



**Please Note:** Every effort has been made to ensure the accuracy of the product documentation in this manual. However, because Atari Corporation is constantly improving and updating our computer hardware and software, we are unable to guarantee the accuracy of printed material after the date of publication and disclaim liability for changes, errors, or omissions.

ATARI, ST, ST Terminal Emulator, and TOS are trademarks or registered trademarks of Atari Corporation. GEM is a trademark of Digital Research Inc. VT, VT52, and VT100 are trademarks or registered trademarks of Digital Equipment Corporation.

Reproduction of this document or any portion of its contents is not allowed without the specific written consent of Atari Corporation.



Copyright ©1986 Atari Corporation  
Sunnyvale, CA 94086  
All Rights Reserved.



# ST Terminal Emulator™

## VT® 100 Version

# TABLE OF CONTENTS



<b>INTRODUCTION</b> .....	1
What is the ST Terminal Emulator? .....	1
How to Use this Manual .....	1
<b>CHAPTER 1: GETTING STARTED</b> .....	3
Hardware Requirements .....	3
Loading the Emulator .....	3
If You Have an \AUTO Folder on Drive A .....	4
Terminal Mode vs. Set-Up Mode .....	6
The Status Line .....	7
Online/Local .....	7
LED Indicators (L1 - L4) .....	7
Clock .....	8
Buffer Capture On/Off .....	8
Keyboard and Keystroke Definitions .....	8
Escape .....	9
Set/Clear Tabs .....	9
Clear All Tabs .....	9
Online/Local .....	9
SET-UP A/B/C .....	9
Toggle 1/0 .....	9
Baud Rate .....	9
Reset .....	9
Backspace .....	9
Tab .....	9
Delete .....	10
Control .....	10
Bell .....	10
Linefeed .....	10
Long Break .....	10
Line-at-a-Time Printing .....	10
Return .....	10
Shift .....	11
Restore SET-UP Features .....	11
Save SET-UP Features .....	11
Break .....	11
Print Screen .....	11
Space .....	11
Caps Lock .....	11
Enter SET-UP Mode .....	11

Exit the Emulator .....	12
No Scroll .....	12
Arrow Keys .....	12
Clear Home .....	12
Numeric Keypad .....	12
(Numeric Keypad) PF1–PF4 .....	12
Characters Per Line .....	13
Audible Indicators .....	13
Click .....	13
Bell .....	13
<b>CHAPTER 2: SET-UP MODE .....</b>	<b>15</b>
What is Set-Up Mode? .....	15
Entering Set-Up Mode: SET-UP A .....	15
SET-UP B .....	16
Changing a SET-UP B Feature .....	17
SET-UP B Features .....	17
Jump Scroll/Smooth Scroll .....	17
Auto Repeat .....	17
Screen Background .....	17
Cursor .....	17
Margin Bell .....	18
Keyclick Tone .....	18
VT100/VT52 Mode .....	18
Auto XON/XOFF .....	18
[#] or [ & ] [3] (Shifted) .....	18
Wraparound .....	18
New Line .....	19
Interlace .....	19
Parity Odd/Even .....	19
Parity Sense Enabled/Disabled .....	19
Bits Per Character .....	19
Power .....	19
Control Characters Executed/Visible .....	19
Status Line .....	20
Buffer Capture .....	20
Fast/Slow Scroll .....	20
Baud Rate .....	20
Answerback Message .....	20
Buffer Capture and Release to and from Disk .....	21
Sending a File .....	21
Receiving a File .....	21
SET-UP C .....	22

Saving the Set-Up Features .....	23
Recalling the Set-Up Features .....	23
Resetting the Emulator .....	24
<b>APPENDIX A: TROUBLESHOOTING .....</b>	<b>25</b>
<b>APPENDIX B: PROGRAMMER'S QUICK REFERENCE .....</b>	<b>27</b>
<b>APPENDIX C: INTERFACE SPECIFICATIONS .....</b>	<b>31</b>
<b>APPENDIX D: CHARACTER TABLES .....</b>	<b>33</b>
<b>CUSTOMER SUPPORT .....</b>	<b>37</b>

# INTRODUCTION



## WHAT IS THE ST TERMINAL EMULATOR?

The ST Terminal Emulator program transforms your ATARI ST Computer into a replacement for the standard Digital Equipment Corporation VT100 Terminal. The Emulator program makes the ST Computer's operating system, TOS™, function like (or emulate) the standard VT100 terminal.

The ST Terminal Emulator has most of the features of the standard VT100 terminal plus some special features of its own, for example, an upload/download capability to or from the host computer and a special SET-UP mode that predefines the ST Computer's function keys. The Emulator does not, however, support 132-column mode.

## HOW TO USE THIS MANUAL

Using the ST Terminal Emulator is not difficult. But even the most experienced VT100 or VT52 user should look through this manual. There are simple operating differences between the ST Terminal Emulator and the VT100. Understanding the differences will make the program easier to use and more productive.

The following outline summarizes the contents of the manual:

**Chapter 1, Getting Started**, demonstrates how to load the Emulator program into your computer and defines the Emulator's basic features, controls, and indicators. A summary of keyboard and keystroke definitions is provided as a quick reference.

**Chapter 2, SET-UP Mode**, explains how to enter the Emulator's special SET-UP mode where you can tailor the terminal's features to your host device's requirements and to your own comfort as an operator. Each SET-UP feature is defined and explained. The chapter also explains how to use the Emulator's buffer capture and release feature.

**Appendix A, Troubleshooting**, contains a rundown of problems you may encounter while running the Emulator and offers simple solutions.

**Appendix B, Programmer's Quick Reference**, provides a summary of VT100 programmer codes and commands.

Appendix C, **Interface Specifications**, details the pin assignments of the ST Computer's RS232 port used with the Emulator.

Appendix D, **Character Tables**, lists the decimal and hexadecimal codes for ASCII characters and the Emulator's (VT100) special graphics set.

The last section, **Customer Support**, tells you how to get more information about your ST Terminal Emulator program.

Paragraphs marked **Warning** or **Note** appear throughout the manual. Warnings alert you to potential problems and suggest ways to avoid them. Notes contain useful hints and other information relevant to the topic at hand.

# CHAPTER 1 GETTING STARTED



This chapter demonstrates how to load the ST Terminal Emulator program into the ST Computer and defines the Emulator's basic features, controls, and indicators. A summary of keyboard and keystroke definitions is provided as a quick reference.

## HARDWARE REQUIREMENTS

The ST Terminal Emulator program allows you to send and receive information to and from another computer (the "host" computer). Communication between two computers requires either connection through standard telephone lines or connection directly to the host computer. To connect the ST Computer to the telephone lines, you'll need a modem and an RS232 cable. A modem processes and decodes (modulates and demodulates), telecommunicated information to and from the computer. An RS232 cable joins the computer and modem.

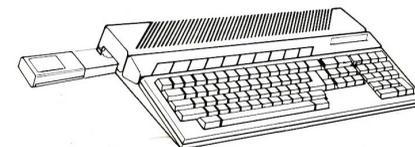
Connect the modem to the computer system by plugging one end of the RS232 cable to the communications port on the modem. Connect the other end of the cable to the port labeled "Modem" on the back panel of the ST Computer.

**Note:** You may also connect an ST Computer directly to the host by cabling the computers together with a null modem cable.

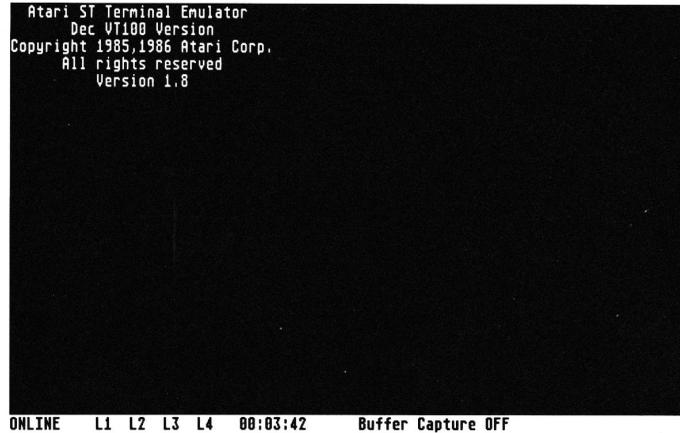
## LOADING THE EMULATOR

The ST Terminal Emulator is an auto-boot cartridge—it loads automatically as soon as you switch on your computer. To install and load the ST Terminal Emulator program, follow these steps:

1. Make certain the computer is switched off. Insert the Emulator cartridge, label side up, into the cartridge slot on the left side of the ST Computer. Switch on the modem, monitor, and disk drive(s).



- Place a formatted disk in Drive A (this speeds up boot time). Now switch on your computer. Almost immediately the ST Terminal Emulator appears on screen. When the Emulator comes up on screen, it is online and in terminal mode, ready for communication with the host computer.



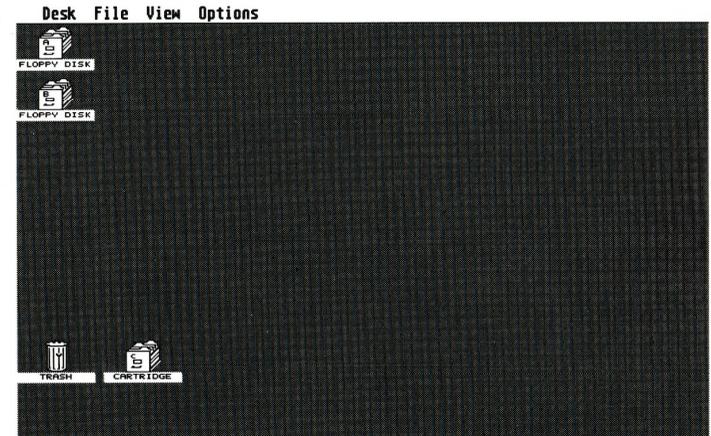
**Warning:** Never insert or remove the Emulator cartridge when the computer's power is on. Always insert the cartridge first, then switch on your computer, and only insert the Emulator cartridge label side up.

### If You Have an \AUTO Folder on Drive A

As you have seen, the Emulator loads automatically as soon as you switch on your computer. The program interrupts your ST Computer's normal initialization procedure and runs the terminal program directly. Because of this, any auto-boot file(s) in \AUTO on Drive A (for instance, a hard disk driver) will not load when you first switch on your computer. You must exit the Emulator, then run the cartridge program from the GEM Desktop.

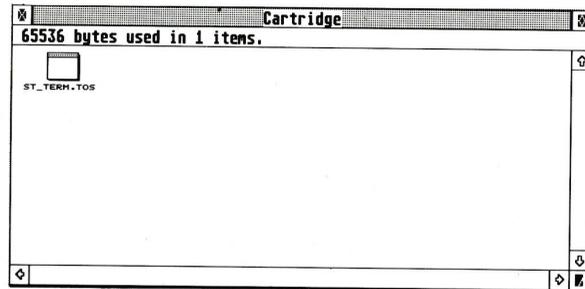
To load any auto file(s) in \AUTO on Drive A, follow these steps:

- Follow Steps 1 and 2 under **Loading The Emulator**.
- Place your disk with the \AUTO folder in Drive A. Press **[Undo]** to exit the Emulator. Drive A whirs as the computer completes normal initialization and loads your auto file(s).
- Soon the GEM Desktop comes up on screen. The Emulator cartridge appears on screen as its own icon, Cartridge c.



**Note:** When you save the GEM Desktop configuration, a DESKTOP.INF file is created. If you've previously saved the GEM Desktop configuration without Cartridge c present and are using that DESKTOP.INF when you switch on the computer, the Cartridge c icon will not appear on screen. You must then install Cartridge c by selecting Install Disk Drive from the Options Menu. You may then select Save Desktop from the Options Menu to save the new desktop configuration. Also, if you have a hard disk drive connected to the system, be certain not to confuse the Cartridge icon c (lowercase "c"), with the hard disk icon, Drive C (uppercase "C").

4. Open Cartridge c by either double-clicking on the cartridge icon, or by using the Open option under the File Menu:



5. Run the file ST\_TERM.TOS from the open window by either double-clicking on ST\_TERM.TOS icon, or by using the Open option under the File Menu. In a moment, the ST Terminal Emulator appears on screen.

When the Emulator appears on screen, it is online and in terminal mode, ready for communication with the host computer.

### TERMINAL MODE VS. SET-UP MODE

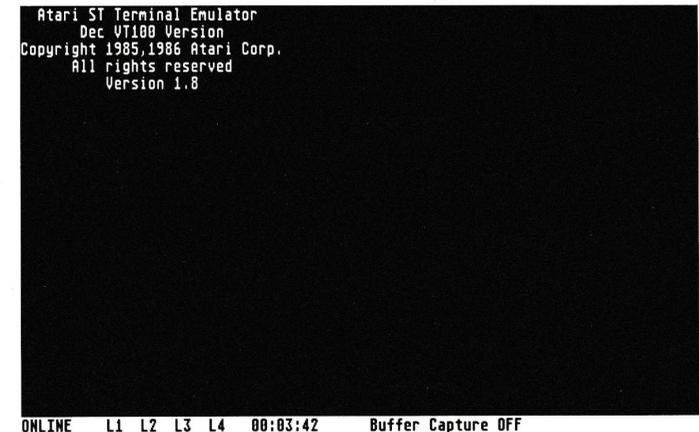
The Emulator operates in either of two general modes: terminal mode and SET-UP mode. In terminal mode, the Emulator is ready for communication with a host computer. The Emulator performs a two-part function in terminal mode: the characters you enter from the ST Computer keyboard are sent to the host, and the information received from the host is displayed on the terminal's screen. Much like having a conventional telephone conversation with someone, the communication between the ST Computer and the host computer is a two-way exchange.

**Note:** The Emulator operates on full-duplex communications lines to the host. This means that all characters typed from the ST Computer keyboard are first transmitted to the host, then "echoed" back to the Emulator for display on screen.

The SET-UP mode is less frequently used than terminal mode. It allows you to design the terminal for operation compatible with the host computer. Once these features are set in accordance with the host's operating requirements, there should be only infrequent need to re-enter SET-UP mode during a given work session. (Refer to **Chapter 2** for more information on SET-UP mode.)

### THE STATUS LINE

The Emulator's Status Line appears on the 25th line of the terminal screen display. The Status Line tells you whether the terminal is online or in local mode, shows the time of day, and displays the standard VT100 LED indicators, as well as the current status of the Emulator's buffer capture and release feature.



### Online/Local

When online, the Emulator is ready to transmit and receive messages to and from the host device. When in local mode, the Emulator cannot communicate with the host. However, the keyboard remains active, and all characters typed are displayed on screen.

### LED Indicators (L1-L4)

The LED Indicators are typically switched on and off by the host. Consult your local operating procedures for the meaning of each indicator.

## Clock

The Emulator's clock display shows the time of day as maintained by the ST Computer's real-time clock. The clock is updated every two seconds. You must set the clock using the GEM Desktop's Control Panel.

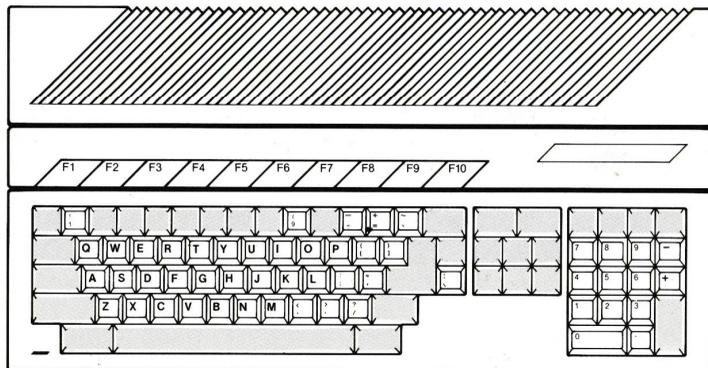
## Buffer Capture On/Off

The Buffer Capture display informs you of the current status of the Emulator's buffer capture and release feature. (Refer to **Buffer Capture and Release to and from Disk** in **Chapter 2**.)

## KEYBOARD AND KEYSTROKE DEFINITIONS

The ATARI ST Computer keyboard is different in many ways from the standard VT100 keyboard. These differences, however, pose no obstacle to full VT100 emulation. Available keys on the ST keyboard are simply assigned standard VT100 functions.

The illustration below shows which keys on the ST Computer keyboard are used in the Emulator program.



**Note:** Except where specifically noted, the numeric keypad keys will not normally initiate an Emulator function or feature. For example, if an instruction states that you should press the [6] key, the proper key to press is , and not the [6] key on the numeric keypad.

## **Escape**

The [Esc] key transmits an escape (ESC) code to the host system.

## **Set/Clear Tab**

The [2] key, in SET-UP A, sets or clears individual horizontal tab stops.

## **Clear All Tabs**

The [3] key, in SET-UP A, clears all current horizontal tab stops.

## **Online/Local**

The [4] key, in SET-UP A, switches the Emulator between its online and local modes.

## **SET-UP A/B/C**

The [5] key, in SET-UP mode, switches the Emulator from SET-UP A to SET-UP B to SET-UP C and vice versa. (Refer to **Chapter 2** for more information.)

## **Toggle 1/0**

The [6] key, in SET-UP B, switches between two (usually opposite) terminal features.

## **or** **Baud Rate**

Either the [7] or [8] key, in SET-UP B, steps the Emulator through available baud rates. There is no split baud rate ability in the Emulator, thus either key toggles both rates.

## **Reset**

The [0] key, in SET-UP mode, resets the Emulator. The screen clears and the SET-UP features entered are those set when you first loaded the Emulator.

## **Backspace**

The [Backspace] key transmits a backspace (BS) code.

## **Tab**

The [Tab] key transmits a tab (HT) code. For information on how to set and clear tab stops, refer to **Entering SET-UP Mode: SET-UP A** in **Chapter 2**.



## Delete

The **[Delete]** key transmits the delete (DEL) character to the host system. The deleted character may or may not be erased from the screen.



## Control

The **[Control]** key, when pressed in combination with another key, transmits a code that has special meaning to the system (the "control code").



## Bell

The **[Control] [G]** keystroke combination transmits a bell (BEL) code to the host.



## Linefeed

The **[Control] [Return]** keystroke combination, if recognized by the host, transmits a linefeed (LF) code to the host.



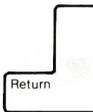
## Long Break

The **[Control] [Insert]** keystroke combination transmits a long break signal of 3.5 seconds, disabling the Data Terminal Ready line of the RS232 port for that period.



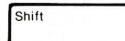
## Line-at-a-Time Printing

The **[Control] [Enter]** keystroke combination provides line-at-a-time printing, sending the lines to the printer. To exit line-at-a-time printing, press **[Control] [Enter]** again.



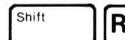
## Return

The **[Return]** key transmits either a carriage return (CR) code, or a carriage return (CR) and linefeed (LF) code, depending on how you've chosen to configure the terminal. (Refer to **SET-UP B** in **Chapter 2**.)



## Shift

The **[Shift]** key, like the **[Shift]** key on a typewriter, allows you to type uppercase and other shifted characters. Where a key has no shifted character, the **[Shift]** key is ignored.

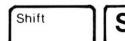


or

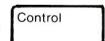


## Restore SET-UP Features

The **[Shift] [R]** or **[Control] [R]** keystroke combinations, in SET-UP mode, restore the current SET-UP features from the file ST\_TERM.OPT. The program looks first to Drive C (hard disk) if one is present in the system. If not, the ST\_TERM.OPT will be read from Drive A. (Refer to **Chapter 2** for more information.)

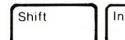


or



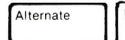
## Save SET-UP Features

The **[Shift] [S]** or **[Control] [S]** keystroke combinations, in SET-UP mode, save the current SET-UP features to the file ST\_TERM.OPT. This file is automatically saved to Drive C (hard disk) if one is present in the system. If not, the file is saved to Drive A. (Refer to **Chapter 2** for more information.)



## Break

The **[Shift] [Insert]** keystroke combination transmits a break signal of approximately 0.2333 second.



## Print Screen

The **[Alternate] [Help]** keystroke combination dumps the current screen to a graphics printer. To halt printing, press **[Alternate] [Help]** again.



## Space

The **[Space Bar]** key transmits a space (SP) code to the host.



## Caps Lock

Press the **[Caps Lock]** key, and the alphabetic characters you type are transmitted as uppercase characters. Press it again, and you switch off the Caps Lock feature.



## Enter SET-UP Mode

The **[Help]** key enters or exits SET-UP mode. It replaces the **[Setup]** key on the VT100 keyboard. (Refer to **Chapter 2** for more information on SET-UP mode.)



### Exit the Emulator

The [Undo] key exits the Emulator and returns control to the GEM Desktop, regardless of what mode the Emulator is currently in. Pressing the [Undo] key does not, however, log you off the host computer.



### No Scroll

The [Insert] key, when pressed, halts transmission of characters to the screen. This function does not send a XON/XOFF control sequence. To resume transmission press the [Insert] key again.



### Arrow Keys

Each of the [Arrow] keys transmits a code that has special meaning to the system. Consult your local operating procedures for their meanings.



### Clear Home

The [Clr Home] key, when unshifted, places the cursor at the upper left-hand corner of the screen. When shifted, it clears the screen as well. Neither action transmits a character to the host computer.

## Numeric Keypad

The numeric keypad is arranged in standard calculator fashion for convenience and speed in number-oriented work. The [Enter] key corresponds to the [Return] key on the main keyboard. The numeric keypad keys may also be interpreted by the host device as special function keys. Consult your local operating procedures for their meanings. If you happen to have a standard VT100 rubber overlay for the keypad, it will fit over the ST Computer's numeric keypad.



### (Numeric Keypad) PF1-PF4

The [, ], [/], and [\*] keys correspond to the PF1-PF4 keys on the standard VT100 terminal keyboard. Each of these keys transmits a code that has special meaning to the system. Consult your local operating procedures for the meaning of each key.

## CHARACTERS PER LINE

The Emulator displays 80 characters per line. In medium- and high-resolution modes, the screen is always 80 characters by 24 lines high. There is no 132-column mode in the Emulator. Also, remember that the use of double-width characters reduces the number of characters per line by one half.

## AUDIBLE INDICATORS

There are two audible indicators featured in the Emulator: a short click and a bell tone.

### Click

The short click sounds whenever you press a key (except the [Shift], [Control], or [Alternate] keys), unless you've switched off the keyclick feature from SET-UP B.

### Bell

The bell tone sounds whenever a bell code is received from the host. The tone also sounds when the cursor is eight characters away from the right margin. You may switch off the margin bell feature from SET-UP B.

## CHAPTER 2 SET-UP MODE



This chapter demonstrates how to enter the Emulator's SET-UP mode and then explains each SET-UP feature. The chapter also explains how to use the Emulator's buffer capture and release feature.

### WHAT IS SET-UP MODE?

SET-UP mode allows you to set the Emulator's built-in features according to your host device's requirements and to your own comfort as a terminal operator. SET-UP mode is divided into three parts: SET-UP A, SET-UP B, and SET-UP C. Each division has range over a specific feature or set of features. SET-UP A displays, and allows you to alter, the horizontal tab stops as set in the terminal. SET-UP B presents a range of terminal controls and options, concerning host-compatibility. And SET-UP C, an extra SET-UP mode that is not found in the standard VT100 terminal, allows you to define the ST Computer's function keys.

### ENTERING SET-UP MODE: SET-UP A

To enter SET-UP mode, press the [Help] key. The screen displays the following:

```
SET-UP A
TO EXIT PRESS 'HELP'

1234567890123456789012345678901234567890123456789012345678901234567890
ONLINE L1 L2 L3 L4 00:06:32 Buffer Capture OFF
```

At the bottom of the SET-UP A screen, you see a numbered ruler line. The numerals in the ruler line mark character spaces. The location of each tab stop is marked by the letter "T" above the ruler. These are the tab stops the terminal will use when communicating with the host computer.

To change the tab stops, follow these steps:

1. Place the cursor at the position you wish to add or delete a tab stop, and press [2]. Use the [Tab], [Space Bar], [Backspace], [Left Arrow], or [Right Arrow] keys to position the cursor. To clear all tab stops, press [3].
2. Once the stops are set, exit SET-UP mode by pressing [Help] again. Or press [5] to move on to SET-UP B.

**Note:** In SET-UP A, press [4] to switch the terminal from online to local mode, and vice versa.

## SET-UP B

SET-UP B can only be entered from SET-UP A. To enter SET-UP B, press [5] while in SET-UP A. The screen displays the following:

```
SET-UP B
TO EXIT PRESS 'HELP'

1 0101 2 0111 3 0000 4 0011 5 0101  BAUD RATE = 9600
ONLINE L1 L2 L3 L4 00:07:38 Buffer Capture OFF
```

SET-UP B consists of five groups of switches that allow you to toggle between the features assigned to each switch. Each switch has two possible states, represented numerically by a 1 or 0.

**Note:** In the standard VT100 terminal, SET-UP B's fifth group of toggles is left for local customization. In the Emulator, however, each switch in the fifth group has been assigned a feature.

## Changing a SET-UP B Feature

With the exception of Baud Rate, the SET-UP B options can be changed as follows:

1. Position the cursor over the switch you wish to change. Use the [Tab], [Space Bar], [Backspace], [Left Arrow], or [Right Arrow] keys to position the cursor. As you scroll horizontally over the switches, the relevant features are named.
2. Press [6] to change a given feature.

## SET-UP B Features

All of SET-UP B's features are listed and defined in this section. Features are listed as they appear on the screen. The Baud Rate feature, not handled by a switch, appears last.

### Jump Scroll/Smooth Scroll

The Jump Scroll/Smooth Scroll feature allows you to choose between scrolling methods. Scrolling is the upward (or downward) movement of displayed lines to make room for new lines at the bottom (or top) of the screen. In Jump Scroll mode, new lines appear just as fast as the remote device can send them. At high baud rates, the text received is almost unreadable. In Smooth Scroll mode, the Emulator slowly scrolls the screen, allowing characters to be read as they appear.

**Note:** Smooth Scroll mode adds six new lines per second to the screen.

### Auto Repeat

The Auto Repeat feature sets the repeat rate of 30 characters per second for any key held down. The No Repeat option switches off this feature.

### Screen Background

The Screen Background feature allows you to choose between two types of screen display: light characters on a dark background or dark characters on a light background.

### Cursor

The Cursor is always displayed as a blinking block.

### **Margin Bell**

The Margin Bell feature works like the margin bell on a conventional typewriter. If enabled, the margin bell sounds when the cursor is eight characters from the end of the current line.

### **Keyclick Tone**

The Keyclick Tone feature allows you to set the keyclick tone. Each time you strike a key, except **[Shift]**, **[Control]**, or **[Alternate]**, your monitor's speaker sounds a short click (provided the monitor's volume control is at an audible level). Many terminal operators find this audio feedback helpful, but you may wish to switch the feature off.

### **VT100/VT52 Mode**

Standard VT100 mode follows the ANSI (American National Standards Institute) conventions for the syntax and semantics of escape sequences. VT52 mode follows DEC (Digital Equipment Corporation) conventions for the syntax and semantics of escape sequences, and is compatible with all previous DEC software. Check your local operating procedures to see which terminal mode is best.

### **Auto XON/XOFF**

The Auto XON/XOFF feature, when enabled, transmits the XOFF code when the internal buffer is nearly full.

When the buffer empties, the Emulator automatically sends an XON to the host, then transmission resumes from the host to the Emulator.

**Note:** To stop transmission, press **[Insert]**.

### **[#] or [£] [3] (Shifted)**

The difference between the U.S. and British character sets is the # and £. When you select the standard U.S. character set, pressing the **[3]** key (shifted) displays the American pound (#) symbol. When you select the U.K. character set, the English Pound (£) symbol is displayed.

### **Wraparound**

The Wraparound feature, when enabled, places the 81st character as the first character of the next line. If disabled, the 81st character and all subsequent characters are overwritten as the last character of the current line.

### **New Line**

The New Line feature, when enabled, transmits a carriage return (CR) and line feed (LF) when you press the **[Return]** key. When a carriage return code is received from the host, it is interpreted as a carriage return and line feed. If disabled, the **[Return]** key transmits a CR code only, and an LF code is interpreted as a line feed only.

### **Interlace**

The Emulator always operates in non-interlaced mode.

### **Parity Odd/Even**

The Parity feature allows you to set the parity type. Parity is a method that computers use to determine whether information has been accurately transmitted. The parity bit is a binary digit added to a group of bits to make the total of all bits odd or even. Depending on your host device, you can choose either odd or even (or none). The parity setting must match your host device's parity sense. If not, the information that passes between the Emulator and host device will be garbled. If a parity incompatibility occurs, the Emulator displays a checkerboard (☐) character in place of the received character.

**Note:** The Parity Sense feature must be enabled, see below, to implement the parity selection (odd or even).

### **Parity Sense Enabled/Disabled**

The Parity Sense feature enables or disables the Parity feature, according to the parity (odd or even) set previously. When disabled, the terminal doesn't use any parity sense.

### **Bits Per Character**

The Bits Per Character feature allows you to choose between the transmission of either 7-bit or 8-bit characters. When set for 8-bit operation (default), the eighth bit is set to a space (or 0) for transmitted characters and is ignored for all characters received. Consult your local operating procedures to determine which you should use.

### **Power**

Power switching is not necessary with the Emulator program.

### **Control Characters Executed/Visible**

The Control Character feature allows you to see on screen the control characters transmitted. Control characters are made visible by showing the control character as the ASCII code plus \$40, then displaying that character in inverse video.

### Status Line

The Status Line feature enables or disables the display of the Status Line.

### Buffer Capture

The Buffer Capture feature enables or disables the Emulator's simple buffer capture/release to or from disk. For more information, see **Buffer Capture and Release to and from Disk** later in this chapter.

### Fast/Slow Scroll

This Scroll Rate feature controls the smooth scroll rate; either fast or slow.

### Baud Rate

The Baud Rate feature allows you to set the baud rate. To set the baud rate, press either the [7] or [8] keys. Both of these keys step the Emulator through available baud rates, as displayed at the bottom of the screen in SET-UP B. There is no split baud rate ability in the Emulator. Available baud rates run from 50 to 19,200. The baud rate you choose must match the host computer's current setting.

### Answerback Message

The Answerback Message feature allows the Emulator to identify itself by sending a message to the host. The answerback sequence actually takes place automatically, without affecting the screen or requiring your intervention. (For more information, see **Appendix B**.)

To set your answerback message, follow these steps:

1. Place the Emulator in SET-UP B.
2. Press [Shift] [A]. The screen will prompt you with A = .
3. Enter your answerback message. It must be of the following form:

<DELIMITER>(64 characters or less)<DELIMITER>

where the delimiter is any character not contained in the answerback message itself. The answerback message may be no more than 64 characters. Control characters, should you use them in the message, are displayed by adding \$40 to their ASCII values, then displaying them in inverse video. Note that there can be no spaces or other separators between the message and its delimiters.

4. Type the delimiter character again. Once the last occurrence of the delimiter character is typed, the message will disappear from the screen.

Once you complete the above steps, the answerback message is temporarily stored in memory. The answerback message can be saved, along with all other options, using the Emulator's save operation. See **Saving the SET-UP Features** later in this chapter.

### Buffer Capture and Release to and from Disk

A simple buffer transfer facility is built into the Emulator. This facility will transmit ASCII files either to or from the host computer. When using the transfer facility, it is recommended that you enable Auto XON/XOFF feature in SET-UP B.

### Sending a File

To send a file from your disk drive (i.e., upload the file) to the host computer, follow these steps:

1. Press [Help] to enter SET-UP mode. Press [5] to enter SET-UP B. Activate the buffer capture feature.
2. Press [Help] again to exit SET-UP mode. The Emulator must be in terminal mode to transmit a file. Now press [Alternate] [S].
3. The Emulator prompts you for a filename. Type in the filename (64 characters or less), then press [Return].

**Note:** If the file doesn't exist (you may have mistyped the name), the Emulator will inform you that the file isn't there. You must include the proper pathname if the file resides outside of your current logged-in directory on the ST Computer.

4. The Emulator now accesses the disk drive and transmits the file, character by character, to the host device.

**Warning:** The host device must be in an appropriate mode for reception of a file.

### Receiving a File

To receive a file from the host (i.e., download a file) to your disk drive, follow these steps:

1. Press [Help] to enter SET-UP mode. Press [5] to enter SET-UP B. Activate the buffer capture feature.
2. Press [Help] again to exit SET-UP mode. The Emulator must be in terminal mode to receive a file. Now press [Alternate] [R].

3. The Emulator prompts you for a filename. Type in the filename (64 characters or less), then press **[Return]**.

**Note:** If the file is to be stored outside your current logged-in directory on the ST Computer, be sure to include the proper pathname.

4. Type the file to the terminal screen. The Emulator captures the file and writes it to your disk drive.
5. When the transfer is complete, press **[Alternate] [R]** to close the file and switch off the transfer facility.

**Warning:** This buffer transfer facility is intended for ASCII text files only. It is recommended that you do not attempt to transmit binary files between the Emulator and the host computer using this facility. The Emulator does not filter out any incoming or outgoing special characters during buffer capture or release.

## SET-UP C

SET-UP C allows you to define and assign a character string to each function key, unshifted and shifted, for a total of 20 possible assignments. These assignments may be no more than 64 characters in length. The shifted version of the function key maps to function keys 11 through 20.

```
SET-UP C
TO EXIT PRESS 'HELP'
FUNCTION KEY DEFINITIONS
F1:
F2:
F3:
F4:
F5:
F6:
F7:
F8:
F9:
F10:
F11:
F12:
F13:
F14:
F15:
F16:
F17:
F18:
F19:
F20:
ONLINE L1 L2 L3 L4 00:08:28 Buffer Capture OFF
```

Function Key Definition Lines (1-20)

Use the **[Up Arrow]** and **[Down Arrow]** keys to move the cursor up and down the 20 function key definition lines. Defining or modifying their settings follows the form as specified for setting the answerback message. See the section on the **Answerback Message** earlier in this chapter.

**Note:** The function key definitions are saved to disk whenever you save the SET-UP features.

## SAVING THE SET-UP FEATURES

As soon as you exit SET-UP mode, the terminal will perform according to the current SET-UP features (both those you've just modified and those you left alone). Once the Emulator is reset or you perform a recall operation (see **Recalling the SET-UP Options**), those SET-UP features you've saved to disk replace those SET-UP features you've temporarily stored in memory.

To save the current SET-UP features to disk, follow these steps:

1. Place the Emulator in SET-UP mode.
2. Press **[Control] [S]** or **[Shift] [S]**. The terminal saves the SET-UP features as currently set to the file ST\_\_TERM.OPT on disk.

Now whenever you load or reset the Emulator, the options as saved in ST\_\_TERM.OPT will be set automatically.

**Note:** If a hard disk is present and active in your system, the ST\_\_TERM.OPT file will be written to the hard disk drive (Drive C); otherwise it will be written to Drive A.

## RECALLING THE SET-UP FEATURES

You may have occasion to modify SET-UP features but not wish to store them on disk. To return to the ST\_\_TERM.OPT file's settings, follow these two steps:

1. Place the Emulator in SET-UP mode.
2. Press **[Control] [R]** or **[Shift] [R]**. The terminal accesses the disk drive and restores the SET-UP features as saved to the ST\_\_TERM.OPT file.

**Warning:** When you perform a recall operation, anything on screen in terminal mode will be lost.

**Note:** If a hard disk is present and active in your system, the program will first look for the ST\_\_TERM.OPT file on the hard disk drive (Drive C); otherwise it will be read from Drive A.

## RESETTING THE EMULATOR

The Emulator may be reset from the keyboard. Resetting the terminal clears its memory and the screen, just as if you were starting from scratch and had just loaded the Emulator. To reset the Emulator, follow these steps:

1. Place the Emulator in SET-UP mode.
2. Press the [0] (zero) key. The terminal is immediately reset, and the SET-UP features as set when the Emulator was first loaded are restored.

## APPENDIX A TROUBLESHOOTING



If you run into problems while operating the ST Terminal Emulator, the difficulty is probably a minor hitch that you can take care of yourself. This Appendix describes some problems and suggests simple solutions.

### IT JUST WON'T WORK

The most common problem is that sometimes the computer just won't respond. Usually the remedy is a very simple matter.

If your computer won't respond (for instance, the screen stays dark), take the following steps:

1. Switch off all parts of your ST Computer System. Make sure all the connections are correct and secure. Check to see that the power cables are connected properly, and that the video cable is plugged in firmly to both the computer and monitor (or television).
2. Switch all components on. Be certain that the computer's front panel power light, the drive's busy light, and the monitor's power light all come on.
3. Check to be sure that the brightness and contrast adjustments on your monitor or television are turned up. If you are using a television, be certain you've moved the sliding switch on the television switch box to the position marked "COMPUTER." If the display is still not proper, your computer, monitor, or television may need service.

### NO KEYBOARD RESPONSE

If your keyboard is responding erratically (you type the characters, but they don't appear on screen), try the following remedies:

1. The connection between the Emulator and host has somehow been broken. Check the connection.
2. Press the [Insert] key.
3. Go to SET-UP mode and press [0] to reset the Emulator. If this fails, reboot your system.
4. You have transmitted a [Control] [S] (XOFF). Press [Control] [Q] (XON) to resume transmission.

## TRANSMISSION/RECEPTION PROBLEMS

If the screen displays garbled characters or the checkerboard character ( ☒ ), one or more of your SET-UP features is incompatible with the host computer's requirements. Check your local operating procedures for the correct settings. Some likely candidates for correction are the following settings: VT100/VT52 mode, Auto XON/XOFF, Bits per Character, Parity, Parity Sense, and Baud Rate.

## APPENDIX B PROGRAMMER'S QUICK REFERENCE

□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

### ANSI COMPATIBLE MODE

#### Cursor Movement Commands

Cursor up	Esc [ Pn A
Cursor down	Esc [ Pn B
Cursor forward (right)	Esc [ Pn C
Cursor backward (left)	Esc [ Pn D
Direct cursor addressing	Esc [ Pl ; Pc H
Direct cursor addressing	Esc [ Pl ; Pc f
Index	Esc D
Next line	Esc E
Reverse index	Esc M
Save cursor and attributes	Esc 7
Restore cursor and attributes	Esc B

#### Line Size Commands

##### (Double-Height and Double-Width)

Change line to double-height top half	Esc # 3
Change line to double-height bottom half	Esc # 4
Change line to single-width single-height	Esc # 5
Change line to double-width single-height	Esc # 6

#### Character Attributes

Esc [ Ps; Ps; Ps ..., Ps m

Ps = 0 or None	All attributes off
1	Bold on
4	Underscore on
5	Blink on
7	Reverse video on

#### Erasing

From cursor to end of line	Esc [ K
From cursor to end of line	Esc [ 0 K
From beginning of line to cursor	Esc [ 1 K
Entire line containing cursor	Esc [ 2 K
From cursor to end of screen	Esc [ J
From cursor to end of screen	Esc [ 0 J
From beginning of screen to cursor	Esc [ 1 J
Entire screen	Esc [ 2 J

## PROGRAMMABLE LEDs

Esc [ Ps ; Ps ; ... , Ps q

Ps = 0 or None	All LEDs off
1	L1 on
2	L2 on
3	L3 on
4	L4 on

## Character Sets (G0 and G1 Designators)

Character Set	G0	G1
United Kingdom (UK)	Esc ( A	Esc ) A
United States (USASCII)	Esc ( B	Esc ) B
Special graphics characters and line drawing set	Esc ( 0	Esc ) 0

## Scrolling Region

Esc [ Pt ; Pb r

## Tab Stops

Set tab at current column	Esc H
Clear tab at current column	Esc [ g
Clear tab at current column	Esc [ 0 g
Clear all tabs	Esc [ 3 g

## Set Modes

Mode Name	Mode	Sequence
Line feed/new line	New line	Esc [ 20 h
Cursor key mode	Application	Esc [ ? 1 h
ANSI/VT52 mode	ANSI	
Scrolling mode	Smooth	Esc [ ? 4 h
Screen mode	Reverse	Esc [ ? 5 h
Origin mode	Relative	Esc [ ? 6 h
Wraparound	On	Esc [ ? 7 h
Auto repeat	On	Esc [ ? 8 h
Keypad mode	Application	Esc = 1

## Reset Mode

Mode Name	Mode	Sequence
Line feed/new line	Line feed	Esc [ 20 / *
Cursor key mode	Cursor	Esc [ ? 1 / *
ANSI/VT52 mode	VT52	Esc [ ? 2 / *
Scrolling mode	Jump	Esc [ ? 4 / *
Screen mode	Normal	Esc [ ? 5 / *

Origin mode	Absolute	Esc [ ? 6 / *
Wraparound	Off	Esc [ ? 7 / *
Auto repeat	Off	Esc [ ? 8 / *
Keypad mode	Numeric	Esc

\*The last character of the sequence is a lower case L (154g).

## Reports

### Cursor Position

Invoked by	Esc [ 6 n
Response is	Esc [ Pl ; Pc R

### Status Report

Invoked by	Esc [ 5 n
Response is	Esc [ 0 n (terminal ok) Esc [ 3 n (terminal not ok)

### What Are You

Invoked by	Esc [ c
Invoked by	Esc [ 0 c
Response is	Esc [ ? 1 ; Ps c
PS = 0	Base VT100, no options

### Reset

Esc c

## VT52 COMPATIBLE MODE

Cursor up	Esc A
Cursor down	Esc B
Cursor right	Esc C
Cursor left	Esc D
Select special graphics character set	Esc F
Select ASCII character set	Esc G
Cursor to home	Esc H
Reverse line feed	Esc I
Erase to end of screen	Esc J
Erase to end of line	Esc K
Direct cursor address	Esc Pl Pc (see note 1)
Identify	Esc Z (see note 2)
Enter alternate keypad mode	Esc 5
Exit alternate keypad mode	Esc
Enter ANSI mode	Esc

**Note 1:** Line and column numbers for direct cursor address are single character codes whose values are the desired number plus 37<sub>8</sub>.

**Note 2:** Response to Esc Z is Esc Z / Z.

### Auxiliary Keypad Codes

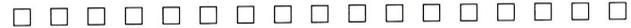
Key	VT52 Numeric Mode	VT52 Application Mode	ANSI Numeric Mode	ANSI Application Mode
0	0	Esc ? p	0	Esc O p
1	1	Esc ? q	1	Esc O q
2	2	Esc ? r	2	Esc O r
3	3	Esc ? s	3	Esc O s
4	4	Esc ? t	4	Esc O t
5	5	Esc ? u	5	Esc O u
6	6	Esc ? v	6	Esc O v
7	7	Esc ? w	7	Esc O w
8	8	Esc ? x	8	Esc O x
9	9	Esc ? y	9	Esc O y
-	-	Esc ? m	-	Esc O m
,	,	Esc ? / *	,	Esc O / *
.	.	Esc ? n	.	Esc O n
Enter	Same as Return	Esc ? M	Same as Return	Esc O M
PF1	Esc P	Esc P	Esc O P	Esc O P
PF2	Esc Q	Esc Q	Esc O Q	Esc O Q
PF3	Esc R	Esc R	Esc O R	Esc O R
PF4	Esc S	Esc S	Esc O S	Esc O S

\*The last character of the sequence is a lowercase L (154g).

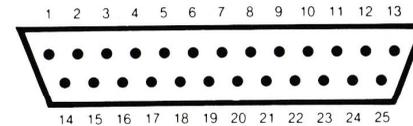
### Cursor Control Key Codes

Cursor Key (arrow)	VT52 Mode	ANSI/Cursor Key Mode Reset	ANSI/Cursor Key Mode Set
Up	Esc A	Esc [ A	Esc O A
Down	Esc B	Esc [ B	Esc O B
Right	Esc C	Esc [ C	Esc O C
Left	Esc D	Esc [ D	Esc O D

## APPENDIX C INTERFACE SPECIFICATIONS



Pin Number	Description
1	Protective ground
2	Transmitted data
3	Received data
4	Request to send
5	Clear to send
6	Data set ready
7	Signal ground
8	Carrier detect
9-19	(not used)
20	Data terminal ready
21	(not used)
22	Ring indicator
23-25	(not used)



# APPENDIX D CHARACTER TABLES



## ASCII CHARACTER TABLE

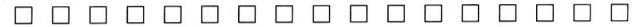
Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII
0	00	NUL	31	1F	US	62	3E	>
1	01	SOH	32	20	SP	63	3F	?
2	02	STX	33	21	!	64	40	@
3	03	ETX	34	22	"	65	41	A
4	04	EOT	35	23	#	66	42	B
5	05	ENQ	36	24	\$	67	43	C
6	06	ACK	37	25	%	68	44	D
7	07	BEL	38	26	&	69	45	E
8	08	BS	39	27	'	70	46	F
9	09	HT	40	28	(	71	47	G
10	0A	LF	41	29	)	72	48	H
11	0B	VT	42	2A	*	73	49	I
12	0C	FF	43	2B	+	74	4A	J
13	0D	CR	44	2C	,	75	4B	K
14	0E	SO	45	2D	-	76	4C	L
15	0F	SI	46	2E	.	77	4D	M
16	10	DLE	47	2F	/	78	4E	N
17	11	DC1	48	30	0	79	4F	O
18	12	DC2	49	31	1	80	50	P
19	13	DC3	50	32	2	81	51	Q
20	14	DC4	51	33	3	82	52	R
21	15	NAK	52	34	4	83	53	S
22	16	SYN	53	35	5	84	54	T
23	17	ETB	54	36	6	85	55	U
24	18	CAN	55	37	7	86	56	V
25	19	EM	56	38	8	87	57	W
26	1A	SUB	57	39	9	88	58	X
27	1B	ESC	58	3A	:	89	59	Y
28	1C	FS	59	3B	;	90	5A	Z
29	1D	GS	60	3C	<	91	5B	[
30	1E	RS	61	3D	=	92	5C	]

Dec	Hex	ASCII	Dec	Hex	ASCII
93	5D	]	111	6F	o
94	5E	^	112	70	p
95	5F	·	113	71	q
96	60	—	114	72	r
97	61	a	115	73	s
98	62	b	116	74	t
99	63	c	117	75	u
100	64	d	118	76	v
101	65	e	119	77	w
102	66	f	120	78	x
103	67	g	121	79	y
104	68	h	122	7A	z
105	69	i	123	7B	{
106	6A	j	124	7C	
107	6B	k	125	7D	}
108	6C	l	126	7E	~
109	6D	m	127	7F	DEL
110	6E	n			

### SPECIAL GRAPHICS SET

Dec	Hex	Character	Dec	Hex	Character	Dec	Hex	Character
0	00	NUL	44	2C	,	88	58	X
1	01		45	2D	-	89	59	Y
2	02		46	2E	.	90	5A	Z
3	03		47	2F	/	91	5B	[
4	04		48	30	0	92	5C	\
5	05		49	31	1	93	5D	]
6	06		50	32	2	94	5E	^
7	07	BEL	51	33	3	95	5F	♦
8	08	BS	52	34	4	96	60	⋮
9	09	HT	53	35	5	97	61	⋮
10	0A	LF	54	36	6	98	62	⋮
11	0B	VT	55	37	7	99	63	⋮
12	0C	FF	56	38	8	100	64	⋮
13	0D	CR	57	39	9	101	65	⋮
14	0E	SO	58	3A	:	102	66	⋮
15	0F	SI	59	3B	:	103	67	⋮
16	10		60	3C	<	104	68	⋮
17	11	DC1	61	3D	=	105	69	⋮
18	12		62	3E	>	106	6A	⋮
19	13	DC3	63	3F	?	107	6B	⋮
20	14		64	40	@	108	6C	⋮
21	15		65	41	A	109	6D	⋮
22	16		66	42	B	110	6E	⋮
23	17		67	43	C	111	6F	⋮
24	18	CAN	68	44	D	112	70	⋮
25	19		69	45	E	113	71	⋮
26	1A	SUB	70	46	F	114	72	⋮
27	1B	ESC	71	47	G	115	73	⋮
28	1C		72	48	H	116	74	⋮
29	1D		73	49	I	117	75	⋮
30	1E		74	4A	J	118	76	⋮
31	1F		75	4B	K	119	77	⋮
32	20	SP	76	4C	L	120	78	⋮
33	21	!	77	4D	M	121	79	⋮
34	22	"	78	4E	N	122	7A	⋮
35	23	#	79	4F	O	123	7B	⋮
36	24	\$	80	50	P	124	7C	⋮
37	25	%	81	51	Q	125	7D	⋮
38	26	&	82	52	R	126	7E	⋮
39	27	'	83	53	S	127	7F	⋮
40	28	(	84	54	T			⋮
41	29	)	85	55	U			⋮
42	2A	*	86	56	V			⋮
43	2B	+	87	57	W			⋮

## **CUSTOMER SUPPORT**



Atari Corporation welcomes any questions you might have about your ATARI ST Terminal Emulator or about any other ATARI Computer product.

You may write to:

ATARI Customer Relations  
P.O. Box 61657  
Sunnyvale, CA 94088

Please write the subject of your letter on the outside of the envelope.

Or contact your local Atari User Group. User groups provide outstanding sources of information on how to get the most from your ATARI Computer. To obtain a list of User Groups in your area, send a self-addressed stamped envelope to:

ATARI User Group List  
P.O. Box 61657  
Sunnyvale, CA 94088