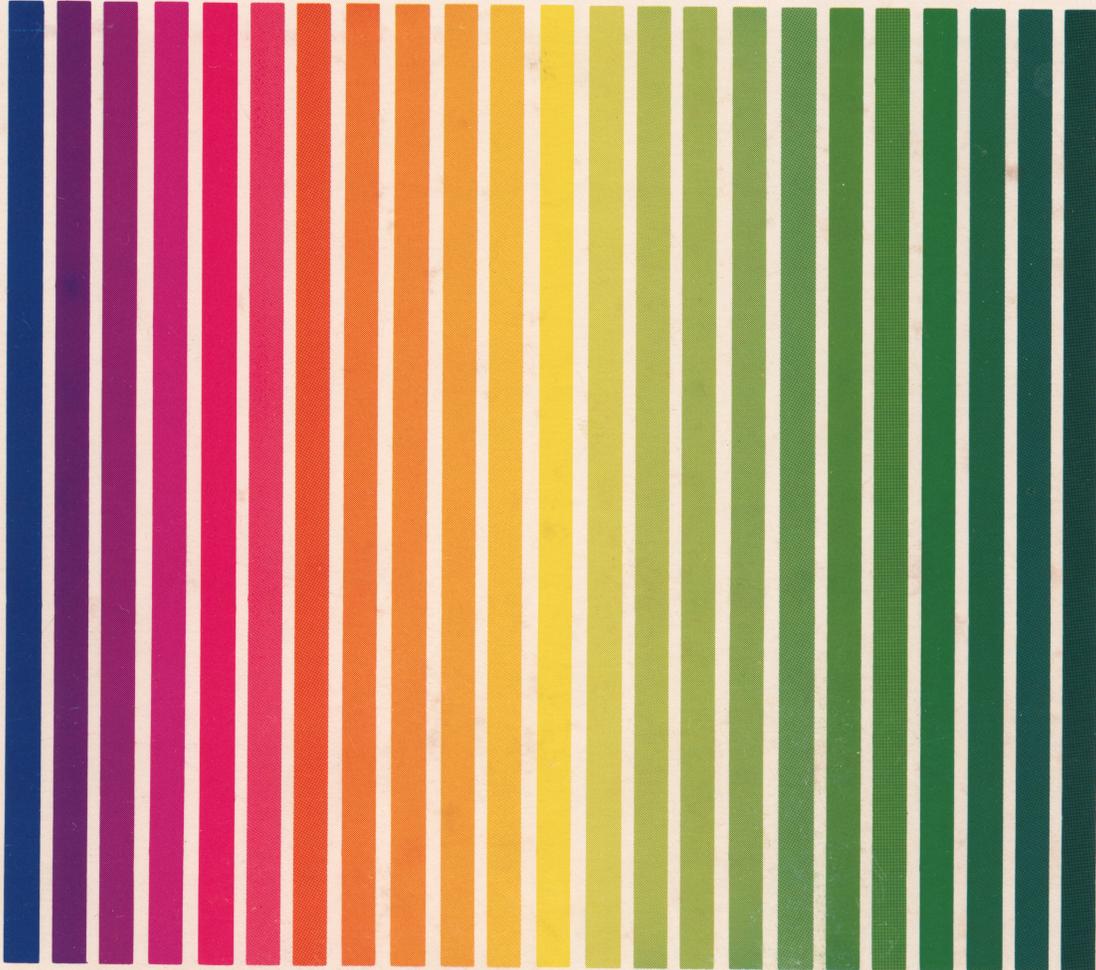


APX

ATARI® PROGRAM EXCHANGE



John Howard Palevich

CHAMELEON CRT TERMINAL EMULATOR

Convert your computer into a Glass
TTY, ADM-3, or VT-52 terminal

Cassette: 16K (APX-10058)

Diskette: 24K (APX-20058)

User-Written Software for ATARI Home Computers

John Howard Palevich

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CHAMELEON CRT TERMINAL EMULATOR

by

John Howard Palevich

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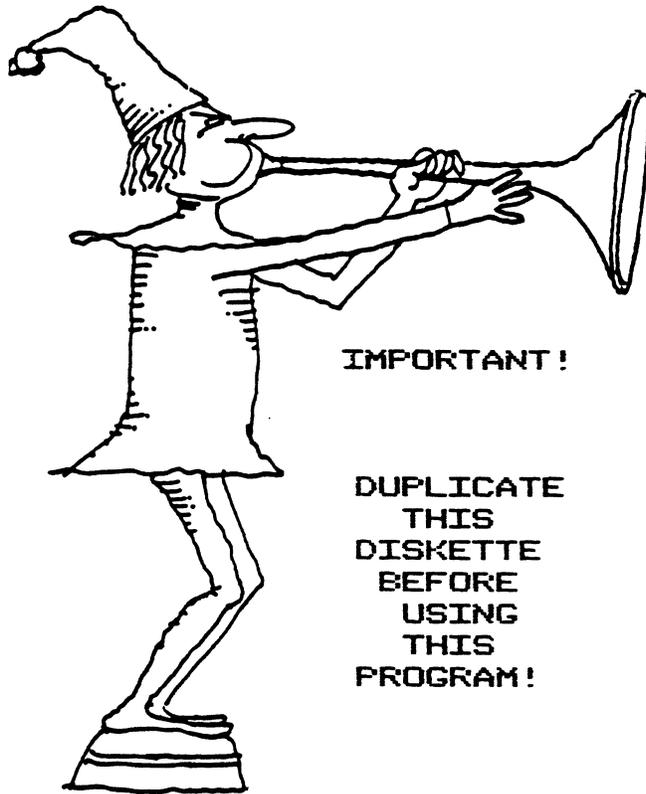
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To duplicate the diskette, call the Disk Operating System (DOS) menu and select option J, Duplicate Disk. You can use this option with a single disk drive by manually swapping source (the APX diskette) and destination (a notched diskette) until the duplication process is complete. You can also use this option with multiple disk drive systems by inserting source and destination diskettes in two separate drives and letting the duplication process proceed automatically. (Note. This option copies sector by sector. Therefore, when the duplication is complete, any files previously stored on the destination diskette will have been destroyed.)

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INTRODUCTION

OVERVIEW

CHAMELEON lets you convert your ATARI Personal Computer into a computer terminal. It emulates four terminals: "Glass TTY" (that is, a video terminal with the same features as a printing terminal), Lear Siegler's ADM-3A, Digital Equipment Corporation's VT-52, and a Test terminal, useful for debugging. For Glass, ADM-3A, and VT-52, CHAMELEON supports tabs, backspace, line feed, form feed, and a visual bell signal. For the ADM-3A and VT-52, it also supports cursor addressing and basic editing features. It doesn't support the special graphics character set of the VT-52 or some rarely used ADM-3A features.

CHAMELEON's major features are: (1) a 24-line, 80-column character display (displaying 40 columns at a time) with a lock cursor feature for automatic horizontal scrolling; (2) previous page buffer; (3) continuous transmission at baud rates of 75 to 4800 and noncontinuous at 9600; (4) selectable input and output parity; (5) a BREAK signal; (6) the full ASCII standard character set; (7) selectable duplex and echoplex; (8) 40- or 80-column margins; and (9) screen dump, upload, and download modes. Assembly language programmers with a 32K disk system and the Assembler Editor Cartridge can define new terminal types with CHAMELEON; the diskette version includes the source code.

REQUIRED ACCESSORIES

For cassette version

16K RAM

ATARI 410 Program Recorder

For diskette version

24K RAM

ATARI 810 Disk Drive

ATARI BASIC Language Cartridge

ATARI 830 Acoustic Modem or an RS-232C device

ATARI 850 Interface Module

OPTIONAL ACCESSORIES

Assembler Editor Cartridge

Printer or any other input/output device

CONTACTING THE AUTHOR

Users wishing to contact the author about CHAMELEON may write to him at:

472 Memorial Drive,
Cambridge, MA 02139

or call him at:

(617) 225-7452

GETTING STARTED

LOADING CHAMELEON INTO COMPUTER MEMORY

If you have the cassette version of CHAMELEON:

- a. Remove any cartridge from the (Left Cartridge) slot of your computer.
- b. Make sure all your equipment is turned off, including your disk drive. Connect your ATARI 830 Acoustic Modem to your ATARI 850 Interface Module or your RS-232C device. Set your modem controls according to the requirements of the host computer you're contacting.
- c. Turn on your interface module or RS-232C device (consult the operating manual for your RS-232C device for any special instructions).
- d. Connect your program recorder to the interface module and to a wall outlet.
- e. While holding down the START key on the computer console, turn on your computer. The computer will beep. Also turn on your TV screen.
- f. Insert the CHAMELEON cassette in the cassette holder of your program recorder, press REWIND, and then press PLAY.
- g. Press the RETURN key on your computer keyboard. The tape will load into computer memory (RAM); then it will stop and the interface module will automatically load its software into RAM.

If you have exactly 16K of RAM, then during the last thirty seconds of loading, CHAMELEON will overwrite the portion of RAM used to store the Display List, causing your TV screen to display multicolored garbage. Don't be alarmed; the CHAMELEON instruction page replaces this garbage as soon as program loading is complete.

- h. After selecting your options on the Terminal Emulator Menu (explained in a later section), press the START key to go to the terminal screen.
- i. Dial the host computer and, at the high-pitched tone, place the phone receiver in the modem.

If you have the diskette version of CHAMELEON:

- a. Insert the ATARI BASIC Language Cartridge in the (Left Cartridge) slot of your computer.
- b. Make sure all your equipment is turned off. Connect your ATARI 830 Acoustic Modem to your ATARI 850 Interface Module or your RS-232C device. Set your modem controls according to the requirements of the host computer you're contacting.
- c. Turn on your interface module or RS-232C device (consult the operating manual for

your RS-232C device for any special instructions).

d. Connect your disk drive to the interface module and turn on your drive.

e. When the BUSY light goes out, open the disk drive door and insert the the CHAMELEON diskette with the label in the lower right-hand corner nearest to you.

f. Turn on your computer and TV screen and wait until the Disk Operating System (DOS) and the AUTORUN.SYS file (for the interface module) load into computer memory. When this loading activity is complete, BASIC's READY prompt will display on your TV screen.

g. Type RUN "D:LIZARD" and press the RETURN key. The CHAMELEON loader program will load CHAMELEON into computer memory (some numbers display during this procedure) and CHAMELEON's information screen will automatically display.

h. After selecting your options on the Terminal Emulator Menu (explained in a later section), press the START key to go to the terminal screen.

i. Dial the host computer and, at the high-pitched tone, place the phone receiver in the modem.

CHAMELEON'S INFORMATION SCREEN

Below is an illustration of the information screen, which displays until you press the SPACE bar. All this information is explained in more detail in this manual.

```
-----
| CHAMELEON TTY EMULATOR          VERSION 2.0
| (c) 1981   John Howard Palevich
| -----
| |SHIFT OPTION |invokes selected FTP
| |  OPTION     |moves to menu screen
| |SHIFT SELECT |toggles cursor lock
| |  SELECT     |displays previous page
| |SHIFT START  |rolls screen left
| |  START      |rolls screen right
| -----
| To get  : Type      To get  : Type
| \       : CTRL-,   ↑@     : CTRL-,
| "       : CTRL-back ↑\     : CTRL-↑
| {       : CTRL-;   ↑]     : CTRL-↓
| }       : CLR      ↑^     : CTRL-←
| RUBOUT  : BACK S   ↑_     : CTRL-→
| SHIFT-ATARI signals 0.5 seconds BREAK
| When viewing the menu screen:
| SHIFT OPTION moves => up one line
|  OPTION     moves => down one line
| SHIFT SELECT decrements the item
|  SELECT     increments the item
|  START     quits CRT TTY page
| Use SEL, BackS, & RETURN to edit fname
| -----
| ---==+* Press SPACE BAR for Menu *+==---
| -----
```

Figure 1 CRT Terminal Emulator Information Screen

USING CHAMELEON

TERMINAL EMULATOR MENU

After pressing the SPACE BAR in response to the Information screen, the terminal emulator menu screen displays in double-width, colored characters. A dark grey arrow (->) points to the item you've selected. The item's name is red and the item's value is yellow. The menu screen looks approximately as follows (the items' initial values are shown).

```
->CRT TYPE GLASS TTY
  INPUT PARITY NONE
  OUTPUT PARITY NONE
  BAUD RATE 300
  DUPLEX FULL
  ECHOPLEX FULL
  MARGINS EIGHTY
  F P:
  TRANSLATION CR=EOL
  FTP DISABLED
  USE OPTION & SELECT
  THEN START TO GO ON
```

Figure 2 Terminal Emulator Menu Screen

Selecting an item--OPTION key

Each time you press the OPTION key, the dark grey arrow moves down one line so that you can select the next item in the menu. You return to the first menu item after reaching the last one. You can also reverse the order by holding down the SHIFT key while pressing the OPTION key, which causes the arrow to move to the previous menu item. With this method, you return to the last menu item after reaching the first one.

Selecting a value for an item -- SELECT key

Each time you press the SELECT key, a new value displays for the current menu item. Again, to reverse the order, hold down the SHIFT KEY while pressing the SELECT key, which causes the previous value to display.

Moving to terminal mode -- START key

Press the START key to move from the Terminal Emulator Menu screen to terminal mode.

If you enabled FTP, then CHAMELEON attempts to open the file you specified in the F line (line 8 in the menu). If this operation fails (because, for example, you specified a nonexistent file), CHAMELEON prints

```
CAN'T OPEN IO FILE: #
```

where "#" is an error code, FTP will be disabled until you return to the Terminal Emulator Menu and correct the problem. See the section on FTP for more information.

If CHAMELEON can't talk to the R: (interface module) device, it prints the message

```
CAN'T TALK RS-232C:#
```

where "#" is a character error code, which you can decode by referring to Table 3 in the FTP section. CHAMELEON hangs at this point. Turn off both your computer and your interface module, and then check the connections as well as the instructions under GETTING STARTED.

Most times, you'll have no problems. CHAMELEON simply prints

```
NO ERRORS IN SETUP
```

at the top of the screen as it places you in terminal mode.

Recalling the Terminal Emulator Menu -- OPTION key

When you're in terminal mode, you can recall the Terminal Emulator Menu by pressing the OPTION key. The grey arrow will point to the last menu item you selected. Characters sent to you while you're in Terminal Emulator Menu mode will be lost.

If you enabled FTP, CHAMELEON closes your file when you recall the menu. You should then disable FTP; if you don't, CHAMELEON will reopen your file when you exit menu mode, and, in the case of downloading or a screen dump, you'll lose all the data you put into the file. This result applies to storage devices only; printers have already printed the information and so may be reopened.

ITEM 1--TERMINAL TYPE

Use the first item to select the kind of terminal you want to emulate. Your choices are:

GLASS TTY

This value simulates a typical printing terminal with eight column tabs, line feed, form feed, backspace, carriage return, and a visual bell with some computer installations. However, it isn't sufficient for time sharing computers capable of sending special characters for cursor control, character editing, and so on. Select one of the video terminal values to communicate with such computers.

VT-52

This value simulates the DEC VT-52 terminal, except for the special graphics character set. CHAMELEON doesn't support the Enable Graphics and Disable Graphics commands. Normal mode lowercase characters print in place of graphics. The alternate keypad mode also isn't supported. However, you may type sequences from the following table to emulate the keypad:

TABLE 1 VT-52 ALTERNATE KEYPAD MODE SEQUENCES

Key	Keypad Numeric Mode	Keypad Application Mode
0	0	ESC ? p
1	1	ESC ? q
2	2	ESC ? r
3	3	ESC ? s
4	4	ESC ? t
5	5	ESC ? u
6	6	ESC ? v
7	7	ESC ? w
8	8	ESC ? x
9	9	ESC ? y
-	- (dash)	ESC ? m
,	, (comma)	ESC ? l
.	. (period)	ESC ? n
ENTER	Carriage Return	ESC ? M
up	ESC A	ESC A
down	ESC B	ESC B
right	ESC C	ESC C
left	ESC D	ESC D
blue	ESC F	ESC F
red	ESC Q	ESC Q
grey	ESC R	ESC R

ADM-3A

This value simulates the Lear Siegler ADM-3A terminal. It supports Option A (24 lines) and Option No. 1 (lowercase characters). However, it won't beep when the cursor crosses the 72nd character position.

The Internal Configuration Control Switches are set as follows:

TABLE 2 INTERNAL CONFIGURATION CONTROL SWITCHES FOR ADM-3A

Left set			
No.	Name	Setting	May be modified by
1	12 line/24 line	24 line	Reassembly
2	50 hz/60 hz	60 hz	N/A
3	Disable Clr Scrn	Clr Scrn	Reassembly
4	Disable Kb Lock	Disable	Reassembly
5	UC Disp/U/L Disp	U/L Disp	Reassembly
6	Space-Adv	Space	Reassembly

Right set			
No.	Name	Setting	May be modified by
1	EOT-OFF	OFF	Reassembly
2	ETX-OFF	OFF	Reassembly
3	CODE - SEC CHAN	CODE (N/A)	Reassembly
4	202-OFF	OFF	Reassembly
5	103-OFF	103	Reassembly
6	LOCAL-OFF	OFF	Reassembly
7	CUR CTL-OFF	CUR CTL	Reassembly

Keyboard Dip Switch Settings:

No.	Name	Settings	May be modified by
L1-L7	& Baud Rates	300	Menu (baud rate)
M1-M4	*Note that CHAMELEON can't run at 19200 baud*		
M5	HDX-FDX	FDX	Menu (duplex)
M6	RS-232C CL	RS-232C	Reassembly
M7	Auto NL-OFF	Wrap	Reassembly
H1	LC EN-UC	UC	SHIFT-lock
H2	PAR ODD/EVEN	None	Menu (I/O parity)
H3	DATA 7/8	None	Menu (I/O parity)
H4	STOP 1/2	1	Reassembly
H5	PARITY-INH	None	Menu (I/O parity)
H6	Bit 8 0/1	None	Menu (I/O parity & ATARI key)

TEST

Characters sent to the screen while CHAMELEON is in TEST mode are printed as is. None of the control characters (even carriage return) are treated specially. When the cursor reaches the right margin, it moves down to the next line. When the cursor reaches the bottom of the screen, it scrolls the whole screen upward one line. Thus, the last several thousand characters sent to CHAMELEON will be visible on the screen.

This mode is useful for debugging new operating systems because it lets you find all padding characters (like nulls and rub outs) or other control characters the operating

system might be sending you.

ITEM 2--INPUT PARITY

Use this item to select the kind of parity check sent to CHAMELEON from the host computer. Consult the manual or User Services for the system you're communicating with for the appropriate value. The values are:

NONE

CHAMELEON displays all eight bits of input.

ODD

The number of ON bits must be odd.

EVEN

The number of ON bits must be even.

OFF

The parity (eighth) bit isn't checked.

ITEM 3--OUTPUT PARITY

Use this item to set the output parity check from your keyboard to the host computer. Consult the manual or User Services for the system you're communicating with to select the appropriate value. The choices are:

NONE

Send characters with parity bit 0.

ODD

Number of bits must be odd.

EVEN

Number of bits must be even.

ON

Send characters with parity bit 1.

ITEM 4--BAUD RATE

Use the second item to select the baud (data transmission) rate. The values are in bits per second. Consult the manual or User Services for the system you're using for appropriate baud rates. Continuous transmission choices are:

75
110
134.5
150
300
600
1200
1800
2400
4800

Noncontinuous transmission is available at:

9600

ITEM 5--DUPLEX

Use this item to control where the characters you type are sent. The choices are:

NONE

Keyboard characters are ignored.

FULL

Keyboard characters go to the RS-232C device.

LOCAL

Keyboard characters go to the screen.

HALF

Keyboard characters are sent to both the RS-232C device and the screen; use this to talk to systems requiring half duplex.

ITEM 6--ECHOPLEX

Use this item to control where characters from the RS-232C device are sent. The choices are:

NONE

R device characters ignored.

FULL

R device characters sent to screen; use FULL unless you know exactly what you're doing.

REMOTE

R device characters sent back to device, but not to screen.

HALF

R device characters sent both to screen and back to device; this mode is useful if you're connected to a FULL DUPLEX terminal and want to provide character echoing for it.

ITEM 7--MARGINS

Use margins to set the width of the screen. The choices are:

FORTY

Right margin is at 40. Longer lines are split on the fortieth character. This mode is useful for reading large amounts of unformatted text because you don't have to roll the screen horizontally.

EIGHTY

Right margin is at 80. If you're using ADM-3A or VT-52 mode, you should probably use this margin setting. Otherwise, CHAMELEON breaks your lines on the fortieth character, making the display somewhat messy.

ITEM 8--F (file name)

File transfer modes (FTP) need a file name. The "F" line (line 8) of the menu displays the file currently selected for file transfer operations. Pressing the SELECT or SHIFT+SELECT keys for this item causes the grey cursor () to appear, replacing the first character of the old file name. Type in the name of the file you want to use. Use the BACK S key to correct typing mistakes. Type RETURN to remove the cursor and send your file name to the computer. See the section on FTP for more information.

If you always keep FTP (the File Transfer Protocol) DISABLED, then you can safely leave this line alone, even if you don't have a P: (printer) device.

ITEM 9--TRANSLATION

Use this item to control how end-of-line characters are sent and received during uploading and downloading. The choices are:

CR=EOL

This choice tries to map ASCII Carriage Return/Line Feed to ATASCII End of Line. During uploading, EOL is converted to Carriage Return. During downloading, Carriage Return is converted to EOL and all line feeds are ignored (i.e., not sent to the FTP file). Use this mode with your ASCII computer system.

NONE

In this choice, all characters are sent and received as is. Use this mode with another ATARI computer or with specially prepared files.

ITEM 10--FTP (File Transfer Protocol)

This item controls what type of file transfer CHAMELEON will do. See the section on FTP for more information. The choices are:

DISABLED

No file transfer selected.

UPLOAD

Transfer characters from an ATARI device up to the RS-232C device.

DOWNLOAD

Transfer characters from the RS-232C device down to a device on the ATARI system.

SCREEN DUMP

Transfer characters from the screen to a device on the ATARI system.

EXAMPLE: SETTINGS FOR COMMUNICATING WITH COMPUSERVE

If you want to call CompuServe, or MicroNET through CompuServe, your settings typically would be as follows:

Your settings on your ATARI 830 Acoustic Modem would be:

```
Q/A/OFF  --> Q
F/H/TST  --> F
```

Your settings on CHAMELEON's Terminal Emulator menu would be:

```
Item 1--TTY type      --> ADM3A
Item 2--Input parity  --> EVEN
Item 3--Output parity--> NONE
Item 4--Baud rate     --> 300
Item 5--Duplex        --> FULL
Item 6--Echoplex     --> FULL
Item 7--Margins       --> FORTY
Item 8--F             -->
Item 9--Translation  --> CR=EOL
Item 10--FTP          --> DISABLED
```

Thus, the menu screen would look like this:

```
CRT TYPE ADM-3A
INPUT PARITY EVEN
OUTPUT PARITY NONE
BAUD RATE 300
DUPLEX FULL
ECHOPLEX FULL
MARGINS FORTY
F F:
TRANSLATION NONE
FTP DISABLED
```

After pressing the START key to go from the menu to terminal mode, you dial the CompuServe number for your area and log in.

CONTROL CODES

While you're using CHAMELEON, some of the ATARI control characters won't do what they normally do. For example, the CAPS key works as it usually does, but the ATARI key has been disabled. As another example, the RETURN key repositions the cursor (the light green square that indicates where the next transmitted character will display on the screen) at the beginning of the current line, not at the beginning of the next line. You'll need to use CTRL-J to move the cursor to the next line. See the tables at the end of this manual for information about what each character and control code means while you're using CHAMELEON.

VERTICAL AND HORIZONTAL SCROLLING

When you select either a VT-52 or an ADM-3A terminal type, you can retain 24 lines of text in a buffer and you have available an 80-column screen. You use the SELECT, START,

and SHIFT keys for these features.

To try recalling the previous screen's worth of lines and scrolling back and forth across the 80 columns, use the menu to set CRT TYPE to GLASS and set DUPLEX to LOCAL. Set the modem's ANS/OFF/ORIG (O/A/OFF) control switch to the "O" position and its FULL/TEST/HALF (F/TST/H) control switch to "TST". The modem will hum and the READY power light will glow. Now, set your menu values to GLASS, input parity NONE, and output parity NONE, 300 baud, duplex FULL, echoplex FULL, margins EIGHTY, translation CR=EOL, and FTP DISABLED. You're ready to try the page buffer and 80-column line features.

24-Line Buffer--SELECT key

If you'll type CTRL-J repeatedly, you'll soon notice that the cursor moves down to the bottom line of the screen and remains there, while the text you've typed in scrolls off the top of the screen. If you press and hold the SELECT key, the screen will display the 24 most recent lines that scrolled off the top of the screen, and the cursor changes to an arrow pointing down to its "true" position. The buffer can hold only 24 lines; all lines previous to these are lost. If you try to type in information while you're displaying the lines in this buffer, you won't see any change; however, when you release the SELECT key, you'll notice that the information you just typed in appears on the screen, with the cursor just to the right of it.

Horizontal scrolling--START and SHIFT + START keys

Type a sentence (such as, "The quick brown fox jumped over the . . .") until you reach the right-hand side of the line. If you continue to type, you'll notice that the cursor has become an arrow pointing right, off the edge of the screen, toward where the next character should display. Press the START key and watch the characters scroll leftward, until the screen is blank and the cursor has changed back into a small square on the left-hand edge of the screen. You've just used the START key to scroll, character by character, to the rightmost 40 columns of the 80-column display.

To return to the first 40 columns, press SHIFT + START. You can use START and SHIFT + START to center the cursor on whatever column you wish. When the cursor is positioned in its true location, it displays as a square. When it is located in a screen area other than its true location (i.e., in the previous page buffer or on columns across the screen), it displays as an arrow pointing toward its true position.

Combining vertical and horizontal scrolling

Use the SELECT key to recall the previous 24 display lines (and CTRL-J to page forward again). Then use the START and SHIFT + START keys to scroll across the 80-column display lines of the previous and current pages.

Locking the cursor for faster data entry--SHIFT + SELECT key

Use the SHIFT + SELECT keys to "lock" the cursor on the screen. That is, when the CURSOR LOCK ON message displays at the top of the screen, CHAMELEON will scroll automatically to keep the cursor square on the screen. This feature is useful when you have a lot of information to type in. You can type faster when CHAMELEON keeps track the cursor on the screen, because you won't have to stop every few words to reposition the cursor with the START and SHIFT + START keys.

Pressing the SHIFT + SELECT keys causes the messages CURSOR LOCK ON and CURSOR LOCK OFF to display alternately, which informs you of the state of the cursor lock. The cursor lock is off when you first use CHAMELEON. For long printouts, many people prefer to control scrolling themselves (CURSOR LOCK OFF), since they can then move the screen around to read the text at their own reading rate, as well as back up to reread a section.

SYSTEM RESET AND BREAK KEYS

If you press the SYSTEM RESET key, you'll return to BASIC. However, you won't be able to read or run a program resident in BASIC at this time since CHAMELEON has overwritten BASIC's program area. To return to BASIC after finishing using CHAMELEON, turn off your computer console and then turn it on again.

CHAMELEON has disabled the computer console's BREAK key in menu and terminal mode because it's so easy to press mistakenly and because the interface module software would stop sending data in that case.

When a file I/O is in progress (for example, when you're entering or leaving menu mode, or during an FTP mode), you can use the BREAK key to abort the I/O.

SENDING A "BREAK" SIGNAL TO THE HOST COMPUTER

You'll sometimes want to send a "break" signal to the host computer--to tell it to stop sending data. To do so, press the SHIFT + ATARI keys. Each time you press these keys, CHAMELEON sends a half-second of BREAK signal to the other computer and then displays the menu line.

ATTACHING AN RS-232C DEVICE TO THE INTERFACE MODULE

CHAMELEON talks to Port 1 of the ATARI 850 Interface Module. Only "Transmit Data", "Receive Data", and ground need be connected, but "Data Terminal Ready" and "Request to Send" are set high (+12V = true) when CHAMELEON starts as a convenience to devices requiring these signals. CHAMELEON ignores all other signals.

FILE TRANSFER PROTOCOLS (FTP)

Terms

"File Transfer Protocol" (FTP) is a generic term for any method of moving data from one place to another, for instance, between two ATARI computers or between an ATARI computer and a large time sharing system.

"Uploading" refers to moving data from your ATARI computer system to some other computer.

"Downloading" refers to moving data from another computer into your ATARI computer system.

There are many ways to upload and download information. CHAMELEON uses one that works

with almost any time sharing computer without any special programs on the other end. If this isn't the case, contact the systems staff and ask about getting "XON/XOFF flow control" installed (or write a program to simulate such a feature). "XON/XOFF flow control" refers to the process whereby a system stops printing characters when you (or CHAMELEON) send it an ASCII ^S (for XOFF), and then waits for you (or CHAMELEON) to send an ASCII ^Q (for XON), when it resumes sending characters.

CHAMELEON uses this flow control to tell the system to stop sending characters for a moment, so that it can turn off the RS-232C port and save the characters it has collected to the file you specified. Thus, if your system doesn't have flow control, you can't download more characters at a time than CHAMELEON has room for in its internal buffer. On an unmodified CHAMELEON, the buffer holds about 300 characters, but you can reassemble CHAMELEON for a 40K disk system to obtain about 16,000 characters of storage.

When one CHAMELEON is uploading a file to another CHAMELEON, the first one will stop sending characters when it gets a ^S and it will restart when it receives a ^Q. Thus, two ATARI computer owners who each own CHAMELEON can transfer uncopyrighted files to one another over phone lines.

Types of devices that can upload

You can upload from any device from which you can read, except for K: (keyboard), S: (TV monitor), and E: (Screen Editor) devices, which either CHAMELEON uses or would interfere with CHAMELEON. Examples are:

```
C:           Cassette tape recorder file
D1:PACMAN.SRC  Disk file
```

Types of devices that can download

You can download to any device that you can write to, except for S: (TV monitor) and E: (Screen Editor) devices, which would interfere with CHAMELEON. Examples are:

```
F:           Printer
C:           Cassette
D1:DEFENDER.OBJ  Disk file
```

Special problems with the program recorder

It's fairly well known that cassettes need a nondata block of 128 characters at the beginning of the tape so that the tape can be opened long before it's read or written to. Since CHAMELEON opens FTP files when you leave menu mode, it has to read or write the first block of data at that time.

The most likely use of FTP with cassettes would be to upload or download programs saved using the LIST command. So as not to lose the first 128 characters of these programs, follow these steps.

For BASIC programs:

1. Type in the direct mode command:

```
OPEN#1,8,0,"C:";FOR I=1TO128:PUT#1,155:NEXT I:LIST"C:"
```

and press the RETURN key.

2. The computer will beep twice. Press the RETURN key.
3. The computer will write one block of data onto the cassette.
4. The computer will beep twice. Press the RETURN key.
5. Then the computer will write your program to the tape.

When you upload this file, CHAMELEON will read in and ignore the first block of data, but it will get all of your program.

For ASSEMBLER EDITOR programs:

1. Type in

```
REN <RETURN>  
01 ;45678911234567892123456789312345678941234567895123456789612 <RETURN>  
02 ;45678911234567892123456789312345678941234567895123456789612 <RETURN>  
LIST#C;<RETURN>
```

2. The computer will beep twice. Press the RETURN key.
3. The computer will then save your program with the two new comment lines in the first block of data.

When CHAMELEON uploads your program, it will read in the two comments and ignore them. Then it will get all of your program.

To ENTER a downloaded or screen-dumped program:

BASIC programs:

1. Type ENTER"C:" and press the RETURN key.
2. The computer will beep once. Press the RETURN key.
3. The cassette program will load in and BASIC will simply ignore the 128 <EOL>s that CHAMELEON wrote into the first block.

ASSEMBLER/EDITOR programs:

1. Type ENTER#C: and press the RETURN key.

2. The computer will beep once. Press the RETURN key.

3. The cassette program will load in, but the Assembler Editor beeps 128 (count 'em) times, once for each EOL it sees in the first block. It also beeps once for each blank line included in a screen dump. While this is admittedly annoying, it works!

UPLOADING TO A TIME SHARING SYSTEM

To upload a file to a time sharing system, follow these steps.

1. Establish a connection with the system, log in, and run your favorite editor.
2. Go into text entry mode. If the mode requires line numbers, make sure your file has them. If a certain sequence of characters will stop text entry, check that your file doesn't contain these characters. Similarly, make sure your file has no control characters that might abort the editor and return you to the top level.
3. Press the OPTION key to go into CHAMELEON's menu mode. Change "F" in line 8 to the file you want to upload. Select a TRANSLATION of CR=EOL. Select an FTP of UPLOAD. If you want to see the file as it uploads, set DUPLEX to HALF.
4. Press the START key. CHAMELEON will open your file for reading and return to terminal mode. If CHAMELEON displays errors, fix them and try again.
5. When CHAMELEON displays the NO ERRORS IN SETUP message, you can continue. Press the SHIFT+OPTION keys to start the uploading.
6. CHAMELEON continues to upload until one of three events occurs:
 - a. It comes to the end of the file, whereupon it prints QUITTING TO TTY MODE and returns you to terminal mode.
 - b. You type any character on the keyboard, whereupon it prints QUITTING TO TTY MODE and returns you to terminal mode.
 - c. A file I/O error occurs, whereupon it prints FILE I/O ERROR WAS :#, where "#" represents a single-colored character listed in Table 3, which follows, and returns you to terminal mode.
7. Once you're back in terminal mode, you can type the special characters that tell your system's text editor you're finished inputting characters. That's it.

TABLE 3 FILE I/O ERROR CODE TABLE

Character	Error Code
space	128 -- BREAK abort
-or-	160 -- Drive number error
<medium red characters>	
"	130 -- Nonexistent device
&	136 -- EOF
*	138 -- Device timeout
+	139 -- Device NAK
,	140 -- Serial bus
.	142 -- Overrun
/	143 -- Checksum
0	144 -- Device done
1	145 -- Read After Write Compare error
<dark grey characters>	
"	162 -- Disk full
#	163 -- Unrecoverable error
%	165 -- File name error
,	167 -- File locked
*	170 -- File not found
<yellow characters>	
E	CHAMELEON can't ftp from/to the E device
K	CHAMELEON can't ftp from/to the K device
S	CHAMELEON can't ftp from/to the S device

Notes. Older time sharing systems often assume terminals will type only a few characters a second, and some--such as the author's Unix system--will crash if characters are sent continuously at 2400 baud. CHAMELEON has a built-in delay to compensate for this problem, but if you find you often lose characters when you upload, you should modify and reassemble CHAMELEON to provide a longer delay.

You can often save characters from the terminal more efficiently than with a text editor. In many operating systems, you can send your characters directly to a file (ask a systems staff member if you're unfamiliar with how to do this). This kind of procedure lets the system save your characters faster (and so lose fewer of them).

When CR=EOL is enabled, CHAMELEON sends a carriage return after each line, which causes the lines to write over one another on the display, but it's usually the correct way to enter text to a time sharing system. Use a specially prepared file and the TRANSLATION NONE mode if your text editor requires something else.

DOWNLOADING FROM A TIME SHARING SYSTEM

The steps for downloading a file from a time sharing system are as follows.

1. Type all but the last character, which is typically pressing the RETURN key, of the command to send the file to your terminal.
2. Press the OPTION key to go to CHAMELEON's menu mode.
3. Select F and enter the file name. Select the appropriate TRANSLATION option (probably CR=EOL), and set FTP to DOWNLOAD.
4. Press the START key. If CHAMELEON displays a file error message, fix the problem and try again.
5. When you have successfully set up the FTP, press the SHIFT+OPTION keys. The prompt "TYPE CHAR TO SEND..." will appear. Now type the last character in your command to send the file to your terminal (probably pressing the RETURN key).
6. Downloading will begin. It will continue until one of two events occurs:
 - a. You type another character, whereupon CHAMELEON types QUITTING TO TTY MODE and returns you to terminal mode.
 - b. A file I/O error occurs. CHAMELEON will display a FILE I/O ERROR WAS:# message, where "#" is a one-character code listed in Table 3, FILE I/O ERROR CODE TABLE.

The download file isn't closed until you return to the menu, so you can download different system files into the same ATARI computer file. If you do, they'll be placed one after the other, in the order you download them.

Notes. Some operating systems use characters like tab (ASCII 9) to compress the number of spaces in a file. There's usually a way to tell the system not to do so; otherwise, you'll have to go through the downloaded file and manually convert the tabs to the appropriate number of spaces.

When a ^S is sent to the time sharing system, the system must stop sending data within 100 characters. If it doesn't, you'll get the message DA BUFFER OVERFLOWED and you'll lose all the characters sent from that point to when the system finally does stop sending data.

SCREEN DUMPING

Use the SCREEN DUMP option of the FTP mode to copy the contents of your current TV screen to an ATARI file. The steps are as follows.

1. Press the OPTION key to go to CHAMELEON's menu mode.
2. Select SCREEN DUMP for FTP, set F to the file name you want to dump to and press the RETURN key. TRANSLATION is not performed during a screen dump, so leave this item alone.

3. Press the START key to go to terminal mode. If CHAMELEON displays any error message, correct the problem and try again.

4. When you're ready to send a copy of the TV screen contents to your specified file, press the SHIFT+OPTION keys. CHAMELEON will display the message DUMPING SCREEN 4 YOU and save the screen to your specified device. Each line ends with an EOF (ATASCII 155) character, and only the characters from the left edge of the screen to the rightmost nonblank character will be saved. Thus, an empty screen would cause 24 EOL characters to be sent to the file, while a very full screen could take up to 1944 (24 x 80 characters + 24 EOLs) characters of storage.

Notes. If any error occurs, CHAMELEON displays a FILE I/O ERROR WAS :# message, where "#" represents a coded error listed in Table 3, FILE I/O ERROR CODE TABLE, and returns you to terminal mode. Otherwise, it displays the message QUITTING TO TTY MODE and returns you to terminal mode.

If no errors occur, you can continue to copy the screen (presumably new data has been written to it) by pressing the SHIFT+OPTION keys. One copy will be written to your specified device each time you press these keys. CHAMELEON ignores any characters sent to it while it's dumping the screen.

Until you return to CHAMELEON's menu, the FTP file isn't really closed. Thus, some data might not yet have been written out to your device. Always return to the menu before using the SYSTEM RESET key or before turning off your computer to end your session with CHAMELEON, so that the operating system can update its buffer and save all your data.

TRANSFERRING A FILE BETWEEN TWO ATARI HOME COMPUTERS

The steps for transferring information from one ATARI Home Computer to another are as follows.

1. Establish a telephone connection between the two computers. One agrees to be the sender, the other the receiver. Each places their phone receiver in the modem cups and loads CHAMELEON into RAM.
2. The receiver sets up his or her system to DOWNLOAD with TRANSLATION NONE.
3. The sender sets up his or her system to UPLOAD with TRANSLATION NONE and the file to be sent specified for F (line 8 of the menu).
4. The receiver presses the SHIFT+OPTION keys and types an asterisk (*).
5. When the sender sees the asterisk, he presses the SHIFT+OPTION keys.
6. Transfer of the file should then begin. When it finishes, the receiver types any character to stop, thanks the sender, presses the OPTION key to go to menu mode (which also closes the downloaded file), and disables FTP.
7. The sender presses the OPTION key to go to menu mode and disables FTP.
8. Both parties hang up their phones.

Notes. Both parties should exercise good judgment in transferring only files whose copyright allows for such transfer.

CHAMELEON uses an extremely general, but also extremely trusting flow control FTP. If you have poor quality communication lines, some characters will probably be lost or be changed during transmission. For a text file, these occurrences are of little consequence. For a binary file, however, it's very important that all characters transmit accurately. For these files, set INPUT PARITY and OUTPUT PARITY to NONE.

For serious use of FTP over low-grade lines, you really want a checksummed file transfer protocol. This protocol usually requires a special program on the time sharing system you use, as well as modification to the TSOP section of CHAMELEON. Good luck!

CUSTOMIZING CHAMELEON

INTRODUCTION

You can reassemble CHAMELEON if you want to customize the program to fit special needs. To modify CHAMELEON, you need:

- (1) At least 32K RAM
- (2) DOS II and at least one ATARI 810 Disk Drive
- (3) The ATARI BASIC Language Cartridge
- (4) The Assembler Editor Cartridge
- (5) Some 6502 assembly language programming experience

Read and modify the source files THEL, TBEG, TMEN, TSOP, TVBL, and TPUT. To change a terminal type definition, you probably need to modify only TPUT. The code is commented, but it will be rough going . . . lots of luck!

With the new version of the source written out to the diskette (it's wise to save a copy of the original CHAMELEON in case you make a horrendous mistake), follow the appropriate instructions given below. The symbol "<CR>" means to press the RETURN key and wait for the computer to carry out your command.

TO CREATE A 24K DISK-BASED VERSION OF CHAMELEON

<u>Language</u>	<u>You type</u>
DOS II	(1) D <CR> TTY <CR> Y <CR>
Assem/Edit.	(2) ENTER#D:THEL <CR> 10 TAPE = 0 <CR> ASM,,#D:HEL <CR> (3) ENTER#D:TBEG <CR> 10 TAPE = 0 <CR> ASM,,#D:BEG <CR> (4) ENTER#D:TMEN <CR> 10 TAPE = 0 <CR> ASM,,#D:MEN <CR> (5) ENTER#D:TSOP <CR> 10 TAPE = 0 <CR> ASM,,#D:SOP <CR> (6) ENTER#D:TVBL <CR> 10 TAPE = 0 <CR> ASM,,#D:VBL <CR> (7) ENTER#D:TPUT <CR> 10 TAPE = 0 <CR> ASM,,#D:PUT <CR>
	(8) C <CR> HEL,TTY <CR> D <CR> HEL <CR> Y <CR>
	(9) C <CR> BEG,TTY/A <CR> D <CR> BEG <CR> Y <CR>
	(10) C <CR> MEN,TTY/A <CR> D <CR> MEN <CR> Y <CR>
	(11) C <CR> SOP,TTY/A <CR> D <CR> SOP <CR> Y <CR>
	(12) C <CR> VBL,TTY/A <CR> D <CR> VBL <CR> Y <CR>
	(13) C <CR> PUT,TTY/A <CR> D <CR> PUT <CR> Y <CR>

Then use BASIC and type RUN "D:LIZARD" to run CHAMELEON.

CHARACTER AND CONTROL CODES

Following are the character and control codes for each terminal type CHAMELEON emulates.

TABLE 4 THE KEYBOARD

Type	To get	ASCII Code
-----	-----	-----
CTRL-COMMA	^@	0
CTRL-<letter>	^<letter>	1-26
TAB	^I (TAB)	9
RETURN	^M (CR)	13
ESC	^C (ESC)	27
CTRL-UP ARROW	^\	28
CTRL-DOWN ARROW	^]	29
CTRL-LEFT ARROW	^^	30
CTRL-RIGHT ARROW	^_	31
CTRL-PERIOD	^-	96
CTRL-SEMICOLON	{	123
SHIFT-CLEAR	}	125
CTRL-DELETE	~	126
BACK S	RUB OUT	127

The following characters are typed exactly as they are in ATASCII:

SPACE	!	"	#	\$	%	&	'	,	*
	-	.	/	0	1	2	3	4	5
	6	7	8	9	<	=	>	?	@
	+	A	B	C	D	E	F	G	H
	I	J	K	L	M	N	O	P	R
	S	T	U	V	W	X	Y	Z	[
]	\	^	_	a	b	c	d	e
	f	g	h	i	j	k	l	m	n
	o	p	q	r	s	t	u	v	w
	x	y	z		,	:	;	()

When you have OUTPUT PARITY set to NONE, the ATARI key controls whether the high bit is ON or OFF (most operating systems don't care).

Characters such as CTRL-4 or CTRL-SHIFT-<any key>, which aren't legal in ATASCII (or ASCII) cause CHAMELEON to lock until you type a legal character.

CONTROL CODES

TEST terminal

The TEST terminal type simple prints all characters it receives, and so it doesn't respond to any control codes. Bytes with the high bit set appear in inverse video. Control characters appear as their ATASCII equivalents (e.g., ASCII nulls show up as little hearts and CTRL-P as a little club).

GLASS TTY terminal

The GLASS TTY terminal type prints all characters except ASCII 0-31 and ASCII 127. Most control codes are ignored. The following, however, are recognized:

TABLE 5 CONTROL CODES FOR GLASS TTY

ASCII Name	Decimal Value	Action
^G	7	Flash visual bell
^H	8	Backspace cursor without erasing character under cursor
^I	9	Tab to next 8-column tab stop
^J	10	Move cursor down one line
^L	12	Clear screen, home cursor
^M	13	Move cursor to beginning of line

ADM-3A Terminal

The ADM-3A terminal type prints the same characters as the GLASS TTY terminal type, but it handles a different set of control characters. They are as follows:

TABLE 6 CONTROL CHARACTERS FOR ADM-3A

ASCII Name	Decimal Value	Action
^G	7	Flash visual bell
^H	8	Move cursor left one space; don't erase character under cursor
^J	10	Move cursor down one line
^K	11	Move cursor up one line
^L	12	Move cursor right one character
^M	13	Move cursor to beginning of current line
^Z	26	Clear screen, home cursor
^[=<Y+32><X+32>	27, etc.	Set cursor to (X,Y)
^^	30	Home cursor

VT-52 Terminal

The VT-52 terminal type prints the same characters as the GLASS TTY terminal type. It reacts to control characters the same as the GLASS, except when ESC (decimal 27) is received. CHAMELEON will treat the next character received specially. If the character isn't in the following table, CHAMELEON ignores it; if the character is in the table, the action is as follows.

TABLE 7 CONTROL CODES FOR VT-52

Letter following ESC	Decimal Value	Action
A	65	Move cursor up one line
B	66	Move cursor down one line
C	67	Move cursor right one column
D	68	Move cursor left one column
H	72	Home cursor to (0,0) (top left of screen)
I	73	Reverse line feed--moves cursor up one line. Top of screen scrolls down one line.
J	74	Clear from cursor to end of screen
K	75	Clear from cursor to end of line
Y<Y+32><X+32>	89<Y+32><X+32>	Move cursor to (X,Y)
Z	90	Sends ESC/Z to R device

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ATARI PROGRAM EXCHANGE

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1. Name and APX number of program _____

2. If you have problems using the program, please describe them here.

3. What do you especially like about this program?

4. What do you think the program's weaknesses are?

5. How can the catalog description be more accurate and/or comprehensive?

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program?

- _____ Easy to use
- _____ User-oriented (e.g., menus, prompts, clear language)
- _____ Enjoyable
- _____ Self-instructive
- _____ Useful (non-game software)
- _____ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

8. What did you especially like about the user instructions?

9. What revisions or additions would improve these instructions?

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

11. Other comments about the software or user instructions:

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