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# PC-500 User Manual

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## Dual Band Transceiver

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**Patcomm Corporation**  
PO Box 1105 Smithtown, NY 11787  
Phone: (631) 265-5228 E-mail: [sales@patcomm.org](mailto:sales@patcomm.org)  
Web Site: [www.patcommradio.com](http://www.patcommradio.com)

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## I. Introduction and Overview of the PC-500

The PC-500 is a high performance HF / VHF Transceiver that provides operation on any two Amateur Bands between 160 and 6 Meters by the use of plug-in band modules. The Transceiver will operate in SSB and CW modes and has an output power level that can be continuously adjusted from less than 1 watt to a maximum of 15 watts. The receiver is a single conversion design with an IF frequency of 10.7 MHz. A 5 pole crystal filter is used at this IF frequency (8 pole available as an option) for superb selectivity. The receiver has an MDS of better than -130 dbm providing plenty of sensitivity for pulling in the weak DX signals. The PC-500 also employs a unique filtering system in the audio stages to provide a continuously variable filter from 600 Hz to 3 kHz which resides within the AGC loop. This is a 16 pole filter whose performance rivals that of a DSP filter but which operates in real time. DSP filters require considerable processing time which makes it very difficult or impossible to place them within the AGC loop and achieve smooth operation. The real time performance is what allows the DVF (Digital variable Filter) to be placed within the AGC loop. The effect is that signals dropped out of the audio passband will not "pump" the AGC or S-meter.

An additional feature of the PC-500 is that a standard PC compatible keyboard may be plugged into the DIN connector at the rear of the Transceiver. The keyboard can be used to send CW, store frequencies in memory, change bands and modes and to perform Direct Frequency Entry. The PC-500 also supports RIT (Receiver Incremental Tuning) and SPLIT Mode operation where the Transmit Frequency can be monitored by a press of a single button on the front panel. The PC-500 provides a feature packed radio at very economical pricing.

## II. Review of Front Panel Controls and Functions

The Front Panel contains 12 pushbuttons, 3 controls, the Main Display, S-Meter and Main Tuning Knob. Additionally, there is a Headphone Jack and a Microphone Jack. The following is a summary of the Front Panel Controls and their functions:

### **Push Buttons:**

**KEYSPEED** - This button will cause the bottom line of the Display to display the following message:

**KEYSPEED> XX wpm**

where XX is the current speed of the internal CW keyer in words per minute (wpm). This value may be changed by rotating the Main Tuning Knob until the desired speed is displayed. If the internal keyer is not required and a straight key will be used, the **LOCK** button can be pressed when in the keyspeed mode and the word **MANUAL** will appear in place of the **XX wpm** message. This indicates that the internal keyer is disabled and that a straight key plugged into the key/paddle jack will operate in that manner. To re-enable the keyer simply press the **LOCK** button again when in the KEYSPEED mode. The **XX wpm** message will re-appear and the keyer will be enabled.

**AGC** - This button is used to switch between a FAST and SLOW Automatic Gain Control Speed. Repeated pressing of this button will cause the AGC speed to toggle between FAST and SLOW. When in the FAST speed the GREEN LED next to the AGC Button will be lit. The SLOW speed is indicated by the RED LED next to the button.

**ATTN** - This button is used to switch a 10 db attenuator in and out of the RF path to the receiver. The Attenuator is in line when the LED is lit.

**PREAMP** - This button is used to switch a 12 db preamp in and out of the RF path to the receiver. The preamp is used to boost the level of weak signals by lowering the MDS level of the receiver. The preamp is in line when the LED is lit.

**NB** - This button is used to enable and disable the optional Noise Blanker. The Noise Blanker will remove impulse type noise from the receiver at the IF frequency. The Noise Blanker is ON when the LED is lit.

**RIT** - This button will bring the unit in and out of RIT (Receiver Incremental Tuning) mode. When in RIT mode the green LED next to the button will be lit. When RIT is invoked the <- symbol next to the transmit frequency on the main display (line with the T next to the Frequency) will blank, leaving only the receive or "R" frequency tunable. Only the receiver frequency is now tunable with the Main Control knob (or the keyboard if one is used). The receiver may be tuned to any frequency within the current band. Once the knob turning stops, (after a few seconds delay) the unit will automatically come out of RIT mode. If there is an offset between RX & TX frequencies which is not standard for the current mode (i.e. equal for SSB and 600 Hz for CW) the green LED will blink. Turning the knob from this point on will cause both the RX and TX frequencies to move together but with the new offset in place. Pressing the SPLIT button and then RIT will clear the RIT offset and turn off the LED.

**SPLIT** - This mode is used to separate the Transmit and Receive frequencies and will not exhibit the timeout feature that is present in the RIT mode. The SPLIT mode will also receive on the transmit frequency when the <- is pointing to that frequency. The <- may be moved between the RX and TX frequencies by repeatedly pressing the SPLIT button. **Note that the unit will not transmit when pointing to the transmit frequency.** To exit the SPLIT mode press the RIT button.

**MODE** - This button will step through the three modes of operation that the PC-500 is capable of. The choices are USB, LSB and CW. The current mode will be displayed on the right hand side of the top line of the display.

**BAND** - Use this button to switch back and forth between the two installed band modules. The unit has bandstacking register capability so you will return to the last frequency you were at when you come back to a band.

**MOX** - This button will put the unit into Transmit mode for as long as the button is depressed. In CW mode a carrier will be transmitted. In SSB mode no output power will be noticed since the

carrier is suppressed.

**TUNE RATE** - This button will change the tuning mode between a fixed 10 Hz step size and a Variable Speed Tuning (VST) rate. The VST mode will dynamically change the step size dependant upon the speed that the Tuning Knob is moving at. The faster you turn the knob the larger the step size. It is recommended that VST be used for large frequency excursions or for just "tuning the band" and then the fixed rate mode be used to fine tune a signal. When in VST mode a **V** will appear at the rightmost digit on the top line of the frequency display (to the right of the Current Mode). It is blank when in the fixed rate mode. The LED next to the Tune Rate button will also be lit when the VST mode is ON.

**LOCK** - This button will Lock the Main Tuning knob from changing the frequency of the radio. When invoked the rightmost digit on the top line of the frequency display will change to an **L**. This reverts to the previous tuning mode when the LOCK is turned off. Repeated pressing of the LOCK button will toggle the mode ON and OFF.

### **FRONT PANEL CONTROLS:**

**PWR** - This knob is used to continuously adjust the output power of the radio from less than 1 Watt to a maximum of 15 Watts. Full counterclockwise is the minimum position while full clockwise is the maximum. The front panel meter will show a "relative" indication of output power. For most bands full output power will be at the SET mark on the bottom scale when the transmitter is running into a matched 50 ohm load. The meter circuit will read about halfway between 4 and SET at full power when on 6 Meters. This is due to the roll off in frequency response of the metering circuit at VHF.

**FILTER** - This control sets the cutoff frequency of the **DVF** (Digital Variable Filter) Low Pass Filter. The minimum frequency (approximately 600 Hz) occurs at the full counterclockwise position. The maximum bandwidth (approximately 2.8 kHz) occurs at the full clockwise position. This filter is in line at all times and is contained within the AGC loop. When signals are dropped from the audio passband they will also stop effecting the S-meter and AGC voltage. This sidesteps the AGC "pumping" problem typically associated with audio filtering such as DSP.

**AF GAIN** - This control sets the volume level of the audio output. The internal amplifier can supply approximately 2.5 Watts of output power into a 4 ohm load. This control also acts as the main power ON/OFF switch for the radio.

**MAIN TUNING KNOB** - This knob is used primarily for changing the frequency of the radio but it is also used for changing the speed of the internal keyer (and keyboard keyer if used) when in the Keyspeed mode (see description above in the Push Buttons definition section).

### **FRONT PANEL CONNECTORS:**

**MIC** - Microphone connector. Follows the standard Yaesu 8 pin connector pin out. Uses the

Audio In, GND and PTT connections only.

**PHONES** - Used for headphone listening. A monoural connection only. Stereo phones must be externally tied together.

### **III Review of Rear Panel Connections and Controls**

**KBD** - Provides a connection for an external PC compatible keyboard. Standard 7 pin DIN connector. Adapter required for PS/2 type connectors.

**PADDLE / KEY** - Input for a Iambic paddle to run the internal keyer. If the keyer is placed in MANUAL mode (see note in KEY SPEED section of the Push Button definitions in the previous section) a straight key may be connected to the DASH side of the paddle connection and this will enable manual keying of the transmitter.

**13.8VDC** - Main power connection for the radio. The supplied power cord connects to this connector. **OBSERVE POLARITY WHEN CONNECTING TO AN EXTERNAL POWER SUPPLY. IF THE SUPPLY IS BACKWARDS THE FUSE IN THE POWER CORD WILL BLOW.** This is done to protect the radio. It is recommended that a 5 to 10 Amp power supply be used with the radio.

**EXT SPKR** - A mono connection for and external Speaker. Using a speaker here will disconnect the internal speaker. A 4 ohm speaker is recommended but 8 ohms will also work.

**ANT** - Antenna connection. For best results the antenna should present a 50 ohm impedance to the radio. The use of an antenna with greater than a 2:1 SWR should be avoided. It is possible to make the output amplifier unstable under these conditions.

**GND** - This screw terminal can be used to connect the transceiver to a good earth ground.

## IV Setting up the PC-500

### A. Changing and Installing Band Modules

To change or install a Band Module the top cover must be removed. The cover is held by 4 screws on the sides. After removing the screws, carefully lift the top cover up watching the cable that connects to the speaker in the top cover. Stand the cover to one side. You will see the Band Modules standing vertically near the rear of the unit. **Be sure the Power is turned off.** Carefully pull up on the Module to be removed it should unplug easily. The new module can now be plugged in its place. Be careful of the left to right alignment. The edge of the board should line up with the second module already in place (the left edge of the module should be approximately .1 inch from the metal enclosure. If it is about .25 in or more it is not positioned properly. **NOTE: The 6 Meter module MUST be placed in the first (slot closest to the front of the radio) slot for proper operation on that band.** Once the new module is installed its operation should be verified before closing the cover. Once operation is verified the cover may be replaced and screwed down. The new band module will automatically be identified by the computer when the radio is turned on.

The best way to replace the cover is to start with the cover a bit more forward than the final position. Press it down in place and then slide it back until the screw holes are aligned.

### B. Antenna Considerations and Power Requirements

Since the PC-500 is a low power Transceiver a good, matched antenna should be used for the best results. It should not only be a good radiator but it should be matched to the output impedance of the transmitter (50 ohms) as closely as possible. You should try to avoid using an antenna that exhibits an SWR greater than 2:1. The final output transistor is extremely rugged and very over rated for this power class therefore it is very unlikely that even a severe mis-match will damage the device. However, it is possible to cause the amplifier to be unstable under severe mis-match conditions which will generate spurious emissions outside of the intended operating frequency range. A good antenna should always be used to get the best performance out of your radio. This is even more important when operating in a low power class.

The PC-500 requires approximately 3 Amps for full output power into a 50 ohm load. In receive the maximum current should not exceed 750 mA. This is the current draw with both the Main Display Backlight and the Meter Lamp on. The receive current can be reduced considerably by turning these devices off. The Backlight for the display draws about 100 mA and the meter lamp draws about 80 mA.

## V Methods of Tuning the PC-500

Main Tuning of the frequency of the PC-500 can be accomplished in a variety of ways. The primary control of frequency is via the Main Tuning knob. The frequency step size can be set as Variable or Fixed. The Fixed step size is set to 10 Hz. This means that a single encoder pulse (there are 127 pulses per dial revolution) will step the frequency 10 Hz up or down. The “fixed step size” mode is invoked by pressing the **Tuning Rate** button next to the Main Tuning knob until the LED is OFF. Pressing the button again will cause the LED to come on indicating that the unit is in **Variable Speed Tuning** mode (VST). In VST mode the step size will change with the speed of rotation of the Main Tuning knob. The faster the knob is rotated the larger the step size up to a maximum of 10 kHz per encoder pulse. Slowly rotating the knob will provide a tuning rate of 10 Hz just as in the Fixed mode. The VST mode is useful for making large frequency excursions quickly. Once the frequency is close to the final number it is a good idea to switch to the Fixed step size mode for final tuning. This will prevent accidental “jumping “ of the frequency if the knob is turned a bit too fast when trying to tune to the final frequency.

### A. Keyboard Control

The PC-500 has additional functions that can be accessed via a PC type keyboard when plugged into the KEYBD Connector at the rear of the radio. One of these functions is Direct Frequency Entry of a particular frequency within the current band. To invoke the Direct Frequency Entry mode press the “\*” key in the numeric keypad area of the keyboard. The bottom line of the front panel display will blank and display the:

**FREQ>\_**

message. This message is prompting the user to enter a frequency to which the radio will then be tuned. Frequencies are entered with one decimal point to the nearest hundred Hertz. For example, the following frequencies are valid formats: 14.0356 14.035 14.03 14.0 14. Remember that frequencies will only be considered valid if they are within the currently selected band. If an invalid format or an out of band frequency is entered an ‘INVALID’ message will be displayed for 2 seconds and then the display will be cleared to allow another frequency to be entered. You can exit the Direct Frequency Entry mode at the frequency entry prompt by pressing the “\*” key again. The “Esc” key will clear any characters that have been entered on the display. The Backspace key can be used to back through already entered characters and edit a frequency that is being entered. When the desired frequency has been entered the “ENTER” key should be pressed. If the frequency is valid for the current band and in the proper format it will be accepted and the radio will be set to the new frequency and the dual frequency display restored.

In addition to Direct Frequency Entry the current frequency can be “jogged” up or down with the right and left arrow keys to the left of the numeric keypad. The right arrow key will move the frequency up while the left arrow will move the frequency down. The step size that the arrow keys will move the frequency will vary depending on the current tuning mode that is selected. If in the Fixed mode the arrow keys will move the frequency in 10 Hz steps. If in the VST mode the step size will be whatever the last step size that was used depending upon the rate of rotation of

the tuning knob.

## **RIT (Receiver Incremental Tuning)**

Pressing the **RIT** button will put the radio into this mode. RIT is used to move the frequency of the receiver only. The transmitter frequency will remain unchanged. Entering this mode will cause the <- symbol next to the transmit frequency on the front panel display to blank. This indicates that no change will be made to the transmit frequency. Turning the main tuning knob will now cause the receiver frequency to change. When rotation of the knob stops for approximately 3 seconds the <- symbol next to the transmit frequency will reappear. This now indicates that the RX and TX are locked and that further tuning will cause both frequencies to change together. If further adjustment of just the receiver frequency is desired then the **RIT** button will have to be pressed again. **NOTE:** If the receiver frequency is moved from the transmit frequency such that a non-standard offset occurs the RIT LED will blink to indicate this condition. A non-standard offset is defined as a difference in RX and TX frequency that is not normally correct for the selected mode. For example, in SSB the RX and TX frequencies would normally be the same since both stations are “zero-beat” with each other for proper tuning of the SSB audio. In CW the TX frequency is normally 600 Hz higher than the RX frequency so a 600 Hz beat note will be created when the two stations are on the same receive frequency.

## **SPLIT Mode Operation**

SPLIT Mode operation allows the transmit and receive frequencies to be manipulated individually. In addition, the radio can be made to receive on the transmit frequency. To invoke SPLIT mode press the **SPLIT** button on the front panel. The SPLIT LED will light and the arrow (<-) symbol will point to just the RX frequency. Repeated pressing of the **SPLT** button will cause the arrow to toggle between the RX and TX frequencies. Using the Main Tuning knob or Direct Frequency Entry mode or the keyboard arrow keys will affect only the frequency to which the arrow symbol is pointing. When the arrow is pointing to the TX frequency the receiver will be tuned to that frequency. **NOTE:** The transmitter will not transmit when the TX frequency is selected. You must move the arrow back to the RX frequency **before** transmitting. To exit the SPLIT mode press the **RIT** button once and the TX frequency will move back to the RX frequency with the standard offset for the current mode.

## **VI Changing and Selecting Modes**

The PC-500 is capable of operation on USB (Upper Sideband), LSB (Lower Sideband) and CW modes. To select the mode of operation press the **MODE** button on the front panel to toggle through all three modes. As the button is pressed the new mode will be displayed on the right side of the top line of the display. As an alternative to pressing the front panel **MODE** button, the **F5** key on the PC keyboard can be used if a keyboard is connected. Note that the frequencies will automatically adjust to the SSB and CW offsets as the modes are changed.

## VII Changing and Selecting Bands

The **BAND** button on the front panel is used to toggle between the two installed band modules. Each time a band is selected the PC-500 will setup to the values in the bandstacking register for that band (Memory 0 - M000). As an alternative to pressing the front panel **BAND** button, the **F8** key on the PC keyboard can be used if a keyboard is connected.

## VIII AGC, Pre-amp and Attenuator Functions

Receiver AGC (Automatic Gain Control) speed can be changed between FAST and SLOW. The **AGC** button on the front panel is used to toggle between SLOW and FAST. The Green LED is lit for FAST AGC and the RED LED is lit for SLOW AGC.

The PC-500 has a 12 db pre-amp that may be switched in or out of the receive signal path. Switching is accomplished by pressing the front panel **PRE** button. When the LED is lit the pre-amp is in line.

The pre-amp is particularly useful on the higher frequency bands (i.e. 10 and 6 meters) to increase receiver sensitivity.

In addition to the 12 db preamp, the PC-500 has a 10 db attenuator that can be switched in and out of the receive signal path. Switching is accomplished by pressing the front panel **ATTN** button. The attenuator is in line when the LED is ON. The attenuator is useful on the lower frequency bands (especially in the evening hours) to reduce the possibility of front end overload from strong shortwave broadcast stations.

## IX Transmitting with the PC-500

### Transmitting in SSB Mode

To transmit in SSB mode first use the **MODE** button to select either USB or LSB (USB is generally used on the higher frequency bands - 20 meters thru 6 meters while LSB is used from 160 thru 40 meters). A suitable microphone should be connected to the **MIC** connector. A suitable antenna should also be connected to the **ANT** connector on the rear panel. If full output power is desired the **POWER** control on the front panel should be rotated fully clockwise. To make a transmission, the PTT (Push to Talk) button on the microphone should be depressed then speak into the microphone. The relative power meter on the front panel will indicate output power is present as you speak. Note that in a SSB transmission there is virtually no output power present without audio input to the microphone even with the PTT switch pressed. Release the PTT switch to receive. If the VOX option is installed in the radio be sure that the VOX Enabled switch is ON (on the rear panel) and that a suitable microphone or headset is connected (the microphone output must be wired directly to the connector without going through a PTT switch for the VOX to operate). To transmit simply speak into the microphone and the transmitter will automatically switch on. When you stop speaking the PC-500 will switch back to receive.

## Transmitting in CW Mode

### Using the Internal Keyer

To transmit in CW with the internal keyer connect a paddle to the rear connector. The paddle should be of the dual lever iambic type to make maximum use of the keyer. Use the **MODE** button to select CW mode. To transmit simply press the paddle and the unit will go into transmit. The PC-500 operates in a near full break-in mode so you will be able to hear the receiver between code elements as you are sending. Pressing the **KEYSPD** button on the front panel will bring up the current keyer speed on the display. Use the Main Tuning knob to change the speed to the desired value. When the desired speed is displayed press the **KEYSPD** button again to exit the keyer speed mode.

### Sending with a Straight Key

If you wish to use a straight key the internal keyer may be disabled. The straight key is connected to the same connector as a paddle. It should be connected to the Dash side of the paddle connections. Select the keyer speed mode with the **KEYSPD** button. It will show the current keyer speed. Press the **LOCK** button next to the Main Tuning knob and the display will show **MANUAL**. The internal keyer is now disabled and the straight key may be used to control the transmitter. To enable the internal keyer enter the keyer speed mode and press the **LOCK** button again. The last selected keyer speed will be displayed and the keyer will be active again.

### Sending CW with an External Keyboard

If an external keyboard is connected to the PC-500 it can be used to send CW. To enter the keyboard send mode press **ALT-F1** (press the ALT key and hold it down while pressing the F1 key). The bottom line of the display will blank and show a flashing cursor block. To transmit just type a character and it will immediately start transmitting the character in Morse at the current keyer speed. Characters can continue to be entered as the earlier ones are being transmitted. There is a 16 character buffer to accept data. If the buffer fills, the sidetone will change to a low pitch indicating a buffer full condition. Characters will not be accepted into the buffer at this point. You must wait until a character is sent out, leaving an empty spot, before typing another character into the buffer. Transmission of the buffer may be suspended by pressing the "Esc" key. To restart transmission from where the buffer left off just press the "Enter" key. To erase the remaining characters in the buffer when transmission is suspended press the "Esc" key again. To buffer up 16 characters to send, hit the "Esc" key while the buffer is empty. Characters can be typed in but will not be sent out. When the message is typed into the buffer press the "Enter" key and the buffer will be sent. Characters can still be typed into the buffer as the buffer is being transmitted. To leave the keyboard send mode press **ALT-F1** again. The display will return to the normal dual frequency display and the keyboard will be inactive for CW sending.

## **X Setting and Recalling Memories with an External Keyboard**

### **Memory Store (F7)**

When an external Keyboard is connected to the PC-500 the memory features may be utilized. There are 4 memories per band plus the bandstacking register. The memories are numbered 1 through 4 and are appended to the band number. For example, 20 meters has memories: 201, 202, 203 and 204. The bandstacking register would be 200. A memory may be used to save the current state of the radio by pressing the **F7** key. The last digit of the displayed memory number will display a blinking cursor where the desired memory number is to be entered. Once the memory number is typed in and the "Enter" key pressed the state of the radio will be saved in that memory. To exit this mode without entering any memory number press the "Esc" key.

### **Memory Recall (F6)**

When the **F6** key is pressed the last digit of the displayed memory number will display a blinking cursor where the desired memory number to be recalled is to be entered. Enter the number (1 thru 4) and then press the "Enter" key. If there is a valid set of data in that memory number the PC-500 will set itself up with the parameters in that memory. If the memory number is invalid or there is no saved data in that location the entry will be ignored. To exit this mode without entering any memory number press the "Esc" key.

## **XI Using the DVF (Digital Variable Filter)**

The PC-500 utilizes an adjustable Switched Capacitor Filter to set the bandwidth of the radio. The filter works in the audio section of the receiver but is contained within the AGC loop. This means as signals are filtered out of the audio passband the AGC voltage ( and the S-meter ) will be unaffected by the filtered signals. The filter acts as an adjustable Low Pass filter whose corner frequency can be continuously varied from about 600 Hz to 2.8 kHz. The **FILTER** knob on the front panel controls this frequency. For SSB operation the filter should be left near the high end (full CW) and backed off just enough to eliminate any adjacent channel interference. This will result in the best voice fidelity. For CW the filter can be used in almost any position required to eliminate adjacent channel QRM.

## **XII Using the VOX Mode on SSB**

The PC-500 has provisions for installing an optional VOX Module. This will allow "hands free" operation on SSB with the proper microphone. A microphone which has audio wired to the connector at all times (i.e. does not run the microphone audio output through a PTT switch) is required for VOX operation. To activate the VOX function, slide the VOX switch on the rear panel to the ON position. Place the PC-500 on a dummy load and power up the radio. Speak into the microphone and check to see if the transmitter keys. If not adjust the THRESHOLD control on the rear panel until the transmitter keys consistently when speaking into the microphone at a

normal volume and distance. The transmitter should drop out after a small delay when you stop speaking. The VOX is now adjusted properly for your microphone. The best results will be obtained with a boom mike headset or a desk microphone.

### **XIII Using the PC-500 on Digital Modes**

In order to make interfacing to a PC Sound Card easier, the Low Level audio signal from the receiver has been brought out to the Microphone Connector. A single cable can be used from the Microphone connector to the PC to enable the total interface. The fixed level audio output signal is brought out to pin 5 on the connector while the TX audio should be introduced at pin 8 (center pin). **Note: There is a DC level at the audio output pin from the receiver. If a DC device such as a isolation transformer is used a blocking capacitor should be inserted in series to prevent disturbing the DC bias level on this pin.** The ground return connection is on pin 7. The audio output level from the computer should be adjusted with the Windows volume control so that the average output power is approximately 10 watts. If the serial control cable is used to key the PTT line the VOX board should be disabled and the audio level can be adjusted independent of the VOX level considerations. The following summarizes the microphone connector pinout:

<b>PIN 8</b>	<b>MIC (TX) AUDIO INPUT</b>
<b>PIN 7</b>	<b>GROUND</b>
<b>PIN 6</b>	<b>PTT (CONNECT TO GND TO KEY TX)</b>
<b>PIN 5</b>	<b>FIXED LEVEL RX AUDIO OUT</b>

PINS 1 - 4 ARE NOT USED

Patcomm also manufactures a cable for interconnecting the PC-500 to an PC sound card. The cable plugs into the Microphone connector on the PC-500 and the other end terminates in two 3.5mm phone plugs that plug into the sound card and a DB-9 connector which plugs into the serial port to control T/R switching via the PTT line. The **RED** connector is the audio out from the PC-500 and should plug into the microphone input on the sound card. The **BLACK** connector is the audio into the microphone input on the PC-500 and should go to the line output or speaker output of the sound card. The volume control on the multimedia window of the operating system can be used to fine tune the audio level. A control program such as "Digipan" (which can be downloaded from the Internet) must be used for communications on PSK-31.

### **XIV Sidetone Adjustment**

The sidetone level may be changed to suit individual taste by an internal adjustment. The sidetone adjustment pot is located on the extreme right hand side of the main PC Board between the vertical standing CPU board (runs front to back on the right side) and the right side of the chassis. It is located very near the back of the unit. The control is labeled R150 and SIDETONE on the main PC board. An adjustment tool can be placed between the CPU board and the chassis to gain access to and adjust the control. Key the transmitter with the MOX button while adjusting the control until the desired level is obtained.

## **XIV Specifications**

### **Standard Features Include:**

- SSB (USB and LSB) and CW modes are standard with any combination of two bands between 160 and 6 meters
- Variable Speed Tuning (VST) plus standard 10 Hz tuning steps
- Continuously adjustable Bandwidth between 600 and 2800 Hz via the DVF filtering circuit.
- Power output is continuously adjustable between 1 and 15 Watts
- Built-in Iambic CW keyer allows the use of any standard paddle. An AT style computer keyboard may be plugged into the built-in patented keyboard interface. This allows sending perfect CW, changing bands, changing modes and direct frequency entry all from the keyboard.
- Fast/Slow AGC operation
- Power consumption .75 Amps RX, 2 Amps TX at 5W, 5 Amps (max) at 15 W (at 14.0 VDC). Requires 11.5 to 14.5 VDC Power source.
- Rugged All Aluminum construction - PC Boards are commercial quality G-10
- Compact Size: 8 in W, 2.75 in H, 7.5 in D Weight 4.75 lbs.

### **SPECIFICATIONS**

- A combination of DDS and Crystal Mixing techniques are used to generate a stable, low phase noise synthesizer. A crystal frequency reference is used for stable, drift free operation. Frequency accuracy = +/- 400 Hz - Frequency Stability = 15 ppm
- Single conversion receiver design using a high dynamic range pre-amp and double balanced mixer to achieve strong signal handling characteristics. Typical MDS = -130 dbm, Third Order DR = 93 db
- A selective 10.7 MHz IF with 2 stages of filtering. A 2 pole post IF amp filter plus 5 pole crystal IF filter provides 7 poles of filtering. An optional 8 pole filter (with a 1.8 shape factor) is also available bringing the filtering to a total of 10 poles.
- A very smooth audio derived AGC is used which contains Patcomm's unique DVF (Digital Variable Filter). The result is that signals falling outside of the continuously adjustable passband of the DVF will not cause "pumping" of the AGC along with the associated receiver de-sensing.
- A combination of RF Clipping and VOGAD is used on SSB transmit to achieve superb audio quality and punch without distortion.

PATCOMM CORPORATION  
FLOWERFIELD M100  
ST. JAMES, NEW YORK 11780

## LIMITED WARRANTY

### Warranty Terms:

Subject to the Limitations of Warranty and the Warranty Procedures described below, PATCOMM CORPORATION hereby warrants this product to be free of defects in materials and workmanship in normal use for a period of twelve (12) months (the "Warranty Period") from the date of the original purchase at retail (the "Limited Warranty").

### Limitations of Warranty:

- A. PATCOMM CORPORATION is not liable for any express warranties except the Limited Warranty described above.
- B. The Limited Warranty extends only to the original retail purchaser, and shall not be valid or enforceable unless such original purchaser fully completes, signs and mails to PATCOMM CORPORATION, within ten (10) days from the date of such original purchase at retail, the Owner's Warranty Registration Card included with this product.
- C. The Limited Warranty shall be limited to repair or replacement of any materials found to be defective, any servicing or adjustment of the product which PATCOMM CORPORATION believes is necessary, or replacement of the product should such repair, servicing, or adjustment be deemed by PATCOMM CORPORATION, to be ineffective. The repair or replacement of defective materials, and the servicing, adjustment, or replacement of the product, under the terms of this warranty, shall be performed free of charge by PATCOMM CORPORATION, or by an authorized PATCOMM CORPORATION Amateur Products Dealer.
- D. Any tampering with, misuse or unauthorized modifications of, or damage (for any reason) to this product shall relieve PATCOMM CORPORATION from any further obligations under this Limited Warranty.
- E. The Limited Warranty applies only to the product as it existed at the time of the original purchase by the original purchaser, and shall not preclude PATCOMM CORPORATION from later making any changes in design, adding to, or otherwise improving subsequent versions of this product, or impose upon PATCOMM CORPORATION any obligation to modify or alter this product to conform to such changes, additions, or improvements.
- F. PATCOMM CORPORATION assumes no responsibility for any consequential damages caused by, or arising out of, any such defect in materials or workmanship.
- G. TO THE FULLEST EXTENT PERMITTED BY LAW, PATCOMM CORPORATION SHALL NOT BE RESPONSIBLE FOR ANY IMPLIED WARRANTY WITH RESPECT TO THIS PRODUCT.
- H. If the original retail purchaser timely complies with the Warranty Procedures described below and PATCOMM CORPORATION elects to send the purchaser a replacement product rather than repair the product returned to PATCOMM CORPORATION, (the "original product"), then the Limited Warranty shall apply to the replacement product only for the remainder of the original product's Warranty Period.
- I. Warranty statutes vary from state to state, so some of the above limitations may not apply to you.

### Warranty Procedures:

- A. To obtain the benefits provided by this Limited Warranty, the original purchaser at retail must comply with the following procedures:
  1. As a first step in seeking warranty assistance, and without expense to PATCOMM CORPORATION, contact the authorized PATCOMM CORPORATION Amateur Products Dealer from whom this product was originally purchased (the "Dealer") and describe fully the defect for which the warranty assistance is sought. The Dealer may be able to advise you regarding field adjustments or procedure changes which may resolve the difficulty.
  2. If the dealer's suggestions do not remedy the product's problems, then without expense to PATCOMM CORPORATION, return this product to the dealer or to PATCOMM CORPORATION, 7 Flowerfield M100, St. James, New York 11780. PATCOMM CORPORATION assumes no responsibility for any PATCOMM CORPORATION product or other items, sent to such dealer or PATCOMM CORPORATION not in accordance with PATCOMM CORPORATION instructions.
  3. Include with the PATCOMM CORPORATION product being returned for warranty service a copy of the original purchase receipt, without which warranty service will not be provided.
- B. Upon receipt by PATCOMM CORPORATION or the dealer of this product returned in accordance with the above-described Warranty Procedures, all reasonable efforts will be expended by PATCOMM CORPORATION to cause this product to conform to its specifications. PATCOMM CORPORATION will return the repaired product (or a replacement product) free of charge to such purchaser, with the decision as to whether to repair or replace this product to be made at the sole discretion of PATCOMM CORPORATION.

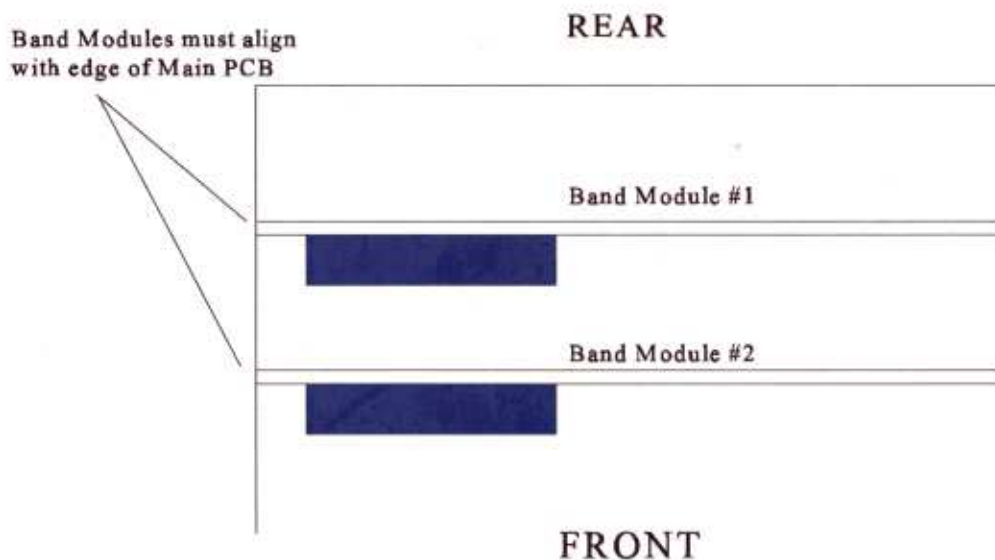
MODEL # \_\_\_\_\_ SERIAL # \_\_\_\_\_

# **IMPORTANT**

## **Please read before attempting to change Band Modules**

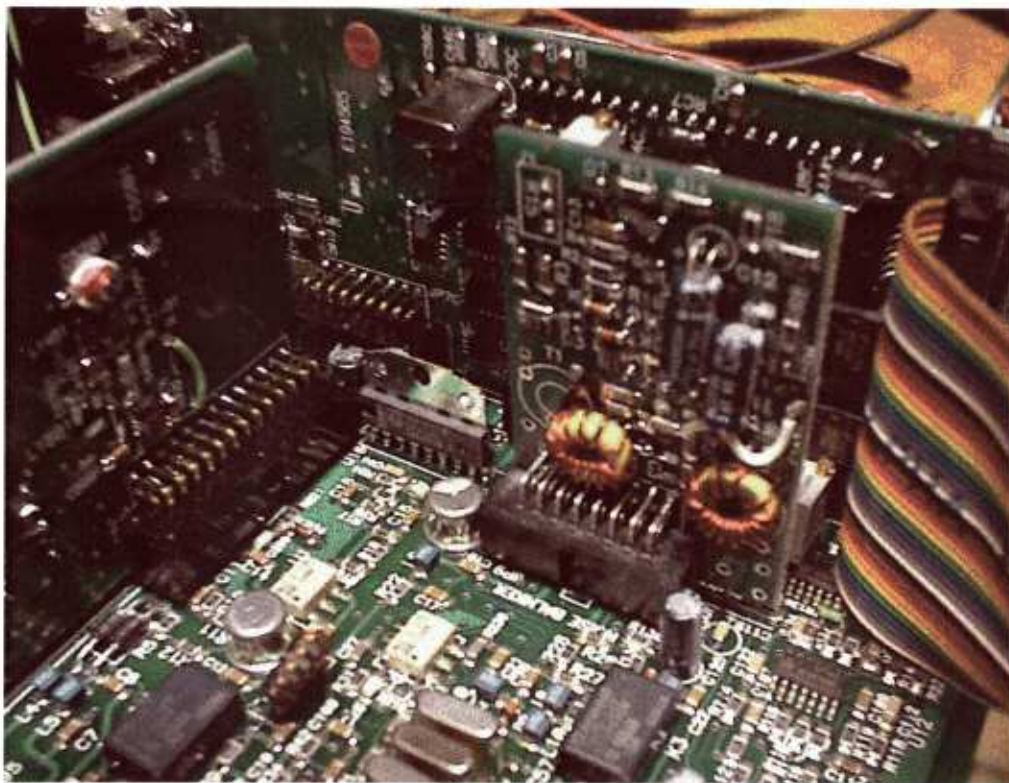
The rear band module must be placed in the proper position before power is applied to the radio. If the module is installed improperly damage to the unit can result.

After the band module is replaced in the radio, check for proper alignment by insuring that the left edge of the band module is aligned with the left edge of the main PC board (see illustration below)



## PC-500 NOISE BLANKER INSTALLATION

Remove the top cover of the radio by removing the 4 retaining screws on the sides of the unit. Lift and remove the top cover slowly so as not to damage the speaker interconnecting cable. Place the top cover to the right side of the radio. Note it is not necessary to unplug the speaker cable. Locate the Noise Blanker socket on the Main PC board at the front right side of the radio (see photo below). Remove the wire jumper installed in the socket. Orient the Noise Blanker board so that the adjustment pot on the board is facing the CPU Board at the edge of the unit (see photo below). Carefully center the connector on the NB board over the socket on the main board and push into place. The board should appear as in the photo below. Turn on the power and check for proper operation before placing and screwing the cover back in place. If the receiver does not operate properly, check to be sure that the alignment is correct on the NB socket (be sure the end pins line up with the end pins on the socket) and if not unplug and re-seat properly.



## **PC-500 VOX BOARD INSTALLATION**

The VOX Board is installed in the socket labeled "VOX" located at the rear of the Main PC board. The board should be oriented so that the two adjustment pots are facing the rear apron of the chassis. They should line up with the two holes in the case labeled "DELAY" and "THRESH". The mounting hole at the top corner of the board should also line up with the standoff on the rear apron of the case. After the board is plugged in and seated properly, secure it to the case to the standoff with the supplied mounting screw and washer.

To activate the VOX mode, slide the small switch on the board to the ON position. Plug in a mic which is suitably wired for VOX operation (the mic connection must be present at all times, not just when the PTT is pressed). Speaking into the mic should cause the PC-500 to go into transmit. There should be a small delay before the radio reverts to the receive mode when you stop speaking. The level at which the radio will go into transmit can be adjusted with the "THRESH" control using a small screwdriver. The amount of time the unit takes to go back to receive can be changed with the "DELAY" control. Only slight movements of the controls should be necessary from the factory settings to achieve the desired result. To turn off the VOX mode and use PTT, slide the switch on the board to the OFF position.

