

Education Committee
Montgomery Amateur Radio Club
Rockville, Maryland

Getting Started with Digital Modes on HF

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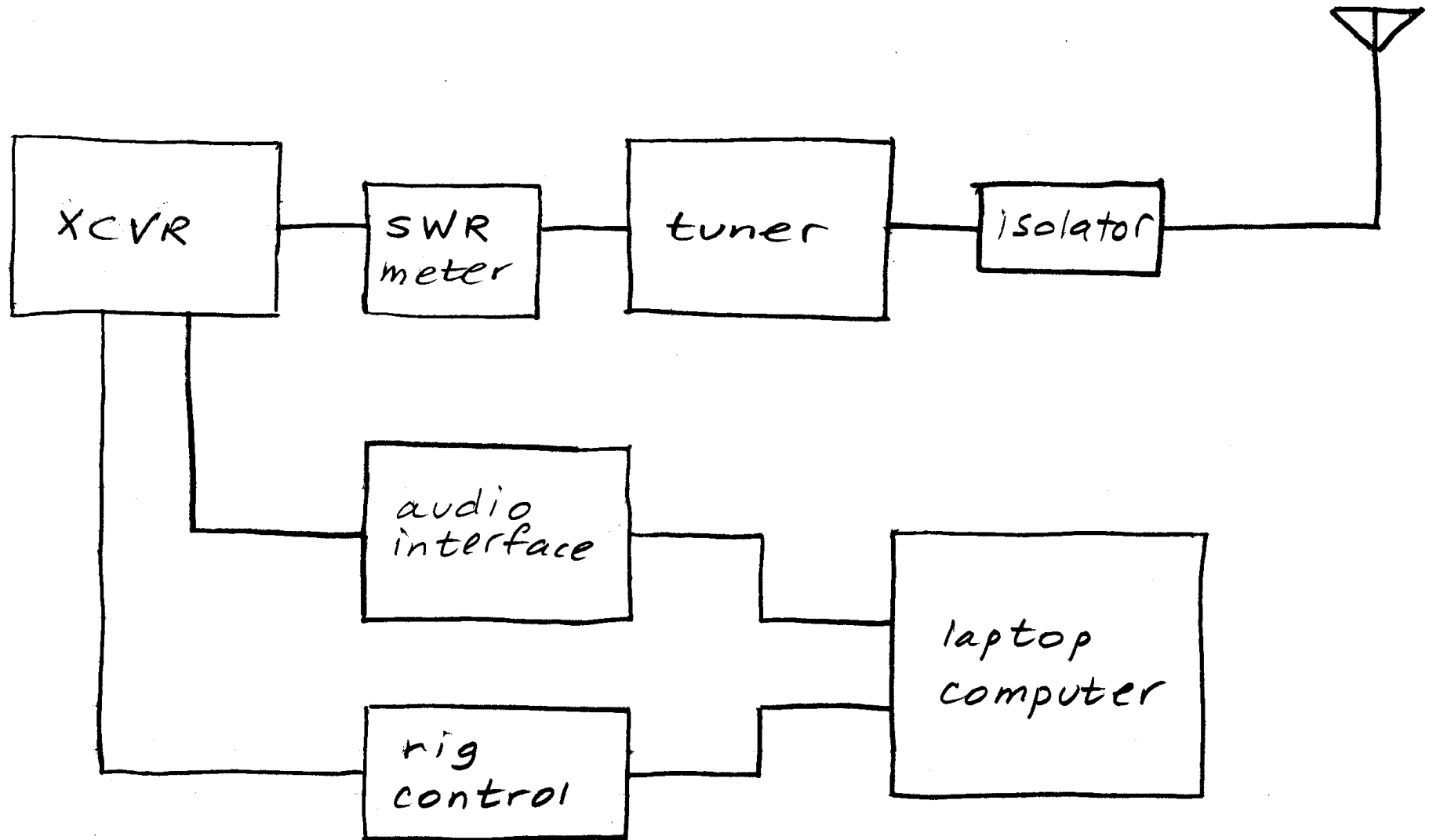
October 21, 2015

introduction

The goal of this presentation is to help get you started with digital modes on HF.

- station equipment
 - transceiver
 - computer to radio sound interface
 - rig control cable
- setting up a transceiver
- setting up a sound interface
- setting up a rig control cable
- setting up a digital modes program
- operating digital modes program

station equipment



station equipment

- transceivers
 - Yaesu FT-857D
 - Icom IC-706MKIIG
- SWR meter – MFJ-860
- automatic antenna tuner
 - LDG Z-100Plus 100 W tuner – generic
 - LDG tuning cables for Tune button
 - Y-ACC – for FT-857D
 - IC-2 – for 706MKIIG
- line isolator – Radio Works T-4-500
- dummy load – MFJ-260C
- antenna

station equipment

- sound interface – Tigertronics Signalink™ USB
 - has built-in VOX
 - 6 pin mini-DIN data cable – SLCAB6PM
 - matching jumper module – SLMOD6PM



- rig control cable – Valley Enterprises
 - USB CT-62 FTDI – for FT-857D
 - USB CT-17 FTDI – for IC-706MKIIG

software

- operating systems:
 - Windows 7
 - Ubuntu Linux 14.04 LTS – W2LNX
- digital modes programs:
 - fldigi – W2LNX
 - JT65-HF – K3RRR
 - Ham Radio Deluxe – WA3SWJ

set up transceiver

- FT-857D
 - set menu items:
 - 019 CAT RATE: 9600 bps
 - 020 CAT/LIN/TUN: CAT
 - 038 DIG MODE: PSK31-U
 - 075 RF POWER SET: 100 or 10 for QRP
 - 085 TUNER/ATAS: OFF
 - set transceiver MODE: DIG, not USB
 - select display: MFi
 - set button B: MTR ALC DISP

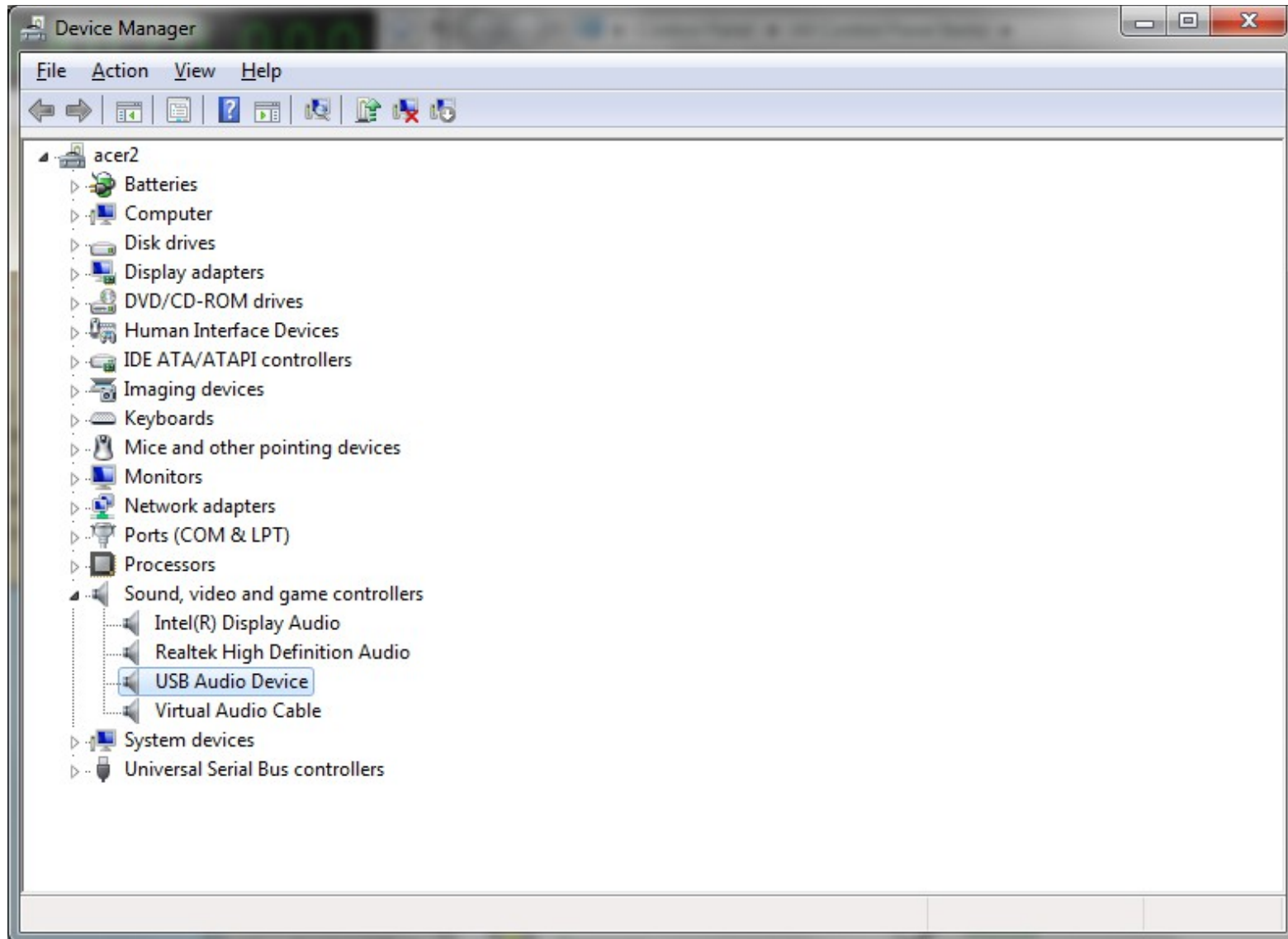


set up transceiver

- IC-706MKIIG
 - Initial set mode:
 - 29 9600 MODE: 1200
 - 35 CI-V BAUD: 19200
 - Quick set mode:
 - Q1 RF POWER: H or 1 for QRP
 - set transceiver mode: USB

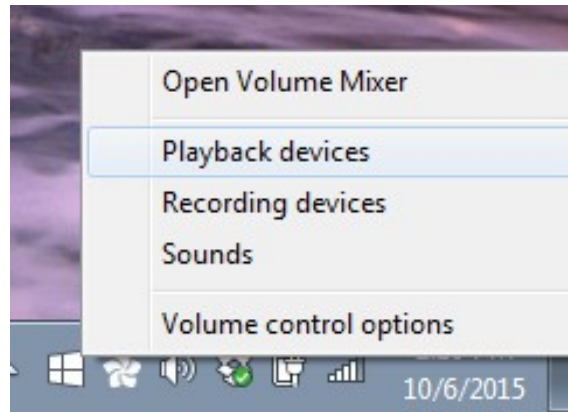
Windows: Control Panel

- Device Manager: look for USB Audio Device



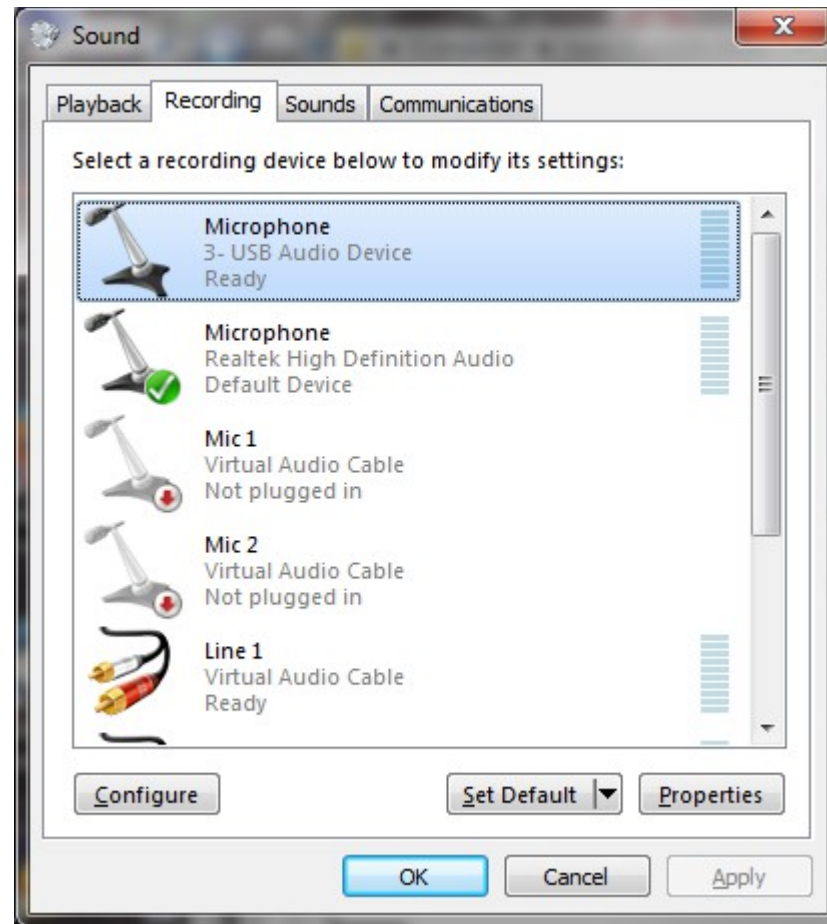
Windows: setting audio input

- right click on speaker icon – select Recording devices



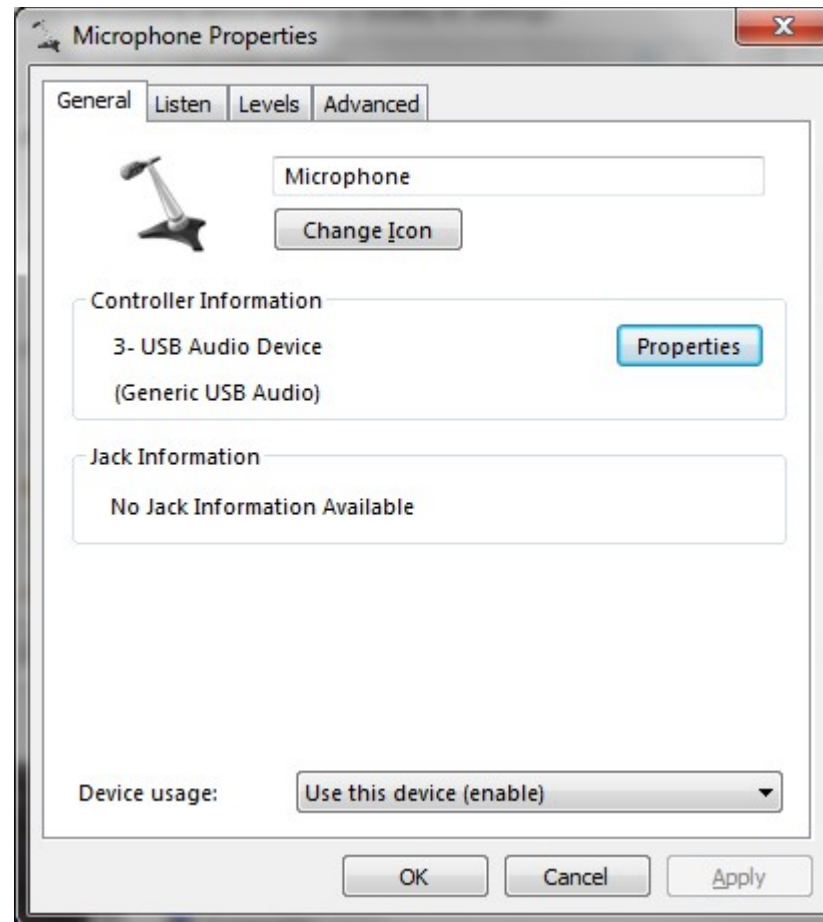
Windows: setting audio input

- select Microphone USB Audio Device – click Properties



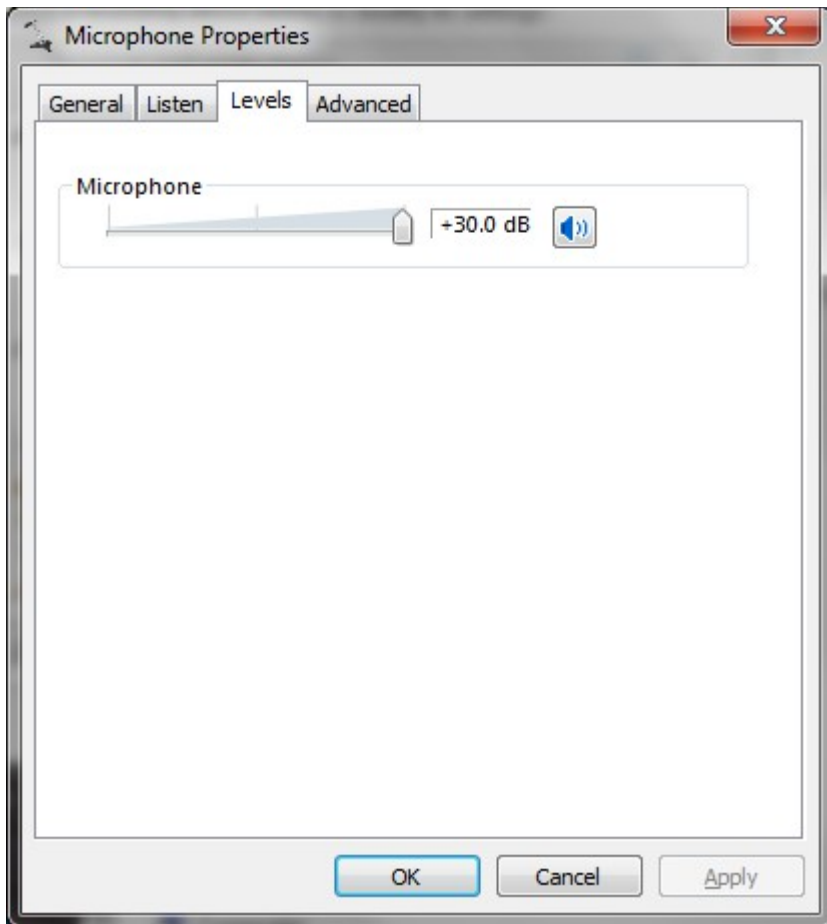
Windows: setting audio input

- click Levels tab

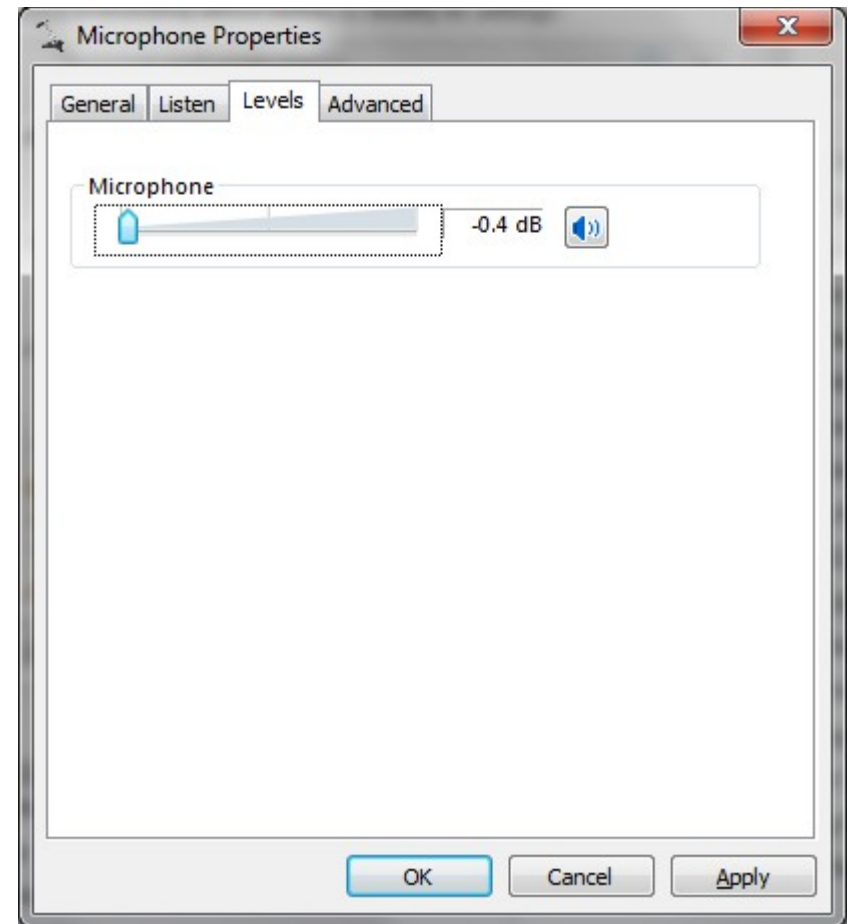


Windows: setting audio input

- select appropriate microphone gain



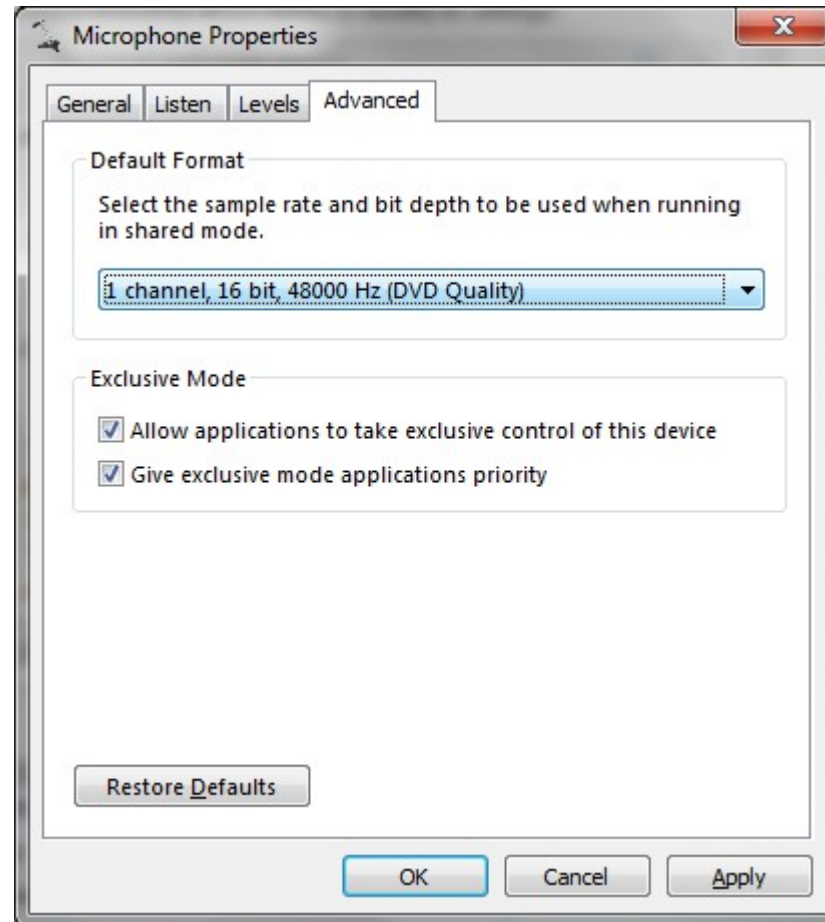
too high



better

Windows: setting audio input

- click Advanced tab – select mono 48000 Hz



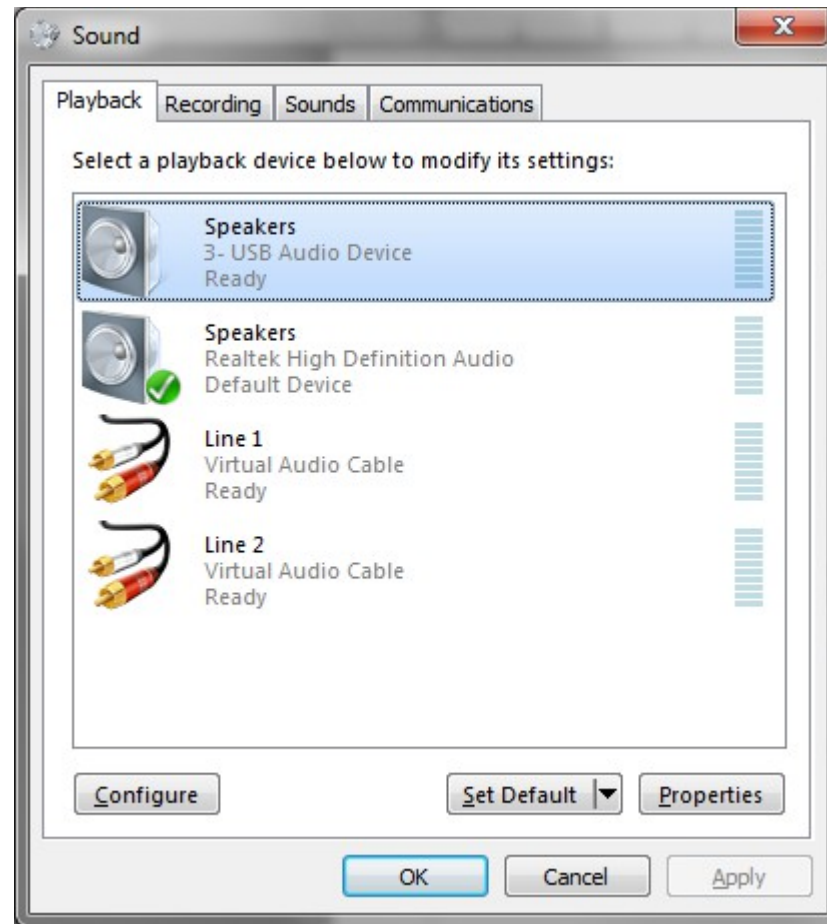
Windows: setting audio output

- right click on speaker icon – select Playback devices



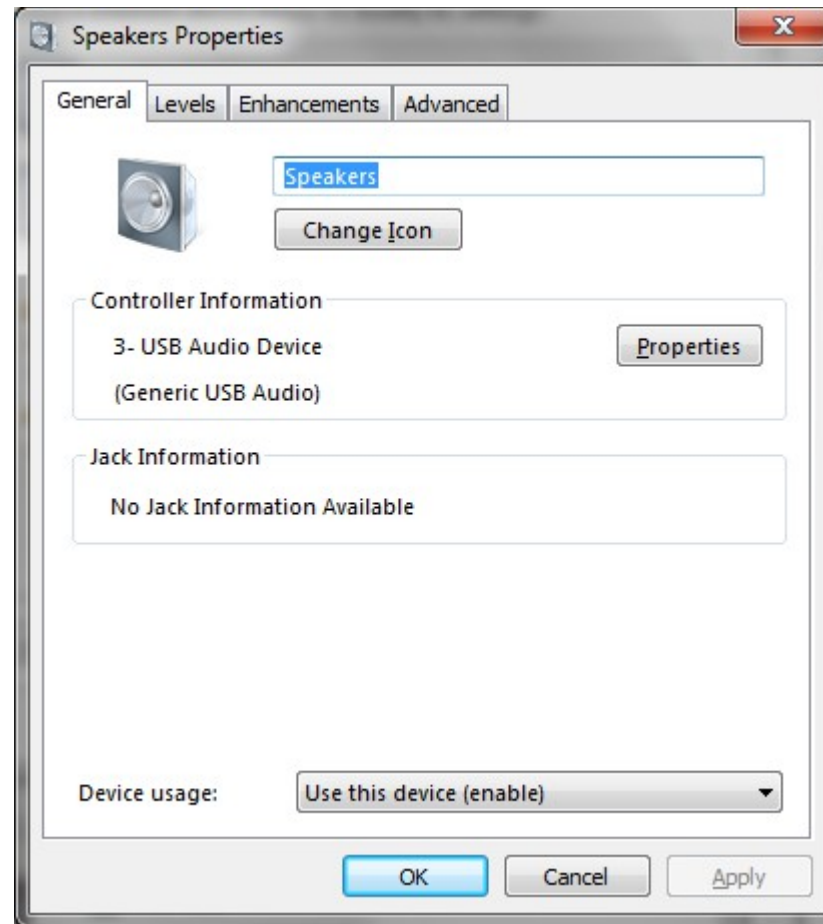
Windows: setting audio output

- select Speakers USB Audio Device – click Properties



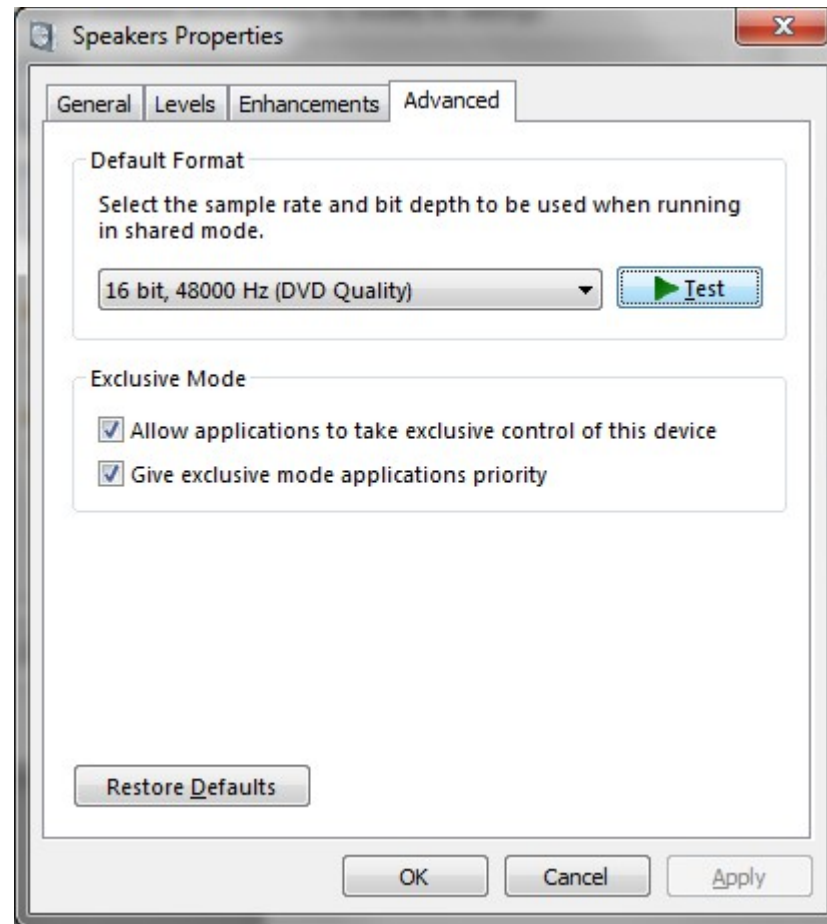
Windows: setting audio output

- click Advanced tab



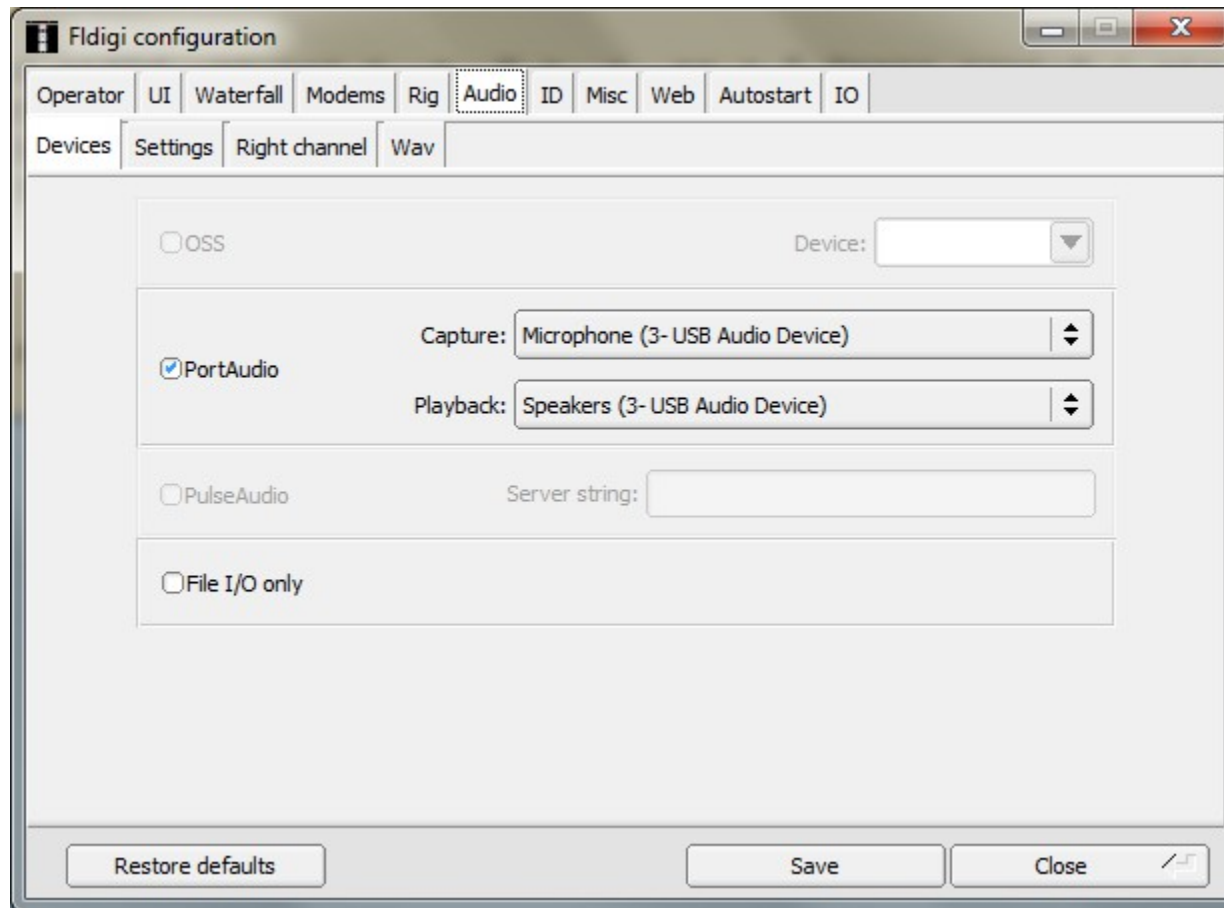
Windows: setting audio output

- select mono 48000 Hz



fldigi: setting sound input/output

- in Configure menu – select Sound Card



fldigi: setting sound output level

- set audio output to appropriate level

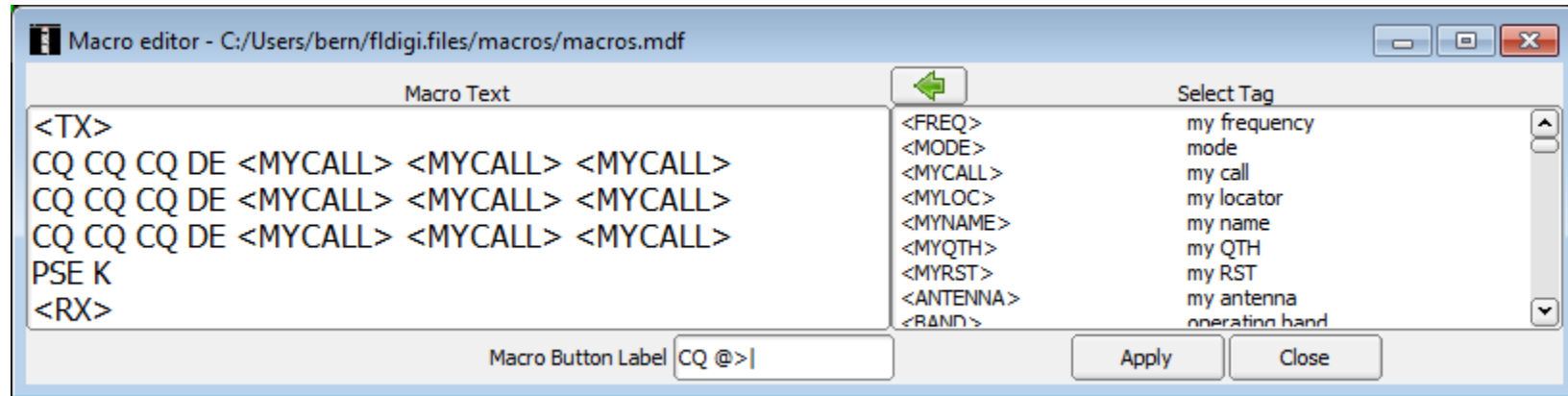


transceiver: set audio drive

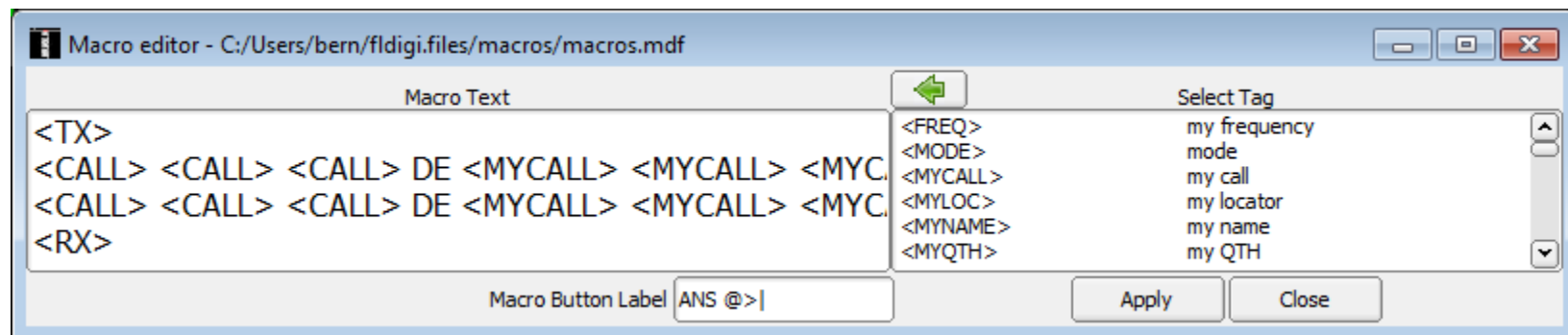
- transmit PSK31 test message – click on CQ macro
 - use dummy load
 - set TX on Signalink to just before ALC indication
 - SWR power meter should
 - be about half RF power setting
 - wiggle slightly for PSK31

fldigi: setting macros

- right click on CQ button

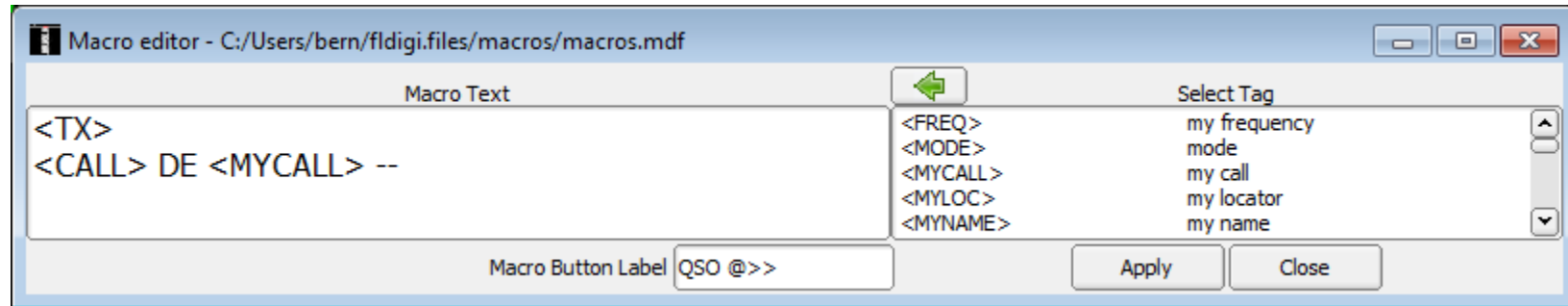


- right click on ANS button

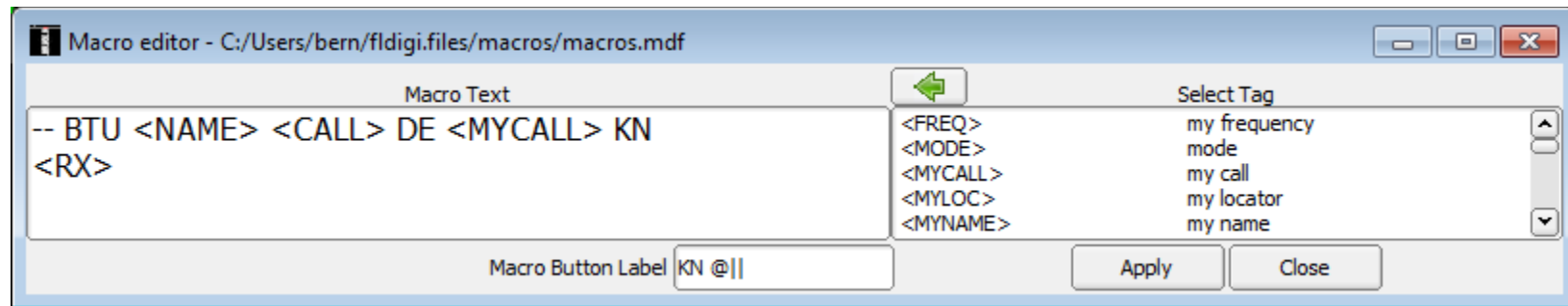


fldigi: setting macros

- right click on QSO button

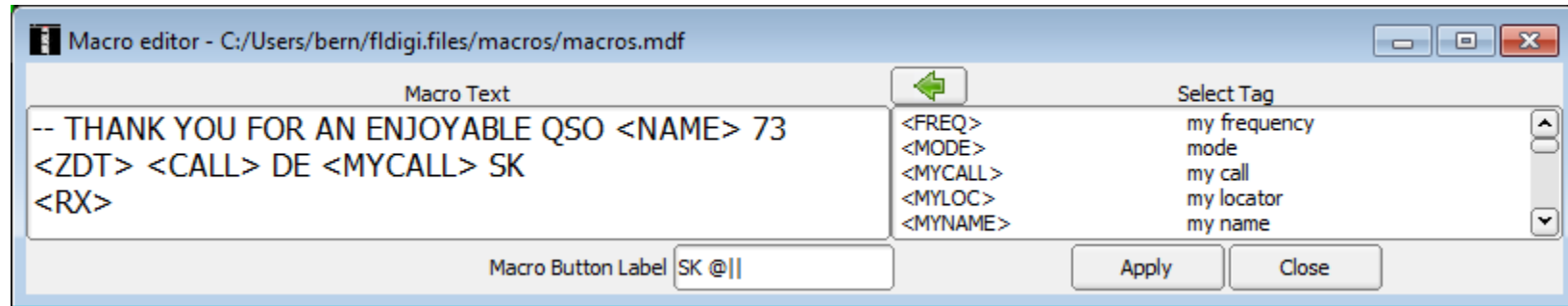


- right click on KN button



fldigi: setting macros

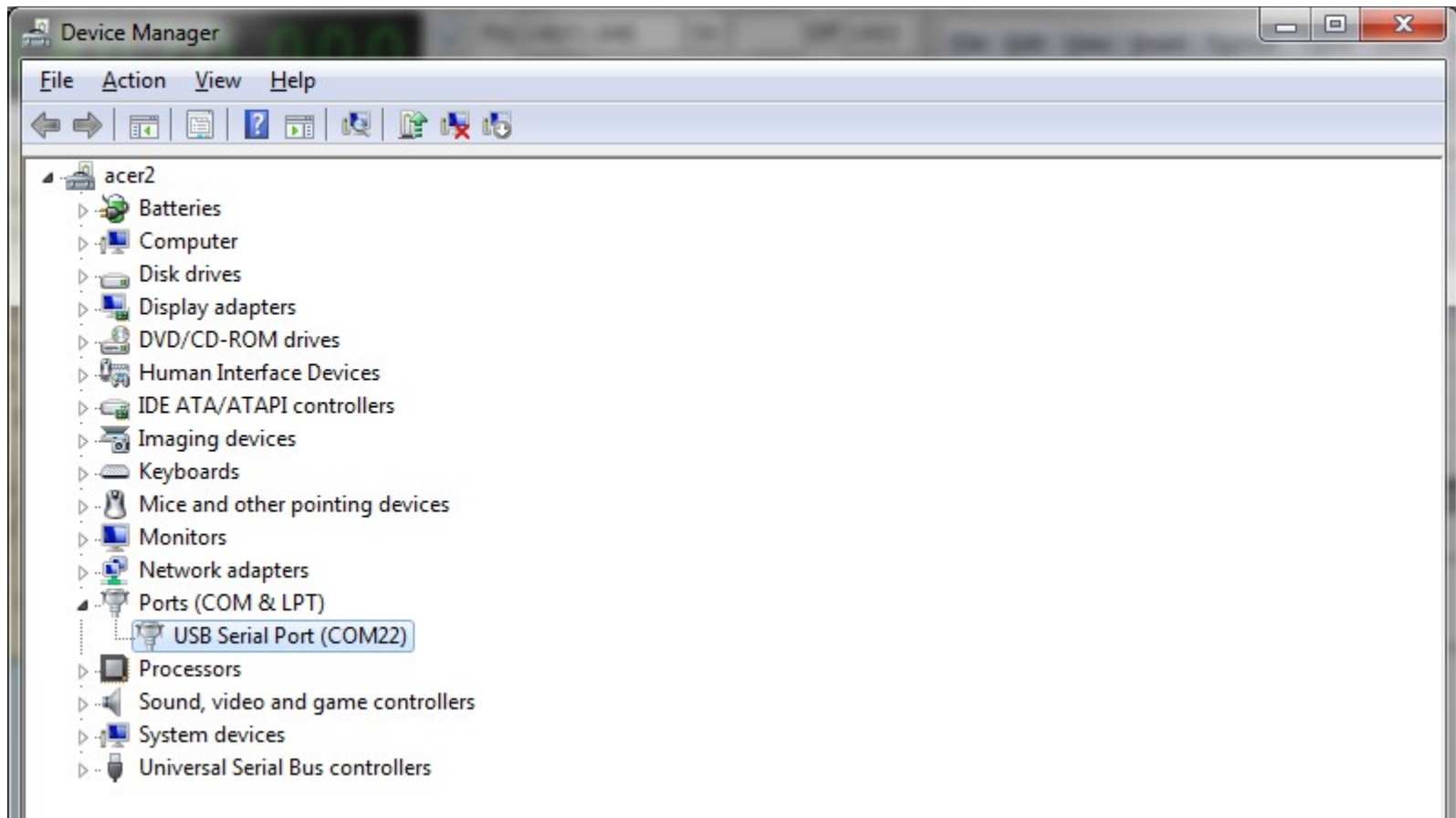
- right click on SK button



- macros correspond to keyboard function keys

Windows: setting rig control

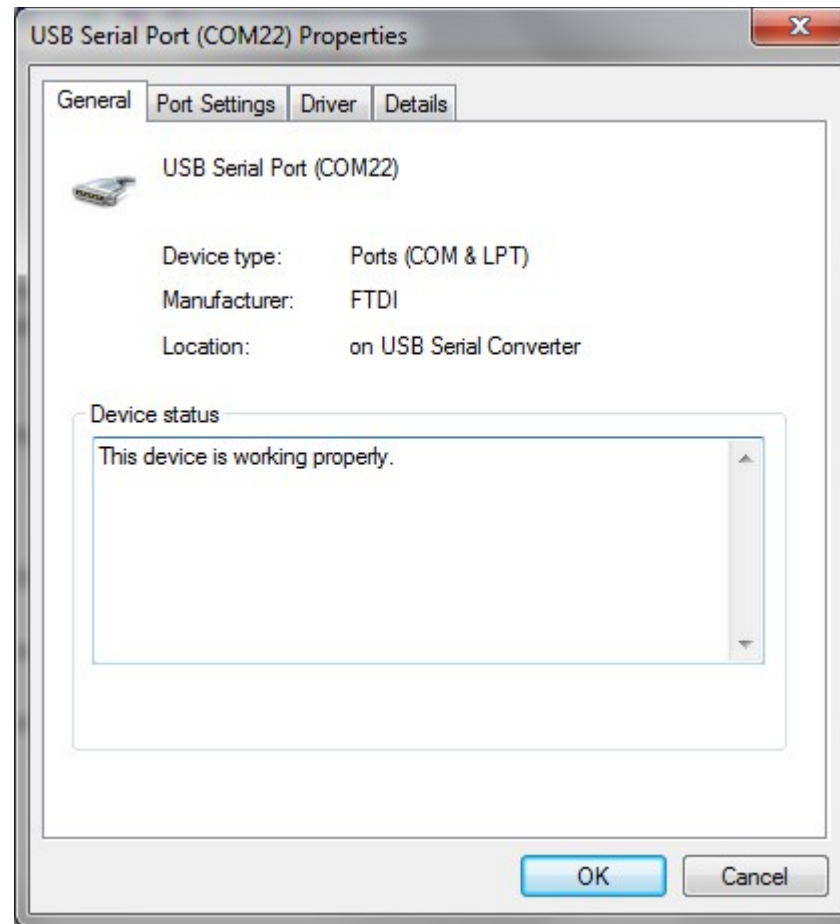
- open Control Panel – open Device Manager – look for USB Serial Port – note COM port



- rig control – a convenience but not necessary

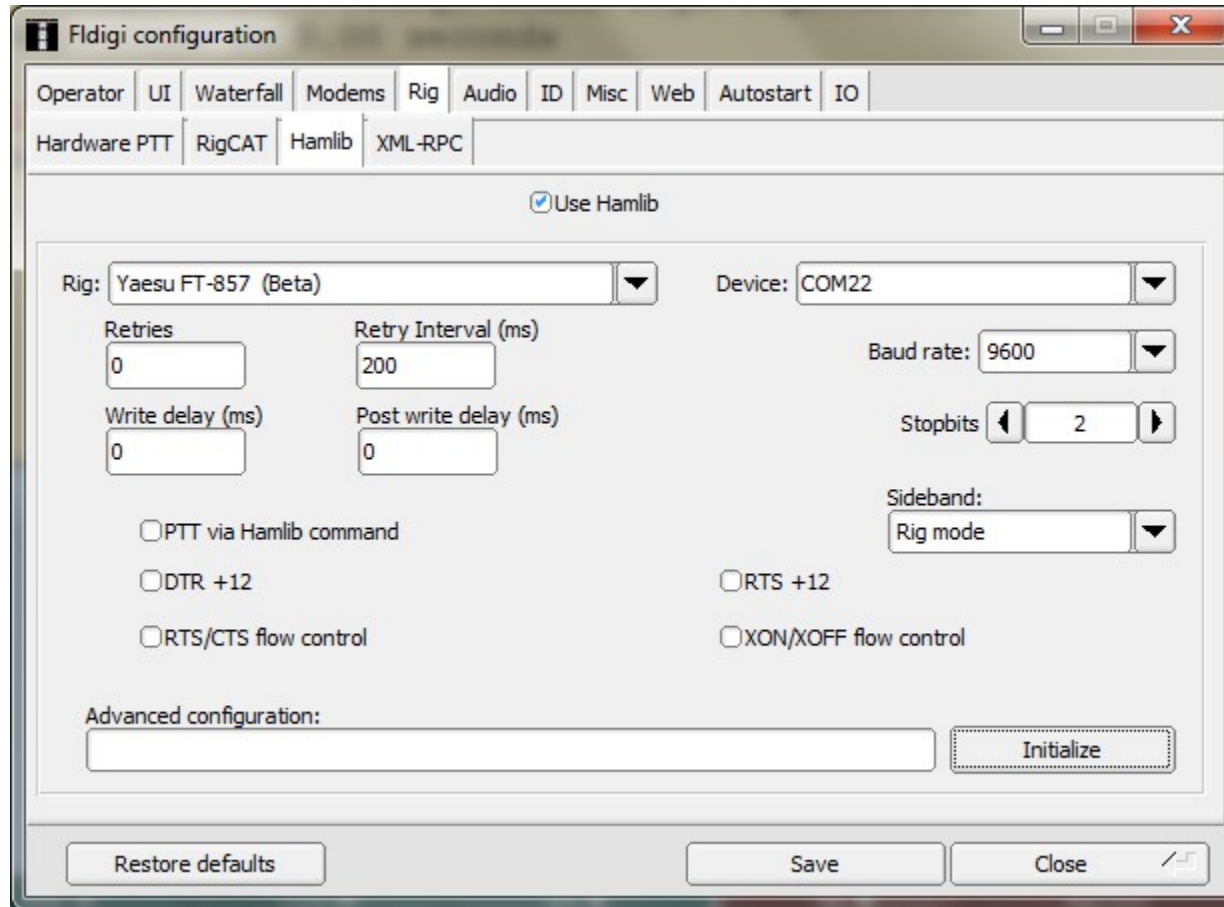
Windows: setting rig control

- right click Properties – note Manufacturer: FTDI



fldigi: setting rig control

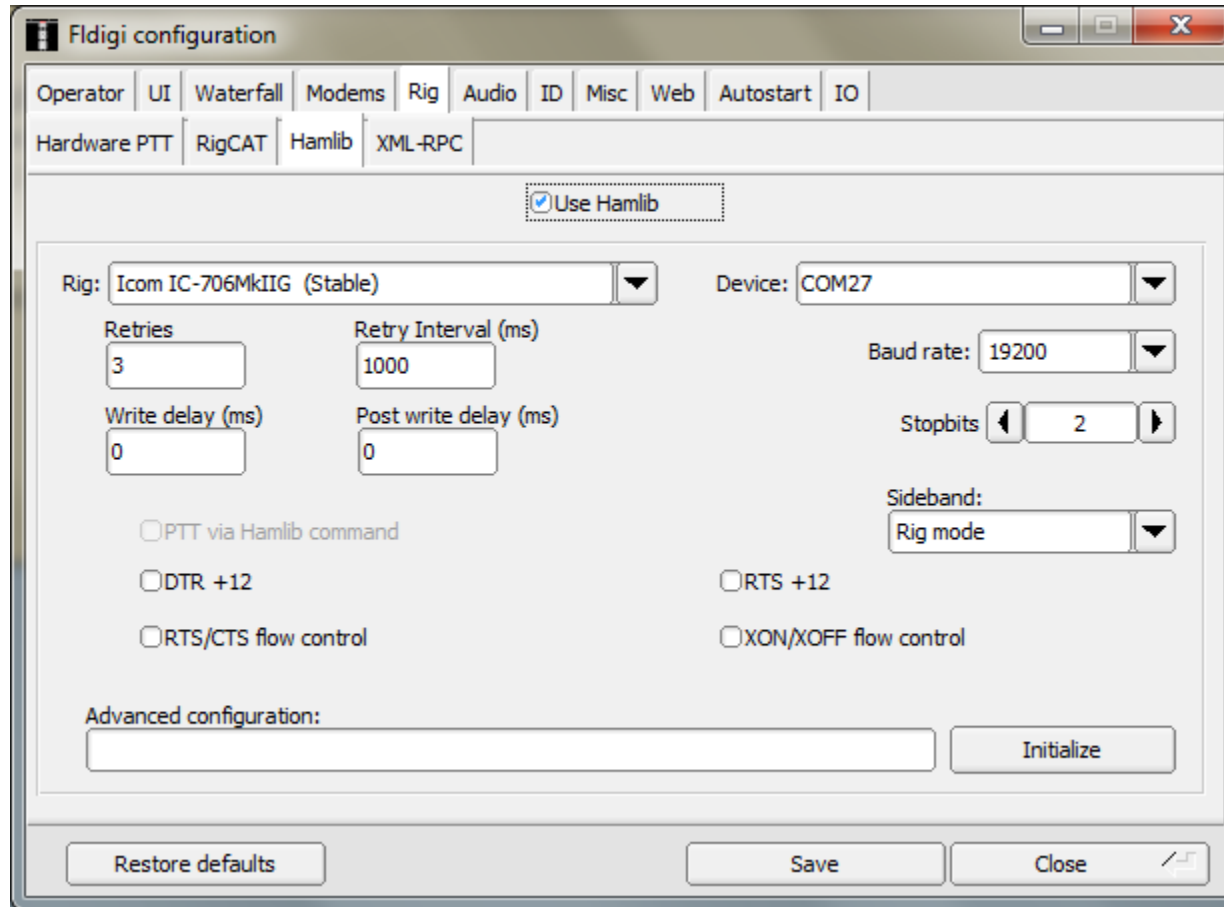
- Configure menu – select Rig control – for FT-857



- click Initialize – red and green LEDs on CT-62 cable should be rapidly blinking

fldigi: setting rig control

- Configure menu – select Rig control – for IC-706MKIIG



- click Initialize – red and green LEDs on CT-17 cable should be rapidly blinking

fldigi: rig control

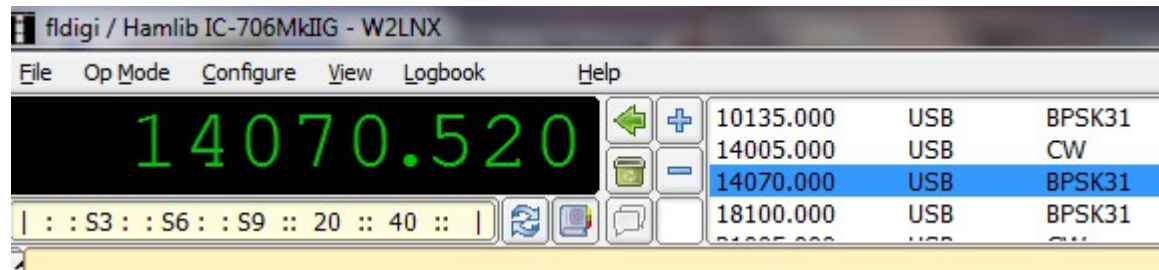
- turning tuning knob on radio should change displayed frequency



- changing frequency with mouse should change frequency display on radio

fldigi: rig control

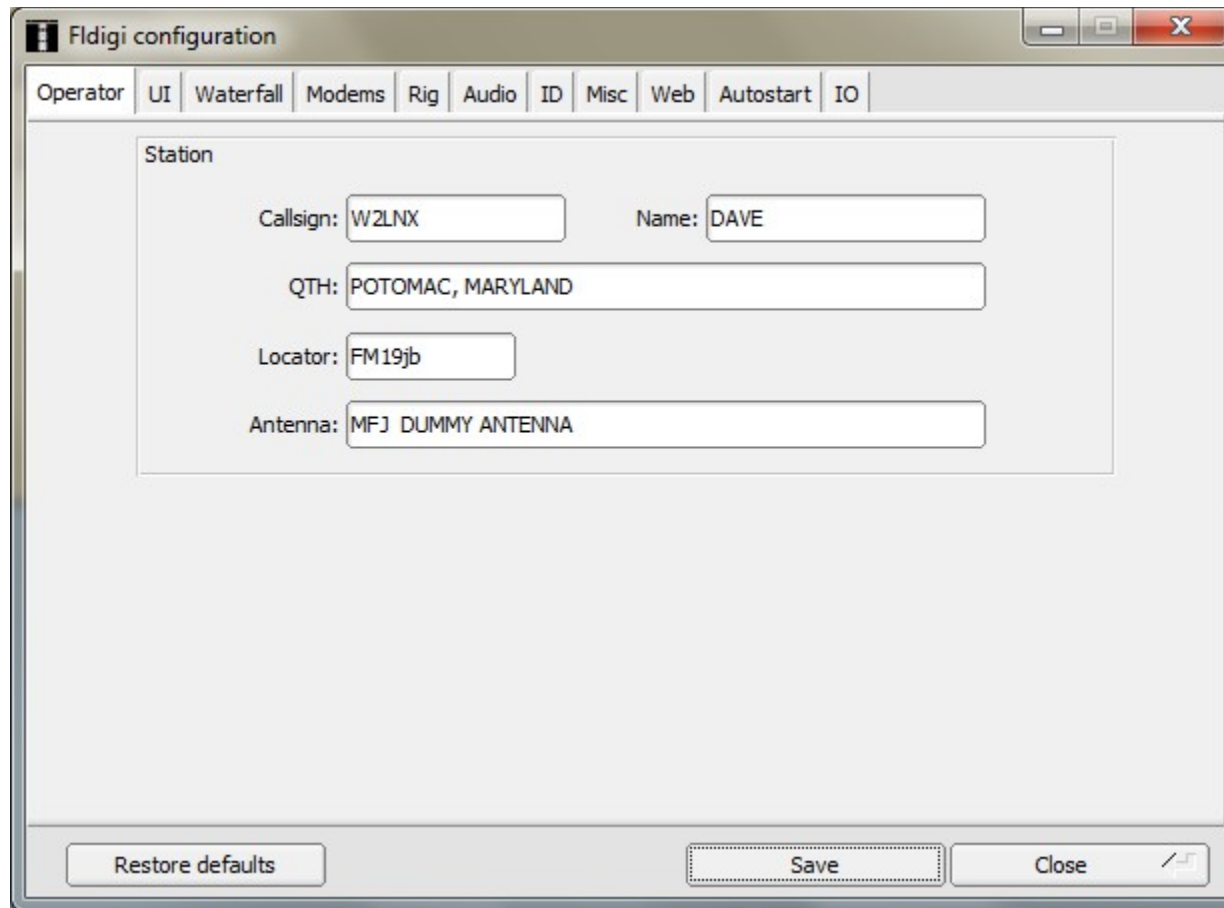
- can change bands and transceiver operating modes



- FT-857D quirk – reset transceiver MODE: DIG

fldigi: setting user interface

- in Configure menu – select Operator – fill in details



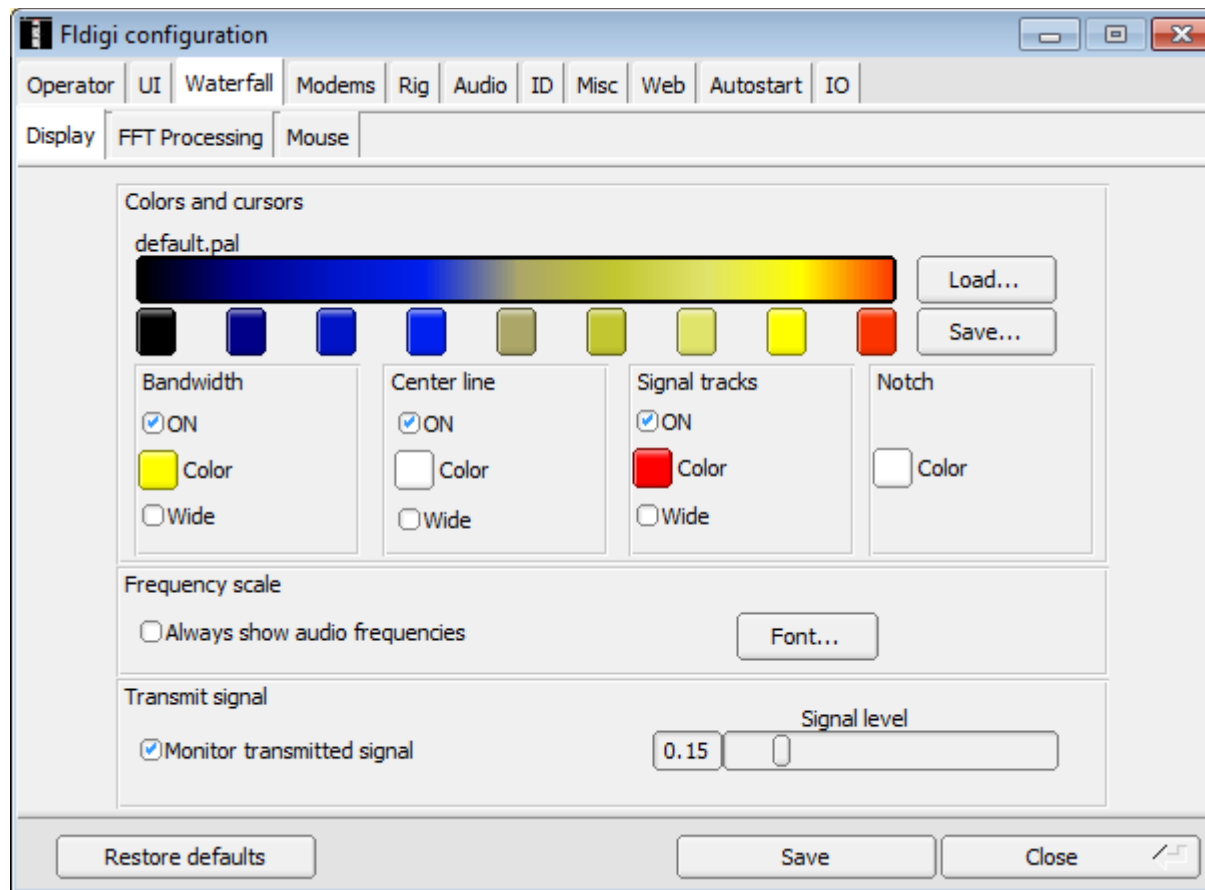
The screenshot shows the 'Fldigi configuration' window with the 'Operator' tab selected. The window contains a 'Station' section with the following fields:

Call sign:	W2LNX	Name:	DAVE
QTH:	POTOMAC, MARYLAND		
Locator:	FM19jb		
Antenna:	MFJ DUMMY ANTENNA		

At the bottom of the window, there are three buttons: 'Restore defaults', 'Save', and 'Close'.

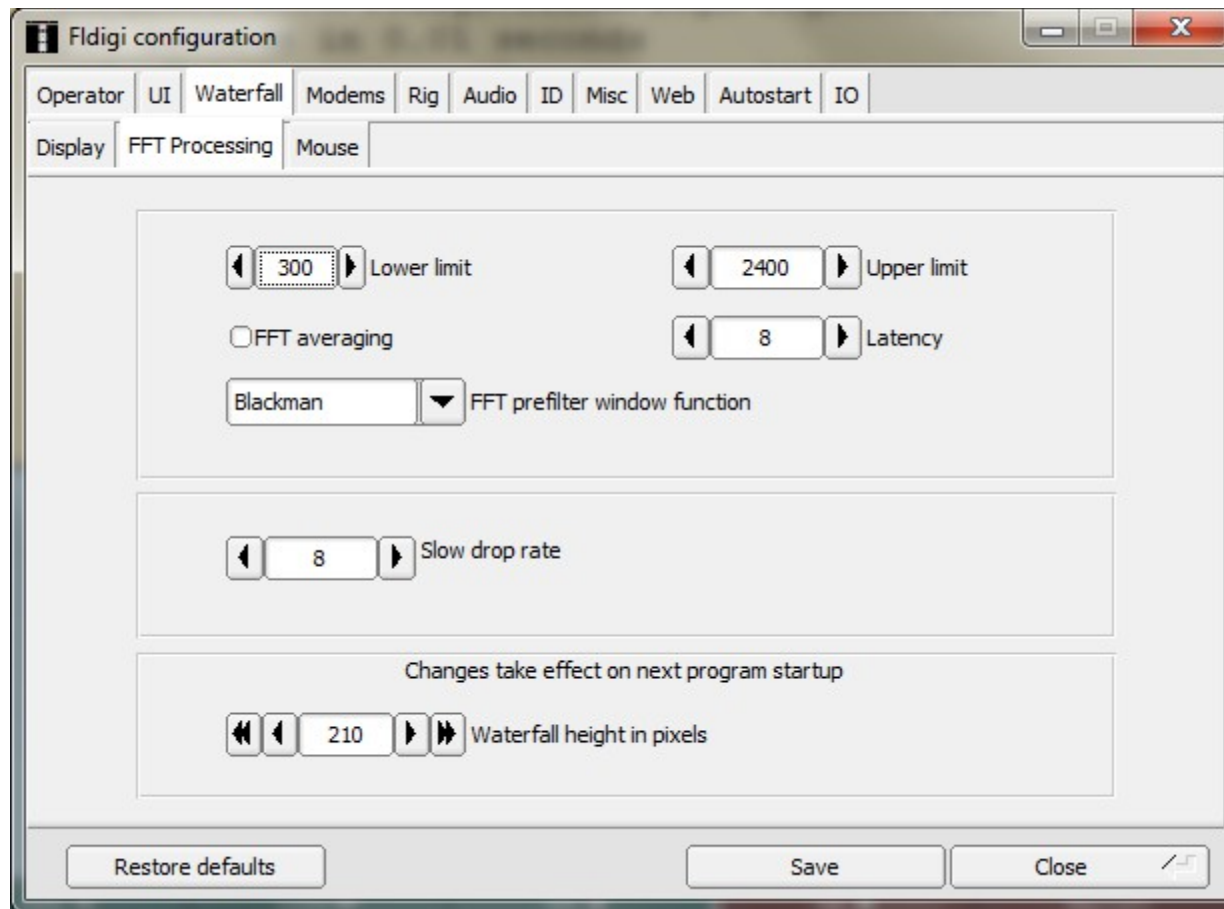
fldigi: setting user interface

- in Configure menu – select Waterfall – Display tab – click Monitor transmitted signal



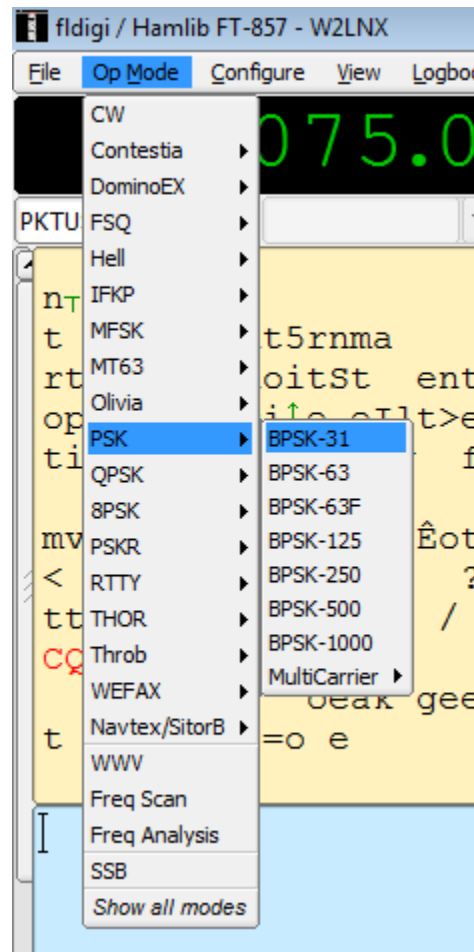
fldigi: setting user interface

- in Configure menu – select Waterfall – FFT Processing tab – set waterfall height in pixel



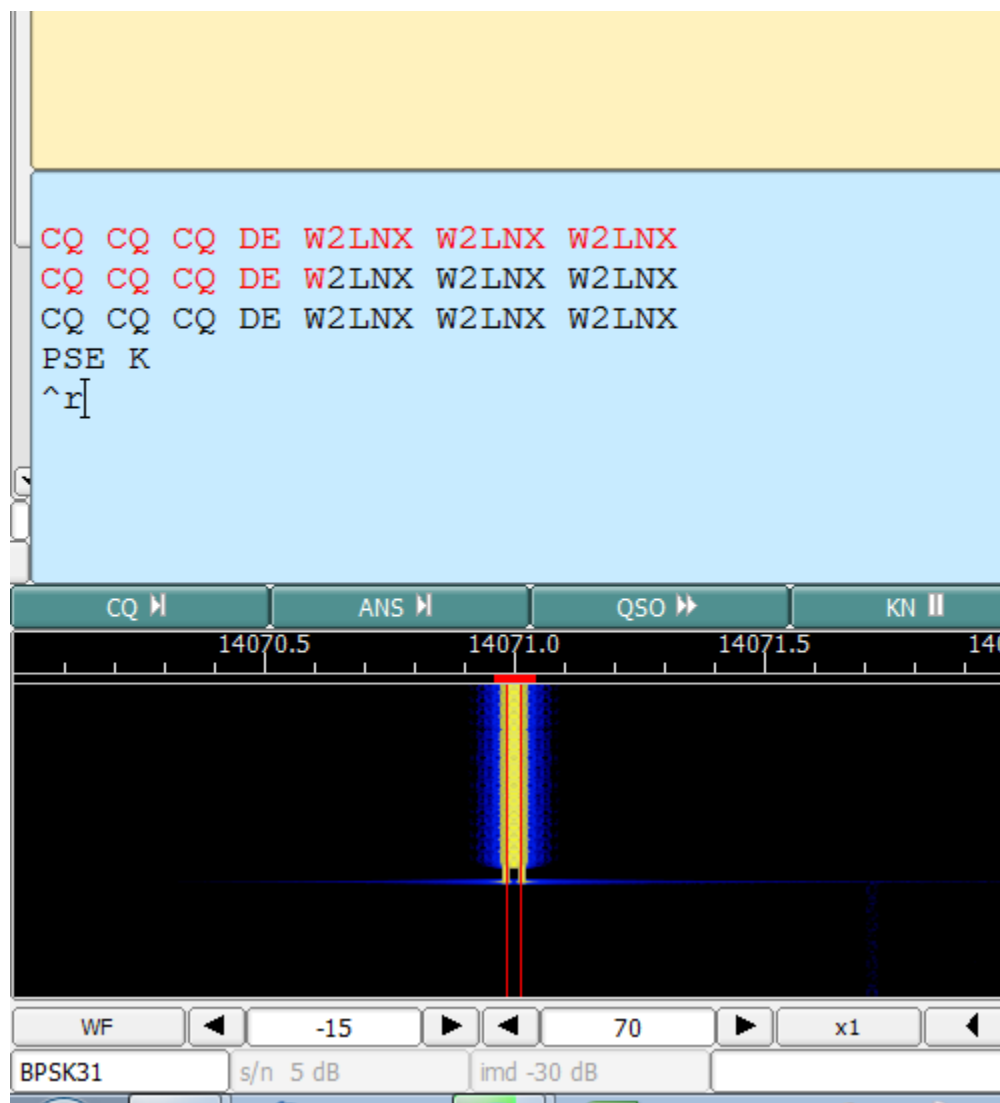
fldigi: using program

- in Op Mode menu – select PSK31



fldigi: using program

- demonstration – PSK31 QSO



conclusions

- this presentation should help get you started with digital modes on HF
 - configuration for two popular transceivers
 - Signalink USB makes it easy to get on digital modes
- PSK31 is a popular low RF power digital mode
 - combines the spectrum efficiency of CW with the convenience of using a computer
- fldigi is a well supported digital modes program
- digital modes on HF are fun!

thank you

- Chris Sylvain, KB3CS for helping me get started with fldigi and sound interfaces

Questions



education@marcclub.org

presentation resources

fldigi:

<http://www.w1hkj.com>

<http://sourceforge.net/projects/fldigi/files/fldigi>

<https://launchpad.net/~kamalmostafa/+archive/ubuntu/fldigi>

Signalink:

<http://www.tigertronics.com/slusbmain.htm>

<http://shop.tigertronics.com/Extra-Radio-Cable-p-n-SLCAB6PM-SLCAB6PM.htm>

<http://shop.tigertronics.com/Plug-Play-Jumper-Module-p-n-SLMOD6PM-SLMOD6PM.htm>

rig control cables:

<http://www.valley-ent.com/catalog/valley-enterprises/rpc-y857/yaesu-usb-ftdi-ct-62-cat-cable-ft-100-ft-817-ft-857-ft-897-p-225.html#.VhQT25egwg4>

<http://www.valley-ent.com/catalog/valley-enterprises/rpc-i17/icom-ct-17-usb-ftdi-chipset-ci-cat-control-programming-cable-feet-p-177.html#.VhL6kZegwg4>

<http://www.ftdichip.com/Drivers/VCP.htm>

antenna tuners:

<http://www.ldgelectronics.com/c/252/products/17/49/1>

presentation resources

SWR/wattmeter:

<http://www.mfjenterprises.com/Product.php?productid=MFJ-860>

line isolator:

<http://www.radioworks.com/ct-4.html>

dummy load antenna:

<http://www.mfjenterprises.com/Product.php?productid=MFJ-260C>