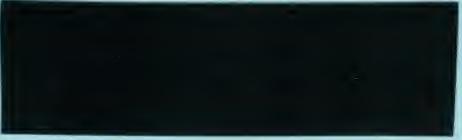


THE MICROCONNECTION [tm]  
USER MANUAL - EDITION 4.0  
14 JANUARY, 1982



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## MANDATORY USER INSTRUCTIONS

The MICROCONNECTION [tm] has been approved by the Federal Communications Commission (FCC) under Part 68 of their Rules and Regulations for a direct interconnection to the national switched telephone network. The registration number is:

#AWY9M5-69193-DM-N

Model UM1

Ringer Equivalence 0.0B

S/N 1801

RJ-11 Jack

In order to fully comply with FCC Rules and Regulations, the user must read and be aware of the following:

1. Direct connection to the telephone must be made from the cord supplied by The MicroPeripheral Corporation to a standard RJ-11 modular jack. Suitable jacks can be installed by your local telephone company or obtained from Radio Shack stores for customer installation.

2. No connections may be made to party lines or coin operated telephone systems.

3. Before you use your MICROCONNECTION [tm], you must advise your local telephone company you have an FCC registered device and desire to connect it to their phone lines. Supply them your phone number, the name of our product (MICROCONNECTION, Model UM-1), along with the FCC registration number and ringer equivalence given above.

4. Repairs to the MICROCONNECTION must be made only by The MicroPeripheral Corporation or their authorized agent. This restriction applies even after the warranty expires. This ruling precludes The MicroPeripheral Corporation from supplying schematics for their product. If any unauthorized repair is performed, both the registration and permission to connect to the telephone line, along with the remainder of the warranty (if any) is withdrawn.

5. In the unlikely event the MICROCONNECTION [tm] causes hum or interference to the telephone network, it must be disconnected immediately. If it is determined that our product is at fault, it should be returned to The MicroPeripheral Corp., or its authorized agent, for repair.



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1 - INTRODUCTION  
=====

The MICROCONNECTION[tm] is a direct connect modem designed to work with most microcomputers and terminals. The most popular version is designed for the standard RS232 serial I/O port. Other versions are available for the TRS-80 data buss, the ATARI I/O cable, an APPLE serial card, and the PET user interface connector.

The MICROCONNECTION plugs directly into the telephone line, either at the wall connection or at the rear of the telephone instrument, eliminating the need for placing the telephone handset into an acoustic coupler. Transmission errors are reduced and line sensitivity is increased because there is no coupling loss. The MICROCONNECTION is quiet (no audible whistle) and room noise pickup is eliminated because of the direct telephone connection.

Be sure to read and understand Steps 2 and 3 of Section 2 before installing your MICROCONNECTION. Besides the duplex modular jack described in Step 3, there may be some additional hardware required (as described in Step 2) to get your MICROCONNECTION on line.

2 - GETTING CONNECTED  
=====

Step 1 - The RS-232 Connection  
-----

If your version of the MICROCONNECTION does not use the RS-232 I/O port then go to Step 2. Connect the RS-232 cable from your computer or terminal to the multi-pin connector on the rear of your MICROCONNECTION. This connector is called a DB-25. If you do not have a suitable cable, one may be obtained from most computer stores, Radio Shack Computer Centers, or from the MicroPeripheral Corporation.

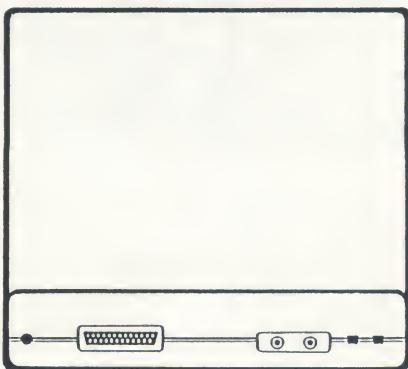


Figure 1 - Rear view MICROCONNECTION

A suitable cable can be made using two Radio Shack connectors (part # 276-1559) and a 5-foot length of ribbon cable (part # 278-771). Remove all but 25 wires from the cable strip and crimp the ribbon into the connectors. The cable should be of suitable length and terminate at each end in a male DB-25 connector. (NOTE: Be sure that each wire from one connector terminal goes to the corresponding terminal on the other connector. See Appendix A for technical specifications of each pin.)

If plastic DB-25 plugs are used, it may be necessary to file the edges slightly to clear the connector opening on the rear of your MICROCONNECTION.

#### Step 2 - Planning the Telephone Connection

The MICROCONNECTION was designed to work with the modular jack telephone system. Even if your telephone is not the new modular system, you can still use your MICROCONNECTION. However, it is YOUR RESPONSIBILITY to insure that your installation and interconnection is done carefully, so as to avoid introducing problems into the national telephone network.

If your telephone was installed within the last few years, it is likely that you have the modular system. This system uses a connector in a tiny plastic block. The block has an "ear" that disconnects the plug when it is slightly depressed and then gently pulled out of the telephone or jack. Look at the base of your telephone. If the cord disappears into an U-shaped hole, you have an older telephone system.

### The Four Pin System

If your telephone plugs into the wall jack with a four pin connector about the diameter of a silver dollar, it will be necessary to either exchange your phone for the newer modular type or acquire an adapter. Your telephone company may provide you with this adapter, on request, or you can order it from the MicroPeripheral Corporation (part # 902).



Figure 2 - Four pin telephone connector

If you are adapting your existing system, it will be necessary to obtain an "Universal Instant Jack" (Radio Shack part # 279-360). This adapter connects to the four pin block, and has provisions for insertion of your existing telephone plug and the plug from your MICROCONNECTION.

### The Wall Block System

An earlier system, using a terminal wall block for the red, green, and yellow telephone wires, may be found in older homes. This terminal block can also be adapted using the "Universal Instant Jack" mentioned above.

You will also need a four pin plug (Radio Shack part # 279-366) to insert into the universal adapter. To install:

1. Remove the cap from the wall plug.
2. Remove the wires leading to the telephone. There are usually three wires, red, yellow, and green. Sometimes a fourth (black) wire may be used. The red and green wires carry the telephone signal and the others are ground.

There is only 50-volts DC on these lines and no shock hazard is present. However, if you should short the red and yellow wires together, anyone calling you will get a busy signal.
3. Replace the adapter over the old terminal block by tightening the center screw securely.
4. Open the plug and reconnect the telephone wires under the screws in exactly the same order as you removed them from the block.

If the red or green wires get transposed with a ground wire, you will not get a dial tone. Should you transpose the red and green wires the phone will work normally (if you have a dial phone). If yours is a "Touch Tone" then you will hear the dial tone, but no sound, when you push the number buttons.

#### Business Applications

Many businesses have rotary systems with four incoming lines. If this is your case, then you will need a different connector (Radio Shack part # 43-271). The adapter is inserted between the heavy metal covered connectors used in business systems. It has four modular jacks to select the line that you wish to connect to your MICROCONNECTION.

Complete installation instructions are provided with this part.

#### Step 3 - Making the Telephone Connection

---

The telephone connect cable extending from the rear of your MICROCONNECTION terminates in a tiny plastic connector. This modular connector is now the standard connector within the telephone industry.



Figure 3 - Standard modular telephone connector

It will be necessary to obtain a "Y" or duplex modular jack to connect your MICROCONNECTION to the telephone lines. This connector allows two jacks (one from the telephone and one from your MICROCONNECTION) to be connected together to the telephone line. The duplex jack can be connected to the rear of the telephone or at the telephone terminal box.

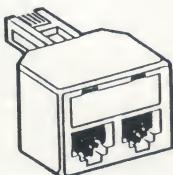


Figure 4 - Duplex modular jack

The duplex modular jack can be obtained from the MicroPeripheral Corporation (part # 902) or Radio Shack (part # 279-357). Radio Shack also has other duplex modular jacks that have a length of telephone wire attached between the duplexer and the jack. (12-ft cord, part # 279-373 or 25-ft cord, part 279-363) One of these can be used if it is necessary to place your MICROCONNECTION some distance from your telephone or terminal box.

#### Step 4 - Making the Power Connection

---

Connect the grey, two wire, cord from your MICROCONNECTION to the two screw terminals on the transformer. NOTE: Do NOT connect these wires to a power source other than 12 volts AC.

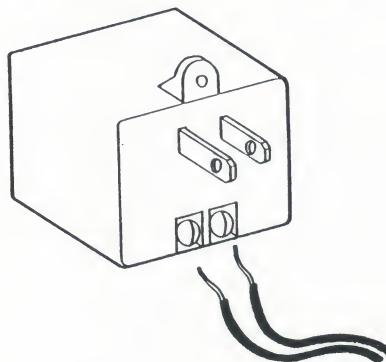


Figure 5 - The MICROCONNECTION power transformer

Plug the transformer into a regular house outlet (110-117 VAC). Because of the extra heavy duty power source supplied, you will have no problems with the transformer by leaving it plugged in. Your MICROCONNECTION draws less than 100 ma of current from the power transformer.

#### Step 5 - Making the Software Connection

---

Normally a terminal does not require programming. It has been "preprogrammed" to perform specific functions. This preprogramming is called "firmware".

However, a computer needs instructions on what it is to do. These operating instructions, loaded into the computer by the operator, are called "software". (The computer or the terminal is "hardware".)

A dumb terminal program is provided with some versions of the MICROCONNECTION. You may have purchased other software or ordered it with your MICROCONNECTION. Follow the directions received with the software for its loading and use with your MICROCONNECTION. If you have the AutoDial/AutoAnswer MICROCONNECTION, be sure to study Section 4 of this manual. If the software does not properly match the operating requirements of the MICROCONNECTION, it may not be possible to put it on-line.

#### Step 6 - Your Connection

---

There are MICROCONNECTIONS for every popular make of personal computers, as well as software to support it. This section will give you specific instructions for your computer.

##### The TRS-80 Connection

The Buss Decoding version of the MICROCONNECTION plugs into the TRS-80 buss and can be used with any Model I, including the Level I, 4K system. Data and address signals are taken from the keyboard buss connector or the screen printer port (also called the buss extension) on the side of the expansion interface.

For telecommunications applications, this version of the MICROCONNECTION eliminates the need for the Radio Shack expansion box, RS-232 adapter board and acoustic telephone interface. The MICROCONNECTION decodes the data and address lines on the buss and creates a RS-232 compatible signal. That signal then controls the circuitry that interfaces to the telephone line. Port 208-209 is decoded so that if the RS-232 board is installed, the user can have two independent or interactive serial I/O ports.

A serial printer can also be used, as the RS-232 signal is also fed to a DB-25 connector on the rear of the MICROCONNECTION. Active pins for this connector are listed in Appendix A.

With your computer turned off, remove the plastic cover at the left corner of your keyboard. Note the "card edge" connector inside the compartment. The end of the 12 inch ribbon cable from the MICROCONNECTION plugs onto this card edge. Before making connection, BE SURE TO clean the corrosion from the top and bottom of the card with an eraser.

With the ribbon pointing downward from the ribbon cable connector, slip the connector over the card edge. Be sure the connector is seated firmly and is straight.

Use the same procedure if you have the expansion interface. Slide the connector on the card edge identified as the screen printer port or buss extension port. DON'T FORGET to clean the card edge first. You are now ready to load the software, using the instructions that came with your program and go on-line.

NOTE: The MICROCONNECTION must be connected and turned on BEFORE the software is loaded.

### The ATARI Connection

There are two versions of the MICROCONNECTION that can be used with the ATARI 400 and ATARI 800 Home Computers. One connects directly to the computer console, the other connects to the ATARI 850 Interface Module.

If your MICROCONNECTION does NOT use the ATARI 850 Interface Module, load the software from the cassette (or diskette) in the normal fashion. Then, if using the cassette, disconnect the ATARI 410 Program Recorder and plug the I/O connector from the MICROCONNECTION into the computer console. If loaded from cassette, now type RUN.

If you own one or more ATARI disk drives, the MICROCONNECTION must be the last peripheral in your "daisy chain". Following the instructions that came with your software, load the program into the computer.

The buss driven version of the MICROCONNECTION for the ATARI 400/800 Home Computer has no provision for AutoAnswer, as the carrier detection circuitry is not present without the ATARI 850 Interface Module.

If your MICROCONNECTION uses the ATARI 850 Interface Module, attach the 9-pin connector to Port 1 of the interface module. If the AutoDial/AutoAnswer module is not installed in your MICROCONNECTION, it can be used with the ATARI TeleLink[tm] I cartridge through the ATARI 850 Interface Module. However, with the AutoDial/AutoAnswer option, the software must provide for proper control of the RTS and DTR lines. For additional information, see Section 4.

### The APPLE Connection

The RS-232 MICROCONNECTION can be used with any APPLE computer which incorporates a serial I/O card. A special MICROCONNECTION is also available with its own serial I/O card. Insert the card into any slot in the APPLE (except 0). Then insert the ribbon cable from the MICROCONNECTION into the 14 pin socket on the rear of the card, with the ribbon pointed towards the back of the computer.

If your MICROCONNECTION has the AutoDial AutoAnswer module, it will be necessary to remove the jumper between pins 1 and 24 on the side of the board OPPOSITE the large integrated circuit chip.

### The PET Connection

This version of the MICROCONNECTION does not require the IEEE interface. It has a card edge connector on the end of a grey cable that plugs into the user port card edge on the rear apron of the CBM-PET. The connector should be inserted so the the cable exits to the left when the computer console is viewed from the rear.

If you have completed Steps 1 through 6, you are now ready to go on line.

NOTE: Except when used with the ATARI 410 Program Recorder, the MICROCONNECTION must be connected and turned on BEFORE the software is loaded.

### 3 - GETTING STARTED

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Your MICROCONNECTION is installed and you're ready to go. Now what?

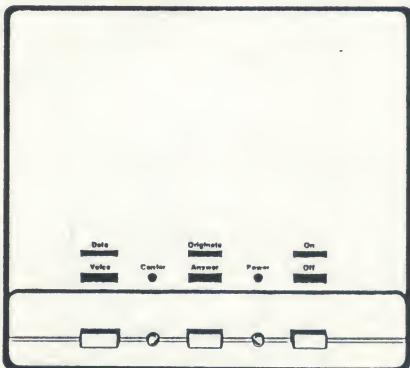


Figure 6 - The MICROCONNECTION front panel

1. Turn on the power to your MICROCONNECTION.
2. Put the ORIGINATE/ANSWER switch in the ORIGINATE position.
3. Turn on your computer. Load and run your terminal program according to the instructions you received with that program.
4. Put the DATA/VOICE switch in the VOICE position.

If you are using an AutoDial program then leave the DATA/VOICE switch in the DATA position. Go to step 8.

5. Pick up your telephone and dial your host computer.
6. When your host computer answers (when you hear the "squeal" through the telephone handset), put the DATA/VOICE switch in the DATA position. The red carrier

lamp will come on.

7. Place the telephone handset back on the cradle.
8. Proceed with whatever logon procedures are necessary... you have just made the connection!

#### 4 - AutoDial AutoAnswer

---

With the addition of a small module, the MICROCONNECTION can be adapted to automatically dial and/or answer your telephone. The AUTO MICROCONNECTION[tm] is designed to function with all popular terminals and computers having a RS-232 serial I/O port and is capable of going on-line in response to a predetermined number of telephone rings. If suitable data signals are received, the modem will remain on-line until the data signals cease, or until the modem is placed off-line by the data terminal equipment.

The AutoDial AutoAnswer module can not be installed in the Atari Buss decoding or The Color Connection MICROCONNECTION modem because they do not support the CD (carrier detect) status line.

On and off-line conditions are controlled by a relay in series with the telephone line. This relay is software controlled; therefore, if the software does not match the modem requirements, it will be impossible to go on-line. All software supplied by the MicroPeripheral Corporation after March 1, 1980 meets the necessary requirements. These requirements are outlined in Appendix A.

The AUTO MICROCONNECTION should be placed in the ORIGINATE mode when used for AutoDial and in the ANSWER mode when used to AutoAnswer.

The Federal Communications Commission requires a 2-second delay after the time the modem goes on-line before data flow occurs. The AUTO MICROCONNECTION meets this requirement with a hardware delay circuit.

#### 5 - The Tape Recorder Connection

---

Using the audio jacks on the back of your MICROCONNECTION, you can easily make cassette recordings of data or programs. Audio tones are used to send and receive the ASCII code over the telephone lines. Therefore, after recording a tape, it can then be played back through your MICROCONNECTION.

The tape can also be played back to another computer using an acoustic modem by holding the cassette recorder speaker to the ear piece of the modem. Since the data is in ASCII, you can even

transfer data to a different brand of computer. Of course, the receiving computer may need resident software to receive and store the incoming data.

#### Making the Connection

---

You must use a cassette recorder that has an extra line input jack. These jacks are usually marked AUX or LINE. The microphone input jack cannot be used for recording, because input to the cassette recorder from the MICROCONNECTION into the microphone jack will overdrive the recorder.

Software (such as any of the terminal programs sold by The MicroPeripheral Corporation) is necessary to handle record and playback of data between your computer and the cassette recorder.

Two shielded cables (Radio Shack Part no. 42-2420) are required to hook your cassette recorder to your MICROCONNECTION.

Follow these steps to set up your cassette recorder (See Figure 1.):

1. Connect the end of one cable to the left jack (audio in) of the MICROCONNECTION.
2. Connect the other end of the cable to the EAR or SPEAKER jack of the cassette recorder.
3. Connect one end of the second cable to the right jack (audio out) of the MICROCONNECTION.
4. Connect the other end of the second cable to the AUX or LINE jack.

#### Making a Recording

---

1. Put the DATA/VOICE switch in the DATA position.
2. Following the directions for your terminal program, and prepare your computer to receive data.
3. The cassette recorder must be manually controlled, using the PLAY and RECORD buttons on the recorder.
4. Some cassette recorders, such as the Radio Shack CTR-80, need a signal out of the earphone jack while recording. This signal is used for monitoring purposes, and can pause the screen display to garble. If this should happen, or if you do not see any response to keyboard input on your monitor, unplug the EAR or SPEAKER jack from your recorder.

### Playing a Recording

1. Put the DATA/VOICE switch in the DATA position.
2. If you have disconnected the EAR or SPEAKER jack from your recorder, reconnect it.
3. Disconnect the MICROCONNECTION from the telephone. Be sure, however that the modem is still connected to your computer terminal and that the DATA/VOICE switch on your MICROCONNECTION is in the DATA position.
4. Following the directions for your terminal program, prepare your computer to receive data.
5. Press the PLAY button on the cassette recorder. Because the modem has been disconnected from the telephone lines, the computer will now accept data from the recorder.

**APPENDIX A - Technical Specifications**

---

FCC Registration number: AWY9M5-69193-DM-N  
Ringer Equivalence: 0.0B  
Power Source: 115-vac, 60-Hz. input.  
Supplies 12-v from UL listed  
AC adapter.

**Technical Specifications for the MICROCONNECTION**

---

Power Source: 115-vac, 60-Hz. input.  
Supplies 12-v. from UL listed  
AC adapter

Dimensions: 7.7-in. wide x 5.5-in. deep x  
1.7-in. high

Weight: One pound

Ambient: Operation temperature - 0 to  
50 degrees C Operating humidity  
10 to 90 percent without  
condensation

Data Rate: Bell 103 compatible at 300  
baud

Modes: Originate and answer, full or  
half duplex

Format: Baud rate, word, parity and  
stop bits are software  
selectable

Receiver Sensitivity: Up to -50 dbm (adjustable)

Send Level: -10 dbm at 600 ohms line  
impedance

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**Technical Specifications for the AutoDial AutoAnswer Module**

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**Ring Detector:** Software selectable, default one ring

**Data Delay:** Two seconds \*

**Carrier Detect:** 15 seconds \*

**AutoDial:** Make-break keying

**Answer Wait:** 15 seconds \*

\* minimum from off hook

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**RS-232 Pin Outs**

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<b>PIN</b>	<b>USAGE</b>
1.	GROUND (connected to pin 7 inside modem)
2.	RX (characters into modem)
3.	TX (characters into modem)
4.	RTS (Request to Send)
5.	CTS (Clear to Send)
6.	DSR (Data Set Ready)
7.	GROUND (connected to pin 1)
8.	DCD (Carrier Detect)
20.	DTR (Data Terminal Ready)
22.	RI (Ring Indicator)

Pins 5, 6 and 8 are tied together and are held high on receipt of a carrier signal.

NOTE: The RTS, DTR, and RI lines are used only on the AutoAnswer AutoDial version of the MICROCONNECTION.

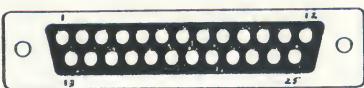


Figure 7 - DB-25 Connector

Buss-Decoding Pin Outs for a Printer

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Refer to Figure 7.

PIN	USAGE
1.	GROUND (connected to pin 7)
3.	TX (characters to printer)
5.	DSR (Data Set Ready)
6.	CTS (Clear to Send)
7.	GROUND (connected to pin 1)
8.	DCD (Carrier Detect)

Pins 5, 6 and 8 are tied together and held high. The printer must be set for 300 baud.

## APPENDIX B - Theory of Operation

---

The Federal Communications Commission requires a 2-second delay from the time the modem goes on-line before data flow occurs. This requirement is met by a hardware delay circuit in the MICROCONNECTION.

### Initializing

After the AUTO MICROCONNECTION is connected to the computer system, and the appropriate software is loaded, DTR must be held high (except when ring counting is desired). RTS must be reserved for automatic or manual control and for the AutoDial function.

### AutoAnswer

On receipt of a valid ring signal, RI goes high for the period of each ring. This signal can be counted by software and DTR brought high after a predetermined number of rings, putting the modem on-line. If this feature is not used then DTR and RTS must be held high. One ring is the default value to bring the modem on-line.

The modem expects a 1270-Hz tone when in answer mode and a 2225-Hz tone when in originate mode. On receipt of the proper tone, CTS, DSR, and DCD will go high. The modem will remain in this state until the carrier ceases (user disconnect) or DTR goes low (host disconnect).

The modem will remain on-line for 15 to 20 seconds waiting for a valid tone. If a valid tone is not received, the modem will reset to its initial conditions.

### Manual Originate

Manual use of the modem is achieved by holding DTR high and RTS low. This can be done with the VOICE/DATA switch on the front of the modem, or with a "manual communications program" (one which does not incorporate automatic dial or answer features).

### Auto Originate

When used as an AutoDial modem, DTR should be high and RTS low to go on-line. Dialing occurs when RTS is held high for 38-ms then low for 62-ms as many times as is required for a digit. There is a 300-ms delay between digits before the next digit is sequenced. This cycle repeats for as many digits as necessary to ring the called number.

### Auto Answer

Programs which incorporate an AutoAnswer feature must hold DTR and RTS high. This condition is met by all AutoAnswer software available from The MicroPeripheral Corporation.

38ms = .038 sec

62ms = .062 sec

300ms = .3 sec

#### APPENDIX C - Data Bases and Bulletin Boards

---

A data base is simply a collection of information that can be accessed by computer through the modem over telephone lines. There are several national data base networks that you can access with a local telephone call. The two most popular data base networks are The Source and CompuServe. Others are available for people with specific interests, such as Dow Jones and DIALOG.

##### The Source

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The Source permits access to literally hundreds of data bases, such as the New York Times and United Press International news service. Information on stocks and bonds, securities and commodities is also available. For information, contact:

Telecomputing Corp. of America  
16166 Anderson Road  
McLean, VA 22102  
703/821-6660

##### CompuServe

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CompuServe's data bases include several daily newspapers, such as the Washington Post and the San Francisco Chronicle, as well as news from the Associated Press. Engineering, accounting, statistical and other programs are available to the user. Or you can write your own in BASIC, Fortran, COBOL, or PASCAL on their DEC equipment and save the program in your MicroNET file space. For information, contact:

CompuServe  
5000 Arlington Centre Blvd.  
Columbus, OH 43220  
614/457-8600

##### Bulletin Boards

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Bulletin boards are a sort of "mini data base." Members can pass programs and messages to each other via the telephone lines.

There are many community and special interest bulletin boards that you may be able to access. Some of the special interest bulletin boards are run for people who have your particular brand of microcomputer.

If there are no bulletin boards listed here that are in your area, check with the people in your local computer store. If there are no bulletin boards in your area at all, you may wish to start one. The MicroPeripheral Corporation may have the software necessary to turn your computer into a "host" computer for your own CBBS (community bulletin board service).

#### APPENDIX D - Troubleshooting

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Because we "burn in" the MICROCONNECTION before shipment, our record of reliability has been excellent. However, as with any piece of complex electronic equipment, problems may happen.

Does not transmit or receive (power light is on), cursor remains in upper left corner.

Can you hear a tone through the telephone handset when the DATA/VOICE switch is in the DATA position? If not, check that the modular plugs are seated securely.

**AUTO MICROCONNECTION:** The carrier lamp should be lit at approximately the same intensity as the power lamp. This indicates that the telephone relay is closed; no tone will be heard if this relay is not closed. Check software for status of DTR and RTS lines.

You suspect that the software did not load correctly.

Try second "cut" on the tape.

Contact your dealer for replacement.

Carrier light flashes when modem is plugged into telephone line when DATA/VOICE switch is in the VOICE position.

Sensitivity control set too high. Sensitivity must be set so that carrier acquisition occurs between -60 and -70 dbm. A carrier level of below -70 db must not activate the modem.

Carrier light flashes when modem is plugged into telephone line when DATA/VOICE switch is in the VOICE position. Sensitivity properly set.

Modem may be in the field of a strong radio station. Disconnect the cord from the telephone circuit. If the flashing stops, it indicates a strong external interference. Request your telephone company to install a radio frequency filter on your line.

Transmits correct character, but echo prints garbage on screen.

Demodulator adjustment may be off slightly. Transmits incorrect characters

Tone setting potentiometers incorrect, resulting in off-frequency operation. Unit needs factory realignment.

TRS-80 version (plugged into keyboard) does not print keyed characters on the screen.

Make sure software is loaded properly. Try second "cut" on tape.

Check keyboard buss contacts. Clean, if necessary.

Inspect connector cable for bent or missing pins.

Make sure connector cable is seated properly at both ends. Some card edges may allow the cable connector to seat off center.

TRS-80 version (plugged into expansion interface) does not print keyed characters on the screen.

Make sure software is loaded properly. Try second "cut" on tape.

Make sure clock is turned off (CMD "T") before loading S-80.

Disconnect cable from expansion interface buss port and connect directly to keyboard. Some software is difficult to load through the expansion interface.

If your problems are minor, or if you simply have a question, you can contact The MicroPeripheral Corporation by logging into the MICROCONNECTION Users Group on CompuServe MicroNET [70003,241] or by R MCONN.

```

10 REM <----- AUTOTERM/BAS ----->
20 REM <----- (C) 04/20/1981 ----->
30 REM <----- MICROPERIPHERAL CORP. ----->
40 REM <----- 2643 151ST PLACE NE ----->
50 REM <----- REDMOND, WA 98052 ----->
60 REM <----- PROGRAMMER: MICHAEL SPOHNHOLTZ ----->
100 REM <---- INITIALIZE ----->
105 CLS:CLEAR1000
110 DEFINT A-Z                                'INTEGERS RUN FAST
115 A$="":X1=127:X2=128                         'PROGRAM CONSTANTS
120 DS=65:Z1=8:Z2=15                            'DIALER CONSTANTS
125 REM <---- USART VALUES FOR 1604, 8251 ARE IN () ----->
126 REM <---- FOR PORT 208 REPLACE FOLLOWING VALUES ----->
127 REM <---- WITH THE ONES IN ()'S. REQUEST 5 NULLS ----->
128 REM <---- AFTER A CARRIAGE RETURN TO REDUCE ERRORS. -->
130 US=234                                     'USART STATUS - (209)
135 UD=235                                     'DATA - (208)
140 UM=232                                     'MODEM - (209)
145 UI=233                                     'INITIALIZE - (209)
150 UC=31                                      'CARRIER DETECT - ( 17)
155 PO=109                                     'PHONE ON-HOOK - ( 37)
160 FF=110                                     'OFF-HOOK - ( 39)
165 UR=0                                       'USART RESET - ( 64)
170 UW=85                                      'SET 300,8,N,1 - ( 78)
171 UA=255                                     'STATUS & BITS - (145)
172 X2=128                                     'RECEIVED BITS - (  2)
175 '
180 FORX=1 TO 9                                'LOAD PHONE NUMBERS
185   READ A$(X)                                ' INTO ARRAY
190 NEXTX
195 GOSUB800                                    'INITIALIZE UART
200 REM <---- MAINLINE ----->
210 CLS
220 PRINTSTRING$(63,"")
230 PRINTTAB(15),"AUTODIALER PROGRAM"
240 PRINTSTRING$(63,"")
250 PRINT
260 PRINT"      1. 723-3282      FORUM-80"
270 PRINT"      2. 763-8879      SEACOMM-80"
280 PRINT"      3. 937-0444      MICROLINE"
290 PRINT"      4. 244-5438      CRATE #2"
300 PRINT"      5. 524-0203      CRATE #1"
310 PRINT"      6. 248-2600      SWAP & SHOP"
320 PRINT"      7. 625-9936      TYMENET"
330 PRINT"      8. 447-9012      TELENET"
340 PRINT"      9. MANUAL NUMBER ENTRY"
350 PRINT:PRINT"ENTER SELECTION: ";
360 A$="":A$=INKEY$:IF A$="" THEN 360
370   IF A$<"1" OR A$>"9" THEN 360
380   IF A$="9" THEN INPUT"ENTER NUMBER: ";A$(2)
390   IF A$="?" AND LEN(A$(2)) < 7 THEN 380
400 A=VAL(A$)
500 REM <---- READY TO DIAL ----->
510 OUT US,PO                                    'MODEM ON-HOOK
520 FORX=1 TO 500:NEXTX                         'WAIT FOR DIAL TONE
530 FORPN=1 TO LEN(A$(A))                        'SCAN NUMBER
540   NN=VAL(MID$(A$(A),PN,1))                  'GET DIGIT
550   GOSUB 1000                                 'PULSE DIGIT
560 NEXT PN                                     'GET ENTIRE NUMBER
570 FOR IL=1 TO 1260                            'LOOP FOR CARRIER
580   IF (INP(UM) AND UA)=UC THEN 700
590 NEXT IL                                     'GOT CARRIER
600 OUTUS,FF                                    'TRY AGAIN..
610 OUTUS,FF                                    'MODEM OFF-HOOK

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```
610 PRINT:PRINT"NO CONNECTION ON NUMBER ";A$(A)
620 FOR X=1 TO 1000:NEXT X                                'DELAY
630 GOTO 200
700 REM <---- BASIC TERMINAL ----->
720 CLS:PRINT"IN TERMINAL MODE.":PRINT
730 A$=INKEY$: IF A$="" THEN 740 ELSE OUTUD,ASC(A$)
740 IF INP(US)ANDX2 THEN PRINT CHR$(INP(UD)ANDX1);
750 GOTO 730
800 REM <---- INITIALIZE UART ----->
810 OUT US,PF                                         'ACHTUNG UART!
820 FOR X=1 TO 10:NEXT X                                'NEED DELAY
830 OUT UM,UR                                         'SEND RESET
840 OUT UT,UR                                         'SET 300,B,N,1
850 OUT US,PF                                         'RTS DTR LOW
860 X=INP(UD)                                         'CLEAN OUT BUFFER
870 RETURN
1000 REM <---- DIALER SUBROUTINE ----->
1010 PRINT NN;                                         'DISPLAY NUMBER
1020 IF NN=0 THEN NN=10                                'CONVERT 0 TO 10
1030 FOR X=1 TO NN                                     'LOOP 1 TO 10 TIMES
1040     OUT US,PF:FOR XX=1 TO Z1:NEXT XX               'OFF FOR 38MS
1050     OUT US,PO:FOR XX=1 TO Z2:NEXT XX               'ON FOR 66MS
1060 NEXT X                                           'ON-HOOK
1070 FOR DL=1 TO DS:NEXT DL                           '15      'INTERDIGIT DELAY
1080 RETURN
2000 REM <---- DATA FOR PHONE NUMBERS ----->
2010 DATA 7233282,7532879,9370444,2445438,5240203
2020 DATA 2482600,6259936,4479012,5551212
```

Public Access Message Systems  
last updated 20-Sep-81

!24 means 24 hour service  
EW means evening & weekend  
\*N means see note N, below  
? means may not be operating

CP/M RIBBS,.....	Cranford NJ 201	272-1874	
CP/M RIBBS,.....	Iselin NJ 201	283-2724	!24 *8,13
HBBS Tru-Data,.....	NJ 201	349-3842	
CBBS CASJ,.....	Bound Brook NJ 201	457-0893	*12
CONNECTION-80,.....	Linden NJ 201	486-2956	!24
FORUM-80 Monmouth,.....	Monmouth NJ 201	528-6623	!24
Starcom System 05,.....	Rockaway NJ 201	627-5151	!24
FORUM-80 Union,.....	Union City NJ 201	688-7117	
PMS - Shrewsbury,.....	Shrewsbury NJ 201	747-6763	EW
ABBS Amateur Computer Group,..	Pompton Plains NJ 201	753-1225	
FORUM-80 Vernon,.....	Vernon NJ 201	764-4974	
PHOTO-80,.....	Haledon NJ 201	790-6795	
ABBS CCNJ,.....	Pompton Lakes NJ 201	835-7228	
ABBS Saddlebrook,.....	Saddlebrook NJ 201	843-4563	
FORUM-80 Bill Taylor,.....	Princeton NJ 201	874-6833	!24
ABBS Wyckoff,.....	Wyckoff NJ 201	891-7441	
ABBS Amateur Computer Group,.....	Dunellen NJ 201	968-1074	
Communique-80,.....	Livingston NJ 201	992-4847	*19
<hr/>			
FORUM-80 Program Store,.....	Washington DC 202	337-4694	!24
WACS Electronic Journal,.....	Washington DC 202	635-5730	*1
<hr/>			
CBBS Stamford,.....	Stamford CT 203	348-6353	!24
ABBS Byte-Swappers,.....	Stamford CT 203	357-1570	
BULLET-80,.....	Bethel CT 203	743-9281	
BULLET-80,.....	Danbury CT 203	744-4644	!24 *19
XBBS Westico,.....	Norwalk CT 203	853-0816	!24
<hr/>			
FORUM-80,.....	Montgomery AL 205	272-5069	
ABBS Computer Center,.....	Birmingham AL 205	945-1489	
<hr/>			
ABBS Apple Crate II,.....	Seattle WA 206	244-5438	
XBBS Seattle,.....	Seattle WA 206	246-8983	
ABBS Seattle,.....	Seattle WA 206	248-2600	
MSG-80,.....	Everett WA 206	334-7394	
CP/M DMS,.....	Yelm WA 206	458-3086	*3
ABBS West Washington,.....	Elma WA 206	482-5134	
West Washington Info. Exchange,.....	Elma WA 206	482-5590	EW
ABBS Apple Crate I,.....	Vancouver WA 206	524-0203	
ARBB Seattle,.....	Seattle WA 206	546-6239	
FORUM-80,.....	Seattle WA 206	723-3282	
SEACOMM-80,.....	Seattle WA 206	763-8879	!24
ABBS Apple Bin,.....	Tacoma WA 206	937-0444	
<hr/>			
Z80-LSI11 BBS,.....	Dinuba CA 209	591-8753	!24 *18
ABBS Fresno,.....	Fresno CA 209	638-6392	
<hr/>			
Modem Over Manhattan,.....	New York NY 212	245-4363	!24 *19
CONNECTION-80,.....	Woodhaway NY 212	441-3755	
ABBS Staten Island,.....	Staten Island NY 212	448-6576	
N* Astronomers,.....	New York NY 212	787-5520	!24
HBBS HUGNJ,.....	Fairlawn NJ 212	791-6935	*11

RSCC BBS,..... Rego Park NY 212 897-1717 \*11  
 ?BBS Bryan Boyles,..... Bronx NY 212 933-9459  
 ABBS McGraw-Hill,..... New York NY 212 997-2186  
 -----213-  
 ABBS 27-micro,..... Los Angeles CA 213 276-4276  
 PMS Los Angeles,..... Los Angeles CA 213 291-9314 !24  
 ABBS Torrance,..... Torrance CA 213 316-5706  
 TSC Telephone Software Connection, Torrance CA 213 329-3715  
 ABBS Original Applecoms,..... Canosa Park CA 213 340-0135 !24  
 Woodland Hills NET-WORKS,..... Woodland Hills CA 213 346-1849 !24  
 ABBS Rainbow Computings,..... Los Angeles CA 213 349-5728  
 ABBS Laundale,..... Laundale CA 213 370-3160  
 ABBS Laundale,..... Laundale CA 213 371-1660  
 ABBS Computer Store,..... Santa Monica CA 213 394-1505 EW  
 Programma International,..... Brentwood CA 213 395-1159  
 ABBS Programma Intl,..... Brentwood CA 213 395-1592 !24  
 ABBS Santa Monica,..... Santa Monica CA 213 396-3905  
 ABBS Peripherals Unltd. Inc,..... Signal Hill CA 213 424-3506  
 ABBS Long Beach,..... Long Beach CA 213 423-4717  
 ABBS Pacific Palisades,..... Los Angeles CA 213 459-3177  
 ABBS Pacific Palisades,..... Los Angeles CA 213 459-6400  
 NET-WORKS Magnetic Fantasies,..... Los Angeles CA 213 465-1431  
 FORUM-80 Los Angeles,..... Los Angeles CA 213 631-3186  
 ABBS Morris Microproducts,..... Inglewood CA 213 673-2206  
 ABBS Hawthorne,..... Hawthorne CA 213 675-8803 !24  
 ABBS Hughes Aircraft,..... Los Angeles CA 213 679-0591  
 CP/M Valley Computer Club,..... Burbank CA 213 709-5423  
 ABBS Funny Bone,..... Bell Gardens CA 213 773-6591  
 ABBS Van Nuys,..... Van Nuys CA 213 787-4004  
 ABBS,..... CA 213 795-3788  
 CP/M CBBS,..... Pasadena CA 213 799-1632 !24  
 ABBS Marina,..... Marina Del Rey CA 213 821-7369  
 ABBS Deltrex,..... Los Angeles CA 213 826-0325 !24  
 ABBS MC Computer Store,..... Santa Monica CA 213 828-3400 EW  
 ABBS Softronics,..... Los Angeles CA 213 836-5723  
 CBBS San Fernando,..... Los Angeles CA 213 843-5390  
 Novation Corp. BBS,..... Los Angeles CA 213 881-6880 !24 \*17  
 ABBS Computer Forum,..... Santa Fe Springs CA 213 921-2111  
 ABBS Agoura,..... Agoura CA 213 991-9269  
 -----214-  
 BBS Jack Coniff,..... Dallas TX 214 243-3164  
 Dallas Information Board,..... Dallas TX 214 248-4539  
 Dante's Inferno,..... Dallas TX 214 327-3585 !24  
 ABBS Computerland,..... Dallas TX 214 361-1386 !24  
 Inner Circle,..... Dallas TX 214 530-0853 !24  
 ABBS KA Computer Store,..... Dallas TX 214 634-2668 !24  
 ABBS Dallas,..... Dallas TX 214 634-2777  
 BBS C. Taylor,..... Dallas TX 214 644-4781  
 ABBS Addison,..... Addison TX 214 661-2969 !24  
 BBS Winesap,..... Dallas TX 214 824-7455 !24  
 BBS The Moon,..... Dallas TX 214 931-3437 !24  
 -----215-  
 Lehigh Press BB,..... Allentown PA 215 435-3388  
 RBBS RCP/M,..... Philadelphia PA 215 527-6087 \*9,19  
 -----216-  
 FORUM-80 NOBUG-BBS,..... Cleveland OH 216 486-4176 EW \*19  
 ABBS Akcom,..... Akron OH 216 644-1965 !24  
 ARBIS-80 Feldman Enterprises,..... Akron OH 216 724-1963 !24  
 ABBS Akron Digital Group,..... Akron OH 216 745-7855 !24  
 ABBS Cleveland,..... Cleveland OH 216 779-1338  
 ABBS Akron,..... Akron OH 216 867-7463  
 -----217-  
 ABBS MC^3,..... Decatur IL 217 429-5505

Decatur NET-WORKS,..... Decatur IL 217 429-5541  
 BULLET-80,..... Springfield IL 217 529-1113  
 -----219-----  
 N\*BBBS Ft. Wayne,..... Ft. Wayne IN 219 627-3488  
 -----301-----  
 CP/M CBBS Prodigy Systems,..... Baltimore MD 301 337-8825 !24  
 CBBS NASA-GSFC,..... Greenbelt MD 301 344-9156 !24  
 PMS - Logical Choice,..... Ellicott City MD 301 465-3176  
 CP/M Baltimore Micro-Mail,..... Baltimore MD 301 655-0393 \*3  
 PSBBS Gaithersburg,..... Gaithersburg MD 301 840-8588 !24  
 -----303-----  
 FORUM-80 #2,..... Denver CO 303 399-8858 EW  
 23-322 DENHUG HBBS,..... Denver CO 303 422-3409 \*11  
 24 hrs ABBS Denver,..... Denver CO 303 759-2625 !  
 FORUM-80 Denver,..... Denver CO 303 774-3826  
 ?BBS Denver,..... Denver CO 303 789-0936  
 -----305-----  
 ABBS Byte Shop,..... Miami FL 305 261-3639  
 Personal Msg. System-80,..... Deerfield Beach FL 305 427-6300 !24  
 CMS-80,..... Fort Lauderdale FL 305 462-8677  
 ABBS Ft. Lauderdale,..... Fort Lauderdale FL 305 486-2983  
 ABBS A.C.E.S.,..... Fort Lauderdale FL 305 524-2237 !24  
 ABBS Palm Beach,..... West Palm Beach FL 305 689-3234  
 FORUM-80 Ft. Lauderdale,..... Fort Lauderdale FL 305 772-4444  
 ABBS Miami,..... Miami FL 305 821-7401 ?  
 FORUM-80,..... Orlando FL 305 862-6917 EW  
 ABBS GLTC.DV1,..... Hollywood FL 305 989-9647 ?  
 -----309-----  
 ABBS Peoria,..... Peoria IL 309 688-0470  
 ABBS Peoria,..... Peoria IL 309 688-0970 EW  
 ABBS Peoria,..... Peoria IL 309 692-6502 EW  
 ABBS Computer Core,..... Washington IL 309 694-6531 !24  
 ABBS Peoria,..... Peoria IL 309 697-2431  
 -----312-----  
 CP/M Calamity Cliffs CC,..... Lake Forest IL 312 234-9257 \*14  
 CLAH NET-WORKS,..... Arlington Heights IL 312 255-6489 EW  
 ABBS NIBS,..... Streamwood IL 312 289-1198 !24  
 ABBS Skiers' Info,..... Northbrook IL 312 291-1619  
 PMS NIAUG,..... Lake Forest IL 312 295-6926 !24  
 FORUM-80 Cook County,..... Chicago IL 312 296-7486  
 ABBS Personal Comp. of Chicago,..... Chicago IL 312 337-6631 EW  
 AIS Chicago,..... Chicago IL 312 338-8827  
 PBBS Games,..... Palatine IL 312 359-9450 !24  
 CBBS Remote CP/M,..... Chicago IL 312 384-4762 !24  
 ABBS SBSS,..... Schaumburg IL 312 397-0397  
 ABBS Illinois Microcomputer,..... Naperville IL 312 420-7995 EW  
 ABBS GameMaster,..... Evanston IL 312 475-4884 !24  
 ABBS Consultants Occ.Dir.Exch,..... Wheeling IL 312 537-7063 !24  
 CBBS#1 Chicago,..... Chicago IL 312 545-8086 !24  
 ABBS Chicago,..... Chicago IL 312 622-9609 ?  
 Free Game System,..... Rosers Park IL 312 743-8176  
 ABBS VideoInfo,..... Bolingbrook IL 312 759-6274  
 FORUM-80 Chicago,..... Chicago IL 312 782-8180 !24  
 COMM-80,..... Chicago IL 312 782-9751  
 AIMS #1,..... Hinsdale IL 312 789-0499  
 HBBS HUG,..... Downers Grove IL 312 852-1305 \*11  
 AIMS Aurora,..... Aurora IL 312 859-2622 !24  
 CP/M CBBS Maude,..... Milwaukee WI 312 876-0974 EW  
 NET-WORKS EIEHGN1,..... Hoffman Estates IL 312 882-9237 !24  
 TRS-80 CP/M,..... Chicago IL 312 749-6189  
 CP/M RIBBS,..... Hyde Park IL 312 955-4493  
 ABBS Downers Grove,..... Downers Grove IL 312 964-7768 EW ?  
 ABBS Compu-Shop,..... Morton Grove IL 312 967-0453

ABBS Rogers Park..... Rogers Park IL 312 973-2227 EW  
-----313-----

CBBS SEMCO,..... Royal Oak MI 313 288-0335 !24  
Download-80,..... Fraser MI 313 294-8248  
ABBS Westland,..... Westland MI 313 326-6050  
FORUM-80 Pontiac,..... Pontiac MI 313 335-8546  
ABBS Michigan Apple-Fone,..... Southfield MI 313 357-1422  
FORUM-80 Medical,..... Mt. Clemens MI 313 465-9531 EW  
ABBS Detroit,..... Farmington MI 313 477-4471  
Pet Bulletin Board,..... Ypsilanti MI 313 484-0732 !24  
ABBS Michigan Apple Club,..... Southfield MI 313 569-2063  
Remote CP/M MINICBBS,..... Royal Oak MI 313 588-7054 !24 \*3  
CP/M Technical CBBS,..... Dearborn MI 313 846-6127 !24

-----314-----

BAMS NET-WORKS,..... St. Louis MO 314 227-8495 EW  
SLHUG HBBS,..... St. Louis MO 314 291-1854  
SLUMS St. Louis,..... St. Louis MO 314 394-7233 !24  
NET-WORKS Computer Station,..... St. Louis MO 314 432-7120  
NET-WORKS #1,..... St. Louis MO 314 781-1308 !24  
FORUM-80 St. Louis,..... St. Louis MO 314 838-7784 !24  
SLAMS St. Louis,..... Florissant MO 314 839-4307 !24

-----315-----

ELPPA System NET-WORKS,..... Utica NY 315 733-9139  
-----316-----

FORUM-80 Wichita,..... Wichita KS 316 682-2113 !24  
-----317-----

PMS Indianapolis,..... Indianapolis IN 317 862-6191 !24  
-----318-----

FORUM-80 Shreveport,..... Shreveport LA 318 631-7107 !24  
-----319-----

ABBS Apple-Med,..... Iowa City IA 319 353-6523 EW  
ABBS Dubuque,..... Dubuque IA 319 557-9618 ?  
-----402-----

ABBS Lincoln,..... Lincoln NE 402 423-8086 !24  
-----404-----

CBBS Atlanta Comp. Soc,..... Chamblee GA 404 394-4220 !24  
Digital Disest,..... Norcross GA 404 447-5254  
ABBS AGS,..... Augusta GA 404 733-3461  
ABBS Baileys Computer Store,..... Augusta GA 404 790-8614  
ABBS Augusta,..... Augusta GA 404 793-1045  
Remote Northstar #1,..... Tucker GA 404 939-1520 !24  
ABBS Cyberian Systems,..... Atlanta GA 404 939-8429  
ABBS Computerland,..... Smyrna GA 404 953-0723 EW  
-----405-----

ABBS Lawton,..... Lawton OK 405 353-2554 EW  
ABBS OKC,..... Oklahoma City OK 405 528-8009  
-----408-----

ACBBS Computer Emporium,..... San Jose CA 408 227-5416  
BULLET-80,..... San Jose CA 408 241-0769 !24  
CBBS Santa Clara,..... Santa Clara CA 408 241-1956 !24  
Billboard-80,..... San Jose CA 408 263-0248  
BBBS#1 Santa Clara,..... Santa Clara CA 408 296-5799 !24  
PMS Santa Cruz,..... Santa Cruz CA 408 476-6181  
PBBS Crisis Timeshare,..... Santa Clara CA 408 727-1640 !24 \*5  
ABBS Sunnyvale Supra,..... Sunnyvale CA 408 737-0255  
-----412-----

CBBS Pittsburgh,..... Pittsburgh PA 412 822-7176 !24  
-----414-----

PBBS Milwaukee,..... Milwaukee WI 414 282-8118  
CP/M CBBS MAUDE,..... Thiensville WI 414 241-8364 !24  
CBBS,..... ?? WI 414 672-1612  
CP/M Rick Martinek,..... Milwaukee WI 414 774-2683  
-----415-----

ABBS Lafayette..... Lafayette CA 415 284-9524  
 CBBS Proxima (North Star)..... San Leandro CA 415 357-1130 !24  
 Apple CP/M Users Group..... Mill Valley CA 415 383-0473  
 Community..... San Francisco CA 415 474-0933  
 PMS Palo Alto..... Palo Alto CA 415 493-7691 !24  
 Conference Tree..... Berkeley CA 415 526-7733  
 CBBS Proxima (North Star, Inc.).... Berkeley CA 415 527-0400 !24  
 TRS Masmidia-80..... Foster City CA 415 573-8768 !24  
 ABBS Computerland..... Belmont CA 415 593-1200 !24  
 ABBS "Kinky Kumper"..... San Francisco CA 415 647-9524 !24 \*10  
 CBBS CONNECTION-80..... Fremont CA 415 651-4147 !24  
 HPBBS (DFM BBS),..... Emeryville CA 415 653-2152 \*16  
 CBBS/Lambda,..... Berkeley CA 415 658-2919 !24  
 ABBS San Francisco,..... San Francisco CA 415 661-0705  
 ABBS Zoram Associates,..... Fremont CA 415 792-8406  
 ABBS Zoram Associates,..... Fremont CA 415 794-8287  
 ABBS "SOUTH-OF-MARKET",.... San Francisco CA 415 821-1714 !24 \*10  
 ABBS PCNet,..... Menlo Park CA 415 863-4703  
 ABBS Byte Shop,..... Hayward CA 415 881-5662  
 Conference Tree,..... San Francisco CA 415 928-0641  
 ABBS PCNet,..... San Francisco CA 415 948-1474  
 -----417-----  
 ABBS Springfield,..... Springfield MO 417 862-7852  
 -----419-----  
 ABBS Bowling Green,..... Bowling Green OH 419 352-4477  
 ABBS Computer Store,..... Toledo OH 419 531-3845  
 ABBS ABACUS II,..... Toledo OH 419 865-1594  
 -----502-----  
 ABBS Louisville,..... Louisville KY 502 426-2975 !24  
 ABBS Louisville,..... Louisville KY 502 896-9624  
 -----503-----  
 ABBS Portland,..... Portland OR 503 224-6409 !24  
 ABBS Eugene,..... Eugene OR 503 485-4546 \*21  
 BBS RCP/M WA7KGX,..... Burlington OR 503 621-3193 \*19  
 ABBS Portland,..... Portland OR 503 641-8555 !24  
 CBBS Northwest,..... Beaverton OR 503 646-5510 !24  
 FORUM-80 J.A.C.S,..... Medford OR 503 779-6800  
 -----504-----  
 CBBS Baton Rouge,..... Baton Rouge LA 504 273-3116 !24  
 -----509-----  
 ABBS Spokane,..... Spokane WA 509 456-8900  
 ABBS Electro-Mart,..... Spokane WA 509 534-2419  
 -----512-----  
 ABBS San Antonio,..... San Antonio TX 512 657-0779 ?  
 ABBS San Antonio,..... San Antonio TX 512 737-0214 !24  
 CBBS Corpus Christi,..... Corpus Christi TX 512 855-1512 EW  
 -----513-----  
 ABBS Dayton,..... Dayton OH 513 223-3672  
 BIG-BYTE-80,..... Cincinnati OH 513 244-2983 !24  
 NET-WORKS ABBS 21st Century,..... Cincinnati OH 513 451-2116  
 ABBS Computer Store,..... Cincinnati OH 513 671-2753 EW  
 BBS-80 Cincinnati,..... Cincinnati OH 513 752-9963 !24  
 XBBS Earl Campbell,..... Hamilton OH 513 863-7681 !24  
 ABBS Computer Store,..... Hamilton OH 513 874-2283  
 BBS-80 Cincinnati #2,..... Hamilton OH 513 896-1700 \*9  
 -----515-----  
 NET-WORKS Computer Emporium,.... Des Moines IA 515 279-8863  
 ABBS Ames,..... Ames IA 515 294-8204  
 -----516-----  
 INNOV-80,..... Great Neck NY 516 482-8491  
 CBBS L.I.C.A. LIMBS,..... Long Island City NY 516 561-6590 !24  
 Connection - 80,..... Centerreach NY 516 588-5836 !24  
 CP/M CBBS Long Island,..... NY 516 698-8619 \*3

-----602-----  
ABBS Computer Store,..... Phoenix AZ 602 866-0258 EW  
ABBS Computer World,..... Phoenix AZ 602 955-1486  
CBBS Phoenix,..... Phoenix AZ 602 956-5612  
EBBS Desert Technology,..... Phoenix AZ 602 957-4423 !24  
EBBS Computerland of Arizona,..... Phoenix AZ 602 957-9282 EW  
CBBS Phoenix,..... Phoenix AZ 602 996-9709

-----603-----  
FORUM-80 Nashua,..... Nashua NH 603 832-5041

-----604-----  
CBBS Burnaby,..... Burnaby BC 604 420-1006  
CP/M CBBS,..... Vancouver BC 604 687-2640 !24

-----607-----  
Triple Cities Bulletin Board,..... Endicott NY 607 754-5571 !24  
CP/M SJBBJ Ed's Comm. Svc,..... Johnson City NY 607 797-6416 EW

-----609-----  
ABBS/IES South Jersey,..... Blackwood NJ 609 228-1149  
ABBS NJAUC,..... Marlton NJ 609 983-5970

-----612-----  
ABBS Zim Computers,..... Minneapolis MN 612 561-6311  
CBBS Minneapolis,..... Minneapolis MN 612 869-5780  
PMS - Minneapolis,..... Minneapolis MN 612 929-6699 !24  
ABBS Minneapolis,..... Minneapolis MN 612 929-8966 !24

-----613-----  
ABBS Compumart,..... Ottawa ON 613 725-2243

-----614-----  
CBBS Columbus,..... Columbus OH 614 268-2227 !24 \*20  
RBBS RCP/M,..... Newark OH 614 366-3252

-----615-----  
ACSS Nashville,..... Nashville TN 615 254-9193 !24

-----616-----  
ABBS Computer Room,..... Kalamazoo MI 616 382-0101 !24

-----617-----  
ABBS Boston,..... Cambridge MA 617 354-4682  
CP/M SJBBJS,..... Amesbury MA 617 388-5125 !24  
FORUM-80 Wellesley,..... Boston MA 617 431-1699  
CBBS Medical,..... Lawrence MA 617 683-2119  
FORUM-80 Westford,..... Westford MA 617 692-3973 !24  
CBBS Cambridge,..... Cambridge MA 617 864-3819 !24  
New England Comp. Society,..... Maynard MA 617 897-0346  
CBBS Boston,..... Randolph MA 617 963-8310 !24

-----618-----  
Net-Works Computer Station,.... Granite City IL 618 877-8080

-----702-----  
FORUM-80 Las Vegas,..... Las Vegas NV 702 362-3609 !24  
ABBS Apple Cider,..... Las Vegas NV 702 454-3417  
AMOS Byte Shop,..... Reno NV 702 826-7234 \*7

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ABBS MSS,..... McLean VA 703 255-2192  
AMRAD,..... Fairfax VA 703 291-2125 !24  
HEX,..... Washington DC 703 281-2222 \*4  
Potomac Micro Magic Inc,..... Falls Church VA 703 379-0303  
TCUG BBS, TRSS Group,..... Reston VA 703 620-4990 !24  
FORUM-80 PWC,..... Prince William County VA 703 670-5881  
CBBS AMRAD-Terry Fox,..... McLean VA 703 734-1387 !24 \*20  
Potomac Micro Magic Inc,..... Falls Church VA 703 750-0930 \*6  
ABBS,..... McLean VA 703 893-9474  
FORUM-80 Genealogy,..... Fairfax VA 703 978-7561 !24

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ABBS Apple Orchard,..... Vacaville CA 707 448-9055 W

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PMS - Gulfcoast,..... Freeport TX 713 233-7943 !2  
ABBS HAUG,..... Houston TX 713 654-0759 E

ABBS Younss Elect Svc.,..... College Station TX 713 693-3462 !24  
ABBS Younss Elect Svc.,..... College Station TX 713 693-8030 EW  
ABBS Houston,..... Houston TX 713 977-7019  
-----714-----  
PMS - Mission Valley,..... Mission Valley CA 714 295-8280 !24  
PMS - Santee,..... Santee CA 714 449-5689 !24  
ABBS Laguna Nisuel,..... Laguna Nisuel CA 714 495-6458  
COMM-80 Orange County,..... Fullerton CA 714 526-3687  
Orange County Data Exchange,..... Garden Grove CA 714 537-7913 !24  
CBBS San Diego,..... San Diego CA 714 571-5550  
PMS - San Diego,..... San Diego CA 714 582-9557 !24  
ABBS Computer Forum,..... Buena Park CA 714 739-0711  
ABBS Computer World,..... Santa Ana CA 714 751-1422 !24  
PMS - \*\*IF\*\*,..... Anaheim CA 714 772-8868 !24  
NET-WORKS Apple Jacks,..... Fontana CA 714 823-1451 !24  
Star-System Network,..... Westminster CA 714 895-1166 \*2  
ABBS Computer World,..... Westminster CA 714 898-1984  
FORUM-80 Orange County Self-Help,..... Anaheim CA 714 952-2110  
ABBS Korsmeyer Elect,..... Huntington Beach CA 714 962-7979 !24  
ABBS Apple Tree,..... Huntington Beach CA 714 963-7222  
-----716-----  
BBS & Remote CP/M,..... Rochester NY 716 334-4604 !24  
-----801-----  
ABBS Download,..... Provo UT 801 375-7000  
ABBS Discovery Software,..... Salt Lake City UT 801 466-1737 !24  
ABBS Frontier Computing,..... Logan UT 801 753-6800  
-----802-----  
XBBS North East,..... Saint Johnsbury VT 802 748-9089  
ABBS Vermont,..... Essex Junction VT 802 879-4981 !24  
-----803-----  
FORUM-80, Augusta GA,..... N. Augusta SC 803 279-5392 !24  
CBBS RCP/M,..... Fort Mill SC 803 547-6576 !24  
FORUM-80 Charleston,..... Charleston SC 803 552-1612  
Compusystems,..... Columbia SC 803 771-0922  
ABBS Columbia,..... Columbia SC 803 772-1592  
-----804-----  
Remote Northstar,..... Virginia Beach VA 804 340-5246 !24  
ABBS Chesapeake,..... Chesapeake VA 804 543-7194  
VA 804 545-6404  
-----805-----  
FORUM-80 Ventura County,..... Oxnard CA 805 484-9904 !24  
CP/M Net,..... Simi Valley CA 805 527-9321 EW  
Remote Northstar,..... Santa Barbara CA 805 682-7878  
Remote Northstar,..... Santa Barbara CA 805 964-4115 \*6  
-----806-----  
ABBS Computer Corner,..... Amarillo TX 806 355-5610  
-----812-----  
CP/M The Hogan,..... Bloomington IN 812 334-2522 WKND\$  
-----813-----  
FORUM-80 Tampa,..... Tampa FL 813 223-7688 EW  
BULLET-80,..... Pinellas Park FL 813 541-2580 !24  
Powercom 2.2,..... Largo FL 813 577-3095 !24  
-----816-----  
Download,..... Kansas City MO 816 523-9121  
ABBS Computer-Video Room,..... Kansas City MO 816 531-1050  
FORUM-80 #1 Kansas City,..... Kansas City MO 816 861-7040 !24 \*19  
Market 80,..... Kansas City MO 816 931-9316  
-----817-----  
1. ABBS Univ. of Texas, CS Dept,..... Arlington TX 817 273-2227  
2. CBBS Waco,..... Waco TX 817 776-1375 .  
3. FORUM-80 Wichita Falls,..... Wichita Falls TX 817 855-3916  
4. FORUM-80 Ft. Worth,..... Fort Worth TX 817 923-0009 !24  
-----901-----

FORUM-80 Memphis.....	Memphis TN 901 276-8196	!24
FORUM-80 Hobbyist.....	Memphis TN 901 362-2222	!24 *19
ABBS Memphis.....	Memphis TN 901 725-5691	
ABBS Computer Lab.....	Memphis TN 901 761-4743	EW
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CBBS Nova Scotia.....	Halifax NS 902 794-8198	?
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ABBS Destin.....	Fort Walton Beach FL 904 243-1257	
6800BBS.....	Pensacola FL 904 477-8783	
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ABBS Ketchikan.....	Ketchikan AK 907 225-6789	
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ABBS Kansas City.....	Kansas City KS 913 341-3502	
ABBS Kansas City.....	Kansas City KS 913 362-6398	
FORUM-80 Educational.....	Leavenworth KS 913 651-3744	!24
Engineer-80.....	Olathe KA 913 764-1520	
Avionics 80.....	Kansas City KS 913 782-5115	?
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CP/M Hank Szyszka.....	Bearsville NY 914 679-6559	
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Computerland.....	El Paso TX 915 533-6255	!24
ABBS El Paso.....	El Paso TX 915 533-7039	*11
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N*BBBS Avionics.....	Sacramento CA 916 393-4459	!24
CBBS Sacramento.....	Sacramento CA 916 483-8718	!24
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FORUM-80.....	Tulsa OK 918 747-2550	EW
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FORUM-80.....	Hull, England (011) 44 482 859169	

\*1 300 baud #, type ^C I <cr> HELP WACS  
\*2 Login with 'ID CCC046 SSS'  
\*3 Call, let ring once, call back for answer  
\*4 Allows Baudot code as well as ASCII  
\*5 <Ctrl M> HELLO-B200,,3  
\*6 Answers after fourth ring  
\*7 Enter 'FREE' to access system  
\*8 6am to 2 am pst only  
\*9 10pm to 6 am eastern time  
\*10 May Contain X-rated material -- if offended please don't call!  
\*11 Mon - Sat - 7 p.m. to 9 a.m. and all day Sun.  
\*12 Login with 'HEL-1999,MAIL'  
\*13 Password "THEREAT" to set into CP/M mode  
\*14 2pm to 2am local time  
\*15 8am to 12pm local time  
\*16 <CR><CR> HELLO-B007,,1  
\*17 Login 'CAT'<cr>  
\*18 Login as user ID 70000,1 and Password CBBS  
\*19 300 or 1200 baud, automatic recognition; program downloading  
\*20 PMMI port, 110 to 600 baud, automatic recognition  
\*21 Operates 24-hr. Thurs.-Sun. and 8am-5pm Mon.-Weds.

NOTICE: ALL NUMBERS IN THE ABOVE DIRECTORY ARE DERIVED FROM  
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POSTED ON THE ABOVE BBS'S ANNOUNCING THE OPENING, CLOSING, OR  
CHANGING OF BBS FACILITIES. NO GUARANTEES ARE MADE, EITHER  
EXPRESS OR IMPLIED, ABOUT THE RELIABILITY OF THE INFORMATION  
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