

AUTOMODEM
Users Manual
Model 1650

 **commodore**

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 the data modem is malfunctioning, it may be affecting the telephone lines outside the permissible operating specification of FCC 68. In this case, the modem should be disconnected until the source of the difficulty is traced.

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 computer with respect to the television or radio.

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THE 1650 AUTOMODEM: A PIONEERING ACHIEVEMENT IN TELECOMPUTING

Commodore wants everyone to take an active part in the Computer Revolution. That's why we invent products that are revolutionary in technology and in price. That's also why we introduce products that make your computer easier to use. Your new 1650 AUTOMODEM is one example of our commitment to making state-of-the-art home computer accessories that are reliable, easy to use, and reasonably priced. The AUTOMODEM lets you use your telephone to connect your computer to other computers and to large computer information services, such as CompuServe, the Source, Dow Jones, and the Commodore Information Network.

The AUTOMODEM works with either the Commodore 64 or the VIC 20 personal computer. This package contains a software cassette called TERM 64 to use with a Commodore 64, and VICTERM I to use with a VIC 20.

The AUTOMODEM offers new features not present in the VICMODEM, which is Commodore's other modem:

- * Built-in Phone Adapter
- * Built-in Y Adapter
- * Automatic Answering
- * Automatic Dialing
- * Compatibility with any modular phone, including Trimline

Automatic dialing and answering make telecomputing even faster and easier. These easy-to-use features are included in the TERM 64 program for the Commodore 64. The VICTERM I program for the VIC 20 includes automatic dialing, but not automatic answering.

TELECOMPUTING

Sending and receiving information on computers over phone lines is called telecomputing. The AUTOMODEM translates electronic signals to and from your computer so that those signals can be sent over phone wires to another computer. Telecomputing lets you instantly perform tasks like these:

- * Sending work from one site to another,
- * Copying programs and information from dial-up computer services,
- * Sending and receiving electronic mail,
- * Connecting your computer to almost any type and size computer.

FREE SUBSCRIPTIONS TO COMPUTER INFORMATION SERVICES

One of the extras we've included with your AUTOMODEM package is free subscriptions to some of the computer information services that you can use with your modem. For example, we've included a free subscription and a free hour of CompuServe and Dow Jones as well as Comp-U-Card and General Videotex (Delphi). The subscription to CompuServe includes access to the Commodore Information Network, our own special information service for Commodore computer users.

Here are just some of the services available through CompuServe and the Commodore Information Network:

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

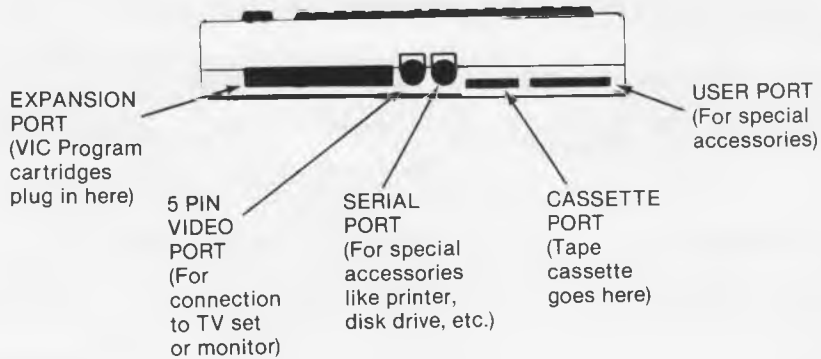
With your new modem, you can access information resources that up to now only the largest libraries and businesses could afford. If you're a programmer, you can use different computer languages and programming tools. Both programmers and non-programmers can take advantage of the many personal services offered through this network.

GETTING STARTED: STEP-BY-STEP INSTRUCTIONS

Please read this entire manual before you turn on your computer. Later in this manual we'll explain how to use the necessary software. Here is a step-by-step explanation of how to connect and use the modem:

INSTALLING THE AUTOMODEM

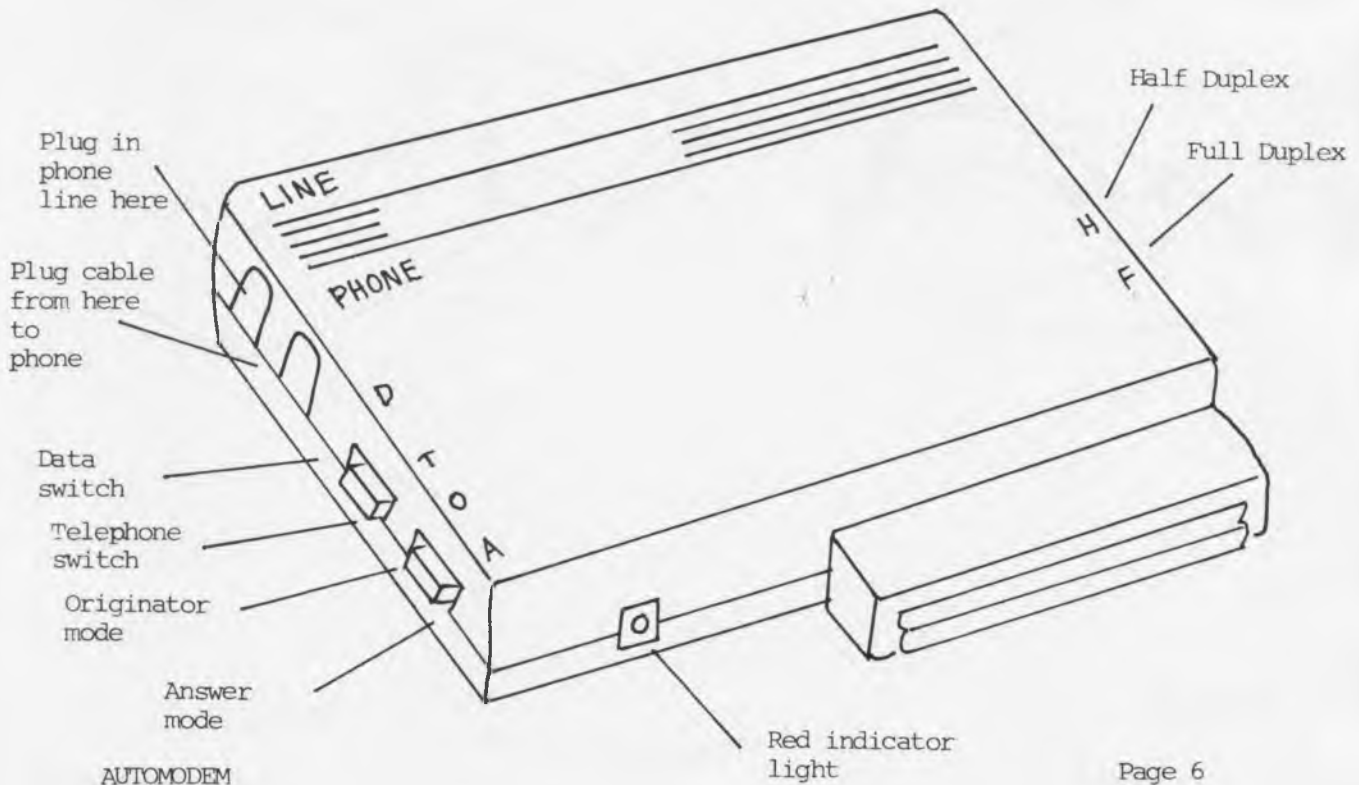
1. Make sure your computer is turned OFF. Whenever inserting or removing any cartridge, make sure your computer is off.
2. Insert AUTOMODEM into the User Port. The picture shows the VIC 20; the user port is in the same position on the Commodore 64.
3. Turn your computer ON.



CONNECTING THE TELEPHONE

You must have a MODULAR phone, but you do not need a modular handset because the AUTOMODEM is plugged into the cord at the base of the phone, not the cord on the handset. The AUTOMODEM has a built-in phone adapter, which means that you can use the modem with ANY TYPE OF MODULAR PHONE, including the Trimline model.

1. Set the Originate/Answer switch on the side of the modem to the correct position. You should push the switch to the O (Originate) position when you are sending information from your computer. For example, this switch should be in the O position when you connect to the Commodore Information Network. Set the switch to A when you are receiving a call from another computer. For example, if you plan to receive a program from a friend, the friend will start in Originate mode, and you will start in Answer mode.
2. Set the Full/Half Duplex switch according to the requirements of the service you are using. There are some additional instructions in the AUTOMODEM box that show which choice to make.
3. Set the Telephone/Data switch. This switch lets you keep the AUTOMODEM attached to your phone even when you aren't using the modem. Just set the switch to the D (Data) position when you want to use the modem, and T (Telephone) when you want to use your phone for regular calls.

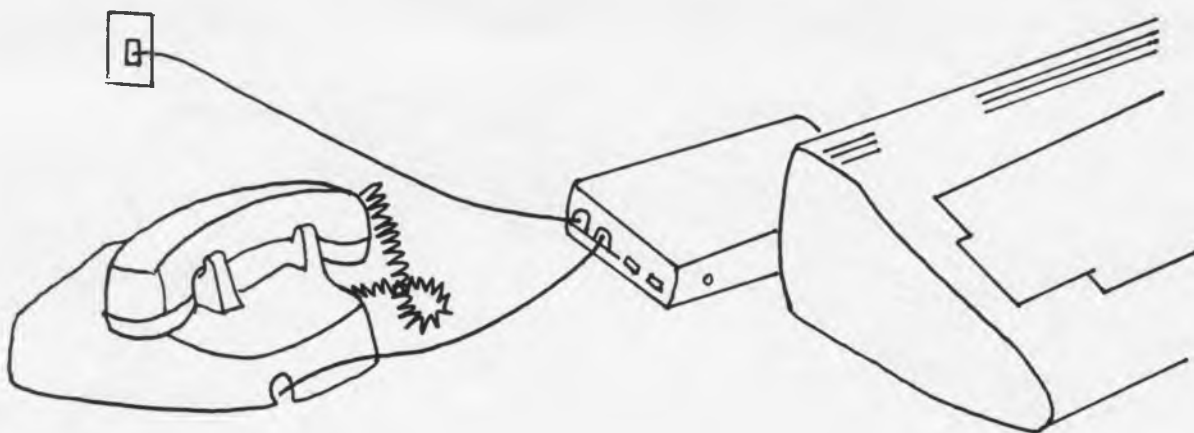


4. Unplug the phone line from the base of your modular phone. Insert the phone line into the socket marked LINE on the AUTOMODEM (see figure 2). Plug one end of the other line into the socket marked PHONE on the AUTOMODEM. Plug the other end into the back of the phone. Now your computer is ready to be operated as a terminal.

If you are using one of the computer information services, refer to the instructions you received with your subscription.

DISCONNECTING THE AUTOMODEM

Manually disconnect the AUTOMODEM by setting the Telephone/Data (T/D) switch to the Telephone (T) position. Although the AUTOMODEM is still connected to your telephone, the modem is off and the phone works normally.



SOFTWARE YOU CAN USE WITH THE AUTOMODEM

Your AUTOMODEM depends on a software program to work. You need this software to make your computer act like a terminal. There are several terminal programs you can use with your AUTOMODEM.

Your AUTOMODEM package includes a FREE cassette that contains two terminal programs:

1. TERM 64 for the Commodore 64. This easy-to-use program lets you use all the automatic features of the AUTOMODEM.

2. VICTERM I for the VIC 20. Similar to TERM 64, this terminal program lets you use automatic dialing.

You can also use VICTERM 40, a cartridge that plugs into the VIC 20. This software package not only turns your VIC into a terminal, it also gives you a choice between a 40 or 22 column display. VICTERM 40 also lets you save the information you receive on disk or print it on your Commodore printer.

Appendix A contains two BASIC terminal programs that you can key in to turn your computer into a terminal.

USING THE TERMINAL SOFTWARE

The free cassette terminal programs, TERM 64 and VICTERM I, are easy to use. Just follow these steps:

1. Install the AUTOMODEM as previously described.
2. LOAD the terminal program by keying in:
LOAD "program name"

The program name is either TERM 64 or VICTERM I. If you use the BASIC terminal program listed in this manual, LOAD it with whatever name you give it when you store it on tape or disk.

3. Key in RUN to start the program when you see the READY prompt.
4. Wait for the prompt that displays this message:
DISCONNECTED
TERMINAL READY

Now you are ready to dial the computer service. The subscription information from each computer service contains the phone numbers and any other data you need for connecting to the service.

There are two ways to connect to a computer service:

1. Use the auto-dial feature to dial a stored number.
2. Input the number when you are prompted.

STORING PHONE NUMBERS

Storing phone numbers for auto-dialing is simple. If you are using a VIC 20, you can store up to five numbers with a maximum of 30 digits each. If you are using a Commodore 64, you can store up to ten numbers with a maximum of 30 digits each. Just follow these steps to SAVE phone numbers:

1. LOAD the TERM 64 program and wait for the READY prompt.
2. Key in LIST to display the phone number storage screen. This screen includes five PRINT statements (lines 20 - 50), each of which can hold one phone number with a maximum of 30 digits.
3. Move the cursor to the first * in the PRINT statement at line 20.
4. Enter the number. You cannot include either of these two symbols: * or # in the number sequence. Include a P (for Pause) if a dial tone interrupts your dialing sequence. For example, if the phone system you are using requires you to dial a 9 to get an outside line, and then gives you a dial tone before you can dial the number, key in the number like this: 9P2221234. Be sure to press the RETURN key after you key in the number.
5. Repeat this sequence for up to four other numbers you want to store, moving the cursor to the first * in the next line before keying in the number.
6. SAVE the phone number program to tape or disk so you can reuse the numbers when you want to auto-dial. Do NOT use the TERM 64/VICTERM I cassette for SAVEing the numbers. Instead, store them on another tape or disk.

DIALING THE COMPUTER SERVICE

When you want to dial the number, using either a stored number or a number you'll input yourself, follow these steps when you see the READY prompt:

1. Key in RUN. You'll see a title screen for the terminal program, and then a TERMINAL READY prompt.
2. Press the F6 key on the right side of the keyboard. You must hold down the SHIFT key to activate F6.
3. Wait for the screen that reads:

```
MOVE T-D SWITCH TO D
MOVE O-A SWITCH TO O
INPUT PHONE NUMBER:
```

4. Move the switches on the AUTOMODEM box according to these instructions. Then do one of the following:
 - a. Key in the number and press RETURN if you are entering the number yourself.
 - OR- b. Key in the at sign (@) and a number from 0 to 4 for one of the five stored numbers. 0 dials the first stored number, 1 dials the second, etc. For example, @ 3 dials the fourth number you have stored on your number storage screen.

The red light on the modem comes on and the screen displays the TERMINAL READY prompt when you are connected to the computer service.

NOTE: If the modem's red light is on and the INPUT PHONE NUMBER screen is displayed, press RUN/STOP to begin communicating.

Each computer service's introductory screen differs. Consult the service's subscription material for instructions on how to supply the information you're prompted for when you're connected.

NOTE: If you make a mistake while entering a number, press the up arrow (right side of keyboard) to clear the screen and redisplay the INPUT PHONE NUMBER screen. Just enter the number again. This is the only way to correct the number because the delete and cursor keys don't work during the INPUT PHONE NUMBER screen. If you want to return to the TERMINAL READY prompt screen, press the RUN/STOP key.

If you don't succeed in connecting to the service you've dialed and the modem hangs up, the auto-dial feature lets you simply redial without reLOADing the program. Just press F6 and repeat the dialing procedure.

NOTE: TERM 64 and VICTERM I won't work properly if you have any cartridges in the expansion port. Be sure to turn the computer OFF before you remove or insert any cartridges.

AUTOMATIC ANSWERING

TERM 64 lets you use your Commodore 64 to automatically answer a modem call. Follow these simple steps:

1. Install the AUTOMODEM.
2. LOAD the terminal program.
3. RUN the program.
4. Press the f8 key when the TERMINAL READY prompt appears. Remember to hold down the SHIFT key to activate f8. F8 displays the auto-answer screen.
5. Move the switches on the AUTOMODEM according to the instructions on the auto-answer screen:

```
MOVE T-D SWITCH TO D
MOVE O-A SWITCH TO A
WAITING FOR CALL
```

NOTE: Press RUN/STOP to get back to the TERMINAL READY screen if you want to terminate the auto-answer feature.

You do not need to be near your computer to receive the call because automatic answering waits to do this for you. When the connection is made, the red light on the AUTOMODEM comes on, and the TERMINAL READY screen reappears.

MANUAL ANSWERING

To answer an incoming call with the AUTOMODEM, follow these steps:

1. Install the AUTOMODEM.
2. LOAD the terminal program.
3. RUN the program.
4. Set the T-D switch to T (Telephone) so you hear the phone ring.
5. Set the O-A switch to A (Answer). The computer sending data to you must be set on O (Originate).
6. Reset the T-D switch to D (Data) when the call comes through. Now you are ready to receive.

You must remain in Answer mode throughout the transmission. Do not reset this switch when you want to send a message to the Originating computer; you can send in Answer mode.

USING THE SPECIAL FUNCTIONS MENU

A menu is a list of all the available options, just like a restaurant menu. When the terminal program indicates "TERMINAL READY", you can call up a menu at any time by pressing the F4 key (be sure to hold down the SHIFT key). The terminal program sends the other computer a special character (control S) that tells it to stop sending so you won't lose any data while reading the menu.

There are two pages in the special functions menu: the Communications Format Menu and the Control Menu. You can switch from one menu to the other by typing the N key. When you are finished with the menu, type the T key to get back into terminal mode. Your computer sends the character (control Q) that tells the other computer to resume sending information to you.

If you have problems with a transmission, try different combinations of settings. For example, if you have problems using 2-color mode while communicating with another Commodore computer, try different duplex settings, both on the menu and on the AUTOMODEM box.

A. COMMUNICATIONS FORMAT MENU

Before you can communicate with another computer, you must set the parameters of the terminal program to agree with the host computer. The parameters that must be compatible with the host are Baud Rate, Duplex, and Word Length.

The terminal programs we provide are preset to CompuServe parameters. To change any of the parameters, follow these simple steps:

1. Key in the highlighted letter of the parameter you want to change.
2. Press the CuRSoR right key until the highlighted box is over the selection you want to make.
3. Press RETURN to finalize the selection.

Here is a brief description of the parameters:

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

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.

Table 1 shows duplex combinations between two computers and the results you can expect on your screen.

Table 1. Duplex Settings

Host Computer	Your Computer	Your Screen	Example
Full	Full	Normal	HELLO
Full	Half	Double characters on screen	HHEELLLOO 1st character is yours 2nd is host's
Half	Full	Only see the mainframe characters	
Half	Half	Normal	

Sometimes you need to have a particular combination of settings. For example; the 2 color VIC option requires both computers to operate at half duplex. To make changes, refer to the host computer's reference manual.

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

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. 300 baud is 30 characters per second.

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 causes many characters to be printed incorrectly.

B. CONTROL MENU

1. LINEFEED

You press RETURN at the end of a line to start a new line. Some computers expect to receive 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. ASCII-to-COMMODORE 64 / 64-to-64, or ASCII-to-VIC / VIC-to-VIC

Most computers create characters according to a standard set of codes called ASCII. Commodore's computers use a slightly different set of codes. The terminal program translates this different "language" from other computers as well as giving you the full range of graphics and sound when communicating VIC to VIC or 64 to 64. When on the second menu, press V to transmit or receive from a Commodore computer. Any other computer requires 64 or VIC to ASCII; select A.

3. 2 Color Option

To improve readability, you can display the 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.

CHANGING SCREEN COLORS

TERM 64 and VICTERM I let you select the color of the character, screen, and border colors. You can change colors only when you are at the screen that displays the TERMINAL READY prompt. This table shows which keys to press to change the colors:

COMMODORE 64	VIC 20	EFFECT ON OUTPUT
CTRL and 5	CTRL and f5	character color
CTRL and 8	CTRL and f3	background color
CTRL and 1	CTRL and English pound	border color
CTRL and 4	CTRL and f1	sending computer's character color (2 color mode only)

FUNCTION KEYS

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

KEY	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; control P is a break key. Breaking tells the computer that you want to exit the program you are currently running.

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

COMMUNICATING WITH OTHER COMMODORE 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 Commodore computer, all the cursor control keys are active, including the CLR/HOME. This means you could clear someone's screen from many miles away.

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

Table 2 lists the ASCII codes, their functions, and how to access these control commands on your computer. 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	Horizontal 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 Separator	-

GLOSSARY

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

1. Answer/Originate

This function refers to the switch on the side of the AUTOMODEM and allows your computer to initiate communications or receive data when another computer connects to you. You use Originate mode when signing onto the Commodore Information Network.

2. Baud Rate (BPS)

This is the speed at which data is transmitted over a communications line. Your AUTOMODEM operates in the range 0 to 300

3. Computer Information Services

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 includes consumer information, an electronic encyclopedia, stock quotes and news reports.

4. Half/Full Duplex

A full duplex mode is one in which two-way communication is accomplished by using two communications lines, one going in each direction. Half duplex uses one communication line.

5. Modem

A modem is the hardware device that lets you telecompute. It is a data transmission device that converts computer "talk" into a form that can be carried over the phone lines.

6. Telephone/Data

The T/D switch on the side of the AUTOMODEM lets you switch back and forth from using your phone line for regular conversation (T) or for modem transmissions (D).

7. 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.

APPENDIX A

TERMINAL PROGRAMS

This simple program turns your computer into a terminal. Once you have keyed it in, you should SAVE it on tape or disk so you can reuse it. After you LOAD this program, just key in RUN to turn the computer into a terminal.

```
100 OPEN 5,2,3,CHR$(6)
110 DIM F%(255), T%(255)
200 FOR J=32 TO 64: T%(J)=:NEXT
210 T%(13)=13: T%(20)=8: RV=18: CT=0
220 FOR J=65 TO 90: T%(J)=K:NEXT
230 FOR J=91 TO 95: T%(J)=J:NEXT
240 FOR J=193 TO 218:K=J-128: T%(J)-K:NEXT
250 T%(146)=16: T%(133)=16
260 FOR J=0 TO 255
270 K=T%(J)
280 IF K <> 0 THEN F%(K)-J:F%(K+128)=J
290 NEXT
300 PRINT " "CHR$(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);:GETA$
370 IF A$ <> "" THEN PRINT#5,CHR$(T%(ASC(A&)));
380 CT=CT+1
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 in on tape or disk for future use.

TERMINAL PROGRAM EXPLANATION

Line Number	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 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 - 290	Define the receiving array (F%) to be identical to the sending array (T%)
300	Clears the screen
310 - 330	Read from the modem and prints that character on the screen
340	Resets the quote mode
360 - 390	Place a cursor on the screen for ease of reading and writing
*400	Checks modem before sending characters

* Delete line 400 if you are using a Commodore 64.

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

```
255 T%(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

AUTOMATIC ANSWER AND DIAL CODE

If you prefer to write your own terminal program, use this BASIC code for automatic answer and dial features. All you add is your own communications code.

NOTE: Check LINE 5 for differences between code for the Commodore 64 and the VIC 20.

```
5 B1=37136:B2=37138: REM FOR 64 B1=56577 AND B2=56579
10 REM: ANCHOR AUTOMATION
20 REM: AUTOVIC DEMO
30 FOR X=1 TO 20
40 PRINT
50 NEXT X
60 PRINT "anchor"
70 PRINT "  automation"
80 PRINT "    inc."
90 PRINT
100 PRINT
110 PRINT"autovic demo"
120 PRINT"dialing & answer"
140 PRINT "programs"
150 PRINT
160 PRINT "hit any key to start"
170 GET A$:IFA$=""THEN170: REM WAIT FOR A KEY
180 GOSUB 1200: REM WAIT A WHILE
210 PRINT"select one:"
220 PRINT "<a>answer"
230 PRINT "<b>dial out"
240 GET A$
242 IF A$=""THEN 240
250 IF A$="a"THEN GOTO300
260 IF A$="b"THEN GOTO500
270 GOTO180: REM NOT A VALID KEY, DO AGAIN
280 :
300 GOSUB 1200: REM WAIT A WHILE
310 POKE B2,32: REM SET UP PORT B FOR ANSWERING
312 POKE B1,0
313 PRINT "move t-d sw to data"
314 PRINT:PRINT
315 PRINT "waiting for ring!!!"
320 X=PEEK(B1)
330 X=X AND 8: REM SEE IF RINGING
333 IFX=0THEN PRINT"ring detected!"
340 IF X=0 THEN GOTO 1000: REM PHONE WAS RINGING, START COMMUNICATING
350 GOTO 320: REM GO BACK AND CHECK AGAIN
360 END
499 :
```



```

500 GOSUB 1200: REM WAIT A WHILE
505 GOSUB 1200: REM WAIT A WHILE
510 POKE B2,32: REM SET UP PORT B FOR DIALING
520 POKE B1,0
525 PRINT"move t-d sw to data"
527 PRINT:PRINT
530 PRINT"enter no. to dial<cr>"
535 INPUT D$: REM INPUT YOUR PHONE #
540 POKEB1,32: REM PICK UP THE PHONE
550 T=1000
560 T=T-1:IFT<>0 GOTO560: REM WAIT A WHILE
570 D=LEN(D$)
580 FOR X=1 TO D
590 N$=MID$(D$,X,1)
592 PRINT N$;
600 N=VAL(N$): REM CALCULATE THE DIGIT
610 IF N=0THENN=10
620 GOSUB 650: REM DIAL THE DIGIT
630 NEXT X
633 PRINT
635 PRINT "dial complete"
640 GOTO 1000: REM START COMMUNICATING
644 :
645 REM SUBROUTINE TO PULSE THE LINE N TIMES
646 :
650 FOR N1=1 TO N
655 POKE B1,0
660 T=6
665 T=T-1:IFT<>0THEN665
670 POKEB1,32
675 T=4
680 T=T-1:IFT<>0THEN680
685 NEXT N1
686 :
690 T=70: REM WAIT A WHILE
692 T=T-1:IFT<>0THEN692
695 RETURN: REM DONE DIALING
799 END
800 :
1000 REM COMMUNICATION PROGRAM GOES HERE
1002 GOSUB 1200
1003 PRINT "ready to communicate!"
1010 END
1200 FOR ZZ=1 TO 36
1210 PRINT
1220 NEXT ZZ
1230 RETURN

```

APPENDIX B

TECHNICAL INFORMATION

AUTOMODEM is a data communications modem. The AUTOMODEM is compatible with the Bell 103 type modems. It is a direct connect modem, can operate in full half duplex, has a switch selectable originate and answer mode and has a data rate of 0 to 300 BPS (Bits Per Second). You can change the baud rate during the VICTERM I and TERM 64 programs.

Be sure your modem is firmly installed in the proper slot in the back of your computer. If you have telephone problems, disconnect the AUTOMODEM and test the telephone again. If the telephone now works properly, the modem may be the cause of the problem. Do not use the modem until it is repaired (examine your warranty). The telephone company is not responsible for difficulties caused by computer equipment.

TELEPHONE COMPANY NOTIFICATION

Since the AUTOMODEM uses phone lines, the telephone company needs the following information before the modem is connected to the phone lines:

- * The number of the telephone to which the modem is to be connected;
- * The FCC registration number; (located on modem decal)
- * The ringer equivalence: 0.1B

MODEM SPECIFICATIONS

Data Rate	300 bits per second	
Modulation	Frequency Shift Keyed	
Line Interface	Direct connect.	
Transmit Frequency	ORIG	ANSR

MARK	1270 Hz	2225 Hz
SPACE	1070 Hz	2025 Hz
Transmit Frequency Accuracy	.01%	
Transmit Level	-12 dbm typical	

Receive Frequency	ORIG	ANSR

MARK	2225 Hz	1270 Hz
SPACE	2025 Hz	1070 Hz
Receive Frequency Tolerance	.5%	
Carrier Detect Threshold	-44 dbm typical	
Carrier Detect Delay	250 ms typical	
Power Requirement	9-11 vac, 60 Hz, 300 mW Supplied via interface connector	
Pulse Duration	60 ms low (Break)	
Pulse Interval	40 ms high (Make)	
Digit Interval	700 ms min high (Make)	
Digit 1 to 9	1 to 9 pulses	
Digit 0	10 pulses	
Data Signal Sense		
OUTPUT (from modem)	MARK = HIGH SPACE = LOW	
INPUT (to modem)	MARK = HIGH SPACE = LOW	
Data Signal Levels		
OUTPUT (from modem)	MARK +4.5 V min typical SPACE +0.5 V max typical	
INPUT (to modem)	MARK +3.5 V min typical SPACE +1.5 V max typical	
Date Format	Serial, binary, asynchronous	
Operation Modes	- Computer controlled pulse dial, computer controlled answer, manual mode select, manual Telephone/Data select, manual full/half duplex select.	
Operating Environment	0 - 50 Degrees 95% RH noncondensing	
Maintenance	None required	
Registration	FCC Part 6B, B4V8N2-70317-DM-R	
Certification	FCC Part 15, Subpart J, Class B FCC ID: B4V8N2AUTOVIC	

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 **commodore**