

CHS Terminal

for the Cartridge Handling Subsystem

User's Guide

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1

Introduction

This chapter provides general information about the CHS Terminal program, contents of this manual, and related publications.

1.1 About the CHS Terminal Program

The CHS Terminal program is designed to be used in conjunction with the diagnostics firmware for the EXABYTE® EXB-10, EXB-10i, and EXB-120 Cartridge Handling Subsystems (CHSs). Operating on a PC or compatible system, CHS Terminal acts as terminal-emulation software for the CHS diagnostics firmware and allows you to do the following:

- Upgrade the CHS firmware
- Write CHS diagnostic dump data to a file

Figure 1-1 shows the CHS Terminal program operating along with the EXB-10i's diagnostics firmware. The top line of the screen is the CHS Terminal program's *status line*. The rest of the screen is the *terminal emulation area*, where the CHS diagnostics firmware appears (either Diagnostics for the EXB-10 and EXB-10i or Console for the EXB-120). For more information about the program screen, refer to Chapter 2.

DIAGNOSTIC MAIN MENU			
EXB-10i CHS VERSION 2.6 12/16/91			
FUNCTIONS		SYSTEM SENSORS	
R - REDRAW SCREEN		CARTRIDGE PRESENT	0
M - MANUAL MOTION CONTROL		CARTRIDGE HOLDER	1
G - GO TO ROM (NEW FIRMWARE)		CTS DOOR	0
S - SYSTEM STATISTICS		CHS DOOR	1
T - SYSTEM TIME / BAUD RATE		SELECT SWITCH	0
H - HISTORY		INCREMENT SWITCH	0
D - DIAGNOSTIC DUMP		VHOME	0
E - EXB-10i DIAGNOSTICS		ZHOME	0
I - SCSI FUNCTIONS MENU			
ERROR CODES		MECHANISM POSITION	
ERROR CODE	05h	Y POSITION	16711936
ERROR TYPE	SOFT ERROR	Z POSITION	16711936
CHS DOOR IS OPEN		Z HOME SENSOR	0

Figure 1-1 CHS Terminal program and the EXB-10i Diagnostics screen

1.2 About This Manual

This manual includes the following chapters:

- Chapter 1, “Introduction,” contains general information about this manual and related publications.
- Chapter 2, “Installing and Starting the Program,” contains information about CHS Terminal program requirements, instructions for installing the program, and instructions for starting and exiting the program.
- Chapter 3, “Using CHS Terminal,” describes how to upgrade CHS firmware, perform a CHS diagnostic dump, and capture the CHS Terminal’s screen.
- Chapter 4, “Error and Status Messages,” provides a list of error and status messages, explanations of what could cause those messages, and corrective actions.
- A glossary, index, and reader’s comment form are included at the back of this manual.

Intended Audience

This manual is intended for anyone who needs instructions for using the CHS Terminal program in conjunction with the Diagnostics program for the EXB-10 and EXB-10i or with the Console interface for the EXB-120. This manual assumes that you are familiar with CHS operations as well as basic DOS terminology and concepts.

Conventions and Terms Used in This Manual

The following typographic conventions are used in this manual:

- **Boldface**: indicates names of keys, such as **F1**.
- **Courier Bold**: indicates information you need to type from the keyboard.
- **Alt** and **Ctrl** sequences: indicates keys you should press simultaneously. For example: **Alt-X** indicates that you should hold down the **Alt** key and then press the **X** key.

The following terms are used in this manual:

- *Enter*: indicates that you should type the command and then press the **Enter** key.
- *CHS*: Cartridge Handling Subsystem. Either the EXB-10, EXB-10i, or EXB-120.
- *Diagnostics firmware*. Either Diagnostics for the EXB-10 and EXB-10i or Console for the EXB-120.

1.3 Related Publications

The following publications provide more information about Cartridge Handling Subsystems and standards used.

EXB-10 and EXB-10i Cartridge Handling Subsystems

- *EXB-10 Cartridge Handling Subsystem Product Specification*, 510400
- *EXB-10 Cartridge Handling Subsystem Installation and Operation*, 510401
- *EXB-10i Cartridge Handling Subsystem Product Specification*, 510600
- *EXB-10i Cartridge Handling Subsystem User's Manual*, 510601
- *EXB-10/EXB-10i Cartridge Handling Subsystem Maintenance*, 510404

EXB-120 Cartridge Handling Subsystem

- *EXB-120 Cartridge Handling Subsystem Product Specification*, 510300
- *EXB-120 Cartridge Handling Subsystem User's Manual*, 510301
- *EXB-120 Cartridge Handling Subsystem Installation*, 510305
- *EXB-120 Cartridge Handling Subsystem Maintenance*, 510304

Standards

- *ANSI Small Computer System Interface (SCSI)*, X3.131-1989
- *ANSI Small Computer System Interface-2 (SCSI-2)* X3T9/89-042
- *ANSI Helical-Scan Digital Computer Tape Cartridge*, X3B5/89-136, Rev. 6

2

Installing and Starting the Program

This chapter describes how to install the CHS Terminal program on your computer's hard disk and how to start and exit the program. This chapter also lists program requirements.

2.1 CHS Terminal Program Requirements

The following items are required for using the CHS Terminal program:

- IBM PC, XT™, AT®, PS/2®, or compatible computer with a 5.25-inch or 3.5-inch floppy drive. A hard disk is recommended, but not required.
- DOS version 3.3 or greater.
- Serial port that is hardware compatible with the IBM PC. The serial port may be set up as COM1 through COM4; if you have a PS/2, it may be set up as Serial 1 through Serial 8.
- MDA, CGA, VGA, or EGA monitor; monochrome or color.
- For the EXB-10 or EXB-10i, a 4-pin to 25-pin RS-232 Monitor cable (EXABYTE part number 727005). For the EXB-120, a 9-pin to 25-pin RS-232 Monitor cable. If the serial port has a 9-pin connector, you will need a 25-pin to 9-pin adapter (available from most computer stores).
- An EXB-10, EXB-10i, or EXB-120 Cartridge Handling Subsystem.

2.2 Installing the CHS Terminal Program

This section describes how to connect the Monitor cable to the CHS and to the terminal. It also describes how to install the software.

Connecting the Monitor Cable

To connect the Monitor cable, follow these steps:

1. Attach the 25-pin end of the Monitor cable to the serial port on the computer. (If the serial port has a 9-pin connector, attach a 25-pin to 9-pin adapter.)
2. Attach the other end of the cable to the diagnostics port on the CHS.

Figure 2-1 shows the location of the diagnostics port on the back of the EXB-10 and the EXB-10i. Figure 2-2 shows the location of the diagnostics port on the EXB-120's control panel.

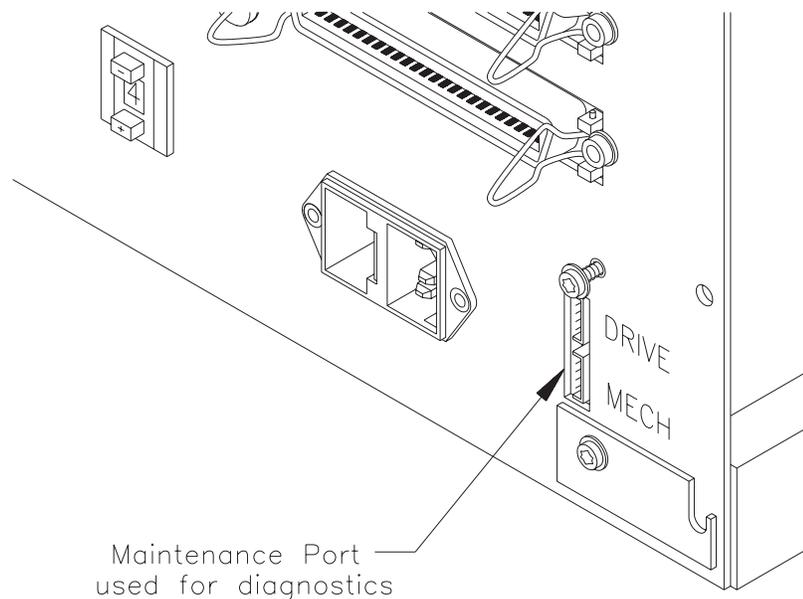


Figure 2-1 Diagnostics port on the back of the EXB-10 and EXB-10i

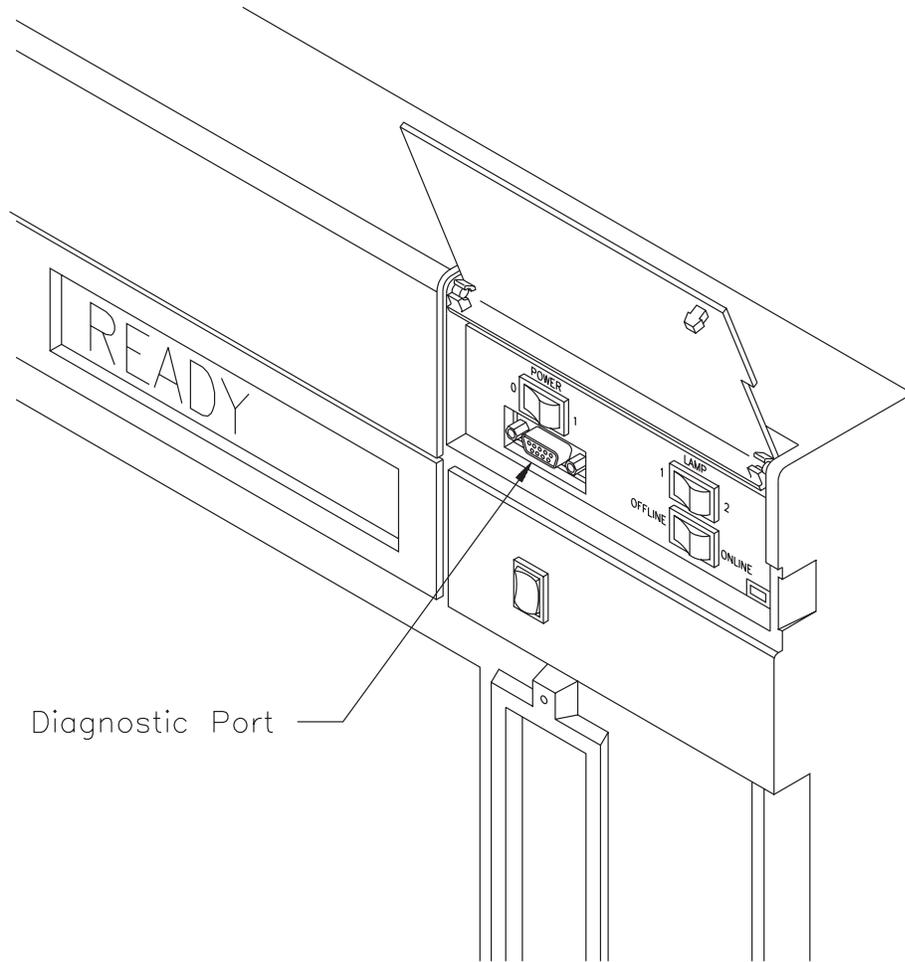


Figure 2-2 Diagnostics port on the EXB-120's front panel

Installing the Program

To install the CHS Terminal program, follow these steps:

1. Insert the disk containing the program file into the **a:** floppy drive.
2. *If you plan to operate the program from a hard disk:*
Create a directory for the program. For example, to create a directory named **\chsterm**, you would enter the following command from the root directory on the hard disk:

```
md \chsterm
```

Switch to the new directory. For example, if the hard disk is **c:** and you created a **\chsterm** directory, enter the following from **c:**

```
cd \chsterm
```

If you plan to operate the program from a floppy disk:

Insert a blank disk into the **b:** drive and switch to **b:**. (The program will be installed on the disk in the **b:** drive.)

3. Run the installation routine by entering the following:

```
a:chst0nnn.exe
```

where *nnn* is the version number of your program. For example, to install version 1.60 of the CHS Terminal program, enter the following:

```
a:chst0160.exe
```

The installation routine displays an informational message and then prompts you to continue.

4. Press **Y** to continue with the installation routine.

The installation routine creates the following files:

- CHSTERM.EXE, the program file
- CHSTERM.DOC, the online documentation file

When the files listed above are created, you are ready to start the program (described in the next section).

2.3 Starting and Exiting the Program

To start the program, follow these steps:

1. Make certain the Monitor cable is properly connected between the serial port on the computer and the diagnostics port on the CHS (see “Connecting the Monitor Cable” on page 2-3).
2. *If you are starting the program from a hard drive:*
Move to the disk and directory where you installed the CHSTERM.EXE file.

If you are starting the program from a floppy drive:

Insert the disk with the CHSTERM.EXE file in the floppy drive and switch to the floppy directory.

3. Enter the following:

chsterm

The CHS Terminal program status line appears on the screen.

4. Press **R** to display the diagnostics firmware.

Figure 2-3 shows an example of the CHS Terminal program operating with the EXB-10i Diagnostics program.

```

F1 Help | Alt-L Log is OFF | Alt-J COM1: | Alt-B 9600 | Alt-X eXit | 9:04:2
DIAGNOSTIC MAIN MENU
EXB-10i CHS VERSION 2.6 12/16/91
-----
FUNCTIONS                                SYSTEM SENSORS
R - REDRAW SCREEN                        CARTRIDGE PRESENT           0
M - MANUAL MOTION CONTROL                CARTRIDGE HOLDER            1
G - GO TO ROM (NEW FIRMWARE)             CTS DOOR                    0
S - SYSTEM STATISTICS                    CHS DOOR                    1
T - SYSTEM TIME / BAUD RATE              SELECT SWITCH                0
H - HISTORY                              INCREMENT SWITCH            0
D - DIAGNOSTIC DUMP                      YHOME                       0
E - EXB-10i DIAGNOSTICS                  ZHOME                       0
I - SCSI FUNCTIONS MENU
-----
ERROR CODES                              MECHANISM POSITION
ERROR CODE                               05h                          Y POSITION                    16711936
ERROR TYPE                               SOFT ERROR                   Z POSITION                    16711936
CHS DOOR IS OPEN                         Z HOME SENSOR                0

```

Figure 2-3 CHS Terminal program and the EXB-10i Diagnostics screen

The top line on the screen, beginning with “F1,” is the CHS Terminal program’s *status line*. Below the status line, beginning with “Diagnostic Main Menu,” is the *terminal-emulation area*, where the CHS firmware is displayed (either Diagnostics for the EXB-10/10i or Console for the EXB-120).

5. To exit the program, press **Alt-X**.

2.4 Command Reference

Table 2-1 lists the commands that can be used in the CHS Terminal program.

Table 2-1 Commands for the CHS Terminal program

Command Name	Command	Description
Help	F1	Displays or closes the help screen.
Send new firmware	Alt-S	Sends the new firmware to the CHS with the XMODEM Checksum protocol.
Diagnostic dump	Alt-L	Toggles the diagnostic dump function on or off, and writes the diagnostic data to a file.
Baud rate	Alt-B	Selects a new baud rate for the serial port.
Screen capture	Alt-F/Alt-G	Alt-F allows you to select a filename for a screen capture. Alt-G captures the screen and writes to the file you specify.
Monochrome /color	Alt-C	Selects a monochrome or color screen display.
Colors	Alt-E/Alt-T	Alt-E changes the default colors of the terminal-emulation area. Alt-T changes the colors of the top status line.
Serial port	Alt-J	Selects a different serial port.
Version	Ctrl-F1	Displays the CHS Terminal program's version number.
Exit	Alt-X	Exits CHS Terminal.

2.5 Configuring the Program

This section describes how to change the CHS Terminal's configuration options, which include the following optional tasks:

- Selecting a serial port
- Forcing monochrome mode
- Changing screen colors
- Selecting a baud rate for the serial port

The configuration options are stored in the CHSTERM.CFG file. This file is created in the directory where CHSTERM.EXE resides.

Selecting a Serial Port (Alt-J)

The serial port your system is currently using is displayed on the CHS Terminal's status line, next to **Alt-J** (see Figure 2-3). If you want to select another serial port, you can press **Alt-J** to toggle through serial port selections or use the `/C` command line switch (described on page 2-11).

Forcing Monochrome Mode (Alt-C)

If you have a color adapter attached to a monochrome display (such as a VGA adapter attached to an LCD display), the display may be more readable if you force monochrome mode. To do this, press **Alt-C** or use the `/M` command line switch (described on page 2-11), then press **R** to redraw the screen.

Changing Screen Colors (Alt-T and Alt-E)

To change the foreground and the background color of the CHS Terminal program's status line and the Help screen, press **Alt-T** to toggle through various color choices.

To change the default color selection of the terminal emulation area of the screen, press **Alt-E** to toggle through various color choices, then press **R** to redraw the screen.

Selecting a Serial Port Baud Rate (Alt-B)

The serial port's current baud rate is displayed on the CHS Terminal program's status line, next to **Alt-B** (see Figure 2-3). If you want to select another baud rate, press **Alt-B** to toggle through baud rate selections or use the /B command line switch (described on page 2-11).

Important

The baud rates selected in the CHS Terminal program and in the CHS diagnostics firmware must be set to the same value. If you see jumbled characters on the screen, the baud rates may be set at different speeds.

- Notes:**
- Although the CHS Terminal program can be set to speeds up to 19,200 baud, the higher speeds will not work reliably on all systems. The speed at which your system can run depends on the PC's processor type, clock speed, monitor type, video display card, and so on.
 - If you notice missing characters in the display, set both the CHS diagnostics firmware and the CHS Terminal program to a lower baud rate.

Using Command Line Switches

When starting the program, you can append any of the command line switches listed in Table 2-2 to the end of the CHSTERM command. With these switches you can do the following:

- Set the serial port baud rate
- Change the serial port used
- Force monochrome mode

To use command line switches, follow these steps:

1. Switch to the drive and directory where you installed the CHSTERM.EXE file.
2. Enter **chsterm**, followed by a space and any command line switch. (The command line switches are not case sensitive.) For example, to use the **/M** (force monochrome) command line switch, enter the following:

chsterm /m

If you want to enter more than one command line switch, separate the commands with a space or tab. For example:

chsterm /m /2

Table 2-2 Command line switches

Switch	Description	Example
<i>/Bn</i>	Sets the serial port speed to the baud rate specified by <i>n</i> .	chsterm /b9600
<i>/C0 through /C9</i> or <i>/0 through /9</i>	Causes the program to use the specified serial port for communications with the CHS, as follows: 0 or C0 = Serial 4 5 or C5 = Serial 5 1 or C1 = COM1: 6 or C6 = Serial 6 2 or C2 = COM2: 7 or C7 = Serial 7 3 or C3 = COM3: 8 or C8 = Serial 8 4 or C4 = COM4: 9 or C9 = Serial 3	chsterm /C1
<i>/M</i>	Forces monochrome mode. Use this command line switch for monochrome LCD displays that emulate CGA, EGA, or VGA.	chsterm /m

2.6 Using Help

If you want to receive online help that describes CHS Terminal program operations, press **F1** to display the help window. To exit this window, press **F1** again.

Note: If the CHS is sending data to the CHS Terminal program while the Help window is displayed and the receive buffer is nearly full, the help window closes and the terminal screen is redisplayed.

3

Using CHS Terminal

This chapter describes how to use some of the CHS Terminal program's features to perform the following tasks:

- Loading new CHS firmware
- Performing a diagnostic dump
- Capturing the screen

3.1 Loading New Firmware

When you receive a new CHS firmware release, you can use the CHS diagnostics firmware in conjunction with CHS Terminal to transfer the new code to the CHS's flash EPROM. The new release file is contained on a floppy disk.

Note: If you have downloaded the most recent level of flash code from the EXABYTE Technical Support Bulletin Board, the file is packed as a self-extracting file. Before upgrading the new firmware, unpack the self-extracting file by entering the name of the executable file. For example, if the name of the file is V10_2i_6.EXE, type **V10_2i_6**.

This section includes separate instructions for the EXB-10/10i and the EXB-120.

Upgrading EXB-10 or EXB-10i Firmware

To upgrade EXB-10 or EXB-10i firmware, follow these steps:

1. Insert the floppy disk that contains the new firmware into the PC floppy drive.
2. From the Diagnostic Main Menu, press **G** to select GO TO ROM (NEW FIRMWARE).

The ROM Console Main Menu appears.

Note: While you are in ROM, error code 0Fh displays on the LEDs.

3. From the ROM Console Main Menu, press **U** to upgrade the new firmware.

The program asks if you are sure you want to erase and program the flash EPROM.

4. Press **Y** to erase the old CHS firmware or **N** to cancel the upgrade function.

If you press **Y**, the program erases the old firmware and displays the following message: "Prepare Xmodem Transfer."

5. Use the CHS Terminal program to prepare an XMODEM transfer of the firmware to the CHS, by following these steps:
 - a. Press **Alt-S**.
 - b. Enter the filename of the firmware file and press **Enter**. For example: **a:chs10.out**.

The new firmware begins transferring. The CHS Terminal program shows the bytes and blocks transferred, the percentage complete, and the minutes left. When the firmware is transferred, the ROM Console Menu redisplay.

6. Press **F** for TRANSFER TO FLASH EPROM. This action executes the new firmware.

When the firmware has been successfully transferred, the message "Upload Successful," displays under MESSAGES. If any error codes display, you need to perform the upgrade procedure again. If the procedure is still unsuccessful, contact your vendor.

Upgrading EXB-120 Firmware

To upgrade EXB-120 firmware, follow these steps:

1. Insert the floppy disk that contains the new firmware into the PC floppy drive.
2. From the Console Main Menu, press **G** for GO TO ROM/UPGRADE FIRMWARE.
3. Press **Y** to cancel all current operations and to transfer to the ROM Console Main Menu.
4. Press **U** to begin the upgrade.
5. Press **Y** to erase the old firmware on the EXB-120, or **N** to cancel this upgrade function.

If you press **Y**, the program displays "XMODEM Transfer" and erases the old EXB-120 flash EPROM firmware. This process takes less than a minute to complete. When finished, the EXB-120 displays "Program" on the LED, which indicates that the erase process is complete.

6. Use the CHS Terminal program to prepare an XMODEM transfer of the firmware to the CHS by following these steps:

- a. Press **Alt-S**.
- b. Enter the filename of the firmware file and press **Enter**.

The new firmware begins transferring. The CHS Terminal program shows the bytes and blocks transferred, the percentage complete, and the minutes left. (It takes approximately 8 minutes to upgrade to new firmware.)

If the upgrade is successful, the Console Main Menu appears. If the upgrade is unsuccessful, the ROM Console Main Menu appears along with an error message. For further instructions, refer to the *EXB-120 Cartridge Handling Subsystem User's Manual*.

5. Retarget the Cartridge Tape Subsystems (CTSs) using the location calibration blocks. For instructions on targeting the CTSs, refer to *EXB-120 Cartridge Handling Subsystem Installation*.

Important

To use the SCSI interface, DIP switch 2 on the MC card must be off (down).

3.2 Performing a Diagnostic Dump

You can use the CHS's diagnostics firmware in conjunction with the CHS Terminal program to perform a diagnostic dump and to write this information to a file. The dump information allows you to obtain analysis data that specifies the internal state of the CHS.

This section contains separate instructions for the EXB-10/10i and the EXB-120.

Performing a Diagnostic Dump for the EXB-10/10i

To use CHS Terminal to perform a diagnostic dump for the EXB-10 or EXB-10i, follow these steps:

1. From the Functions Menu, press **D** to select DIAGNOSTIC DUMP.

You are prompted to prepare an ASCII transfer from the CHS to your terminal.

2. Press **Alt-L** to turn on the dump function and to prepare an ASCII transfer.

The program prompts you for a filename for the dump. You can use the default, CHSTERM.LOG, or specify another filename.

3. Specify a filename for the data and press **Enter**.
4. Press **Enter** another two times.

The diagnostic data begins to scroll on the screen while it is being written to an ASCII file.

5. Press **Alt-L** to turn off the diagnostic dump function.
6. Press **R** to redraw the screen.

Note: For more information about the diagnostic dump data, refer to *EXB-10/EXB-10i Cartridge Handling Subsystem Maintenance*.

Performing a Diagnostic Dump for the EXB-120

To use CHS Terminal to perform a diagnostic dump for the EXB-120, follow these steps:

1. From the Console Main Menu, press **D**.

The following appears on the EXB-120's LED display:

T-80

The EXB-120 begins a 20-second countdown. When the countdown is complete, the following message appears:

DIAGDUMP

2. Press **Alt-L** to turn on CHS Terminal's diagnostic dump function and to prepare an ASCII transfer.

The program prompts you to use the default, CHSTERM.LOG, or to specify another filename.

3. Specify a filename for the data and press **Enter**.

The diagnostic data begins to scroll on the screen while it is being written to an ASCII file.

When the diagnostic dump is complete, the EXB-120 performs a 10-second countdown. (To turn off the diagnostic dump during this countdown, press **Alt-L**.) The EXB-120 then returns to its normal state and a READY message appears on the operator display.

Note: For more information about the diagnostic dump data, refer to the *EXB-120 Cartridge Handling Subsystem User's Manual* or *EXB-120 Cartridge Handling Subsystem Maintenance*.

3.3 Capturing the Screen

You can use the CHS Terminal program to capture screen images to a file. This can be useful if you want to capture a small portion of information, such as the system statistics for the EXB-10.

To capture screen images, follow these steps:

1. Display the screen that you want to capture.
2. Press **Alt-F** and enter a filename for the screen capture file.

The default filename is CHSTERM.SCR. If you want, you can enter a different name.

3. Press **Alt-G** to capture the currently displayed screen image.

The information on the screen is written to an ASCII text file.

4. If you want, you can use **Alt-G** to capture more screen images. All screen images will be appended to the file you specified with **Alt-F**, until you specify a different filename.

Notes:

4

Error and Status Messages

This appendix provides an alphabetical list of error and status messages that may appear on the CHS Terminal status line. Each error message listed in this appendix contains an explanation of what can cause the message to occur and what you can do to correct the problem.

Bad checksum error — transfer canceled

Explanation: The packets of firmware data the CHS received did not pass the CHS checksum test, which may indicate that the data was corrupted.

Action: Check the serial port connection, power the CHS off and then on again, then retry the transfer. You may also want to use a slower baud rate. If this message appears again, contact your vendor.

CHS failed to acknowledge final EOT

Explanation: The CHS did not complete the attempted firmware load.

Action: Try loading the firmware again. If this message appears again, contact your vendor.

COM1: not found

Explanation: The CHS Terminal program could not find the serial port.

Action: Ensure that you have a serial port properly installed on your PC and configured for your system.

Download canceled by CHS

Explanation: The CHS terminated the firmware load, possibly because the file was too long.

Action: Verify that you are sending the correct firmware file and then try reloading the firmware. If this message appears again, contact your vendor.

**Error writing to file
or
Error closing file**

Explanation: The CHS Terminal program was unable to write to a disk file, most likely because the disk was full, write-protected, or removed.

Action: Make certain that you have enough disk or that you have a floppy disk inserted in the floppy drive. Also make certain that you are not trying to overwrite a DOS read-only file.

Framing error

Explanation: The CHS Terminal program did not properly receive a stop bit. This message may indicate a timing problem on the serial port.

Action: Make certain that the CHS diagnostics firmware and the CHS Terminal program are both set to the same baud rate.

Overrun error

Explanation: The CHS Terminal program did not properly receive all the characters over the serial port. The message often appears when you first enter the CHS Terminal program.

Action: If you just entered the CHS Terminal program, press the up arrow key to clear the message. If the message appears again, exit the program and check the serial port connections. Enter the program again.

Time out error — transfer canceled

Explanation: The CHS did not complete the attempted firmware load.

Action: Check the serial port connection, power the CHS off and then on again, then retry the transfer. You may also want to use a slower baud rate. If this message appears again, contact your vendor.

Unable to open file

Explanation: The CHS Terminal program was unable to open a file, most likely because the drive, directory, or filename was invalid.

Action: Verify that you have correctly specified the filename and that the specified drive and directory are present. Retry the procedure.

Unexpected response from CHS — transfer canceled

Explanation: The characters the CHS sent to the CHS Terminal program were corrupted.

Action: Try using a lower baud rate and reload the firmware. If this message appears again, contact your vendor.

Glossary

ASCII	American Standard Code for Information Interchange.
block	A group of bytes; usually 128 bytes.
byte	Eight bits or one character.
CHS	Cartridge Handling Subsystem. Either the EXB-10, EXB-10i, or EXB-120.
Console	Firmware for the EXB-120 that is contained on the flash EPROM. This firmware can be used to determine possible problems in EXB-120 operations and to gather system statistics about EXB-120 operation.
CTS	Cartridge Tape Subsystem. Either the EXB-8200, EXB-8200SX, EXB-8500, or the EXB-8500c.
Diagnostics	Firmware for the EXB-10 and EXB-10i that is contained on the flash EPROM. This firmware can be used to determine possible problems in EXB-10/10i operations and to gather system statistics about EXB-10/10i operation.
diagnostics firmware	Either Diagnostics for the EXB-10i and EXB-10, or Console for the EXB-120.
dump	The process of copying CHS state information from the CHS to an ASCII file.
EOT	End of tape.
EPROM	Erasable programmable read-only memory.
EXB-10	A robotic Cartridge Handling Subsystem that provides sequential, unattended access to up to 50 gigabytes of data storage capacity.

EXB-10i	A robotic Cartridge Handling Subsystem that provides sequential and random, unattended access to up to 50 gigabytes of data storage capacity.
EXB-120	A robotic Cartridge Handling Subsystem that provides up to 1.0 terabyte of data storage capacity.
ROM	Read-only memory.
XMODEM	A file transfer protocol, which CHS Terminal uses to load new firmware from the PC into the CHS.

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