## Installation & Operation
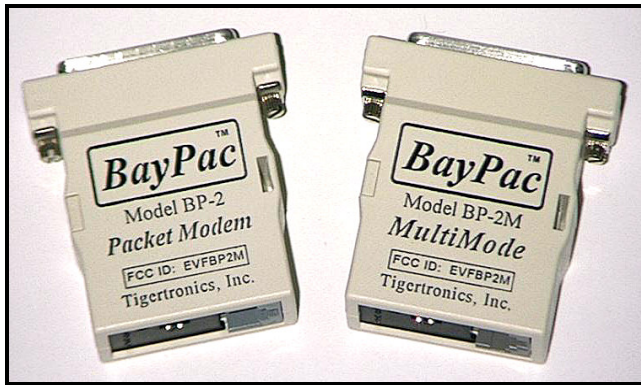


### - INTRODUCTION -

The Model BP-2 is an enhanced version of our ever popular BayPac BP-1 Packet Modem.  The BP-2, when combined with BayCom compatible software, forms a full-function Packet Terminal Node Controller (TNC).  It provides not only normal message handling, but also advanced features like digipeating and file transfer.  Not much bigger than a "pack of gum", the BayPac employs advanced CMOS circuitry consuming less than 9 milliwatts of power.  You'll never have to worry about dead batteries or where to plug this one in! Connect your BP-2 to a "Palm Top" and HT and you have a "world wide" digital communications system that can be held in one hand!

The BayPac Model BP-2M is the MultiMode version of the BP-2.  While the BP-2 is designed exclusively for 1200 baud packet, the BP-2M also does 300 baud (HF) packet and a host of other modes, such as CW, RTTY, AMTOR, SSTV, WEFAX and more.  You will find more information on these modes and programs in the "MultiMode Operation" section of this manual and in the "SOFTWARE.DOC" disk file. Since packet communications is the primary function of the BayPac, these instructions will focus mainly on that application, using the BayCom software which is included. Regardless which software you are planning to use, you will find these instructions applicable.   Only the section on "MultiMode Operation", applies exclusively to the BP-2M.

Both modems come completely assembled and tested. Installation is a two-step process.  The first step involves connecting the BayPac to your radio and computer.  This document will help you through that process.  The second step involves setting the transmit and receive audio levels. We have provided a program on our setup disk to make that

task very easy.  In addition, you will of course need to install BayCom compatible TNC emulation software on your computer. Such programs are available commercially or as shareware on many telephone BBS's and on the Internet. We have included a copy of the popular BayCom Terminal Program on our setup disk to get you started.

### - WHAT YOU WILL NEED -

To run the software you will need an IBM PC/XT/AT or fully compatible computer (clone).  To install the BayPac Modem, your computer will need a serial port.  Serial ports COM1 through COM4 can be used, provided you are using software that supports the port that you have chosen.   In addition, you will need whatever connectors are required to attach to the external speaker jack and microphone input on your radio.  These parts may have been supplied with your radio or may be purchased from your local electronics dealer.

### - CONNECTING THE COMPUTER -

If your computer has a standard DB-25 connector on its serial port, you simply need to plug the BayPac into the connector.  If your computer uses a DB-9 connector, you will need an adapter cable.  You can either build a suitable cable or purchase one at your local computer store.  Whether you build or buy this adapter, BE SURE IT HAS SHIELDED CABLES.    If you wish to build the adapter cable, refer to the diagram in Figure 1. Be sure to remember which COM port you have connected the modem to.  You will be prompted to enter the serial port number, when you run the INSTALL program.

### - CONNECTING THE RADIO -

There are only four wires required to connect the BayPac to a transceiver.  The connector pin-out is shown in Figure 2.



Figure 1

Figure 2
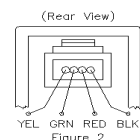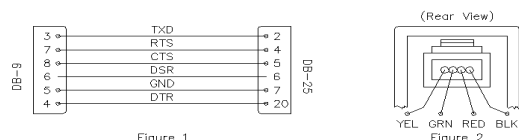
- IMPORTANT -  Notice the orientation of the colored wires with respect to the body of the connector. BE SURE that the cable you plug into the BayPac does not have these wires in

the reverse order! Remember that when viewing the connector from the rear, with the release lever on the top, the left most wire *MUST BE YELLOW*.

If you only plan to receive packet (not transmit), you can simply connect the Black ground wire and the Green audio input wire to the external speaker jack on your radio. These are the only connections necessary to receive in any mode.
If you are connecting the BayPac to a transceiver, you will also need to connect the PTT line (Red) to key the transmitter and the Audio Out line (Yellow) to the microphone input. Exactly where these connections are made will vary with each model of radio. Most base station and mobile radios of recent manufacture have all the required connections (including the speaker output) available on the microphone connector. This is the ideal situation since it makes the cabling very neat and simple. If your radio does not have the speaker connection on the mic connector you might consider modifying it so that it does. You will find it worth the effort. You will need to refer to your radio manual for the specific pins to connect to.

If your radio does not have the speaker signal on the mic connector, you will need to run a short jumper cable to the external speaker jack. Note that having the speaker cable exit from the mic connector housing (rather than splitting the cable outside the connector) makes a much nicer installation. Refer to Figure 3.
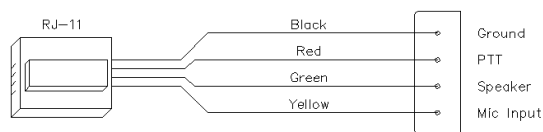


Figure 3

You should verify that your radio requires the PTT line to be grounded to key the transmitter. This is the case for the vast majority of radios. The BayPac expects to pull the PTT line to ground to enable the transmitter. The PTT output is a FET transistor capable of sinking about 75 ma at 12 volts. If your radio needs some other keying arrangement (not likely) you will need to provide it. If your radio is an older model with high voltage or high current on the PTT line, you will need to install a small relay to do the keying (very low current 12v relay).

### - HT OPERATION -

If you are connecting the BayPac to an HT you may find that there is no separate PTT line. Many of these radios key the PTT by grounding the mic line through a resistor. If this is the case with your HT, you can activate an internal PTT keying resistor (3.0K) inside the BayPac by installing a shunt across the two pins extending from the rear of the BayPac case. We have supplied a shunt for this purpose. Remember, if you use the internal keying resistor, DO NOT connect the Red Wire (PTT) to anything on the radio. If the internal keying resistor is not an appropriate value for your

radio, install the correct value resistor between the Red and Yellow wires at the mic connector end of the cable and DO NOT install the shunt on the back of the BayPac. Note that it is very unusual for the internal resistor we used not to work. Refer to your radio manual and the HINTS.DOC disk file for specific PTT suggestions for your radio. NOTE: When using your HT for packet, WE STRONGLY RECOMMEND that you use an EXTERNAL ANTENNA located at least ten feet away from both the BayPac and the computer. Because the connectors on most HTs are only a fraction of an inch from the antenna, you will almost certainly pickup enough RF to cause some sort of malfunction during transmit or pickup excessive computer generated noise that will degrade the receive performance. Refer to the section on RF Interference, in this document, for further information.

### - SOFTWARE INSTALLATION -

We have supplied a software disk that contains several files to help you install and operate the BayPac Modem and BayCom software. You can get further instrucions by using an ASCII Text Editor (like DOS EDIT) to view or printout the README.DOC disk file. We have supplied an installation program on the disk called INSTALL.EXE. This program installs a specially configured version of BayCom on your computer and inserts your call letters and serial port selection in the initialization file (SCC.INI). To run the software, simply put the Setup Disk into your "A" floppy drive and type A:INSTALL. You will be prompted to supply the necessary installation information.

*NOTE:* The files on the installation disk are "compressed". After installation you will find that the "destination disk" contains many files that did not appear on the original!

### - CALIBRATION -

Most functions within the BayPac are self-calibrating. However, there are two adjustments which should be checked by the user since they can vary slightly with the type of radio being used. Both of these adjustments can be made using the BPMODE.EXE program provided on the BayPac Setup Disk. Instructions for performing the necessary procedures are provided by a Help Screen within the program. Be sure to perform all testing on an unused (Non Packet!) frequency. Use a dummy load if at all possible and keep your transmissions short.

The first adjustment you will make involves setting the modulation 'Level' control. This adjustment is made by inserting a small screwdriver through the access hole on the rear of the BayPac case. This adjusts the level of the tones going to the microphone input of your transceiver. It must be set to provide a transmitter deviation of about 3 KHz. We have already adjusted this level control at the factory to be compatible with the vast majority of radios. So...Y*ou should not make any adjustments* unless you are sure it is really necessary.

The second step in setting up your equipment for packet operation, involves finding the best setting for the volume control on your transceiver. This setting determines the amount of audio going to the BayPac during receive. Normally, for most transceivers, you will need to adjust the volume control to about two-thirds rotation (1 - 2 volts p-p of audio). It may seem to some users that this is a little high. This is done so that the BayPac can scale the level to its needs. If the level is inadequate, receive performance will be degraded and you will get excessive "Rejects" when you connect to other stations.

## - MULTIMODE OPERATION -

Perhaps the most exciting feature of the BP-2M is its ability to operate with many MultiMode shareware and commercial programs like HamComm, JVFAX, and various WEFAX (weather facsimile) and SSTV (slow scan television) programs. Using these programs you will be able to explore CW, Baudot, ASCII, AMTOR, ARQ/FEC, SITOR, NAVTEX, WEFAX, SSTV (bw/color) and more! Most of these programs are either distributed as "Freeware" or "Shareware" over the vast network of telephone BBS's and Internet Web Sites. Many other excellent programs are sold as commercial products and can be found in the various ham and SWL publications. Because most software authors prohibit distribution of their software with a commercial product, Tigertronics does not supply any of these programs with the BayPac Modem. However, they are very easily obtained. In fact, most can be downloaded from our Internet Web Site at: http://www.tigertronics.com Refer to the SOFTWARE.DOC disk file for an extensive list of compatible programs. Note that we regularly publish updated copies of the SOFTWARE.DOC, on our web site, for you to download.

Before you can use the BP-2M with any program, you will need to be sure that it is set to the correct "Mode". We have included a program called "BPMODE.EXE" for making this selection. The program is very easy to use and contains a "Help" screen to assist you in mode selection. You will need to execute BPMODE prior to starting any program, unless you are certain that the BayPac is already in the correct mode. Note that if you selected "SAVE & EXIT", when you last ran BPMODE, the BP-2M will "remember" your last mode selection. For example: If the last program you ran was JVFAX (say... yesterday) and you want to run HamComm now, you will not need to run BPMODE again, because the BayPac will remember that you "SAVED" Mode 3 yesterday! (Note that both of these programs required Mode 3 for operation.) Mode settings, for programs not listed on the "Help" screen, can be found in the SOFTWARE.DOC file. You might like to consider placing BPMODE in a "batch file", so that it executes automatically when you launch your various programs.

One final thought... The performance of the various MultiMode Software programs varies dramatically with different combinations of radios, computers and operator skills. Particularly with Shareware, you will find programs that range from outstanding to those that just don't seem to work at all on some equipment! So, be patient, take your time and experiment until you find what works for you. If you lack the time or patience to do that, we suggest that you opt for the commercial offerings. Remember... This is just a Hobby! Experimenting is part of the fun!

## - RF INTERFERENCE -

The BayPac Modem was designed with RF immunity in mind. Not only is its circuitry designed to minimize the generation of radio emissions, but it is also designed to suppress emissions from your computer. Nevertheless, if you operate the unit in the presence of excessively high RF fields (HF Kilowatts!), you are probably going to have problems with both the computer (especially laptops) and the BayPac. If this situation is unavoidable, you can increase your chances for success by using shielded cables from an interface box as shown in figure 4. This approach is especially helpful when using an HT in portable operation where the antenna is located very close. RF induced problems are easily identified since they generally cause the BayPac and/or computer to become totally inoperative (lock up) after transmitting. If this happens, you can reset either device by simply turning off the power and then restarting the program. *WARNING:* Excessively high levels of RF can permanently damage your equipment. Try to keep your antenna at least ten feet away from the computer and the BayPac.
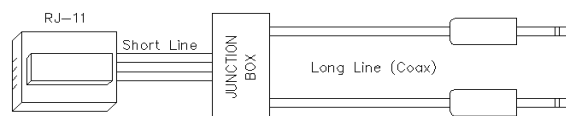


Figure 4

## - HELPFUL HINTS -

Be sure to read the HINTS.DOC disk file for operating and installation tips. This file contains specific information on most radio models as well as general information to increase your enjoyment of both the BayPac Modem and the BayCom software.

## - THE MOST COMMON PROBLEMS -

The following are the most common causes of problems, as reported by our Technical Support Staff. All are easily avoided!

1) *NEVER!* Never try to operate BayCom or any of the MultiMode programs from Windows! No matter what anyone tells you... Just Don't! If it works at all, it will never work *correctly* - Not even as a "full screen" DOS application. It does not matter how fast your computer is or what version of Windows you are using. The problem has to

do with how multitasking systems share their resources. BayCom requires the *total undivided attention* of the computer to work reliably.

2) The second most common mistake is declaring the wrong COM port when installing the software. You MUST know which serial port you are connected to (COM1 - COM4). If you declare a COM port that is wrong or non-existent the software may appear to transmit on the screen but nothing will happen at the radio. Naturally, it will not receive anything either. Note that BayCom versions prior to v1.6 and many other programs do not support COM3 or COM4. If you are using either of these ports, be sure that you are using software that supports it!

3) The most common reason that BayCom software will not function is the presence of another "TSR" operating in your computer. If you have any problem with the software, you should temporarily remove any CONFIG.SYS and AUTOEXEC.BAT files that you may have and try again. "TSR" programs include anything that is always running on the computer such as a mouse or menu program. Another problem source is anything that "pops up" with a special key sequence (SideKick, PC Tools, etc.).

4) We are not aware of any problems using DOS Versions later than v3.2, except for a few (very few) isolated cases with DOS 5.0. We have seen very few instances where the software really didn't work! It is almost always a problem with conflicting TSR's or the incorrect COM port selection.

5) BE SURE that you wired the radio connector correctly. DO NOT do anything we didn't ask you to do! For Example: DO NOT install a capacitor or resistor in the mic lead. Many other TNC's require this - WE DO NOT. If you install one (because your best friend said to!) your BayPac might work..... but not very well!

6) If you are a new ham or just getting started in packet and are just generally unsure of what you might be doing wrong, you might seek the help of a more experienced ham in your community. A cry for help on the local repeater or at a club meeting will generally draw the aid of a more experienced user. This is generally the quickest way to get help without long distance phone calls!

7) If you are absolutely sure that everything is right and the problem still persists, you might want to try testing with a different computer or radio. Also be sure you check the HINTS.DOC file to see if your specific equipment is mentioned as a potential problem.

## - WORLD WIDE WEB -

If you have Internet access, please visit our Home Page on the World Wide Web at: *http://www.tigertronics.com* This website contains the latest news about Tigertronics products, as well as a wealth of information of interest to all Hams and SWL's. This site is also your best source for the latest updates to all of our software.

## - YOUR COMMENTS WELCOME -

Tigertronics has made every effort to make the BayPac the best product possible. We believe it represents a major technological breakthrough in packet radio and hope we have anticipated your every need in using it. We welcome any comments or suggestions that you would like to make. Please drop us a note to let us know about your experiences, tips you would like to share with other users, or how we might do a better job for you.

## - LIMITED WARRANTY -

Tigertronics warrants the BayPac Modem to be free of defects in material and workmanship for a period of 90 days from the date of shipment. Tigertronics will repair or replace, at its option, any parts found to be defective during the warranty period. This warranty does not include any unit which has been subject to misuse, neglect, improper installation or operation. This warranty is in lieu of all others, express or implied, and no person or representative is authorized to assume for Tigertronics any other liability in connection with the sale or use of this product. Tigertronics will not be responsible for any expense or loss of revenue or property incurred by the user due to operation or malfunction of this equipment. Tigertronics reserves the right to make circuit or component changes, or to incorporate new features, at any time, without obligation.

## - RETURN POLICY -

A Return Material Authorization Number (RMA#) must be obtained from the factory before any product will be accepted for return or repair. Items received at the factory without an RMA# clearly marked on the OUTSIDE of the package WILL BE REFUSED. Items being returned must be sent prepaid. Returned items should have a note attached showing the RMA#, customer name, return address, phone number, and action requested. Units being returned for warranty repair must be accompanied by a copy of the original sales invoice showing the date of purchase.

Customers wishing to return a product for REFUND, for ANY REASON, must receive an RMA# within 15 days from the shipping date shown on the original sales invoice. Customers returning products for refund will be charged a Restocking Fee equal to 20% of the purchase price, to cover the cost of re-testing and re-stocking. Products which have been damaged or modified in any way, may not be returned. Contact our Technical Support department for the RMA#.

## - TECHNICAL SUPPORT -

If you encounter problems that you cannot resolve with the BayPac (not software), you can reach our Technical Support Center at (541) 862-2639 any Monday, Wednesday, or Friday between 1:00 PM and 5:00 PM (PST). Be sure to have your equipment available for testing when you call. Also, have a printout of your AUTOEXEC.BAT and CONFIG.SYS files available for review. Please DO NOT mail or fax your technical inquiries to us. We realize that calling is a little more expensive, but more can be accomplished in a few minutes on the phone than can be done in hours of writing! We simply are not able to respond to written inquiries involving technical problems.

## - FCC STATEMENT -

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

*Caution*: Changes or modifications not expressly approved by the party responsible for compliance could void the users authority to operate the equipment.

To meet FCC requirements, shielded cables are required to connect this device to a personal computer or other Class B certified device.

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**FCC ID:  EVFBP2M**
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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(Rev. 10/10/05)