How to Use Waterfall Displays While Contesting and DXing

Presented by N6TV <u>n6tv@arrl.net</u>





Presentation Overview

- Legacy "Panadapters"
- CW Skimmer's SDR waterfall
- Current radios with waterfall displays
- Waterfall display advantages
- How to use waterfall displays while contesting or DXing
- Q & A

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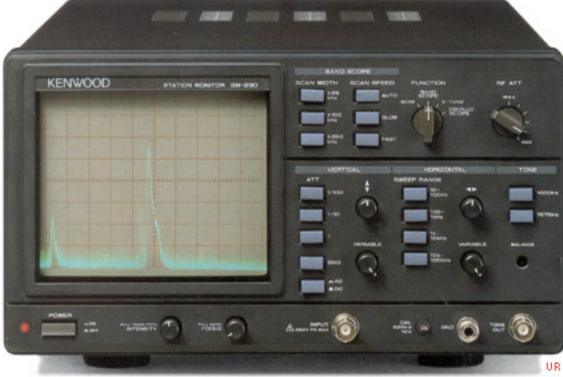




Legacy Panadapters



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





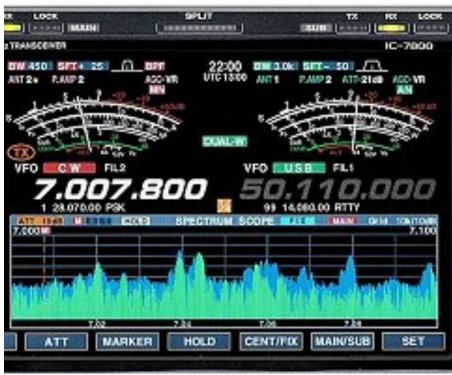
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http://www.universal-radio.com/

Legacy Panadapters



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





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Spectrum Displays Hide Weak Signals

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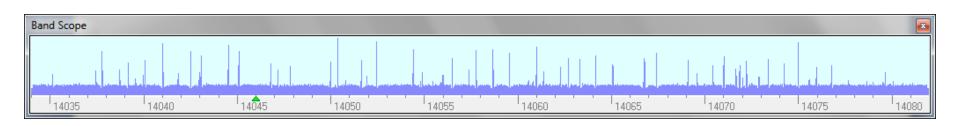
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CW Skimmer's Band Scope



• From the CW Skimmer menu, select View \rightarrow Band Scope



- Much better, but display is still very jumpy,
- No "peak signal" memory

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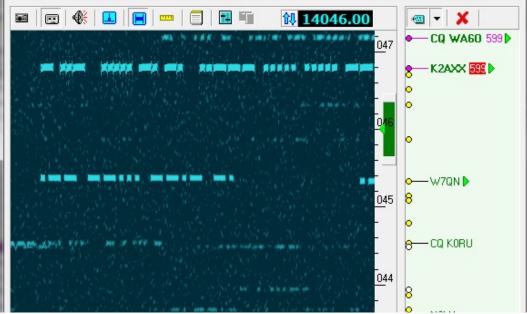


Legacy Panadapter Limitations

- 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 • GTW • CONTEST UNIVERSITY Dayton 2015

Better Waterfall Displays

The Elecraft P3 Panadapter



Major improvement over legacy designs



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http://www.elecraft.com



Elecraft P3 + P3SVGA Option



- P3 resolution only 480 x 272 pixels
- P3SVGA: internal SVGA Large Screen

Adapter

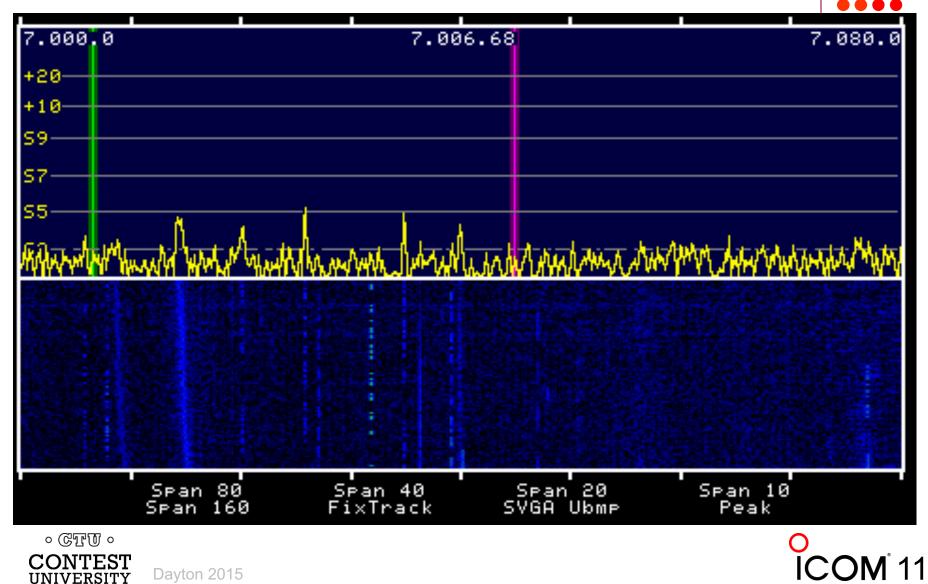
- 1024 x 768
- 1280 x 1024
- 1440 x 900
- 1920 x 1080
- Displays far more signals



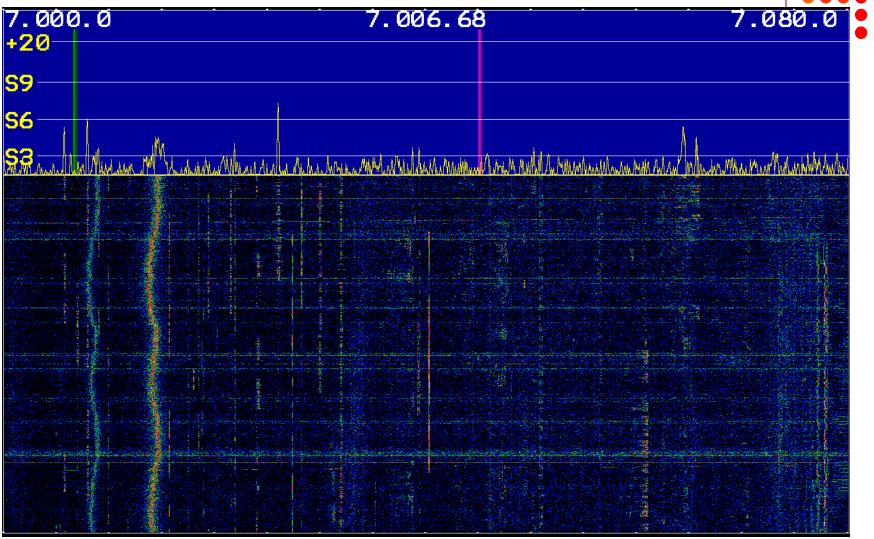




P3 Built-in Display at 480 x 272



P3SVGA at 1440 x 900



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http://www.icomamerica.com

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Icom IC-7800 with V3.0 firmware





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http://www.icomamerica.com

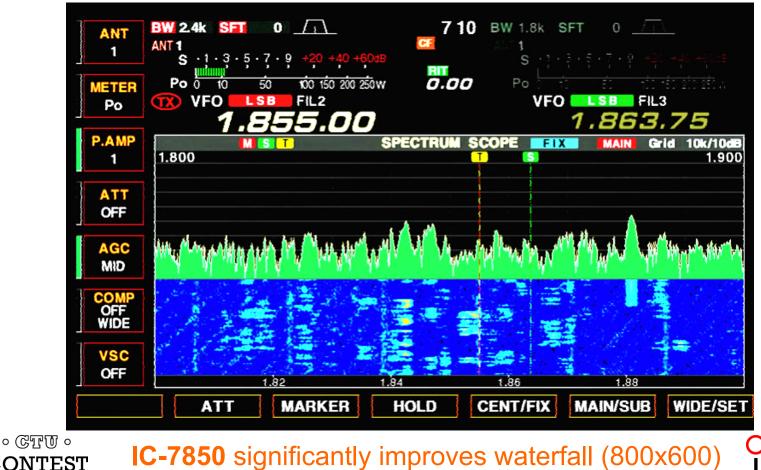
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IC-7800 V3.0 Screen Shot

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IC-7700 V2.0 Also Supports Waterfall Feature

800 x 480 (with or without external monitor)



Kenwood TS-990S



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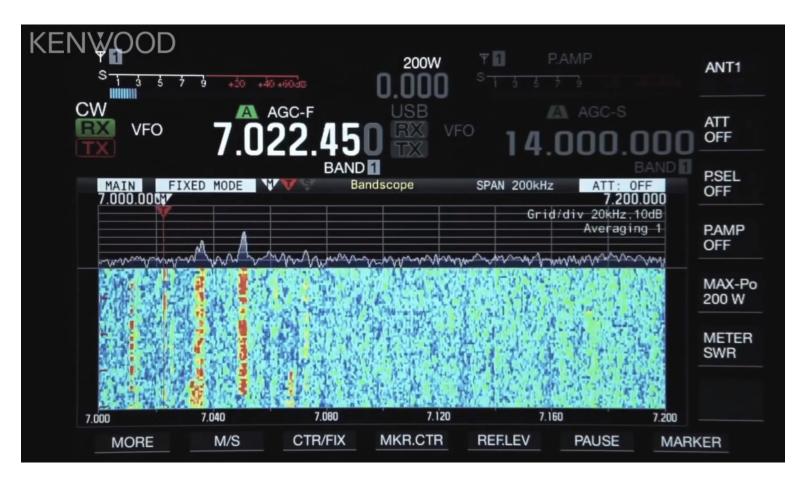


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http://www.kenwoodusa.com

TS-990S screen shot







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FlexRadio FLEX-5000™, FLEX-6700™







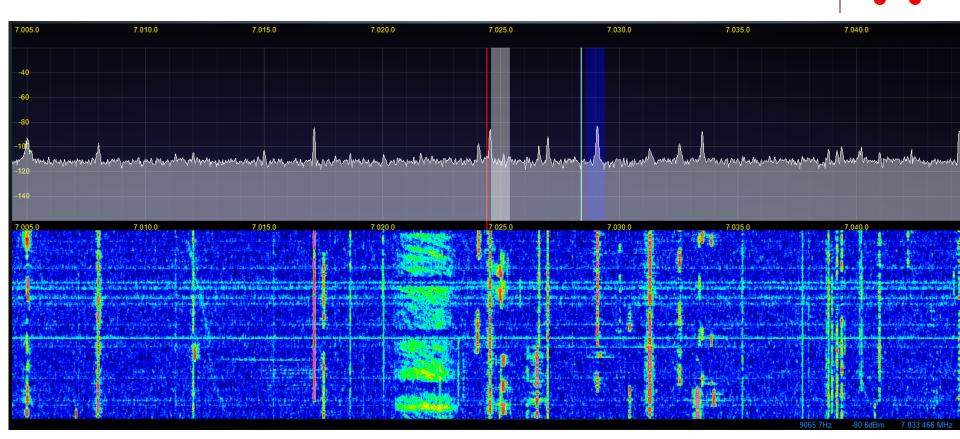


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http://www.flexradio.com



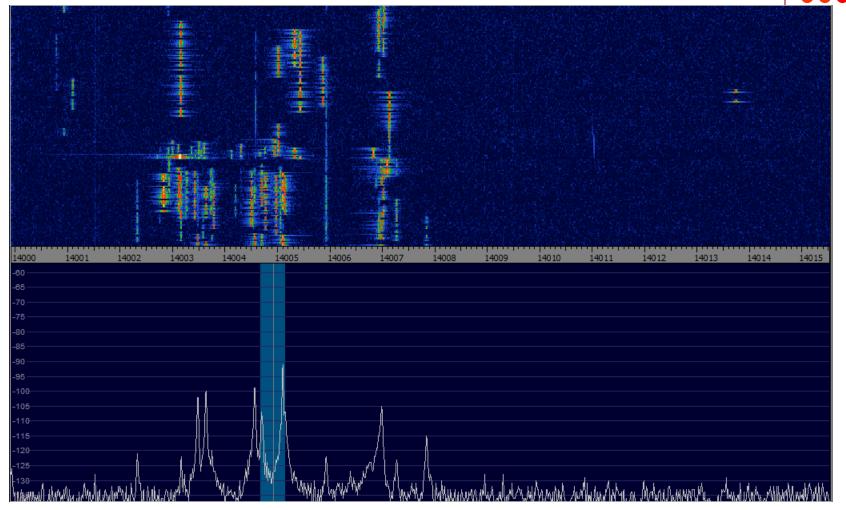
PowerSDR[™] Software for FlexRadio







Winrad Software

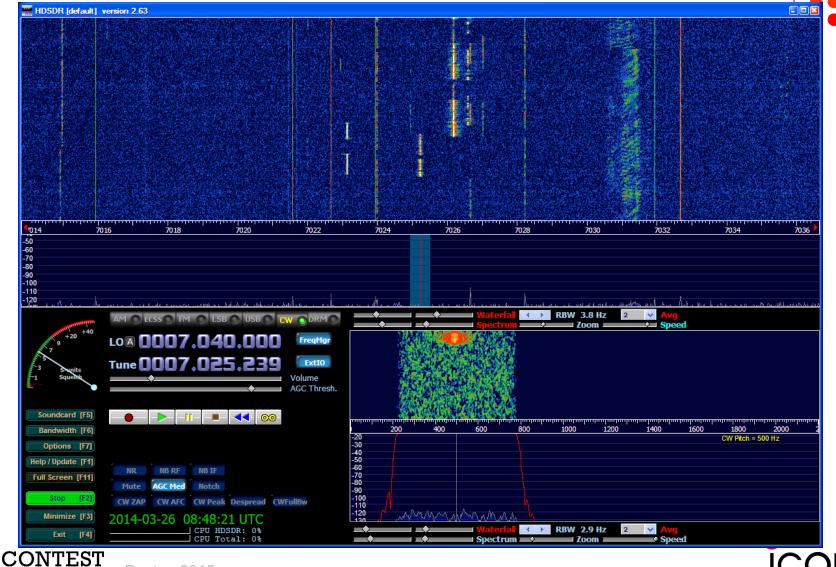




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HDSDR Software

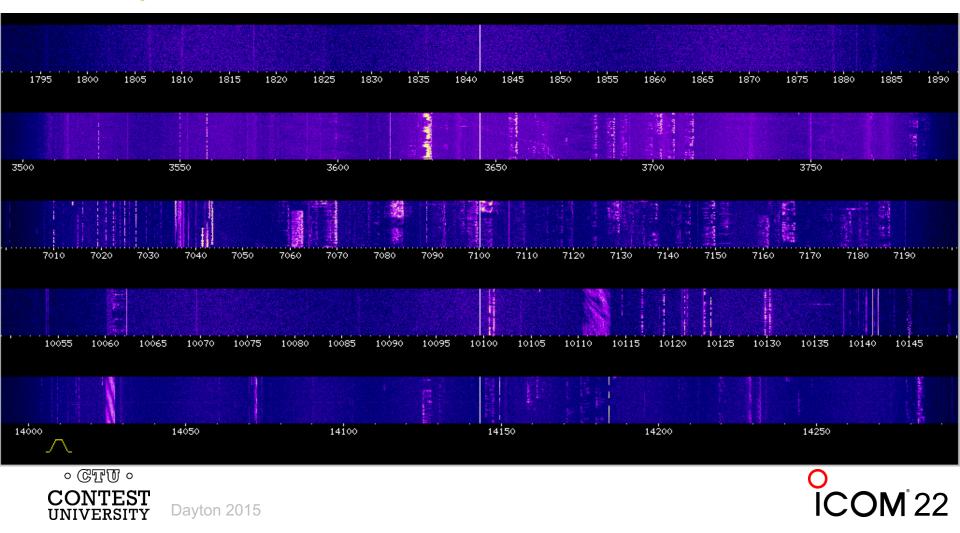


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WebSDR: Waterfalls on the Web <u>http://websdr.ewi.utwente.nl:8901/</u>



Waterfall Display Advantages

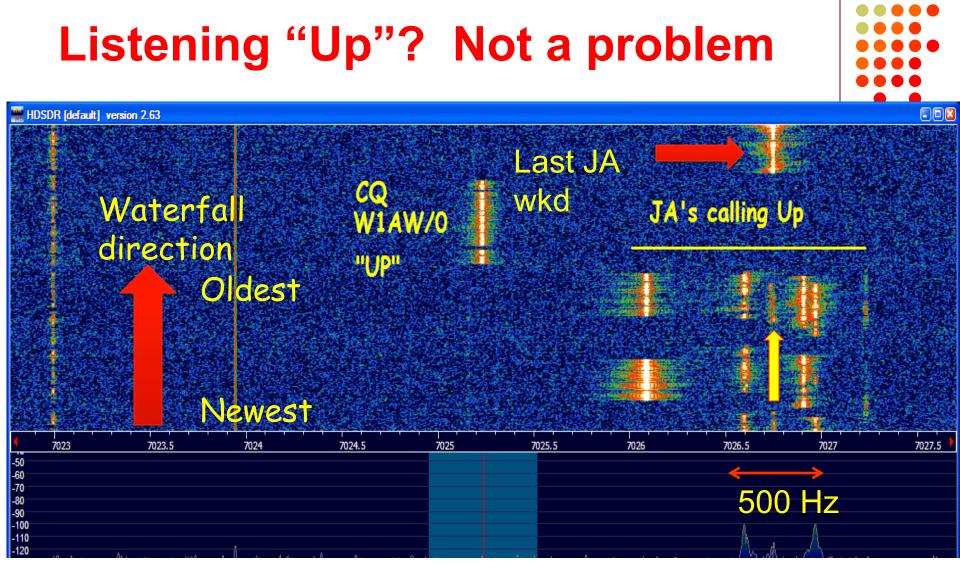


- "Click to Tune" direct access using a mouse
 - IC-7800 V3.0, IC-7850, Flex/PowerSDR, HDSDR (but not K3/P3)
- Weak signals easy to spot (faint traces)
- Many zoom levels: 7.5, 15, 30, 60, ..., 800 KHz
 - Watch the whole band at once, or a small slice
- Find clear frequencies *fast*
- Find who the DX just worked, fast
- Spot the gaps in a crowded CW pileup



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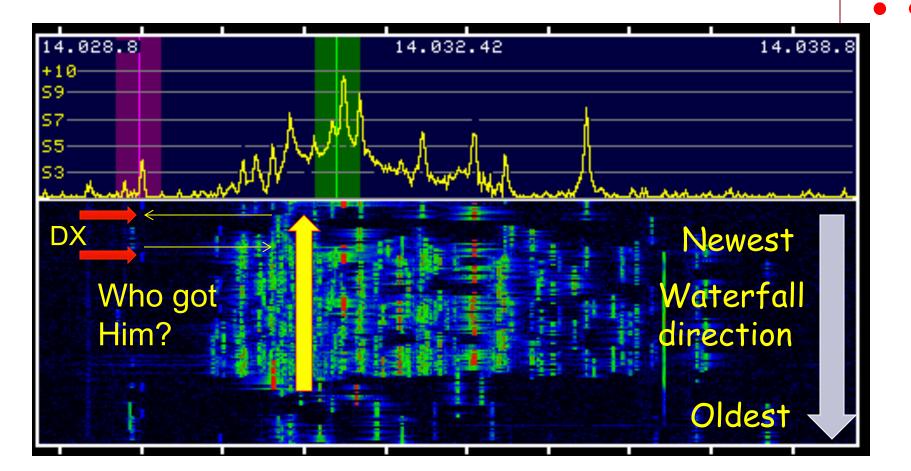


Who will W1AW/0 answer next?



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E30FB CW Pileup on P3 display



Where will he listen next?



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Advantage: Waterfall

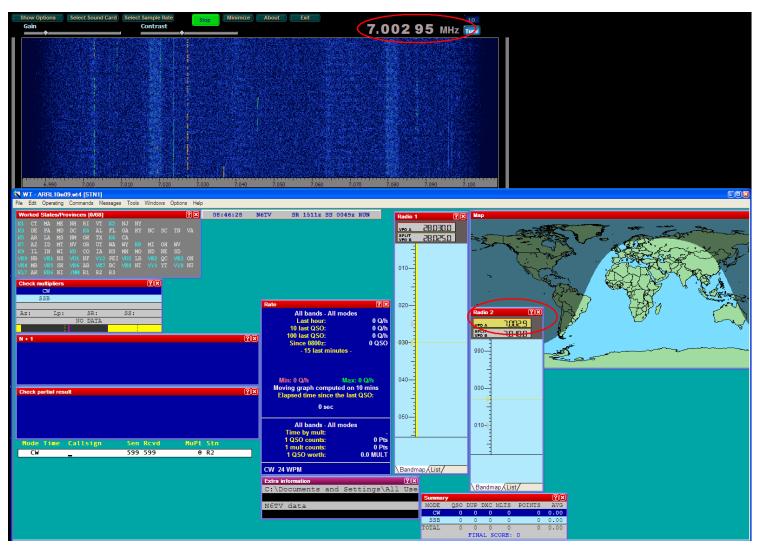


- Find "good spots to call" in a CW pileup
- Find clear spots to call CQ
- QRM? You can see where to move your VFO to minimize it
- During S&P, find the "next" signal fast (no more slow tuning)
- Position VFO B or 2nd receiver without having to listen to it
 - S&P while CQing, "SO2V" (single-op, two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





Winrad on Top, Win-Test on Bottom

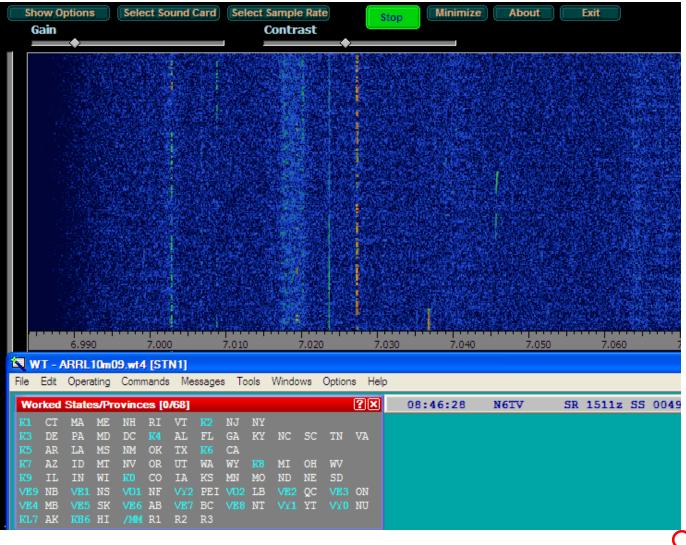




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Winrad & Win-Test (zoomed)



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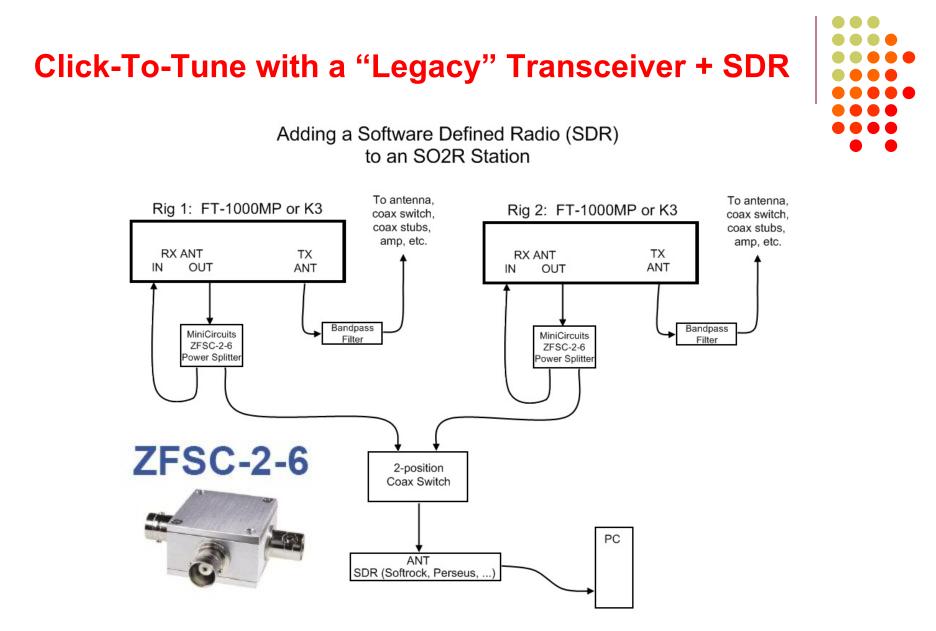
Waterfall Display Disadvantages



- Radios don't automatically jump from signal-tosignal 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"







Drawing by N6TV@arrl.net 31 May 2008



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



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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?



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

