flrig\_help 2.0.04

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# flrig\_help\_2.0.04

FLRIG is a transceiver control program designed to be used either stand alone or as an adjunct to FLDIGI and other 3rd party programs such as wsjtx. The supported transceivers all have some degree of CAT.

📷 firig IC-7300				- <u>-</u> ×
<u>File Config Memory Key</u>	er <u>H</u> elp			
S3S6S9+20+40+60	70	000 289	70	70.000
Ps 20 40 60 80	/	000.000	vfoA vfol	B 🚺 Tune 🖊
1 600 🔍 USB-D 💌	ATT PRE	NB AN	A / B 🖂 Spl	it 🗌 🗌 PTT
SQL 12	Lock 0		MED 100	
Mic 0	ClrPBT 0		🗆 NR 🛛 0 📘 🗕	
Pwr 100	Nch 3000	<b>1</b> [	Vol 5 -1-	

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\_\_\_\_\_

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# **Initial Setup**

Select the transceiver with the "Config / Setup / Transceiver" menu item.

••	•	f	Irig IC-7
File	Config	Memory k	Keyer
	Setup →	Transceive	n
	UI 🔸	TCPIP - TO	з L
S:	3 S6 :	PTT-CMed	ia 🔍 🗌
		PTT-Gener	ric 3
Po :	20 40	PTT-GPIO	ſ
Vol	0	Other	
SLC	) 100 -	TMATE-2	- 1
SC	2L 0 🚺	Server	
	0	Client	[
	ATT	Polling	NB D
		Commands	s
		Send comr	nand
		Restore	
		Trace	

Each of the menu items will open the configuration dialog to the respective tab:

- · Transceiver select transceiver and configure serial i/o parameters
- · TCPIP TCI configure interface to a remote tcpip/serial controlled transceiver
- PTT CMedia configure PTT using Cmedia codec pin 13
- PTT Generic configure PTT using serial port CAT, DTR or RTS
- PTT GPIO configure PTT using GPIO port, Pi hardware platform
- · Other configure separate auxiliary serial ports (if used)
- TMATE-2 setup the TMATE-2 interface
- · Server change XmIRpc server port designation
- · Client address of the server this client will connect to

- Polling select and configure transceiver parameters to poll
- · Commands add/delete/modify user created CAT commands
- Send command edit/send single CAT command
- Restore select and configure transceiver parameters to read and restore
- Trace select and display program execution paths

### 3.1 Xcvr Select

		Configu	ration				
▼ Configure	Rig:	IC-7300					•
Xcvr BTT Conorio	Update	/dev/cu.SLAB_L	JSBtoUART				•
PTT-Cmedia	Baud:	115200		Retries 📢 🜗	2		
TMATE-2		1 Stop Bit	2 Stop Bits	Timeout 📢 🚺	50		
TCPIP & TCI			RTS/CTS	Write delay 📢 📢	0		
Server		RTS +12 v	DTR +12 v	Post delay 📢 📢	0		
Client	0×94	Default		Poll intvl 🕊 📢	100	Þ	•
Poll				Act	ivate		
Commands	- USB (	audio		Connected <		nit	

Figure 3.1 I/O Ports - Xcvr

Select the rig in use from the "Rig" combo box.

The default values associated with that transceiver will be preset for you. These have been verified by the test team but might require some tweaking for your particular h/w.

If required by the hardware interface, set either RTS or DTR to +12 if interface power is derived from the serial port.

### 3.1.1 Configure PTT

	Configuration
	CW mode PTT  disable PTT in CW mode  PTT on CAT Serial Port  BOTH CAT OFF TRTS OFF TDTR Init  RTS +12 v DTR +12 v
Server	PTT control on Separate Serial Port
Client	Port NONE
Restore	SCU-17 OFF TRTS OFF DTR Init
Commands Send	RTS +12 v DTR +12 v



Select CAT PTT if your transceiver supports a CAT command for PTT on/off. This control will default to checked if CAT PTT is supported.

You may prefer to use h/w PTT signaling instead of CAT PTT. The h/w PTT may be shared with the CAT serial port. Note that both RTS/CTS handshake and RTS PTT cannot both be used on a single serial port.

Your PTT h/w control may also make use of a second serial port. If that port is the secondary serial port of the SCU-17 then you must also enable the "Serial Port is SCU-17 auxiliary" control.

#### 3.1.2 Configure CMEDIA PTT

	Configuration	
✓ Configure     ✓ Xcvr     ✓ PTT-Generic     PTT-Creedia	<ul> <li>C-Media audio codecs used in DRA Series have 8 user controllable GPIO pins.</li> <li>GPIO signal line 3 (pin 13) is used for PTT control.</li> <li>On Linux: add a file named cmedia.rules to /etc/udev/rules.d/ containing:</li> </ul>	
TMATE-2 TCPIP & TCI	KERNEL=="hidraw*", \ SUBSYSTEM=="hidraw", MODE="0664", GROUP="plugdev"	
Client Poll	C-Media device	ו
Commands Send	GPIO line GPIO-3 TEST	)

Figure 3.3 Cmedia PTT control

Cmedia audio codec chips are used in a number of inexpensive USB audio thumbnail devices.

It is also used in the DRA@ series of sound card adapters. The DRA is a radio optimized sound card used to connect a two-way radio to a computer for digital communications. The DRA-Series digital radio adapter is used for Packet Radio or other digital programs and applications like VARA-FM, VARA-HF, SoundModem or fldigi.

All RA Series radio adapters include GPIO support. The Cmedia device supports 4 unbuffered input/output lines, GPIO-1 ... GPIO4. GPIO-3 is used to drive a fully buffered and deadman protected PTT circuit. All DRA Series radio adapters include a Heartbeat Monitor. When the Cmedia device is reading or writing audio data, the Heart⇔ Beat status LED (HB) will be flashing. If everything is okay, (HB LED is flashing) a Blue LED called "COMM OK" illuminates. If the HB LED stops flashing because the radio adapter or the computer/appliance has failed, or the software has stopped reading or writing audio data, the Blue COMM OK LED goes out. The Blue LED indicates the health status of the system, and illuminates when everything is okay.

The PTT line on any DRA Series radio adapter is interrupted with the failure of this health status. This function will kill the PTT line the audio stream is interrupted. This will occur if fldigi and similar modem program is not reading/writing audio data.

The circuitry was designed to operate correctly no matter if the Heartbeat has stuck in the on or off state.

The PTT type, the device and the GPIO line must be selected. If multiple C-Media devices are discovered they will enumerate as C-Media-A, C-Media-B, etc.

You must test the selected interface as it is not possible to know which is the correct one for the DRA interface. Pressing the TEST button will cause the PTT line to rapidly toggle for a period of 2 seconds. This will cause the RED PTT led to flash and the transceiver PTT to toggle on and off.

### 3.1.3 Configure TCPIP & TCI

Configuration
Remote firig         TCPIP address:       192.168.0.122         TCPIP port:       4001       Retry (secs) ((10))         Ping delay       (10))       Allowed drops         Vise tcpip       Connected         TCI interface         TCI address:       127.0.0.1         TCI port:       40001

Figure 3.4 Remote FIrig Setup

#### TCPIP

flrig is can communicate with a transceiver that provides CAT control over ethernet. It can also communicate with a remote computer with a software serial to ethernet converter such as SOCAT. Both the device address and port must be specified.

#### TCI

Transceiver Control Interface was developed by Expert Electronics company, for advanced connection between the ExpertSDR2 and third-party software. TCI has all required control commands similar to CAT system, but even more, it can transfer IQ-streams from the ExpertSDR2 to client applications. The ExpertSDR2 is the only TCI capable transceiver.

### 3.1.4 Use Pi GPIO PTT

Configuration							*
🗆 Configure				□Use GPI0 PTT			
Xcvr	BCM	GPIO	Pin ON	BCM	GPIO	Pin ON	
PTT-Generic	0 17	00	11 🗆	. 5	21	29 🗌	
PTT-Cmedia	0 18	01	12	0 6	22	31 🗆	
PTT-GPIO	27	02	13	13	23	33	
TCPIP	□ 22	03	15	□ 19	24	35	
Auxiliary	0 23	04	16	. 26	25	37	
Boll	0 24	05	18 0	0 12	26	32 0	
Poli	0 24	05	10 0	0 12	20	36 0	
Commands	0 25	00	22 0	0 10	27	30 []	
Send	4	07	7 📋	20	28	38 🗌	
Trace	▲ 0		Pulse width	(msec) 🗌 21	29	40	

Figure 3.5 GPIO PTT control

The Pi series of miniature computers offer a large array of possibilities for controlling devices. It has a array of General Purpose Input Output, gpio, lines of a 40 pin in-line header. 17 of these gpio lines can be used for things like push-to-talk. There are several add on boards for the Pi3 and Pi4, such as the NW Digital Radio UDRC-II, that has a full interface for digital operations, including PTT and audio codecs.

Access to hardware ports is always limited to the user who either is root or has root privileges. setuid and setgid (short for set user ID upon execution, and set group ID upon execution, respectively) are Linux access rights flags that allow users to run an executable with the permissions of the executable's owner or group respectively and to change behaviour in directories. They are often used to allow users on a computer system to run programs with temporarily elevated privileges in order to perform a specific task. While the assumed user id or group id privileges provided are not always elevated, at a minimum they are specific.

It is possible to give full gpio access and control privileges by elevating flrig with setuid root. But this is not advisable as flrig is also granted access to both serial and network services. There is a way to provide the access via a second program that does have the elevated privilege

This is a copy of material at

https://projects.drogon.net/raspberry-pi/wiringpi/download-and-install/

for installing WiringPi which includes a really nice utility called gpio.

To obtain WiringPi using GIT:

\$ git clone git://git.drogon.net/wiringPi

If you have already used the clone operation for the first time, then

\$ cd wiringPi
\$ git pull origin

Will fetch an updated version then you can re-run the build script below.

To build/install there is a simplified script:

\$ cd wiringPi
\$ ./build

The build script will compile and install it all for you. It does use the sudo command at one point, so you may wish to inspect the script before running it.

#### Test wiringPi's installation

run the gpio command to check the installation:

```
$ gpio -v
$ gpio readall
```

That should give you some confidence that it's working OK.

WiringPi is released under the GNU Lesser Public License version 3.

flrig uses the gpio program for initializing the gpio port, which also happens to the change the privilege of the temporary sys file for setting the port state.

#### Read the man document for gpio

GPIO is a swiss army knife of a command line tool to allow the user easy access to the GPIO pins on the Raspberry Pi and the SPI A/D and D/A converters on the Gertboard. It's designed for simple testing and diagnostic purposes, but can be used in shell scripts for general if somewhat slow control of the GPIO pins.

It can also control the IO's on the PiFace IO board and load the SPI and I2C  $\,$  kernel  $\,$  modules if required.

Additionally, it can be used to set the exports in the /sys/class/gpio system directory to allow subsequent programs to use the /sys/class/gpio interface without needing to be run as root."

After installing gpio on your Pi you can set the gpio port on flrig's GPIO configuration tab. The UDRC-II for example uses pin 16, BCM # 23, for push to talk. It has an LED indicator on the board to show when PTT has been enabled. For this board you select "BCM 23" and select the corresponding "= 1 (on)" check box.

During start up flrig uses the gpio program to set up the gpio pins with the command

\$ gpio export NN out

This is the command to export a GPIO pin in the /sys/class/gpio directory. Note that the pin number is the BCM\_ GPIO number. 'out' sets the pin to be an output control, and 'in' an input control.

Once a GPIO pin has been exported, the gpio program changes the ownership of the

/sys/class/gpiogpioX/value

and if present in later kernels, the

/sys/class/gpio/gpioX/edge

pseudo files to that of the user running the gpio program. This means that you can have a small script of gpio exports to setup the gpio pins as your program requires without the need to run anything as root, or with the sudo command.

During shutdown flrog uses the gpio program to disable access to the gpio pins used with PTT by invoking the command

gpio unexport NN.

You can check that this is working correctly from a terminal window using the command

\$ gpio readall

### 3.1.5 Configure other auxiliary ports

	Configuration
✓ Configure     Xcvr     PTT-Generic     PTT-Cmedia     TMATE-2     TCPIP & TCI     Other     Server     Client     Poll     Restore	Auxiliary I Use only if your setup requires a separate Serial Port for a special Control Signals Aux NONE SCU-17 auxiliary Yaesu 2nd USB port Init Power limit Enable power limit
Send Send	

Figure 3.6 I/O Ports - Other

Att Auxilliary Control:	DTR	□ RTS	T PTT

Figure 3.7 Aux Controls

You might also need access to special h/w functions. FLRIG provides this via the DTR and RTS signal lines of an independent serial port. Additional main dialog controls are enabled and shown if you select anything other than NONE (the default). Enable the "Serial Port is SCU-17 auxiliary" if you are using the SCU-17 secondary serial port.

Also on this same page a transmit power out limit may be set if your radio supports that feature. To activate it just set the desired power level and check the enable box.

#### 3.1.6 Configure Polling

				C	onfigurati	on			
▼ Configure		Mete	ers						
Xcvr			S-mtr		Pwr out		SWR	ALC	Set all 🗸
PTT-Generic		Ope	rating Co	ntrols	3			 	
PTT-Cmedia			Freq		Mode		BW		Set all
		Addi	itional Co	ntrols	3				
Other	4		Volume		Mic		RF	Power	PTT
Server			IF		Notch		Auto	Tuner	
Client			Pre/Att		Squelch		Solit	OSK	
Poll			Disalar		Nation		Opin	DOT	
Restore			Blanker		Noise re	a⊻	Comp	PBI	Set all
Commands				alDad	Sonior	_		)icable B	olling
Send	-		isable All	intpo	, Server			isable P	uning

Figure 3.8 I/O Ports - Polling

Providing your transceiver supports the various meters and controls, you can elect to poll these every time the poll cycle occurs. Polling a value causes FLRIG to follow as well as control a particular transceiver function or control. The polling cycle will slow down as you elect to poll more and more values.

### 3.2 Config Data Files

Configuration and data files used by flrig consist of the following:

OS	Folder	File	Usage
Windows XP	c:\Documents and Settings\user- name\flrig.files	flrig.prefs	names transceiver file & xmlrpc port
Windows XP	c:\Documents and Settings\user- name\flrig.files	IC-7100.prefs (1)(2)	IC-7100 specifc configuration items
Windows XP	c:\Documents and Settings\user- name\flrig.files	IC-7100.mat (1)(2)	IC-7100 specific memory file
Windows 7/8/10	c:\Users\user-name\flrig.files	flrig.prefs	names transceiver file & xmlrpc port
Windows 7/8/10	c:\Users\user-name\flrig.files	IC-7100.prefs (1)(2)	names transceiver file & xmlrpc port
Windows 7/8/10	c:\Users\user-name\flrig.files	IC-7100.mat (1)(2)	names transceiver file & xmlrpc port
Linux/Unix/OS-X	\$HOME/.flrig	flrig.prefs	names transceiver file & xmlrpc port
Linux/Unix/OS-X	\$HOME/.flrig	IC-7100.prefs (1)(2)	names transceiver file & xmlrpc port
Linux/Unix/OS-X	\$HOME/.flrig	IC-7100.mat (1)(2)	names transceiver file & xmlrpc port

(1) Several TRANSCEIVER.prefs and mat files may be in the folder. Each specifc to the configured transceiver (2) Files such as IC-7100.prefs.1, IC-7100.mat.1, up to a prefix of 5 may appear in the folder. These are aged files, with the oldest file having the largest prefix value. The mat files are only created if the user actually saved items to memory.

Transceiver Prefs details are shown in this file: Prefs file contents.

The file is human readable. Editing the file is not recommended.

# **Configure Read/Restore Xvcr Settings**

Flrig will read various transceiver parameters and restore them upon closing. The next image shows the available read/restore parameters for the lcom 7200. If a parameter is not available (or coded) it will be disabled and grayed out. Check each parameter that you want to read and restore. Reading and restoring transceiver parameters takes time, especially on older transceivers with low baud rate serial i/o. Check "Use xcvr data" i\lf you want flrig to NOT change the transceiver operating state when it begins execution.

Configuration				×
Configure		Read / Restore t	hese parameters	
PTT-Generic	🕑 Freq		Noise Red'	
PTT-Cmedia	🕑 Mode	Notch	🗹 Comp On/Off	
PTT-GPIO	Bandwidth	Auto Ntch	Comp Level	
Auxiliary	Volume	Squelch		
Server	🕑 Mic gain	🕑 Split		
Poll	🔽 RF gain	Pre/Att		
Commands	Pwr level	Blanker	🗌 Use xcvr data	
Send				
Trace				

Figure 4.1 Restoring transceiver Status

# **Additional Controls**

Additional control settings may be available depending on the transceiver being controlled. These are in a dropdown area toggled by the arrow button to the left of the attenuator button on the small aspect ratio dialog view. These are the controls for the Yaesu FT-710.

flrig extra controls	-	2	8			
Band CW QSK Vox Misc A B C						
<u>1.8</u> <u>3.5</u> <u>7</u> <u>10</u> <u>14</u>		18				
21 24 28 50 GEN						

Left-click on a Band button to QSY to that band. Typically this will apply the settings saved in the top register in your rig's Band Stacking Registers for that band, if your rig supports BSR. This should provide similar functionality to physically pressing the rig's Band button. For example, on an Icom IC-7610, this will recall the frequency, mode, filter selection, and if FM mode, the tone frequencies last used on the selected band.

Additionally, if your rig supports the functionality, right-clicking on a Band button will store current values in the top register for that Band. You must right-click on the Band you are currently on. Most, if not all, rigs will reject attempts to set frequency values outside of the ham band limits in the BSR for a given band.

flrig extra controls	-	0	8
Band CW QSK Vox Misc A B C			
▼▲18     ▼▲3.0     Spot       wpm     Weight     □ Keyer			

The CW tab is pretty well self explanatory. Set the WPM as desired. Weight refers to the ratio of Dit to Dash, but is not available on all rigs. What other controls are visable will depend on the rig being used.

flrig extra controls	-	0	8
Band CW QSK Vox Misc A B C			
QSK? A 15 Bk-in Dly QSK delay			

The QSK tab allows you to select Semi-breakin or Full-breakin with the QSK button. Bk-in Dly sets the time delay during Semi-breakin operation so the rig does not return to receive while keying. QSK delay does the same thing during Full-breakin operation.



Gain refers to the sensitivity to your voice causing it to switch to transmit.

Anti refers to the Anti-Vox function of reducing the sensitivy to speaker or other noises so the rig will not go into transmit unintentionally.

Delay refers to the transmit-receive delay after cessation of speech.

	-	2	8			
Band CW	QSK Vox	Misc	A B C			
□Special □Ext tuner	<b>I Rig au</b> I Rig au	to On to Off	Sync Clk Use GMT	Sync SYNC	Nov C'D	v

For those rigs with CAT controlled Power On/Off available set it as desired. Auto-on activates when flrig is first started. Auto-off activates as flrig shuts down. If the computer has CAT controlled time setting available flrig can set the rig's internal clock to the computer's time/date. This happens on the exact minute so you will see it showing the time until it has synchronized.

	-	ø	8				
Band CW QSK Vox Misc A B C							
cmd 1	cmd 2	cmd 3	cm	nd 4			
cmd 5	nd 5 cmd 6 cmd 7		cmd 8				

The A, B, and C tabs are 3 sets of 16 entries that can be CAT commands to perform functions that flrig does not have coded for your radio. Things like setting audio output level or any other functions that can be CAT controled. Entries are setup via the flrig Config/Setup/Commands tab. See Chapter 10, User-Defined Commands, in this document.

# **Configure User Interface**

		)			flrig IC·	-7300
File	C	onfig		Memory	Keyer	Hel
	S	etup	+	h70 (	ഫി	_
	U		•	Meters d	ialog	
S:	3	_ S6	- 0	Meter filt	ering	vfo
				Power m	eter scal	le 34
Po :	20	4	0	Small	sliders	Lo
Vol		0		🕑 Embe	d tabs	rPE
SLC	וו	100	-	🗹 Tooltig	os	Nc
SC	۶L	0		O Voltm	eter	1
[ NR		0		User Inte	erface	Pw

#### 6.0.1 Meter Display and Filters



Figure 6.1 Meters Dialog



**Figure 6.2 Meter Filter Controls** 

You can control the behavior of both the average and peak values of the S-meter and Power out meters. Setting the controls to 1 for both average and peak will simply display the latest value available from the transceiver. The average setting results in the display showing the average of the last N readings. The peak value will display the average peak value over the last M readings.



Figure 6.3 Meter Scale

Right click on the main dialog power meter scale to open up this selection dialog. Each of the 4 scales and the "Auto scaled" box are buttons. Press the one you want to use. Auto-scaling adjusts the meter scale to the smallest scale consistent with the current measured peak power. If that power is fluctuating near the transistion point between two scales you might want to fix the scale to either the larger or smaller.

### 6.0.2 Slider sizing

When the user interface is configured to be "small" then the UI submenu will contain the item "Small sliders". Toggling this menu item will immediately change the size and positions of the various slider controls. Select the toggle button "Small sliders" on the Config menu for 1/2 size sliders and a dialog layout that uses less vertical space.

firig FT-9	91A 🔶 🛨 🕹 🕹
<u>F</u> ile <u>C</u> onfig <u>M</u> emory <u>K</u> e	yer <u>H</u> elp
7070.000	14070.000
S3 S6 S9 +20 +40 +60	vfoA vfoB A<->B Split
	3000 🔽 DATA-U 💌
P₀ 10 20 30 40	
Vol 30	
RF 100	1
□ NR 1 ■	
IFsh 0	I
Nch 1340	_ <u>1</u>
Mic 0	
Pwr 50	
■ TAtt TPO TNB	

Figure 6.4 Small UI - Large Sliders

firig FT-9	91A 🔶 – 🗙
<u>File Config Memory Ke</u>	/er Help
7070.000	14070.000
S3 S6 S9 +20 +40 +60	vfoA vfoB A<->B Split
	3000 🔽 DATA-U 💌
P₀ 10 20 30 40	[ IFsh 0
Vol 30	Nch 1340
RF 100	Mic 0
□ NR 1	Pwr 50
■ ☐ Att ☐ IPO ☐ NB	

Figure 6.5 Small UI - Small Sliders

# **User Interface Styles**

### 7.1 Transceiver Control

The FLRIG user interface changes to accommodate the degree of CAT support available for the transceiver in use.

Three different main dialog aspect ratios can be selected to suit the computer screen dimensions and operator preferences. The wide aspect ratio can be resized horizontally. The narrow aspect ratios are fixed in width and height.

📷 flrig IC-7300 📃 🗆 💌							
<u>F</u> ile <u>(</u>	Confi	g <u>M</u> em	ory <u>K</u> ey	er <u>H</u> elp			
	7	089.	000		7070.000		
S3	, S6	S9 +20	+40 +60	vfoA	vfoB A / B Split		
р., 10 Ро 20	- 	, 60		1 600	USB-D		
[□Vol]	5	-1					
( MED	100				1		
SQL	12	<b></b>					
	0	1					
Lock	0						
CIrPBT	0						
Nch	0	1					
Mic	0	1					
Pwr	100				1		
	Π	PRE	) ( NB		Tune TT		

📷 firig IC-7300 📃 🗆 🖛
<u>File Config Memory Keyer Help</u>
3580.000 14070.000
53 S6 S9 +20 +40 +60 vfoA vfoB A / B Split
P₀ 20 40 60 80
MED 100
SQL 12
Lock 0
CIrPBT 0
Nch 3000
Mic 0
Pwr 100
Band CW QSK Vox Spch RX Misc Cmds A B C
1.8 3.5 7 10 14 18
<b>21 24 28 50</b> 144 430
1.2 G TONE 88.5 T TONE 88.5

Figure 7.1 With embedded extras tab



Figure 7.2 Separate extras tab dialog

📷 flrig IC-7300	
<u>F</u> ile <u>C</u> onfig <u>M</u> emory <u>K</u> eyer <u>H</u> elp	[
	7070.000
	vfoA vfoB Tune
1 600 USB-D TATT PRE NB AN	A / B Split PTT
SQL 12 Lock 0	MED 100
Mic 0	NR 0
Pwr 100	Vol 5 -1-

A fourth interface is available for all transceivers. It is suitable for use on a touch screen

firig FT-991A						
File Config Memory Keyer Help	MAIN SLIDERS BUTTONS OTHER Aux DTR Aux RTS					
S3 S6 S3 -20 +40 +60 F5 10 20 30 40 3000 ▼ DATA-L ▼	7070.000 A PWR 50	PTT				

Figure 7.3 Shown at 75% of full size

### 7.2 Select Interface

••	•	flrig IC-73	300
File	Config	Memory Keyer	<u>-</u> lelp
	Setup >		14070 000
	UI →	Meters dialog	14070.000
S:	3 S6 :	Meter filtering	vfoA vfoB A / B Split
		Power meter scale	3400 💌 USB-D 💌
Po 2	20 40	Small sliders	Lock 0
Vol	0	Embed tabs	rPBT 0
C SLC	) 15 -	Tooltips	Nch 0
SC	2L 0 🚺	Voltmeter	Mic 0
	0	User Interface	Pwr 1001
■ TTT □		PRE [ NB ]	

🕨 🔵 🔹 👘 Firig User Interface							
Main Dialog Aspect Ratio (change requires restart)           Image: Narrow UI         Image: Wide UI         Image: Touch UI							
✓ Freq top/bottom left click ✓ Xcvr follows slider drag							
	System						
14070.000	gtk+	¢ UI	Default				
Font Color Back	Bngd	Bgnd2					
S3 S6 S9 +20 +40 +60	Smeter	15 -1					
Swr 1.5 2	SWR	Bngd	Button				
р <del>адаараараараараараараараараараараараар</del> аараар	Pwr	Default					
Volts 8 10 12 14	Peak	Lt Btn	Default				
Reset Cancel OK <=	Volts	Tab Clr	Def Clr				

Many details regarding the user interface can be customized via selections with this dialog.

Turning on "Tooltips" will be very helpful to understand what will change when as item is selected. Changes are shown immediately so the change is obvious.

"Freq. top/bottom left click" refers to changing the frequency via the mouse clicking on the frequency digits in the main display.

"Xcvr follows slider drag" refers to dragging the slider buttons on the flrig interface either changing as you drag or waiting to change until the dragging stops.

The font and size of the frequency display maybe chosen via the Font, Color, Back(ground) buttons. Note: Using fixed fonts usually gives better results.

The "System" group refers to different looks & feel of the main dialog. Try each and see which you prefer. Also the Fgnd, Bngd & Bgnd2 will affect those aspects of the main GUI.

Change the default meter indicator colors by clicking on the corresponding button.

The main interface slider backgrounds & button colors are changed via the buttons in that group.

In the group at the bottom right the "Lt Btn" button allows the changing of the "On" light color. The "Tab Clr" refers to the color of the additional controls tabs visable when you click the large down arrow in the main flrig display.

# Main Dialog Controls

### 8.1 Frequency Controls



Figure 8.1 Frequency Control

The frequency display is also a control; it displays frequency in kHz. In addition to allowing you to set the rig frequency, it will track with changes made on the rig itself.

The number of digits that may be entered and the number of decimal digits displayed are determined by hard-coded data for the rig selected if using rig control. The intent is to match the actual rig display.

If you select NONE for rig control, 7 digits to the left of the decimal and 3 digits to the right are displayed.

In the rig control case, the maximum frequency is determined by the rig; in the NONE case, the maximum frequency is 9,999,999.999 kHz.

The maximum frequency **based on the number of digits displayed** is given in the tooltip. Note that this may be greater than the maximum frequency possible for your rig. If you attempt to set an unsupported frequency, the result depends on the rig.

You can set the frequency two ways without the control being in "focus" and several more ways with it in focus.

#### With or without Focus

- Move the mouse cursor over a digit and roll the wheel
- Highlight a numeric frequency in text in the application and then move the mouse cursor over the control and press the middle mouse button to paste selection

#### With Focus

**Shift-Left-Click** (hold keyboard SHIFT button and press left mouse button) in the control to set focus. The foreground and background colors reverse to indicate the control has focus.



Figure 8.2 Frequency Control - vfoA has focus

Each digit is sensitive to the mouse. Clicking the left or right button over the top half of a digit increments it while clicking over the lower half decrements it. Holding the mouse button down will cause the number to rapidly increase or decrease. In all cases the numbers "roll over" - i.e., you can change the digit you point to and all digits to the left of it. **Be aware** that if you have chosen to uncheck the **Freq Top/Bottom left click** box in the User Interface dialog that the incrementing/decrementing reverts to left click increments and right click decrements the digit under the mouse pointer.

Arrow and Page Up / Page Down Keys can be used to increment and decrement digits. Digits are numbered 0-9, right to left, with the digit's significance matching that of the rig's display. For example, if the rig's resolution is 1 Hz, D0's range is 0-9 Hz.

Keys	Normal	SHIFT + key	CTRL + key	
right / left arrow	+/- D0	+/- D1	+/- D2	
up / down arrow	+/- D3	+/- D4	+/- D5	
Page Up / Page Down	+/- D6	+/- D7	+/- D8	

All of the foregoing change techniques result in immediate changes to the frequency of a controlled rig.

There are two additional ways to set the frequency when the control has focus: **PASTE from clipboard** and **direct keyboard entry**.

You can paste from the clipboard (Ctrl/Meta-v) in addition to from the Selection buffer (middle mouse button). When pasting from a selection (highlighted number), the selection must be from text within the application whereas the clipboard paste will paste values copied from any application. The value pasted is expected to be numeric in units of kHz and can include a decimal point. If the value being pasted would exceed the maximum frequency allowed, the Paste action is silently ignored. Paste actions result in an immediate command to set the frequency on a controlled rig.

Lastly, you may enter a frequency directly from the number keys or keypad of a keyboard. Enter the frequency in kHz, including decimal point if there are non-zero decimal components, using either the number keys or the keypad. You may use any legal floating point format. For example:

- 14070.235
- 14.07e3 (Remember that the numeric value is in kHz so this example is 14070 kHz or 14.070 MHz)

When you press the first number, the decimal point in the display will blink to indicate you are in numeric entry mode. While in numeric entry mode, all other entry modes are disabled (i.e., no mouse clicks, rolls, or pastes are possible).

Continue to enter numbers, and optionally a decimal and more numbers. The value does NOT get sent to a controlled rig until you press the ENTER key. Pressing the ENTER key sends the value to the rig and exits the numeric entry mode.

If you want to make changes as you are entering numbers, you can use the backspace key to delete undesired numbers digit by digit, or Ctrl/Meta-Backspace to clear all digits on the side of the decimal point you are currently entering; use Ctrl/Meta-Backspace again to clear the left of decimal numbers as well if you have already entered a digit to the right of the decimal point, and then resume entering numbers.

If you attempt to enter more digits on either side of the decimal than there are digits available, the excess digit entries are ignored.

If you want to abort the process you can press the ESC (escape) key or click outside the control in a widget that will take focus (like a text field) or outside the application and the frequency will remain as it was; this exits numeric entry mode.

Vfo-A and Vfo-B are separate controls, A on the left, B on the right. If your radio has two VFOs, you can make one or the other active for transmission and reception by clicking on the corresponding button. Note that many radios allow you to change the frequency of an inactive VFO through remote command, in which case you do not have to click on the corresponding button to set its frequency.

Left click on the A/B button to swap several of the parameters of the VFOs (e.g., frequency, filter setting, mode) and change the active VFO to follow (so effectively your operation has not changed but you are using the other VFO).

Shift-click to copy just the frequency from Vfo-A to Vfo-B, and Ctrl-Click to copy in the other direction.



Figure 8.3 Control Sliders

The buttons that have a light box are toggles - activated when the lighted box is colored. Some of these are linked to a slider. If the button state is inactive then that associated slider will be greyed out. In the example the volume control is active and the NR control is inactive.

PTT can be activated at FLRIG or using the T/R button on FLDIGI. FLDIGI also engages the PTT via the macro <TX> <RX> tags. When operating digital modes with FLDIGI you should use the PTT from FLDIGI.

# **Memory Dialog**

Operating frequency, mode, and bandwidth can be saved for later use. Save the current values to the memory file using the "Memory / Save" menu item. Open the memory manager using the "Memory / Manage" menu item

Add 🕨	Frequer	псу		BW		Mode	I	Comments
Pick	76	20.000		300		CW-U	Τ	40 CW
	76	70.000		3000		DATA-U	T	PSK sub band
	70	000.089		3000		DATA-U	1	Feld Hell net
Clr								
Font								
Close								
Close								
Tag:	Feld Hell n	et						

The "Add", "Pick", "Del" and "Clr" buttons operate as labeled.

Note: When clicking the Add button the current contents of the active VFO will be entered sorted by frequency. To add a comment entry left click on a line to enable modifying the Tag line for that entry. Terminate the tag entry with the "Enter" key.

The contents of a typical transceiver .mat file contains:

```
020000 2 5 "40 CW"
7070000 11 16 "PSK sub band"
7089000 11 16 "Feld Hell net"
```

Each line contains a frequency (Hz), Mode Nr., Bandwidth Nr., and "text tag". The file contents are specific to a transceiver and are not meant to be shared other transceivers.

The file is human readable. Editing the file is not recommended.
## **CW Keyer**

#### 10.1 CW Keyer

Open the keyer dialog

CW keying	$\Phi$	. [	
20 Char WPM Config Clear	Send	l/Pa	use
CQ         f2         f3         f4         f5         f6         f7         f8         f9         f10         C0	RZ	)[T	EST

with the main dialog menu item "Keyer/CW keyer".



- WPM slider selects the keyer speed.
- Clear clears the text in the transmit buffer.
- Transmit text will marquee to the left as each character is transmitted.
- · Send/Pause button toggles sending text.
- Macro buttons / function keys load transmit buffer with canned message.
  - Left click to load macro contents into transmit buffer.
  - Control left click to open macro editor dialog.
- The transmit text buffer must have keyboard focus for character entry. left click on the entry area to gain keyboard focus.

Tip for the function / macro buttons:

~		CW keying			-	e 🙁
1						
20		char V	VPM Config	Clear	Send	Pause
		f5 f6	f7   f8	f9 f10	OBZ	TEST
	Action - Function	Key Left click				
	Edit - Control left	click				

Control-left-click opens:

🔲 Message	Editor	• ×
F1-F4 F5-f8	F9-F12	BT = 🔻
Label	Message Text	AA ~ 💌
F9		AS < 💌
		AR > 🔽
		SK + 💌
F10		KN %
		INT & 🔽
		НМ {
F11		VE } 💌
		'[' Send
		']' Recv
F12	/VV DE W1HKJ K]	Cancel
		Apply
		Close

A CQ macro with start/stop (ptt enable/disable):

#### [CQ CQ DE W1HKJ K]

Prosign characters can be configured by the user. The macros and prosign assignments are save in the transceiver prefs file.

Config opens:

CW Configuration	×
Use CAT 🗹 Use SEP 🗌 🕊 🚺 1.1 D D WPM Comp msec 🗆 Calibrate	e PTT delay 0
Use AUX 🗌 Inverted 🗌 🕊 🕇 -2.00 🕨 🕅 Xcvr comp msec	Keyline RTS 💌
Ser. Port NONE	Connect

The DTR/RTS port can be either

- · shared with the CAT port
- · shared with the SEP port
- · shared with the AUX port
- a unique serial port configured on this dialog

Select either DTR or RTS for the keyline as required by h/w.

Calibrate button sends standard "PARIS " word, WPM times. Program measures actual time to transmit and sets compensation value. WPM Comp msec can be adjusted by user.

Xcvr comp msec is used to increase or decrease each key down interval by the specified time interval.



Figure 10.1 7300 CW DTR/RTS keying @ 24 WPM

The effect of a -2 msec Xcvr comp adjustment is clearly seen and easily heard.

It is especially important to correct weight errors introduced by the transceiver keying circuits when operating QRQ (high speed CW). At 80 wpm 2 msec is a significant part of the target dit interval of 15 msec.

PTT delay is in milliseconds. Enter a non-zero value to enable a delay between the PTT-on and the first CW keyline closure. The same delay will be applied to the last CW keyline closure and PTT-off.

The CW keyer is specifically designed to work with a DTR/RTS keyline to emulate the closure of a CW key. Several transceivers have this capability built in to the hardware. Some expose a separate keying port (FT-991A) and some share the CAT serial port (IC-7300). A simple DTR/RTS keying circuit can also provide the h/w interface. This one provides galvanic isolation:



Inexpensive USB serial-to-CW-keyline devices are available from internet vendors. This is one sold by by Amazon. com and WalMart.com.



# **FSK Keyer**

Open the FSK keyer dialog

FSK keying	
[	
	Config Clear TXmt / Rcv
	jabber RYRY

with the main dialog menu item "Keyer/FSK keyer".

📷 flı	rig IC-73	300			
File	<u>C</u> onfig	<u>M</u> emory	<u>K</u> eyer	He	elp
	35	80.00	<u>C</u> W Key FSK Ke	yer yer	1

Config opens:

🔲 FSK Configura	tion		
Use CAT	Use SEP 🗌	Inverted 🗌	PTT delay 2 💂
Use AUX 🗌	CWIO shared 🗌	1.5 stop bits 🗹	FSK Keyline DTR 💌
Ser. Port NONE			Connect

#### The DTR/RTS port can be either

- · shared with the CAT port
- shared with the AUX port
- · shared with the SEP port
- shared port with CWIO (if separate)

- a unique serial port configured on this dialog
- Inverted enable if interface requires a Mark/Space reversed signal level
- select either DTR or RTS for the keyline as required by h/w, selection must not conflict with CW keyline

PTT delay is in milliseconds. Enter a non-zero value to enable a delay between the PTT-on and the first FSK keyline closure. The same delay will be applied to the last FSK keyline closure and PTT-off.

Control-left-click opens:

FSK Message Editor	• ×
F1-F4 F5-f8 F9-F12	
Label Message Text	'[' Send
F9 The Jaws that bite, the claws that catch:	']' Recv
The frumious Bandersnatch!	Cancel
F10	Apply
	Close
F11	

An RY macro with start/stop (ptt enable/disable):

## **User-Defined Commands**

Configuration			_		×
Configure     Xcvr     PTT-Generic     PTT-Cmedia     TMATE-2     TCPIP & TCI     Other     Server     Poll     Restore     Commands     Send     Trace	1-4       5-8       9-12       13-16       17-20       21-24       Start/Exit         Label       Command         1       80/40 CW       xFE xFE x98 xE0 x25 x00 x00 x50         SHIFT       xFE xFE x98 xE0 x25 x00 x00 x50         2 cmd 2       SHIFT         3 cmd 3       SHIFT         4 cmd 4       SHIFT         Response       FE FE E0 98 FB FD	x52 x03 x02 x07	XOO XI	FD	
	Band CW QSK Vox Spch RX Misc A 80/40 CW cmd 2 cmd 3 cmd 5 cmd 6 cmd 7	BC	IC761 cmc	× 10	

Figure 12.1 Defining Commands for Extra Controls A, B, C Tabs

Flrig supports 24 unshifted and 24 shifted user-defined commands. The commands are defined via the Configuration dialog "Commands" tab and are invoked via buttons on the A, B, and C tabs on the flrig extra controls dialog. Refer to your rig's remote interface control documentation to learn how to construct a command.

As shown in the Figure, the user provides text for the button label and an appropriate command string for their radio. The command can be tested by clicking on the button in the extra controls dialog and examining the response in the Configuration dialog. In the example, the unshifted command sets the frequency in use on the Main band of an Icom IC-7610 radio to the 80 meter CW range, and the shifted command sets it to the 40 meter CW range (these commands only affect frequency - not mode). In the label in this example, the '/' is used as a way to distinguish the unshifted/shifted functions.

The command string must comply with the transceiver requirements. If ASCII text is used, as with transceivers based on the Kenwood command set, you enter the string without spaces; e.g.,

#### FA;

to read the A vfo .

For binary strings, used in older Yaesu transceivers and all Icom CI-V type transceivers, you need to enter the string as space-delineated hex values; e.g.,

Yaesu: x00 x00 x00 x01 x05 Icom: xFE xFE x70 xE0 x1A x05 x00 x92 x00 xFD

Additionally, the user can define commands that should be executed during program start-up or termination by making entries on the Start/Exit tab of the Commands configuration page.

#### 12.0.1 Send Command String

Configuration	
<ul> <li>□ Configure</li> <li>□ Xcvr</li> <li>□ PTT-Generic</li> <li>□ PTT-Cmedia</li> <li>□ PTT-GPIO</li> <li>□ TCPIP</li> <li>□ Auxiliary</li> <li>□ Server</li> <li>□ POII</li> <li>□ Restore</li> <li>□ Commands</li> <li>□ Send</li> <li>□ Trace</li> </ul>	Enter text as ASCII string Or sequence of hex values, x80 etc separated by spaces Response to the SEND button ICOM pre ICOM post SEND

Figure 12.2 I/O Ports - Sending

Testing your transceiver commands. FLRIG might not support a particular CAT command for your transceiver. You can test the support for a particular command using the "Send Cmd" tab. The command string must comply with the transceiver requirements. If ASCII text is used, as with transceivers based on the Kenwood command set you enter the string without spaces, i.e.

FA;

to read the A vfo .

For binary strings, used in older Yaesu transceivers, and all Icom CI-V type transceivers you need to enter the string as space delineated hex values, i.e.

Yaesu: x00 x00 x00 x01 x05

Icom: xFE xFE x70 xE0 x1A x05 x00 x92 x00 xFD

The button "ICOM pre" and "ICOM post" will insert the preamble and postamble hex code sequences for the selected lcom transceiver.

Press the SEND button to transfer the command to the transceiver. The response will appear in the lower text control.

The diamond indicators will be lit for transceiver and fldigi connections respectively.

# **Controlling Multiple Transceivers**

You can have multiple instances of flrig running, each controlling a separate and unique transceiver. Doing this requires a separate configuration folder for each target transceiver. Either start flrig from a command line or copy the desktop launch icon and then modify it's "target" executable. In either case you will be adding a command line parameter

#### "--config-dir <target-dir>"

Note the double dash. The <target-dir> will be unique to each supported transceiver, for example: "C:\ $\leftrightarrow$  Users\<user-name>\flrig.ic7200" on Win-10, "/home/<user>/flrig.ic7200" on Linux or OS X. You will have to configure each instance with the correct interface parameters.



## **Configure XmIRpc Server**

Flrig accepts remote control via an XmIRpc socket interface. fldigi uses this access method for reading and writing transceiver parameters via flrig. WSJT-X and several other third party programs also use this method.





#### 14.1 flrig XmIRpc Command Structures

main.set_frequency	d:d	set current VFO in Hz
main.get_version	s:n	returns version std::string
rig.get_AB	s:n	returns vfo in use A or B
rig.get_bw	A:n	return BW of current VFO
rig.get_bws	A:n	return table of BW values
rig.get_bwA	A:n	return BW of vfo A
rig.get_bwB	A:n	return BW of vfo B
rig.get_pbt	A:n	return passband tuning
rig.get_pbt_inner	i:i	return passband inner
rig.get_pbt_outer	i:i	return passband outer
rig.get_info	s:n	return an info std::string
rig.get_mode	s:n	return MODE of current VFO
rig.get_modeA	s:n	return MODE of current VFO A
rig.get_modeB	s:n	return MODE of current VFO B
rig.get_modes	A:n	return table of MODE values

rig.get\_sideband s:n return sideband (U/L) rig.get\_notch i:n return notch value i:n return PTT state rig.get\_ptt rig.get\_power i:n return power level control value rig.get\_power i:n return power le rig.get\_pwrmeter s:n return PWR out rig.get\_pwrmeter\_scale s:n return PWR out rig.get\_pwrmeter\_scale s:n return scale for power meter rig.get\_pwrmax s:n return maximum power available rig.get\_swrmeter s:n return SWR meter reading Ing.get\_swrmetering.get\_swrmeterrig.get\_SWRs:nrig.get\_SWRs:nrig.get\_DBMs:nrig.get\_Sunitss:nrig.get\_spliti:nrig.get\_updates:nrig.get\_vfos:n<tr rig.set\_ABn:sset VFO A/Brig.set\_bwi:iset BW iaw BW tablerig.set\_bandwidthi:iset bandwidth to nearest requested valuerig.set\_BWi:iset L/U pair rig.set\_BW rig.set\_pbt i:A set pbt inner, ... rig.set\_pbt\_inner rig.set\_pbt\_outer i:i set pbt outer rig.set\_frequency d:d set current VFO in Hz i:s set MODE iaw MODE table ... set MODE A iaw MODE table rig.set\_frequency rig.set\_mode rig.set\_modeA rig.set\_modeA rig.set\_modeB rig.set\_notch rig.set\_power rig.set\_pt rig.set\_ptt rig.set\_vfoA rig.set\_vfoB rig.set\_vfoB rig.set\_rfgain rig.set\_rfgain rig.set\_rfgain rig.set\_ptt\_fast rig.set\_ptL rig.set\_rfgain rig.set\_vfoA rig.set\_rfgain rig.set\_vfoA\_fast rig.set\_vrify\_AB rig.set\_vrify\_bw rig.set\_vrify\_bandwidth rig.set\_vrify bandwidth to neare rig.set\_verify\_bandwidth i:i set & verify bandwidth to nearest requested value rig.set\_verify\_BW i:i set & verify L/U pair rig.set\_verify\_frequency d:d set & verify current VFO in Hz rig.set\_verify\_mode i:s set & verify MODE iaw MODE table rig.set\_verify\_modeA rig.set\_verify\_modeA rig.set\_verify\_modeB rig.set\_verify\_modeB rig.set\_verify\_notch rig.set\_verify\_power rig.set\_verify\_power rig.set\_verify\_vfoA rig.set\_verify\_vfoB rig.set\_verify\_split rig.set\_verify\_vfoB rig.set\_verify\_vfoB rig.set\_verify\_vfoB rig.set\_verify\_rfgain rig.set\_verify\_rfgain rig.set\_verify\_micgain rig.set\_verify\_ rig.set\_verify\_modeA i:s set & verify MODE A iaw MODE table

rig.tune	n:n	enable transceiver tune function
rig.cat_string	s:s	execute CAT std::string
rig.cat_priority	s:s	priority CAT std::string
rig.shutdown	i:n	shutdown xcvr & flrig
rig.cwio_set_wpm	n:i	set cwio WPM
rig.cwio_text	i:s	send text via cwio interface
rig.cwio_send	n:i	cwio transmit 1/0 (on/off)
rig.fskio_text	i:s	send text via fskio interface
rig.mod_vfoA	d:d	modify vfo A +/- NNN Hz
rig.mod_vfoB	d:d	modify vfo B +/- NNN Hz
rig.mod_vol	n:i	modify volume control +/- NNN %
rig.mod_pwr	n:i	modify power control level +/- NNN watts
rig.mod_rfg	n:i	modify rf gain by +/- NNN units
rig.mod_cwio_wpm	n:i	modify cwio WPM by +/- NNN wpm
rig.mod_bw	i:i	modify bandwidth +- to nearest new value
rig.vfoA2B	n:n	set vfo B to vfo A freq/mode
rig.freqA2B	n:n	set freq B to freq A
rig.modeA2B	n:n	set mode B to mode A
rig.cmd	n:i	execute command button 124; 2548(shift)

The xmlrpc command structure can be accessed using the menu item help/xml-help.

			Command line text	•	-		×
	main.set_frequency	d:d	set current VFO in Hz				
	main.get_version	s:n	returns version string				
I	rig.get_AB	s:n	returns vfo in use A or B				
	rig.get_bw	s:n	return BW of current VFO				
	rig.get_bws	s:n	return table of BW values				
	rig.get_bwA	s:n	return BW of vfo A				
	rig.get_bwB	s:n	return BW of vfo B				
	rig.get_info	s:n	return an info string				
	rig.get_mode	s:n	return MODE of current VFO				
	rig.get_modeA	s:n	return MODE of current VFO A				
	rig.get_modeB	s:n	return MODE of current VFO B				
	rig.get_modes	s:n	return table of MODE values				
	rig.get_sideband	s:n	return sideband (U/L)				
	rig.get_notch	s:n	return notch value				
	rig.get_ptt	s:n	return PTT state				
	rig.get_power	s:n	return power level control value				
	rig.get_pwrmeter	s:n	return PWR out				
	rig.get_smeter	s:n	return Smeter				
	rig.get_split	s:n	return split state				
	rig.get_update	s:n	return update to into				
	rig.get_vto	s:n	return current VFO in Hz				
	rig.get_vtoA	s:n	return vio A in HZ				
	rig.get_viob	s:n	return vio B in HZ				
	rig.get_xcvr	s:n	returns name of transceiver				
	rig.get_volume	s:n	returns volume control value				
I	rig.get_rigain	s:n	returns ri gain control value				
	rig.get_micgain	5:11	cet VEO A/R				
I	ILY.SEL AD	5:5	SEL VEV A/D	_	_	-Tr	Ľ.
П							

1	014(	0.00	10	140.000	)
S3	S6 S9 +	20 +40 +60	🔽 vfoA 🖂 v	rfoB 🛛 A -> B 🕅 Spli	it
<b></b>			3000	<b>▼</b> DIGI	┓
Po 10	20 30	40		0 )X (640)	в
<b>Vol</b> 2	25		IFsh 0		-
RF 1	00	1	MIC 0		-
PWR 4	10				_
🗣 🗆 Att	Spi	ot 🗌 🕅 NB		Tune 🗌 🗆 PTT	
Att	C Sp	ot 🗌 🥅 NB		Tune ☐ PTT fldigi -	• •
Att	Mode Co	ot ) ( $\square$ NB nfigure <u>V</u> ie	M Logbook	Tune ☐ PTT fldigi - <u>H</u> elp	- w
♥ ☐ Att File Op TT-5	Mode Co	ot ) ( NB nfigure <u>V</u> ie	W Logbook	Tune ☐ PTT fldigi - Help Off Call	• •
Att     Att <u>F</u> ile Op     TT-5	Mode <u>Co</u> 50 (	ot NB	M Logbook	Tune PTT fldigi - Help Off Call 1358	- w

Figure 14.2 FLRIG/FLDIGI

Operating FLRIG with FLDIGI requires a simple setup in FLDIGI. Open the fldigi configuration dialog to *rig control / flrig* 

	Fldigi configuration	-	ø	8
<ul> <li>☐ Configure</li> <li>① Call</li> <li>③ Colors-Fonts</li> </ul>	Rig Control/flrig			
Contests     IDs     Logging     Modem     Misc     Operator-Station	firig is the preferred method of tranceiver control ②Enable firig xcvr control with fidigi as client OShutdown firig with fidigi Poll Interval (msec)	F H	.]	
Rig Control     firig     CAT (rigcot)	firig xmlrpc server parameters these controls are mirrored on the IO configuration tab			

Deselect all other rig control methods and enable fldigi as an flrig client. Xmlrpc is used via a local socket device for the two programs to communicate. flrig acts as the server and fldigi the client. There is no requirement for start / stop ordering of the programs.

FLRIG sends rig configuration data to FLDIGI when the two programs initially recognize each other. This data is used to populate the rig name, the available modes and the available bandwidths.

After this initial communications the operator can set the paired controls from either FLDIGI or FLRIG. The two programs will remain synchronized. The data from the computer to the transceiver is always from FLRIG.

Flrig can service multiple xmlrpc clients. Changes either at the transceiver, flrig, or one of the clients will quickly be reflected at the other entities.

## **Remote flrig**

#### 15.1 Remote Flrig Server

flrig's xmlrpc server interface is always executing. If the computer that is connected to the transceiver is on a local area network then another computer may access that instance of flrig via the xmlrpc interface. This is an instance of my FT-710 being controlled on a computer whose network address name is "tk7"

flrig FT-710	
<u>File</u> Config Memory Key	er <u>H</u> elp
7070.000	14070.000
S3 S6 S9 +20 +40 +60	vfoA vfoB A / B Split
	3500 VUSB
Po 5 10 15 20	□IFsh 0
	Nch 1890
RF 100	Mic 0
□ NR 4 -	Pwr 100
	AN <b>F</b> Tune FTT

Figure 15.1 flrig server

It has been configured to use the default xmlrpc port

Configuration		<u> </u>
<ul> <li>Configure</li> <li>Xcvr</li> <li>PTT-Generic</li> <li>PTT-Cmedia</li> <li>TMATE-2</li> <li>TCPIP &amp; TCI</li> <li>Other</li> <li>Server</li> <li>Client</li> <li>Poll</li> <li>Restore</li> <li>Commands</li> <li>Send</li> </ul>	Change port if multiple instances of flrig / fldigi will execute concurrently. Be sure to change the respective fldigi configuration item for xmlrpc server port. Xmlrpc port: 12345	



#### 15.2 Remote Client

A second computer on the local area network has been configured to run an instance of flrig that connects to the above server.

0			flrig FT	-710 CL	IENT			$\odot$ $\times$
<u>F</u> ile <u>C</u>	Config	Mem	ory <u>K</u> e	yer <u>H</u>	lelp			
	7	070	.000	0	1	4	070	.000
S3 		S9 +20 15	. +40 _+6 	50 <mark>- vfo</mark> 	DA 🔤 v	/foB ▼	A / B USB	Split
RF □ NR	100 4		-1					<u> </u>
☐ IFsh ☐ Nch Mic	0				<u> </u>	-		
Pwr A		PRE	<u></u> ■ NB		AN		Tune	□ PTT

Figure 15.3 flrig client

Note that the title bar indicates that this is a client and not directly connected to the transceiver.

The server address and port must be configured on the client tab before attempting to connect to the external xmlrpc server.

0	Configuration 💿 🛞
<ul> <li>□ Configure</li> <li>Xcvr</li> <li>PTT-Generic</li> <li>PTT-Cmedia</li> <li>TMATE-2</li> <li>TCPIP &amp; TCI</li> <li>Other</li> <li>Server</li> <li>Client</li> <li>Poll</li> <li>Restore</li> <li>Commands</li> </ul>	This address / port is the server flrig to which this client flrig will connect. Address may any valid http port: localhost, LAN or WAN. Xmlrpc addr: tk7 Xmlrpc port: 12345



The Xcvr tab is then configured to use the xmlrpc interface by selecting "xml\_client" in lieu of a serial port inteface, and pressing the Init button.

0	Configu	ration			
📮 Configure	Rig: FT-710				
Xcvr	Update xml_client				
PTT-Generic PTT-Cmedia	Baud: 38400		Retries ┥ ┥	2	
TMATE-2	🔽 1 Stop Bit	🗌 2 Stop Bits	Timeout 📢 ┥	50	
TCPIP & TCI		RTS/CTS	Write delay ◀ ┥	0	
Other Server	🗆 RTS +12 v	DTR +12 v	Post delay ┥ 🕇	0	
Client	Default		Poll intvl 📢 ┥	200	<b>&gt;</b>
Poll	Delduit		□Acti	ivate	
Restore	USB audio				
Commands	<b>V</b>		Connected 🔇	> II	nit

Figure 15.5 select xml\_client

# **Program Debugging**

#### 16.1 Event Log

Several debugging tools are available in flrig, including the ability to observe code execution in various parts of the program.

The event log is opened from the "Help/Events" menu item. It allows you to view the serial and xmlrpc data exchanges between FLRIG, FLDIGI, xmlrpc transactions, and the transceiver.

	Event log	↑ <u> </u>
Info		clear
ans TX0;		
cmd TX;		
W:09:04:51: get PTT OK 50 ms		
ans TX0;		
cmd TX;		
W:09:04:47: get PTT OK 50 ms		
ans TX0;		
cmd TX;		
W:09:04:42: get PTT OK 50 ms		
ans TX0;		
cmd TX;		
W:09:04:38: get PTT OK 50 ms		
ans TX0;		
and TV.		

Figure 16.1 Event Log

#### 16.2 Tracing Program Execution

The trace tool sends time annotated data to both a viewing dialog and a file named "trace.txt" which is written to the flrig files folder. The trace tool is very useful to the programmer developing a 3rd party application using the flrig xmlrpc server. It may also be used at the request of a support person assisting the user with transceiver connection or data stream issues.

Configuration		×
<ul> <li>Configure</li> <li>Xcvr</li> <li>PTT-Generic</li> <li>PTT-Cmedia</li> <li>PTT-GPIO</li> <li>TCPIP</li> <li>Auxiliary</li> <li>Server</li> <li>Poll</li> <li>Restore</li> <li>Commands</li> <li>Send</li> <li>Trace</li> </ul>	<ul> <li>□Trace support code</li> <li>□Trace debug code</li> <li>□Trace rig class code</li> <li>□Trace rig class get code</li> <li>☑Trace rig class set code</li> </ul>	<ul> <li>Trace xml_server code</li> <li>Trace xmlrpcpp code</li> <li>Trace serial code</li> <li>Trace start/stop code</li> <li>4 ▼ XmlRpc trace level</li> </ul>

Figure 16.2 Configure code execution trace

- Trace support code main processing loop execution points.
- Trace debug code replicate the event log debugging output.
- Trace rig class code execution points within a specific transceiver class (not for all).
- Trace xml\_server code execution points within the xmlrpc interface code for i/o to/from fldigi.
- Trace xmlrpcpp code sent and received xmlrpc data packets six levels of detail 0 ... 5 can be specified.

Trace log	↑ _	
13:57:11.195 : set_power_control PC050;		
13:57:11.195 : selectB FT3;		
13:57:11.195 : get_vfoB FB; FB014070000;		
13:57:11.195 : get_modeB MD0; MD03;		
13:57:11.195 : get_bwB SH0; SH012;		
13:57:11.195 : get_preamp PA0; PA00;		
13:57:11.195 : get_attenuator RA0; RA00;		
13:57:11.195 : get_auto_notch BC0; BC00;		
13:57:11.195 : get split tx FT; FT1;		
13:57:12.195 : get split rx FR; ?;		
13:57:12.195 : get_power_control PC; PC050;		
13:57:12.195 : get_volume_control AG0; AG0000;		
13:57:12.195 : get_if_shift IS0; IS0+0000;		
13:57:12.195 : get_notch BP00; BP00000;		
13:57:12 195 · aet_noise NBO· NBOO·		
<u> </u>		
	Cle	ear

Figure 16.3 Example showing support code trace

# **Supported Transceivers**

Each table entry is a clickable link to a specific transceiver.

Elecraft	lcom	Kenwood	Ten-Tec	Yaesu	Other
K2	IC-703	TS 140	TT 516	FT 100D	AOR5000
KX2	IC-705	TS 440	TT DELTA-II	FT 450	PCR 1000
K3	IC 706 MK IIG	TS 450S	TT 538	FT 450D	RAY 152
KX3	IC-718	TS 480HX	TT 550	FT 736R	
K4	IC 728	TS 480SAT	Omni-VI	FT 747	PowerSDR
	IC 735	TS 570	TT Orion-II	FT 757GX2	Flex 1500
	IC 746	TS 590S	Onmi-VII	FT 767	SunSDR2 Pro
	IC 746 Pro	TS 590SG	TT Eagle	FT 817	SmartSDR
	IC 751	TS 790		FT 817BB	TCISDR
	IC 756	TS 850		FT 818ND	
	IC 756 Pro	TS 870S		FT 847	Xiegu 5105
	IC 756 Pro II	TS 890S		FT 857D	Xiegu G90
	IC 756 Pro III	TS 940S		FT 890	Xiegu 6100
	IC 910H	TS 950		FT 891	
	IC 7000	TS 990		FT 897D	FDM-DUO
	IC 7100	TS 2000		FT 900	
	IC 7200			FT 920	
	IC 7300			FT 950	TX500
	IC 7410			FT 990	
	IC 7600			FT 990A	QRP Labs QCX+

Elecraft	lcom	Kenwood	Ten-Tec	Yaesu	Other
	IC 7610			FT 991	QRP Labs QDX
	IC 7700			FT 991A	QRP Labs QMX
	IC 7800			FT 1000/D	
	IC 7851			FT 1000MP	TMD710
	IC 9100			FT 1000MP-A	
	IC 9700			FT 2000	
	IC F8101			FT DX10	
	IC R71			FT DX101D	
				FT DX101MP	
				FT DX1200	
				FT DX3000	
				FT DX5000	
				FT DX9000	

#### 17.1 Transceiver Setup Examples

- FT-991A setup
- IC 7100 menu setup
- IC 7300 menu setup
- IC-7600 Setup
- TT550 Pegasus

Additional setup examples may be found on the fldigi wiki: https://sourceforge.net/p/fldigi/wiki/how↔ \_to/

# **Supported Elecraft Transceivers**

f 🚾	ilrig K2	_ ×
<u>Files</u> <u>Config</u> <u>Save</u>	S <u>a</u> ved	Help
14070.00	90	14070.000
S3 S6 S9 +20 +40 + 	60 VfoA	A └ vfoB A -> B └ Split
PWR 0 1 Att Pre		Tune PTT

Figure 18.1 K2

firig KX2	_ = ×
<u>File Config Memory Keyer Help</u>	
14070.000 14070	9.000
S3 S6 S9 +20 +40 +60 <b>□ vfoA □ vfoB </b> A	/ B 🗌 Split
N/A VISI	в 🗸
¦P₀ Ś 10 15 20 '	
RF 120	<u>I</u>
Fsh 0	
Mic 0	
Pwr 0	
	<b>□ PTT</b>

#### Figure 18.2 KX2

📅 firig K3 🛛 – 🚬 🔅
Files Config Memory 🇭 Debug Help
14070.001 14070.000
S3 S6 S9 +20 +40 +60 A/B A<->B Spli
1000 USB
RF 15 -1-
[ IFsh]1500
MIC 0
PWR 15
Att Pre NB

Figure 18.3 K3

flrig KX3		<u> </u>
<u>F</u> ile <u>C</u> onfi	ig <u>M</u> emory <u>H</u> elp	» []
140	70.000	14070.000
S3 S6	<u>\$9</u> +20 +40 +60 	A/B A<->B Split 3000 ▼ USB ▼
Vol 0		
RF 0		
IFsh 0		
Mic 0		
Pwr 0		
	Pre DB	

Figure 18.4 KX3

flrig K4	4						_ ×
<u>F</u> ile	Config	Mem	ory <u>K</u> ey	ver <u>H</u> elp	D		
	140	)70.	000	]	L40	70.	000
S3	3 <u>56</u> 	<u>59 +20</u> 	+40 +60	vfoA [	vfoB	A / B USB 800	Split
AG-S							
IFsh Mi	c 10	])-					
		PRE				I	PTT

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# **Supported ICom Transceivers**

	flrig IC	-703	
<u>Files</u> Config	Memory	Debug	Help
140	70.000	14	4070.000
S3 S6 S	9 +20 +40 +60	🔽 vfoA 🖂	vfoB A -> B 🖂 Split
		NARR	VUSB V
Po 5 10	15 20	IFsh (	
Vol 0			
RF 100 -	<u> </u>	MIC	
SQL 10 -	1	PWR 0	
Att 🛛	Pre 1 🗌 🗌 NB		Tune Tune
Vox Spch			
(10)( gain	10 ) ( 100 anti han	)	

Figure 19.1 IC 703

			firig	IC-705		
<u>F</u> ile	Config	g <u>M</u> em	ory <u>K</u> e	yer <u>H</u> el	р	
	14(	970.	000		7070	0.000
S3 ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	S6  10	, S9 , +20 	+40 +6	vfoA 13000 700	vfoB A / USB ✓ USB	B Split
Vol	0	1				
SQL	10	<u> </u>				
<u></u>	0	I —				
Lock	0			<u>l</u>		
CIrPBT	0			<u>l</u>		
Nch	1500			<u>I</u> -		
Mic	0	I				
Pwr	10.0					
	Π	☐ PRE	□NB	AN	🔄 🗌 Tune	PTT





Figure 19.3 IC 706 MKIIG

	firig IC	-718	-×
<u>Files</u> Config	Save 🕨 S <u>a</u> v	ed <u>H</u> elp	
1407	0.000	140	70.000
S3 S6 S9 +2	20 +40 +60 	■ vfoA 🔽 vfoB Wide 🔍	A -> B ☐ Split
Vol 0 [- RF 0 [-			
NR 0 1	-1		
Att Pre	□ NB	AN	

Figure 19.4 IC 718

		flr	ig IC-728	}	
<u>F</u> iles	<u>C</u> onfig	Save 🕨	S <u>a</u> ved	Help	
	140	70.00	90	140	70.000
S3 P₀ 20	S6 S9 	+20 +40 + +20 +40 + 60 80		foA	A -> B Split

Figure 19.5 IC 728

		flr	ig IC-7	35			
<u>F</u> iles	<u>C</u> onfig	Save 🕨	Saveo	<u>н</u>	elp		
	140	70.00	90	14	40	70.0	900
S3		+20 +40 +		vfoA ARR	vfoB vfoB	A -> B USB	□ Split
P₀ 2ŭ	) 40	60 80					

Figure 19.6 IC 735

		f	lrig IC	-746			×
<u>F</u> iles <u>C</u>	onfig	Save	→ S <u>a</u> v	ed	<u>H</u> elp		
1	40	70.0	000		140	70.00	0
S3 SI	6 S9	+20 +40	+60	VfoA	└─ vfoB	A -> B 🖂 Sp	lit T
<del>["""""""""""""""""""""""""""""""""""</del>	40		ղուղուղուղող 30	, i cita	· · · ·		_
□ Vol	0	I					
RF	0	[					
SQL	0	<b>[</b>					
	0	[					_
🗌 IFsh	0				I		
□ Ntch	0	[]					_
MIC	10						_
PWR	0						_
☐ Att	Pre	e 🗆	NB		Tu	ne 🗌 🏳 PTT	

Figure 19.7 IC 746

	firig IC-746PRO
<u>Files</u> <u>Co</u>	nfig Save > Saved Help
14	1070.000 14070.000
S3 S6	S9     +20     +40     +60       ■     vfoA     ∨foB     A -> B     Split       2800     ▼     D-USB     ▼
r===================================	յուրադադադադադադադադադադադ 40 60 80
□ Vol	0
RF	0
SQL	0
□ NR	0
☐ IFsh	0
□ Ntch	0
MIC	10
PWR	0
☐ Att	□ Pre □ NB □ Tune □ PTT

Figure 19.8 IC 746

🔲 firig	IC-751 🗉 🕱
<u>File</u> Config Memory Ke	/er <u>H</u> elp
14070.00	14070.00
S3 S6 S9 +20 +40 +60	vfoA vfoB A / B
	USB 🔽
•	□ PTT

Figure 19.9 IC 751

🔲 firig l	IC-756
<u>F</u> ile <u>C</u> onfig <u>M</u> emory <u>K</u> ey	ver <u>H</u> elp
14070.000	14070.000
53 S6 S9 +20 +40 +60	└ vfoA └ vfoB A / B └ Split
	NORM USB
	Lock 0
	CIrPBT 0
RF 0	□ Nch 0
SQL 0	Mic 0
	Pwr 0
	AN   Tune   PTT

Figure 19.10 IC 756

firig IC-756PRO 🔺 🗕 🗙
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
P₀ 40 80 120 160
Vol 20
RF 0
<b>Lock</b> 0
CIrPBT 0
□ Nch 0 1
Mic 0
<b>Pwr</b> 0
Att Amp 2 NB AN Tuner PTT

Figure 19.11 IC 756 pro

		flrig l	C-756PR	0-11	
<u>F</u> iles <u>C</u>	Config	Save 🕨	S <u>a</u> ved	Help	
1	40	70.00	90	1407	70.000
S3	6. <u></u> 9.	+20 +40 +	60 280 280	foA vfoB	A -> B ☐ Split
P₀ 20	40	60 80	_		
RF	0				
SQL	0				
	0				
🗌 IFsh	0			— <u>I</u> ——	
□ Ntch	0 -			<u> </u>	
MIC	10				
PWR	0	I			
☐ Att	🗌 Pre	e _ N	В	Tu	ne 🗌 🏳 PTT

Figure 19.12 IC 756 pro2

10			flrig	) IC-7	56PI	RO-III		↑ <u>-</u> ×
<u>F</u> iles	Conf	fig	Mem	nory	₩	Debug	<u>H</u> elp	
	14	07	70.	00	0		4070	0.000
S3	_ S6	_S9	+20	+40	+60	🔽 vfoA	vfoB A ->	> B 🖂 Split
						2800	USE	3 🔍 🔻
P₀ 20	4(	)	60	80				
🔽 Vol	0		_	_	-	_	_	
RF	15	—	-1					
SQL	10	_	-11-	_	_			
	1	•∎-			_			
🗌 IFsh	0	_	_	_	_			
MIC	0				_			
PWR	0							
A	tt		Pre		NB	) [_ AN	] Tune	

Figure 19.13 IC 756 pro3

~	flrig IC-9	10H	- 😣
<u>File</u> Conf	ig <u>M</u> emory <u>K</u> ey	er <u>H</u> elp	
144	4000.00	140	970.00
S3 S6	<u>59</u> +20+40+60 	vfoA vfoB	A<->B ☐ Split VSB
Vol 0		Lock 0	
RF 0		ClrPBT 0	
SQL 0		Mic 0	J
NR 0		Pwr 0	J
	) 🗆 Pre 📄 🕅 NB		

Figure 19.14 IC 910 H

		(	flrig IC-	7000			
<u>F</u> iles <u>C</u>	onfig	<u>S</u> ave	► S <u>a</u> v	/ed	Help		
1	40	70.	000		140	70.0	000
S3 SI	6 S9	+20 +4	0 +60	FILT-1	vfoB	A -> B D-USB	🗆 Split
r	40	, 60	80 199				
□ Vol	0						
RF	0	[					
SQL	0	[					
□ NR	0	[					
🗌 IFsh	0				<b>I</b>		
□ Ntch	0				[		
MIC	10	<u> </u>					
PWR	0						
☐ Att	P	re 🛛	NB		Tu	ine 🗌	PTT

Figure 19.15 IC 7000

flrig IO	-7100	
<u>F</u> ile <u>(</u>	Confi	g Memory Help
14	40	70.000 7070.000
S3	_ S6	
р <del>ацияниция</del> Ро 40		1 3000 VSB V
	20	<u>I</u>
RF	0	<u> </u>
SQL	10	<u>1</u>
<b>NR</b>	0	<u>1</u>
Lock	0	<u>1</u>
CIrPBT	0	<u>1</u>
[ IFsh	0	<u>I</u>
Mic	20	
Pwr	0	L
	B dB	Pre 2   NB   Tuner   PTT

Figure 19.16 /IC 7100

flrig IC-7200 🔷 🗕 🗙
File Config Memory Help
14070.000 7070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split W 2800 ▼ USB ▼
Po 40 80 120 160
Vol 20
SQL 10
Lock 0
CIrPBT 0
Nch 0
Mic 0
<b>Pwr</b> 0
► TT Pre NB AN Tuner PTT

Figure 19.17 IC 7200

flrig IC-7300	≙ _ ×
<u>File Config Memory Help</u>	
14070.000	7070.000
S3 S6 S9 +20 +40 +60	vfoA vfoB A<->B Split
Р₀ 40 80 120 160 1	3000 🛡 USB-D 💌
O	
SLO 255	1
SQL 0	
■ NR2 0	
Lock 0	- <u>1</u>
ClrPBT 0	-1
Nch 300 -	
Mic 0	
Pwr 0	
Att Pre NB 1	

Figure 19.18 IC 7300

firig IC-7410 📃 🗙
Files Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
3000 VSB
Po <u>5</u> 10 15 20
Vol 21
RF 100
SQL 10
□ NR 1 • 1
[ IFsh] 0
[ Nch 2000
MIC 15
PWR 19
Tune PTT

Figure 19.19 IC 7410

	firig IC-7600				
<u>F</u> iles <u>C</u>	onfig	Save 🕨	S <u>a</u> ved	Help	
1	40	70.00	<b>90</b>	1407	0.000
S3 S	6	+20 +40 +	60 <b>I vf</b> 280	oA <u>vfoB</u> A 0 ▼ P	-> B Split
P₀ 20	40	60 80			
Vol	0	I			
RF	0	<b>I</b>			
SQL	0	<b></b>			
□ NR	0	[			
🗆 IFsh	0			-1	
□ Ntch	0 -			- <u> </u>	
MIC	10	_ <u> </u>			
PWR	0				
☐ Att	Pro	e 🗌 N	В	Tune	e 🗌 🗌 PTT

Figure 19.20 IC 7600

E firig l	C-7610 🔲 🗖 🕷
<u>F</u> ile <u>C</u> onfig <u>M</u> emory <u>K</u> ey	er <u>H</u> elp
14070.000	7070.000
S3S6S9+20+40+60	└ vfoA └ vfoB A / B └ Split
	1 3000 VUSB-D1 V
Po 5 10 15 20	Lock 0
└ Vol 0	CIrPBT 0
<b>SLO</b> 97	Nch 300 -
SQL 0	Mic 0
□ NR 0 1	Pwr 0
■ PRE □ NB	AN TUNE TT

Figure 19.21 IC 7610

E firig l	C-7700 💶 🗆 🗙
<u>F</u> ile <u>Config</u> <u>Memory</u> <u>K</u> ey	ver <u>H</u> elp
14070.000	7070.000
S3 S6 S9 +20 +40 +60	└ vfoA └ vfoB A / B └ Split
	1 3000 VUSB
Po 5 10 15 20	Lock 0
Vol0	CIrPBT 0
RF 15	Nch 1500
SQL 0	Mic 0
□ NR 0 1	Pwr 15
■ ATT □ PRE □ NB	T Tune TPTT

Figure 19.22 IC 7700

		flrig IC-7800				
File Config Memory Help						
14	0	70.000 14070.000				
S3 S6 S9 +20 +40 +60 <b>vfoA vfoB</b> A<->B						
P₀ 1						
Vol	0	<u></u>				
RF	100					
SQL	10	<u>l</u>				
<b>NR</b>	0	<u>1</u>				
[ IFsh	0	<u>1</u>				
[ Nch	0	<u>1</u>				
MIC	0	<u>1</u>				
PWR	15	-1				
	t	Pre NB Tune PTT				

Figure 19.23 IC 7800



Figure 19.24 IC 7851
-	flrig IC-9100
<u>File</u> Confi	g Memory Help
140	70.000 14070.000
S3 S6 	.59       +20       +40       +60       ✓ vfoA       ✓ vfoB       A<->B       Split         3000       ✓ USB       ✓
Vol 0	<u>1</u>
FST 100	
SQL 10	
NR 0	1
Fish 0	
Nch 0	1
MIC 0	1
PWR 15	<u>1</u>
Att 🗌	Pre NB AN Tune PTT

Figure 19.25 IC 9100

🔲 firig l	C-9700
<u>F</u> ile <u>C</u> onfig <u>M</u> emory <u>K</u> ey	/er <u>H</u> elp
14070.000	7070.000
S3 S6 S9 +20 +40 +60	vfoA vfoB A / B Split
	3000 USB-D
Po 5 10 15 20	Lock 0
	CIrPBT 0
FST 0	□ Nch 0
SQL 0	Mic 0
	Pwr 0
■ ATT P0/E0 NB	AN   Tune   PTT

Figure 19.26 IC 9700



Figure 19.27 IC F8101



Figure 19.28 IC R71

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# **Supported Kenwood Transceivers**

flrig TS140	_ ×
File Config Memory Hel	p
14070.00	14070.00
\$3 \$6 \$9 +20 +40 +60	vfoA vfoB A<->B Split
Po 40 80 120 160	
□ NB	

Figure 20.1 TS 140

ilri.	TS-440 🗖 🗖 🕱
<u>File</u> Config Memory K	/er <u>H</u> elp
14070.00	7070.00
S3 S6 S9 +20 +40 +1	vfoA □ vfoB A / B USB ▼ PTT

Figure 20.2 TS 440

flrig TS-450S	≙ _ ×
<u>File Config Me</u>	mory <u>H</u> elp
14070	.00 14070.00
S3 S6 S9 +2	20 +40 +60
Po 40 80 120	анараараараараараараараараараараараараар
	□ NB □ PTT

Figure 20.3 TS 450S

firig TS-480HX 🔷 🗕 🗙
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
Po 40 80 120 160
Vol 0
AGC 255
SQL 0
□ NR 0 1
[IFsh] 0
Mic 0
Pwr 0
■ ATT □ Pre □ NB □ AN □ Tuner □ PTT

\_\_\_\_\_

Figure 20.4 TS 480HX

firig TS-480SAT 🔷 🗕 🗙
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
L 200 ▼ USB ▼ P₀ 40 80 120 160
AGC 255
SQL 0
[ IFsh 0
Mic 0
Pwr 0
■

Figure 20.5 TS 480SAT

		fl	rig TS	-570			
Files	<u>C</u> onfig	Save 🕨	S <u>a</u> v	ed	<u>H</u> elp		
	140	70.0	00		140	70.	000
		+20 +40	+ 60	VfoA	vfoB ▼	A -> B USB	Split
			,				
PV Att			NB		Tu	ine	∏ PTT

Figure 20.6 TS 570

		flrig	TS-	590S	
<u>F</u> iles	Config	Memory	₩	Debug	Help
	L40	70.00	0	14	4070.000
S3 [] [	<u>, S6 , S9 ,</u> 	+20 +40 +60		vfoA	vfoB A -> B Split
Vol	30 = 800 = C 0		1		_L
PW	R 0 I	Pre 🗌 🥅 N	IB	)	Tune Tune

#### Figure 20.7 TS 590S

flrig TS-590SG	≙ _ X
File Config Memory Hel	p
14070.000	14070.000
\$3 \$6 \$9 +20 +40 +60	vfoA    vfoB    A<->B
Po 40 80 120 160	□ IFsh 0 1
└ Vol 0 .	Nch 300
RF 255	SQL 0
■ NR2 1	0
Pwr 0	] [ AN ] [ Tuner ] [ PTT

Figure 20.8 TS 590SG

			firig T	<b>S-7</b> 9	0				
<u>F</u> ile	<u>C</u> onfig	Memory	<u>K</u> ey	er	Help				
	146	900.	00		1	46	900	0.0	0
	3 <u>, 56</u> , 5	;9  +20  ++	40 +60	vi	foA 🔽	vfoB	A / B LSB		

Figure 20.9 TS 790

flrig TS-850	_ ×
File Config Memory Hel	p
14070.00	14070.00
S3 S6 S9 +20 +40 +60	VfoA vfoB A<->B Split
P₀ 40 80 120 160	
■ NB 2	PTT

Figure 20.10 TS 850

flrig TS-870S	≙ _ X
File Config Memory Hel	p 📃
14070.00	14070.00
S3 S6 S9 +20 +40 +60	vfoA vfoB A<->B Split L 300 ▼USB ▼
Po 40 80 120 160	IFsh 0
	0
Pwr 0	
Att NB 2	

Figure 20.11 TS 870S

				fili	ig T	S-89	05			×
<u>F</u> ile (	Config	g <u>N</u>	1emo	ory	<u>K</u> ey	er	Help	р		
	14	07	Ό.	00	0		1	L40	070.	.000
<sup>S3</sup>	_ S6	, Sʻ9	+20	+40	+60	<mark>г</mark> v Н	foA   3000	vfoB	A / B	Split
Vol	0								-	
RF	255				_	_				<u> </u>
SQL	0				_	_				
□ NR	0				_	_				
□ IFsh	0									
□ Nch	300									
Mic	0									
Pwr	0									
	Π	P	RE	N	B		AN		Tune	<b>□ PTT</b>

Figure 20.12 TS 890S

	firig T59405							
<u>F</u> ile	Config	<u>M</u> emory	Key	er	Help			
14070.00						14	070	9.00
L.J.S.	3 , S6 , S	69 <u>+20 +4</u>	0 +60	<mark>  </mark>	/foA   □	vfoB	A / B LSB Tune	Split

Figure 20.13 TS 940S

	firig TS-950						
<u>F</u> ile	<u>C</u> onfig	<u>M</u> emory	<u>K</u> ey	er <u>H</u> e	lp		
14070.00 14070						9.00	
S3	S <u>6</u> S	9 +20 +4	0 +60	vfoA	∏ vfoB	A / B	
				FM-W	<b>•</b>	USB	<b>_</b>
				🗆 Data			PTT
	Firmer 00 44 TO 050						

Figure 20.14 TS 950



#### Figure 20.15 TS 990

flrig TS-2000 🔷 🗕 🗙
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
P₀ 40 80 120 160 USB ▼
RF 100
MON 0
Nch 300 -
0
<b>Pwr</b> 0
Att Pre AGC F AN Tuner PTT

Figure 20.16 TS 2000

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# Supported TenTec Transceivers

		fi	lrig ∏	-516		
<u>F</u> iles	<u>C</u> onfig	<u>S</u> ave	S <u>a</u> v	ved	Help	
	140	70.0	00		140	70.000
F <sup>3</sup> S3 S3 S3 S3 S3 S3 S3 S3 S3 S3 S3 S3 S3	S6S9  10	+20 +40	+ 60 	vfo 3000	A vfoB	A -> B Split
☐ IFsh ☐ Att	0		NB		-1	

Figure 21.1 TT 516

E firig	DELTA-II
<u>File</u> Config Memory Ke	yer <u>H</u> elp
14070.000	14070.000
S3S6S9+20+40+60 ₩	VfoA vfoB A / B USB

Figure 21.2 TT DELTA-II

		flr	ig TT-538		(	-×
<u>F</u> iles	<u>C</u> onfig	Save 🕨	S <u>a</u> ved	Help		
	140	70.0	00	140	70.0	00
S3	.S6 .S9	+20 +40 +	60 <b>I</b> vf	oA 🗌 vfoB	A -> B	Split
р <del>опродолоро</del> Ро 20	արարարարար ) 40	60 80			ien.	
∏ Vol	0	I				
l I	RF 100 -					
🗌 IFsh	0					
🗌 Att						PTT

Figure 21.3 TT 538



Figure 21.4 TT 550

		flri	g OMNI-\	/1	_×_
Files	<u>C</u> onfig	Save 🕨	Saved	Help	
	140	70.0	00	140	70.000
S3.	.S6 .S9.	+20 +40 +		foA vfoB	A -> B ☐ Split
'P₀ ' 2ù	) <sup>'</sup> 40 <sup>'</sup>	60 80			

Figure 21.5 Omni VI

	flri	g Orion-II		
<u>Files</u> Conf	ig <u>S</u> ave 🕨	S <u>a</u> ved	Help	
140	970.00	90	140	70.000
S3 S6 S	69 +20 +40 +	60 <b>Vfo</b> / 100	A □ vfoB	A -> B ☐ Split
└ Vol 0 RF 0				
IFsh 0			1	
Att	Pre			PTT

Figure 21.6 TT Orion-II

		flri	g Omni-VII	)	
<u>F</u> iles	<u>C</u> onfig	Save 🕨	S <u>a</u> ved	Help	
	140	70.0	00	140	70.000
L	.S6.S9.	+20 +40 +	60 <b>I</b> vfo	A	A -> B □ Split
Po 20		eo 80	աստուստի .		
🗆 Vol	0	I			
l l	RF 100 -				I
🗌 IFsh	0			-1	
🗆 Att					FTT PTT

Figure 21.7 Omni VII

🖬 firiç	g Eagle		
<u>Files</u> <u>Config</u> <u>Save</u>	S <u>a</u> ved	Help	
14070.00	0	140	70.000
S3 S6 S9 +20 +40 +60	) ■ vfo. 100	A vfoB	A -> B Split
P₀ 20 40 60 80 PWR 5 -1			
Att Pre		1	∏ PTT

Figure 21.8 TT Eagle

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# **Supported Yaesu Transceivers**



Figure 22.1 FT 100D

firig FT-450 🔺 🗕 🖌
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split WIDE VISB
Р₀ 40 80 120 160
NR2 1
[IFsh] 0
Nch 0 -
Mic 0
Pwr 0
■ TIT PRE NB 1     Tuner PTT

Figure 22.2 FT 450

firig FT-450D 🔷 🗕 🗙
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
3000 VSB
RF 255
□ NR2 1 1
[ IFsh 0
□ Nch 0 1
Mic 0
Pwr 0
■ TIT PRE NB 1 Tuner PTT

Figure 22.3 FT 450D

				fi	rig F	T-736R			_ = = ×
<u>F</u> ile	Config	g <u>M</u>	lemo	ry	<u>K</u> ey	er <u>H</u> e	elp		
	14	40	70	).0	0		430	002	1.00
, S;3	3 S¦6 .	_S,9	. +2,0	+40	.+60	vfoA		A/B USB	

Figure 22.4 FT-736R

flrig FT-747	≙ _ X
File Config Memory Hel	p
14070.00	14070.00
S3 S6 S9 +20 +40 +60	vfoA □ vfoB A<->B □ Split
Po 40 80 120 160	
□ NB 1	PTT

Figure 22.5 FT-747

	flrig FT-757GX2						
<u>F</u> ile	<u>C</u> onfig	Memo	ry <u>K</u> ey	/er <u>H</u> e	lp		
	14	070	00.00		14	070	9.00
, S	3 <u>56</u> 9	59 +20	+40 +60	vfoA	∏ vfoB	A / B	🗆 Split
						USB	<b>_</b>
						Γ	PTT



flrig FT-767	_ ×
File Config Memory Hel	p
14070.00	14070.00
<u>53</u> <u>56</u> <u>59</u> +20 <u>+40</u> +60	vfoA vfoB A<->B Split
Po 40 80 120 160	[ PTT

Figure 22.7 FT-767

		flr	ig FT-817		-×
<u>F</u> iles	<u>C</u> onfig	<u>S</u> ave 🕨	S <u>a</u> ved	<u>H</u> elp	
	1407	70.00	90	1407	70.000
S3 Po 20	<u>, S6 , S9</u> , <u>S6 , S9</u> , <u>S6 , S9</u> , <u>S6 , S9</u>	+20 +40 + 		oA vfoB	A -> B  ☐ Split USB  ▼
					T PTT

Figure 22.8 FT-817

	firig FT-817BB							
File	<u>C</u> onfig	Memo	ory <u>I</u>	Keye	er <u>H</u> elp	)		
	14	070	9.0	0		14	070	9.00
S:	3 <u>56</u> 9	59 +20	+40	+60	vfoA	vfoB	A / B	🗌 Split
р. Ро	5 10	15	20				USB	

Figure 22.9 FT-817BB

	firig FT-818ND							
<u>F</u> ile	<u>C</u> onfig	Mem	ory	<u>K</u> ey	er <u>H</u> e	lp		
	14	070	9.0	90		14	070	9.00
S:	3 <u>56</u> 5	59 +20	+40	+60	vfoA	∏ vfoB	A / B	🗆 Split
[				 	2400		USB	
P₀	<u>5 10</u>	15	20				<u> </u>	⊤ Į

Figure 22.10 FT-818ND

_	
E firig	FT-847
<u>File Config Memory Ke</u>	yer <u>H</u> elp
14070.00	14070.00
S3 S6 S9 +20 +40 +60	VfoA ↓ vfoB A / B USB ▼ □ PTT ↓

Figure 22.11 FT-847

flrig FT-857D	_ ×
File Config Memory Hel	p
14070.00	14070.00
<u>53</u> 5659+20+40+60	vfoA vfoB A<->B Split
Po 40 80 120 160	T PTT

Figure 22.12 FT-857D

			firig FT	890	
File	<u>C</u> onfig	Memory	<u>K</u> eyer	<u>H</u> elp	
	14	070.	00	14	070.00
C ,, Po	3 <u>56 5</u> 	9 +20 +4 	0 +60 <b>-</b>	vfoA 🗍 vfoB	A/B USB

Figure 22.13 FT-890



		flri	g FT-897	D	
<u>F</u> iles	<u>C</u> onfig	<u>S</u> ave 🕨	S <u>a</u> ved	Help	
	140	70.0	00	140	70.000
S3	<u>, S6 , S9 , S9 , S9 , S9 , S6 , S9 , S6 , S9 , S9</u>	+20 +40 +		foA vfoB	A -> B ☐ Split
					T PTT

Figure 22.15 FT-897D

firig FT-900	≙_×
File Config Memory Hel	p
14070.00	14070.00
S3 S6 S9 +20 +40 +60	vfoA vfoB A<->B Split
Po 40 80 120 160	
NB 1	PTT

Figure 22.16 FT-900

flrig FT-920	_ ×
File Config Memory Hel	p
14070.000	14070.000
\$3 \$6 \$9 +20 +40 +60	vfoA vfoB A<->B Split wide USB
₽₀ 40 80 120 160	[ PTT

Figure 22.17 FT-920



Figure 22.18 FT-950

			firig	FT-99	90			_ = = ×
<u>F</u> ile	<u>C</u> onfig	Memor	ry <u>K</u> e	yer	Help			
	14	070	.00			14	070	9.00
LL S3	se s	9 +20	+40 +60	240	foA 🔽	vfoB	A / B USB	Split
Po :	5 10	15	20				Tune	

Figure 22.19 FT-990

			il	rig FT-99	AO			_ 0 ×
<u>F</u> ile	<u>C</u> onfig	Memo	ory	<u>K</u> eyer	He	lp		
	14	070	9.0	0		14	070	0.00
S S	3 <u>56</u> 5	9 +20	+40	+60 🗖 \	/foA	∏ vfoB	A / B	🗆 Split
				24	00		USB	<b>_</b> _
Po	5 10	15	20					
						Γ	Tune [	PTT

Figure 22.20 FT-990A

firig FT-991 🔷 🗕 🗙
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
Po 40 80 120 160
RF 255
□ NR 1 1
[ IFsh 0]
[Nch 1500
Mic 0
[Pwr] 5 []
Att Amp 2 NB 1 AN Tuner PTT

Figure 22.21 FT-991

🔳 firig F	T-991A		_ = = ×
File Config Memory Key	ver <u>H</u> elp		
14070.000		4070	.000
S3 S6 S9 +20 +40 +60	🗖 vfoA 📋	vfoB A /	B 🗌 Split
	2300	USB 🗸	<b>_</b>
Po 5 10 15 20	□ IFsh 0	0	- <u>I</u>
Vol 0 ∎	□ Nch 15	00	- <u>I</u>
AGC 15	Mic	D 📕 🗕 🚽	
□ NR 1 1	Pwr 1	5 –	
	☐ AN	🗌 🗌 Tune	□PTT

Figure 22.22 FT-991A

flrig FT-1000/D	≙ _ X
<u>File Config Memory Hel</u>	p
7100.00	7100.00
S3 S6 S9 +20 +40 +60	vfoA vfoB A<->B Split
Po 40 80 120 160	
■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	Tuner

Figure 22.23 FT-1000D

flrig FT-1000MP	≙ _ X
<u>File Config Memory He</u>	p
14070.00	3580.00
S3 S6 S9 +20 +40 +60	vfoA vfoB A<->B Split /2.4 ▼USB ▼
Po 40 80 120 160	Tuner Tuner

Figure 22.24 FT-1000MP

firig FT-1000MP-A	
<u>File Config Memory Keyer Help</u>	
14070.00 358	0.00
S3 S6 S9 +20 +40 +60 <b>√vfoA √vfoB A / B</b>	Split
P <sub>e</sub> 5 10 15 20 ▲ AN I Tune	∏ PTT

Figure 22.25 FT-1000MP-A



Figure 22.26 FT-2000

			firig F	Tdx10			_ = = ×
<u>F</u> ile (	Confi	g <u>M</u> emo	ory <u>K</u> ey	er <u>H</u> el	р		
	14	070.	000	-	140	70.	000
L. S3 ,, Po 5	, S6 		+40 +60	vfoA 300	□ vfoB	A / B USB	Split ▼
Vol RF	0 15	I <u></u> I					
□ NR □ IFsh	1			-1			
∏ Nch Mic	0	I <u></u>					
Pwr	15 П	PRE	□NB	AN		Fune	PTT

	fir	ig FTdx1	101D		_ • ×
<u>F</u> ile <u>C</u> onfig	<u>M</u> emory	<u>K</u> eyer	<u>H</u> elp		
140	970.00	90	14	1070.	000
S3 S6	S9 +20 +40	+60 📃	vfoA 🗌 v	foB A / B	🗌 Split
Po 5 10	, 15 20	De	efault	<b>▼</b> USB	
Vol 0	1				
RF 15	<u> </u>				
IFsh 0			<u>_l</u> _		
<u>Nch</u> 0	<u> </u>				
Mic 0	1				
Pwr 15					
	☐ PRE		AN	🗌 Tune	PTT

Figure 22.28 FTdx101D

			firig FTd	x101MP			
<u>F</u> ile <u>C</u>	onfig	Memo	ory <u>K</u> ey	er <u>H</u> elp			
1	L40	70.	000	1	40	70.	000
S3	S6S	9 +20	+40 +60	vfoA 🗌	vfoB	A / B	🗌 Split
				Default		USB	<b>_</b>
¦P₀ 5	i 10	15	20 '				
Vol	0						
RF	15 -	<u> </u>					
🗆 IFsh	0 -						
□ Nch	0						
Mic	0						
Pwr	15 -						
	Т	PRE		□ AN		Tune	□ PTT

Figure 22.29 FTdx101MP

flrig FTdx1200 🔷 _ 🗙
Eile Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
P₀ 40 80 120 160
RF 255
[ IFsh ] 0
[ Nch ] 300
Mic 0
Pwr 5
Att Amp 2 NB AN Tuner PTT

Figure 22.30 FT-dx1200

flrig FTdx30	000	≜ _ X
<u>F</u> ile <u>C</u> onfi	g <u>M</u> emory <u>H</u> el	р []
1407	70.000	14070.000
S3	S9 +20 +40 +60	vfoA vfoB A<->B Split
Po 40 81	, 120 160	3200 VUSB
Vol 0	1	
RF 255		1
Fsh 0		L
<b>Nch</b> 300		
Mic 0	1	
Pwr 5	1	
■ Att	IPO NB 2	

Figure 22.31 FT-dx3000

firig FTdx5000 🔷 🗕 🗙
File Config Memory Help
14070.000 14070.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A<->B Split
3200 🔍 USB
Po 40 80 120 160
RF 255
[ IFsh 0]
Nch 300
Mic 0
Pwr 5 1
Att □ □ PD1 □ NB 2 □ AN □ Tuner □ PTT □

Figure 22.32 FT-dx5000

			firig FT	dx9000			0 🗙
<u>F</u> ile <u>C</u> o	onfig	Memo	ry <u>K</u> ey	er <u>H</u> elp			
1	.40	70.	000	1	.40	70.	000
LS3 ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u>56 59</u>	9 <u>+20</u> 	+40 +60	▼vfoA   [ 3200	vfoB	A / B USB	Split
Vol RF	0 📘	_1					
IFsh Nch	0			<u>I</u> _			
		PRE		AN		Гune	□ PTT

Figure 22.33 FTdx9000

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# **Other Supported Transceivers**

firig AOR-5000	_ = ×
<u>File Config Memory Keyer Help</u>	
14070.000 14070.	000
S3 S6 S9 +20 +40 +60	
	□ PTT

#### Figure 23.1 AOR5000

firig PCR-1000	≙_X
File Config Memory Hel	p
14070.00	14070.00
S3 S6 S9 +20 +40 +60 mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	vfoA vfoB A<->B Split 2.8k USB
Vol 25	

#### Figure 23.2 PCR 1000

		flri	g RAY 15	2		-×
Files	Config	Save 🕨	S <u>a</u> ved	Help		
	140	70.00	90	140	70.00	90
S3	_S6S9	+20 +40 +	60 <b>I</b> v	foA vfoB	A -> B	Split
P₀ 20	40	60 80	<b>↓</b> 15	00) R		
□ Vol	0	1				
-	RF 0					
S	QL 0	[				
		<u>□</u> N	B	AGC	∏ P	Π

Figure 23.3 RAY 152

📷 firig	g Po	wers	DR						E	
<u>F</u> ile (	Confi	g <u>M</u>	emo	ory	<u>K</u> ey	er	Help	)		
	14	07	0.	00	0		1	.40	70.	000
S3		 	+20	+40	+60		foA	vfoB	A / B USB	Split
Vol RF	0									_
SQL	0									
	0									
[ IFsh	0	<b>I</b> —								
Mic	0									
Pwr	0							_		
					IB		AN		Tune	

Figure 23.4 Power SDR

📷 flrig	) FLI	EX1500				-	_ <b>D</b> X
<u>F</u> ile (	Confi	g <u>M</u> em	ory <u>K</u> ey	/er <u>H</u> e	elp		
	14	070	.000		140	70.	000
S3 ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, S6 , , , , , , , , , , , , , , , , , , ,		+40 +60	vfoA	)	A / B USB	) 🗆 Split
🗌 Vol 📄	0	1				_	
RF	120						
SQL	0						
	0						
[ IFsh	0	1					
Mic	0						
Pwr	0	1					
			NB			Tune	



🕒 Ex	perts	DR2	SunS	DR2								
ს		RX2 🔻	0dB	<b>▼</b> B	S AN	TT RX A	NT 🔻	PA	$\mathbf{Q}$	MEM		
мох	Tune	VAC	SQL	Mute	e VOX	Breakli	n 🔻 Pi	ROC 🔻	¢	8	<b>&amp;</b>	
	•	e IQ	Mixer	EQ	F	۲:		D	rive:			1
AM	SAM	DSB	LSB	USB	CW	NFM DI	GL DIO	U WF	MDR	М	160M	80M
SubRX	B->A	2 ].⊆ A->B   T ▼ A	B<->A GC: Sla	B TX	<b>~</b>	LOC SAV SET		I) BIN				► F
							¥					
-60-	<u>F</u> ile	<u>C</u> onfi	g <u>M</u> e	mory	Keye	er <u>H</u> elp	)					
-70-		14	03	1.7	80		70	27	.50	0		
-80-	S3	S6	, S9 +	-20 +4 	10 +60	vfoA [ // 800	vfoB	A / B CW	Sp	olit   		
-100-	Vol	83		. 20	•				L)	-1		
-110- MU WW	Maril	атт    ///////			hrow	www	L NwW	Tune M		~~~1 <sup>11</sup> Vik	17445-111441	MM

Figure 23.6 SunSDR2 Pro

				filr	ig Sn	nartS	DR				
File	Config	g <u>№</u>	1emo	ory	<u>K</u> ey	rer	Help	D			
	7	07	Ό.	00	90			70	70.	.00	0
,S;	3 <u> </u>	, sj9	, +2¦0	. +40	+60 · 1	<mark>v</mark> 180	foA   00	vfoB ▼	A / B USB		
F Pwr	F 100										-1
•		-								□ PTT	

Figure 23.7 SmartSDR

📷 flrig TciSDR	<b>-</b> ×
<u>File</u> Config Memory Ke	yer <u>H</u> elp
14031.780	7027.500
\$3, \$6, \$9, +20, +40 +60	vfoA vfoB A / B Split
Po 5 10 15 20	
Pwr 20.0     ATT PRE	

Figure 23.8 TCISDR

		fi	rig Xiegu	-5105			
File	<u>C</u> onfig	<u>M</u> emory	<u>K</u> eyer	<u>H</u> elp			
	140	70.0	00	1	40	70.	000
S: 	3 <u>56</u> 5	;9 <u>+20 +4</u>	0 +60 <mark> </mark>  \\	vfoA   ┌ /ide	vfoB	A / B USB	▼

Figure 23.9 Xiegu-5105

flrig Xiegu-G90	+ _ O X
<u>File Config Memory Keyer Help</u>	
$\begin{array}{c c} & \begin{array}{c} s_{3} & s_{6} & s_{9} & s_{20} & s_{40} & s_{60} \\ \hline & & & & \\  & & & & \\  & & & & \\  & & & \\  & & & & \\  & & & \\  & & & & & \\  & & & & \\  & & & & \\  & & & & \\  & & & & \\  & & & & \\  & & & & \\  & & &$	7070.000           vfoA         vfoB           A / B         Split
Vol 31 Pwr 19	SQL 0

Figure 23.10 Xiegu-G90

	firig X6	100	_ = ×
<u>F</u> ile <u>C</u> on	ifig <u>M</u> emory <u>K</u> eyer	r <u>H</u> elp	
14	1070.000	70	70.000
S3 S	6 S9 +20 +40 +60 <b>1</b>	vfoA vfoB	A / B Split
Vol 0	1		
<b>SLO</b> 10	0		I
SQL 0	1		
□ NR 0	1		
Mic 0	1		
Pwr 0	<b>I</b>		
	PRE NB		□ PTT

Figure 23.11 X6100

📷 flrig FDN	1 DUO		= ×
<u>File</u> Config	<u>Memory K</u> ey	er <u>H</u> elp	
140	070.000	1407	0.000
S3 S6 Po 40 80	<u>S9</u> +20 +40 +60 		A / B Split SB V
	0		
SQL 0	U		
	U		
Mic 26	U		
Pwr 5.0			1
	PRE NB		ne) 🗆 PTT 👘

Figure 23.12 FDM-DUO

📷 flrig TX500	O ×
<u>File</u> Config Memory Key	yer <u>H</u> elp
0.000	0.000
S3 S6 S9 +20 +40 +60 P₀ 20 40 60 80	vfoA vfoB A / B

Figure 23.13 Lab599 TX500

	firig QCX+			×				
<u>F</u> ile	<u>C</u> onfig	Memo	ory	<u>K</u> ey	er <u>H</u> e	lp		
	70	40.	00	)0		70	25.	000
S3	3 . S6 . S	i9 +20	+40	+60	vfoA	∏ vfoB	A / B	🗌 Split
					200		CW-R	
								PTT

Figure 23.14 QCX+

firig QDX	_ 0 ×
<u>File Config Memory Keyer Help</u>	
7070.000 14070	.000
S3 S6 S9 +20 +40 +60	B Split

Figure 23.15 QDX

firig QMX	
<u>File Config Memory Keyer Help</u>	
7070.000 14070	.000
S3 S6 S9 +20 +40 +60 vfoA vfoB A / f	3 🗌 Split
3200 USB	

Figure 23.16 QMX

		1	ilrig TMD	/10		X
<u>F</u> ile	<u>C</u> onfig	<u>M</u> emory	<u>K</u> eyer	<u>H</u> elp		
	14	070.	90	14	070	9.00
L.J.	3 <u>56</u> 5	i9 +20 +4(	) +60 <mark>[]</mark>	/foA │ □ vfoB	A / B NFM	<b>_</b> _
SC Pwr						
₽						□ PTT

Figure 23.17 TMD710

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## FT-991A setup

CAT control involves both software and settings on the radio itself. The default radio settings on the FT-991A are not likely to work "out of the box".

Some initial things to verify are in place:

- Download and install the USB driver for the radio. NOTE: be sure the USB cable is UNPLUGGED from the computer when you install the driver regardless of the OS your are using.
  - If you're using Windows get the driver from Yaesu.
  - If using Linux or MacOS then get the drivers direct from Silicon Labs. Some versions of Linux have a driver built in.
  - For MacOS High Sierra and later be sure to go to Security & Privacy in the System Configuration settings and in the General tab allow the driver to be accessed. Without doing that it will be unusable.
- Download the latest version of Fldigi. Flrig is written as a companion to fldigi and adds much greater rig control than is possible with just fldigi. It is especially good with the FT991A. I basically only touch the radio to turn it on or off when running digital modes, and even that can be automated.

### 24.1 Transceiver setup

#### 24.1.1 FT-991A Menu Settings

On the rig, press the MENU button. Then change these menu items as shown:

Menu #	Name	Value
31	CAT RATE	38400 bps
32	CAT TOT	10 msec
33	CAT RTS	ENABLE
59	CW FREQ DISPLAY	PITCH OFFSET
60	PC KEYING	DTR
62	DATA MODE	OTHERS
63	PSK TONE	1500 hZ
64	OTHER DISP (SSB)	1500 Hz
65	OTHER SHIFT (SSB)	1500 Hz
66	DATA LCUT FREQ	300 Hz

Menu #	Name	Value
67	DATA LCUT SLOPE	18 dB/oct
68	DATA HCUT FREQ	3600 Hz
69	DATA HCUT SLOPE	18 dB/oct
70	DATA IN SELECT	REAR
71	DATA PTT SELECT	DAKY
72	DATA PORT SELECT	USB
73	DATA OUT LEVEL (RX)	100
74	FM MIC SELECT (PHONE)	MIC
75	FM OUT LEVEL (Rx)	50
76	FM PKT PTT SELECT	DTR
77	FM PKT PORT SELECT	DATA
106	SSB MIC SELECT	MIC
107	SSB OUT LEVEL	50
108	SSB PTT SELECT	DAKY
109	SSB PORT SELECT	USB
110	SSB TX BPF	300-2700
114	IF NOTCH WIDTH	NARROW
146	DATA VOX GAIN	50
147	DATA VOX DELAY	100 msec
148	ANTI DVOX GAIN	0

You should have already installed the driver for the built-in sound card in the FT-991A.

Connect the rig to the computer with a USB A-Male to B-Male cable and turn on the radio.

#### 24.1.2 Initial Setup

With the radio on and the USB cable connected and no other communications program running, Start flrig. It will come up with just a basic display.

~	flrig NONE						-	8	
File	<u>C</u> onfig	Memo	ory <u>k</u>	(eyer	Help				
	1407	70.0	000		14	070	9.0	0	0
ی نیب ک	3 <u>, 56</u> , 9	39 <u>+20</u>	+40 +	+60 <mark>- v</mark>	foA 🕅 v	vfoB A	<->B	) 🗆 🤊	Split
P₀ 4	40 80	<u>    120                                </u>	160	3				PT	т

Figure 24.1 Initial FIrig Dialog

Open the menu Config/Setup/Transceiver.

		Configu	ration				
▼ Configure	Rig:	IC-7300				ŀ	•
Xcvr BTT Conorio	Update	/dev/cu.SLAB_USBtoUART					
PTT-Cmedia	Baud:	115200		Retries 📢 🖣	2		
TMATE-2		1 Stop Bit	2 Stop Bits	Timeout 📢 🖣	50		
TCPIP & TCI			RTS/CTS	Write delay 📢 🖣	0	▶	₩
Server		RTS +12 v	DTR +12 v	Post delay 📢 🖣	0		₩
Client	0x04	Default		Poll intvl 🕊 📢	100	Þ	
Poll	0,000	Delault		[□ Ac	tivate		Ĭ
Commands Send	VSB :	audio		Connected		nit	

Figure 24.2 Select FT991A

Choose the FT991A from the Rig dropdown list. That will select the default settings which will work on . Note: The RTS +12v and DTR +12v boxes do not normally need to be checked.

#### 24.1.3 Select the Serial Port to use:

Mac / Linux - Select the SilconLabs driver from the dropdown list. If it isn't in the list then click the SerPort
button to repopulate the list. It if still isn't in the list then the driver is not loading for some reason like the radio
is not on or connected or the driver has not been installed properly so that needs to be rectified before going
on. If you're using MacOS High Sierra or a later version of MacOS you may need to authorize the driver install
in Security & Privacy setup in System Preferences after runing the install program. There will be a message
on the General page if it has been blocked.

•

• Windows - Open the device manager and determine to which com port the serial driver from Silcon Labs is assigned and choose that from the drop down list.

Verify that the Baud rate in flrig matches the baud rate selected in the rig. It's better to choose a fixed baud rate than Auto. Now, click the Init button. It should go from red to black lettering. If it does not go to black lettering then verify all of the above again, especially baud rate and echo.

• Flrig now should have control of the rig so changing frequency in flrig will changed the frequency on the rig and visa versa. The buttons and sliders should do as they are labeled.

#### 24.1.4 Restore tab:

Configuration				*
Configure     Xovr				
PTT-Generic	🕑 Freq		Noise Red'	
PTT-Cmedia	🕑 Mode	Notch	🗹 Comp On/Off	
PTT-GPIO	Bandwidth	💌 Auto Ntch	Comp Level	
Auxiliary	Volume	Squelch		
Server	🕑 Mic gain	Split		
Poll	💌 RF gain	Pre/Att		
Commands	Pwr level	Blanker	🗌 Use xcvr data	
Trace				

and choose whether you want firig to save and restore all the radio's parameters on startup and exit or whether you want it to open with the same settings as the rig is currently using. If Use xcvr data is checked firig will start up with the same settings as the rig currently is using.

#### 24.1.5 Poll tab

	Configuration	
✓ Configure     Xcvr	Meters S-mtr Pwr out SWR ALC Set all	
PTT-Generic PTT-Cmedia TMATE-2	Operating Controls           Image: Preq Preq Preq image: Preq image: Preq im	
TCPIP & TCI Other	Additional Controls	
Client	<ul> <li>✓ Notch ✓ Auto ✓ Tuner</li> <li>✓ Pre/Att ✓ Squelch ✓ Split ✓ QSK</li> </ul>	
Restore	Blanker V Noise red Comp V PBT Set all V	
Send	Disable XmlRpc Server     Disable Polling	

and click the Set All buttons for the initial polling options.

I would recommend before you move on that you go to the Config/UI menu and select Tooltips. They are a great help to the new user to figure out what each control does as not all are labeled. You can choose 4 different UI's from the narrow one with small sliders (I use this one – see above screen shot of flrig), to a narrow one with large sliders, to a wide version or a touch version. Now close flrig and restart it to be sure all is well. Everything should be working and you should be able to change frequency on the radio and flrig should follow.

### 24.2 flrig/FT991A/fldigi

Start fldigi and fill in the initial setup pages presented. You can ignore the last page for now. All these pages can be accessed via the configuration menu later to be changed as you wish. Since you've chosen to use flrig then go to the fldigi menu "Configuration/Rig control/flrig" and check the top box to tell fldigi to use flrig for rig control with fldigi as client.

Leave the other controls at their default setting.

10140.000	10140.000
S3 S6 S9 +20 +40 +60	└─ vfoA └─ vfoB A -> B └─ Split
·	3000 VDIGI V
Po 10 20 30 40	4 0 PR 4 0 PX 4640 PB
<b>Vol</b> 25	□ IFsh 0
RF 100	MIC 0
PWR 40	
Att Spot NB	AN Tune TT
■ Att Spot NB	AN Tune PTT fldigi - W
Att Spot NB     Eile Op Mode Configure View	AN Tune PTT fldigi - W v Logbook Help
Att Spot NB     Att Spot NB <u>File Op Mode Configure View</u> TT-550	AN Tune PTT fldigi - W v Logbook Help req On Off Call
	AN Tune PTT fldigi - W v Logbook Help req On Off Call 3.132 1358

Once that is done fldigi should communicate with flrig and changes such as frequency or bandwidth in flrig or fldigi should be reflected in the other. If the lower box is checked then flrig will send fldigi audio to the radio when the PTT button is clicked otherwise PTT will just key the rig with no power out. Click Save at the bottom of the page.

All that is left is to customize fldigi for how you want to operate. Many things can be changed such as the UI scheme, colors, Macros, and many more. Read the help manual to learn about all the options and features that are available.

#### 24.2.1 Final Setup

With fldigi running verify you have a blue waterfall running. If you don't see that then there is a problem with the audio input to fldigi. Verify the Soundcard setup.

Note:

- For MacOS Mojave and later you must enable the microphone for fldigi in Security & Privacy in the System Preferences settings.
- For Windows 10 be sure to grant permission for fldigi to access the Microphone.

Now we will verify the power out of the radio. Set the radio power control on the rig to max, 100% and leave it there.

Set Power Meter scale: Right click on the lower portion of the S-meter scale and choose the power scale desired. The max digital power out used for a QSO should cause no ALC action on the radio. The FT991A will put out quite a bit of power without ALC action, but you don't want to interfere with other close signals on the band either so ideally the power should be between 25-40 watts.

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## IC-7100 Setup

### 25.1 IC 7100 menu setup

Press the transceiver SET button then the on screen item: then Connectors.

Make sure the settings for these items are as follows:

- USB Audio SQL OFF
- · ACC/USB Output Select AF
- ACC/USB AF Level 50%
- ACC/USB IF Level 50%
- ACC MOD Level 20%
- DATA MOD Level 100%
- USB MOD Level 10%
- DATA OFF MOD MIC, ACC
- DATA MOD USB
- CI-V
  - Baud Rate 19,200
  - Address 88h
  - Transceive OFF
  - Output (for ANT) OFF
  - USB Port Unlink from REMOTE
- FUNCTION
  - Monitor ON
  - Monitor Level 50%
  - Beep Level 50%
  - CW Normal Side USB

### 25.2 flrig setup

You should have already installed the driver for the built-in sound card in the 7100.

Connect the transceiver to the computer with a USB A-Male to B-Male cable and turn on the radio.

#### 25.2.1 Install flrig.

For Windows flrig will install to it's own folders and should be installed in the normal application folder where other applications are installed.

Putting them in other folders can causes permissions issues sometimes on Windows 10. For Mac and Linux install them as you would any other application.

With the radio on and the USB cable connected and no other communications program running, Start flrig.

It will come up with just a basic display.

~		- 🙁			
File	<u>C</u> onfig	Memory	<u>K</u> eyer	<u>H</u> elp	
	1407	0.00	0	14070.0	000
S:	3 <u>, 56 , 5</u>	:9 +20 +4 	0_+60	/foA vfoB A<->	B Split
Po 4	40 80	120 160	Inninninni		
			NB		<b>PTT</b>

Figure 25.1 Initial FIrig Dialog

Go to the menu Config/Setup/Transceiver.

Configuration				<b>-</b> ×
🗆 Configure	Rig:	IC-7100		
Xcvr	Update	ART Bridge C	ontroller IC-7100	02010930 A-if00-port0
PTT-Generic	Bauda	10200		
PTT-Cmedia	Dauu:	19200		Retries at 2 F F
PTT-GPIO		1	2 -StopBits	Timeout 🕊 4 50 🕨 🕨
TCPIP			RTS/CTS	Cmds # 4 20 ) )
Auxiliary		■ RTS ±12 v	DTB +12 v	Poll intyl
Server		V N15 +12 V	V DIN +12 V	
Restore	0x88	Default		Byte intvl <b>4 0</b>
Cmds				
Send	OUCD -	audio.		
Trace	UD2B 6	audio		Connected 🔶 🛛 Init

Figure 25.2 Select IC7100
Choose the 7100 from the Rig dropdown list. That will select the default settings which will be good for starters. Note: The RTS +12v and DTR +12v boxes do not need to be selected.

Select the Serial Port to use

- · Windows select the correct COM port
- · Mac/Linux Select the SilconLabs driver from the dropdown list.

If the device does not appear in the list then click the SerPort button to repopulate the list. It if still isn't in the list then the driver is not loading for some reason like the radio is not on or connected or the driver has not been installed properly so that needs to be rectified before going on. If you're using MacOS High Sierra or a later version of MacOS you may need to authorize the driver install in Security & Privacy setup in System Preferences after runing the install program. There will be a message on the General page if it has been blocked.

Windows:

Open the device manager and determine to which com port the serial driver from Silcon Labs is assigned and choose that from the drop down list. Verify that the Baud rate in flrig matches the baud rate selected in the rig. It's better to choose a fixed baud rate than Auto. Now, click the Init button. It should go from red to black lettering. If it does not go to black lettering then verify all of the above again, especially baud rate.

#### 25.2.2 Restore xcvr parameters

Select the restore tab

Configuration				• ×
Configure     Xcvr		Read / Restore t	hese parameters	
PTT-Generic	🕑 Freq	<ul> <li>IFshift</li> </ul>	Noise Red'	
PTT-Cmedia	Mode	Notch	🗹 Comp On/Off	
TCPIP	Bandwidth	🕑 Auto Ntch	Comp Level	
Auxiliary	Volume	Squelch		
Server	🕑 Mic gain	Split		
Poll	💌 RF gain	Pre/Att		
Cmds	Pwr level	<ul> <li>Blanker</li> </ul>	Use xcvr data	
Send				
Trace				

Figure 25.3 Restore IC7100 Settings

and choose whether you want firig to save and restore all the radio's parameters on startup and exit or whether you want it to open with the same settings as the rig is currently using. If Use xcvr data is checked firig will start up with the same settings as the rig currently is using.

#### 25.2.3 Select the Poll tab

Configuration		
<ul> <li>Configure</li> <li>Xcvr</li> <li>PTT-Generic</li> <li>PTT-Cmedia</li> <li>PTT-GPIO</li> </ul>	Meters S-mtr Pwr out SWR ALC Operating Controls Freq Mode BW	Set all
TCPIP Auxiliary Server	✓ Volume ✓ Mic ✓ RF ✓ Power ✓ pbt ✓ Notch ✓ Auto ✓ Tuner	PTT
Poll Restore Cmds	<ul> <li>✓ Pre/Att ✓ Squelch ✓ Split ✓ QSK</li> <li>✓ Blanker ✓ Noise re ✓ Comp</li> </ul>	Set all
Trace		

Figure 25.4 IC7100 Polling Settings

and select to poll all of the parameters.

Flrig now should have control of the rig so changing frequency in flrig will changed the frequency on the rig and visa versa. The buttons and sliders should do as they are labeled.

📷 flrig IC-7100	- <u> </u>
<u>File Config Memory Key</u>	er <u>H</u> elp
7089.000	7070.000
S3 S6 S9 +20 +40 +60 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	vfoA    vfoB    A / B    Split     13000    USB-D    ▼     Lock    0    ■
Vol         0	ClrPBT 0
NR 0	Pwr 100     Tune     PTT

Figure 25.5 IC7100 Main Dialog

I would recommend before you move on that you go to the Config/UI menu and select Tooltips. They are a great help to the new user to figure out what each control does as not all are labeled. You can choose 4 different UI's from the narrow one with small sliders (I use this one – see above screen shot of flrig), to a narrow one with large sliders, to a wide version or a touch version. Now close flrig and restart it to be sure all is well. Everything should be working and you should be able to change frequency on the radio and flrig should follow.

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# IC-7300 Setup

### 26.1 IC 7300 menu setup

Press the transceiver MENU button then the on screen items: Set , then Connectors.

Make sure the settings for these items are as follows:

- · USB SEND Off
- · USB Serial function CI-V
- · Data Mod USB
- Data Off Mod Mic, ACC or just Mic if you wish. This applies only when the rig is not in data mode.
- USB MOD Level I have mine set at 28% so you might try this for starters. This is the input level control for the TX sound from the computer. How to fine tune it will be explained later.
- · ACC/USB AF Beep/Speech level Off
- ACC/USB AF SQL Off
- ACC/USB AF Output level I have mine set at 80%. This is the built-in soundcard in the radio output level that goes into fldigi on receive. Too much and you overdrive fldigi and decoding suffers, too little and you may miss weak signals though fldigi does very well with very weak signals. Something to play with to make it work best for you. See the fldigi manual on setting up the sound levels.
- ACC/USB Output Select AF

Once the above are set then touch the CI-V line on screen to get a list of items to set especially for CAT control. Many of these are ok at default, but verify the ones listed below:

- · CI-V address 94h
- · CI-V Transceive Off
- · CI-V USB Port Unlink from REMOTE
- CI-V USB Baud Rate 19,200. I use 115,200, but use 19,200 for starters as that is what flrig defaults to. Response will be a bit quicker with higher rates, but it will do well at 19,200 also.
- CI-V USB Echo Back On. On is only needed for compatability with other software. Firig does not need it on so if only using firig then set to Off.

## 26.2 flrig setup

You should have already installed the driver for the built-in sound card in the 7300.

Connect the transceiver to the computer with a USB A-Male to B-Male cable and turn on the radio.

#### 26.2.1 Install flrig.

For Windows flrig will install to it's own folders and should be installed in the normal application folder where other applications are installed.

Putting them in other folders can causes permissions issues sometimes on Windows 10. For Mac and Linux install them as you would any other application.

With the radio on and the USB cable connected and no other communications program running, Start flrig.

It will come up with just a basic display.

~		fl	rig NONE		- 🙁
File	<u>C</u> onfig	Memory	<u>K</u> eyer	<u>H</u> elp	
	1407	0.00	0	14070.	000
S: لىب	3 <u>, 56 , 5</u>	i9 +20 +41	0 +60 🗖	/foA VfoB A<->	>B Split
Po 4	40 80	120 160	Inninninul		
			NB		PTT

Figure 26.1 Initial FIrig Dialog

Go to the menu Config/Setup/Transceiver.

Configuration				>
Configure Xcvr	Rig: Update	IC-7300 _UART_Bridge	_Controller_IC-730	0_02013576-if00-port0
PTT-Cmedia PTT-GPIO	Baud:	115200		Retries <b>H</b> ( 2 ) Timeout <b>H</b> ( 50 ) N
TCPIP Auxiliary		_	RTS/CTS	Cmds 4 4 5 1 1
Server Poll Restore	0x94	Default	_DTR +12 v	Poll intvl <b>4 100 b</b>
Cmds Send Trace	USB a	audio		Connected 🔶 🛛 Init

Figure 26.2 Select IC7300

Choose the 7300 from the Rig dropdown list. That will select the default settings which will be good for starters. Note: The RTS +12v and DTR +12v boxes do not need to be selected.

Select the Serial Port to use

- · Windows select the correct COM port
- Mac/Linux Select the SilconLabs driver from the dropdown list.

If the device does not appear in the list then click the SerPort button to repopulate the list. It if still isn't in the list then the driver is not loading for some reason like the radio is not on or connected or the driver has not been installed properly so that needs to be rectified before going on. If you're using MacOS High Sierra or a later version of MacOS you may need to authorize the driver install in Security & Privacy setup in System Preferences after runing the install program. There will be a message on the General page if it has been blocked. Windows

Open the device manager and determine to which com port the serial driver from Silcon Labs is assigned and choose that from the drop down list. Verify that the Baud rate in flrig matches the baud rate selected in the rig. It's better to choose a fixed baud rate than Auto. Now, click the Init button. It should go from red to black lettering. If it does not go to black lettering then verify all of the above again, especially baud rate.

#### 26.2.2 Restore xcvr parameters

Select the restore tab

Configuration				• ×
Configure Xcvr		Read / Restore t	hese parameters	
PTT-Generic	🕑 Freq		Noise Red'	
PTT-Cmedia	Mode	<ul> <li>Notch</li> </ul>	Comp On/Off	
TCPIP	<ul> <li>Bandwidth</li> </ul>	Auto Ntch	Comp Level	
Auxiliary	Volume	Squelch		
Server	🕑 Mic gain	Split		
Poll	🖌 RF gain	Pre/Att		
Cmds Send Trace	Pwr level	Blanker	Use xcvr data	

Figure 26.3 Restore IC7300 Settings

and choose whether you want firig to save and restore all the radio's parameters on startup and exit or whether you want it to open with the same settings as the rig is currently using. If Use xcvr data is checked firig will start up with the same settings as the rig currently is using.

#### 26.2.3 Select the Poll tab

Configuration		×
<ul> <li>□ Configure</li> <li>□ Xcvr</li> <li>□ PTT-Generic</li> <li>□ PTT-Cmedia</li> </ul>	Meters S-mtr Pwr out SWR ALC Operating Controls Freq Mode BW	Set all
PTT-GPIO TCPIP Auxiliary Server	Additional Controls	☑ PTT
Poll Restore Cmds Send	<ul> <li>✓ Pre/Att ✓ Squelch ✓ Split ✓ QSK</li> <li>✓ Blanker ✓ Noise re ✓ Comp</li> </ul>	Set all
Trace		

Figure 26.4 IC7300 Polling Settings

and select to poll all of the parameters.

Flrig now should have control of the rig so changing frequency in flrig will changed the frequency on the rig and visa versa. The buttons and sliders should do as they are labeled.

📷 flrig IC-7300	- <u> </u>
<u>File</u> Config Memory Key	/er <u>H</u> elp
14070.000	7070.000
S3 S6 S9 +20 +40 +60	vfoA vfoB A / B Split
	150 VLSB V
Po 10 20 30 40	Lock 0
Vol 0	CIrPBT 0
MED 15 -1-	Nch 0
SQL 15 -1	Mic 0
□ NR 0 ■	Pwr 100
	AN Tune TT

Figure 26.5 IC7300 Main Dialog

I would recommend before you move on that you go to the Config/UI menu and select Tooltips. They are a great help to the new user to figure out what each control does as not all are labeled. You can choose 4 different UI's from the narrow one with small sliders (I use this one – see above screen shot of flrig), to a narrow one with large sliders, to a wide version or a touch version. Now close flrig and restart it to be sure all is well. Everything should be working and you should be able to change frequency on the radio and flrig should follow.

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# IC-7600 Setup

#### Submitted by Andy - VE3NVK / G8VTV

flrig IC-70	600 <u>* - ×</u>
<u>F</u> iles <u>C</u> onfig <u>M</u> emory	Debug Help
14070.000	14070.000
S3 S6 S9 +20 +40 +60	vfoA vfoB A -> B Split
	3000 VUSB V
Po 20 40 60 80	
✓ Vol 0 ■	• 🗍 IFsh 0 🗕 📕
RF 15	• Nch 0
SQL 10 -	• MIC 0
□ NR 0 ■	• PWR 0
Att IPO NB	Tune TTT

How to use the USB audio connection of the IC-7600 to a computer with FLDIGI and FLRIG.

## 27.1 IC-7600 SETTINGS

Setting the IC7600 menu items

- 1. Go into setup on the 7600 (Exit/set) then goto "set" and finally "Levels"
- Scroll to the item "Data 1 mod" and change the setting to USB (by turning the tuning dial). If you do not change this setting then the rig will not get the transmit audio - it still sends the received audio signal out though. You can use any of Data 1 to Data 3 settings if you have reason to but it is simplest to use the first.
- 3. Scroll up to the setting for "USB MOD Level" make sure it has some level set (mine is at 40%).

- Scroll up to "USB Audio SQL" and make sure it is off(open) We want the software to do any squelching on digital modes.
- 5. You will probably also want to leave the setting for DATA OFF MOD at the default of "Mic,Acc", if you still intend to use a microphone for SSB! You can just turn it to Mic alone to avoid any confusing complications.
  If you have another audio interface plugged into the auxiliary port, such as a TNC you will probably want to

If you have another audio interface plugged into the auxiliary port, such as a TNC you will probably want to leave it alone.

That should be it for the radio settings.

### 27.2 SOFTWARE SETTINGS

Now, on the computer, make sure that the sound card on the output side has some initial level set; try from 20 to 60% for starters.

If using FLRIG, (the companion software) to FLDIGI, both of which I strongly recommend, set a level for microphone and power level (start at say 50%). I find that I ended up with the mic level very low at about 5%. If you are not using FLRIG in association with FLDIGI then you do have some other interface options, explained in the main FLDIGI on-line help.

Start both FLDIGI and FLRIG, make sure that FLDIGI is set to use XML-RPC for rig control, and not anything else. If you try to use rig control from both FLDIGI with FLRIG running then there will be conflicts, and who knows which programme will be in charge. FLDIGI sends frequency, mode and bandwidth changes to the transceiver via FLRIG when XML-RPC is selected. FLRIG in turn annunciates changes back to FLDIGI. The radio, FLRIG and FLDIGI should stay in synch no matter where the change occurs.

#### 27.2.1 FLDIGI

- 1. On FLDIGI's "Configure" tab and rig control tab make sure that you only select XML-RPC.
- 2. On the "Audio" tab make sure (on Linux) that you have selected the correct audio device. I use PortAudio so I have selected both Capture and Playback show up as "USB Audio CODEC: USB Audio ..." (after that is will show the hardware port as something like (HW:0,0) this last part will change depending on how your computer is set up to identify the audio ports.
- In the OS sound mixer application, the 7600 USB audio will probably be identified as "PCM2901 Audio Codec."
- 4. If you are using Pulse audio the mixer function is performed in the Pulse-audio mixer application. Pulse audio will remember both the record and playback levels required for each application that it serves.

#### 27.2.2 FLRIG

- 1. Open the Config/Transceiver select tab and perform the following in the dialog window that opens
- Make sure to select the rig ic-7600 that the serial port is selected it will be something like (again in Linux) /dev/ttyUSB0, the number at the end may be different, and if you have more than one USB serial device connected, make sure you have the correct one. (Hint: use the command, in a terminal screen, 'Ismod')
- 3. Make sure the CI-V address is correct, the default for the 7600 is 0x7A
- 4. Check off the "USB Audio" box.

- 5. Select the button for PTT via CAT.
- 6. Ensure that the baud rate is compatible with what you have set on the 7600 I use 19200.
- 7. Select 1 stop bit
- 8. Enable the checkbox for Echo.
- 9. Now for retries, retry interval, cmd interval and query interval, I use 2, 50, 5, 100, but other values will certainly work for you. If you want faster response to the frequency when changed using the tune dial on the rig you may want to try reducing the value of QRY interval.

Make sure to press the INIT button before closing the window so that the settings you have changed TAKE.

When using digital modes make sure that (even for CW) that you have selected "USB-D1" for the audio connection. If you use anything else, you will NOT be able to transmit, just receive. (Unless you decided to set up for USB-D2 or D3). This shows in both FLRIG and FLDIGI.

The rig should then also show that it is set to USB-D1 with a blue background just above the frequency display and between the VFO and filter setting indicators.

If, as has happened to me with some of the iterations of FLRIG, the 7600 stops showing USB-D1, change it back by either pressing the USB button repeatedly on the 7600 until it shows, or in FLRIG if you can.

#### 27.2.3 SETTING LEVELS AND TUNING

Finally using the TUNE button on FLDIGI, set up the power and modulation levels for almost no ALC action. You will have to play with both the MIC setting in FLRIG, and the output level setting for your sound mixer to get this right. You can work digital modes such as PSK31 very well with power levels of less than 25 watts output. Doing so does not stress your output finals too much and still gives you an effective signal out (unless your antenna system is awful.) At 25 watts output my rig shows about 13 amps for Ip.

When making these level selections make sure you press in and hold the rig's meter button for 1+ sec so that all the readings show at the same time.

Please note that the TUNE button on FLRIG does not work the same as the same as the tune button in FLDIGI. The tune button on FLRIG tells the 7600 to use its internal tuner to match to the antenna at the frequency selected. If you are already tuned then if will go on and off again very quickly with no time to adjust modulation level settings. The TUNE button on FLDIGI sends a continuous two tone signal at the maximum level, and is intended for setting the modulation levels - that is the one to use.

As I only use Linux on my rigs computer I have not been able to provide instructions for Windows users but they are essentially the same except as to how the serial port and audio ports are identified.

#### CAUTION

Last of all, always turn the 7600 on before starting FLRIG and FLDIGI, and always close the two programmes before turning off the 7600. If you do not do it in this fashion you may have to reset settings on starting up the programmes, and they will almost always hang on shutting down - at times necessitating a reboot in Windows.

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# TT550 - Pegasus

📷 flrig TT-550 🗖 📿 🗵
Files Config Memory 🕨 Debug Help
10140.000 14070.000
S3 S6 S9 +20 +40 +60 VfoA vfoB A -> B Split
1 3000 V DIGI
<b>Vol</b> 38
RF 100
[ IFsh 01
MIC 0
PWR 30
Att Spot NB AN Tune PTT
CW Vox Spch Audio RX TX 302-A 302-B
(24) (1.00) (20) (20) (15) Weight Delay S-T vol Spot Vol

Figure 28.1 FLRIG - TT550

FLRIG provides a full implementation of all TT550 control functions including the operation of the Model 302 remote keypad. The TT550 selection can also be used with the TT538, Jupiter. The Jupiter emulates all of the Pegasus commands.

All of the FLRIG "front panel" controls operate the same as for any other transceiver with a few exceptions. The Pegasus does not have any preamp control. So that button is converted for use as a spot control when the rig is in CW mode.

Select CW mode and then press the spot button. You should hear the sidetone (if not you may need to increase the Spot Vol ... see below). You can then adjust the B (BFO) control for the desired sidetone frequency.

The DIGI mode is unique to FLRIG and the TT550. The control commands available on the Pegasus allow the program to control the center frequency and the bandwidth for all of the DSP filters. The DIGI mode is designed to always place the center frequency of the filter at 1500 Hz. When FLRIG is used with FLDIGI this provides a very convenient and easy way to QSY to a received signal and then narrow down the filter. The Pegasus DSP filters are very well suited to digital mode operations.

🗌 I/O Ports 📃 🗙				
Primary PTT Aux Polling	Send Cmd Close Init <			
Rig: TT-550	Fldigi port: 7362			
Retries ( 1 )				
Retry intvl (ms) (2)	Ser. Port /dev/ttyS0			
Cmd Intvl (ms) (10)	Baud: 57600 💌			
qry intvl (ms): 📢 100 🕨	✓ 1			
● PTT via CAT ■ RTS/CT	S CI-V adr Default			
○PTT via RTS □RTS +1	2 V Ouch audio			
OPTT via DTR  ☑ DTR +1	2 v			

Figure 28.2 I/O Ports - Primary

Selecting the TT550 from the rig selection combo box should preset all of the interface controls. You should only need to select from the serial port combo. FLRIG will find all unused serial ports so be sure that the TT550 is not being accessed by another software when you start FLRIG.

It is necessary to press the Init button when you first set the program for use with a transceiver. Subsequent use should not require any action on the part of the operator.

The TT550 has it's own set up dialog for accessing those controls that are not routinely used. This dialog is opened by the "Config / Xcvr setup" menu.

### 28.1 Additional Control

Access to the additional controls is obtained by the down arrow button to the left of the Att control.

CW Vox Spch Audio RX TX 302-A 302-B	
(24) (1.00) (20) (20) (15) Keye	r

Figure 28.3 TT550 - CW

#### 28.1.1 CW

The internal keyer can be enabled and both the words/min and the weight of the keyer can be adjusted. The Pegasus is a QSK rig and you can adjust the QSK hold in milliseconds. You can adjust the keyer sidetone volume relative to the received audio. Set the control to zero if you do want to hear the sidetone. The Spot Vol control is associated with the Spot button on the front panel. This volume is also relative to the receiver volume control.

#### 28.1.2 VOX



Figure 28.4 TT550 - VOX

You can operate the Pegasus with manual SSB PTT or with Vox. The three Vox controls are controlled IAW the 550 manual.

#### 28.1.3 Speech



Figure 28.5 TT550 - Speech

You can monitor the SSB speech level (recommended only with headphones). The compression level is also adjustable and speech compression can be enabled or disabled as suited.

The Accessory socket line out level can be set to prevent overdriving of a terminal node controller or computer sound card interface. The front panel NB, noise blanker, control can be set for any level from NONE to

1. AGC can be set for slow, medium or fast. The transmitter can be disabled. Very useful if you do not want idle hands pressing the PTT switch. The Tloop (for amplifier) can be enabled and finally if your Pegasus has the built-in tuner it can be bypassed.

### 28.1.4 Audio

line out 🕴 80 🕨 🗹 Acc Inp.
U

Figure 28.6 TT550 - Audio

Audio can be either from the Mic connector or from the Accessory input (digital mode ops). The level of the line out on the remote connector can be controlled independent of the speaker.

#### 28.1.5 RX

🔺 🗌 Att 📄 🗌 Spot		Tune PTT
CW Vox Spch Au	dio RX T	X 302-A 302-B
4	med	
NB level	AGC	Vto Adj(ppm)

Figure 28.7 TT550 - Receive

The signal frequencies internal to the Pegasus are all derived from a single oscillator. That oscillator can be corrected for frequency error using the VFO adjustment control.

#### 28.1.6 TX

CW Vox Spch Audio RX TX	302-A 302-B
✓Tx ON □Tloop □Tuner	3000 Vmt BW
	Ante BW

Figure 28.8 TT550 - Transmit

The signal frequencies internal to the Pegasus are all derived from a single oscillator. That oscillator can be corrected for frequency error using the VFO adjustment control.

#### 28.1.7 302A

CW Vox Spch Audio	RX TX 302-A	302-B
	<b>(</b> 4 <b>)</b>	10 🖨
Time out	Sensitivity	Step size

Figure 28.9 TT550 - 302A

302 Keypad Accessory If you have the 302 keypad you can set various parameters to adjust it's performance. The function keys can be assigned on of several response functions:

None
Clear
CW++
CW Assian
Band++
Band
Step++
Step

Both the Pegasus and the Jupiter can be controlled with the Model 302 key pad / encoder.

As you enter keypad values from the keypad they will appear in an entry box at the upper right of the main dialog. These are used for entering a frequency in kHz (i.e. 14.070 MHz is entered as 14070.000). You can abort the input by pressing the decimal value twice in succession.

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# **Prefs file contents**

#### A typical transceiver prefs file contains:

```
; FLTK preferences file format 1.0
; vendor: w1hkj.com
; application: IC-7100
[.]
version:1.3.49.06
mainx:526
mainy:24
mainw:735
mainh:150
uisize:0
xcvr_serial_port:/dev/serial/by-id/usb-Silicon_Labs_CP2102_USB_to_UART_Bridge
+_Controller_IC-7100_02010930_A-if00-port0
comm_baudrate:6
comm_stopbits:2
comm_retries:2
comm_wait:50
comm_timeout:50
serloop_timing:200
byte_interval:0
comm_echo:1
ptt_via_cat:1
ptt_via_rts:0
ptt_via_dtr:0
rts_cts_flow:0
rts_plus:1
dtr_plus:1
civadr:0
usbaudio:0
aux_serial_port:NONE
aux_rts:0
aux_dtr:0
sep_serial_port:NONE
sep_rtsptt:0
sep_dtrptt:0
sep_rtsplus:0
set_dtrplus:0
poll_smeter:1
poll_frequency:1
poll_mode:1
poll_bandwidth:1
```

poll\_volume:4 poll\_auto\_notch:4 poll\_notch:4 poll\_ifshift:4 poll\_power\_control:4 poll\_pre\_att:4 poll\_micgain:4 poll\_squelch:4 poll\_rfgain:4 poll\_pout:1 poll\_swr:1 poll\_alc:1 poll\_split:4 poll\_noise:4 poll\_nr:4 poll\_compression:4 poll\_all:1 bw\_A:34 mode\_A:11 freq\_A:7070000 bw\_B:34 mode\_B:1 freq\_B:14100000 +-1 -1 -1 -1 -1 -1 -1 -1 use\_rig\_data:0 restore\_frequency:1 restore\_mode:1 restore\_bandwidth:1 restore\_volume:1 restore\_mic\_gain:1 restore\_rf\_gain:1 restore\_power\_control:1 restore\_if\_shift:1 restore\_notch:1 restore\_auto\_notch:1 restore\_noise:1 restore\_squelch:1 restore\_split:1 restore\_pre\_att:1 restore\_nr:1 restore\_comp\_on\_off:1 restore\_comp\_level:1 bool\_spkr\_on:1 int\_volume:13 dbl\_power:100 int\_mic:50 bool\_notch:0 int\_notch:0 bool\_shift:0 int\_shift:0 pbt\_lock:0 pbt\_inner:0 pbt\_outer:0 rfgain:100 squelch:0 no\_txqsy:0 schema:0 rx\_avg:5 rx\_peak:5 pwr\_avg:5 pwr\_peak:5

pwr\_scale:2 digi\_sel\_on\_off:0 digi\_sel\_val:0 dual\_watch:0 ic7610att:6 ft950\_rg\_reverse:1 line\_out:0 data\_port:0 vox\_on\_dataport:1 agc\_level:1 cw\_wpm:24 cw\_weight:3 cw\_vol:0 cw\_spot:0 spot\_onoff:0 cw\_spot\_tone:600 cw\_qsk:15 cw\_delay:200 enable\_keyer:0 break\_in:0 vox\_onoff:0 vox\_gain:10 vox\_anti:10 vox\_hang:100 compression:0 compON:0 noise\_reduction:0 noise\_red\_val:4 nb\_level:50 bool\_noise:0 int\_preamp:0 int\_att:0 vfo\_adj:46 bfo\_freq:600 rit\_freq:0 xit\_freq:0 bpf\_center:1500 use\_bpf\_center:1 label1:cmd 1 command1: shftcmd1: label2:cmd 2 command2: label3:cmd 3 command3: shftcmd3: label4:cmd 4 command4: shftcmd4: label5:cmd 5 command5: shftcmd5: label6:cmd 6 command6: shftcmd6: label7:cmd 7 command7: shftcmd7: label8:cmd 8 command8: shftcmd8: label9:cmd 9 command9:

shftcmd9: label10:cmd 10 command10: shftcmd10: label11:cmd 11 command11: shftcmd11: label12:cmd 12 command12: shftcmd12: label13:cmd 13 command13: shftcmd13: label14:cmd 14 command14: shftcmd14: label15:cmd 15 command15: shftcmd15: label16:cmd 16 command16: shftcmd16: fg\_red:0 fg\_green:0 fg\_blue:0 bg\_red:232 bg\_green:255 bg\_blue:232 smeter\_red:0 smeter\_green:180 smeter\_blue:0 power\_red:180 power\_green:0 power\_blue:0 swr\_red:148 swr\_green:0 swr\_blue:148 peak\_red:255 peak\_green:0 peak\_blue:0 fg\_sys\_red:0 fg\_sys\_green:0 fg\_sys\_blue:0 bg\_sys\_red:192 bg\_sys\_green:192 bg\_sys\_blue:192 bg2\_sys\_red:255 bg2\_sys\_green:255 bg2\_sys\_blue:255 slider\_red:232 slider\_green:255 slider\_blue:232 slider\_btn\_red:0 slider\_btn\_green:0 slider\_btn\_blue:128 lighted\_btn\_red:255 lighted\_btn\_green:255 lighted\_btn\_blue:0 fontnbr:4 tooltips:0 ui\_scheme:gtk+ tcpip\_port:4001 tcpip\_addr:127.0.0.1

```
tcpip_ping_delay:50
tcpip_tcpip_reconnect_after:10
tcpip_drops_allowed:10
use_tcpip:0
xcvr_auto_on:0
xcvr_auto_off:0
external_tuner:0
trace:0
rigtrace:0
gettrace:0
settrace:1
debugtrace:0
xmltrace:0
rpctrace:0
startstoptrace:0
rpc_level:0
f160:1805000
m160:6
txT160:0
rxT160:0
offset_160:0
oF_160:600
f80:3580000
m80:6
txT80:0
rxT80:0
offset_80:0
oF_80:600
f40:7070000
m40:6
txT40:0
rxT40:0
offset_40:0
oF_40:600
f30:10140000
m30:6
txT30:0
rxT30:0
offset_30:0
oF_30:600
f20:14070000
m20:6
txT20:0
rxT20:0
offset_20:0
oF_20:600
f17:18100000
m17:6
txT17:0
rxT17:0
offset_17:0
oF_17:600
f15:21070000
m15:6
txT15:0
rxT15:0
offset_15:0
oF_15:600
f12:24920000
m12:6
txT12:0
rxT12:0
offset_12:0
```

oF\_12:600 f10:28070000 m10:6 txT10:0 rxT10:0 offset\_10:0 oF\_10:600 f6:50070000 m6:6 txT6:0 rxT\_6:0 offset\_6:0 oF\_6:600 f2:144070000 m2:6 txT2:0 rxT2:0 offset\_2:0 oF\_2:600 f70:432100000 m70:6 txT70:0 rxT70:0 offset\_70:0 oF\_70:600 hrd\_buttons:1 sliders\_button:1 cwioWPM:20 cwioKEYLINE:2 cwioSHARED:0 cwioPORT: cwiolabel[0]: cwiomessage[0]: cwiolabel[1]: cwiomessage[1]: cwiolabel[2]: cwiomessage[2]: cwiolabel[3]: cwiomessage[3]: cwiolabel[4]: cwiomessage[4]: cwiolabel[5]: cwiomessage[5]: cwiolabel[6]: cwiomessage[6]: cwiolabel[7]: cwiomessage[7]: cwiolabel[8]: cwiomessage[8]: cwiolabel[9]: cwiomessage[9]: cwiolabel[10]: cwiomessage[10]: cwiolabel[11]: cwiomessage[11]: