VIC 20

The friendly computer

VICMODEM™

VICMODEM
Telephone Interface Cartridge

commodore COMPUTER
Made in U.S.A.

Model 1600

Retrocomputing

commodore
COMPUTER

REQUIRED FCC NOTICE

The Federal Communications Commission (FCC) has established rules which govern data modem direct connection to the telephone network. A jack is provided by the telephone company for the direct connection. Jacks of the modular type required for the connection are not provided on party lines or coin lines.

If it is suspected that the data modem ¡is malfunctioning, it may be causing effects on the telephone lines outside the permissable operating specification of FCC 68. In this case, the modem should be disconnected until the source of the difficulty is determined.

This equipment generates and uses radio frequency energy and if not installed in strict accordance with the installation and operating instructions may cause interference to radio and television reception. The modem has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications of Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this modem does cause interference to radio or television reception, which can be determined by disconnecting the modem, the user is encouraged to try to correct the interference by changing the position of the VIC with respect to the television or radio.

A PIONEERING ACHIEVEMENT IN MODEM TECHNOLOGY

Commodore wants everyone to join the "Computer Revolution" that's why we invent products which are not only revolutionary but also affordable. The VICMODEMTM is only an example.

When Commodore introduced VIC 20TM the Friendly Computer, the first color computer priced under $300, we wanted to include a telephone modem to go with it, but we wanted our modem to be in the $100 range, so everyone could afford telecomputing.

Unfortunately none of the major modem manufacturers we contacted would, or could, make a modem we could sell at this price. Finally we located a small creative design group and presented them with our concept and design specifications. The group started working with us and a few months later delivered the modem we asked for. It took a total of 6 months from concept to production and in March 1982 the first VICMODEMs were delivered for sale.

The result is a low priced modem cartridge which plugs into the VIC 20 and connects directly to your telephone. The VIC 20 and the VICMODEM together retail for less than $410... and that price is lower then the price of many modems!

We at Commodore are committed to leading the Personal Computer Revolution with new products that bring you the most advanced technology available, at prices you can afford.

WHAT IS ELECTRONIC COMMUNICATIONS?

What is "Electronic Communications"? Very simply, it's the ability to send and receive information over phone lines using your computer. The VICMODEM "translates" electronic signals to and a from your computer so those signals can be sent over the telephone. Your VICMODEM lets you communicate and

exchange data with almost any type or size computer. You can use your VIC to "talk" over the phone with other VIC users or users of other computers, tie into computer "telephone bulletin boards," or access a computer information service.

SCIENCE FICTION IS NOW REALITY

Science fiction writers used to speculate that one day we'd be able to use "electronic libraries" in our home or office - the technology has been here for several years - but it took the low-priced VIC-20 and VICMODEM to make this service affordable... and turn science fiction into reality.

Your Commodore computer gives you tomorrow's world of electronic communications...today. By allowing you to connect your computer to a telephone, your VICMODEM puts you in touch with incredible information services like "CompuServe", "The Source", "Dow Jones", and other computer networks.

FREE "COMPUSERVE" SUBSCRIPTION

As a VICMODEM owner, you're entitled to **ONE FREE HOUR** of access time on the CompuServe Information Service... **PLUS** ... Commodore gives you a **FREE SUBSCRIPTION** to CompuServe, wich includes Commodore's own special information network for Commodore computer users.

Here are just a few of the services available through CompuServe (and the "Commodore Information Network"):

* educational programs	* commodities prices
* sports scores	* newswire stories
* encyclopedia	* financial reports
* computer games	* wordprocessing
* spelling aids	* stock quotes
* home budgeting	* airline schedules
* electronic mail	* research data
* Commodore Product News	* Commodore Technical Data

With your new modem, YOU can access information resources that up to now only the largest libraries and businesses could afford. If you're a programmer, you can use different computer languages and programming tools. Add to this the many personal services available and you've stepped into the next era of technology ... the Computer Information Age.
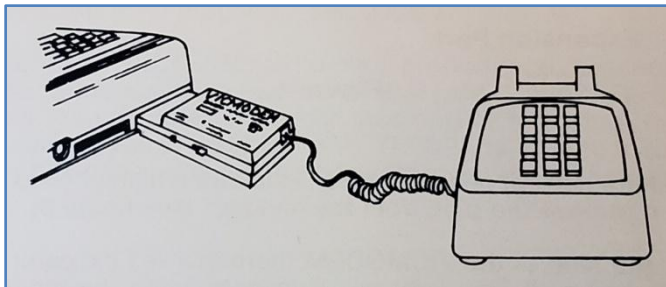

GETTING STARTED --- STEP-BY-STEP INSTRUCTIONS

Please read this entire manual before you turn on your computer. Here is a step-by-step explanation of how to connect and use the modem:

INSTALLING THE VICMODEM

1. Make sure your computer is turned OFF. (When ever inserting or removing any cartridge it is best to have the unit off.

2. Insert the VIC MODEM into the User Port (see figure 1).

3. Turn your computer on.
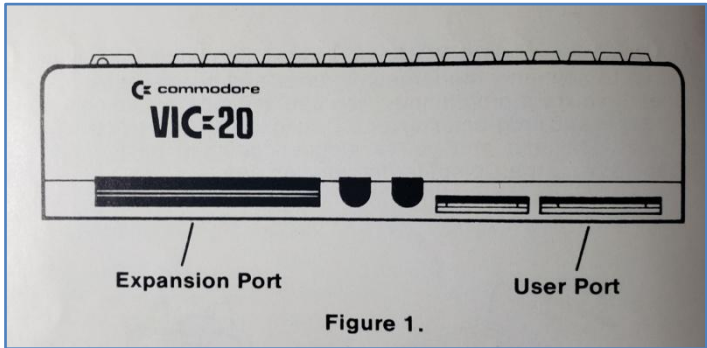
Figure 1.

3. Dial the correct phone number, listen for a high pitched tone, then remove the plug from the handset. (see figure 3)

4. On the side of the VICMODEM there is a red indicator light. (see figure 2) This light will illuminate when the modem is transmitting and receiving information via the telephone.

Figure 2.

4
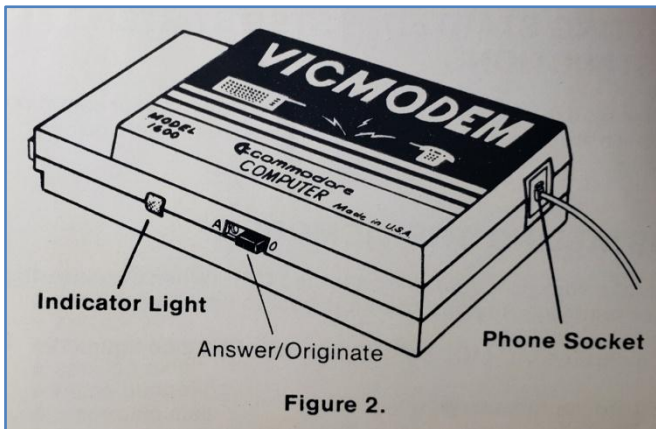
5. Load your terminal software (you will need to use a "terminal program" to allow your VIC to "talk" over the telephone). You can use any of the following programs.

a. VICTERM 1 - this is a cassette program included with your VICMODEM. Requires use of the DATASSETTE to load into the computer. See instructions later in this manual.

b. VICTERM-40 Cartridge - A special Terminal cartridge available summer 1982.

c. VIC-terminal program. - see page 7.

6. In order for VICTERM I to function properly you must not have any cartridges in the Expansion Port (see figure 1). Be sure to turn the computer off before inserting or removing any cartridges. If you are not using VICTERM I be sure to follow the instructions as given in the manual provided with the software.

CONNECTING THE TELEPHONE

1. **You must have a modular telephone in which the plug may be disconnected from the handset.** (see figure 3) If your handset does not have an RJ11C plug (a four pin plug) you may have to purchase a VICMODEM Non Modular Telephone Adapter.

2. Set the originate/answer switch on the side of the modem to the correct position. You should push it to the "O" position (originate mode), when you are using your computer to "talk" to most information providers. **It will be in this position to the Commodore Information Network**. It is set "A" (answer mode), when you are receiving a call originated by another computer; example, you plan to communicate directly by phone with a friend; he will start his VICMODEM in "originate mode" and you will set yours to "answer mode".

4. Insert the plug into the phone socket in the back of the VICMODEM. (see figure 2) Now your computer is ready to operate as a terminal. At this point you must follow the instructions given to you with your CompuServe subscription, or, if using another service, in their instructions. (NOTE: Once you have removed the handset, put it on the side, DO NOT put it on the phone cradle!)
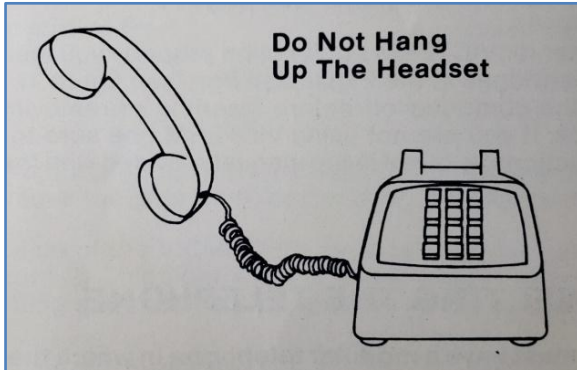
SOFTWARE

Included **FREE** in this package is VICTERM 1, which is loaded into your computer via the Commodore DATASSETTE. By loading this software and following the instructions provided in the manual your computer will be able to operate over the telephone.

Also available is VICTERM-40, a cartridge which plugs into the VIC 20 User Port. This software package not only turns your VIC into a terminal, it gives you a 40 or 22 column display and allows you to save the valuable information you receive, on your Commodore printer or the Commodore disk.

The following computer program is for use with the VIC 20. This is a third method of turning your VIC into a terminal. You may type this into the computer and then start it by typing "run". those of you learning to program may find some of the routines interesting! For your convenience, we have provided an explanation of the listing.

Terminal Software for the VIC.

```
100 OPEN 5,2,3,CHR$(6)
110 DIM F%(255), T%(255)
200 FOR J=32 TO 64: T%(J) =J: NEXT
210 T%(13)=13: T%(20)=8: RV=18: CT=8
220 FOR J=65 TO 90: K=J+32: T%(J)=K: NEXT
230 FOR J=91 TO 95: T%(J)=J: NEXT
240 FOR J=193 TO 218: K=J-128: T%(J)=K: NEXT
250 T%(146)=16: T%(133)=16
260 FOR J=0 TO 255
270 K=T%(J)
280 IF K<>0 THEN F%(K)=J: F%(K+128)=J
290 NEXT
300 PRINT " "CHR$(147)
310 GET#5,A$
320 IF A$= "" OR ST<>0 THEN 360
330 PRINT " "CHR$(157); CHR$(F%(ASC(A$)));
340 IF F%(ASC(A$))=34 THEN POKE 212,0
350 GOTO 310
360 PRINT CHR$(RV) " "CHR$(157); CHR$(146);: GET A$
370 IF A$<>"" THEN PRINT#5,CHR$(T%(ASC(A$)));
380 CT=CT+1 a en
390 IF CT=8 THEN CT=0: RV=164-RV
400 IF (PEEK(37151) AND 64)=1 THEN 400
410 GOTO 310
```

NOTE: insert a space between the quotes in program lines 300, 330, and 360. Do not put a space in the quotes in line 320.

> **TIP**. Once you have typed the above program into
> your computer, save it on your tape or disk for
> future reference or use.

Software Explanation

Line Number(s)	Explanation
100	Opens channel to modem
110	Dimensions input and output buffers
200	Places special characters into transmitting array
210	Enters carriage return, disables Shift in to the array and defines the reverse key
220	Enters lower case characters into the array
230	Enters special characters into the array
240	Enters upper case characters into the array
250	Defines the RVS/OFF and f1 keys as break keys
260 thru 290	Defines the receiving array (F%) to be identical to the sending array (T%)
300	Clears the screen
310 thru 330	Reads from the modem and prints that character on the screen
340	Resets the quote mode
360 thru 390	Places a cursor on the screen for ease of reading and writing
400	Checks modem before sending characters

You can add the following line to your program to give the standard start and stop commands.

```
255 T1%(137)=03: T%(134)=17: T%(138)=19
```

> T%(137) turns the f2 key into a control C
> T%(134) turns the f3 key into a control Q
> T%(138) turns the f4 key into a control S

GLOSSARY

The following is a brief explanation of a few of the words used in this manual.

1. Answer/Originate — This function refers to the switch on the side of the VICMODEM and allows your computer to initiate communications or receive data when another VIC or other computer connects to you. **You will use originate mode when signing onto the Commodore Information Network**.

2. BPS (Baud Rate) — This is the speed in which data is transmitted over a communications line. Your VICMODEM operates in the range 0 to 300 BPS (0 - 300 Baud).

3. Full Duplex — A full duplex mode is one in which two-way communications is accomplished by using two communications lines, one going in each direction.

4. Information Utilities — Providers of information services like "The Source" and "CompuServe". Information can be obtained (for an hourly connect fee) from the providers through your computer. The information you can obtain ranges from games, consumer information to an electronic encyclopedia, stock quotes and news reports.

5. Modem — A modem is your key to accessing the world of telecomputing. It is a data transmission device that converts computer "talk" into a form that can be carried over the phone lines.

6. X/ON and X/OFF — These commands allow you to stop and Start the flow of the data transmission on your screen. Control Q and control S are the traditional commands for X/ON and X/OFF.

TECHNICAL INFORMATION

VICMODEM is a data communications modem. The VICMODEM is compatible with the Bell 103 type modems. It is a direct connect modem, can operate in full duplex, has a switch selectable originate and answer mode and has a data rate of 0 to 300 BPS. (The baud rate may be changed thru VICTERM I).

Troubles?! Be sure your modem is firmly installed in the proper slot. If you still encounter telephone problems disconnect the VICMODEM. Check to see if you still have those problems. If not, the modem may have been the cause. Do not use it until it has been repaired (examine your warranty). The telephone company is not responsible for difficulties caused by this equipment.

TELEPHONE COMPANY NOTIFICATION

Since the VICMODEM utilizes phone lines, the telephone company will need the following information before it is connected to the phone lines:

* The telephone number, in your home, to which the modem is to be connected.
* The FCC registration number: B4V8N2-68331-KX-N
* The ringer equivalence: 0.0B

MODEM SPECIFICATIONS

Data Format: Serial, Binary, Asinchronous
Operate Mode: Manual Dial, Manual Answer/Originate select, Full Duplex
Data Rate: 0-300 BPS
Modulation: Frequency Shift Keyed

Line Interface: FCC part 68, Direct Connect
Data Interface: TTL Standard
Indicator: Data Carrier Detect Lamp
Power Requirement: 9-11 Vac, 60 Hz, 180 mW

VICTERM I

Introduction

The VICTERM I software gives your computer the ability to act as a "terminal". When you connect your microcomputer to a modem and a telephone you become an active participant in the Information Age. To ease your entry into this era Commodore has designed VICTERM I so that you can enjoy your new VICMODEM within a matter of minutes. We have made every effort to make this manual and software as uncomplicated as possible. It's what we call "user friendly". The capabilities of VICTERM I can be best understood if you read the entire manual before attempting to use this software.

VICTERM I FEATURES
WHAT THE PROGRAM CAN DO

VICTERM I, has many impressive features. They include:

* **"User Friendly"** - menu operation where you can "order" such delectables as baud rate, parity, and stop bits to match almost any system! More about these terms later.

* **Format end of line** - use to stop wraparound. Wraparound occurs when a word is too large to fit at the end of a line, and the remainder of the word is continued on the next line. Even a little wraparound makes the text difficult to read. Therefore we designed the "Format end of line" to eliminate wraparound and create easier to read text!

* **2 color option** - aids in reading the computer dialogue by making your text a different color than the host computer's text. This makes the dialogue easier to read.

* **Activated control** - keys to send operating instructions to the host computer such as stop, hold, and begin transmitting.

* **100% machine language program** - give you very fast and accurate program operation.

SPECIAL FUNCTIONS MENU

A menu is a listing of all the options available to the user, in the same manner a restaurant menu is a listing of the entrees available. When VICTERM I indicates "TERMINAL READY" you can call up a menu at any time by typing f4 (To do this, hold down the SHIFT key and press f3). VICTERM I sends the other computer a special character (control S for the technically minded) that tells it to stop sending so you won't lose any data while reading the menu.

There are 2 different menus, the Communications Format Menu and the VIC Control Menu. You can switch from one menu to the other by typing the N key. When finished with the menu, type the T key to get back into terminal mode. The VIC sends the character (control Q) that tells the computer to resume sending information to you.

A. COMMUNICATION FORMAT MENU, MENU #1

1. Baud Rate - This controls the speed of communications in bits per second. The VICMODEM operates in the range 0 to 300 baud. If you get nothing but strange characters on the screen, check the baud rate.

   To set the baud rate press the B key, then use the CRSR right key until the correct rate is found. Press RETURN to make the selection.

2. Duplex — A computer in full duplex mode will "echo" back to the sender's screen all signals it receives. This checks information against loss or alteration. It is similar to speaking to someone who repeats every word you say.

   The half duplex mode of operation does not "echo", It is similar to normal conversation between two people.

   Below is a table of duplex combinations between two computers and the results you can expect on your screen.

Table 1. Duplex Settings

Host Computer	Your Computer	Your Screen
Full	Full	Normal
		Ex: HELLO
Full	Half	Double characters on screen
		Ex: HHEELLOO
		1st character is yours
		2nd character is the host
Half	Full	Only see the Mainframe characters
Half	Half	Normal

Sometimes it is desirable to have a particular combination of settings (ex: 2 color VIC option requires that both computers operate at half duplex). To make changes refer to the host computers reference manual.

3. Word Length - This controls how many bits are in each character. Most computers use 7 or 8 bits.

    Set the word length by pushing W, then use the CRSR right key to make your selection. Press RETURN when finished.

4. Stop Bits - Some computers require that blank bits be sent after each character, to signal the end of a character. Normally, a 300 baud computer gets 8 bits of data for each character, this makes a total of ten bits including the start and stop bit. Hence, 300 baud becomes 30 characters per second.

    To set the number of stop bits, you press the S key, use the CRSR right key to select the number of stop bits. Hit RETURN when the proper selection is made.

5. Parity - Some computers check for transmission errors by setting the highest bit in each character in a certain way. In even parity, the total number of "on" bits in each character should always be an even number, in odd parity, the number of "on" bits is odd. Space parity always leaves the highest bit off and mark parity leaves the bit "on".

    Incorrect parity will cause many of the characters to be printed incorrectly.

    Set the parity on the first menu page by pressing the P key, then use the CRSR right key to select the proper parity. Press RETURN when through.

B. VIC CONTROL MENU, MENU #2

1. Linefeed - You press return at the end of a line, in order to start a new line. Some computers expect to receive a "carriage return", to start a new line. Other computers expect both a "carriage return" and a "linefeed" signal. You can select both signals by pressing L. To choose the "carriage return only signal" type C.

2. VIC-to-VIC/VIC-to-ASCII - Most computers create characters according to a standard set of codes called ASCII. Commodore's computers use a slightly different set of codes. VICTERM I translates this different "language" from other computers as well as giving you the full range of graphics and sound when communicating VIC to VIC. When on the second menu press V to transmit or receive from a Commodore computer. Any other computer requires VIC to ASCII, select A.

3. 2 Color Option - To improve readability, we have made it possible to display characters you send in one color and the characters you receive in another color. Select the 2 color option by hitting the 2 key, while the second menu is displayed. To cancel this feature press the 2 key again.

4. Format End of Line - Words that run past the end of the line on the screen normally appear fragmented, partially on one line and partially on the next. By selecting format end of line, any words that would have been broken up are moved entirely to the next line, this makes text more readable.

   Select the format end of line by hitting F, and to cancel the choice press F again.

GETTING STARTED

1. VICTERM I tape should only be used on VIC's without extra memory. This means there can be no expander cartridges or game cartridges plugged into the back of the VIC. When the screen comes up it should read 3583 bytes free.

2. Install the modem as given in the modem instruction manual.

3. Turn on the VIC, and rewind the VICTERM I tape.

4. Type "Load" command on the VIC, press play on the cassette when prompted on the TV screen.

5. When the VIC has found the program, "loading" will appear on your TV screen, which lasts for a minute or two.

6. As soon as loading is complete the computer will say "READY." Type "RUN" and press return. The screen will briefly flash the copyright notice and next, TERMINAL READY will appear at the top of the screen.

7. Type f4, to make the necessary selections from the menu pages. Press N to change from menu one to menu two. Type T to enter terminal mode.

8. Now pick up your telephone. Dial the telephone number of the computer you're calling. The computer will answer the phone with a high pitched tone. Connect the phone jack to the back of the modem. The red light on the modem will light up when the connection is complete.

9. Use the sign on procedure as described in your computer network reference guide.

CHANGING SCREEN COLORS

VICTERM I lets you control the character, screen and border colors. To change the screen color, for example, hold down the CTRL key and hit the f3 key; you'll see the color change on the screen. Continue pressing the f3 key until screen is the color you want. Below is a table of the color control functions.

Table 2. Color Controls

Depress CTRL key with:	Effect on Output:
f3	screen background
English Pounds	border
f5	character color
f1	(2 color mode only)
	sending computers character color

FUNCTION KEYS

We have set each of the function keys to send a different control signal.

Type	Result
f1	control C
f3	control P
f5	control Q
f7	control S

Control C and control S are traditionally used to indicate a stop command; control Q means to resume sending and control P is a break key. (This tells the computer that you want to exit the program you are currently running.)

Check the manual from the information provided to be sure that these keys are to be used.

COMMUNICATING
WITH OTHER COMPUTERS

"Talking" with your computer to other computers is as simple as typing on the keyboard. As you hit each key, the character is immediately transmitted through the modem, to the other computer. When communicating with another VIC (or any other Commodore computer) all the cursor control lets are active, including the CLR/HOME. This means you could clear someone's screen from miles away!

NOTE: Remember, communicating with another computer requires the modems to be set in opposite modes, one in "answer" the other in originate. Normally, working with services like CompuServe you modem should be set to "O" (originate).

Listed below, in table 3, is a listing of the ASCII codes, their functions and how to access these control commands on the VIC. Included in this listing are the special codes that tell the host computer to transmit, receive and stop.

Table 2. Generating ASCII Codes

ASCII #	FUNCTION	Hold CTRL and Press
3	End Transmission	C
7	Bell	G
9	Horiz. Tab	I
10	Linefeed	CRSR down
12	Form Feed	L
13	Carriage Return	RETURN
15	SI	O
17	X-On	Q
19	X-Off	S
27	ESCAPE	:
28	File Separator	Left Arrow
29	Group Separator	;
30	Record Separator	Up Arrow
31	Unit Seperator	-

NOTES

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