

# CATfix – Kenwood CAT Command Interceptor User Guide

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## Introduction to CATfix

CATfix is a Windows program that has two principal functions:

- CATfix corrects, or “fixes”, certain shortcomings in digital application software when used with Kenwood transceivers.
- CATfix modifies the action of the front-panel TF-SET button, to make the radio switch automatically between the two IF Filters when the button is pressed and released – very useful for SPLIT operation.

CATfix started life as a very simple utility that converted the **TX**; CAT command to **TX1**; – this is necessary with certain digital apps that send the wrong TX command when the intent is to transmit the audio tones via the TS-590S USB or ACC2 port, rather than via the mic socket. Further capabilities were subsequently added, leading to a package that today provides many options to help set up a suitable operating environment.

## What can go wrong when transmitting digital signals?

Picture this: You are chasing a rare DX station on top band. SSB voice. 100 watts. Audio processor switched on. Hard compression. Using ARCP-590 to control the radio. Finally, you catch him!

Now, flushed with success, you decide to try some digital operating. You start up the digital program, but something isn't quite right:

- The program seems to be a little sluggish, and doesn't seem to respond to every command.
- Signals appear to be in the “wrong place”.
- The dial frequency has changed.
- In the monitor your signal sounds horribly distorted.
- People complain you are transmitting on the wrong frequency.

Or perhaps you don't hear the expected audio tones in the monitor, but hear your own voice instead.

Then the penny drops....

... You had forgotten several things:

- You had forgotten that ARCP-590 uses the radio's Auto Information function, which can overload the input to the application program and cause it to slow down or even miss data.
- You had forgotten to lock the radio's front panel.
- You had forgotten to reduce power to a few watts.
- You had forgotten to turn off the audio processor.
- You had forgotten to switch to upper sideband.
- You had forgotten to configure the application to transmit audio via the USB (or ACC2) port, instead of via the mic (or maybe it isn't even possible to configure the application to do this).

All of these factors can conspire against you, preventing you transmitting a clean digital signal. CATfix provides options that let you set up the radio to overcome these problems.

### **Switching between the IF Filters when using SPLIT**

CATfix monitors the radio's TF-SET button, and (optionally) toggles between IF Filter A and IF Filter B when you press and release the button. This is especially useful when chasing a rare DX station that is working split – you can set up a narrow filter to listen on the DX station's TX frequency and a wider filter to monitor around your own TX frequency, then automatically toggle between the two filters as you press and release TF-SET.

[Without this CATfix option you need to press and hold TF-SET with one finger, and press the IF FIL button with another finger to listen around your TX frequency..... and at the same time turn the tuning dial with your other hand to adjust your TX frequency..... and then when you release TF-SET, you have to press IF FIL again to return to the original IF filter. The novelty of this two-finger-two-hand operation wears off very quickly – particularly if you are left-handed!]

### **Transceiver Support**

CATfix was written specifically for the TS-590S, but most of the functions should also work with other Kenwood radios, including the TS-990S and TS-2000 (and possibly others).

### **Application Programs**

CATfix does not require any changes to application programs, other than changing the COM port that you usually use to communicate with the radio. There is no need to apply any software patches. You run application programs in exactly the same way as usual.

CATfix operates on CAT control commands. It has no effect on the analog TX and RX audio passing between the application program and the radio.

### **No Changes to the Radio's Firmware**

CATfix does not in any way change the radio's firmware. There is no requirement to flash a new version of the firmware.

### **Background Reading**

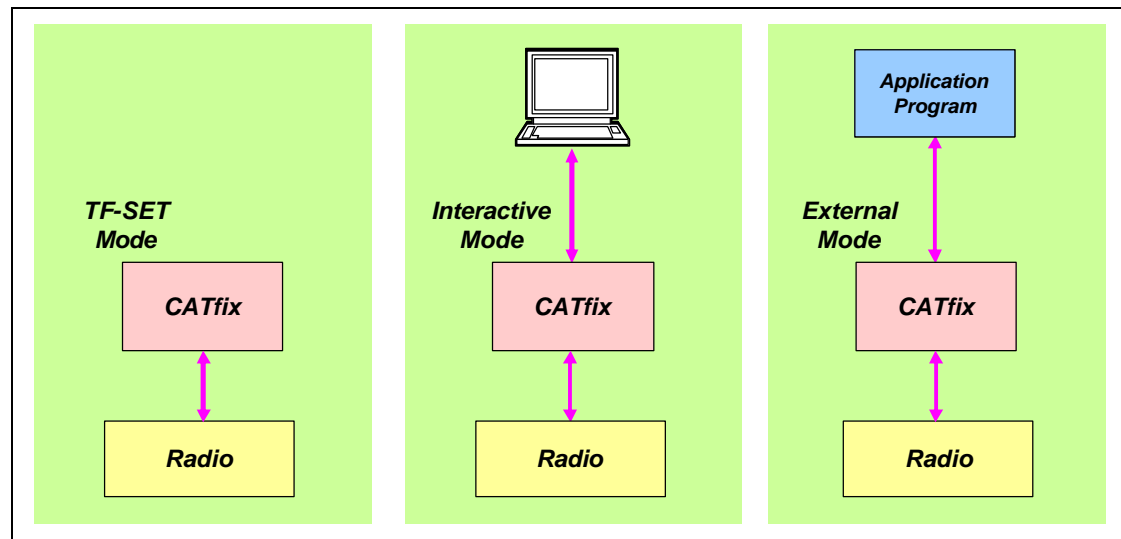
For full details of TS-590S CAT commands and responses, see the TS-590S PC Control Command Reference Manual [1].

## CATfix Modes

CATfix has three modes of operation:

- TF-SET Mode
- Interactive Mode
- External Mode

See Figure 1.



**Figure 1: The three CATfix modes**

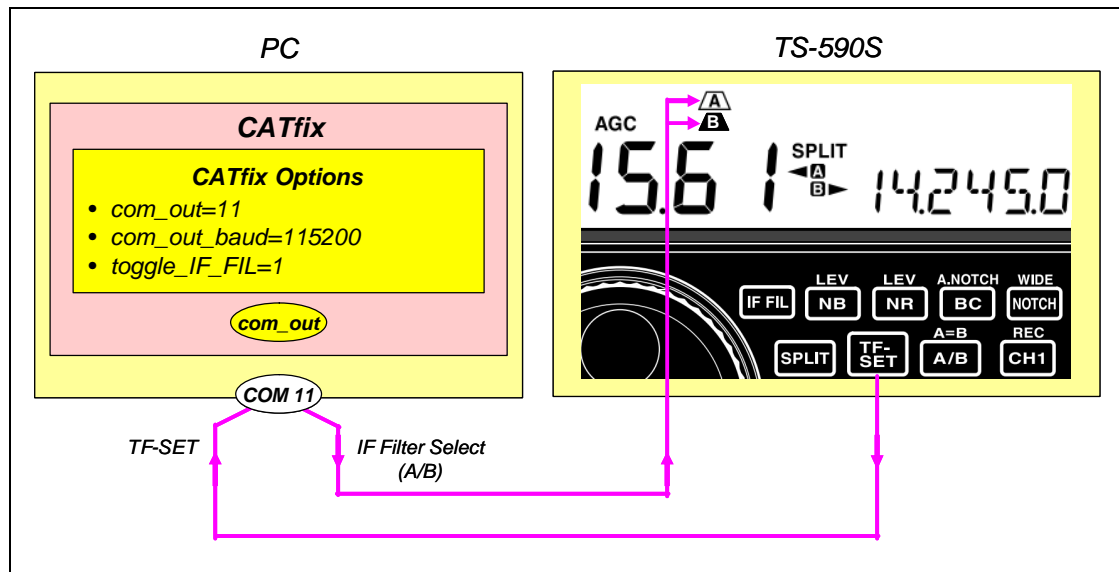
- In TF-SET Mode, CATfix monitors the radio for TF-SET button pushes. Whenever the button is pressed and released, CATfix commands the radio to switch between the two IF filters.
- In Interactive Mode, CATfix lets you communicate between the PC screen/keyboard and the radio. This is useful for checking out the connection to the radio, and for learning how CAT commands work.
- In External Mode, CATfix intercepts CAT commands from the application program, and optionally modifies them, before passing them on to the radio.

CATfix operation is controlled by the options you set up in a CATfix configuration file. You can edit this file with any suitable plain-text editor.

CATfix also lets you record all CAT commands and responses in plain-text log files, for later analysis.

## TF-SET Mode

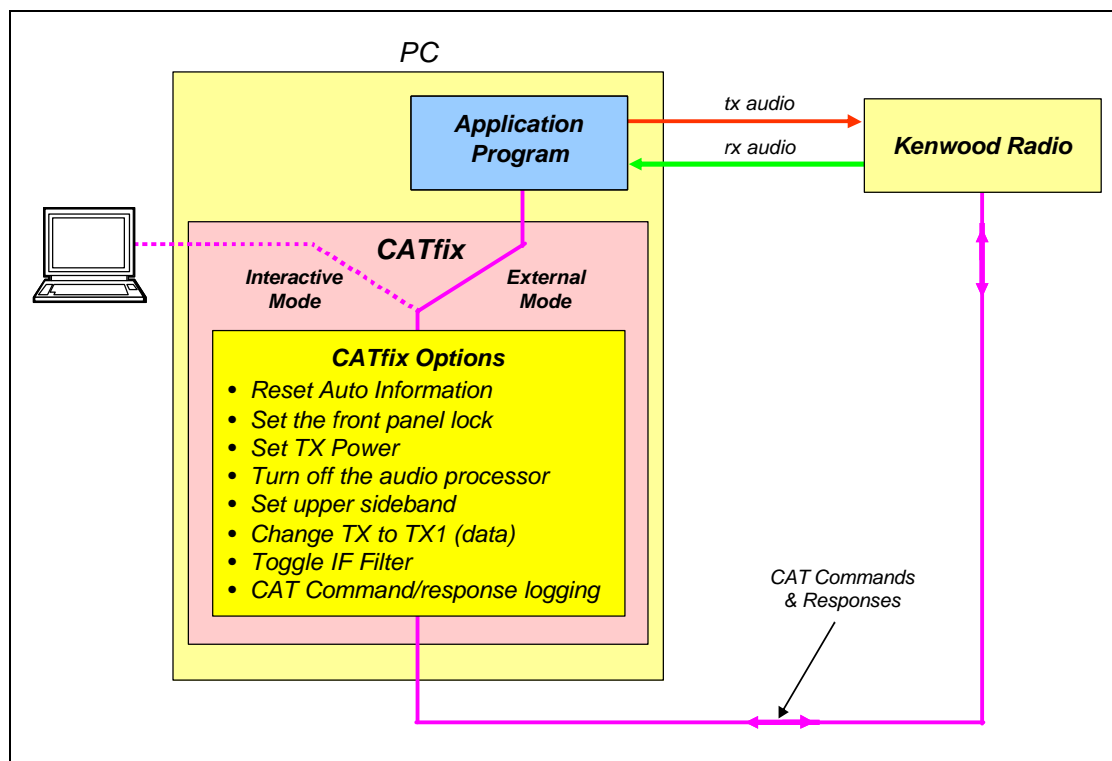
If you are using CATfix to monitor the TF-SET button (and toggle the IF Filter), there are only three options required in the CATfix configuration file. See Figure 2.



**Figure 2: CATfix monitors the TF-SET button. When the button is pressed and released, CATfix toggles between IF Filter A and IF Filter B. (The output port shown here, COM11, is just an example. Selection of a suitable COM port number is described later)**

## Interactive Mode and External Mode

The CATfix options for Interactive Mode and External Mode are shown in Figure 3.



**Figure 3: When in Interactive Mode, CATfix provides keyboard access to the radio, allowing CAT commands to be entered manually and the responses to be displayed on the screen. When in External Mode, CATfix monitors CAT commands issued by the application program, and optionally modifies or adds to them to provide a suitable operational environment for digital transmission. In both modes, each CATfix option is individually configurable, and all CAT commands and responses can be optionally logged**

## CATfix Options

### Operational environment

- When running digital programs for long periods (perhaps days on end), it is a good idea to lock the radio's front panel to prevent accidentally changing any of the controls. CATfix has an option that locks the panel on startup.
- When transmitting digital signals, the audio processor should never be enabled, because of the distortion that the processor introduces. CATfix lets you turn off the processor on startup.
- Most digital applications require upper sideband transmission, but it is very easy to forget to set the radio to upper sideband. CATfix lets you set the mode to upper sideband.
- Most digital applications work very well with only a few watts of transmitter power. CATfix lets you set the power level.

### Shortcomings in digital programs

- Some programs (for example, ARCP-590) enable Auto Information (AI) mode. This mode makes the radio send unsolicited responses back to the program whenever changes occur in the radio – for example, whenever the signal strength meter value changes, or when the operator changes any front panel control.  
In itself, this is not an issue, but if the program fails to disable AI mode when it terminates, the radio continues to output the unsolicited responses to the PC. These responses can then completely overwhelm other programs if those programs are not designed to handle them. To prevent this happening, CATfix lets you disable AI on startup.
- Some programs (for example, MMTTY, or older versions of Ham Radio Deluxe) do not send the correct transmit command to the radio – they send the **TX;** (or **TX0;**) command, which transmits the microphone audio, instead of **TX1;**, which transmits the audio that is input to the radio's USB or ACC2 port. CATfix has an option that automatically changes **TX;** (or **TX0;**) to **TX1;**.

### CAT command/response monitoring

- CATfix provides on-screen monitoring of all CAT commands and responses.
- Transmit and receive traffic is color-coded for easy recognition.
- Transmit and receive traffic is timestamped (current time of day and elapsed time from start of session).
- CAT commands can be issued either by a digital program or manually from the PC keyboard.
- Commands and responses can be optionally logged to a text file for later analysis.

## Installing the Software on the PC

- **Latest Firmware:** It is important to run the latest version of the TS-590S firmware when running CATfix.

CATfix displays a warning message if the radio is a TS-590S and the firmware version is earlier than v1.08. This warning is a reminder that known bugs in v1.07 and earlier versions can cause incorrect functioning of the radio. See Appendix 3 for details.

The Kenwood software site [2] hosts the latest version of the firmware.

- **CATfix:**
  - Create a folder for the program; for example, c:\catfix.
  - Download CATfix from the web [3], and unzip into this folder.  
The zip file contains:
    - the program (**CATfix\_v1.x.exe**)
    - the default CATfix configuration file (**catfix.ini**)
    - a “raw mode” CATfix configuration file (**catfix\_raw.ini**)
    - a “TF-SET” CATfix configuration file (**catfix\_tf-set.ini**)
    - the G3NRW desktop icon file (**g3nrw.ico**)
    - the CATfix User Guide (**CATfix\_v1.x.pdf**)
  - (To uninstall the program, delete the folder c:\catfix and its contents).
- **Virtual Serial Port Emulator (VSPE):** Only required when running CATfix in External Mode. Download VSPE from the web [4], and install as directed.

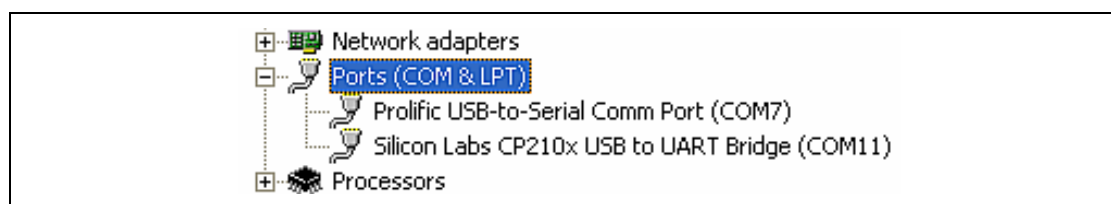
## Discovering the Windows COM Ports

CATfix can communicate with the TS-590S through one of two possible Windows COM ports:

- The Serial COM Port, via the 9-pin D-type connector on the rear panel of the radio. This connection is usually implemented using a USB-to-serial adaptor cable – the USB end of the cable plugs into the PC, and the other end plugs into the TS-590S COM connector.
- The Virtual COM Port (VCP), via the USB A/B cable connecting the PC to the radio. Installation of the VCP driver is described at [5].

You can use either of these ports for CATfix.

To discover the available COM ports,<sup>1</sup> go to Windows Control Panel, then click on System > Hardware > Device Manager. Next, click on Ports (COM & LPT). This will show the configured COM ports. For example, see Figure 4.



**Figure 4: The Windows Device Manager shows that two COM ports are available here. COM7 is used by a USB-to-serial connection to the 9-pin COM port on the radio, and COM11 is used for the connection via the USB A/B cable to the USB port on the radio**

Choose one of these COM ports (for example, COM11) for use by CATfix. This becomes the CATfix “com\_out” port, described later.

<sup>1</sup> These steps apply specifically to Windows XP. The procedure will be similar for other versions of Windows.

## Configuring CATfix for TF-SET Mode

If you are only interested in having CATfix monitor the front panel TF-SET button, and toggling the IF Filter when the button is pressed and released, you can use a shortened form of the CATfix configuration file:

```
# catfix_tf-set.ini

# Use this file when configuring CATfix to monitor TF-SET and toggle between
# IF Filter A and IF Filter B.

com_out=11           Set to the COM port connected to the radio.

com_out_baud=115200 Set to the baud rate of the com_out port.

# OPTIONS

# Set "start_minimized" to 1 to start with closed window.
start_minimized=1

# set "toggle_IF_FIL" to 1 to toggle between IF Filter A and IF Filter B when
# TF-SET is pressed/released
toggle_IF_FIL=1
```

This file (**catfix\_tf-set.ini**) is included in the CATfix zip file.

You just need to configure the COM port that you will use to connect CATfix to the radio. For example, if you use COM9, then change the entry to `com_out=9`.

Also, you can change the baud rate of the port if required.

**Reminder:** If you change the baud rate in the radio, you need to switch the radio off and on again for the change to take effect.

Once you have edited the COM port entries in this file, rename the file to **catfix.ini**.

With this shortened configuration file:

- CATfix does not communicate with any other program.
- CATfix will start minimized (showing only as a tab in the Windows Taskbar).
- CATfix does not create a log.
- CATfix enables Auto Information (AI).
- CATfix leaves the front panel lock setting unchanged.
- CATfix leaves the transmit power setting unchanged.
- CATfix leaves the audio processor on/off setting unchanged.
- CATfix leaves the mode (sideband) settings unchanged on both VFOs.
- CATfix does not change **TX;** (or **TX0;**) CAT commands to **TX1;**

Now start CATfix. You should then see that whenever you press and release the TF-SET button, the IF Filter will swap between A and B.



### Configuring CATfix for Interactive Mode

Interactive Mode is used to send CAT commands from the keyboard to the radio, and responses from the radio are displayed on the monitor. This is useful for testing and for learning how commands and responses work .

To run CATfix in Interactive Mode, you set up a dummy COM port number (COM0) in the CATfix configuration file. See Figure 5.

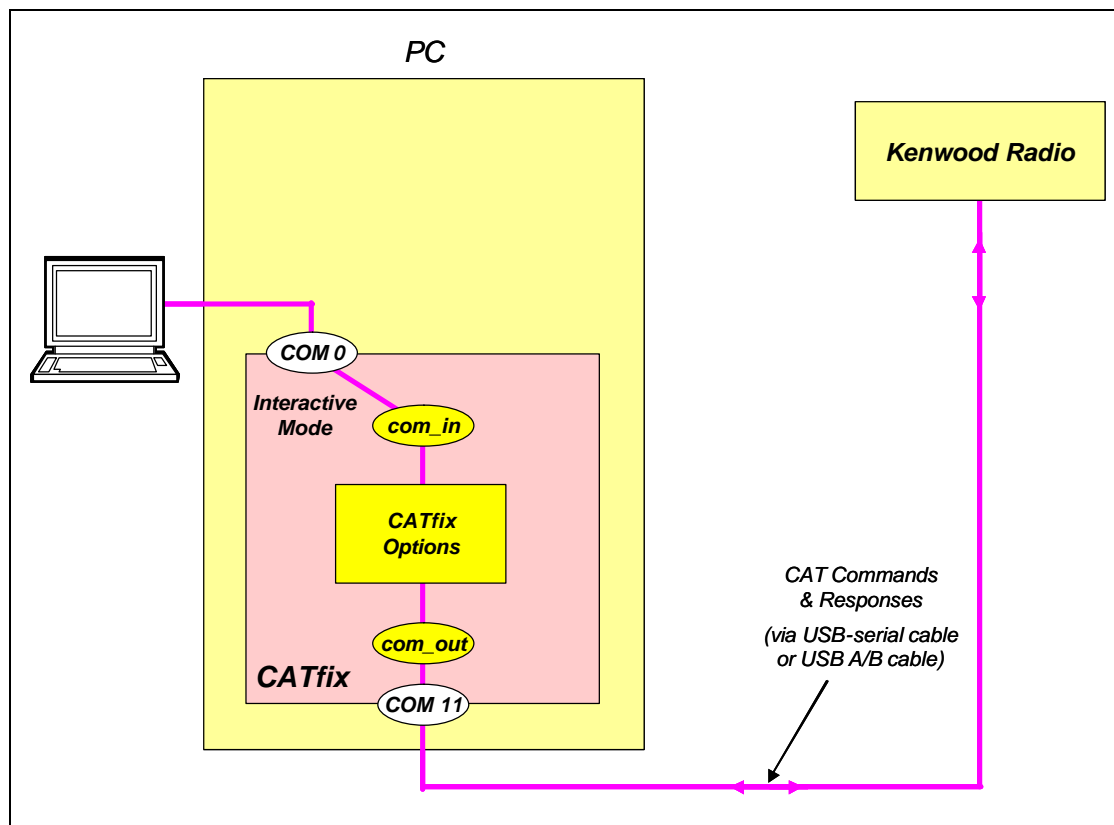


Figure 5: CATfix Interactive Mode is selected with the option `com_in=0`

## Setting the CATfix Options

The default CATfix configuration file supplied with the program is **catfix.ini**. Using a plain text editor, change the entries in **catfix.ini** as required.

The default configuration file looks like this:

```
# catfix.ini

# set "com_in" to 0 for interactive keyboard CAT commands
# set "com_in" to 1-n for external CAT commands

com_in=0           For Interactive mode (CAT commands originate from the keyboard), set to 0.
                   For External Mode (CAT commands originate from the application program),
                   set to a VSP port number – for example, COM5 in Figure 1 (see later).

com_in_baud=57600  Set to the baud rate of the application program.
                   (ignored when in Interactive Mode).

com_out=11         Set to the COM port connected to the radio.

com_out_baud=115200 Set to the baud rate of the com_out port.

# OPTIONS

# Set "start_minimized" to 1 to start with closed window.
start_minimized=0

# Set "enable_log" to 1 to create log in the CATfixLogs folder.
enable_log=1

# Set "reset_AI" to 1 to turn off Auto Information.
reset_AI=1

# Set "set_lock" to 1 to lock the front panel of the radio.
set_lock=0

# Set "set_power" to 0 to leave the current power setting unchanged.
set_power=5

# Set "reset_PROC" to 1 to turn off the audio processor for digital transmission.
reset_PROC=1

# set "set_usb" to 1 to set the mode to USB for both VFOs.
set_usb=1

# set "fix_tx_data" to 1 to change TX/TX0 to TX1
fix_tx_data=0

# set "toggle_IF_FIL" to 1 to toggle between IF Filter A and IF Filter B when
# TF-SET is pressed/released
toggle_IF_FIL=0
```

- For now, leave `com_in` set to 0. This means that CATfix will run in Interactive Mode, which you will use for initial testing.
- Set `com_out` to the COM port that communicates with the radio – for example, COM11 in Figure 5. This port must already exist in the PC, either as a serial COM port or a USB virtual COM port (VCP).
- Set `com_out_baud` to the same speed as the COM baud rate in the radio – Menu 61 or 62 in the TS-590S.

Again: If you change the baud rate in the radio, you need to switch the radio off and on again for the change to take effect.

## The Complete Set of CATfix Options

<b>CATfix Option</b>	<b>Function</b>	<b>Comments</b>
<code>start_minimized=0</code>	When the program starts, open the CATfix monitor window.	Allows all commands and responses to be seen on the screen.
<code>start_minimized=1</code>	When the program starts, do not open the CATfix monitor window.	CATfix starts as a tab in the Windows taskbar. Click on the tab to open the CATfix window.  Useful when CATfix is started as part of a sequence of programs, where there is usually no need to monitor CAT commands and responses – for example, when running JTAlert, WSJT-X and CATfix.
<code>enable_log=0</code>	Do not create a log of CAT commands and responses.	
<code>enable_log=1</code>	Create a log of CAT commands and responses.	The log is created in the <b>CATfixLogs</b> subfolder.
<code>reset_AI=0</code>	Do not issue an Auto Information (AI) command when CATfix starts.	AI status remains unchanged.  If AI is already enabled, the radio will (continue to) send unsolicited responses to the application whenever there are changes in radio settings. This may be a problem if the application cannot handle them.
<code>reset_AI=1</code>	Issue an Auto Information reset command ( <b>AI0</b> ) when CATfix starts.	Disables the AI function.  This prevents the radio from sending unsolicited responses to the application.  Recommended CATfix setting.  <b>Note: This setting is ignored if <code>toggle_IF_FIL=1</code> (see below)</b>
<code>set_lock=0</code>	Do not change the current front panel lock setting when CATfix starts.	
<code>set_lock=1</code>	Lock the front panel when CATfix starts.	
<code>set_power=0</code>	Do not change the current power setting when CATfix starts.	
<code>set_power=x</code>	Set the power to <b>x</b> watts when CATfix starts.	<b>x must be a whole number, and a multiple of 5 watts if TS-590S menu 48 is OFF.</b>
<code>reset_PROC=0</code>	Do not change the audio processor (PROC) setting when CATfix starts.	If PROC is ON before CATfix is started it will remain ON. PROC should not be used for digital modes.
<code>reset_PROC=1</code>	If PROC is ON when CATfix starts, turn it OFF.	Recommended CATfix setting for digital transmission, where signal distortion is unacceptable.
<code>set_usb=0</code>	Leave the sideband settings unchanged.	Transmission may be upper or lower sideband
<code>set_usb=1</code>	Set both VFOs to upper sideband when CATfix starts	Use this CATfix setting for most digital transmissions.
<code>force_TX1=0</code>	Allow the <b>TX</b> ; and <b>TX0</b> ; commands to function normally.	Use when the audio input is fed to the MIC socket on the TS-590S front panel (typically when using an external hardware interface).
<code>force_TX1=1</code>	Change the <b>TX</b> ; and <b>TX0</b> ; commands to <b>TX1</b> ;	Use when the audio input is fed to the USB port or the ACC2 port on the rear panel of the TS-590S, and where the app is not capable of sending <b>TX1</b> ;
<code>toggle_IF_FIL=0</code>	Ignore press/release of the TF-SET button.	
<code>toggle_IF_FIL=1</code>	Monitor the TF-SET button. When the button is pressed or released, toggle between IF Filter A and IF Filter B.	This option overrides the <code>reset_AI</code> option, and sends the <b>AI2</b> ; command to the radio at CATfix startup.

## The First Test: CATfix in Interactive Mode

Start CATfix. Assuming the `start_minimized=0` option is selected, a new window will open, and a message similar to the following will appear:

```
CATfix: v1.0
-----
Opening CATfix options file: 'catfix.ini' ....
  com_in=0
  com_in_baud=57600
  com_out=11
  com_out_baud=115200

  start_minimized=0
  enable_log=1

  reset_AI=1
  set_lock=0
  set_power=5
  reset_PROC=1
  set_usb=1

  force_TX1=0
  toggle_IF_FIL=0
-----

07:52:37 Opening log file '131120-075237 CATfix v1.0 log.txt'
07:52:37 Opening output port: COM11
07:52:37 INTERACTIVE MODE via keyboard -- enter CAT command(s), terminated by ;
-----
07:52:38 SESSION STARTED

07:52:39 ***** DATE: Wed.20 Nov 2013
07:52:40      0.03  AI0; PC005;PR0; [+more]
                                AI0; turns off Auto Information
                                LK00; turns off the front panel lock
                                PC005; sets the power to 5 watts
                                PR0; turns off the audio processor
```

The number `0.03` alongside the timestamp is the elapsed time in seconds since the session started.

The commands `AI0`; (reset AI), `PC005`; (power = 5 watts) and `PR0`; (reset PROC) are displayed in black, indicating they were automatically inserted by CATfix.

Now type a few CAT commands, each command terminated with a semicolon. Commands may be in upper case or lower case.

The input commands will be echoed in red as you type, and the responses from the radio will be displayed in green. For example:

```
07:52:40      0.17  fa;
07:52:40      0.18  FA00014076000;
07:52:42      2.35  if;
07:52:42      2.36  IF00014076000   -0130000900D0000000;
07:52:55     15.47  md;
07:52:55     15.47  MD2;
```

Assuming you receive CAT responses from the radio, you know that CATfix is working.

If you do not receive any responses from the radio, you need to find out why. As an independent check, try running ARCP-590 (on its own, without CATfix). If ARCP-590 won't talk to the radio, CATfix won't work either.

### Testing the CATfix Options

You can now try other CATfix options. For example, edit **catfix.ini** as follows:

```
force_TX1=1
```

Restart the program, then type the TX commands (in red below) at the keyboard. CATfix changes the commands to TX1 ; .

```
tx; \TX1;           TX1 replaces TX. ("\" means "replaced by")
tx0; \TX1;         TX1 replaces TX0.
```

Further details of the commands inserted by CATfix are shown in Appendix 1.

### RAW Monitor Mode

If you set all the seven options listed in the table below to 0, CATfix then operates in Raw Monitor Mode.

CATfix Option		Function	Comments
reset_AI=0	and	When all these seven options are set to "0", CATfix runs in RAW MONITOR MODE.	CATfix does not change or add any commands or responses as they pass to and from the radio.
set_lock=0	and		
set_power=0	and		
reset_PROC=0	and		
set_usb=0	and		
force_TX1=0	and		
toggle_IF_FIL=0			

In Raw Monitor Mode, all CAT commands are sent to the radio without modification, and all responses are passed back from the radio, again without modification. This is useful to see how the radio responds to commands, without any intervention from CATfix.

## Configuring CATfix for External Mode

External Mode is used to send CAT commands from an application program to the radio, and responses from the radio are relayed back to the application. In this mode, CATfix is essentially a software “shim” that sits between the application and the radio.

CAT commands issued by the application pass through a Virtual Serial Port Emulator (VSPE) to CATfix, which modifies the command stream according to selected options, then passes the commands to the radio. Responses from the radio pass back through VSPE to the application.

The VSPE described in this User Guide is from Eterlogic [2]. However, if you already use another serial port emulator (such as DDUtil’s VSP Manager or com0com) you can use that here instead.

To run CATfix in External Mode, you set up a non-zero COM port number in the CATfix configuration file – COM5 in Figure 6.

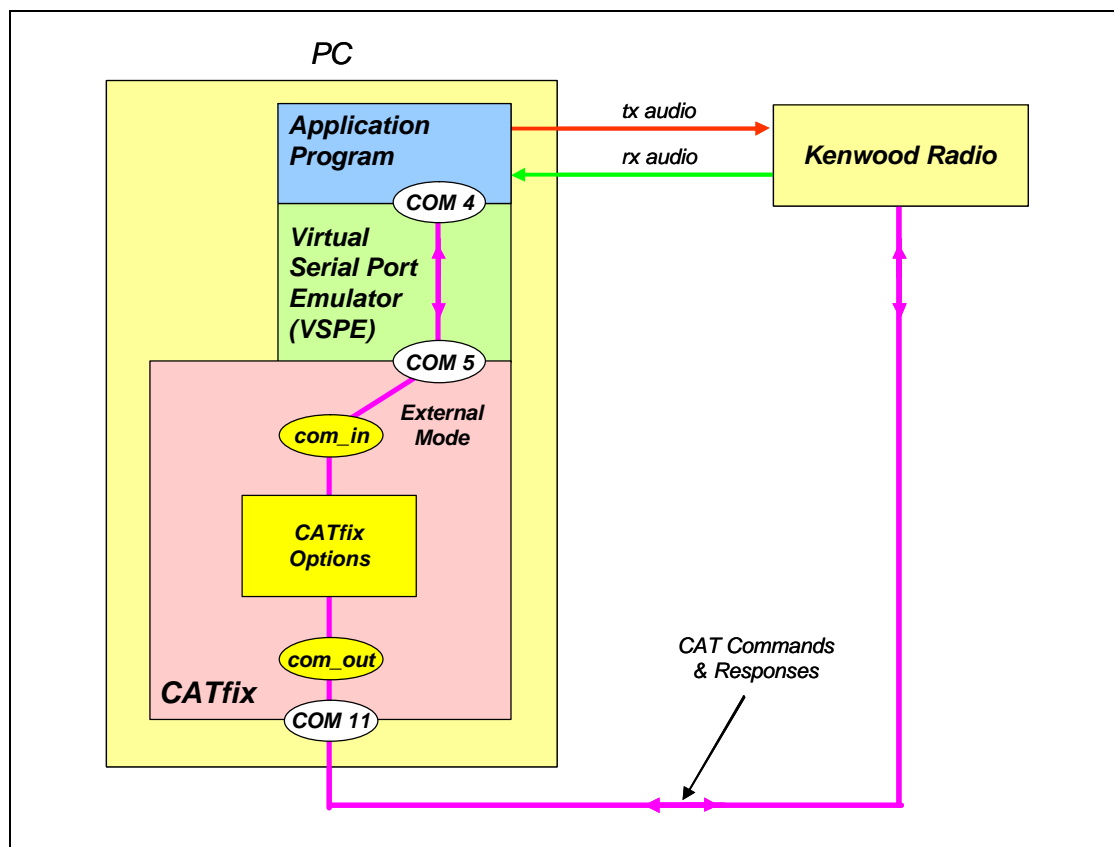


Figure 6: CATfix in External Mode. In this diagram:

- COM4 and COM5 are the Virtual Serial Ports (VSPs) that connect the application program via the Virtual Serial Port Emulator (VSPE) to CATfix.
- COM11 is the port number used for the cable connecting CATfix to the radio.

*Note that the non-zero COM port numbers shown here are only examples, used throughout this guide. In reality the actual port numbers will depend on existing port availability and usage*

## Virtual Serial Ports

When operating in External Mode, CATfix communicates with the application program via the VSPE. The VSPE is configured as a two-port “plugboard” that connects two Virtual Serial Ports (VSPs), whereby:

- One VSP is connected to the application program (COM 4 in Figure 6).
- The other VSP is connected to CATfix (COM5 in Figure 6).
- Traffic passing through COM4 appears on COM5, and traffic passing through COM5 appears on COM4.

**Note:** The VSPs have nothing at all to do with the Virtual COM Port (VCP) that you may have configured for communicating through the USB A/B cable to the radio.

## Allocating the COM Ports

The COM port numbers used throughout this guide (COM4, COM5 and COM11) are just examples. In practise, choosing suitable port numbers is a four-part process:

1. Discover the COM ports already set up in Windows. One of these ports will be designated the output port to be used by CATfix to communicate to the radio.
2. Allocate a pair of VSP COM ports in the VSPE “plugboard”.
3. Designate the COM port to be used by the application program. This will be one of the two VSP ports.
4. Allocate the other VSP port as the input port to be used by CATfix.

In detail:

**Discover the Windows COM ports:** This process was described earlier. Choose one of the two available COM ports (for example, COM11) for use by CATfix. This becomes the CATfix “com\_out” port.

**Allocate a pair of VSP COM ports:** Having discovered the available Windows COM ports, you are now free to designate two VSP COM port numbers. These may be any two numbers, *excepting those that are already allocated by Windows*.

So, using the examples in this guide, this means that you can *not* use COM 7 or COM11 for the VSP ports. Instead, you may allocate any *other* port numbers – COM4 and COM5 were chosen in this guide.

**Designate the COM port to be used by the application program:** Once you have decided on the two VSP COM port numbers, you can designate either of them to be used by the application program – it doesn’t matter which one. COM4 was arbitrarily chosen here.

This port number then becomes the port number you use in the application program.

**Allocate the other VSP port:** The other port number of the VSP pair (COM5 here) then becomes the CATfix “com\_in” port.



## Configuring VSPE

Before you can run CATfix in External Mode, you need to configure VSPE. To do this:

- Start VSPE.
- Click Device > Create.
- Select Device Type “Pair” from the dropdown list.
- Select two COM ports; for example, COM4 and COM5. See Figure 7.

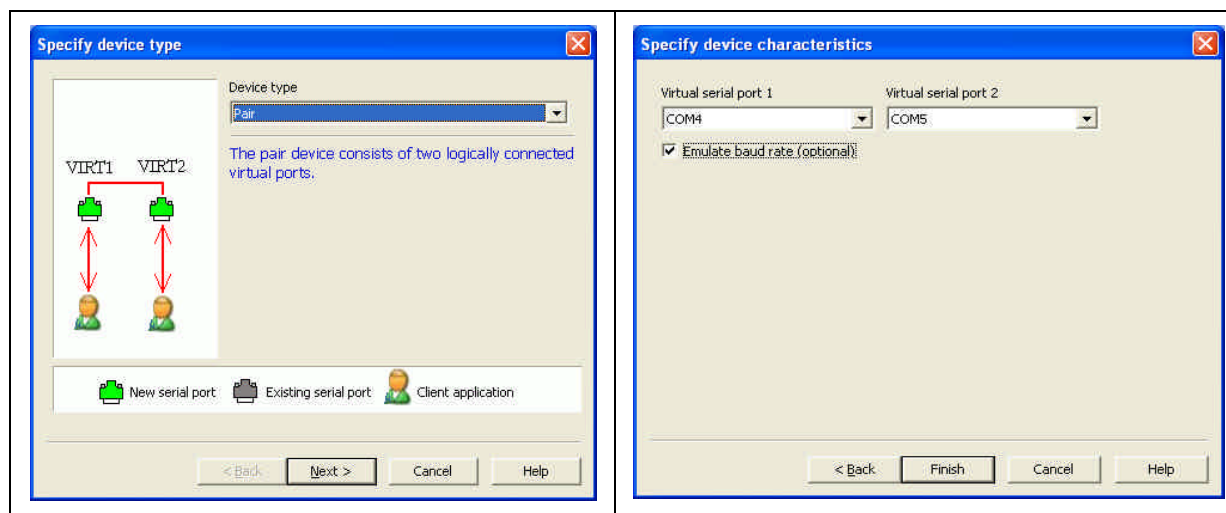


Figure 7: Configuring VSPE

- Click on Finish.
- Click on File > Save As to save the definitions, using a meaningful filename – for example, **Pair COM4-COM5**.

## Running CATfix in External Mode

To run CATfix in External Mode:

- Edit **catfix.ini**, changing the `com_in` entry to one of the two VSPs you defined in VSPE. For example:  
`com_in=5`
- Configure the application program to communicate with the other VSP of the VSPE pair. For example, COM4. Make sure the application program’s COM port baud rate is the same as `com_in_baud` specified in **catfix.ini**.
- Start VSPE, click File > Open ... and select the predefined “Pair” file (for example, **Pair COM4-COM5**). **VSPE must be running for CATfix to work.**
- Start CATfix.
- Start the application program.
- You should now see the CAT traffic between the application program and the radio displayed in the CATfix window.

(As an interesting exercise, configure ARCP-590 or Ham Radio Deluxe to use USB/COM port COM4, and watch the feathers fly!)

## The CATfix Display

As already described, CATfix shows outgoing CAT commands in red and black on the display, and incoming CAT responses in green. However, CATfix also automatically inserts a CRLF after each command/response. This makes it easier to read the display. These CRLF characters are not transmitted to the radio, nor are they sent to any connected application program.

## The CATfix Log

If you specify the `enable_log=1` option, a log is automatically created in the **CATfixFiles** subfolder. The log file is a plain text `.txt` file, which can be read with Notepad, TextPad or similar. The name of the logfile incorporates a date-timestamp, together with the CATfix version number. For example:

```
131120-075237 CATfix v1.0 log.txt
```

The logfile contains essentially the same information as displayed in the CATfix monitor window, except, as it monochrome text, additional characters are introduced, as follows:

- > indicates outbound CAT command(s) to the radio.
- < indicates inbound response(s) from the radio.
- [ ] indicate commands/responses added by CATfix.

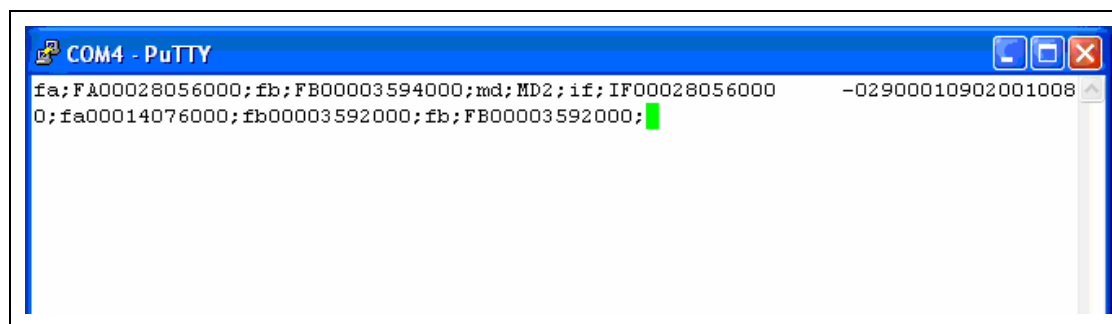
For example:

```
07:52:40      0.03  > [AI0;LK10;PC050;PR0;MD2;FR1;MD2;FR0;] or fr0/fr1
07:52:40      0.17  > fa;
07:52:40      0.18  < FA00014233000;
07:52:42      2.35  > if;
07:52:42      2.36  < IF00014233000      -0130000900D0000000;
07:52:55     15.47  > md;
07:52:55     15.47  < MD2;
07:56:40     236.76 > fb00014078000;
07:59:34     596.88 > tx;[\TX1;]
```

## Monitoring the Raw CAT Traffic

If you want to monitor the raw CAT traffic, you can use a terminal emulator such as `putty` [5] or Windows HyperTerminal as the applications program connected to CATfix.

For example, with `putty` configured for COM4, you will see a display something like Figure 8.



**Figure 8: Viewing raw CAT traffic using `putty`. CAT commands are echoed locally in lower case, and the responses are in upper case. Note that none of the extra commands inserted by CATfix appear here**

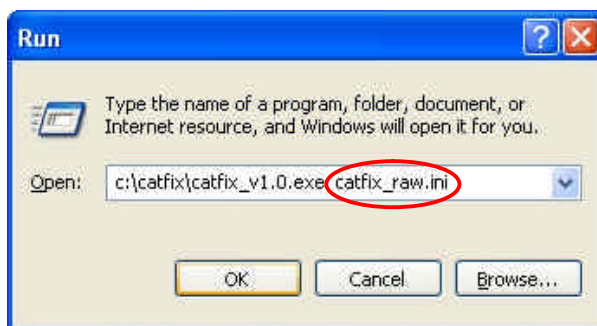
## Using Different CATfix Configuration Files

You can use the default CATfix configuration file, **catfix.ini**, as described thus far, but sooner or later you will find that repeatedly editing the file for different scenarios becomes a chore. To make things easier, CATfix lets you create several configuration files, each file containing the options for a different situation.

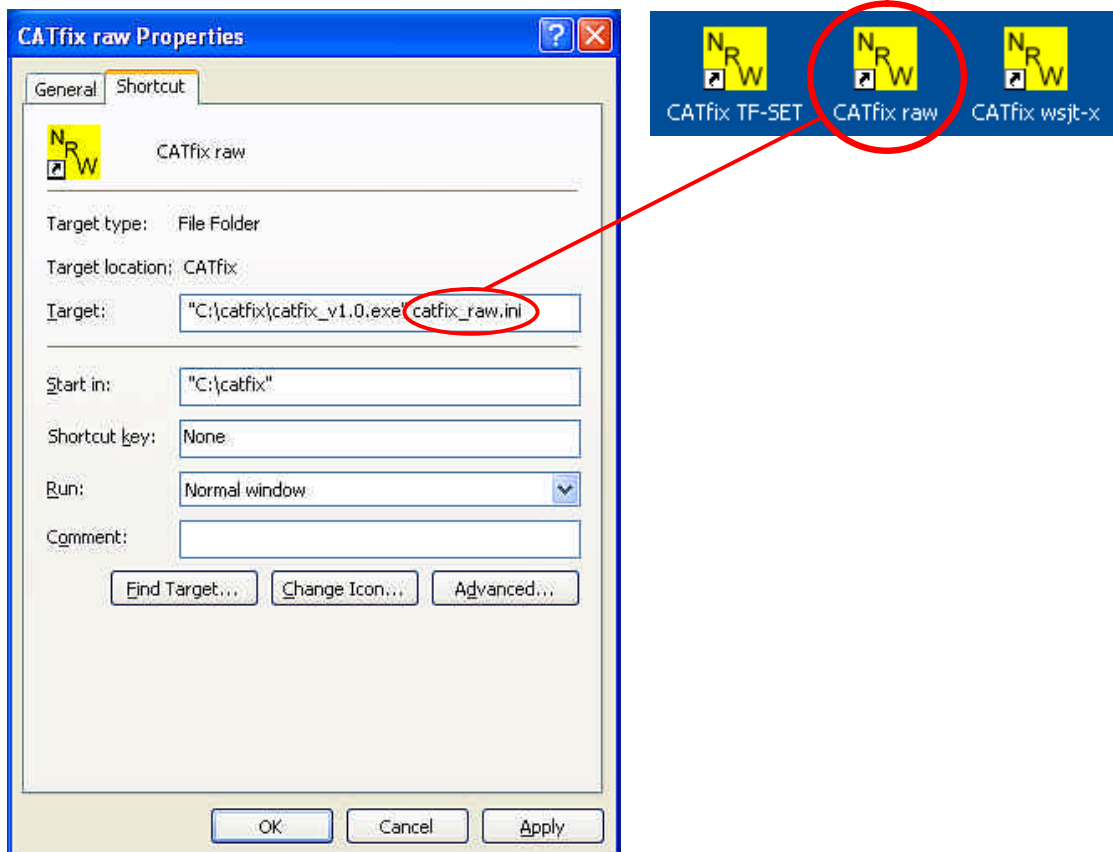
To create a new configuration file, copy **catfix.ini** to a new file (for example, **catfix\_raw.ini**), then edit the new file as required. The new file must reside in the same folder as **CATfix\_v1.0.exe**.

You can then run CATfix with the new configuration file, as follows:

- On the Windows desktop, click on Start.
- Click on Run ...
- In the Open box, type the name of the program, followed by the CATfix configuration filename (for example, **c:\catfix\catfix\_v1.0.exe catfix\_raw.ini**), then click on OK:



Alternatively, you can create Windows desktop shortcuts, adding the CATfix configuration filename as a parameter in the Target box of the Properties window. For example:



## Runtime Operating Tips

### Running CATfix with an application

When running CATfix with an application, it is easy to forget to start VSPE. So it is helpful to create a Windows batch file to start the application. For example, here is a skeleton batch file to start Ham Radio Deluxe:

```
rem catfix_hrd.bat
rem Start VSPE in background
start "" "c:\Program Files\Eterlogic.com\Virtual Serial Ports Emulator\VSPemulator.exe" ^
-hide_splash "Pair COM4-COM5.vspe"

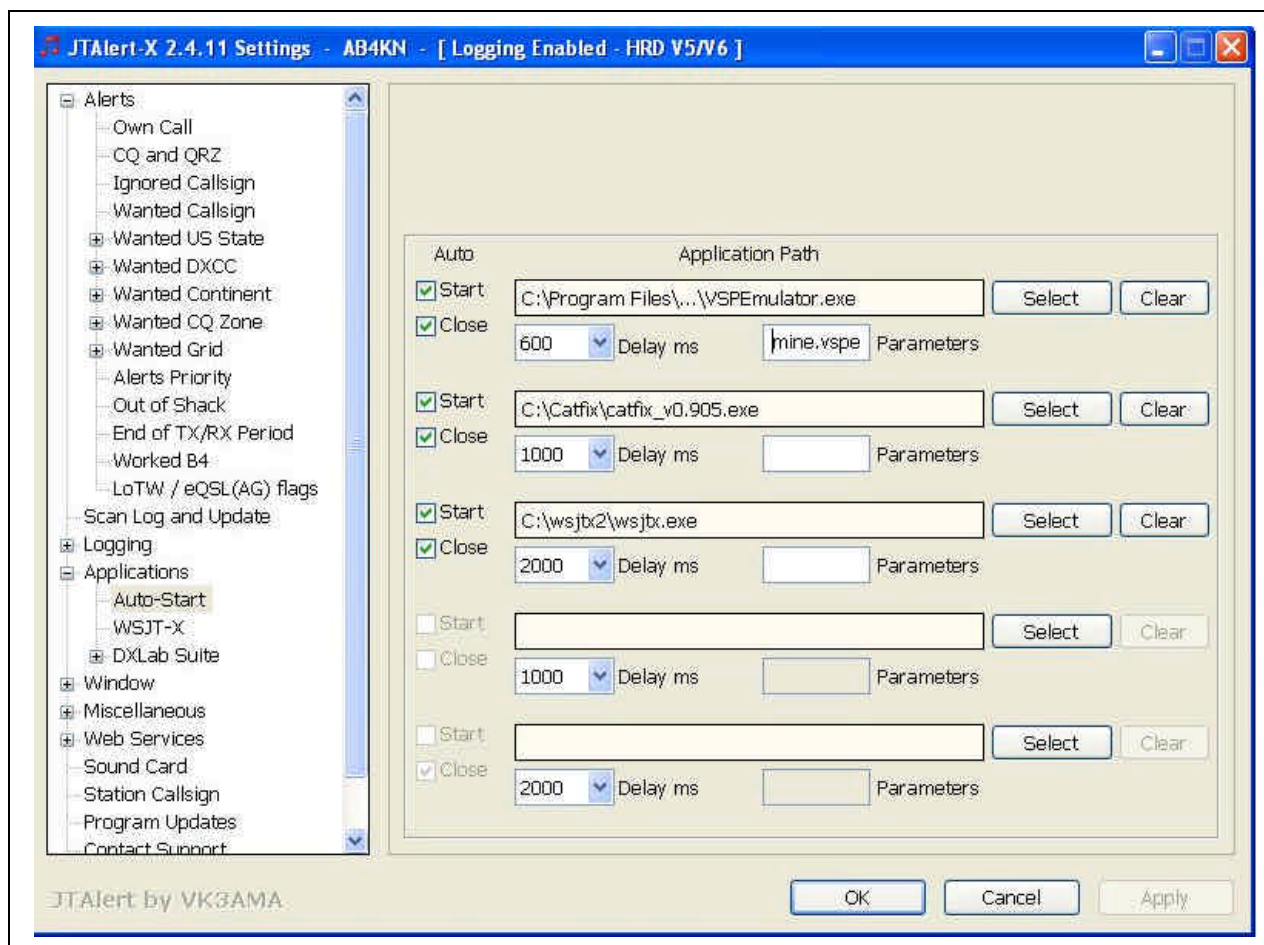
rem Start CATfix in background
start "" c:\catfix\catfix_v1.0.exe catfix_hrd.ini

rem Start HRD
"c:\Program Files\Amateur Radio\Ham Radio Deluxe\HamRadioDeluxe.exe"
```

If you then create a shortcut to this file on the Windows desktop, you can start HRD simply by double-clicking on the shortcut.

### Running CATfix with JTAlert

JTAlert has a built-in batch control feature that you can use with CATfix. This picture (courtesy of George Daniel, AB4KN) shows how you can set up all the batch requirements for a WSJT-X session:



## Appendix 1: CATfix Options

This appendix contains details of the additions and changes that CATfix makes to certain commands when certain options are selected.

### Key

Command in black	CAT command sent from CATfix to the radio
<i>Response in green</i>	Response received from the radio

### CATfix Option Settings

<i>reset_AI</i>	<b>CAT command sent to radio</b>	<b>Remarks</b>
reset_AI=0		Auto Information setting remains unchanged <b>NOTE:</b> This setting is overridden if toggle_IF_FIL=1. In that situation, CATfix sends AI2; at startup
reset_AI=1	AI0;	Only sent to radio once, when CATfix starts <b>NOTE:</b> This setting is overridden if toggle_IF_FIL=1. In that situation, CATfix sends AI2; at startup

<i>set_lock</i>	<b>CAT command sent to radio</b>	<b>Remarks</b>
set_lock=0		Lock setting remains unchanged
set_lock=1	LK10;	Only sent to radio once, when CATfix starts

<i>set_power</i>	<b>CAT command sent to radio</b>	<b>Remarks</b>
set_power=0		Power setting remains unchanged
set_power=xxx	PCxxx;	Only sent to radio once, when CATfix starts

<i>reset_PROC</i>	<b>CAT command sent to radio</b>	<b>Remarks</b>
reset_PROC=0		Processor setting remains unchanged
reset_PROC=1	PR0;	Only sent to radio once, when CATfix starts

<i>set_usb</i>	<b>Main VFO at CATfix startup</b>	<b>CAT commands/responses to/from radio</b>	<b>Remarks</b>
set_usb=0			Sideband setting remains unchanged
set_usb=1	VFO-A	FR; <i>FR0</i> ; FT; <i>FTx</i> ; MD2;FR1;MD2;FR0;FTx;	Only sent to radio once, when CATfix starts
	VFO-B	FR; <i>FR1</i> ; FT; <i>FTx</i> ; MD2;FR0;MD2;FR1;FTx;	Only sent to radio once, when CATfix starts

<i>force_TX1</i>	<b>Original CAT command from app program</b>	<b>CAT command sent to radio</b>
force_TX1=0	TX;	TX;
	TX0;	TX0;
	TX1;	TX1;
force_TX1=1	TX;	TX1;
	TX0;	TX1;
	TX1;	TX1;

<i>toggle_IF_FIL</i>	<b>CAT response/command from/to radio</b>	<b>Remarks</b>
toggle_IF_FIL=0		CATfix does not monitor the TF-SET button
toggle_IF_FIL=1	TS0; or TS1; FL1; or FL2;	CATfix sends the FL command to select the appropriate IF Filter whenever TF-SET is pressed/released

## Appendix 2: CATfix Startup

When CATfix starts up, the following actions take place:

- CATfix issues a **PS;** command, to discover the Power Status of the radio. If powered up and operational, the radio responds with **PS1;**. (If a **PS1;** response is not received, CATfix polls the radio indefinitely with **PS;** until **PS1;** is received).
- CATfix issues an **AI;** command, to discover the current Auto Information setting, and saves the setting.
- CATfix issues an **AI0;** command, to turn off Auto Information.
- CATfix issues an **ID;** command, to discover the model (TS-590S, TS-990S, etc).
- CATfix issues a **TY;** command, to discover the radio type (K or E).
- CATfix issues an **FV;** command, to discover the firmware version number.
- If logging is enabled, CATfix saves the model, type and firmware version in the log. For example:  

```
MODEL: TS-590S. TYPE: E 01. FIRMWARE VERSION: 1.08.
```
- If the model is a TS-590S and the firmware version is earlier than v1.08, CATfix issues a warning that the radio may not function correctly in split.
- CATfix issues an **FL;** command, to discover the current IF Filter setting (Filter A or Filter B).
- If `toggle_IF_FIL=0`, CATfix issues an **AIx;** command, to restore the original Auto Information setting.
- If `toggle_IF_FIL=1`, CATfix issues an **AI2;** command, to turn on Auto Information.

All of the above CAT startup commands are issued silently – they are not displayed in the CATfix monitor window or in the CATfix log.

### Appendix 3: Bugs in TS-590S Firmware v1.07 and earlier

Version v1.07 (and earlier) of the TS-590S firmware has two serious bugs:

- When the radio is in SPLIT mode and the digital program sets the VFO-B frequency, the radio does not always transmit on that frequency – it sometimes transmits on a *previously set* frequency.  
*(This bug is particularly insidious, because the VFO-B transmit frequency displayed on the radio's front panel appears to be correct, whereas the radio actually transmits on a different frequency. This led to many on-air complaints).*
- When the radio is in SPLIT mode and the digital program sets VFO-A and VFO-B to frequencies in the *same* band (for example, VFO-A = 14.076 MHz and VFO-B = 14.075 MHz), the radio sometimes does not transmit at all.

These bugs were originally exposed by the WSJT-X program from Joe Taylor (K1JT), which makes clever use of SPLIT to handle both JT-65 and JT-9 signals in the same passband. Andy Durbin (K3WYC) and John Brush (WA3CAS) publicly reported the bugs in the summer and fall of 2013.

**Because of the seriousness of these bugs, it is highly recommended that users install v1.08 or later of the TS-590S firmware [2].**



## References

<i>Resource</i>	<i>URL</i>
[1] Kenwood TS-590S Control Command Reference Manual	Go to the "TS-590S Resources Page": <a href="http://homepage.ntlworld.com/wadei/ts-590s.htm">http://homepage.ntlworld.com/wadei/ts-590s.htm</a> Click on the "KENWOOD TS-590S DOCUMENTATION" button. Then download document # 3: "TS-590S PC Control Command Reference"
[2] TS-590S Firmware <b>The firmware must be v1.08 or later</b>	Go to the "TS-590S Resources Page": <a href="http://homepage.ntlworld.com/wadei/ts-590s.htm">http://homepage.ntlworld.com/wadei/ts-590s.htm</a> Click on the "KENWOOD TS-590S SOFTWARE" button. Then follow the link to the official Kenwood site for the TS-590S firmware
[3] CATfix software	Go to the "TS-590S Resources Page": <a href="http://homepage.ntlworld.com/wadei/ts-590s.htm">http://homepage.ntlworld.com/wadei/ts-590s.htm</a> Click on the "CATfix" button. Then download <b>CATfix.zip</b> for the CATfix software and User Guide
[4] Virtual Serial Ports Emulator (VSPE)	<a href="http://www.eterlogic.com/Products.VSPE.html">http://www.eterlogic.com/Products.VSPE.html</a>
[5] Virtual COM Port (VCP) driver	<a href="http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpcdrivers.aspx">http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpcdrivers.aspx</a>
[6] Putty serial terminal emulator	<a href="http://www.putty.org/">http://www.putty.org/</a>

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- Jim Tedeschi , K5USF

## Document Version History

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1.0	16 December 2013	First public release