Using Waterfall Displays as a Contesting Advantage

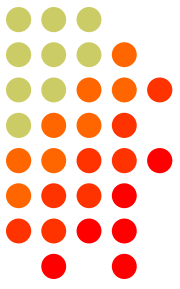## Presented by N6TV

n6tv@arrl.net
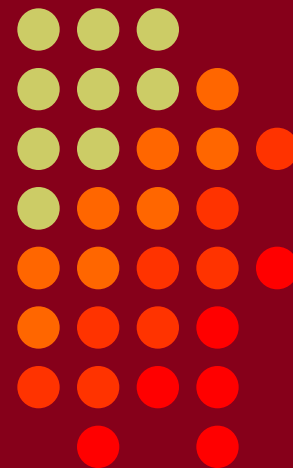
Presentation Overview

- 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

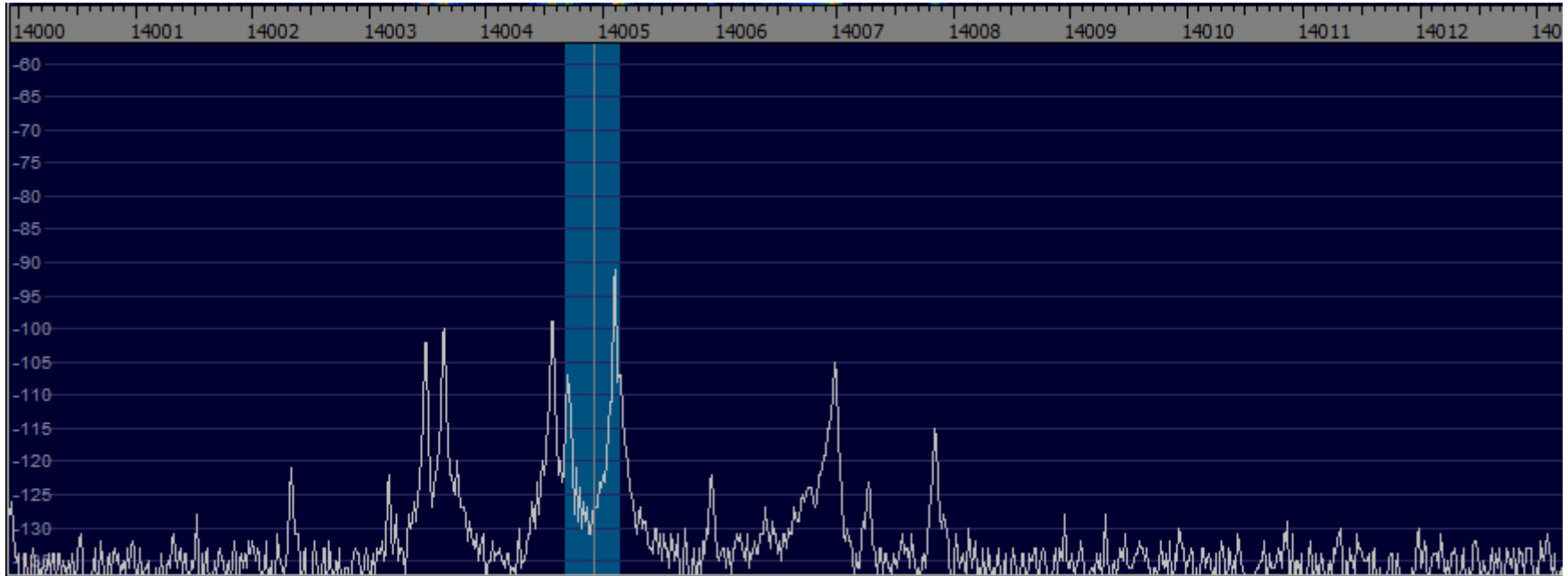- Kenwood SM-230 Station Monitor (25, 100, or 250 KHz):

http://www.universal-radio.com/

iCOM 3

Legacy Panadapters

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

# Spectrum Displays Hide Weak Signals

ICOM 5

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

ICOM 6

CW Skimmer Waterfall Limitations
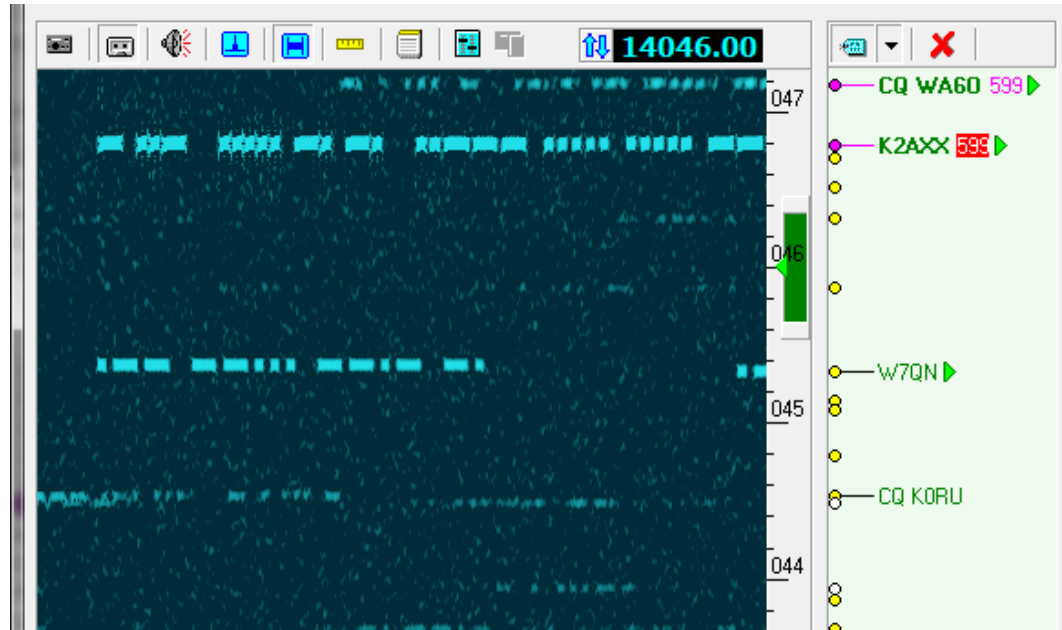
- You only see 10 - 15 kHz of the band at most

- Scale is fixed, cannot "zoom" in or out, or tune smoothly

- Narrow 500 Hz CW filter – *not* useable on phone

ICOM 7

Better Waterfall Displays

- The Elecraft P3 Panadapter

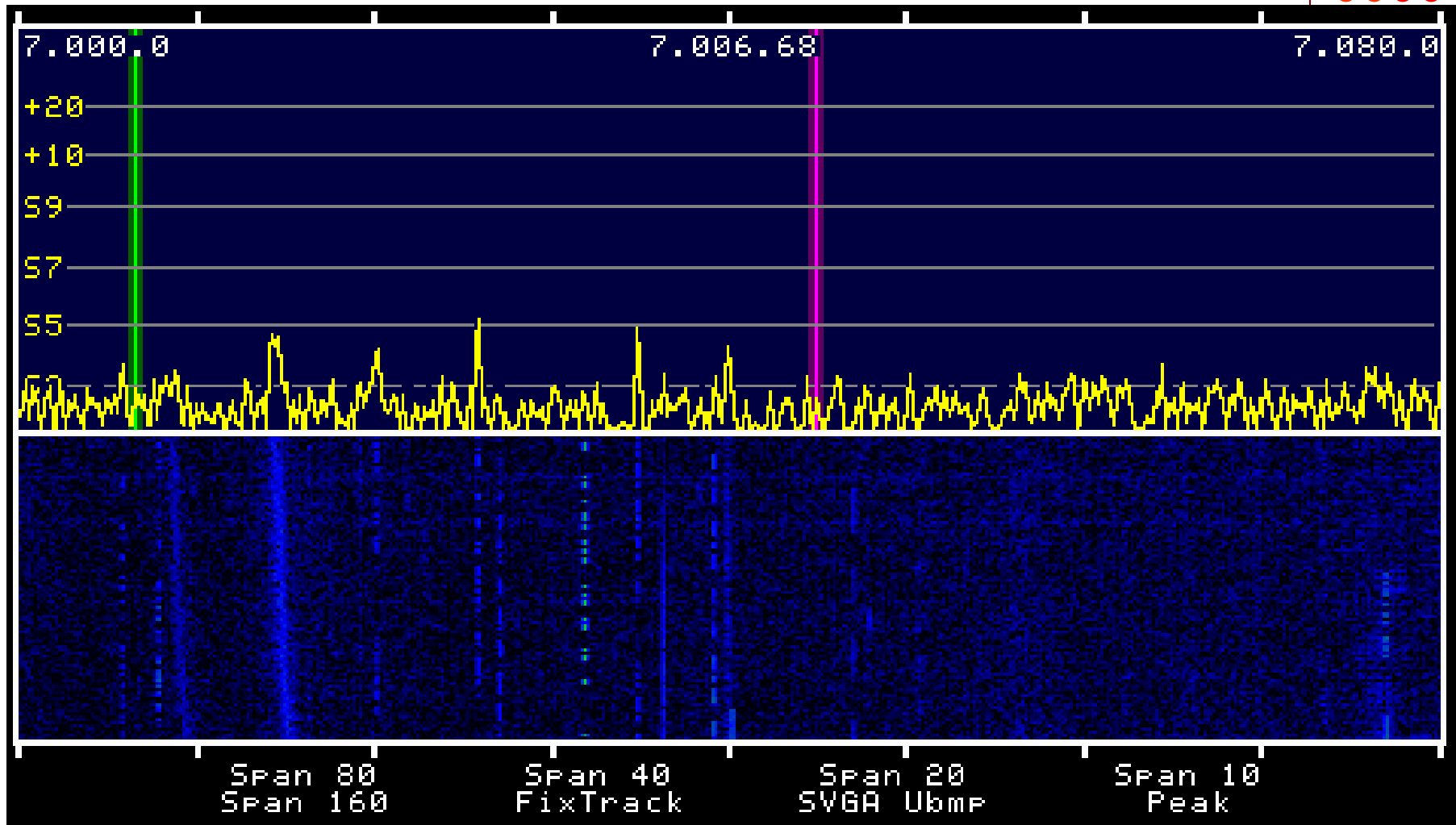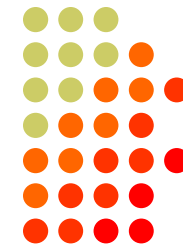- Major improvement over legacy designs

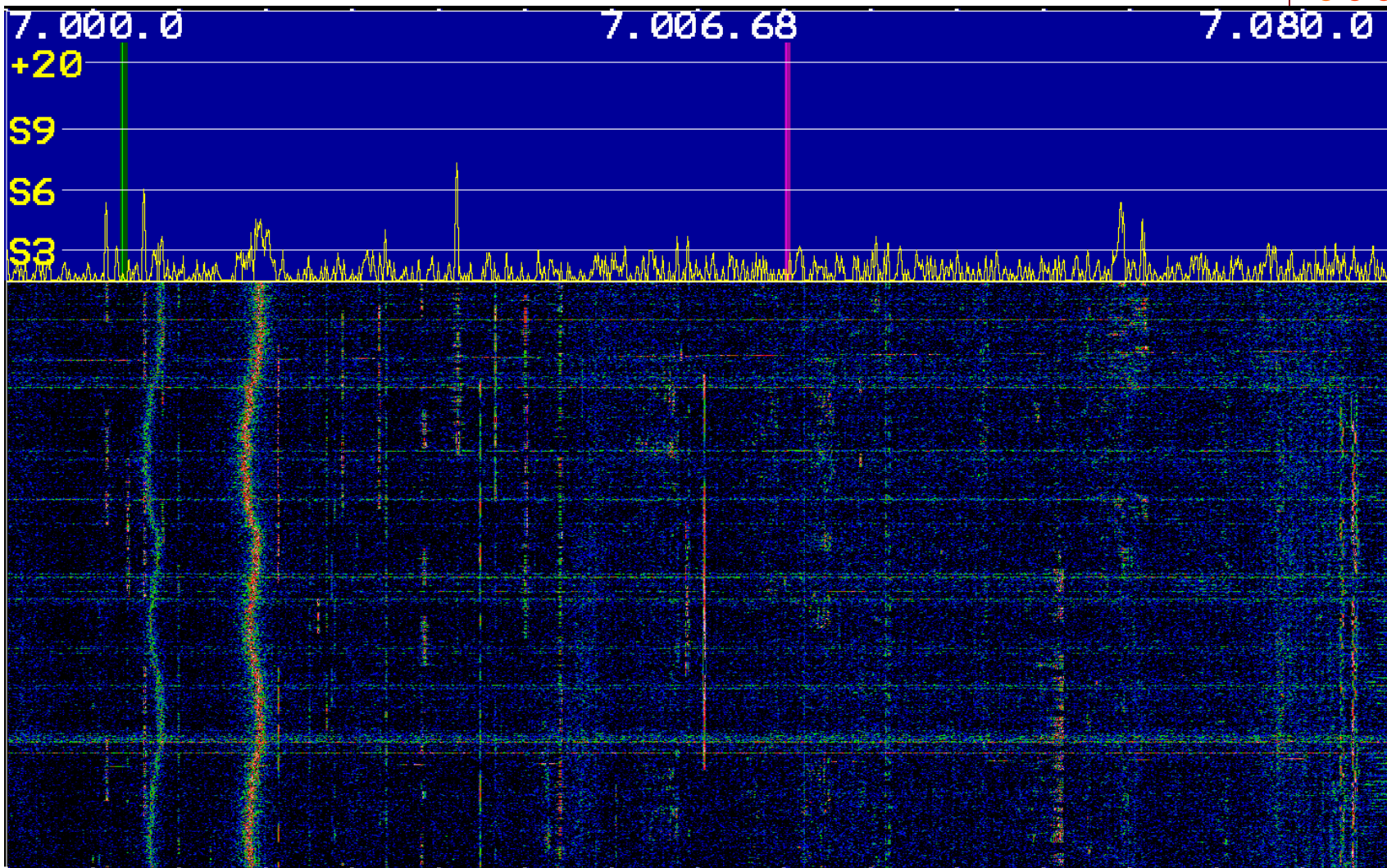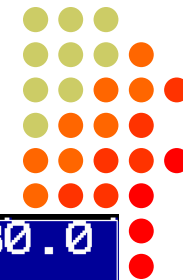http://www.elecraft.com

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

P3 Built-in Display at 480 x 272
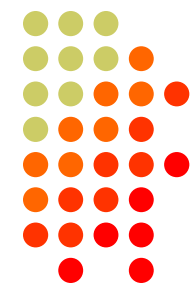
P3SVGA at 1440 x 900

CTU
CONTEST
UNIVERSITY

ICOM 11

Old Icom IC-7800 firmware

http://www.icomamerica.com

ICOM 12

Icom IC-7800 with V3.0 firmware

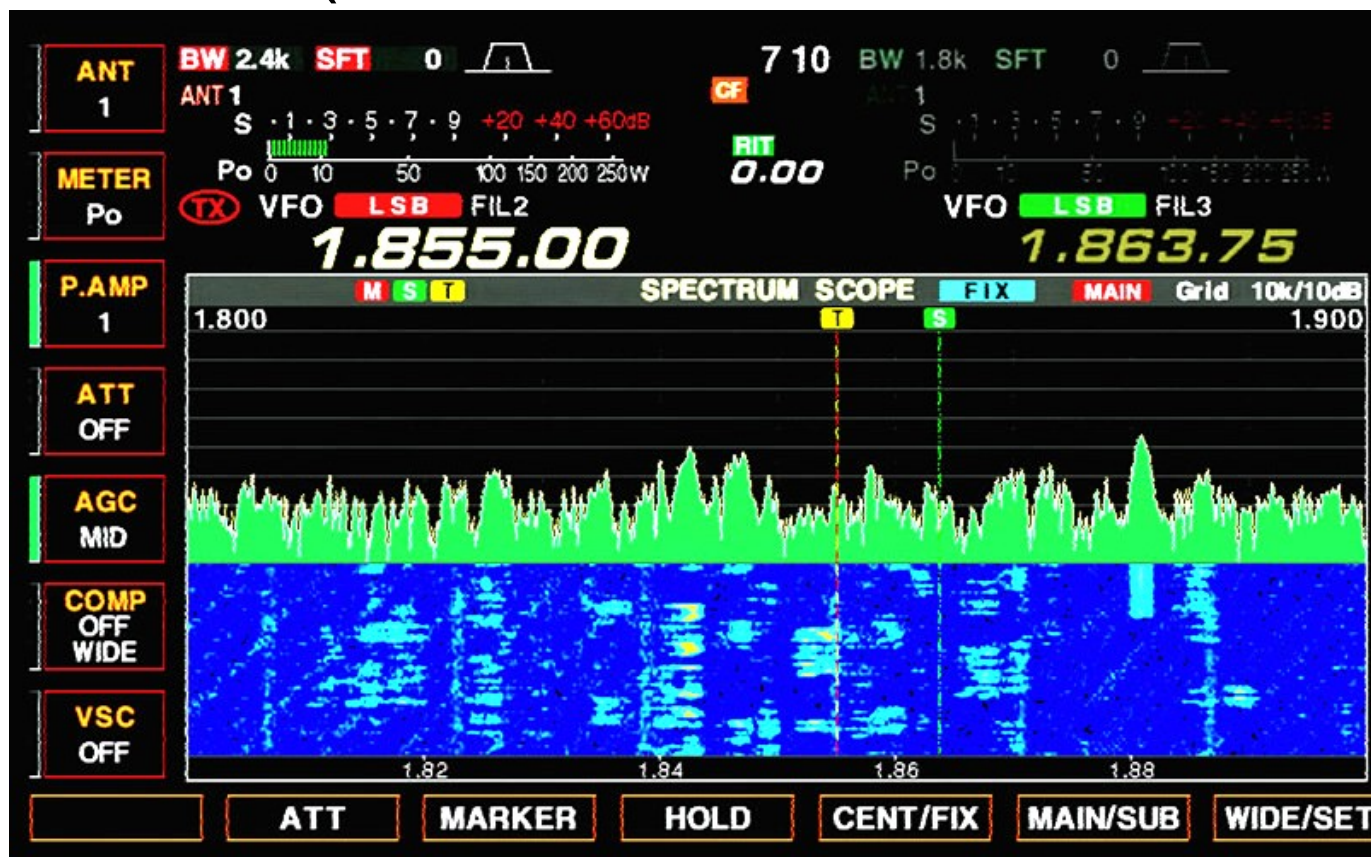http://www.icomamerica.com

ICOM 13

IC-7800 V3.0 Screen Shot

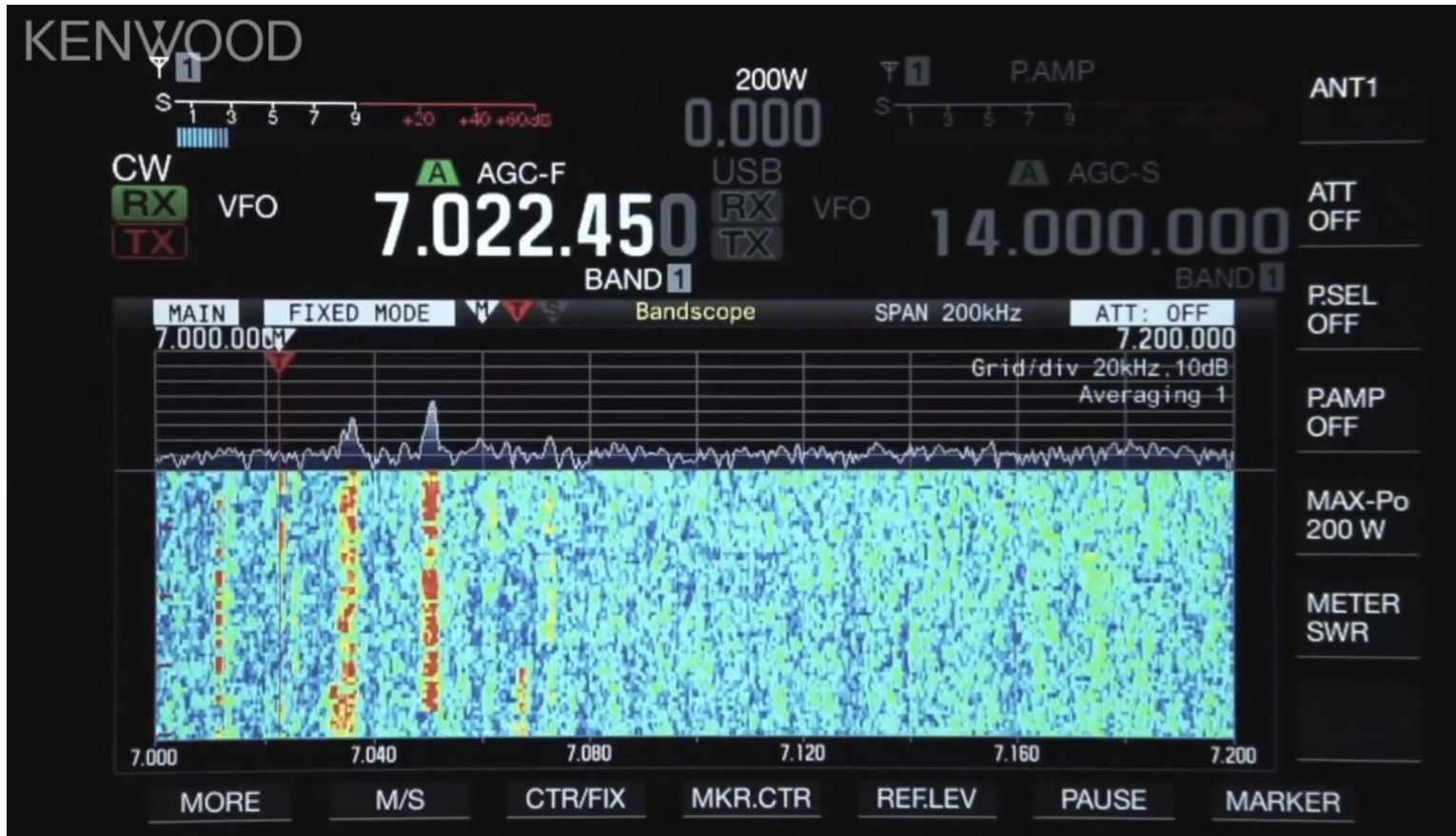### IC-7700 V2.0 Also Supports Waterfall Feature

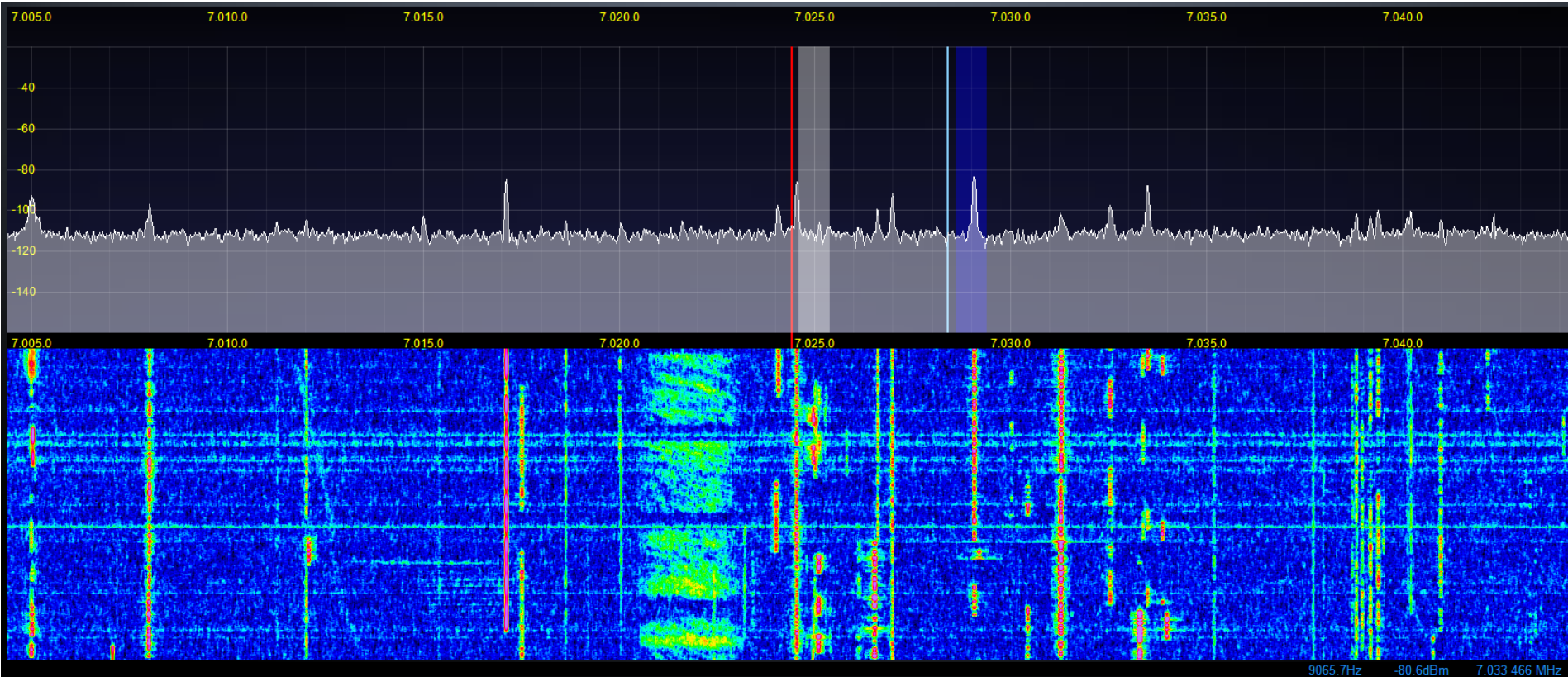- 800 x 480 (with or without external monitor)

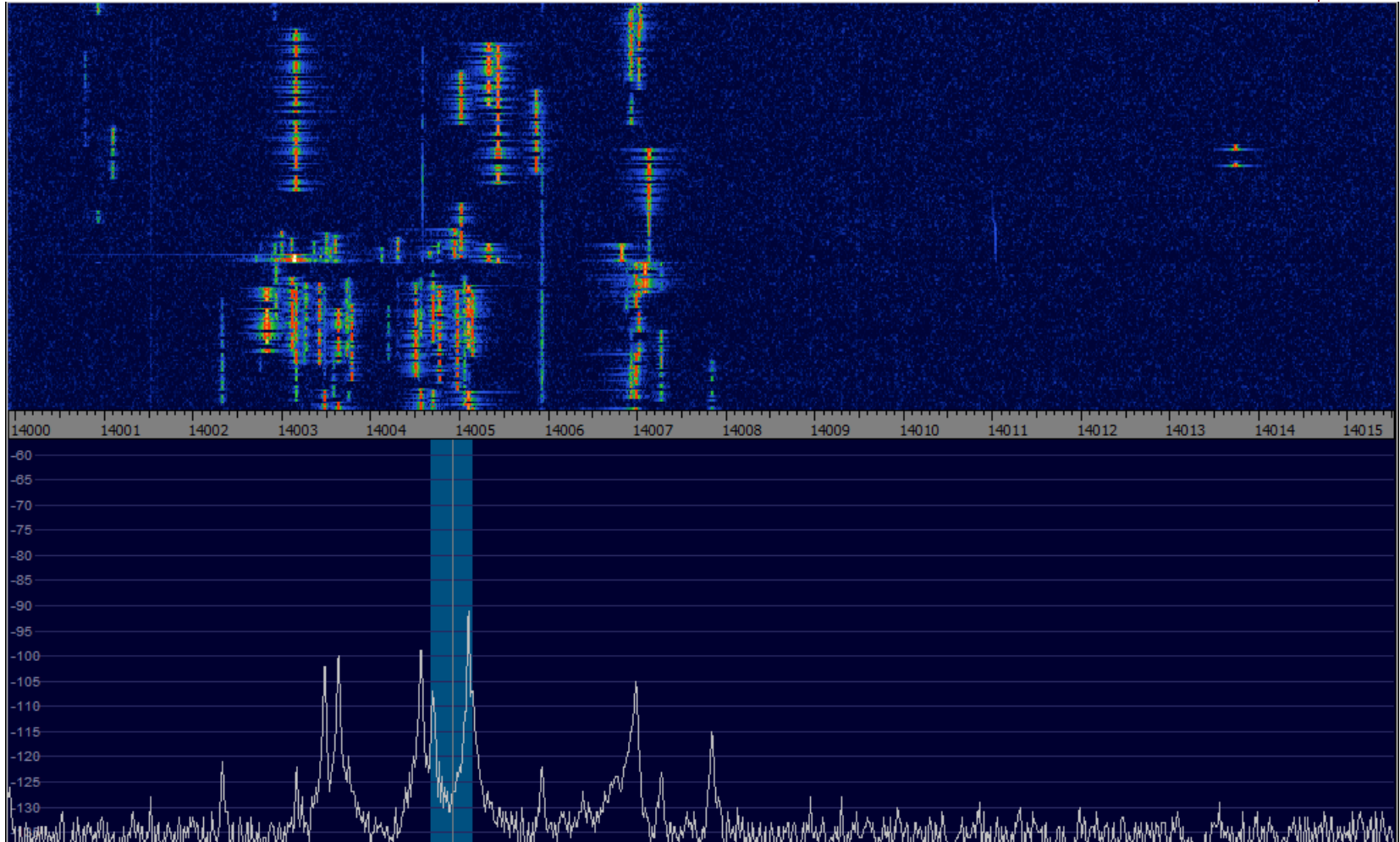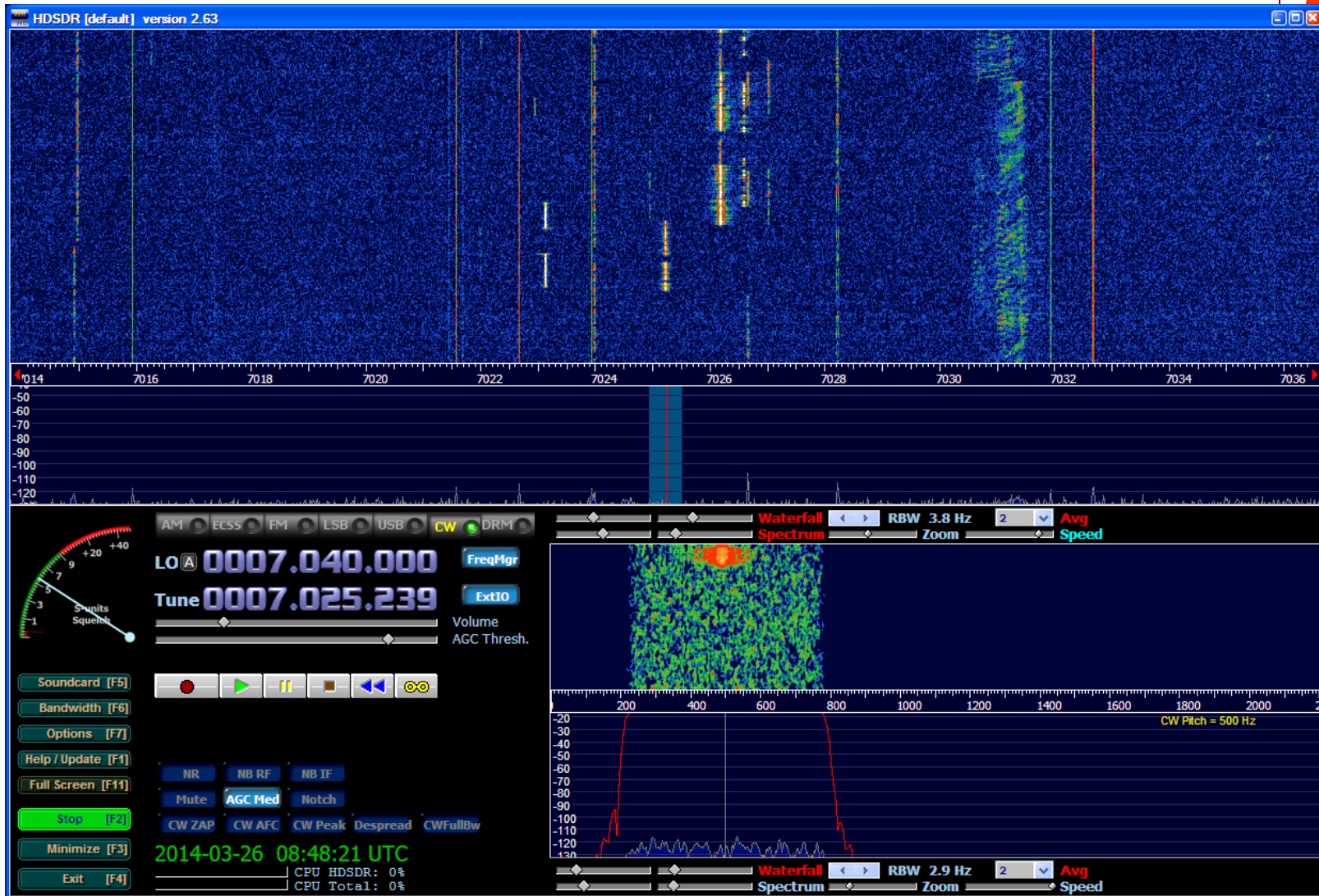# Kenwood TS-990S

15

TS-990S screen shot

FlexRadio FLEX-5000™, FLEX-6700™
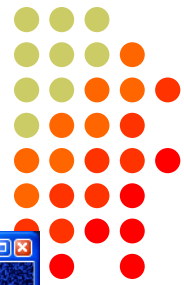
http://www.flexradio.com
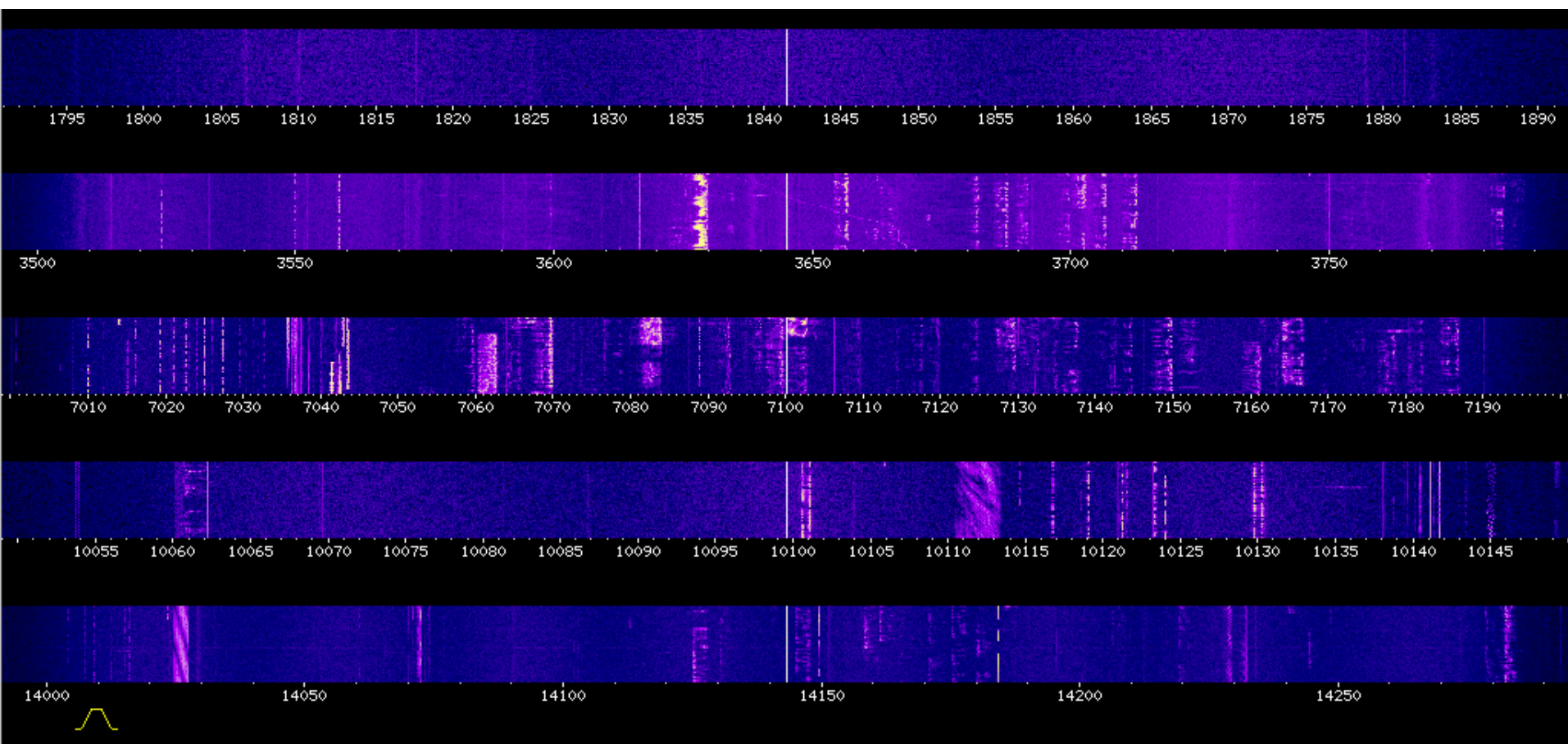
17

PowerSDR™ Software for FlexRadio

ICOM 18

Winrad Software
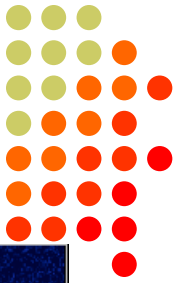
HDSDR Software
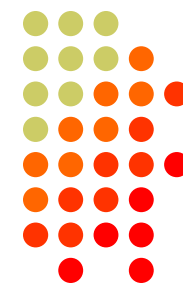
WebSDR: Waterfalls on the Web

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

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
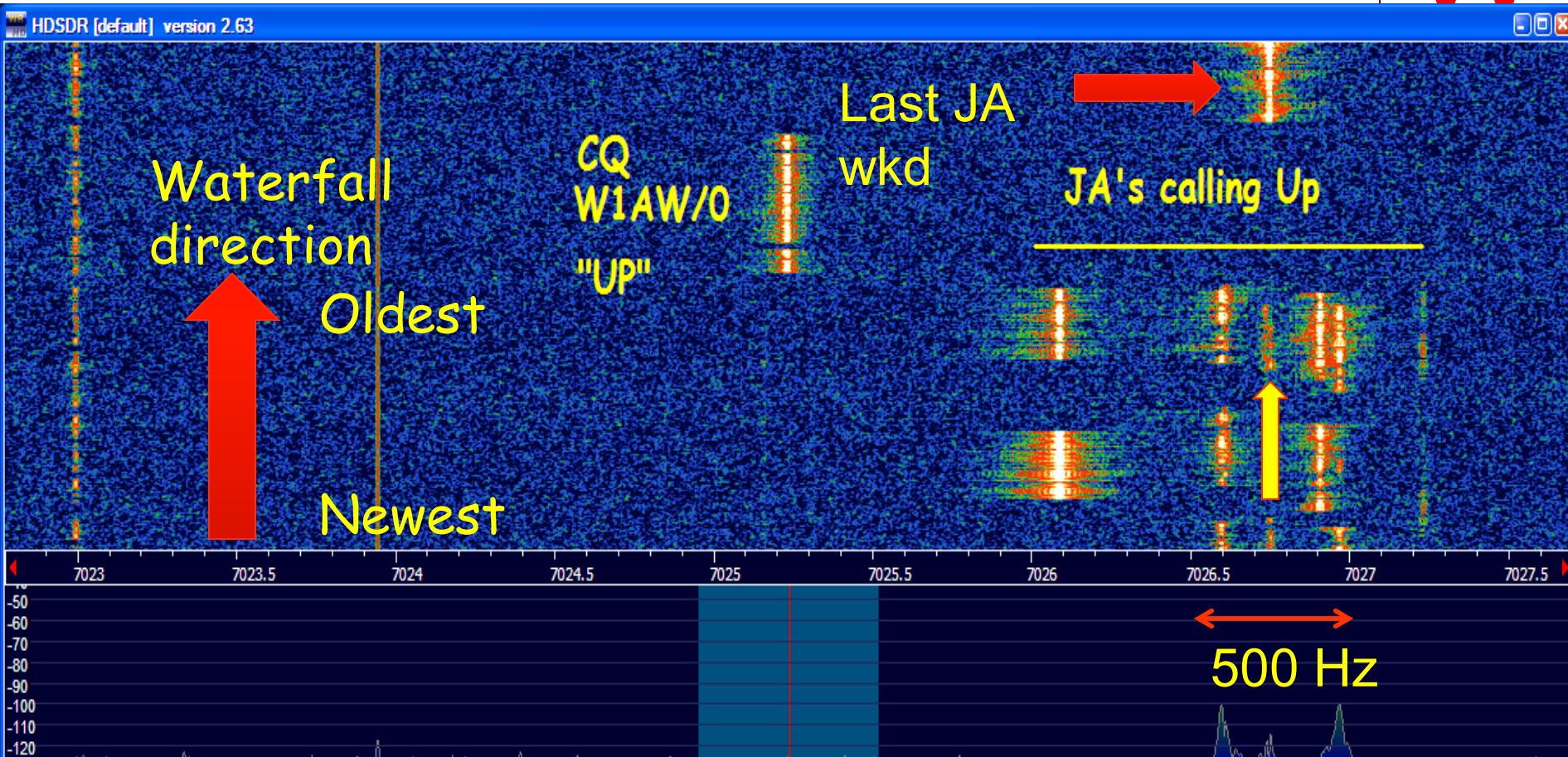
Who will W1AW/0 answer next?

CTU CONTEST UNIVERSITY

ICOM 23

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
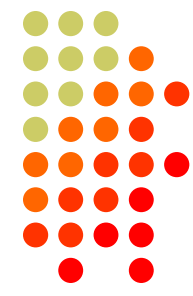- Keep an eye on the local competition

ICOM 24

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"

Adding a Software Defined Radio (SDR) to an SO2R Station
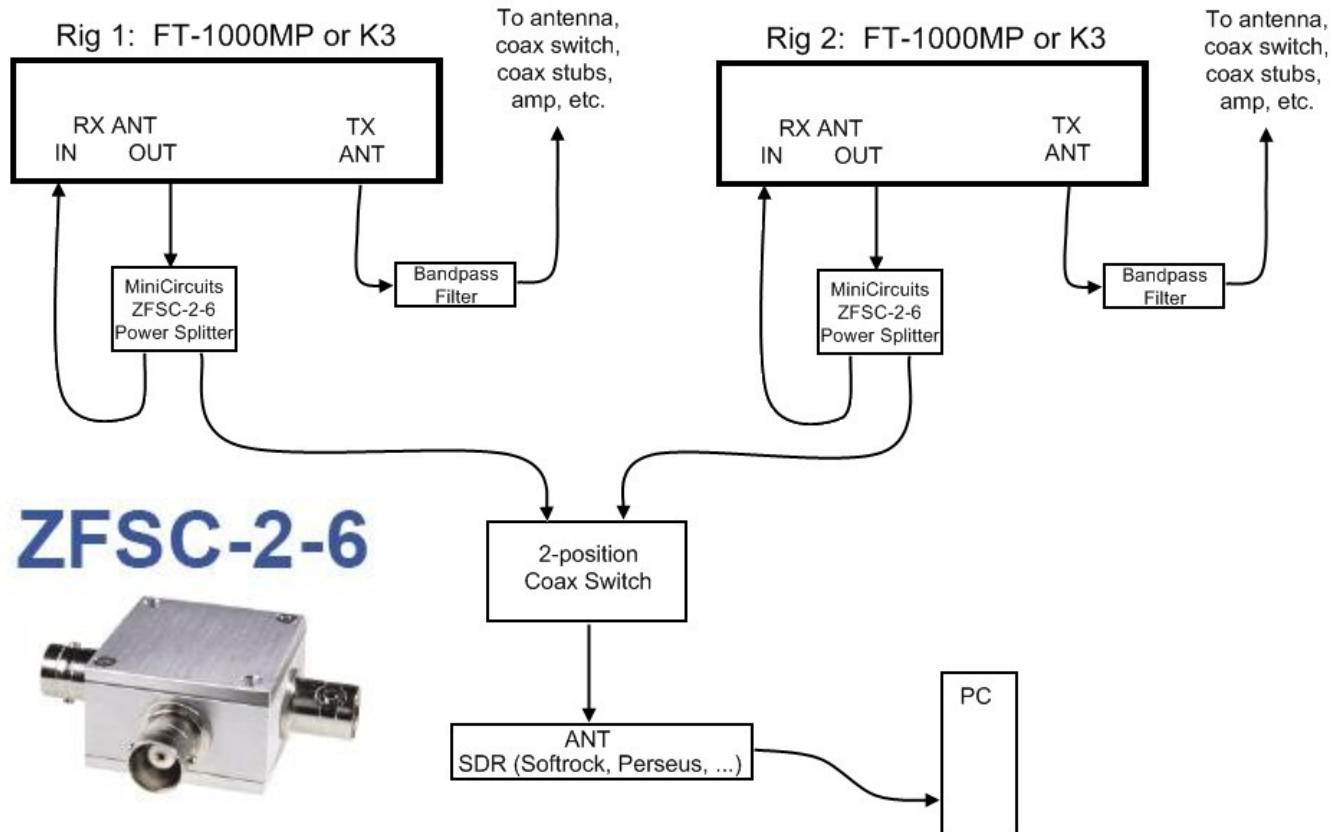
Drawing by N6TV@arrl.net 31 May 2008

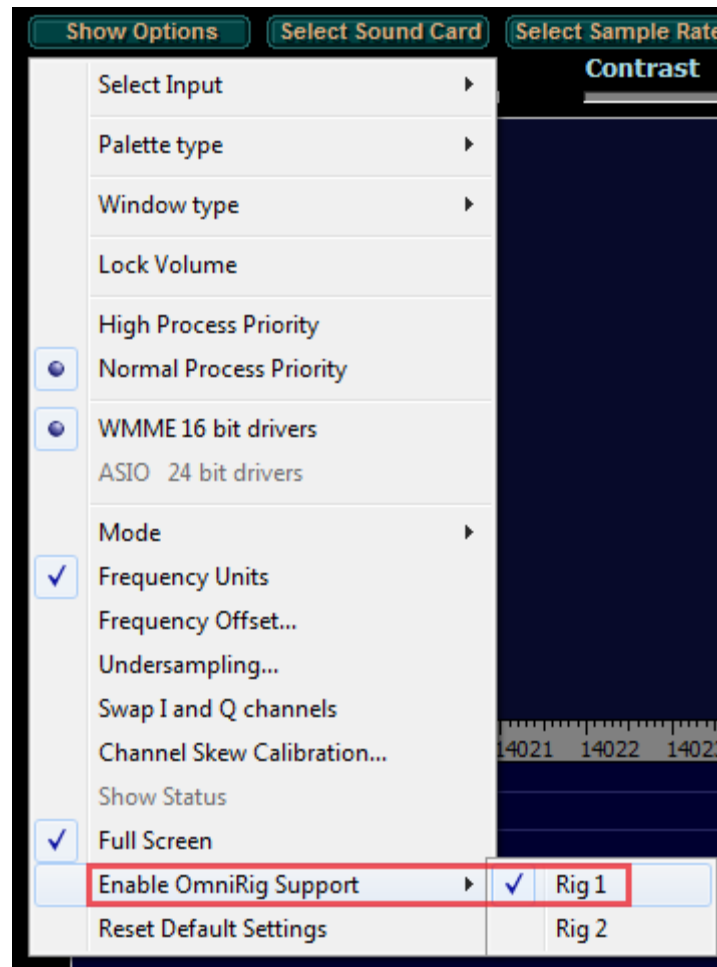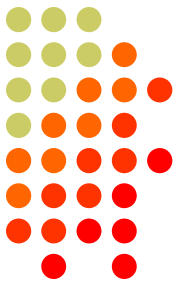# Use Omnirig support in Winrad or HDSDR to synch freq. with any transceiver

ICOM 29

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

ICOM 30

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

ICOM 31