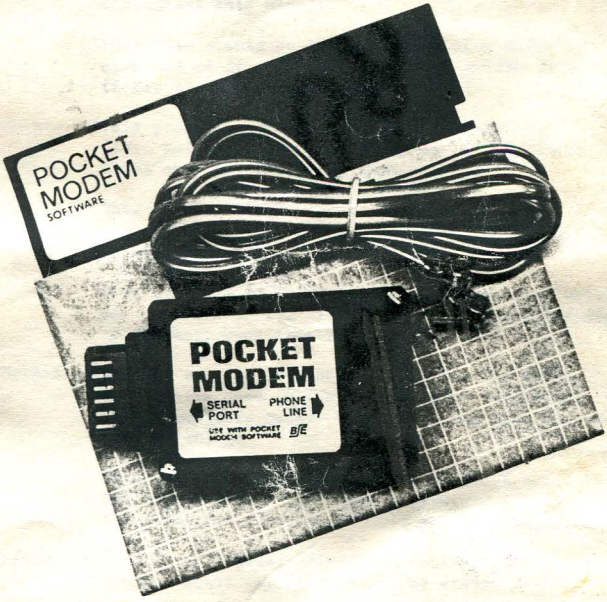
POCKET MODEM DOCUMENTATION

VERSION 2.08



** IMPORTANT NOTE IF YOU HAVE THE TERMINAL SOFTWARE ON DISK **

Due to a high demand for disk software, the Pocket Modem Terminal software is now supplied on Disk or Cartridge. If you have disk software, you should read the important information below.

The disk you received has four files on it. IT DOES NOT HAVE DOS ON IT AND WILL NOT FUNCTION AS IS. A listing and brief description of the files contained on this disk are shown below as well as a description of what should be done with these files.

TERM.OBJ - This is a disk version of the cartridge based Terminal program which is described in detail throughout this manual.

This file should be copied onto a disk which has only DOS on it. It can be renamed AUTORUN.SYS if the auto boot facility is desired.

This program should be loaded with BASIC out. (ie. Hold down the option key on the 600XL and 800XL when switching the computer on).

PDRIVE.OBJ - This is a machine language driver utility for the Pocket Modem which is used with the MODEM.BAS Terminal program.

This file should be copied onto another disk which has only DOS on it. It can be renamed AUTORUN.SYS if the auto boot facility is desired.

MODEM.BAS - This is a Basic Terminal Program for the Pocket Modem which runs in conjunction with PDRIVE.OBJ This program is public domain and has been included free of charge.

This file should be copied onto the disk which has DOS and the above mentioned PDRIVE.OBJ file on it. The MODEM.BAS file name should not be changed.

PDRIVE.DOC - This is an ATASCII file which contains the documentation for the PDRIVE.OBJ driver utility.

LOADING DISK SOFTWARE:

- Turn your computer and disk drive off.
- Plug the phone line into the modem.
- Insert the modem into the extra serial connector on the back of the disk drive.
- Turn your drive on and insert the Pocket Modem Terminal software disk.
- Turn your computer on.
  (If you have an 600XL or 800XL and you are using the machine language terminal program, you must hold down the OPTION key).
  (If you have an Atari 400 or 800 and you are using the Basic terminal program, you will require a Basic cartridge).
- The file should load into the computer and the main menu should appear on the screen after a few seconds.
- The Pocket Modem is now awaiting your command.

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INTRODUCTION

Welcome to the world of electronic telecommunications. With the Pocket Modem and software you will be able to access local and distant Bulletin Board Systems (BBS), as well as other public and commercial services such as The Source, Compuserve, and Dow Jones news and stocks. With these services you will have access to up-to-the-minute news, prices, stock values, and huge amounts of information; all only a phone call away!

This manual will take you through the steps of setting up your Pocket Modem package. It will explain each feature of the Pocket Modem and software and how to use it. In the back is a glossary of terms if something stumps you. Have fun!

HOOKING UP THE POCKET MODEM

The Pocket Modem plugs directly into the Peripheral Port of your Atari Home Computer. If you have a disk drive, printer or any other peripherals, the Pocket Modem can be daisy chained by plugging it into the Peripheral Ports of any of your peripherals.

The other end of your Pocket Modem has a plug to accept a standard modular male to male telephone cable which plugs directly into a phone jack. The Pocket Modem does not interfere with the normal operation of your phone, so it can remain connected to your phone line at all times.

NOTE

If you are using a 410 or 1010 cassette recorder, you will have to disconnect it while using the Pocket Modem. Please refer to Usage Examples on page 12 to see how to use the cassette recorder with the Pocket Modem.

GETTING STARTED

After connecting the Pocket Modem, plug the Pocket Modem software cartridge into your computer. If you are using a disk drive, turn it on, insert a disk with DOS on it - then turn the computer on. After a few seconds, the title page specifying the software and its version number will appear. Approximately ten seconds later the Main Menu will be displayed. The modem is now operational and awaiting your commands.

SCREEN FORMAT

The top line of the screen displays the Time of Day, the Time elapsed, the modem on line and off line status, as well as the carrier detect status. The modem is off line when the arrow inside the square brackets points down and on line when the arrow points up. When the modem detects a carrier, the arrow will be high-lighted (i.e. inverse video). The next portion of the screen displays the various menus and the text going in or out. The bottom line, the prompt line, displays all prompts for data input and any other user information.

CHANGING SCREEN COLORS

While in the Main Menu pressing the "+" key will brighten the characters displayed and pressing the "-" key will dim them. Pressing CTRL (or CONTROL) and the up arrow key will brighten the color of the screen, while pressing the down arrow along with CTRL (or CONTROL) will dim it. Pressing the left and right arrow keys along with CTRL (or CONTROL) will change the color of the whole screen.

PHONE FUNCTIONS

Pressing "P" will cause the Pocket Modem to "pick up" the phone, and you should be able to hear the dial tone through the television speaker. The pick up phone function is used to find out if the phone line is already in use or to test for proper phone line connection. To "hang up" the phone, press "H".

Pressing "A" causes the Pocket Modem to pick up the phone and emit an "answer tone", which in turn tells the calling computer that your computer is "on line". This function is mainly used to manually answer calls from another computer.

PLACING A CALL

1) Press "D" while in the Main Menu. If the Pocket Modem is on line when "D" is pressed, the modem will hang up, and the software will then prompt you for the number to dial.

2) Enter the phone number in any of the following formats, where "N" denotes a digit between 0 and 9.

- for local calls

  NNN-NNNN or NNN NNNN or NNNNNNN

- for long distance calls (same area code)

  N-NNN-NNNN or N NNN NNNN or NNNNNNNN

- for long distance calls (different area code)

  N-NNN-NNN-NNNN or N NNN NNN NNNN or NNNNNNNNNNN

3) Press RETURN.

After the RETURN key has been pressed, the Pocket Modem will pick up the phone and proceed to dial the number entered.

If the number you called is busy, press "H" to hang up, wait a while, then press "R", and the software will redial the number for you!

NOTE

Typing an asterisk, "*", between digits in the phone number will cause the software to pause a second before dialing the next digit.

TERMINAL MODE

After dialing and getting an answer tone from the computer you are calling, press "T" while in the Main Menu to put the software into terminal mode. In this mode of operation all data transmitted and received will be displayed on the 40 character by 22 line screen area. You will probably be spending most of your time in this mode talking to other computers.

The following function keys are active in terminal mode;

OPTION

Pressing the OPTION key brings you back to the Main Menu.

SELECT

Pressing the SELECT key zeros out the time connected clock.

START

The START key allows you to save, or capture, the text that you are seeing on the screen as you see it. This text is stored in a buffer area which can be later reviewed, printed, or saved. Pressing the START key again will disable the save mode. The save status, "Saving" or "Stopped", and the amount of memory used and available will be displayed at the bottom of the screen on the prompt line.

NOTE

Some systems that you call will prompt you to enter several parameters, most frequently asked are: (Note that these are valid ONLY in ASCII mode)

Line Feeds - answer No or Off, actually the software ignores Line Feeds, but if it sees two in a row, it will assume a RETURN.

Screen Width - usually 40, but if you adjust the left margin, answer accordingly.

Clear Screen - code is FF (Form Feed) or decimal 12 (hex $0C).

ELECTRONIC MAIL

With the advent of electronic telecommunications a new form of mail has arisen: Electronic Mail. It is now possible for someone to leave a message on your computer, with the computer keeping track of several messages. You can come home, review any mail that has arrived while you where gone, and reply. The Pocket Modem software is also capable of sending mail to other Pocket Modem systems at a specific time to save on phone rates, etc. To enter the Electronic Mail Menu, press "E" while in the Main Menu.

RECEIVING MAIL

Pressing "R" enters the Receive Mail mode. In this mode of operation the computer waits to receive a phone call. When a phone ring is detected, the Pocket Modem picks up the phone and then emits an answer tone. The software will now wait 15 seconds for the calling computer to respond with an originate tone. If an originate tone is not detected within this time, the Pocket Modem will hang up and wait for the next call. If an originate tone is detected within this 15 second interval, the software will respond by displaying a valid call message and prompt the calling system to send the mail. All received mail will be shown on the screen as well as saved in the buffer. If the calling computer has finished or hung up, the Pocket Modem will hang up and the software will continue waiting for other calls. Multiple messages are simply stored one after the other in the buffer. To exit the Receive Mail mode press the BREAK key.

SENDING MAIL (Manually)

To send mail manually you must go to the Main Menu and dial the required number. Once the other Pocket Modem system you are calling has answered with an answer tone, you simply enter the Terminal mode and type in the message manually.

ENTERING MAIL

In order to use the automated mail sending capabilities of the Pocket Modem software, it is necessary to store information in the buffer, this is necessary since the software sends the contents of the buffer. To enter information into the buffer press "E" while in the Electronic Mail Menu. The computer will now save any information which is entered through the keyboard. To exit the Enter Mail mode press the ESC key. It is also possible to create a text file with a word processor, AtariWriter as an example, and load the text into the buffer and have it sent.

SENDING MAIL (Automatically)

The Pocket Modem software can be programmed to automatically dial another Pocket Modem system in receive mail mode at a specific time within a 24 hour period. Once this number has been dialed and an answer tone is detected, the presence of another computer system, the software will send any message(s) which are currently stored in its buffer. If an answer tone is not detected within 60 seconds, the Pocket Modem will hang up and the software will redial the number until a carrier is detected, the software will redial this number no more than 3 times in total.

Press "S" to send mail. If the buffer is empty, an error message will appear. If it is not, the software will prompt you to enter a phone number and a time at which you wish the call to commence. The computer will then wait for this time, dial the number you entered, and send the mail to the receiving computer. To exit the Send Mail mode press the BREAK key.

FILES MENU

The Files Menu handles all the Buffer, Input/Output and Upload/Download commands. Press "F" from the Main Menu to get to the Files Menu.

CLEAR BUFFER

Pressing "C" will clear the buffer. Be careful, since it is possible to erase valuable information. To prevent this, you are asked if you want to clear the buffer; press "Y" for yes or "N" for no.

REVIEW BUFFER

Pressing "R" will display the contents of the buffer on the screen. To pause the display, press any key, pressing any key again will continue the display. Pressing BREAK will bring you back to the Files Menu.

BUFFER LOAD AND SAVE

Pressing "L" will load the buffer with a file from disk (or cassette). Pressing "S" will save the contents of the buffer in a file on disk (or cassette). Please refer to Usage Examples on page 12 to see how load and save with the cassette drive. After choosing load or save, you will be asked for a file name. For disk files, simply enter the file name without the drive number for files on drive one and as normal for files on other drives, for cassette operation enter "C:" as the file name. The buffer will then be loaded or saved.

DISK DIRECTORY

Pressing "I" will read and display the directory of the disk in drive one. To pause the display, press any key, pressing any key again will continue the display.

UPLOAD/DOWNLOAD

Uploading or Downloading is the process of sending or receiving programs or data files over telephone lines between two computers. The software handles two methods of uploading, the first is for sending text to a receiving computer (i.e. messages, bulletins, etc.), the second method is the one mentioned below. The uploading and downloading of programs and data files uses a widely accepted protocol, called the XMODEM or MODEM7 protocol.

UPLOADING PROGRAMS (XMODEM)

To upload a program, first load the buffer with the program. Then press "U", the computer will then proceed to send the program, if by any chance nothing happens after 10-20 seconds, press and hold the START key, in about 10 seconds the transmission should begin. To cancel the upload, press the BREAK key, within 10 seconds the upload will be terminated.

DOWNLOADING PROGRAMS (XMODEM)

To download a program, press the "D" key. After the download is complete, the program will reside in the buffer. To cancel the download, press the BREAK key, within 10 seconds the download will be terminated.

UPLOADING TEXT

To send text to another computer, load the buffer with your text, then press "T". The software will now prompt you for either straight or prompted upload. For most applications straight upload will suffice, however some systems have the capability for prompted upload, just set the upload prompt to 6 (ASCII "ACK"). Press the desired key, "S" or "P", the software will then proceed to send the text to the receiving computer.

CONFIGURATION MENU

The Configuration Menu allows you to change several of the operating parameters of the modem and software. To enter the Configuration Menu, select "C" from the Main Menu.

SETTING THE TIME OF DAY CLOCK

To set the Time of Day clock press "S". Then enter the time in a 24 hour format, 000000 to 235959, then press RETURN to enter the new time (eg. 1:05 pm would be 130500).

DUPLEX

On some systems when you type a character on the keyboard, the receiving computer does not echo what was typed. So to see what you are typing, change the duplex to HALF, otherwise leave it at FULL. To toggle the duplex flag between FULL and HALF, press "D".

PARITY

To specify the parity on transmit and receive, press the appropriate key, "T" or "R". You will then be prompted to enter a parity number between 1 and 3, pressing ESC will exit without changing the parity. The exact meaning of these numbers is shown below. Please note that parity is valid ONLY in ASCII mode.

Parity number, parity type

1 = 8 bits, No parity
2 = 7 bits, Even parity
3 = 7 bits, Odd parity

ECHO FLAG

To toggle the echo character flag from on to off, press "E". What this option does is echo back any character received, an example can be seen in the Usage Examples.

LEFT MARGIN

On some TV sets the left hand portion of the screen is not properly aligned and text is sometimes not visible. To make the lost text visible, you can adjust the left margin by pressing "L". You will then be prompted for a value between 0 and 3. Enter the new left margin by pressing the desired number key, pressing ESC will exit without changing the left margin.

ASCII / ATASCII

Most computers communicate with standard ASCII. However, the Pocket Modem software enables your Atari to communicate in ASCII or ATASCII (Atari ASCII). In the ASCII mode your Atari functions as a true ASCII terminal, doing all ASCII to ATASCII and ATASCII to ASCII conversions internally and automatically. In the ATASCII mode however, your Atari will function as normal, with all special keyboard functions (clear screen, cursor movement, graphics characters, etc.) being handled. Pressing "C" toggles the software from ASCII to ATASCII, pressing "C" again toggles it back.

BAUD RATE

There are four different baud rates that the software supports; 300, 110, 400, and 500. Press "B" until the desired baud rate is displayed. Please note the most systems use 300 baud.

USAGE EXAMPLES

Using the cassette drive

Since the modem will not work with the cassette drive plugged in, it is necessary for you to disconnect the cassette drive while using the Pocket Modem. However, there will be occasions when you WILL want to use your cassette drive to save a program or some data. Let's say that you have just downloaded a program from a bulletin board and you wish to save it on a cassette. After downloading, log off, and with the Pocket Modem software still in place, disconnect the modem WITHOUT turning the power to the computer off. Then plug the cassette drive in and go through the save buffer procedure. To load a program from cassette is similar, let's say that you wish to upload a program. Before you call up the bulletin board, disconnect the modem and plug in the cassette drive, then go through the load buffer procedure. Now disconnect the cassette drive and plug in the modem, call up the bulletin board, and upload it.

Chatting over the phone lines with the modem

One of the more interesting uses of modems is the chatting over the phone lines with them. Chatting is mostly useful when the SYSOP of a BBS wishes to talk with you, but it is also possible for you to call up someone and chat with them.

In order for you to do this, the answering system must be configured with echo character at YES and duplex at HALF, and the originating system must be configured with echo character at NO and duplex at FULL, all other parameters should be the same. Now when someone calls, press "A" in the Main Menu, then press "T" to get into Terminal mode - with the caller pressing "T" when they hear the answer tone. You can now chat!

Uploading and downloading

One of the more frequent uses of modems is the exchange of public domain programs between computers over telephone lines. Let's say that you have a friend that you wish to send a program to. The first step is to call your friends computer, when your friend hears the phone ring, they should press "A" to answer the phone and go into answer mode. Then you should go to your Files Menu and press "U" to go into upload mode, your friend should then go to their Files Menu and press "D" to go into download mode. The file transfer will then commence. The most important thing to remember here is that you should go into upload mode before the other computer goes into download mode. Also, if you and the other person are using Pocket Modems to upload and download programs, it is possible for you to use the higher baud rates that the Pocket Modem software supports, thus speeding up your program transfers.

The other upload/download situation that you will run into is between yourself and a BBS. The most popular Atari Bulletin Board Systems are AMIS and FOREM, to download a program off either type of BBS, press "F" while you are logged on in command mode. You will then be asked for a download section, choose the one that you wish to download from, the BBS will then list the programs available in that section. When you are back in command mode, press "D", the BBS will ask you for a file name, enter one of the file names on the list. You will then be asked if you are using XMODEM protocol, answer "Y". Then wait for the ready to download message. Now press OPTION to go to the Main Menu, press "F" to go to the Files Menu and press "D" to go into download mode, the download will then commence.

To upload a program to the BBS, load the buffer with your program. While in command mode on the BBS, press "U", you might be asked for an upload section, if you are, choose one. You will then be asked for the name of the file that you are uploading, enter a name with a maximum length of 8 characters. Then wait for the ready to upload message. Now, press OPTION to get into the Main Menu, then press "F" to get into the Files Menu. Now since the AMIS and FOREM boards don't quite follow XMODEM protocol, press and hold START, then press "U", the upload will then commence.

APPENDIX

AN EXPLANATION OF SOME KEY TERMS

FREQUENCY SHIFT KEYING

The Pocket Modem is a device that allows your Atari Home Computer to "talk" over the telephone lines to another computer. This communication takes place via a method called "Frequency Shift Keying", or FSK for short. In FSK two frequencies are used, one (the higher one) corresponds to a "0" binary state, while the the other corresponds to a "1" binary state. The information in your computer is sent out of the computer in a serial fashion (one bit after another) in impulse form. These pulses are then converted to a frequency by the modem. At the other end, the modem decodes the FSK signals into impulses and the receiving computer adds up the serial information to create "bytes" or "words" that it can work with.

ANSWER & ORIGINATE

Since one way conversation with a computer is usually not very useful, we need a way to have the other computer talk to us. This is again facilitated by FSK, but this time we use different frequencies. The different frequencies are then filtered from the out going frequencies, thereby giving us a means to talk and listen at the same time. Since these frequencies are associated with incoming and out going data, the names ORIGINATE and ANSWER are used to describe which tones are used by what computer. If you are calling a computer, you should use ORIGINATE as you are originating the call. On the other hand, the Pocket Modem can also answer a call, in which case you should use ANSWER as you are answering a call.

FULL & HALF DUPLEX

Next consider how we talk to a computer over the telephone line. While we are talking we usually want the character typed to show up on the screen. That is fairly simple, we just have our computer display what we type. A problem then arises, how do we know that the computer at the other end of the line has received what we typed? The answer is that we don't. To get around this problem we have the other computer echo back what we type. Here we again have a problem, if our computer also shows what we type, we would then have two characters echoed for everyone we type. To get around this problem the modem software has an option that allows us to disable the local echo. This option is called FULL or HALF duplex. To sum it up, in full duplex the other computer echos back our character, while in half duplex our computer shows what we type.

PARITY AND XMODEM PROTOCOL

Finally consider what happens if the FSK signal goes down a noisy telephone line. In this case we could end up with some mixed up bits in our information. To guard against this an extra bit can be included in the serial information. This bit, called the parity bit, will tell if there are an even or odd number of "1" bits in the serial character. If the parity is in error, the receiving computer will then recognize the error and ignore the character. If the character in error was part of a text string it is very likely that the error would be trivial, but if we had been sending a program, the error could be catastrophic. In the latter case we use a system of cross checking the data. There are several of these methods in existence, but the most popular is the XMODEM (or MODEM7) protocol. It suffices to say that with XMODEM the data is sent with several cross checks of the transmitted data, and if an error is detected, a retransmit of the data is requested by the receiving computer.

GLOSSARY OF TERMS AND ACRONYMS

ACK

The ASCII code and acronym for ACKnowledge.

ASCII

ASCII is the acronym for American Standard Code for Information Interchange, a standardized code which most computers use to represent characters and other information.

ATASCII

ATari ASCII.

BAUD or BAUD RATE

The transmission rate in bits per second, it usually translates to 10 bits per character (i.e. 300 baud = 30 characters per second).

BBS

Bulletin Board System. A system set up by an individual or several people for the storage (and retrieval) of messages, for sale/want ads, public domain programs, etc.

BUFFER

The buffer is a section of memory allocated for storing data that will be going in or out.

CARRIER

The term "carrier" can be used interchangeably with the term "tone" (i.e. answer tone and answer carrier).

DAISY CHAIN

The peripherals for the Atari Home Computers are "daisy chained" to one another, i.e. connected in series with each other.

DOS

Disk Operating System. A program (or set of programs) that allow your computer to use a disk drive for the storage of data and programs.

DOWNLOAD

The process of sending a program "down" to your computer.

MODEM

Modem is the acronym for MODulator DEModulator. Since computers talk in strict voltage levels, a device is needed to translate them to tones that the phone system can handle. The modem is this device that does these translations of voltage levels to tones and back, MODulating and DEModulating the signals.

OFF LINE

When the modem is "off line", it is the same as saying that the phone is ON the hook or the modem is OFF the phone line.

ON LINE

When the modem is "on line", it is the same as saying that the phone is OFF the hook or the modem is ON the phone line.

PARITY

A technique used for detecting errors in transmission.

SYSOP

You will come into frequent contact with this term, it is the acronym for SYStem OPerator of a BBS or any other modem service.

UPLOAD

The process of sending a program "up" to another computer.

BASIC CONTROL UTILITY FOR THE BOT POCKET MODEM

Below is a listing of a simple basic program which can be used to control the POCKET MODEM (Atari version). This program will work on both the 300 Baud modem and 1200/300 Baud upgrade.

```
        REM: THIS PROGRAM CAN BE USED TO COMMAND THE MODEM TO PICK UP/
        REM: HANG UP THE PHONE, SELECT ANS/ORG MODE, SELECT HIGH OR
        REM: LOW SPEED, AND INHIBIT DATA I/O TO AND FROM THE MODEM.

1       DIM C(8) : REM STORE DESIRED COMMAND IN ARRAY C
1000    IF C(6)=0 THEN POKE 1280,0:POKE 54018,63   ***
1005    M1=PEEK(54019)
1010    M2=PEEK(54018)
1020    POKE 54019,M1-8                            SET COMMAND LINE LOW
1030    FOR T=1 TO 8
1040    POKE 54018,M2                              SET MOTOR LINE LOW
1050    POKE 54019,M1-8+(C(T)*4)
1060    POKE 54018,M2-8                            SET MOTOR LINE HIGH
1070    NEXT T
1080    POKE 54019,M1                              RESTORE REGISTER
1090    POKE 54018,M2                              RESTORE REGISTER
1100    RETURN                                     RETURN TO MAINLINE
```

*** THIS LINE IS NECESSARY ONLY WHEN USING THE CARRIER DETECT UTILITY LISTED ON THE NEXT PAGE.

COMMAND BIT SUMMARY

C(1) = NOT USED SET TO 0
C(2) = LOW SPEED/HIGH SPEED SELECT (0-LOW/1-HIGH) *
C(3) = 1200 BAUD # OF BITS SELECT (SEE TABLE BELOW) *
C(4) = 1200 BAUD # OF BITS SELECT (SEE TABLE BELOW) *
C(5) = MODEM DATA ENABLE (1) (SET TO 0 WHEN ACCESSING DISK DRIVE)
C(6) = OFFLINE/ONLINE CONTROL (0-OFFLINE/1-ONLINE)
C(7) = ORIGINATE/ANSWER CONTROL (0-ORG/1-ANS)
C(8) = DIAL MODE ENABLE (LEAVE SET TO 0 AND USE PULSE DIAL SUBROUTINE)

NUMBER OF BITS IN HIGH SPEED MODE (1200 BAUD)	C(3)	C(4)
8	0	0
9	0	1
10	1	0
11	1	1

* REQUIRES 1200 BAUD UPGRADE, OTHER WISE HAS NO EFFECT.

IE. TO PUT THE MODEM TO ANSWER MODE, LOW SPEED, AND ONLINE WITH DATA ENABLED, THE C ARRAY SHOULD BE LOADED AS FOLLOWS:

C(1),C(2),C(3),C(4) AND C(8) = 0
C(5),C(6),C(7) = 1

THEN GOSUB 1000.

```
        REM: THIS PROGRAM CAN BE USED TO DIAL A NUMBER WHEN USED IN
        REM: CONJUNCTION WITH THE MODEM COMMAND PROGRAM (LINE 1000).
        REM: THE PHONE NUMBER IS ASSUMED TO BE 7 DIGITS LONG BUT CAN BE
        REM: CHANGED AS REQUIRED.

1       DIM N(7) : REM STORE PHONE NUMBER IN ARRAY N
2000    M1=PEEK(54019)
2010    GOSUB 3000
2020    FOR D=0 TO 1000:NEXT D                  ONLINE DELAY BEFORE DIALING
2030    FOR P=1 TO 7
2040    N=N(P):IF N=0 THEN N=10                 SET "0" TO 10 PULSES
2050    FOR L=1 TO N
2060    POKE 54019,60                           SET COMMAND LINE LOW
2070    FOR R=0 TO 20:NEXT R                    BREAK LINE DELAY
2080    POKE 54019,52                           SET COMMAND LINE HIGH
2090    FOR R=0 TO 13:NEXT R                    MAKE LINE DELAY
2100    NEXT L
2110    FOR D=0 TO 350:NEXT D                   INTERDIGIT DELAY
2120    NEXTP
2130    POKE 54018,60                           SET MOTOR LINE LOW
2140    FOR D=0 TO 1000:NEXT D                  1.5 SEC DELAY
2150    C(8)=0:GOSUB 3000                       DISABLE DIAL MODE
2160    POKE 1280,0:POKE 54018,63               ENABLE CARRIER DETECT INTERRUPT
2170    POKE 54019,M1                           RESTORE REGISTER
2180    RETURN                                  RETURN TO MAINLINE

3000    POKE 54019,52
3010    FOR T=1 TO 8
3020    POKE 54018,60
 030    POKE 54019,52+(C(T)*4)
3040    POKE 54018,52
3050    NEXT T
3060    POKE 54019,52
3070    RETURN

 NOTE : INTERRUPTS ARE DISABLED WHILE THE MODEM IS DIALING
```

```
        REM: THIS PROGRAM IS USED TO DETECT THE RING AND CARRIER.
        REM: SINCE THE RING AND CARRIER DETECT USE INTERRUPT LINES
        REM: IT WILL BE NECESSARY TO INCORPORATE A SHORT ASSEMBLER PROGRAM
        REM: WHICH CAN BE POKED IN THROUGH  BASIC (SHOWN ON NEXT PAGE).
        REM: CURRENT LOCATION OF MACHINE CODE STARTS AT 0502 HEX (1282 DEC.)
        REM: LOCATION OF CARRIER DETECT FLAG IS 0500 HEX (1280 DEC).
        REM: LOCATION OF RING DETECT FLAG IS 0501 HEX (1281 DEC).
        REM: A "0" IN THESE LOCATIONS INDICATES NO CARRIER OR NO RING.
        REM: A "1" INDICATES THAT A RING OR CARRIER IS PRESENT.
        REM: TO READ FLAGS USE PEEK(1280) AND PEEK(1281)
4000    FOR T=0 TO 1000: READ A                 POKE IN MACHINE CODE
4005    IF A=-1 THEN T=1001: GOTO 4020           (SHOWN ON NEXT PAGE)
4010    POKE (1282+T),A
4020    NEXT T
4030    POKE 1280,0                             CLEAR CARRIER FLAG
4040    POKE 1281,0                             CLEAR RING FLAG
4050    POKE 54018,60                           DISABLE CARRIER INTERRUPT
4060    POKE 54019,60                           DISABLE RING INTERRUPT
4070    POKE 514,02                             SET CARRIER INTERRUPT VECTOR
4080    POKE 515,05                              TO 0502 HEX
4090    POKE 516,41                             SET RING INTERRUPT VECTOR
4100    POKE 517,05                              TO 0527
4110    POKE 54018,63                           ENABLE CARRIER DETECT (+EDGE)
4120    POKE 54019,63                           ENABLE RING DETECT (+EDGE)

4130    DATA 8,173,2,211,41,2,240,13,169,1,141,0,5,173,2,211,41,253
4140    DATA 76,35,5,169,0,141,0,5,173,2,211,41,253,9,2,141,2,211
4150    DATA 40,104,64,8,169,1,141,1,5,40,104,64,-1
```

---- MACHINE CODE LISTING FOR RING AND CARRIER DETECT SUBROUTINE -------

CARRIER DETECT INTERRUPT SERVICE ROUTINE CONTAINED IN DATA STATEMENTS

```
0502    PHP             08              :SAVE ACCUMULATOR STATUS
0503    LDA   $D302     AD 02 D3        :CHECK IF CARRIER IS TURNING
0506    AND#  $02       29 02            ON (+EDGE) OR OFF (-EDGE)
0508    BEQ   $0517     F0 0D           :JUMP IF TURNING OFF (-EDGE)
050A    LDA#  $01       A9 01           :SET CARRIER DETECT FLAG TO "1"
050C    STA   $0500     8D 00 05
050F    LDA   $D302     AD 02 D3        :SET INTERRUPT FOR -EDGE TRIGGER
0513    AND#  $FD       29 FD            (IE.  TRIGGER ON LOSS OF
0514    JMP   $0523     4C 23 05         CARRIER)
0517    LDA#  $00       A9 00           :CLEAR CARRIER FLAG (IE.  "0")
0519    STA   $0500     8D 00 05
051C    LDA   $D302     AD 02 D3        :SET INTERRUPT FOR +EDGE TRIGGER
051F    AND#  $FD       29 FD            (IE.  TRIGGER IF CARRIER
0521    ORA#  $02       09 02            PRESENT)
0523    STA   $D302     8D 02 D3
0526    PLP             28              :RESTORE ACCUMULATOR STATUS
0527    PLA             68              :RESTORE ACCUMULATOR
0528    RTI             40              :RETURN FROM INTERRUPT
```

RING DETECT INTERRUPT SERVICE ROUTINE CONTAINED IN DATA STATEMENTS

```
0529    PHP             08              :SAVE ACCUMULATOR STATUS
052A    LDA#  $01       A9 01           :SET RING DETECT FLAG TO "1"
052C    STA   $0501     8D 01 05
052F    PLP             28              :RESTORE ACCUMULATOR STATUS
0530    PLA             68              :RESTORE ACCUMULATOR
0531    RTI             40              :RETURN FROM INTERRUPT
```

SAMPLE PROGRAM TO DETECT N NUMBERS OF RINGS

```
        REM: THIS PROGRAM WAITS FOR N RINGS THEN RETURNS
        REM: RING AND CARRIER DETECT UTILITY MUST BE LOADED FIRST

5000    N=5: POKE 1281,0                    RESET RING DETECT FLAG
5005    PRINT" WAITING FOR ";N;" RINGS"
5010    IF PEEK(1281)=0 THEN GOTO 5010      WAIT FOR FIRST RING PULSE
5020    POKE 1281,0                         CLEAR FLAG
5030    FOR D=0 TO 20: NEXT D               20 HZ MASK DELAY
5040    IF PEEK(1280)=1 THEN 5010           CHECK IF STILL ON FIRST RING
5050    N=N-1: IF N<>0 THEN GOTO 5010       IF NOT DECREMENT N
5060    PRINT " RINGS DETECTED"
5070    RETURN                              RETURN TO MAINLINE
```

LOCATION 54018 DEC. AND 54019 DEC. ARE HARDWARE CONTROL REGISTERS (PIA CONTROL). THEY CAN CONFIGURED AS SHOWN IN THE TABLE BELOW.

LOCATION	BIT #	BIT = 0	BIT = 1
54018	0	DISABLE INTERRUPT (CARRIER)	ENABLE INTERRUPT (CARRIER)
54018	1	INTERRUPT OCCURS ON -TIVE GOING EDGE (CARRIER TURNING OFF)	INTERRUPT OCCURS ON +TIVE GOING EDGE (CARRIER TURNING ON)
54018	2	------ NOT REQUIRED FOR MODEM CONTROL ------ (DONOT CHANGE THIS BIT)	
54018	3	MOTOR CONTROL LINE HIGH	MOTOR CONTROL LINE LOW
54018	4-7	------ NOT REQUIRED FOR MODEM CONTROL ------ (DONOT CHANGE THESE BITS)	
54019	0	DISABLE INTERRUPT (RING)	ENABLE INTERRUPT (RING)
54019	1	INTERRUPT OCCURS ON -TIVE GOING EDGE	INTERRUPT OCCURS ON +TIVE GOING EDGE
54019	2	------ NOT REQUIRED FOR MODEM CONTROL ------ (DONOT CHANGE THIS BIT)	
54019	3	COMMAND CONTROL LINE HIGH	COMMAND CONTROL LINE LOW
54019	4-7	------ NOT REQUIRED FOR MODEM CONTROL ------	

COMMUNICATING WITH YOUR DRIVE

```
        REM: THIS PROGRAM ILLUSTRATES HOW TO TALK TO THE DISK DRIVE
        REM: WITH THE MODEM CONNECTED

6000    FILE$="D:TEST" : A=0
6010    C(5)=0 :GOSUB 1000                  GO DISABLE MODEM DATA LINES
6020    OPEN #1,8,0,FILE$                   SO MODEM DOES NOT INTERFERE
6030    PUT #1,A                            WITH DISK
6040    CLOSE #1
6050    C(5)=1 :GOSUB 1000                  GO ENABLE MODEM DATAS LINES
6070    POKE 53760,160: POKE 53762,11       RESTORE BAUD RATE TO 300 BAUD
6080    POKE 53764,160: POKE 53766,11       RESTORE BAUD RATE TO 300 BAUD
6090    RETURN
```

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BOT ENGINEERING LTD. WILL REPAIR OR REPLACE FREE OF CHARGE ANY POCKET MODEM WHICH FAILS TO FUNCTION PROPERLY FOR A PERIOD OF 90 DAYS AFTER PURCHASE. ANY SUCH MODEMS SHOULD BE RETURNED POST PAID TO THE BELOW ADDRESS. A COPY OF THE PURCHASE RECEIPT MUST BE INCLUDED. BOT ENGINEERING WILL, AT ITS CHOOSING, REPAIR OR REPLACE THE UNIT UPON INSPECTION, PROVIDED THE FAILURE IS NOT CAUSED BY IMPROPER INSTALLATION, HANDLING OR OTHER EXTRA-ORDINARY SITUATIONS. NO OTHER LIABILITY IS ASSUMED OR IMPLIED.

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