



**OT 80**



**Eighty Column Dumb  
Terminal for the ATR  
8000**



**INTRODUCTION.....3**

**THE TERMINAL .....3**

**THE MOUSE.....4**

**OPTIONS .....5**

**TABLE 1 .....6**

**LIMITED WARRANTY .....7**

**NOTES.....8**



## Introduction

DT-80 is a cartridge designed to give ATR-8000 CP/M users access to a full 80 by 24 screen without the expense of an 80-column board. DT-80 uses the Atari's internal display hardware to show remarkably legible characters in a 4 by 8 matrix, allowing the full 80-column screen width.

The display is best on an Atari connected to a monochrome monitor, but it is readable on a black & white TV, a color monitor, and even a color TV. Stray colors, called artifacts, are a natural by-product of Atari's high-resolution graphics, and they limit DT-80's usefulness with a color display.

DT-80 needs only 16K of RAM to run, and it executes immediately after you plug it into the cartridge slot (left slot on an 800) and turn on the computer. Be sure the ATR-8000 is powered on before starting DT-80. DT-80 does not boot the disk. It resets the ATR-8000 and waits 5 seconds. When the black screen appears, the letters "ATRMON" above the flashing cursor signal that the ATR-8000 is ready. You may then use ATRMON or type "B" to boot the CP/M disk in drive #1. Lavish in 80 columns.

## The Terminal

DT-80 emulates two functionally independent devices: the keyboard and the CRT. The keyboard is solely an input device. What you type is sent directly to the ATR-8000 over the 9600 baud serial line. The CRT, on the other hand, is an output-only device. What the ATR-8000 sends over the serial line is directly displayed on the CRT for you to see.

The ASCII codes generated by the keyboard device are shown in the left half of Table 1. Most of the key definitions match the legends on the keycaps, but ASCII and ATASCII have a few differences, which are shown in Table 1. The CAPS/LOWER key works in the Atari's normal



fashion, except that there is no control lock. The keyboard device can directly generate all 128 ASCII codes.

How the CRT interprets the ASCII codes it receives is shown in the right half of Table 1. Codes less than 20 (hex) are control codes and don't normally appear as characters. They cause the CRT to perform a specific function, as listed in Table 1.

The "escape" code signals the start of a special sequence of characters called the "escape sequence". Escape sequences, like control codes, are not displayed, and they cause certain actions by the CRT. DT-80 obeys the same escape sequences listed in the ATR-8000 CP/M Supplement.

Code \$1f causes the CRT to display the next character it receives, even if it is a control character. Instead of performing the control function, the CRT displays the corresponding ATASCII graphics character.

The CRT and the keyboard devices are independent in that whatever the user types appear on the screen only if the ATR-800 echoes the character it receives, that is if it sends back the same character codes sent to it. Under CP/M, the ATR-8000 almost always echoes. In some cases, though, it interprets the codes it receives from the keyboard and converts them to other characters, which it then sends to the CRT. For that reason, if you type a key shown on the left side of Table 1, the CRT may not always display the corresponding character from the right side of Table 1.

## The Mouse

When you move the joystick or trackball plugged into joystick port #1, the terminal types CTRL-ARROW keycodes for you at a quick rate. This feature allows you to use the trackball as an upside-down mouse. Pressing the fire button causes a single CTRL-RETURN keycode to be typed.



## Options

To suit your viewing preferences, you can change the screen appearance. Pressing **[SHIFT]-[START]** toggles the cursor between three different modes: flashing, steady, and invisible. Pressing **[START]** alters the characters' brightness and pressing **[SELECT]** changes the background. You can choose black letters on a white background with these keys. For users with color displays, pressing **[SHIFT]-[SELECT]** changes the screen color to help mask artifacting.

Pressing **[OPTION]** cycles through three menus. To select a menu, press **[START]** when the desired menu title appears.

The first menu lets you redefine any key on the keyboard. First, type the key, including the SHIFT or CTRL if needed. You then see the hexadecimal ASCII code assigned to that key. If you do not want to change it, press RETURN to return to the terminal. To change it, type the new two-digit hex code. As you type, the number on the screen scrolls left, and the most significant bit is zeroed, allowing only hex values from 00 to 7F. When you press RETURN, you return to the terminal, and the key has a new assignment. You can change the codes the mouse sends by redefining the CTRL-ARROW keys and CTRL-RETURN key.

The second menu lets you adjust the speed of the joystick or trackball mouse. To change the repeat rate, type a digit from 1 (fastest) to 9 (slowest), and press RETURN.

The third menu lets you enable or disable fine scrolling with the screen scrolls up. Then enabled, fine scrolling doesn't slow down the display, so the scrolling will be smooth only if it occurs at a rate of less than 8 lines per second.

While a menu is displayed, the terminal can't print any characters the ATR-8000 might send. The terminal has a 256-character buffer, but if it overflows, all characters in it are lost. So, it is best to use the menus only when the ATR-8000 is idle.



Table 1

KEYPRESS THAT SEND ASCII CODE	ASCII CODE (HEX)	CHARACTERS PRODUCED WHEN ASCII CODE RECEIVED
Any otherwise-undefined key	00	null
Ctrl-A to Ctrl-F	01 to 06	null
Ctrl-G	07	Bell
Ctrl-H, Ctrl+, Back S	08	Backspace / Cursor Left
Ctrl-I, Tab, Shift-Tab	09	Horizontal Tab
Ctrl-J, Ctrl-=	0A	Line feed / Cursor down
Ctrl-K, Ctrl--	0B	Cursor up
Ctrl-L, Ctrl-*	0C	Cursor right
Ctrl-M, Return, Shft-Return, Ctrl-Return	0D	Carriage return
Ctrl-N to Ctrl-Y	0E to 19	null
Ctrl-Z, Ctrl-Tab	1A	Clear screen and home cursor
Esc, Shft-Esc, Ctrl-Esc	1B	Escape
Ctrl-2	1C	null
Ctrl-.	1D	null
Ctrl-<	1E	Home cursor
Ctrl->	1F	Display next control character
Space, Shft-Space, Ctrl-Space	20	Space
as per keycaps	21 to 5F	Capitals, numbers, punctuation
Ctrl-/	60	'
A to Z (Caps lock off)	61 to 7A	Lower-case letters
Shft-<	7B	{
Shft-=	7C	
Shft->	7D	}
Shft-;	7E	~
Shft-Back S	7F	g



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## Notes