steps to insert your diskettes:

- *If your computer has two floppy drives*: Insert your program diskette (the source disk) in drive A: and your blank diskette (the target) in drive B:. Press any key to start copying.

- *If you have one floppy drive:* Insert your program diskette in drive A: and press any key to continue. When the computer is ready to write to your blank diskette, this prompt appears:

  Insert TARGET diskette in drive A:

  Press any key when ready . . .

  Remove your original program diskette and insert your blank diskette. Press any key to resume copying. When the computer tells you to insert the source diskette again, remove the target diskette and reinsert the IBM reference diskette.

The following files should be copied:

File	Description
CFG3780.EXE	Configurator program
IP.EXE	Interactive emulator program
CMDP.EXE	Batch emulator program
EMDAT.PRM	Configuration parameters file
EMSCRN.FRM	Screen driver file
@7092.ADF	CC-432A configuration file

Copy the @7092.ADF file across to your IBM system diskette to configure the CC-432A board. For information on this procedure, refer to your *CC-432A User's Manual*.

When the computer is finished copying, the following message appears:

> Copy complete.
>
> Copy another (Y/N)?

Press **N.**

You must use a *high-density* 3.5-inch diskette for your back-up diskette. If you get this message after you insert your blank diskette:

> Drive types or diskette types
> not compatible.

replace your blank diskette with a high-density diskette.

You are now ready to install the CC-432A in your computer. See your AST Research *CC-432A User's Manual* for installation procedures.

2.2 Hard Disk Installation

If you plan to operate your AST-3780 software from a hard disk, refer to the following section for instructions on creating an AST-3780 directory and installing your files.

2.2.1 Creating Your AST-3780 Directory

STEP 1
Make sure you are in the root directory of your hard disk: For example, if the name of your hard disk drive is C:, type the following at your DOS prompt:

> **C: <Enter>**
> **CD\ <Enter>**

STEP 2
Create your AST-3780 directory: At the DOS prompt, type the following:

MD 3780 <Enter>

A directory named "3780" should now be created on your hard disk.

2.2.2 Installing Your AST-3780 Files

STEP 1
Insert your AST-3780 program diskette into drive A:.

STEP 2
Make sure you are working from the A: drive: Type the following at the DOS prompt:

A: <Enter>

STEP 3
Copy the AST-3780 files from your program diskette into your AST-3780 directory: Type the following command at the DOS prompt:

COPY *.* C:\3780 <Enter>

STEP 4
Store your AST-3780 program diskette(s): Now that you have your files installed in your AST-3780 directory, you can use the master diskette as your back-up. If you want more than one back-up diskette, follow the procedures in Section 2.1.1 for making a backup diskette.

You are now ready to install the CC-432 or CC-432A adapter. To do this, refer to the installation instructions in the *CC-432 User's Manual* or the *CC-432A User's Manual.*

NOTES

SOFTWARE CONFIGURATION 3

Before your computer can communicate with the host computer system, you must configure your AST-3780 emulation software.

The configuration program is easy-to-use and menu-driven. This section describes how to configure your AST-3780 program for use with a specific host computer. Figure 3-1 presents an overview of the steps to take when configuring your software.

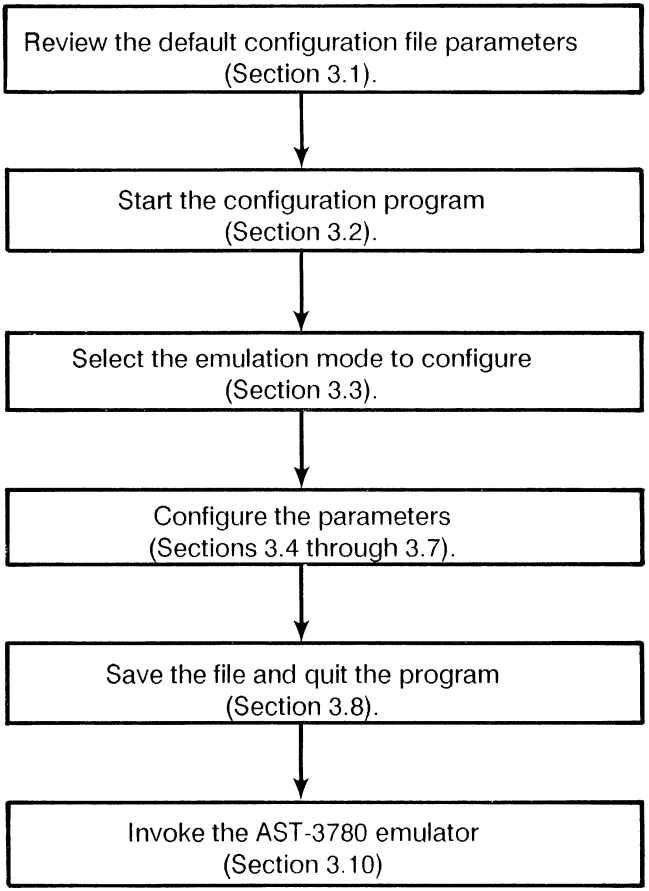

Figure 3-1. AST-3780 Product Configuration Overview.

3.1 Reviewing the Default Configuration File Parameters

Your product diskette provides a configuration file (CFG3780.EXE) that contains the default AST-3780 settings. Refer to Appendix A for the default parameter values. If these settings match your system requirements, skip to Section 3.12 for instructions on loading the AST-3780 software, then to either Section 5 or 6 for instructions on running the Interactive (IP) or Batch (CMDP) mode emulators.

3.2 Starting the Configuration Program

Before you start the configuration program, you must delete the configuration file created by the previous configuration program. To delete the configuration file, place the working copy of your product diskette in drive A: or change to the hard disk directory where your AST-3780 product is stored. From the DOS prompt, type the following command.

Del EMDAT.PRM <Enter>

Now you are ready to run the new configuration program. From the DOS prompt, type the following command.

For AST-3780:

CFG3780 <Enter>

For AST-3780A:

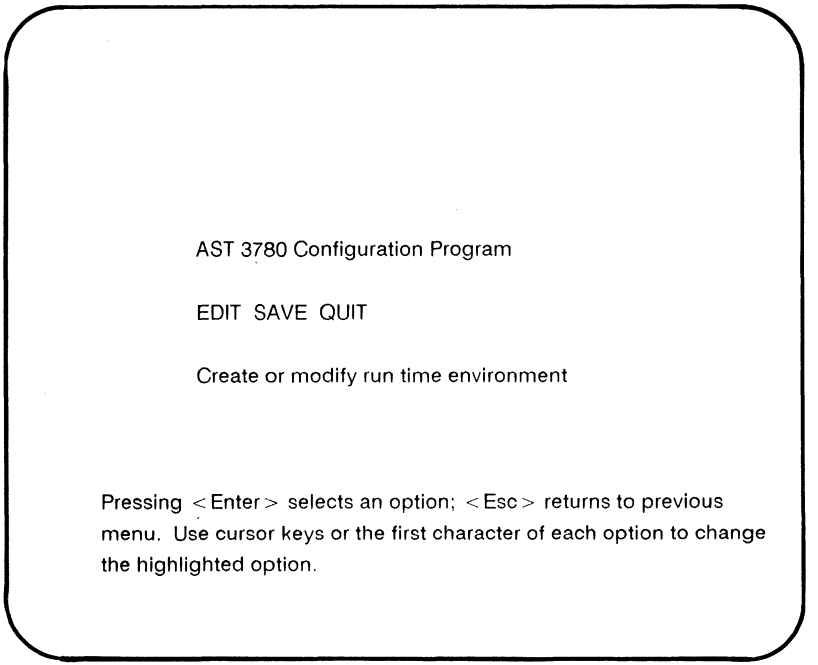

Figure 3-2. Main Configuration Menu

You can edit the configuration file, store and save the file, or quit the program and return to DOS without storing any changes.

As with all the menus in this program, use the <Right arrow> and <Left arrow> to move between the options and press <**Enter**> to select an option; or type the first letter of the option name. As each item is highlighted, the message below it changes to reflect this.

When you select *EDIT*, the following question appears.

Create/modify file: EMDAT.PRM ([y]/n)?

The default answer is **Y**. Press <**Enter**> to tell the program you want to create a new file or modify an existing configuration file. The default name for this file is EMDAT.PRM.

If you do not want to create or modify a file, type **N** and press <**Enter**>. This returns you to Figure 3-2.

3.3 Selecting Configuration Parameters

After you have created or modified the configuration file, the screen in Figure 3-3 appears:

```
Edit AST-3780 Configuration

MODE  TRANSMIT  RECEIVE  XPARENT_SW  IRQ  EDIT_TABLES  QUIT

Define Type of Equipment to Emulate: 2780, 2770 or 3780, 3741

Current Configuration

Emulator Mode:                    3780
Space Compression:                ON
Records per Block:                Multiple
Transmission Block Size:          512
Transparent Parameters:           Translate, Deblock
Disk Selection Code:              17
Printer Selection Code:           17
Printer Initialization Characters: 15 0
Interrupt Request Line:           2
Gross Transmit Timeout (second)   100
Gross Receive Timeout (second)    300
```

Figure 3-3. Configuration File Edit Menu.

Use this menu to create a new configuration file or modify an existing one.

NOTE

> If you are using the AST-3780*A* version, the *IRQ* option does not appear in the above screen, nor does it appear in the current configuration list. Instead, the configuration file, @7092.ADF, automatically sets the interrupt request line for you.

You may need to change the configuration values listed in Figure 3-3 as your emulation environment dictates. For specific requirements, refer to your system operator's manual.

If you need to change a specific parameter, highlight one of the options at the top of the edit menu (MODE, TRANSMIT, RECEIVE, XPARENT_SW, and so on.) with the <Right arrow> and <Left arrow> and press <**Enter**>. You can also press the first letter of the option name (for example, press "T" to enter the Transmit menu). As you move to each option, a brief explanation appears below it.

To return to DOS without storing changes, select QUIT. To return to the previous option, press <**Esc**>.

Each of these options controls one or more of the configuration parameters listed in Figure 3-3. Refer to Table 3-1 below for the option and its corresponding parameters.

Table 3-1. Menu Parameters

Option	Parameters Accessed
MODE	Emulate Type
TRANSMIT	Space Compression Records per Block Transmission Block Size Gross Transmit Timeout
RECEIVE	Disk Selection Code Printer Selection Code Printer Initialization Characters Current Gross Receive Timeout
XPARENT_SW	Transparent Parameters
IRQ	Interrupt Request Line

NOTE

If you are using the 3780*A* version of the emulator program, you do not see the *IRQ* selection option. The program automatically configures the interrupt request line for you.

Besides the selection options mentioned in Table 3-1, there is an additional option called EDIT_TABLES. This option defines the translation tables, a parameter that is created and stored on a separate file, named MAPDFT.AST. For more information on this, see Section 3.11.

In the following sections each of the configuration parameters is briefly explained. If you prefer to work on-line, a discussion of each parameter is provided in the Configuration Program itself.

3.4 Selecting the Emulation Mode

AST-3780 provides communication between your computer and host systems using one of three different protocols: 2780, 2770/3780, or 3741. Before your computer can communicate successfully, you must select the appropriate emulation mode.

Select MODE. The following options appear.

2780 2770/3780 3741 QUIT

The current emulator mode is listed below the note. Default emulator mode is 3780.

Either select a new emulator mode, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS.

3.5 Configuring Transmission Parameters

When you select the TRANSMIT option from the main menu, the following menu appears.

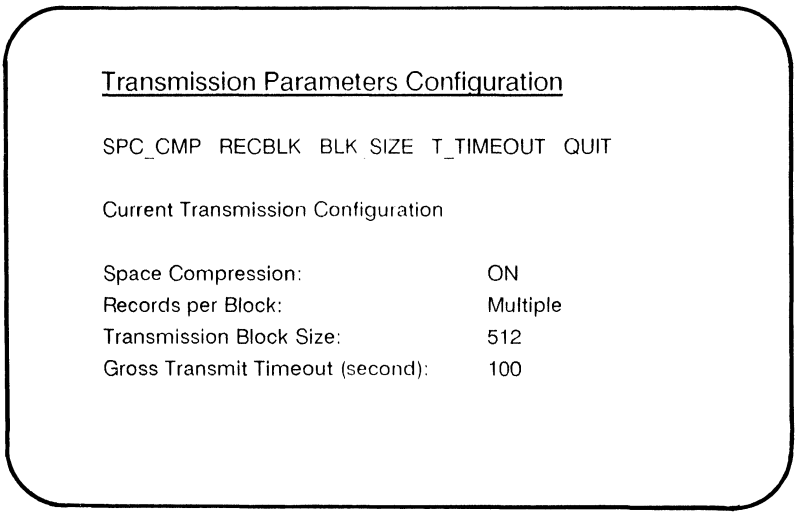

Figure 3-4. Transmission Parameters Menu

This menu allows you to specify which transmission options your PC has while communicating with the host.

Choose from the options. Current transmission configuration values are listed below the options.

3.5.1 Space Compression Feature

If you select the SPC_CMP option from the Transmission Parameter menu, the following menu line appears.

COMPRESSION NO_COMPRESSION QUIT

Below these options is listed the current space compression status.

This parameter specifies whether space compression should be performed on transmitted data for a 3780 emulation. This value is ignored in 2780 mode. Received data is always decompressed. The default for data transmission is compressed.

Either select a new space compression value, press <**ESC**> to return to the previous menu, or select QUIT to return to DOS.

3.5.2 Records per Block

If you select the RECBLK option from the Transmission Parameters menu, the following menu line appears.

SINGLE MULTIPLE QUIT

Below the options is a brief definition of the parameter, followed by the current value.

This parameter specifies whether multiple records are sent as part of the same block during transmission. Records are always deblocked on reception. This should be set to MULTIPLE when operating as a 3780 device. The default records per block is MULTIPLE.

Either select a new record block definition, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

3.5.3 Transmission Block Size

If you select BLK_SIZE from the Transmission Parameters menu, the following message and prompt appears.

```
Transmission Block Size

        1 - 512     Block Size
        Current Block Size: 512
New Value (1-512 or Entry Key if you don't want change): _
```

This menu defines the current block size and positions the cursor for entry of a new value, if you require one.

The Transmission Block Size parameter defines the maximum size of each transmission block. Receive block size is determined by the host system. Set this value to 80 for most 2780 systems and most transparent transmissions to a host computer; set to 512 for the 3780. You may not set the block size to a value greater than 512 for normal mode or 250 for transparent mode.

Either select a new transmission block size, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

3.5.4 Gross Transmission Timeout

If you select the T_TIMEOUT option from the Transmission Parameters menu, the following message and prompt appears.

Gross Transmission Timeout

Current Gross Transmit timeout: 100
New value (or Entry Key if you don't want to change): _

This parameter defines the maximum time (in seconds) the line waits once the emulator has been given the command to transmit. The default time is 100 seconds. After this, it displays an error message and ends the program.

Either select a new timeout value, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

NOTE

Only use a gross transmission timeout value when running CMDP, the batch mode version of the emulator.

3.6 Configuring the Receive Parameters

If you select the RECEIVE option from the main menu, the following menu appears.

Receive Parameters Configuration

DEVSEL PRTSTRING R_TIMEOUT QUIT

Below these options is a brief description of the option currently highlighted. Below this appears the current receive parameters:

Current Receive Configuration

Disk Selection Code:	18
Printer Selection Code:	17
Printer Initialization Characters:	15 0
Current Gross Receive Timeout:	300

This menu enables you to specify which reception options your computer has while communicating with the host.

Either select a new receive parameter, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

3.6.1 Device Selection Codes

When you select DEVSEL from the Receive Parameters menu, the following message and prompt appears.

Device Selection Codes

Current Values (Punch,Print): 17, 18

New Value (Punch):

The punch and print parameters are used with the General Receive feature. The punch code defines the diskette (punch) selection, and the print code defines the printer selection. Both values must be entered as decimal EBCDIC, where:

18 = 3780 Punch code (DC2)

17 = 3780 Print code (DC1)

Either select a new device code, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

3.6.2 Printer Initialization Characters

When you select the PRTSTRING option, the following message and prompt appears.

> Printer Init. String
>
> Current Initialization Characters: 15 0
> New Value: _

This parameter is a string of characters used by the emulator to initialize an attached printer device (LPT1:). This can be used to set the printer (using IBM or Epson MX-80 format) to condensed print mode allowing 132 characters on each line. To learn what character string your line printer needs to initialize it, refer to your printer operator's manual.

Specify as many values as you require by first entering a numeric value and pressing <**Enter**>. (All values should be in decimal format, not hexadecimal.) The number you entered disappears and is replaced by a new blank. Continue to enter numbers and press <**Enter**> until you are finished. To end the string, type in "**0**" and press <**Enter**>. The program returns you to the previous menu.

3.6.3 Gross Receive Timeout

When you select the R_TIMEOUT option from the Receive Parameters menu, the following message and prompt appears.

Gross Receive Timeout

Current Gross Receive Timeout: 300

New value (or Entry Key if you don't want to change): _

The Gross Receive Timeout parameter defines the maximum time in seconds the system allows for a timeout during receiving. If data is not received within this time, the program displays an error message and terminate. The default value is 300 seconds (5 minutes).

To specify a new timeout duration, enter a number at the cursor position and press <**Enter**>. Either select a new timeout, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

NOTE

Only use a gross receive timeout value when running the emulator in CMDP.

3.7 Setting Transparent Parameters

When you select XPARENT_SW from the main menu, the following menu displays.

Transparent Parameters

0 1 2 3 QUIT

This parameter determines whether data undergoes ASCII/EBCDIC translation in the transparent mode. If it is set for translation, both transmit and receive translation takes place.

At the same time, you can specify whether you want data blocked or deblocked in the transparent mode. If the deblock option is chosen, received records are deblocked at 80-character intervals. This should be used when receiving transparent punch data from the host. Set this parameter to 1 when transferring files between two personal computers in transparent mode.

Each option number represents a different combination of the two variables:

0 = translate/no deblock
1 = no translate/no deblock
2 = translate/ deblock
3 = no translate/deblock

To change the default setting (Translate/Deblock), select the appropriate setting. The meaning of each option number is explained beneath the option list as it is highlighted. The current transparent parameters are displayed beneath the brief explanation.

Either select a new parameter, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

3.8 Defining the Interrupt Request Line

When you select IRQ from the main menu, the following menu displays.

Interrupt Request Line

2 3 4 5 6 7 QUIT

This parameter determines the hardware interrupt request line the emulator uses during the program's operation. This value should not be changed from the default of *2* unless a hardware device conflict exists. For more information on this, refer to the *CC-432 Advanced Communication Board User's Manual.*

Either select a new interrupt request line, press <**Esc**> to return to the previous menu, or select QUIT to return to DOS without saving changes.

NOTE

If you are using the AST-3780*A* emulator program, you do not select an interrupt request line. The program automatically selects an interrupt request line for you.

3.9 Editing the Translation Tables

The AST-3780 program provides a complete ASCII and EBCDIC translation tables. These translation tables are stored on a separate file named MAPDFT.AST. Normally, you are communicating with a host system which uses conventional character sets and therefore, conventional translation tables; however, there are occasions when you might need to edit your translation tables to communicate successfully with the host.

To edit the translation tables, select the *REMAP_TABLES* option from the main configuration menu. The table shown in Figure 3-5 appears.

EBCDIC TO ASCII TRANSLATION TABLE

First Hexadecimal Character of EBCDIC Character Set

	0x	1x	2x	3x	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	00	10	00	00	20	26	2D	00	00	00	00	00	7B	7D	5C	30
x1	01	11	00	00	00	00	2F	00	61	6A	7E	00	41	4A	00	31
x2	02	12	1C	16	00	00	00	00	62	6B	73	00	42	4B	53	32
x3	03	13	00	00	00	00	00	00	63	6C	74	00	43	4C	54	33
x4	00	00	00	00	00	00	00	00	64	6D	75	00	44	4D	55	34
x5	09	0A	0A	1E	00	00	00	00	65	6E	76	00	45	4E	56	35
x6	00	08	17	00	00	00	00	00	66	6F	77	00	46	4F	57	36
x7	7F	00	1B	04	00	00	00	00	67	70	78	00	47	50	58	37
x8	00	18	00	00	00	00	00	00	68	71	79	00	48	51	59	38
x9	00	19	00	00	00	00	00	60	69	72	7A	00	49	52	5A	39
xA	00	00	00	00	5B	21	7C	3A	00	00	00	00	00	00	00	00
xB	0C	00	00	00	2E	24	2C	23	7B	7D	00	00	00	7D	00	00
xC	0C	1C	00	14	3C	2A	25	40	00	00	00	00	00	00	00	00
xD	0D	1D	05	15	28	29	5F	27	00	00	5B	5D	28	29	00	00
xE	0E	1E	06	00	2B	3B	3E	3D	00	00	00	00	2B	00	00	00
xF	0F	1F	07	1A	21	5E	3F	22	00	00	00	5F	2B	00	00	00

Figure 3-5. EBCDIC- to-ASCII Translation Table.

If you need to change the EBCDIC-to-ASCII values for any of the hexadecimal characters shown, enter a new 2-digit hexadecimal character code at the cursor position and press <**Enter**>. This alters the EBCDIC character code as it is translated to its ASCII equivalent. Continue to enter new values as needed until you are finished. Press <**Esc**> to exit this table. The table shown in Figure 3-6 appears.

ASCII TO EBCDIC TRANSLATION TABLE

First Hexadecimal Character of ASCII Character Set

	0x	1x	2x	3x	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	00	10	40	F0	7C	D7	79	97	00	10	40	F0	7C	D7	79	97
x1	01	11	5A	F1	C1	D8	81	98	01	11	5A	F1	C1	D8	81	98
x2	02	12	7F	F2	C2	D9	82	99	02	12	7F	F2	C2	D9	82	99
x3	03	13	7B	F3	C3	E2	83	A2	03	13	7B	F3	C3	E2	83	A2
x4	37	3C	5B	F4	C4	E3	84	A3	37	3C	5B	F4	C4	E3	84	A3
x5	2D	3D	6C	F5	C5	E4	85	A4	2D	3D	6C	F5	C5	E4	85	A4
x6	2E	32	50	F6	C6	E5	86	A5	2E	32	50	F6	C6	E5	86	A5
x7	2F	26	7D	F7	C7	E6	87	A6	2F	26	7D	F7	C7	E6	87	A6
x8	16	18	4D	F8	C8	E7	88	A7	16	18	4D	F8	C8	E7	88	A7
x9	05	19	5D	F9	C9	E8	89	A8	05	19	5D	F9	C9	E8	89	A8
xA	25	3F	5C	7A	D1	E9	91	A9	25	3F	5C	7A	D1	E9	91	A9
xB	0B	27	4E	5E	D2	4A	92	C0	0B	27	4E	5E	D2	4A	92	8B
xC	0C	1C	6B	4C	D3	E0	93	6A	0C	1C	6B	4C	D3	E0	93	6A
xD	0D	1D	60	7E	D4	BD	94	D0	0D	1D	60	7E	D4	BD	94	D0
xE	0E	1E	4B	6E	D5	5F	95	A1	0E	1E	4B	6E	D5	5F	95	A1
xF	0F	1F	61	6F	D6	6D	96	07	0F	1F	61	6F	D6	6D	96	07

Figure 3-6. ASCII-to-EBCDIC Translation Table.

Enter the ASCII-to-EBCDIC translation table.

If you need to change the ASCII-to-EBCDIC values for any of the hexadecimal characters shown, enter a new 2-digit hexademical character code at the cursor position and press <**Enter**>. This alters the ASCII character code as it is translated to its EBCDIC character code equivalent. Continue to enter new values as needed until you are finished. Press <**Esc**> to exit this table and return to the main menu.

You have now completed your configuration file. Press <**Esc**> to return to the main menu, save, and quit.

3.10 Starting the AST-3780 Emulator

Once you have created the configuration file (EMDAT.PRM), you are ready to enter the AST-3780 emulator program itself. The emulator can be operated in one of two ways:

- Keyboard Controlled (IP).
- Batch File Controlled (CMDP).

3.10.1 Keyboard Controlled

Start the AST-3780 interactive program by typing the following command at the DOS prompt.

IP <Enter>

The keyboard controlled, interactive version of AST-3780 comes up and you can initiate communications between your computer and the host system.

See Section 4 for information on running in the interactive mode. Once you have started the AST-3780 emulator, turn on and bring up your modem connection to the host. Refer to your modem user's manual for information on how this is done.

3.10.2 Batch File Control

You invoke the emulator in batch mode by entering the following command.

CMDP <file.bat <Enter>

where:

<file.bat is the name of the batch file you created for this program. The batch file name must be preceded by the "less-than" (<) symbol. If the file is stored on another directory or in another drive, include the full pathname (directory or drive designator, subdirectory designator, and so on). For complete instructions on creating a pathname, see your DOS Manual.

See Section 5 for information on running in the batch mode. Once you have started the AST-3780 emulator, turn on and bring up your modem connection to the host. Refer to your modem user's manual for information.

3.11 Initializing a Serial Printer

If you have a serial printer connected to your computer, you can use it as an output device by executing the appropriate DOS commands before running the AST-3780 program. The following example illustrates this procedure.

```
A> MODE COM1:1200,N,8,1 <Enter>
A> MODE LPT1:=COM:1 <Enter>
A> IP <Enter>
```

where:

1200 is a selected baud rate.

N indicates no parity.

8 indicates 8 data bits.

1 indicates 1 stop bit.

LPT1: = COM:1 tells the program that you are defining line printer 1 as the port supporting the above communications parameters.

These options differ from printer to printer. Refer to your printer manual for the baud rate, parity, data bit, and stop bit specifications used for your specific printer.

Once you have initialized your printer, you should be set up to print out any data produced from your communications with the host through your serial printer.

NOTES

PART II. USING AST-3780

4. Interactive (IP) Operation
5. Batch Mode (CMPD) Operation

INTERACTIVE OPERATION 4

4.1 General Information

This section tells you how to run the interactive version of the AST-3780 package. This program is keyboard-driven, and is started by typing **IP** in response to the DOS prompt.

4.1.1 Main Menu Selections

Figure 4-1 shows the first menu screen displayed after you start the IP program.

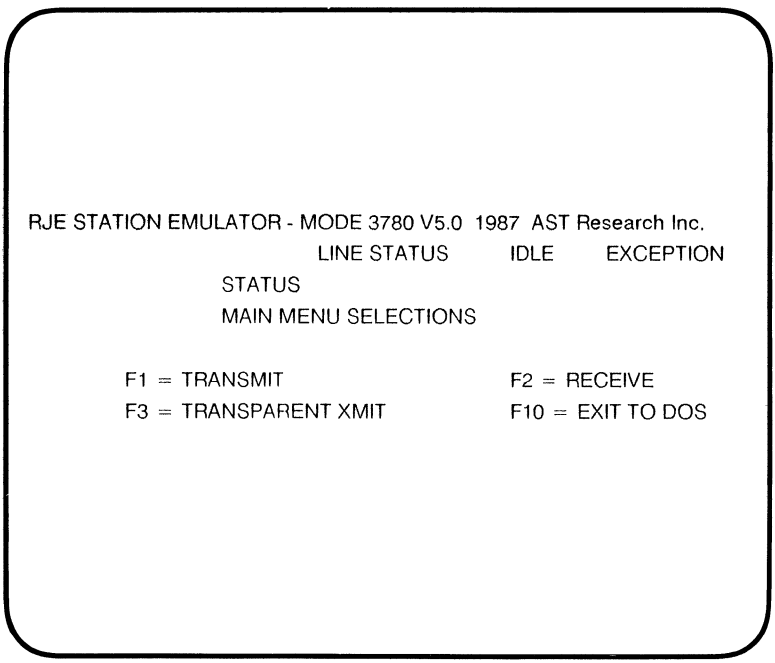

Figure 4-1. Main Menu Selections Screen

If this is the AST-3780A emulation program, "V5.0/A" appears on the top line instead.

All functions are controlled by the function keys. Press the <**F10**> key to return the program to DOS. Press <**F1**> to enter the transmit mode and <**F2**> to enter receive mode. To transmit in the transparent mode, press the <**F3**> key.

There is also a Hot Key feature enabling you to shift instantly between DOS and IP mode when you are at the main menu. To go from the IP mode to DOS, press the <**Right-Shift**> and <**Left-Shift**> keys together; to return to IP mode from DOS, use the <**Right-Shift**> and <**Left-Shift**> keys together.

You cannot run both transmit and receive operations simultaneously. Assign the receive device and/or output files *first* (Section 4.3), then select the transmit functions (Section 4.2).

4.1.2 Communications Status

The AST-3780 emulator informs you of the progress of communications in the Line Status and Exception Status fields on the display screen. These messages follow a specific sequence when communications are proceeding normally. They are discussed below.

IDLE

This is the initial state of the emulator when it is first brought up. After a transmit operation, IDLE is displayed to indicate that the last message has been sent, followed by an EOT (end of transmission). After a receive operation, the IDLE state indicates that an EOT has been received, which means that the emulator can request the communications line.

LINE REQUEST

After you have directed AST-3780 to initiate a transmission, it bids to gain control of the line by sending ENQ (enquiry) characters. After each ENQ is sent, there is a three-second pause to allow the host to respond with an ACK (affirmative acknowledgement). If it does not respond with an ACK, the emulator sends the ENQ again. After three tries, the Exception Status field displays "REMOTE NOT READY," but the ENQ is still sent at three-second intervals indefinitely or until you press the <**F10**> key. If the host is also trying to bid for the line, the message "REMOTE CONTENDING" appears in the Exception Status field. Depending on host system conventions, you can choose to abort the transmission or take no further action.

REMOTE READY

This message is displayed once AST-3780 has received an ACK to its ENQ. If the retry limit had previously expired (see above), the "REMOTE NOT READY" message is erased. Similarly, if a contention problem exists, the "REMOTE CONTENDING" message is erased. From the time that "REMOTE READY" is displayed until the first message is transmitted, AST-3780 sends TTD (temporary text delay) sequences to maintain control of the line.

TRANSMITTING

This denotes the actual transmission of data. If the message is not acknowledged properly, the emulator retries the message protocol up to fifteen times in accordance with bisync procedures. If a recovery is not possible, it displays "PROTOCOL ERROR" in the Exception Status field, then returns to the IDLE state. If the host sends an RVI (reverse interrupt) in place of an

ACK character, the Exception Status field reads "REV INT - ABT XMIT" (reverse interrupt - abort transmit). This reverse interrupt condition usually means that the host has a high-priority message to send, and you should abort the transmission as soon as possible (using <**F10**>).

FINISHING - WAIT

After the last message has been sent from a file or you have aborted transmission, this message appears in the Line Status field while AST-3780 sends the EOT character. This may take up to three seconds to allow the line to attain the proper state. On completion, this message is overwritten by the "IDLE" message.

RECEIVING

This shows that the emulator is receiving a message. This is obvious when the output device is the display or the printer, but not so obvious when it is the diskette.

REMOTE DELAY

If the host sends a TTD sequence, the emulator displays this message to show that it is still in the receive mode, but no actual transfer of data is taking place. This is a temporary condition caused by the transmitting station.

WAITING/COMPLETE

This message appears when you start a receive operation, if the host has not yet requested control of the communications line. It also appears after the end of a receive session to the printer or display showing that the current message is completed but another is forthcoming.

REMOTE DISCONNECT

This shows that an EOT sequence has been received from the host, indicating an end to communications. Some host systems disconnect the telephone line after sending this.

4.2 Transmit Mode

When the system displays the following message in the Main Menu selections menu (see Section 4.1.1), press <**F1**> to enter the transmit mode.

F1 = TRANSMIT

AST-3780 then displays a new form entitled "TERMINAL DEVICE SELECT".

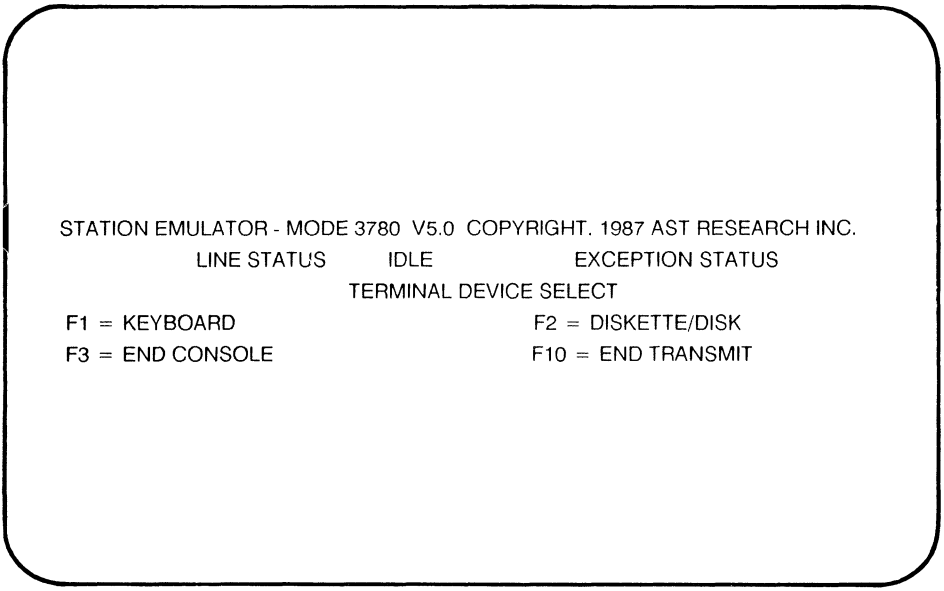

Figure 4-2. Terminal Device Select Screen.

If this is the AST-3780A emulation program, "V5.0/A" appears on the top line instead.

4.2.1 Transmission From the Keyboard

The ability to transmit directly from the keyboard of the PC can be very useful, especially for entering short job streams or sending commands to the system spooler. Press <**F10**> to return to the Main Menu screen at any time.

Select <**F1**> for keyboard operation and the Line Status field changes to the following message.

LINE REQUEST

This indicates that AST-3780 is attempting to initiate a transaction with the host system. It sends the ENQ character until the host responds with an ACK sequence. If the host does not respond after three ENQ transmissions, the Exception Status field displays this message.

REMOTE NOT READY

The host continues retrying indefinitely, since no further communication can take place until the remote is ready. If necessary, you can end this by pressing <**F10**>. If it continues to occur, see Appendix A.

When the host responds with an ACK, the following message is displayed.

REMOTE READY

The cursor moves to the bottom line of the screen, and is displayed in reverse video. You can now enter data for transmission.

You may use several editing keys. The <Left arrow> and <Right arrow> move the cursor forward and backward without erasing. The backspace key (above <Enter>) moves the cursor backward erasing data as it goes. The keyboard is usually in lowercase mode after the system is first brought up, so if the host requires uppercase characters, press <**Caps Lock**>.

To send the message, there are several options available. If you want to send a multiple line message, press the <**Enter**> key after the message. This causes the line to be sent to the host, followed by an ETB character. After typing each line, press <**Enter**> until the last line. Follow this last line (or a single line message) by pressing <**F9**> (the END CONSOLE key) to send the message, followed by an ETX and an EOT to relinquish the line. <**F9**> automatically sets the emulator into receive mode, receives a message, then switches back to transmit mode. This is useful for inquiring into spooler status. If you do not want an automatic return to transmit mode, press <**Shift**>-<**F9**>.

<**F10**> returns you to the Main Menu selections screen. It also sends an EOT character, if any message has been sent. If you are sending a file, the last line should end with ETX and use <**F9**>. There can be a slight delay (two to three seconds) while this is being done, during which time the Line Status field displays this message.

FINISHING - WAIT

When the Line Status returns to "IDLE," the Main Menu selections screen appears and you can continue. Once the message has been acknowledged, AST-3780 maintains its transmit status by sending the TTD sequence until another line is entered from the keyboard or <**F10**> is pressed. <**F10**> sends an EOT character and returns the line to "IDLE" as described above.

Messages transmitted from the keyboard are padded or truncated (depending on how many characters have been entered) to an 80-column card image in 2780 mode and are sent "as is" in 3780 mode.

4.2.2 Transmission From the Diskette

When transmitting files from diskette, press <**F2**> under Terminal Device Select. <**F10**> enables you to return to the Main Menu, ignoring any file names you might have entered. The system clears the bottom half of the screen (except for the bottom line), and displays the following message.

```
FILE NAME.TYP      STATUS        (. = END)
```

The cursor appears under the File Name.Typ column and prompts you to enter a file using the proper name and extensions for each file. Then press <**Enter**>. Enter up to eight files, pressing <**Enter**> after each one. At the end of this list, use either a period (**.**) and <**Enter**> or <**Enter**> <**Enter**> to signal AST-3780 that the list is now complete.

You can also send several files with the same file name but different extensions (for example, FILE.1, FILE.2, FILE.3) or different file names with the same extension (like EXEC.BAT, SIM.BAT, APR.BAT) by using the DOS wildcard character (*), and <**Enter**> as in the following example.

```
FILE NAME. TYP     STATUS        (. = END)
FILE.* <Enter>
*.BAT <Enter>
MYFILE.EXT <Enter>
. <Enter>
```

After you finish the list, the system checks to ensure that each file is on the appropriate disk. When you use the wildcard extension in your list, the program searches on your disk and reports the total number of files it finds there with that file name. This report is displayed under the right (END) column. The program also displays "READY" in the STATUS column for each file that is found. Otherwise, "FILE NOT FOUND" appears, the checking operation ceases, the cursor reappears at the first input line, and you can edit the file names.

If the file specified on a particular line is already valid, press <**Enter**> without retyping the entire name or moving the cursor to the end of the line. Use <Left arrow> and <Right arrow> to edit the file names.

After all files have been entered and validated, the lower half of the screen should look like this:

```
FILE NAME.TYP      STATUS        (. = END)
FILE.*             READY         Total No. Files = 4
MYJOB.EXT          READY
```

AST-3780 now initiates a LINE REQUEST as described in Section 4.1.2. The files are sent in the order they were entered, with the final block terminated by the ETX character.

After AST-3780 sends an ENQ and receives an ACK, the Line Status displays the following message.

REMOTE READY

While the files are being transmitted, it becomes the following message.

TRANSMITTING

If you have specified the transmission of a group of files using the wildcard character, each file appears in the FILE.NAME column with its full extension as it is transmitted.

When you have sent all the files, the display shows the following message.

FINISHING - WAIT

The Status then displays the following message.

IDLE

The Main Menu selections screen is once again displayed.

While each file is being sent, the message "XMIT IN PROGRESS" is displayed in the corresponding STATUS field. When the file is finished, this changes to "DONE" to enable you to monitor the progress of the transmit operation. Here is an example of a transmit in progress.

```
FILE NAME.TYP      STATUS        (. = END)
FILE.1             DONE
FILE.2        XMIT IN PROGRESS
MYJOB.EXT          READY
```

Abort the file transmission by pressing <**F10**>. The next block of the current file is then sent with an ETX terminating character, followed by the EOT sequence.

When transmitting files in 2780 mode, AST-3780 pads or truncates each line to the length specified in the block size parameter (see Section 4.7.2). In 3780 mode, lines are sent at their original length (up to 512 characters maximum). It sends multiple lines per block and automatically provides space compression as provided for in the configuration file, EMDAT.PRM.

Long File Transmission

AST-3780 incorporates three features enabling you to send files longer than one diskette or disk volume.

The first feature enables you to specify a percent sign (**%**) as the first character of a transmit file (see Section 4.2.2). When the emulator is about to open this file, it pauses and displays the following message.

MOUNT VOLUME; ENTER = READY, A = ABORT.

You must now change the diskette and press <**Enter**>. If you press "E" instead, this file will not be sent. In this way a file may be split between two or more diskettes, but still be transmitted with the same operation. For example:

```
FILE NAME.TYP      STATUS      (. = END)
JOB1A.MSG
B:JOB1B.MSG
%B:JOB1C.MSG
```

NOTE

When the percent "%" sign precedes a file specification, no check is made to verify its existence.

The second feature is similar to the first, except that the same file name will be used for the operation continuously until you press "E". To use this feature, specify an ampersand (&) before the file name. This is useful if you have many files of the same name on separate diskettes. When you press "E" in response to the prompt, the file on the following line is transmitted.

The third feature available uses of the pound sign (#) before the file specification, sending the last block of the file, followed by an ETB character, rather than an ETX. The host system interprets the two files (the current one and the following one) as one long file. For example:

```
FILE NAME.TYP      STATUS      (. = END)
#JOB2A.MSG
#B:JOB2B.MSG
%B:JOB2C.MSG
```

You can only use one feature per line.

4.2.3 Reverse Interrupt

The host system can force AST-3780 to suspend or terminate its transmit operation by sending the RVI (Reverse Interrupt) sequence. If this should happen, AST-3780 stops sending data and displays the following message in the Exception Status field.

REV INT - ABT XMT

If this occurs, press <**F10**> to abort the transmit operation, and place AST-3780 into the receive mode, as explained below. You can override this, however, by not taking any further action.

4.2.4 Contention

If the host and AST-3780 try to transmit at the same time, a contention problem results. AST-3780 displays the following message in the Exception Status field.

REMOTE CONTENDING

Press <**F10**> and enable the host to complete its transmission before returning to transmit mode.

4.2.5 Transmit Disconnect

Pressing <**F3**> sends a disconnect sequence to the host (DLE/EOT). In most cases, this ends the transmit sequence.

4.3 Receive Mode

4.3.1 Receive Device Selection

After you press <**F2**> (RECEIVE) at the Main Menu selections screen, the display shows three output devices and <**F4**> (GENERAL RECEIVE) in the Receive Output Device menu (see Section 4.3.6).

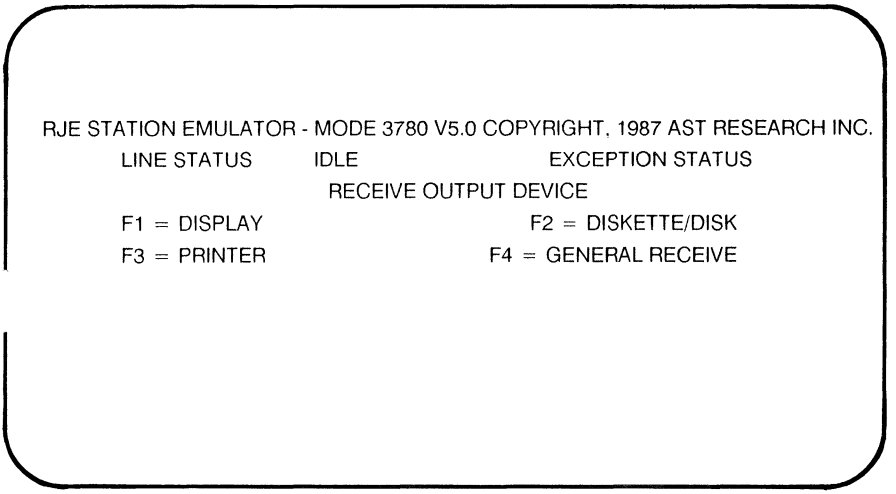

Figure 4-3. Receive Output Device Screen.

If this is the AST-3780A emulation program, "V5.0/A" appears on the top line instead.

NOTE

<**F10**> returns AST-3780 to the Main Menu selections screen even if you are in the middle of a receive operation (see Section 4.3.5 for more details).

The selected output device is used for all subsequent receives until another device is selected. <**F9**> is the Change Device key. Use it to change devices while receiving, without loss of data. If output is received before a device is specified, the Receive Output Device menu appears and prompts you to "SPECIFY DEVICE".

4.3.2 Receiving to the Display

Press <**F1**> to direct all output to the screen. The display operation begins one line above the bottom of the screen and scrolls upwards to the line immediately beneath the bottom of the menu. Lines that have been scrolled off the screen are lost. All form feeds and line skips are removed from the text and are not displayed.

The received data is expanded to its proper format for the equipment type (for example, 2780 or 3780) before it is displayed. Lines longer than 80 characters are truncated, and lines less than 80 characters are padded with spaces.

After you press <**F1**>, the Line Status field displays the following message.

WAITING/COMPLETE

This signifies that AST-3780 is waiting for the host system to send a message. The system waits indefinitely or until you press <**F10**>. Once the host begins transmission, the Receive Session Control menu appears.

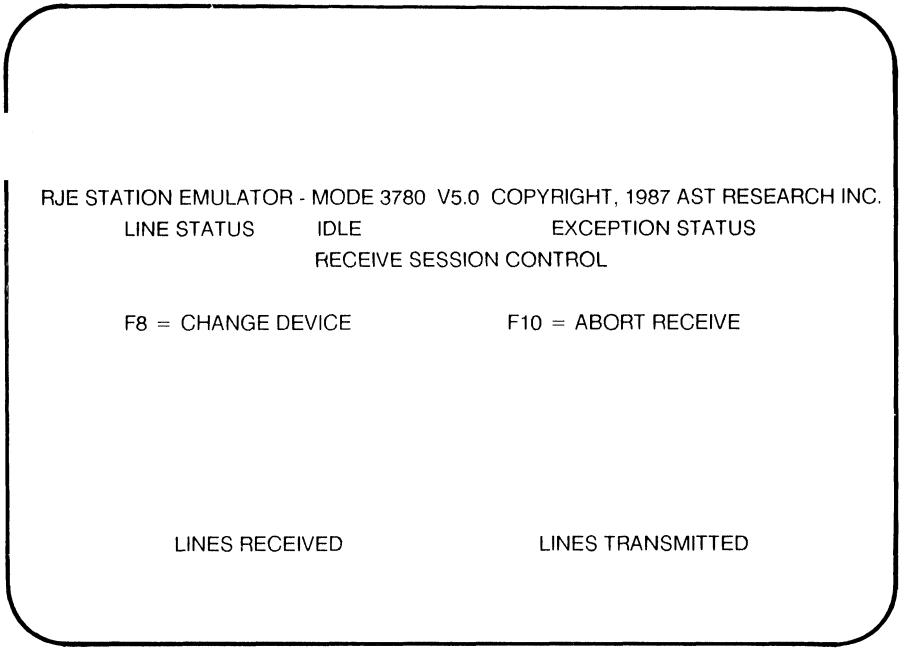

Figure 4-4. Receive Session Control Screen.

If the host system is busy, the Line Status field displays the following message.

REMOTE DELAY

When the host is finished sending the current message, AST-3780 returns to Main Menu selections and sets the Line Status field to "IDLE."

4.3.3 Receiving to the Diskette

Press <**F2**> under the Receive Output Device menu to specify the diskette/disk as the receive output device and direct all data to the files specified below the menu.

The "FILE NAME.TYP" form appears at the bottom of the screen, enabling you to specify up to eight receive files (see Section 4.2.2). If a specified file already exists, the following prompt appears.

DELETE (Y/N)?

This gives you the option to overwrite the file. While the receive operation is taking place, the Line Status field displays the following message.

RECEIVING

All output is written to the files. As each file is opened, the corresponding STATUS column entry changes to the following message.

RECEIVE IN PROGRESS

Once the entire text is received, AST-3780 closes the current file. The Status Line column entry changes to the following message.

DONE

If the drive is not ready to accept data, or if the diskette is write-protected or out of space, AST-3780 automatically sends an error message to the Exception Status field and the Receive Output Device menu appears, enabling you to correct the problem and continue reception without loss of data.

AST-3780 expands text as necessary to conform to equipment type; the output is a printable file. Use the "TYPE" command for this purpose. (See the DOS Manual for further information.)

When all files have been completed, the Line Status field displays the following message.

IDLE

The Main Menu selections form reappears and you can specify another operation.

If your PC does not include a high speed printer, receiving to the disk and printing off-line saves money on telephone charges and line connect time.

Automatic Receive File Specification

If you do not know how many files are being received, you can utilize the Automatic Receive feature. Specify one file name, preceded by an exclamation point (!), and the emulator automatically creates a new file by that name, with a numerically sequenced file type field, for the next file it receives. For example, if you enter the file name "!RCVDAT", the emulator creates the files "RCVDAT.1, RCVDAT.2, ..., RCVDAT.999". Do not enter a period or a file type after the file name since this causes a "BAD FILE NAME" error.

After you have entered the Automatic Receive file name, the emulator changes the exclamation point to a plus sign (+) to show that the name is being expanded. File numbers run in ascending order. If you exit and re-enter the program, and the Automatic Receive option is then enabled, the file types will begin at "1" again. No check is made to ascertain whether a file of the same name already exists, so old files are overwritten unless you use a different file name or rename the files between runs.

If, for instance, you used the following format,

```
FILE NAME.TYP      STATUS      (. = END)
!AUTORCV
```

the system responds with the following display.

```
FILE NAME.TYP      STATUS      (. = END)
+AUTORCV.0         READY
```

While receiving the first file, the display changes to the following:

```
FILE NAME.TYP      STATUS        (. = END)
+AUTORCV.1         RECEIVING
```

After receiving the second file, the following display appears:

```
FILE NAME.TYP      STATUS        (. = END)
+AUTORCV.2          DONE
```

Notice that previously received file names are not kept on the screen after the beginning of a subsequent receive.

4.3.4 Receiving to the Printer

Pressing <**F3**> (Printer) under the Receive Output Device menu sends data to the printer. All tab characters are interpreted as if the printer had the Printer Horizontal Format Control Option for the 2780/3780. If the host does not send a format record, AST-3780 assumes a tab stop at every eighth column. Full space decompression is provided as it would be for an original equipment 3780 station. Tape-controlled carriage is simulated as follows:

Table 4-1. EBCDIC Code Table

EBCDIC Code	Carriage Operation
ESC /	Single Space
ESC S	Double Space
ESC T	Triple Space
ESC A	Form Feed
ESC B	Skip 2 Lines
ESC C	Skip 3 Lines
ESC D	Skip 4 Lines
ESC E	Skip 5 Lines
ESC F	Skip 6 Lines
ESC G	Skip 7 Lines
ESC H	Skip 8 Lines

NOTE

All carriage control operations are performed after printing the line, as defined in the 2780 and 3780 specifications.

AST-3780 automatically initializes the printer with a string of characters as defined in EMDAT.PRM. As distributed, this sets the Epson printer to condensed print mode to enable 132 characters on a line.

4.3.5 Receive Termination

You can abort any receive operation by pressing <**F10**>. This does not force the host to stop transmitting; it only causes AST-3780 to send an EOT character in response to the next message received. When the host relinquishes the line, AST-3780 automatically switches to Keyboard Transmit mode, enabling you to enter a command. You can temporarily suspend reception by pressing <**Ctrl**>-<**Num Lock**> and restart reception by pressing any other key. AST-3780 will hold off the host until it is ready to receive again.

4.3.6 General Receive

When you press <**F4**> on the Receive Output Device menu, the emulator directs output to the device listed in the component selection field of the message. Two parameters in EMDAT.PRM can be used to specify these codes: one for disk (punch) and one for printer. Any other code contained in a message is routed to the screen.

Because punch output can be written to diskette, you must specify the diskette file names before you select General Receive. AST recommends using the automatic receive option for this. Selecting any receive device after General Receive disables this option.

After it is finished, the emulator returns to Main Menu selections.

4.4 Error Reporting

If some problem occurs during a transmit or receive operation, (such as disk full or write error), AST-3780 temporarily suspends operation and displays an error message in the Exception Status field. You can restart the program after correcting the problem by specifying the operation again.

4.5 System Finish

You can terminate AST-3780 by pressing the <**F10**> key under Main Menu selections. This closes open files and resets the system to its prior status. The screen clears AST-3780 returns control to DOS.

4.6 Transparent Data Feature

AST-3780 provides for the transmission and reception of transparent data, as defined in the *Binary Synchronous Communications* specification. The transparent mode should be used to transfer non-ASCII files between two systems.

4.6.1 Receiving Transparent Files

Transparent receive does not need user intervention beyond what is performed for a non-transparent receive. When AST-3780 receives a transparent data block, it writes it to disk or printer without any special formatting, enabling binary files or RAM images to be transferred.

Selecting the display as an output device for a transparent receive is not recommended because it leaves the control characters output unchanged. This could lead to the current screen form scrolling off the top of the display. Although the emulator continues to function normally, the only way to restore the form is to exit to DOS and restart AST-3780.

4.6.2 System-Dependent Functions

When you specify the transparent option for the host system, all punched card output is transmitted in unblocked, untranslated format. For this reason, the emulator's parameter file must specify a "2" as the fifth parameter.

4.7 Internal Diagnostic Test

AST-3780 contains an internal loopback test to provide a go/no-go indication of the interface between the PC and the modem. The test sends and receives all character codes from 256 to 50, in that order.

To use the test, set the modem to analog loopback mode (see your modem user's manual for details on setting this mode), and press <**F4**> under Main Menu selections. The test result appears on the 25th line of the screen.

4.8 Line Monitor Dump

Using the Line Monitor Dump (LMD), you can ascertain the condition of line activities between your computer and the host system. This is particularly useful if the system is hanging up or acting erratically. To analyze the line, order a line monitor dump. Use LMD to create a special file which records the flow of data from the host to your personal computer. The data is displayed in its raw hexadecimal form.

To invoke the LMD program, press <**PgDn**>. This begins the operation. The program writes all data to a file called "ST.DAT" in drive A:. To stop the LMD, press <**Home**>. Once the data is collected, open ST.DAT and analyze it using one of several commercially available utilities such as Norton Utilities.

Use the LMD function in either IP or CMDP mode.

NOTE

A two-character hexidecimal sequence (ABh, 7Bh) identifies the start of receiving data; and another two-character hexidecimal sequence (AAh, FBh) identifies the start of transmitted data.

COMMAND PROCESSOR OPERATION 5

The Command Processor Operation (CMDP) is the file-driven (batch) subprogram that you start by typing "CMDP" in response to the DOS prompt.

5.1 Purpose

The Command Processor provides you with automatic, unattended operation of the AST-3780 emulator. You can place commands in a diskette file that can be used to perform all of the functions found in the Interactive Processor package.

5.2 File Format

The following section explains how to format your program for use by CMDP.

5.2.1 Input File Format

The program CMDP gets its operating instructions from any standard input device (floppy diskette, hard disk, or tape drive) as defined by PC-DOS (STDIN). This feature is supported by DOS version 2.0 or later. When the system is first initialized, all input commands must be typed on the keyboard. You can redirect this input by specifying the name of a file on the command line preceded by a "less than" (<) sign. For example:

A> **CMDP <EMFIL.DAT <Enter>**

Create a Command Processor input file using EDLIN or another text editor. If the file contains only a few commands, use the DOS COPY CON command to create it. For example, the following sequence entered at the DOS prompt creates the command processor input file shown as the first example in Section 5.6.

```
A> COPY CON: EMFIL.DAT <Enter>
T MYJOB.XMT <Enter>
W <Enter>
P <Enter>
X <Enter>
<Control>-Z <Enter>
```

This file can contain any of the commands listed in Section 5.3.

5.2.2 Output File Format

The Command Processor sends a complete record of all commands executed in a session to device STDOUT. DOS initially assigns this device to the system display but you can reassign it by invoking the Command Processor with a file or device name on the command line preceded by a "less than" sign. For example:

```
A> CMDP <EMFIL.DAT >MYJOB.LOG

A> CMDP <NEWJOB.MSG >PRN:
```

The first example takes input from the file named EMFIL.DAT located on drive A: and writes to the file named MYJOB.LOG, also on drive A:. The second example uses file NEWJOB.MSG on drive A as input and writes to the system printer. Arrange the format of the information output as follows:

- *Line number*. This corresponds to the current line that has been read from the input file. The first line read is line 1.

- *Current time*. Read the system clock for this value (only if the system clock has been set).

- *Command line*. The actual command line read from the input file.

5.3 Commands

All the commands you are likely to use in writing your input files are discussed in the following section.

5.3.1 Transmit

Use the "T" command to transmit a file. The format for this command is the following.

T [device]filename}extension}

where:

device is the type of device to which you are sending the output.

filename is the name you assign to the transmitted file.

extension is the qualifier you add to modify the file name.

The file specification can also contain a directory field under DOS version 2.0 or later. This command is analogous to the "F1 = Transmit" command in the Interactive Processor. Also as in IP mode, you can send several files with the same name but different extensions by using the wildcard (*) extension. This automatically transmits all files with the same file name.

5.3.2 Receive

Use the "R" command to receive a file to disk. The format for this file is:

R [device]filename}extension}

where:

device is the type of device where you are receiving the output data.

filename is the name you assign to the file you want to receive.

extension is the qualifier you add to modify the file name.

The file specification can also contain an optional directory name according to DOS 2.0 conventions. This command receives one file to any DOS-compatible device, including hard disk, diskette, printer, and so on. It is analogous to the Auto Receive command in IP mode (see Section 4.3.3) and uses the exclamation point (!) prefix to create a new file name with a numerically sequenced file type extension. Data is received to disk with tab characters left intact. To receive with tab characters expanded to the proper number of spaces, see the "Z" command below.

Receive To Disk With Tab Expansion

The "Z" command receives data to disk or diskette with the tab characters expanded to their proper spacing. The format used is:

Z [device]filename}type}

where:

device is the type of device you are using to receive the output file.

filename is the name you assign to the file you want to receive.

extension is the qualifier you add to modify the file name.

This is similar to the "R" command except that tab characters are expanded as dictated by the Printer Horizontal Format Control Record sent by the host. If no control record has been sent, a tab stop is assumed at every eighth column.

5.3.3 Print

Use the "P" command to receive data to the printer. The format of this command is:

P (no other parameters)

5.3.4 Exit

Use the "X" command to end and return to DOS. The format for this command is:

X (no other parameters)

Use <**F10**> to terminate a program and return to DOS.

The system hardware is reset, meaning that no further communication can take place.

5.3.5 Exit Maintain Link

Use the "Y" command to end a session and return to DOS. The format of this command is:

Y (no other parameters)

This is identical to the "X" command with the exception that the Data Terminal Ready line is *not* dropped, maintaining the communication link after the Command Processor exits to DOS. This can be useful when the batch file must query you and return to CMDP without ending communications.

5.3.6 Set Transparent Mode

Use the "B" command to set binary transmission mode. Use the following format for this command:

B (no other parameters)

All files sent after this command are in transparent mode. Any data byte can be sent in this mode without affecting the communication link protocol. Combining this command with a "T" command is equivalent to the "F3 = Transparent Xmit" option in the Interactive Processor.

5.3.7 Set Normal Mode

Use the "N" command to return transmission to normal mode after a "B" command. This is the default condition when the emulator is started. Use the following format for this command:

N (no other parameters)

5.3.8 Set ETX Mode

Use the "E" command to specify that an ETX character is sent as the message terminator for the last block of each file. This is the default condition. Use the following format for this command:

E (no other parameters)

5.3.9 Set ETB Mode

Use the "F" command to specify that an ETB character is sent as the message terminator for the last block of each subsequent transmit file. Use the following format for this command:

F (no other parameters)

Provided that the host system requires an ETX at the end of each file, using this command has the effect of collating files. Remember to include an "E" command before sending the last file; this returns the emulator to ETX mode to close out the file.

5.3.10 Set EOT Mode

The "G" command tells the emulator to send an EOT character and thereby relinquish control of the communications line after transmitting the last block of each subsequent transmit file. This is the default condition. Use the following format for this command:

G (no other parameters)

5.3.11 Set TTD Mode

Use the "H" command to send the TTD sequence after the transmission of each subsequent transmit file. Use the following format for this command:

H (no other parameters)

This maintains control of the communications line so another file can be transmitted. Using this command before sending a string of files performs the same function as specifying several transmit files at the same time using the Interactive Processor. Remember to include a "G" command before sending the last file.

5.3.12 Connect Incoming Call

Use the "A" command to answer an incoming call sequence if the PC is to transmit first (after the call is received). If your computer receives first, this command is not necessary. Use the following format for this command:

A (no other parameters)

Once you invoke this command, the emulator waits until an ENQ message is received, sends an ACK message, and waits for an EOT message. This simulates the 2780/3780 Auto Answer option.

5.3.13 Disconnect

Include the "D" command in the input stream to send the sequence DLE/EOT to the host. Use the following format for this command:

D (no other parameters)

Use this command with care. Make sure the host has finished sending data before invoking this.

5.3.14 Wait For Incoming Call

Use the "W" command to tell the emulator to wait for an incoming call. Use the following format for this command:

W [timeout period]

where:

Timeout period is the duration you specify the emulator to wait for an incoming call. Specify the time delay in seconds within a range from 1 to 65,535.

This actually monitors the status of the Data Set Ready signal from the modem, and proceeds to the next command when it is ready. You can add an optional time delay after the command to request a certain timeout period after which the program aborts if Data Set Ready is not seen.

5.3.15 Display Parameters

Use the "Q" command to tell the emulator to display all parameters you have changed. Use the following format for the command:

Q (no parameters)

Once you invoke this command, the emulator displays all parameters you have changed on the screen.

5.4 General Discussion - Receive

Include a separate receive command in the command file for each file you want to receive, listed in the order of expected reception. Use either an "R" command or a "P" command. The program considers either command complete when it receives a block ending with ETX or EOT. Once one of these signals is received, the program moves to the next command in the batch file.

As previously described, you can receive more than one file with the same file name but different extensions by using the exclamation point prefix, in the following manner:

R ! <filename> (no extension)

where:

filename is the name you assign to the file you want to receive.

This feature is exactly like the Auto Receive feature in the IP mode.

5.5 General Discussion - Transmit

The commands to set emulator modes (B, N, E, F, G, and H) must precede the actual transmit commands for the system to recognize them properly.

5.6 Sample Command Files

The following section contains sample command files, showing you how to implement the commands you read about in the previous section. Use these examples to help in constructing your own files.

To send a file and receive to printer:

```
W
T MYJOB.XMT
P
X
```

To answer an incoming call and send two files as one:

```
A
F
H
T B:File.JOB
E
G
T FILE2.JOB
X
```

To wait for an incoming call, receive a file, transmit a file in transparent mode, print a file, and send a disconnect sequence:

```
W
R File.RCV
B
T B:CRDIMG.DAT
N
P
D
```

5.7 DOS Batch File Interface

The Command Processor is designed to be used with the DOS batch file facility. It provides a clean interface to enable the construction of batch files that directs the operation of the communications link.

5.7.1 Starting Command Line

When you first invoke the Command Processor, it initializes the communications hardware and system software so that it begins reading commands at the first line of the file. This hardware initialization causes the Data Terminal Ready signal to drop for a short period of time, causing many modems to hang up.

To avoid this (especially during error recovery), the command processor must start reading the command file at some point other than the first line. The following procedure provides a means of doing this.

Setting the Command Line

The DOS batch file can set a string to "LINE = xxx" where xxx is the line number that should be executed first. For example, to tell the emulator to start executing commands at line 6, you do the following.

A> **SET LINE=6 <Enter>**
A> **CMDP <DUMPFILE.JOB> <Enter>**

You can also enter the SET command directly from the keyboard. Remember that once you have issued a SET command it remains in effect until you reinitialize DOS or until you or your batch file remove it, in the following way.

A>**SET LINE= <Enter>**

If you have not entered this command at some point after CMDP finishes, any further running of the Command Processor will start executing from the specified line.

Use the SET command to place multiple command streams in the command file. Simply start the file at the appropriate line number. For error recovery, the batch file could determine what error has occurred, and restart the Command Processor at a line that notifies the host what has happened.

Line Monitor Dump

Using the Line Monitor Dump (LMD), you can ascertain the condition of line activities between your computer and the host system. This is particularly useful if the system is hanging up or acting erratically. To analyze the line, order a line monitor dump. Use LMD to create a special file which records the flow of data from the host to your personal computer. The data is displayed in its raw hexadecimal form.

To invoke the LMD program, press <**PgDn**>. This begins the operation. The program writes all data to a file called "ST.DAT" in drive A:. To stop the LMD, press <**Home**>. Once the data is collected, open ST.DAT and analyze it using one of several commercially available utilities such as Norton Utilities.

Use the LMD function in either IP or CMDP mode.

NOTE

A two-character hexidecimal sequence (ABh, 7Bh) identifies the start of receiving data; and another two-character hexidecimal sequence (AAh, FBh) identifies the start of transmitted data.

5.7.2 Stopping the Command Sequence

At any point, you can stop the batch command processor by pressing <**F10**>. This halts the command processor and returns you to the DOS command.

5.8 Error Handling

Error handling has been designed to be compatible with the DOS batch "ERRORLEVEL" variable. The Command Processor outputs a code indicating the status of the communications session. You can write commands into your batch file that can interpret error messages you receive and automatically assign an operation to that error condition. Do this by inserting statements in your file like the following.

```
if errorlevel 8 goto timeout
if errorlevel 7 goto fixprnt
if errorlevel 6 goto badfile
```

As in this example, write in the errorlevel commands in descending order. Each error message has an error level assigned to it.

Here is a list of possible error messages and their respective error levels; the messages themselves are sent to STDOUT or a file (if specified).

CMDP.0

Explanation: Execution terminated normally at line #}.

Action: This is more of a status message. It indicates that the Command Processor has encountered an "X" command during the course of execution. All system software is reset to its initial state, Data Terminal Ready is lowered, and communications are terminated. Try the sequence again.

CMDP.1

Explanation: CC-432 is not installed. Execution is terminated. The Command Processor cannot make an interface with the CC-432 Card, because it is not installed or is defective.

Action: Install the CC-432 board. If you already have a CC-432 board installed, the board is probably defective. Get a new one.

CMDP.2

Explanation: System parameter file EMDAT.PRM was not found. The parameter file could not be located on the default disk or diskette drive.

Action: Run the configuration program (CFG3780 or CFG3780A) as discussed in Section 3.

CMDP.3

Explanation: Selected transmit filename} was not found in line #}. The file name specified in a T command could not be located on the default hard disk or diskette.

Action: Check to see whether the file you wanted to transmit was located on the default hard disk or diskette. If it was not, go back and assign the correct device name to your command statement.

CMDP.4

Explanation: Data set ready signal from DCE was not seen at line #}. At some point during processing of the command file stream, the DSR signal coming from the modem dropped.

Action: This is usually due to a serious communication error. Make a new modem connection before continuing. If this still does not work, consult with your systems manager.

CMDP.5

Explanation: Protocol error detected at line #}. Activity time for bidding the line has been exceeded.

Action: This can be the result of an especially poor phone connection but if the problem persists, consult with your systems manager about tracing its cause.

CMDP.6

Explanation: Could not open the file specified for receiving in line #}. The specified receive file could not be opened. This can be due to a defective diskette, or one that has no more space left on it.

Action: Try a new diskette.

CMDP.7

Explanation: Error while writing file to line #}. A disk or diskette I/O error has occurred. This error can be caused by defective media, defective drive hardware, or a disk full condition.

Action: If you are using a diskette, try a new one. If you are using a hard disk, you may need to discuss the problem with your system administrator. If a "disk full" condition exists, move your file to a new diskette or disk drive.

CMDP.8

Explanation: The printer is not ready, is off-line, or is out of paper in line #}. This message only appears during the execution of a P command or an "R PRN:" command.

Action: Check to make sure that the printer is properly attached, that it is loaded with paper and on-line.

CMDP.9

Explanation: The wait period elapsed without detecting data set ready in line #}. The time period specified as the argument to a "W" command has elapsed without seeing the data set ready signal from the modem, meaning that a call is being received.

Action: Wait until the line is clear.

CMDP.10

Explanation: An error occurred while reading the file in line #}. During a transmit operation, DOS has detected an error while reading the specified file. This can be caused by a defective diskette or drive.

Action: Check to make sure that the drive door is firmly closed. Then check the diskette or drive.

CMDP.11

Explanation: No activity time out period has elapsed in line #}. The program is terminated when the communication line remains idle for five minutes.

Action: Restart the program.

NOTES

PART III. APPENDICES

A Troubleshooting

B. Error Messages

C. Technical Support Checklist

TROUBLESHOOTING A

Although your AST-3780 software is designed for easy installation and operation, you may occasionally have problems. This section lists some possible causes and solutions.

The information in this section is only a brief guide for troubleshooting and is not intended as an all-inclusive or highly technical overview. In case of problems, check first with the host system coordinator who troubleshoots the host.

Below are some of the more common problems you may encounter and a list of possible solutions to the problem.

NOTE

Throughout this appendix, the term PC refers to the personal computer you are using, whether it is an IBM PC, XT, AT, or PS/2.

PROBLEM

The host does not answer the telephone. When you try to reach the host from your PC, the call is not answered.

ACTION

Check the following items:

1. Has the operator dialed the correct access number?

2. Has power been applied to the host computer and its modem? Is it on-line and available?

3. Are all host cables properly connected?

4. Has the host modem operation been verified?

5. Does the host modem have auto-answer capability? Has this capability been enabled?

6. Has the system manager defined a line for the PC? (See Appendix D.)

7. Is the line definition correct? Check for proper line protocol and modem characteristics.

8. Has the host line been started? POWER and JES must be started to allow auto-answer.

PROBLEM

PC does not respond to host.

ACTION

Check the following items:

1. Has the correct access telephone number been dialed?

2. Is the PC powered on, and has the AST-3780 diskette been loaded?

3. Have you typed the appropriate command (i.e., IP or CMDP)?

4. Is there power at the PC wall outlet?

5. Are all cables connected properly between the PC and the modem? Between the modem and the communication line?

6. Has the modem been put into DATA mode?

7. Has the analog loopback test been run? The modem self test?

PROBLEM

Telephone line is busy.

ACTION

Check these items:

1. Have you dialed the right telephone number?

2. Is the communication port on-line and available? Verify this with the host system operator.

PROBLEM

Line disconnects or drops.

ACTION

Check the following items:

1. At either the host or the PC end, has power dropped? Have either of the two modems become unplugged?

2. Are the two modems compatible?

NOTE

IBM modems are NOT compatible with "standard" telephone company modems.

3. Has the host system been generated to recognize a 2780, 2770, 3741, or 3780 device with the EBCDIC character set?

4. Has an activity timeout error occurred at the host? Most host systems require the operator to transmit a sign-on message within thirty seconds after connection.

5. Has the proper sign-on message been sent? Was it accepted by the host? Was it considered valid?

PROBLEM

Data transmission fails. You cannot send data from your PC to the host.

ACTION

Check the following items:

1. Was the terminal sign-on successful? Verify this with the host operator.

2. Does the host believe the PC's card reader is active? If not, start the reader.

3. Was a card reader defined in the host configuration parameters?

4. Have incorrect JCL or operator commands been sent to the host? Sometimes the system ignores all job streams associated with erroneous JCL cards.

5. Has the JCL or operator command been sent as transparent data? This is usually not necessary and requires that the text be in uppercase characters and padded out to 80 bytes.

6. Was the host application program started?

PROBLEM

Data reception fails.

SOLUTION

Check the following items:

1. Has the terminal been successfully signed on?

2. Does the host believe that the PC's printer and punch are on-line and active? It may be necessary to start these devices by sending an operator command.

3. Have the printer and punch been defined correctly? See Appendix D.

4. Is the print or punch job on hold status? Consult your system manager to determine if this is the case.

PROBLEM

Incorrect print or diskette output.

ACTION

Check the following items:

1. Is there a program logic error in the host application? The programmer should check the host's output data set to see if the data is correct there.

2. Did the host application ABEND?

3. Is the application program formatting the data for a terminal type other than 2780, 2770, 3741, or 3780?

4. Are the character translation tables on the host identical to those on the PC? In some rare instances, the user may have to change the board.

PROBLEM

Output line fails.

ACTION

Check the following items:

1. What is the printer or punch width specification?

2. Has the application program specified the appropriate block size?

3. Has the host's communication block size been generated to be large enough to handle the entire line? If not, loss of data may occur.

PROBLEM

Transparent or punched card output fails.

ACTION

Make sure the fifth parameter in EMDAT.PRM is set to 2.

ERROR MESSAGES B

B.1 Error Messages

The following section provides you with a list of error messages and their definitions.

BAD FILE NAME

Explanation: The file name you entered is invalid.

Action: Check your DOS format. You may also have accidentally entered a period or file type when specifying an automatic receive file name.

CC-432 NOT INSTALLED

Explanation: CC-432 or CC-432A board is not installed correctly.

Action: Check to make sure you installed the communication board in accordance with the instructions given in the *CC-432 User's Manual* or *CC-432A User's Manual*. Also check to make sure that no other devices in the system use the locations 0300h through 030Fh for I/O.

DEVICE FAULT

Explanation: An interface adapter other than the CC-432 board has returned a hardware error indication.

Action: Check cable connections, and run the appropriate diagnostics.

DEVICE I/O ERROR

Explanation: An irrecoverable error has occurred during a DOS operation, probably due to a bad diskette.

Action: Replace and try again.

DEVICE UNAVAIL

Explanation: This occurs when you try to access a non-existent device, such as specifying "B:" in a single drive system.

Action: Check your device assignments.

DISK FULL

Explanation: There is no more room available on the specified volume.

Action: Specify another receive device, or insert a different volume and re-enter the receive file name. The "RECEIVE OUTPUT DEVICE" screen automatically appears when you encounter this error, and no loss of data takes place.

DISK NOT READY

Explanation: The drive is not ready.

Action: Make sure there is a diskette in the proper drive and that the door is closed. If the problem persists, run the appropriate diagnostic.

DSK WRT PROTECT

Explanation: The named diskette or hard disk drive is write-protected.

Action: Remove the write-protect.

ERROR ON FILE EMDAT.PRM

Explanation: When this message is displayed while running IP, it indicates the file EMDAT.PRM is not found on the current drive, or an invalid parameter was found within the file. If it appears while running CP, it means that the command file name specified in the file (for example, EMFIL.DAT) was not found.

Action: Restore the original EMDAT.PRM from the distribution diskette.

FILE ALREADY EXISTS DELETE (Y/N)?

Explanation: A specified receive file is already present on the disk.

Action: Type "Y" to overwrite it or "N" to specify another file name.

FILE NOT FOUND

Explanation: A file that has been specified for transmit cannot be found on the specified device.

Action: Re-enter the file name, or insert the proper diskette.

OUT OF PAPER

Explanation: The printer has run out of paper during a receive operation. The emulator prompts for another receive output device.

Action: Add paper and specify the printer again.

PARAMETER ERROR

Explanation: This is displayed when an error occurs that the emulator does not understand. It is usually caused by an incorrect setting in EMDAT.PRM.

Action: Make sure the settings contained in that file match the parameters for your host system. If this does not clear up the problem, copy down the numbers that appear after the "ERR=" and "ERL=" and contact AST Technical Support.

PROTOCOL ERROR

Explanation: This message indicates a fatal communication error. It may be due to 15 continuous NAKs (negative acknowledgments) to a message or an acknowledge sequence error (for example, receiving an ACK 1 when an ACK 0 was expected).

Action: Reestablish communication once the problem is corrected. The problem is probably a very noisy communication link or a defective modem. Run the modem loopback test, or contact your telephone company for assistance.

REMOTE CONTENDING

Explanation: This message means the host is trying to send the PC a message at the same time that the PC is trying to transmit.

Action: If you have designated the PC as the master station (ask your host operations manager if this is the case), do nothing; the host yields to the PC. If the PC is designated as the slave station (this is usually the case), press <**F10**> to allow the host to send first, then retry the operation.

REMOTE DISCONNECT

Explanation: The host system has sent a DLE EOT sequence. This usually happens after you transmit a signoff message, and may signify that the host is terminating communications.

Action: Re-dial the HOST.

REMOTE NOT READY

Explanation: This message is displayed after three unsuccessful bids for the communication line.

Action: Check all connection points (for example, PC to modem, modem to communication line, and so on), and make sure that the host is on-line and ready to communicate.

REVERSE INTRPT

Explanation: This means the host has a high-priority message to send immediately.

Action: Abort the current transmit as soon as possible.

TEST FAILS

Explanation: The analog loopback test has failed to operate properly.

Action: Check the PC-modem connection and ensure that the modem is set to analog loopback mode. Try running the test with a different modem.

NOTES

TECHNICAL SUPPORT CHECKLIST C

The following checklist provides a means of assembling pertinent information about your AST-3780 or 3780A product in case you need to call your authorized AST reseller or AST Technical Support. Fill out the checklist before you call so that you will have the information necessary to describe the problem.

You may want to make copies of the checklist so that you can fill one out each time you require technical support. You should also have a copy of the host information checklist on hand.

CHECKLIST

1. Person to contact at your site with whom to communicate regarding the host system.

   Name: _____

   Phone: (____) _____

2. Person contacted as AST for technical support.

   Name: _____

   Date contacted: _____

3. Date acquired AST-3780/3780A: _____

4. Type of PC:

   AST Premium/286 _____
   IBM PC _____
   PC XT _____
   PC AT _____
   PS/2 _____
   Other: ___

5. Serial Number: Board _____

6. Total amount of memory in PC: _____

7. Version of DOS: _____

8. Version of CC-432: _____

9. Version of AST-3780: _____

10. Host system to which you are connected to:

    _____

11. Version of host software:

    _____

12. Type of host connection you have:

    Leased Switched

13. Boards, such as emulation and network, installed in your PC:

    _____

14. CC-432 Configuration:

    IBM base I/O address: _____

    IRQ number: _____

15. Configuration of entire line (include other terminals):

16. Explain the problem -- when and how it occurred.

17. Can the problem be repeated/duplicated by a certain sequence of actions? If so, how?

18. List any error messages displayed related to the problem.

19. If you tried various solutions, explain what you did and give the results.

20. If it is an intermittent problem, track the dates and/or circumstances of occurrence, if possible

21. List or explain any other pertinent information.

LIMITED WARRANTY

AST RESEARCH AST STORAGE SUBSYSTEM

AST Research, Inc. (AST) warrants the original purchaser of this AST product that it is to be in good working order for a period of 180 days from the date of purchase from AST or an authorized AST dealer. Should this product, in AST's opinion, malfunction during the warranty period, AST will, at its option, repair or replace it at no charge, provided that the product has not been subjected to misuse, abuse, or non-AST authorized alterations, modifications and/or repairs.

Products requiring Limited Warranty Service during the warranty period should be delivered to AST or an AST authorized service center with proof of purchase. If the delivery is by mail, the purchase agrees to insure the product or assume risk of loss or damage in transit. The purchase also agrees to prepay shipping charges to AST.

CAUTION: THE ORIGINAL SHIPPING CONTAINER AND SHIPPING COMPONENTS MUST BE RETAINED; SHIPPING HARD DISK OR TAPE EQUIPMENT IN OTHER THAN ORIGINAL OR FACTORY-SUPPLIED CONTAINERS AND COMPONENTS WILL VOID THE WARRANTY.

ALL EXPRESSED AND IMPLIED WARRANTIES FOR THIS PRODUCT INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE ABOVE 180-DAY PERIOD. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

UNDER NO CIRCUMSTANCES WILL AST RESEARCH, INC. BE LIABLE IN ANY WAY TO THE USER FOR DAMAGES, INCLUDING ANY LOST SAVINGS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF USE OF, OR INABILITY TO USE, SUCH PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages for consumer products, so the above limitation or exclusion may not apply to you.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

The limited warranty applies to hardware products only.

FCC WARNING

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Use shielded cables to attach only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits to your computer. Operation without shielded cables or with noncertified peripherals is likely to result in interference to radio and TV reception.

Instructions to the User

This equipment generates and uses radio frequency energy and if not installed and used properly, that is in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.
- Ensure that board slot covers are in place when no board is installed.
- Ensure that all brackets are fastened securely to the PC chassis.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission (FCC) helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4

AST RESEARCH, INC.

Product Comment Form

AST-3780/3780A
User's Manual
000658-001 A

We appreciate your comments regarding any problems or suggestions related to AST Research products. Please use this form to communicate any observations that you have concerning the improvement of either the product itself or the product documentation provided in this manual.

Submitter Information

Submitter's name:

Address:

Product/Manual Comments and Suggestions

Please mail this form to:

AST Research, Inc.
Attn: Product Marketing
2121 Alton Ave.
Irvine, CA 92714-4992

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