



ComCAT Windows Control Program

Version 0.9d Beta Release

ComCAT is a Microsoft Windows based program written in straight C using Win32 API calls to control the upgraded Ten-Tec 1254 Shortwave radio from a PC over optionally either a RS-232 serial port or a USB port. It allows easy control of the radio using PC keyboard entries, screen buttons, mouse clicks, and mouse wheel spins.

Because the 1254 upgrade uses the Ten-Tec Orion communication protocol the **ComCAT** program can also control that radio, but only for the main receiver. Another CAT program could be used with the 1254 upgrade by telling that program that it is talking to a Ten-Tec Orion.

Installation

The program **ComCAT.exe** and its dll are included in the zip file **ComCAT.zip** downloaded from:

<http://cholakian.com/ComCAT.zip>

To install the program open the zip file and copy the **ComCAT.exe** program and the **lcclibc.dll** to any convenient location on your PC hard disk. No other files are required. No installation is required. No files are written to or modified on your disk and no changes are made by **ComCAT** to the Windows registry.

Communication to the Ten-Tec 1254 radio can be made using either a RS-232 serial COM port or a USB port depending on the kit version ordered.

To use a RS-232 serial PC COM port connect a straight wired connection serial DB9 cable from the back of the radio to the PC com port. One end of the cable is male and the other is female. Note only pins 2,3, and 6 are used in the wiring, pin to pin, from a DB9 female to a DB9 male connector. There is no handshaking used either in hardware or software. The connection parameters are automatically set by the **ComCAT** program when it starts to 57600 baud, 1 start bit, 8 bits data, 1 stop bit.

Using the USB port kit version is straight forward, just connect the mini-USB port to an available USB port on your computer using a standard USB cable. Windows will automatically download and install any required drivers. Windows will assign a virtual COM port number for this device, and that number will be noted in a pop up window on the task bar during driver installation.

The assigned port number is also available by looking in the Windows Device Manager under “**Ports (COM and LPT)**”.

Environment Variable Setting

In either version of the kit hardware the **ComCAT** program must know which port number you're connected to. This is not settable from the within program, it must be set in advance within the Windows system using an environment variable:

COMCAT=COMx ... where x is the com port number your plugged into on your PC (real or virtual).

Setting the Environment Variable in Windows XP

To set this variable using **Windows XP** open the “**Control Panel**” then select “**Performance and Maintenance**” then “**System**” then click on the “**Advanced**” tab. There is a button labeled “**Environment Variables**” on the lower left of the “**System Properties**” window. Click that button. Then under “**User variables for...**” press the “**New**” button. In the popped up window find “**New User Variable:**” then type in the six letters **COMCAT**. In the “**Variable value:**” field type the com port name your using, either one built into your PC or the virtual COM port installed by Windows when you first connected the radio's USB port to your PC.. This is the three letters **COM** followed by the com port number. Examples are: **COM1 COM2 COM3 COM4**... Once the data is entered hit the **OK** buttons until all windows are closed. The **ComCAT** program will now set communications to the selected com port when started.¹

Setting the Environment Variable in Windows 7

To set this variable using **Windows 7** open the “**Control Panel**” then select “**System and Security**” then “**System**” then click on “**Advanced system settings**” on the left sidebar. A “**System Properties**” window will pop up, in it there is a button labeled “**Environment Variables...**” on the bottom right of the window. Click that button. Then under “**User variables for...**” press the “**New**” button. In the new popped up window “**New User Variable**”, type in the six letters **COMCAT** after “**Variable name:**” In “**Variable value:**” field type the com port name your using, either one built into your PC or the virtual COM port Windows installed when you first connected the radio's USB port to your PC. This is the three letters **COM** followed by the com port number. Examples are: **COM1 COM2 COM3 COM4**... Once the data is entered hit the **OK** buttons until all windows are closed. The **ComCAT** program will now set communications to the selected com port when started.

Program Features

The **ComCAT** program controls all the parameters used in the radio. These are the tuned frequency, the receiver mode, and the tuning step speed. Also any of the memory channels can be saved and recalled. The front panel of the radio can be locked from changing the radio state. For convenience the amateur radio bands can be preselected using a set of windows radio control buttons. The COM port number used is displayed in an area labeled **Port**.

Synchronization is automatically made between the radio and the PC upon connecting the serial cable. Note that the radio should not be set to memory mode. If a connection is not made either power cycle the radio with the **ComCAT** program running, or use the program's system menu and select “**Radio Restart**”. A pop up window will inform you that the radio is now connected and on which COM port.

¹You must use the same USB slot on your PC each time to have the same assigned virtual COM port number. If you use a different slot Windows will assign a new and different port number to that slot.

Numeric Entries

There are a few ways to enter numbers into the program. One is to use the number buttons shown in the program window. Each time you press a number button with a mouse click that number is entered into the box labeled **Direct**. To clear the numbers entered in the box hit the **CLR** button.

The **Direct** box, in white, can also accept numbers typed in directly using the PC keyboard. First click on the **Direct** box to place the windows caret in the box. Then type the number desired, either frequency to tune, memory channel or new step speed. Do not hit the PC keyboard **Enter** key, instead to complete a selection press the **Frequency**, **Memory**, or **Speed** button. The typed number, if valid, will be transferred to the selected box, **Memory**, **Speed**, or **Frequency**, and the **Direct** box will be cleared. If the number typed is invalid the **Direct** box will be cleared, but no other action will be taken.

Note frequency entries are assumed to be to in exact Hz if no decimal point is entered, and a frequency in MHz if a point is part of the entered number: i.e. 14.07 MHz could be entered as either 14070000 or 14.07

Each entry box, **Frequency**, **Memory**, and **Speed** can be changed with a click on the up down arrows in the box. A click up or down changes the frequency by one speed increment. Up or down clicks on the **Memory** arrows change the memory channel to access. Up or down clicks on the **Speed** box changes to the next available frequency step increment.

The easiest method to change the data in the boxes is to use the mouse wheel. First click on the box you wish to change to move the Windows focus to that location. Then roll the mouse wheel up or down to spin through all the possibilities. This is very useful for frequency selection. Note though that you can scroll through frequencies very fast this way, in fact faster then the radio can accommodate. There may be a lag between the PC window and the radio if you exceed the number change limit. The rate you roll through the frequencies is set by the current **Speed** number. The radio operates best rolling very fast on steps of 1 KHz or greater. When tuning in finer steps scroll through the frequencies more slowly.

Receiver Mode Selection

The radio has two modes, **AM** and **SSB** (both upper and lower). There will in a future radio firmware release be a **CW** mode, but currently selecting **CW** is the same as selecting **SSB**. To change the mode click the labeled radio button.

Frequency Band Group

The radio buttons in the **Band** group can be clicked at anytime to jump to the beginning of each band. At any other time when a frequency is selected that is within one of the amateur bands the radio button is automatically shown selected. There are two band groups available, the **Amateur Bands**, and general **Shortwave Bands**. Select the group shown with the system pull down menu, (clicking on the cat).

Memory Channels

Use any of the methods to change the number shown in the **Memory** box. To recall a channel previously saved in the radio in that channel click the **Read** button. To save the current frequency and mode to the channel shown in the **Memory** box click on the **Write** button. You will get a pop up window to make sure you wish to do the write.

Radio Lock

When any change is made on the radio using its front panel controls that change is reflected in the **ComCAT** Windows program. To lock the radio from simultaneously making mode and frequency changes click on the check box **Lock**.

Locking the radio also completely turns off the radio display. Turning off the display significantly reduces the radio's current load, and eliminates the possibility of electrical switching noise generated by the display drive circuitry.

Ext - External Controlled Tuning

The tuning speed of the radio is dependent on tuning step size and frequency range. In general when making frequency steps less than 1 KHz more time is required to calculate the PLL register values used. The extra calculation time causes a delay which can be noticeable when trying to spin quickly through frequencies with the mouse wheel.

The **Ext** check box sets the method used for the PLL tuning, either by the microprocessor in the radio, or PC controlled by the **ComCAT** program. Both frequency change speed and selection accuracy are improved by using the PC's processor to calculate the PLL register values. Setting the check box turns control over to the PC. Note that when using this setting **ComCAT**'s frequency control is not compatible with the Ten-Tec Orion radio control protocol.

S Units

Signal strength is shown in the box **S Units**, but it's a relative non-calibrated number derived from the radio's AGC circuit. It is not sensitive to weak signals.

Line Level Audio Output

When the line level audio output from the upgraded radio is run into a PC sound card this control program can be used in conjunction with other programs such as DigiPan, MMTTY, and MMSSTV to decode data, digital, and images.

Digital Audio Streaming

Digital audio streaming from the radio to the PC can be enabled by checking the associated Digital Audio **Enable** box. Audio data is sampled and sent over the serial port connection interleaved with radio status information. Audio data is 16 bits wide at an 8 KHz sample rate in ADPCM format and routed to the standard Windows sound device. Using this option allows you to receive digital audio on your PC without the use of a sound card.

