



Using Waterfall Displays As a Contesting Advantage

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Presentation Overview

- Legacy “Panadapters”
- CW Skimmer’s SDR waterfall
- Current radios with waterfall displays
- Waterfall display advantages
- How to use waterfall in a contest
- Q & A

Legacy Panadapters

- Kenwood SM-230 Station Monitor (25, 100, or 250 KHz):



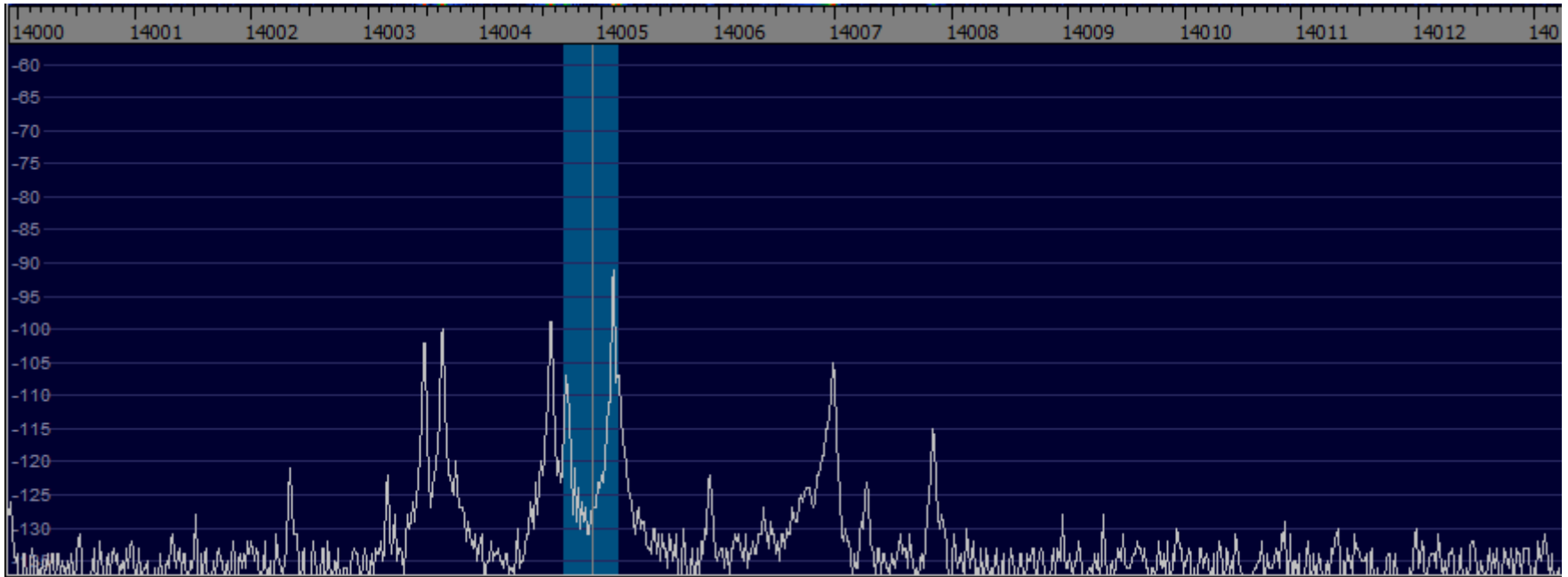
Photo courtesy <http://www.universal-radio.com/>

Legacy Panadapters

- “Band Scopes” in Icom IC-781, IC-756ProIII, IC-7800 (before V3.0), IC-7700, etc.



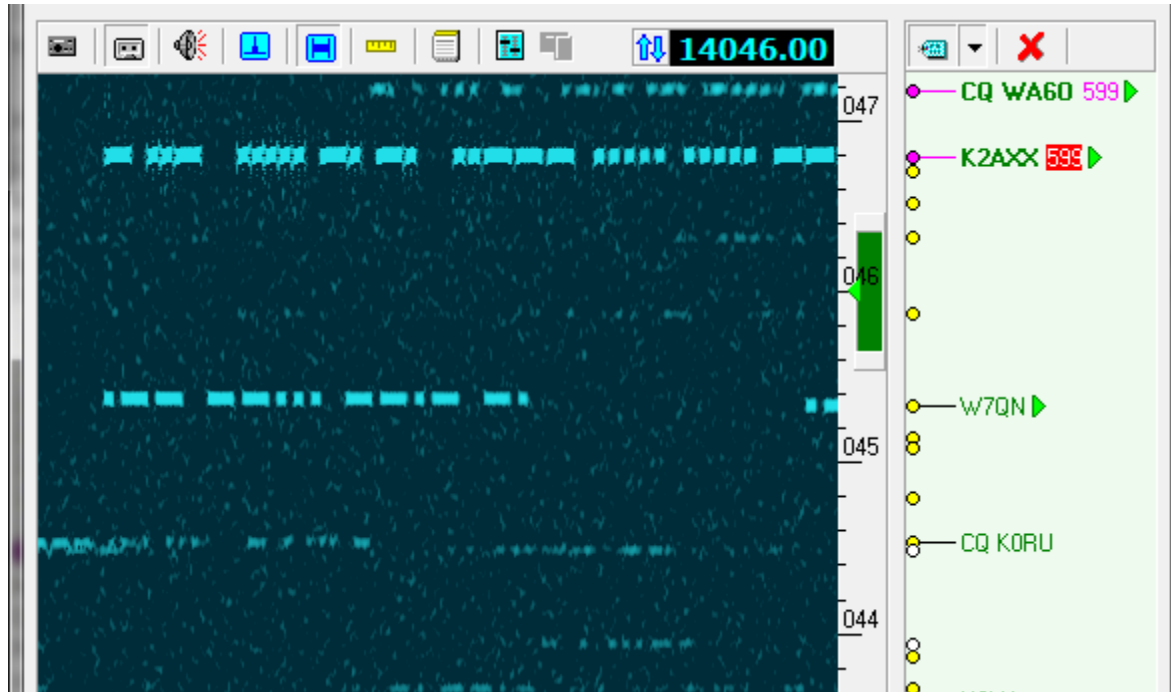
Spectrum Displays Hide Weak Signals



Legacy Panadapter Limitations

- Big signals dominate the display
- Weak signals very difficult to spot
- Signal peaks disappear, no history
- Difficult to find “clear spots” on a crowded band
- Limited zoom in or out
- Display jumpy, distracting
 - Signal averaging helps, but it also hides things

CW Skimmer Waterfall Limitations



- You only see 10 - 15 kHz of the band at most
- Scale is **fixed**, cannot “zoom” in or out, or tune smoothly
- Narrow 500 Hz CW filter – *not* useable on phone

Better Waterfall Displays

- The Elecraft P3 Panadapter



- Major improvement over legacy designs

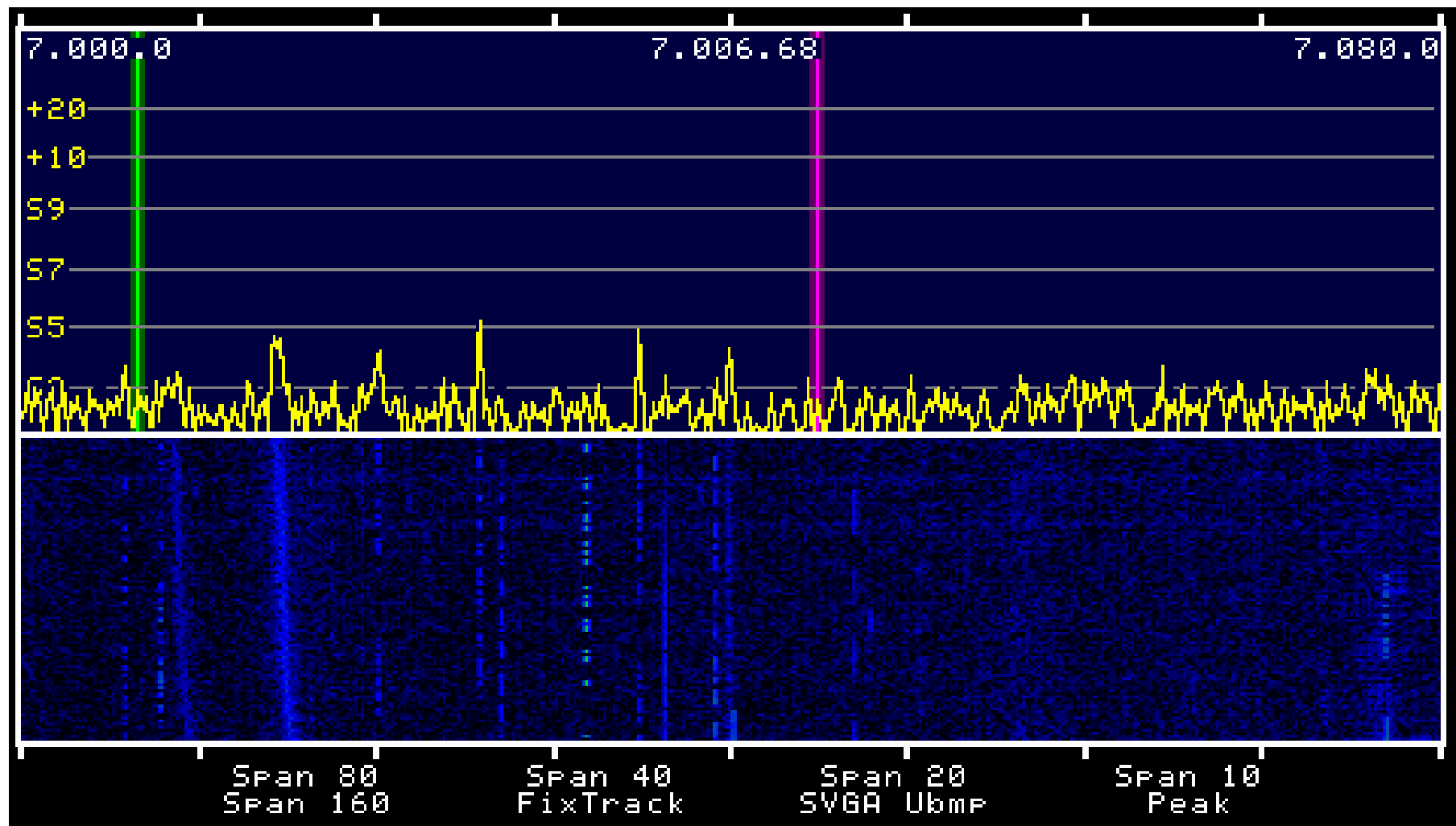
Elecraft P3 + P3SVGA Option

- P3 resolution only 480 x 272 pixels
- P3SVGA: internal SVGA Large Screen Adapter
 - 1024 x 768
 - 1280 x 1024
 - 1440 x 900
 - 1920 x 1080
- Displays far more signals

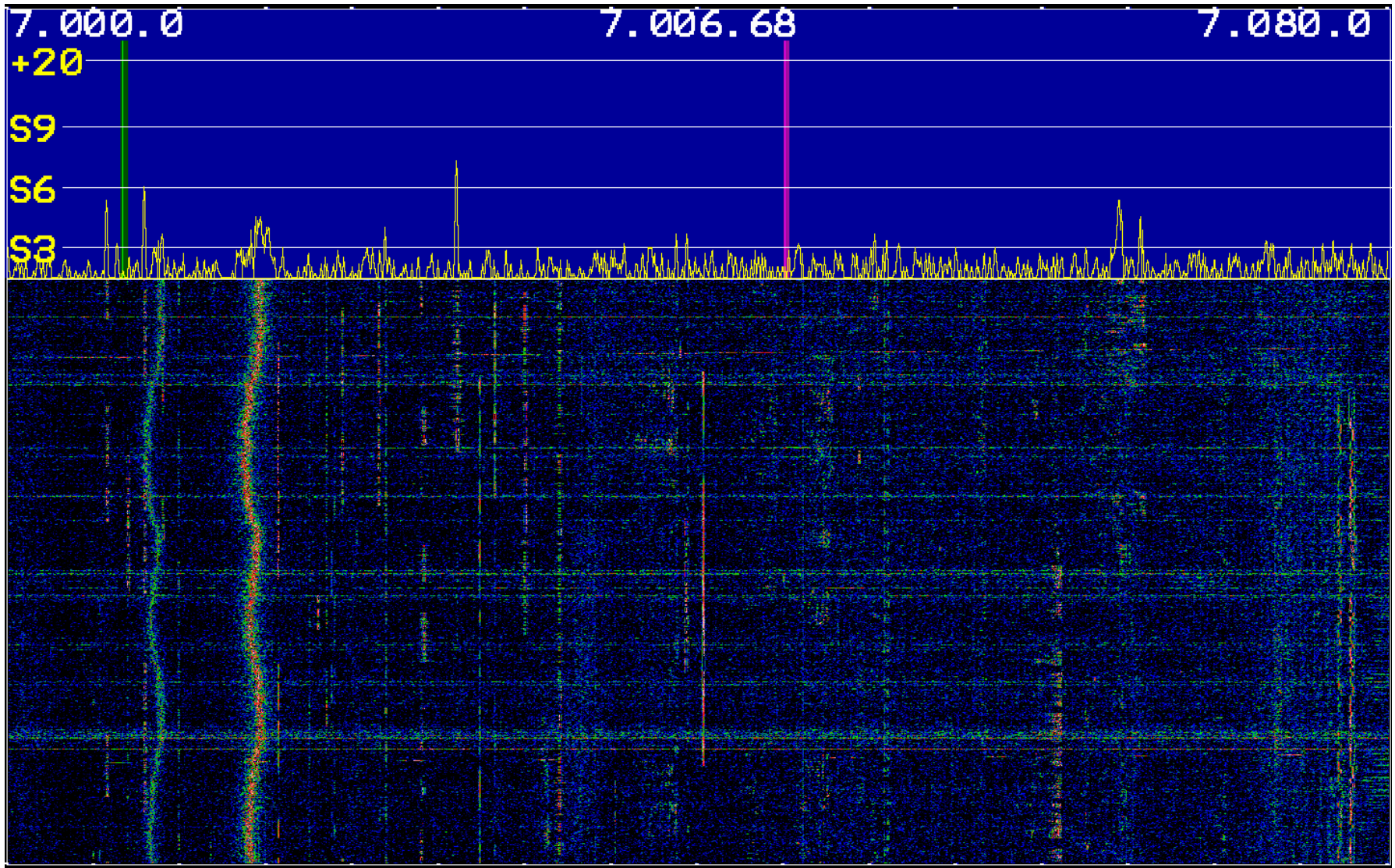


Photo courtesy <http://www.elecraft.com>

P3 Built-in Display at 480 x 272



P3SVGA at 1440 x 900



Old Icom IC-7800 firmware



(no waterfall)

Icom IC-7800 with V3.0 firmware

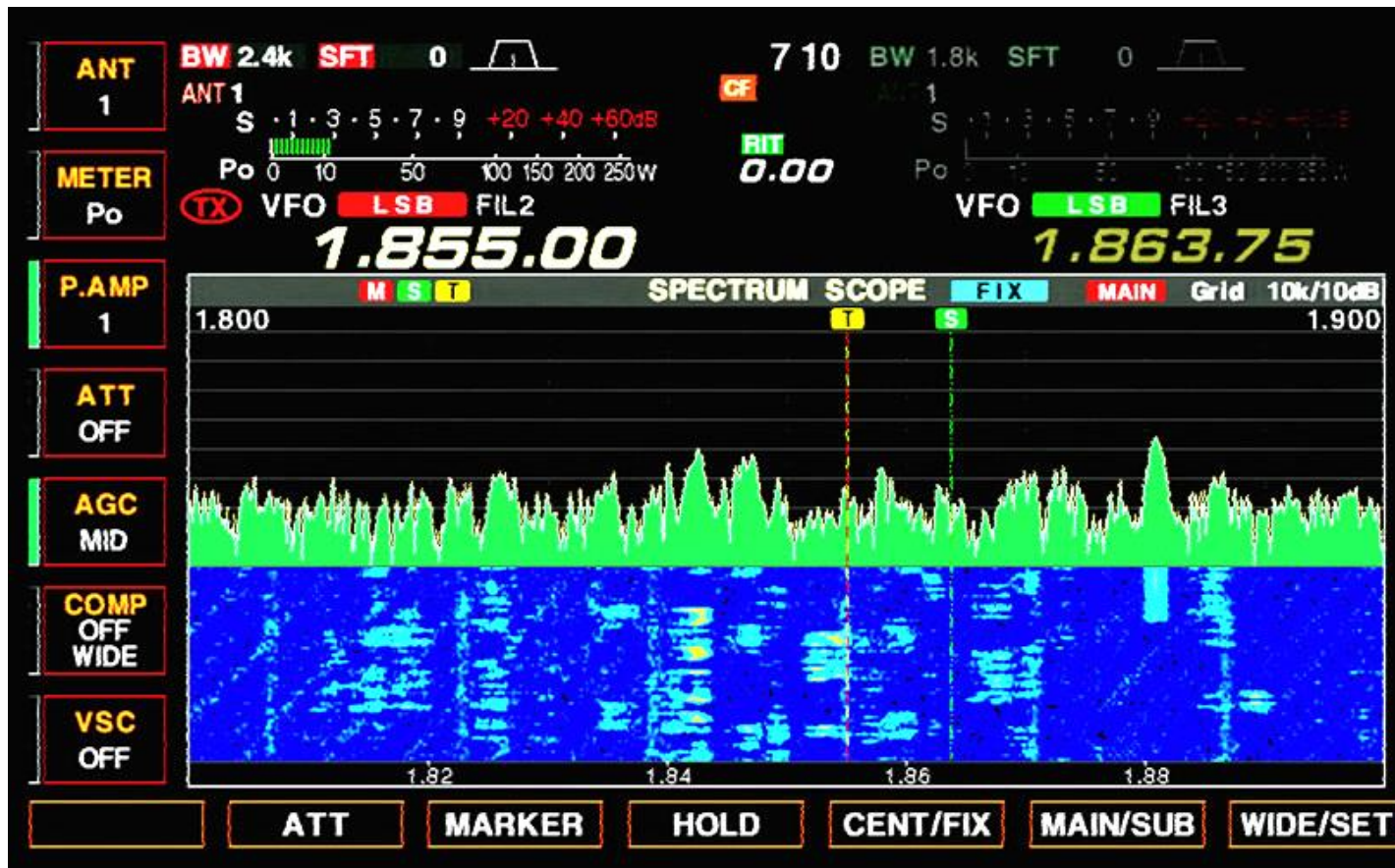


Photo courtesy <http://www.icomamerica.com>

IC-7800 V3.0 Screen Shot

IC-7700 V2.0 Also Supports Waterfall Feature

- 800 x 480 (with or without external monitor)



Kenwood TS-990S

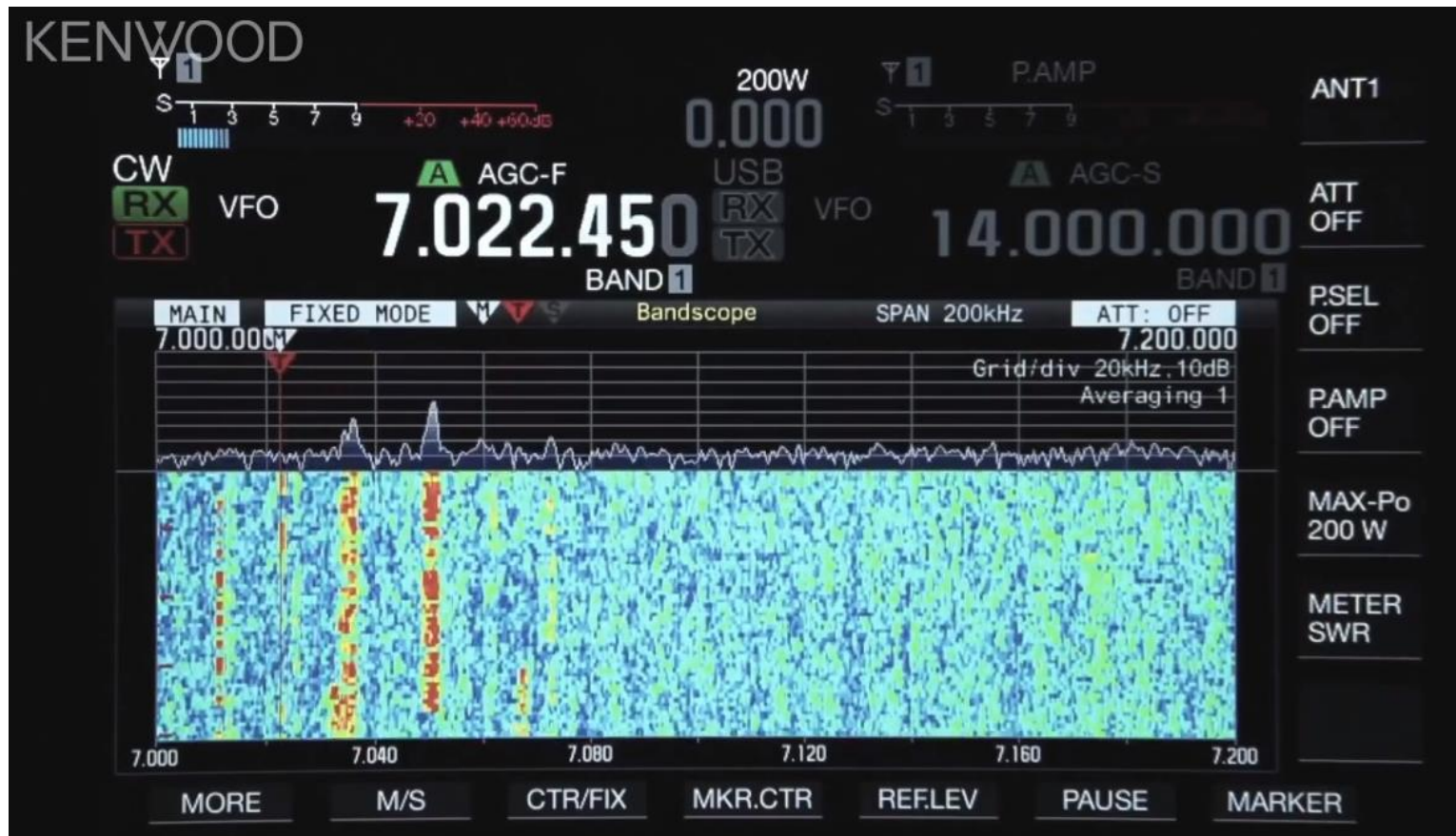


Photo courtesy <http://www.kenwoodusa.com>

2014 Contest Academy

TS-990S screen shot

- 800 x 600 or 848 x 480 pixels



FlexRadio FLEX-5000™, FLEX-6700™



Photos courtesy <http://www.flexradio.com>

PowerSDR™ Software for FlexRadio

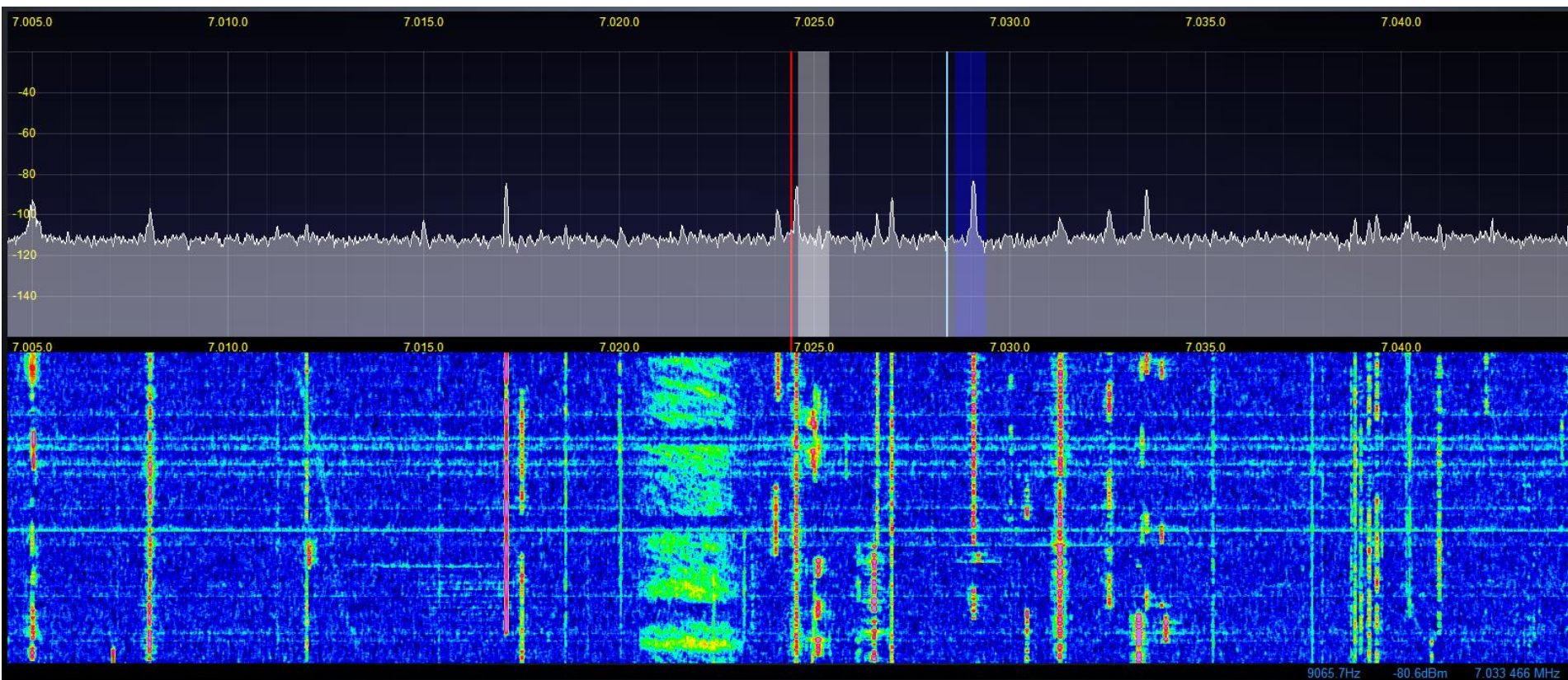
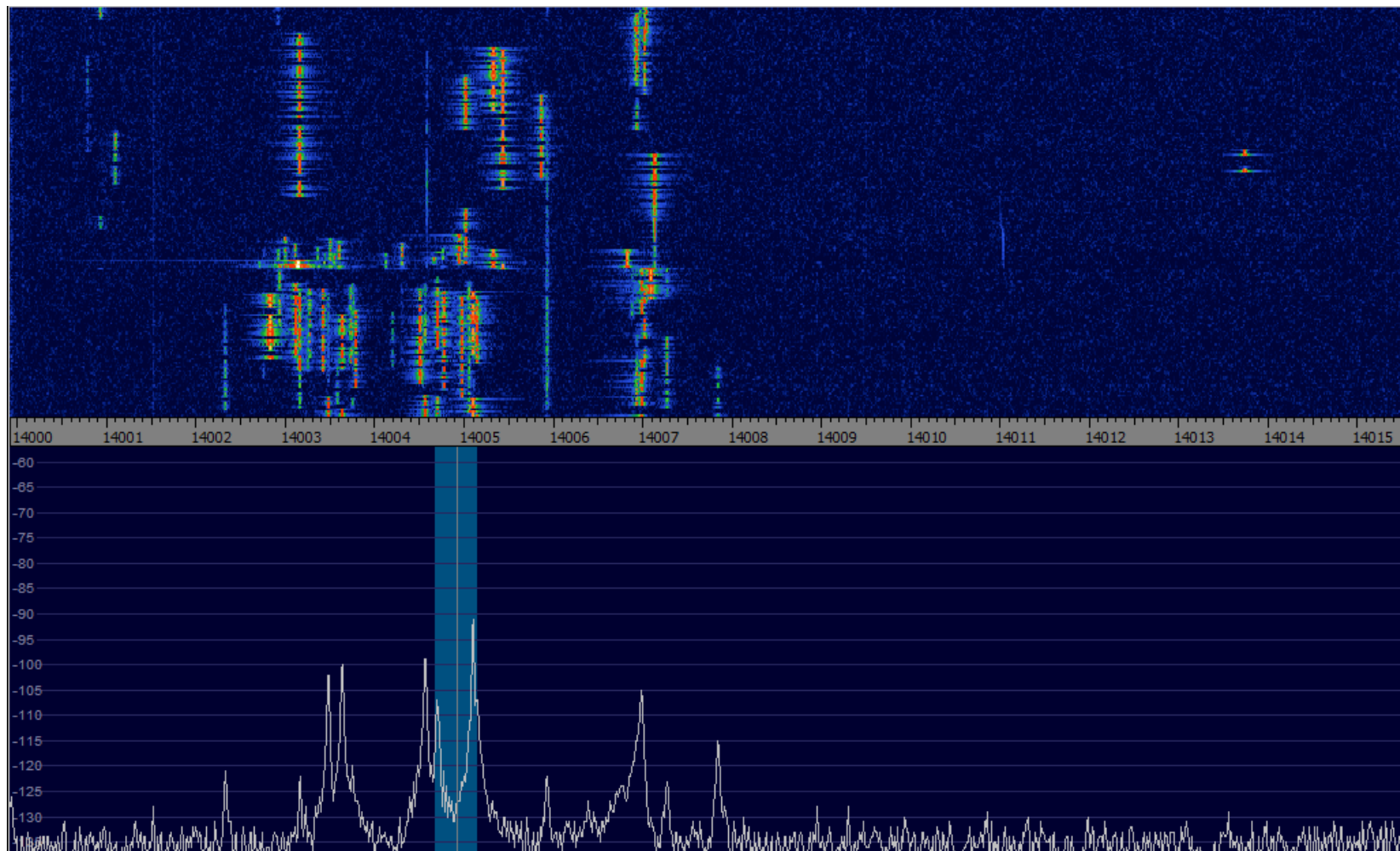
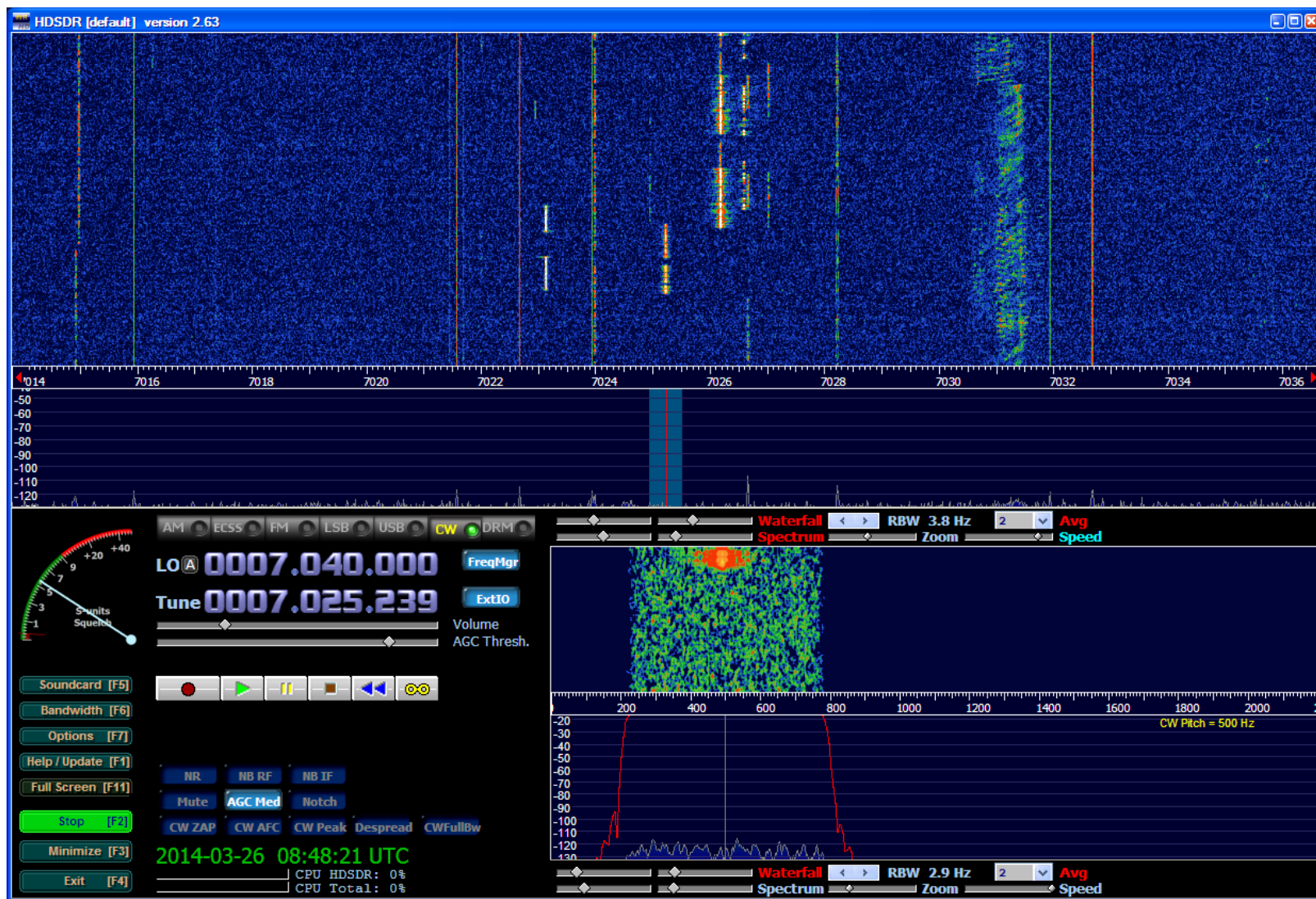


Image courtesy K3UK

Winrad Software

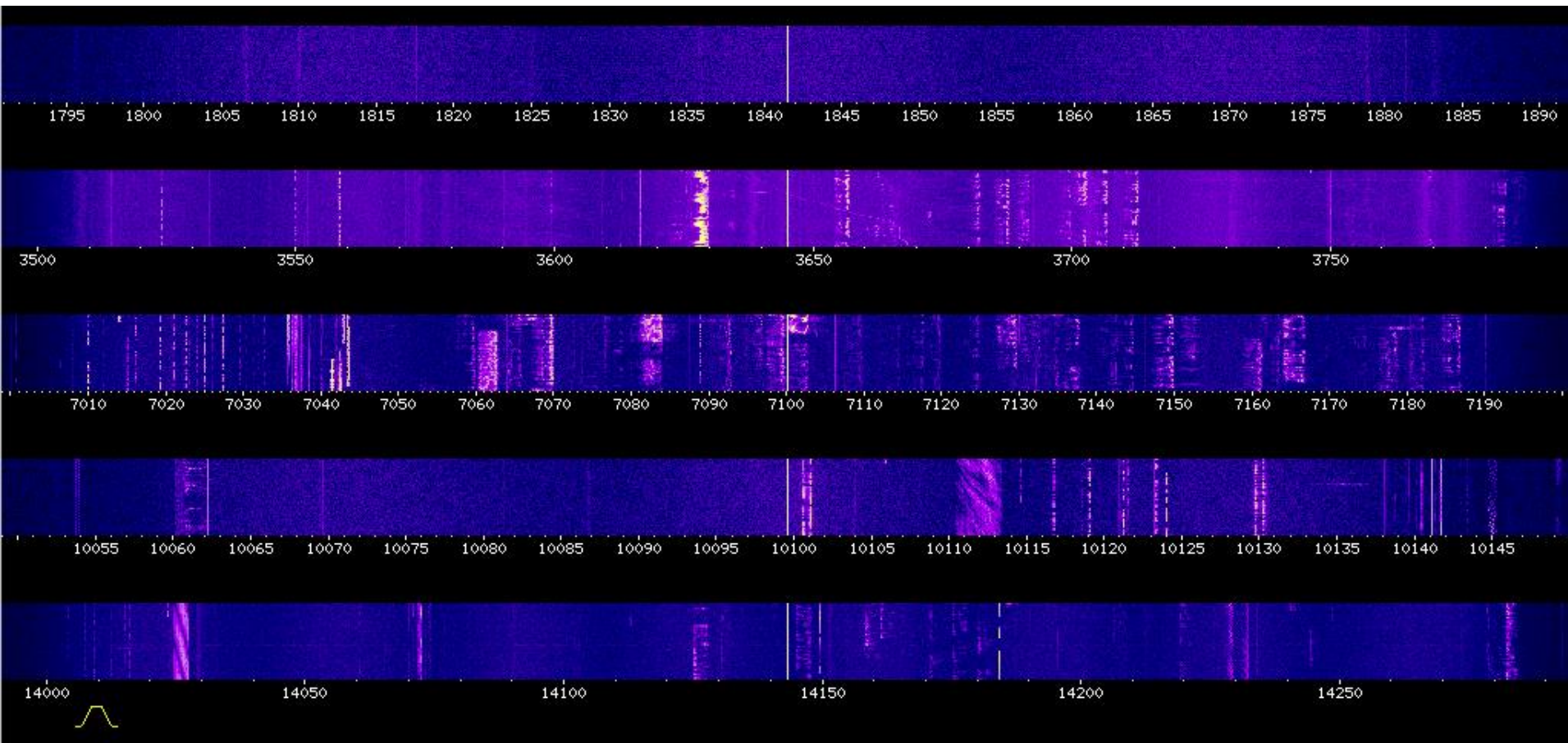


HDSDR Software



WebSDR: Waterfalls on the Web

- <http://websdr.ewi.utwente.nl:8901/>

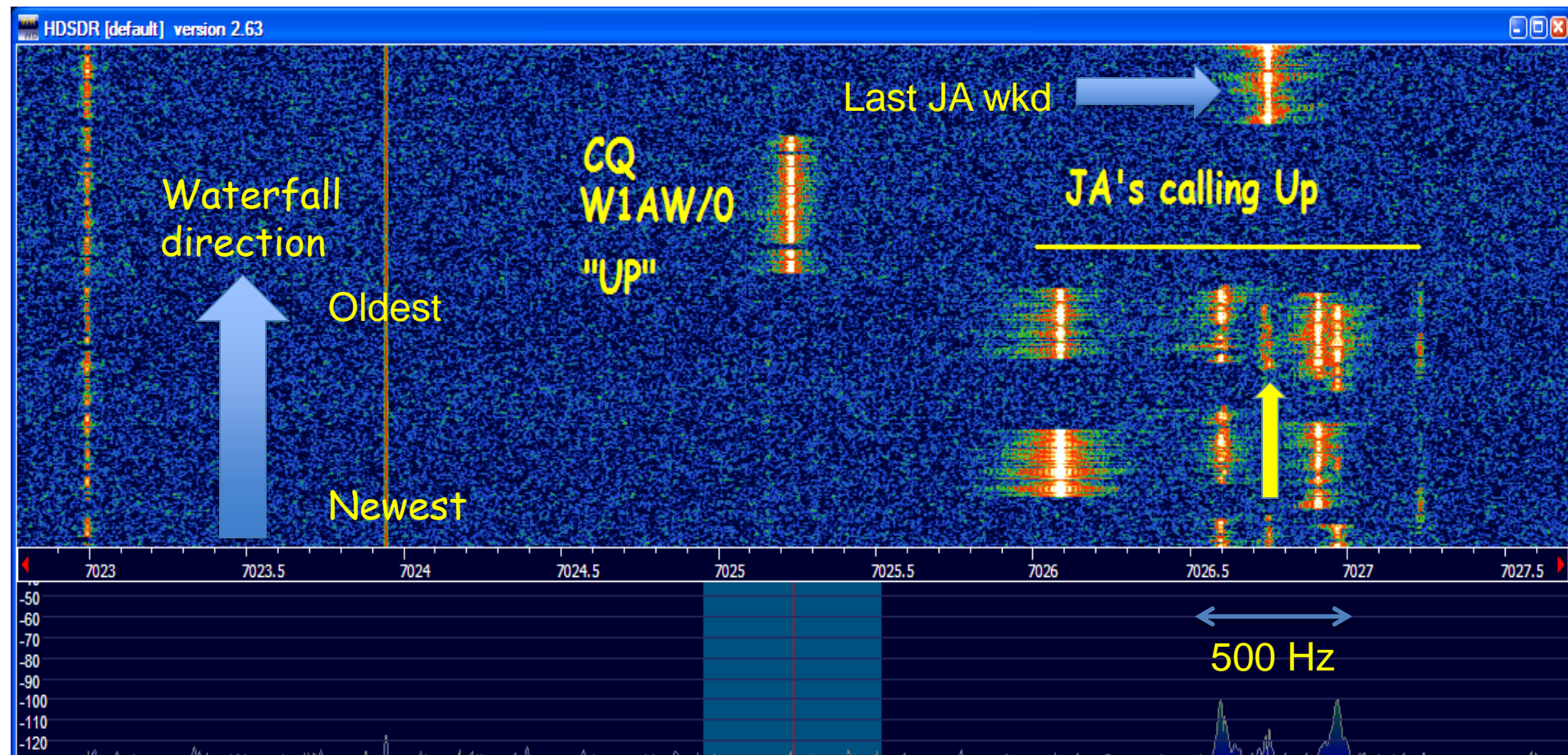


Watch 5 Bands at once!

Waterfall Display Advantages

- “Click to Tune” – direct access using a mouse
 - IC-7800 V3.0, PowerSDR, HDSDR (but not K3/P3)
- Weak signals easy to spot (faint traces)
- Many zoom levels: 7.5, 15, 30, 60, ..., 800 KHz
 - Watch the whole band at once, or a small slice
- Find clear frequencies *fast*
- Find who the DX just worked, *fast*
- Spot the gaps in a crowded CW pileup

Listening “Up”? Not a problem

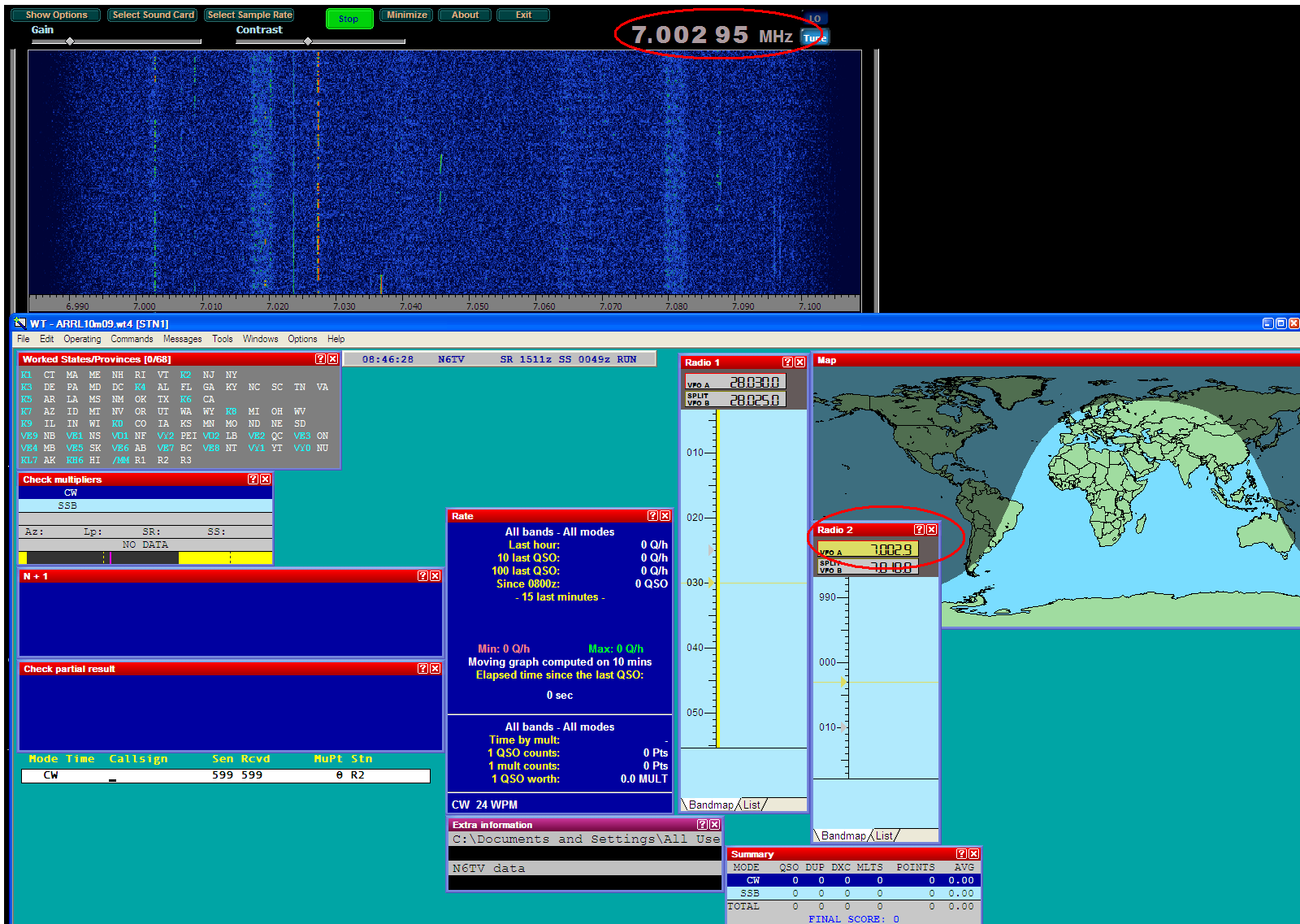


Who will W1AW/0 answer next?

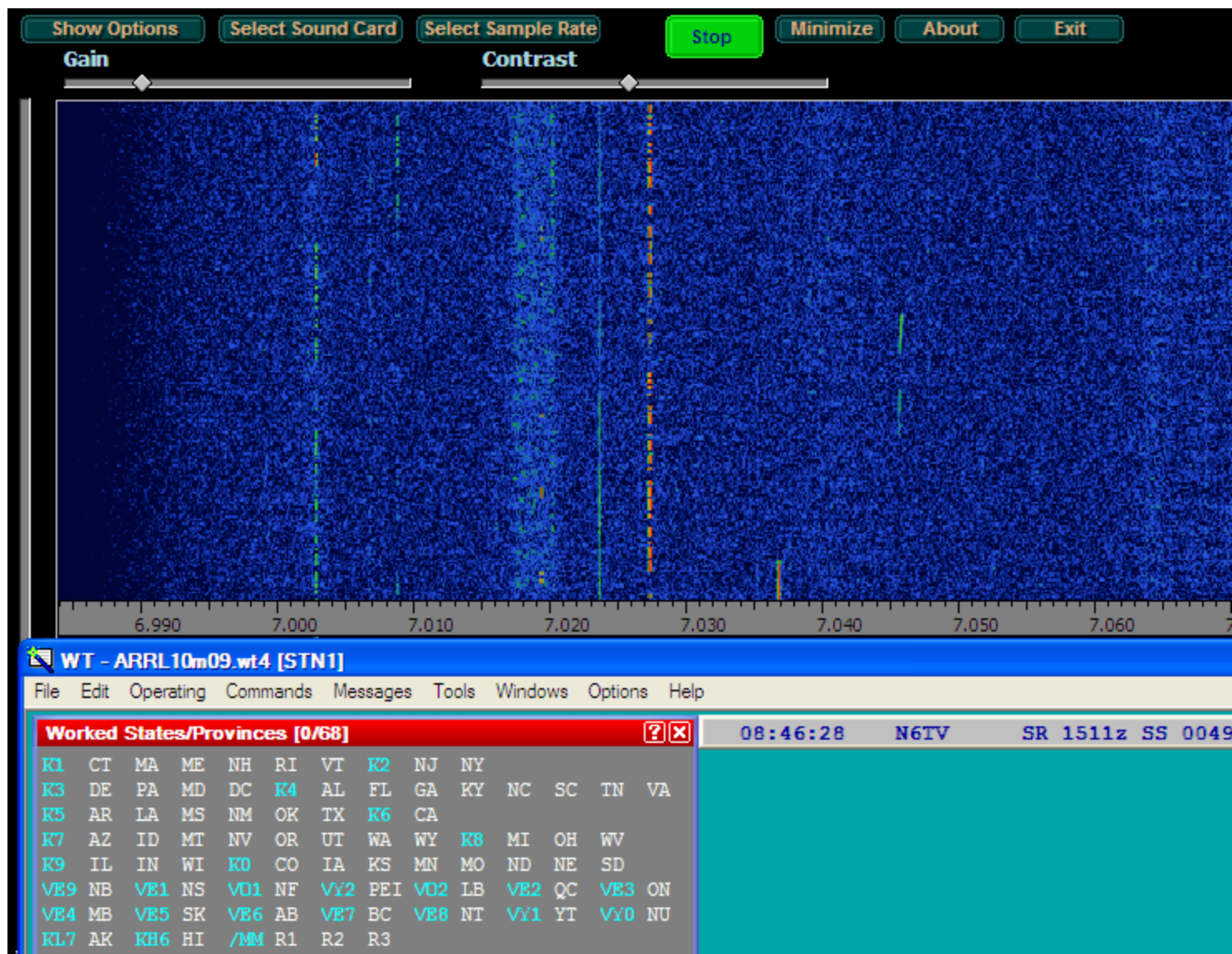
Using Waterfall in a Contest

- Find clear spots to call CQ
- QRM? You can [see](#) where to move your VFO to minimize it
- Find “good spots to call” in a CW pileup
- During S&P, find the “next” signal fast (no more slow tuning)
- Position VFO B or 2nd receiver without having to listen to it
 - S&P while CQing, “SO2V” (single-op, two VFOs)
- Monitor overall band activity
- Keep an eye on the local competition

Winrad on Top, Win-Test on Bottom



Winrad & Win-Test (zoomed)

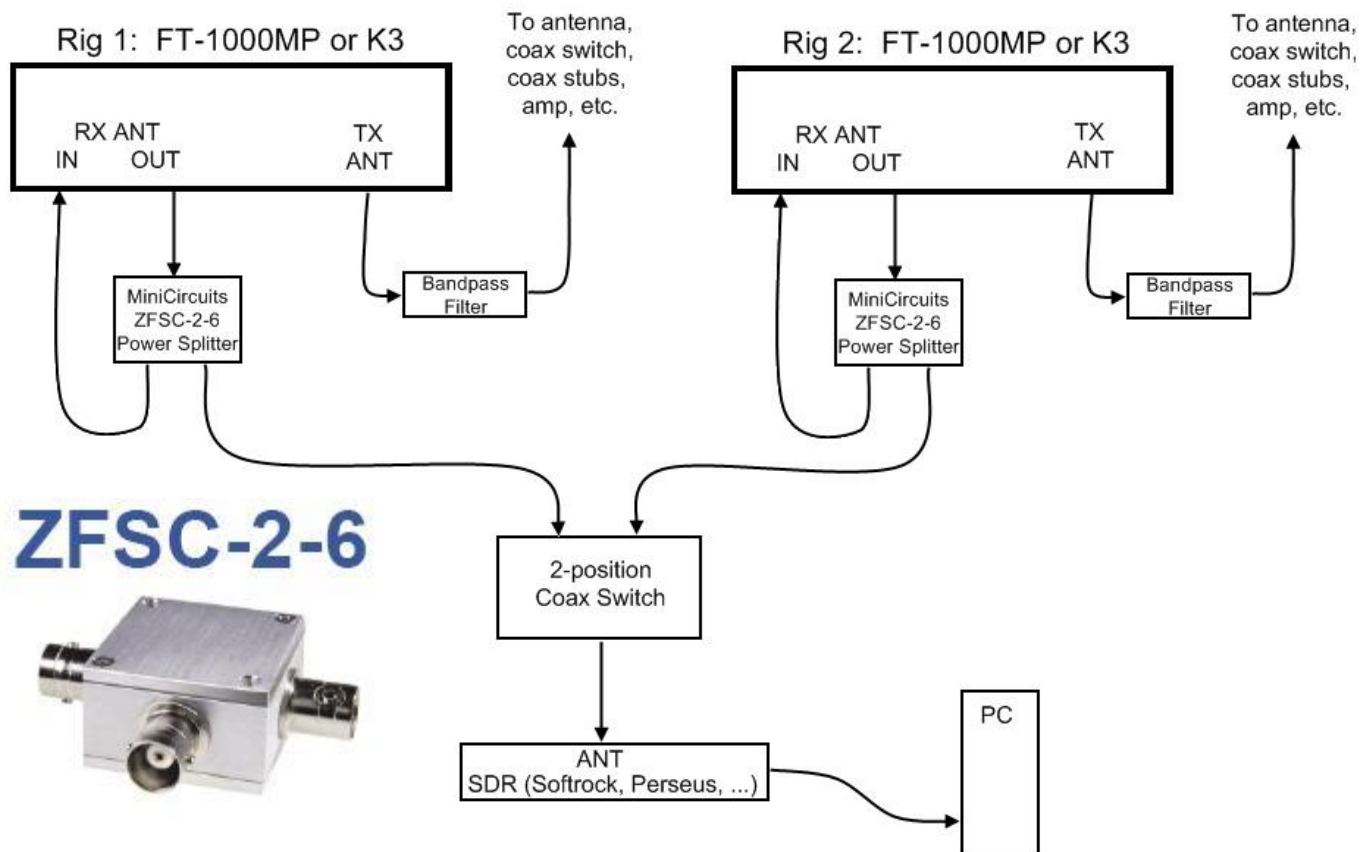


Waterfall Display *Disadvantages*

- Radios don't automatically jump from signal-to-signal like CW Skimmer (yet)
- Clicking on a signal with the mouse not as precise as tuning with VFO, must still fine tune, contest software loses focus
- Can be visually distracting to some
- **But, if you're *not* using a waterfall display in a contest, you're really operating "blind"**
- A waterfall display is really the "killer app"

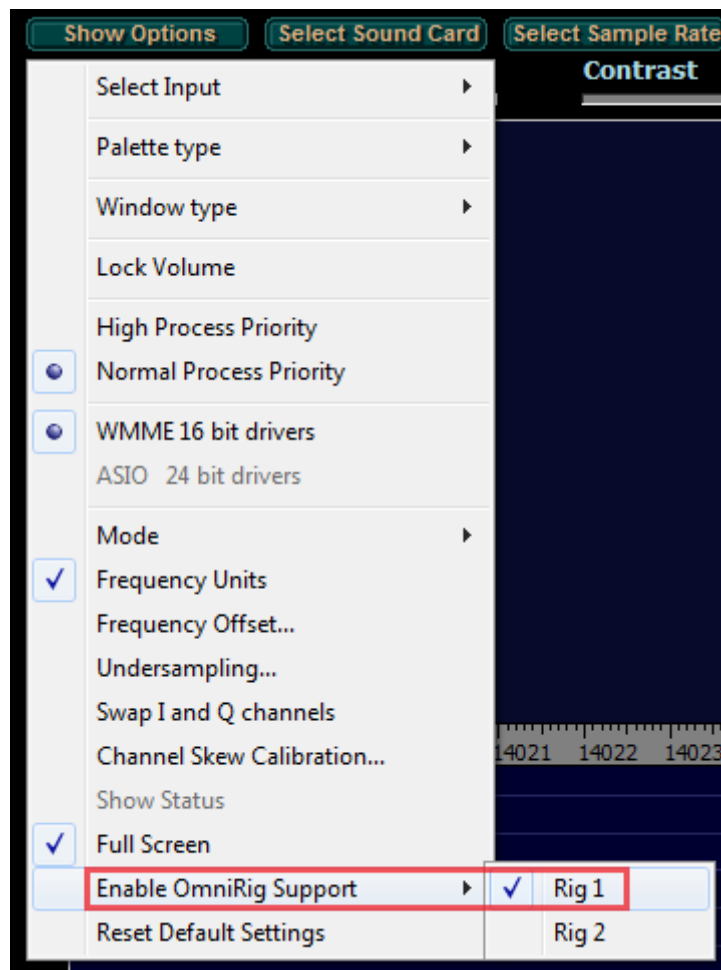
Click-To-Tune with a “Legacy” Transceiver + SDR

Adding a Software Defined Radio (SDR)
to an SO2R Station



Drawing by N6TV@arrl.net 31 May 2008

Use Omnirig support in Winrad or HDSDR to synch freq. with any transceiver



Demo of Winrad's Waterfall

- Perseus SDR used to make a wideband recording (122 KHz for 10 minutes = 300 MB)
- Demo will play back that recording and others
- To try the demo yourself, follow instructions at
 - <http://www.kkn.net/~n6tv>

Questions?

- <http://www.winrad.org> - Winrad software
- <http://http://www.hdsdr.de/> - HDSDR software
- <http://www.kkn.net/~n6tv> - Winrad demo file
- <http://www.qrz.com/db/n6tv> - Links to this and other presentations