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Recent SDR Projects

Dave Robinson WW2R

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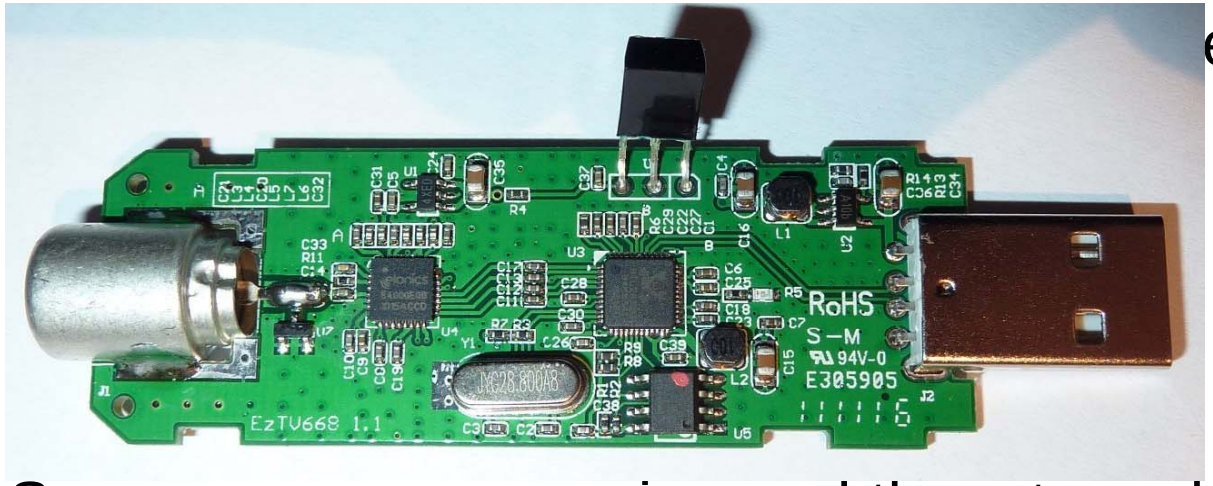
DTV USB Dongles for Hams?

I first came across them on the G4VXE blog

For $22 it was worth a try!



e

Someone reverse engineered them to make them into an SDR

Mine has OCX antenna connector. Same as used on some GPS so adaptor cables are available

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Not all are the same… Check!

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Tuner	Frequency range
Elonics E4000	52 - 2200 MHz with a gap from 1100 MHz to 1250 MHz *
Rafael Micro R820T	24 - 1766 MHz*
Fitipower FC0013	22 - 1100 MHz (FC0013B/C, FC0013G has a separate L-band input, which is unconnected on most sticks)
Fitipower FC0012	22 - 948.6 MHz
FCI FC2580	146 - 308 MHz and 438 - 924 MHz (gap in between)

RTL2832 Decodes TV signals

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Sensitivity NBFM 12.5kHz b/w

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Frequency	Sensitivity (NBFM)
70.4000 MHz	-112dBm
101.1000 MHz	-116dBm
121.1000 MHz	-119dBm
145.2000 MHz	-114dBm
168.5000 MHz	-114dBm
432.2000 MHz	-119dBm
458.0000 MHz	-115dBm
1050.0000 MHz	-116dBm

Not brilliant but works OK for $22. It does have front end filtering

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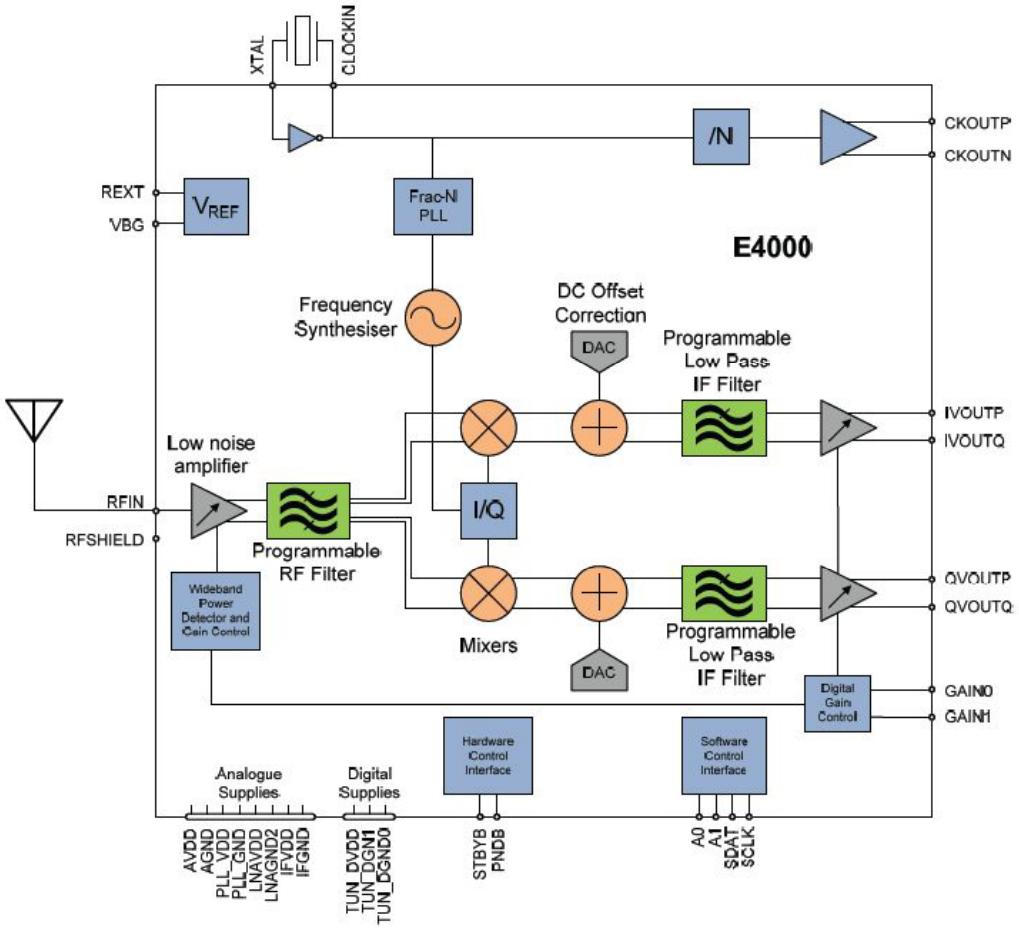
E4000 Block Diagram



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What can they be used for?

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1. Monitor/Scan local repeaters144/220/432/902
2. Monitor local beacons144/220/432/902
3. Use as a Panadaptor for Microwave IF (144MHz)
4. Decode ADSB and find aircraft scatter targets (1090MHz)
5. GPS receiver (covers ~1500MHz)
6. (UK) Watch TV when bands close!

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Available Software

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Name	Type
gr-pocsag	GRC Flowgraph
multimode RX (try first!)	GRC Flowgraph
simple_fm_rvc	GRC Flowgraph
python-librtlsdr	Python Wrapper
pyrtlsdr	Python Wrapper
rtlsdr-waterfall	Python FFT GUI
Wireless Temp. Sensor RX	Gnuradio App
QtRadio	SDR GUI
gqrx (fork)	SDR GUI
rtl_fm	SDR CLI
SDR#	SDR GUI
tetra_demod_fft	Trunking RX
gqrx (original)	SDR GUI
airprobe	GSM sniffer
gr-smartnet (WIP)	Trunking RX
gr-air-modes	ADS-B RX
Linrad	SDR GUI
gr-ais (fork)	AIS RX
GNSS-SDR	GPS RX (Realtime!)
LTE-Cell-Scanner **(NEW)**	LTE Scanner / Tracker
Simulink-RTL-SDR **(NEW)**	MATLAB/Simulink wrapper
gr-scan **(NEW)**	Scanner
kalibrate-rtl **(NEW)**	calibration tool
pocsag-mrt **(NEW)**	Multichannel Realtime Decoder

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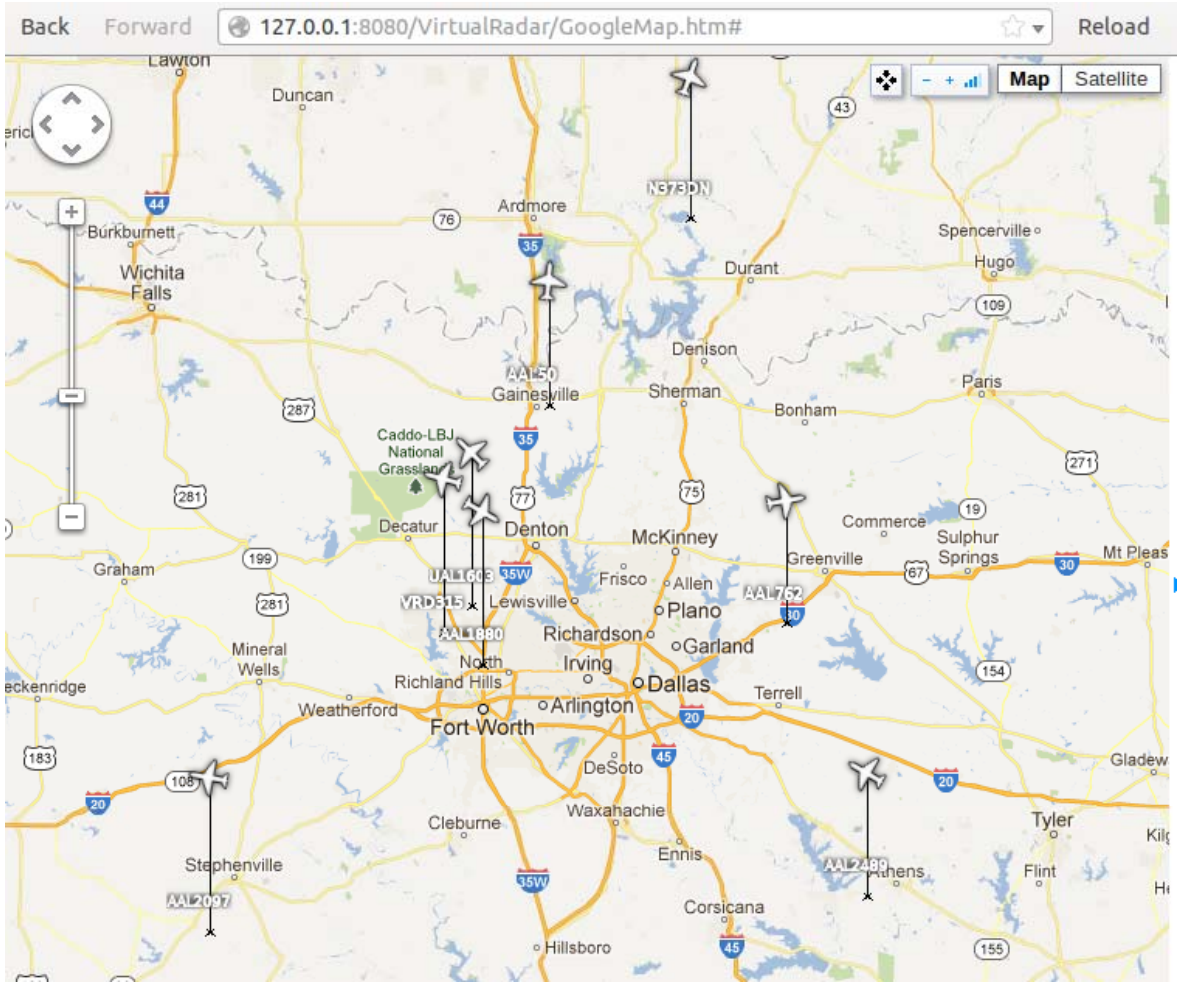
RTL2832U/E4000 Dallas



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ADSB Loft Antenna

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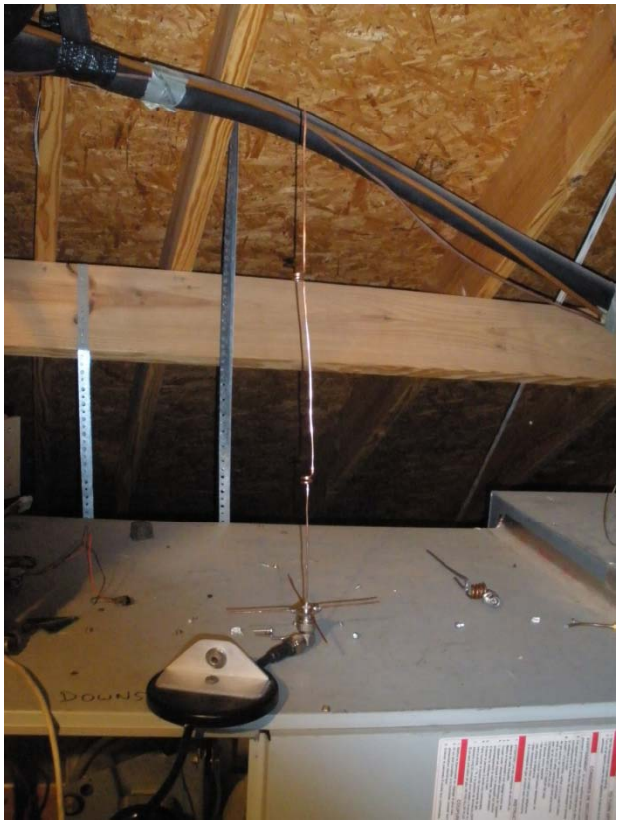
J pole. 2 pieces semi-rigid



Co-linear 14AWG cable

Next Version

Of course they soon sold out!. Recently another version has become available I got one for $18!

Rafael Micro R820T tuner

Covers 24-1700MHz so can be used as a 28MHz pan adaptor

More sensitive than RTL2832 tuner

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R820T/E4000

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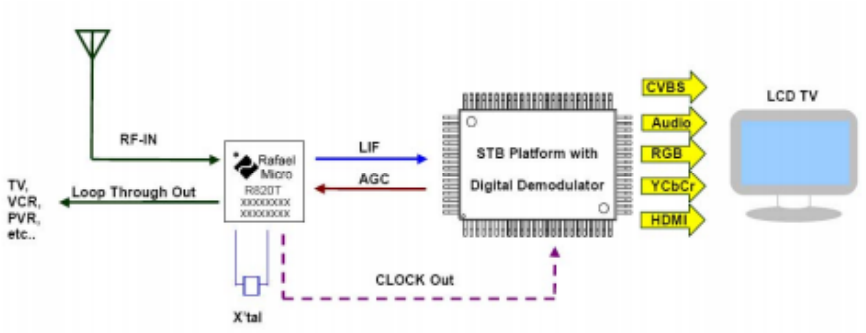
R820T

Features

- Support all digital TV standards: DVB-T, ATSC, DTMB, IRIB and ISDB-T.
- Lowest BOM cost WITHOUT external SAW filters, LNA, balun, LDO, and adjustable parts.
- Low cost Single-In Digital TV Application
- Compliant with EN 300 744, Nordig 2.2, D-BOOK 7.0, ARIB B21, ABNT 15604, ATSC A74 and GB20600-2006
- Compliant with EN-55020, EN55013 and FCC
- Ultra low power consumption < 190mA
- Single power supply with 3.3V
- 2-wired I2C interface
- 24-pin 4x4 QFN lead-free package

Applications

- Terrestrial Digital TV
- Desktop/Laptop PCTV, Mini-card, and USB peripherals
- Set Top Box
- Portable Media Player



Universal DTV

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DL4MEA ModeS beast

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Down converter plus FPGA

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ModeS beast

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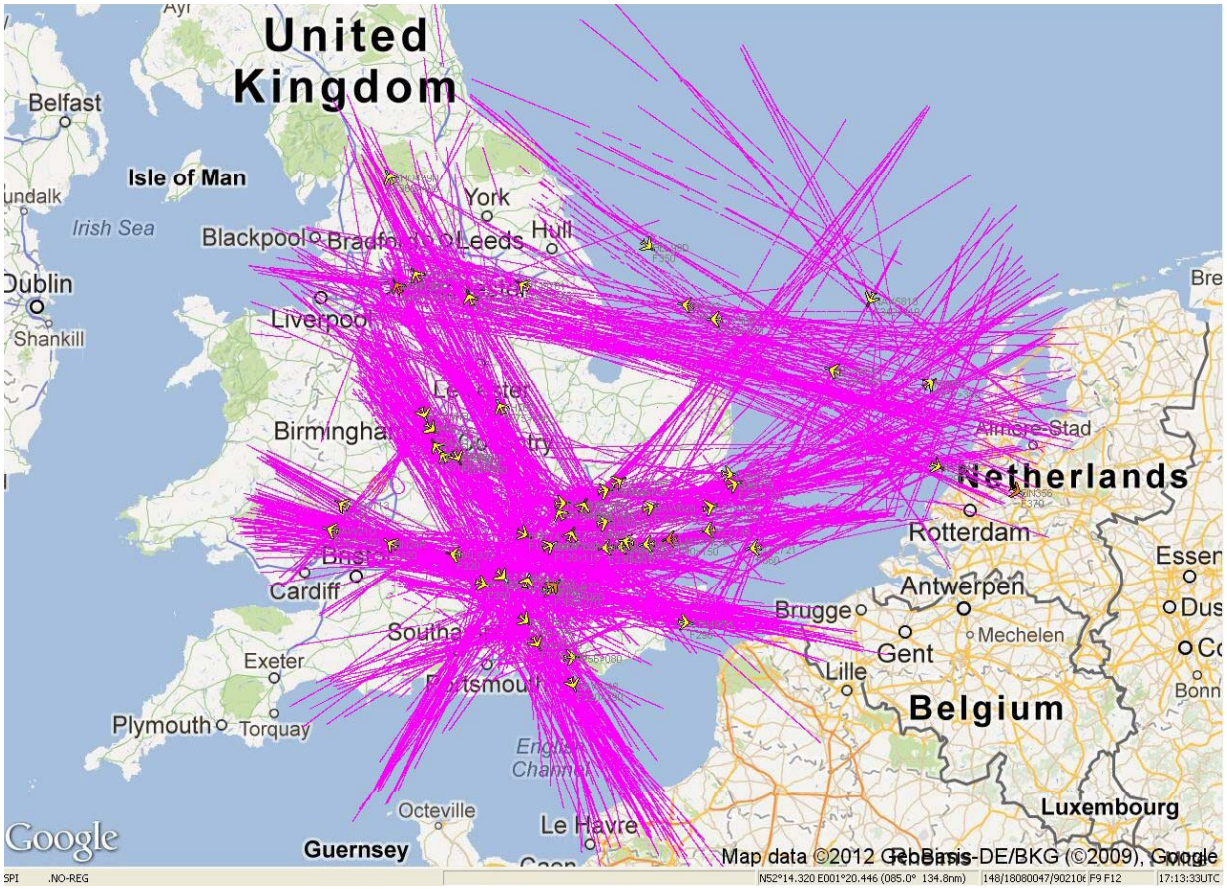

Indoor co-linear antenna on window sill

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HPSDR

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RX Board + TX Board + Ethernet board + RX filter board + TX filter board!

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Anan-10

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- 100kHz thro 6m
- 10W+ output
- GigE Interface
- Transverter Output

Anan-10

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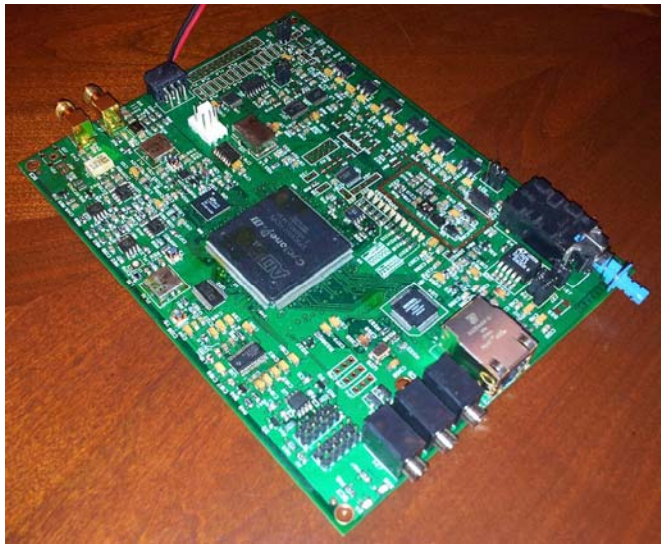

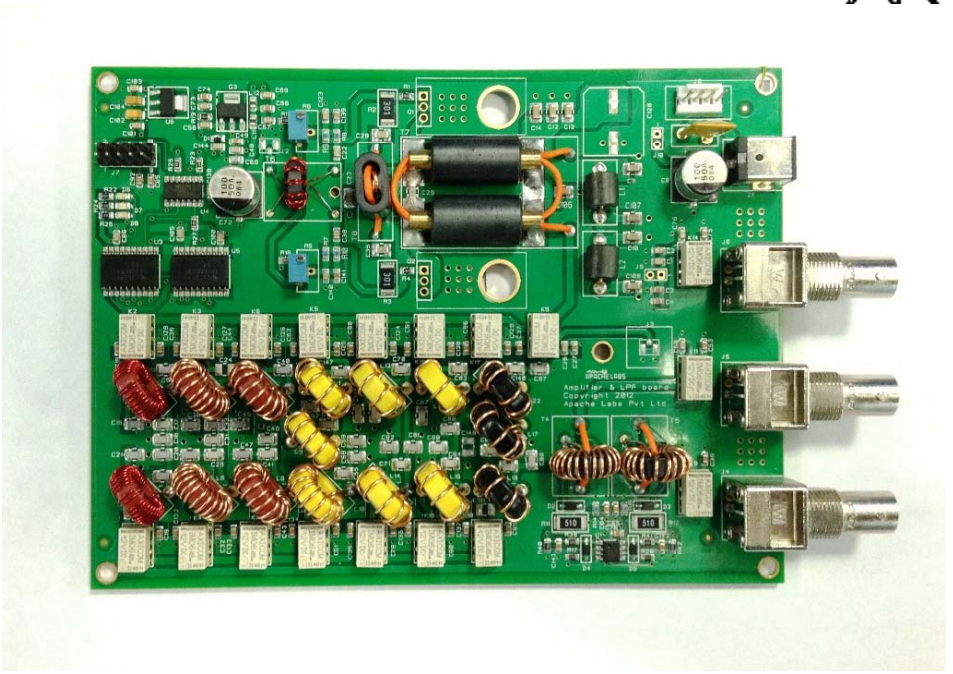

RX+TX+Ethernet

PA/Filters

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Dual receiver W5WC

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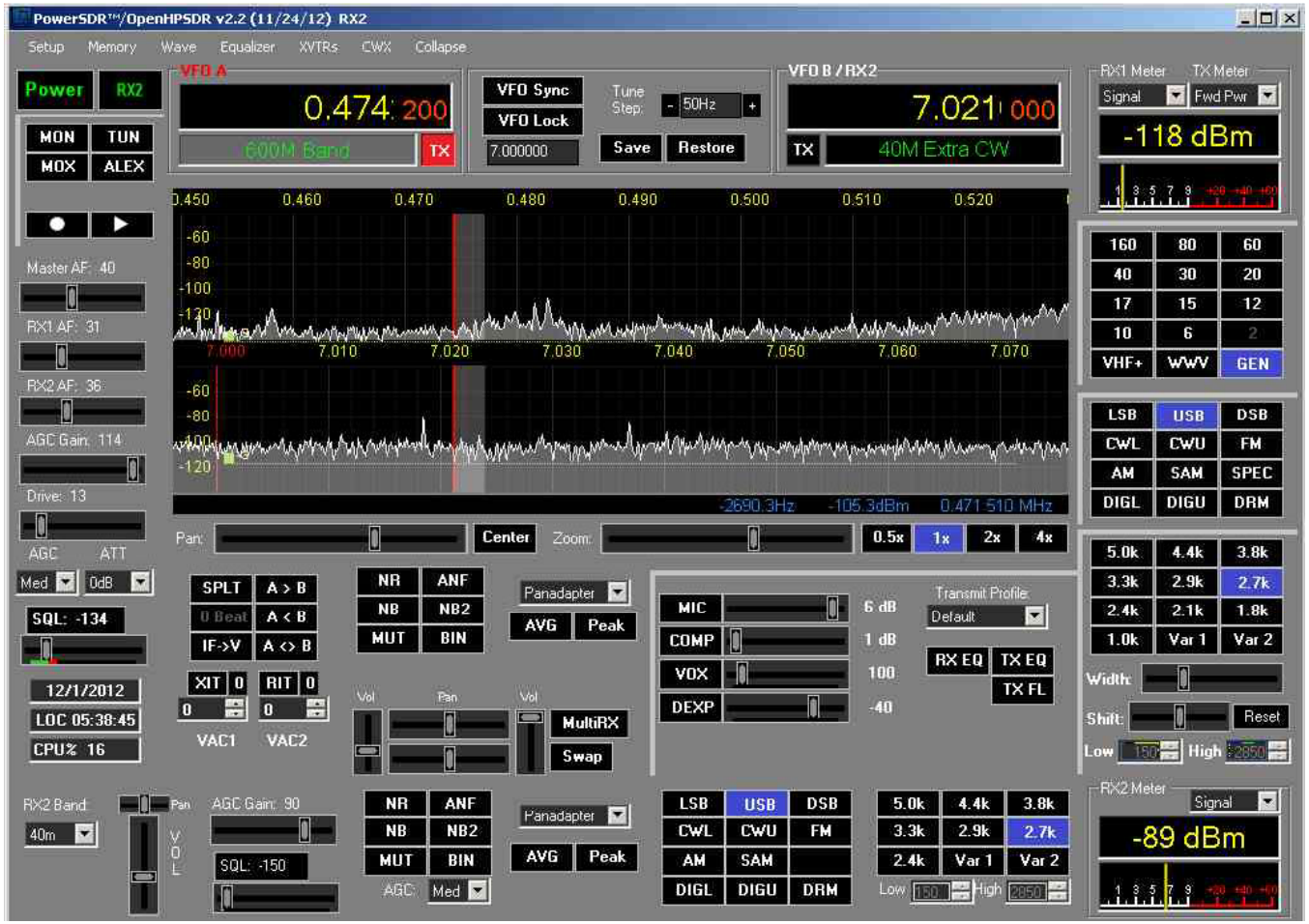

Rx covers 50+ MHz so can monitor LF & 40m

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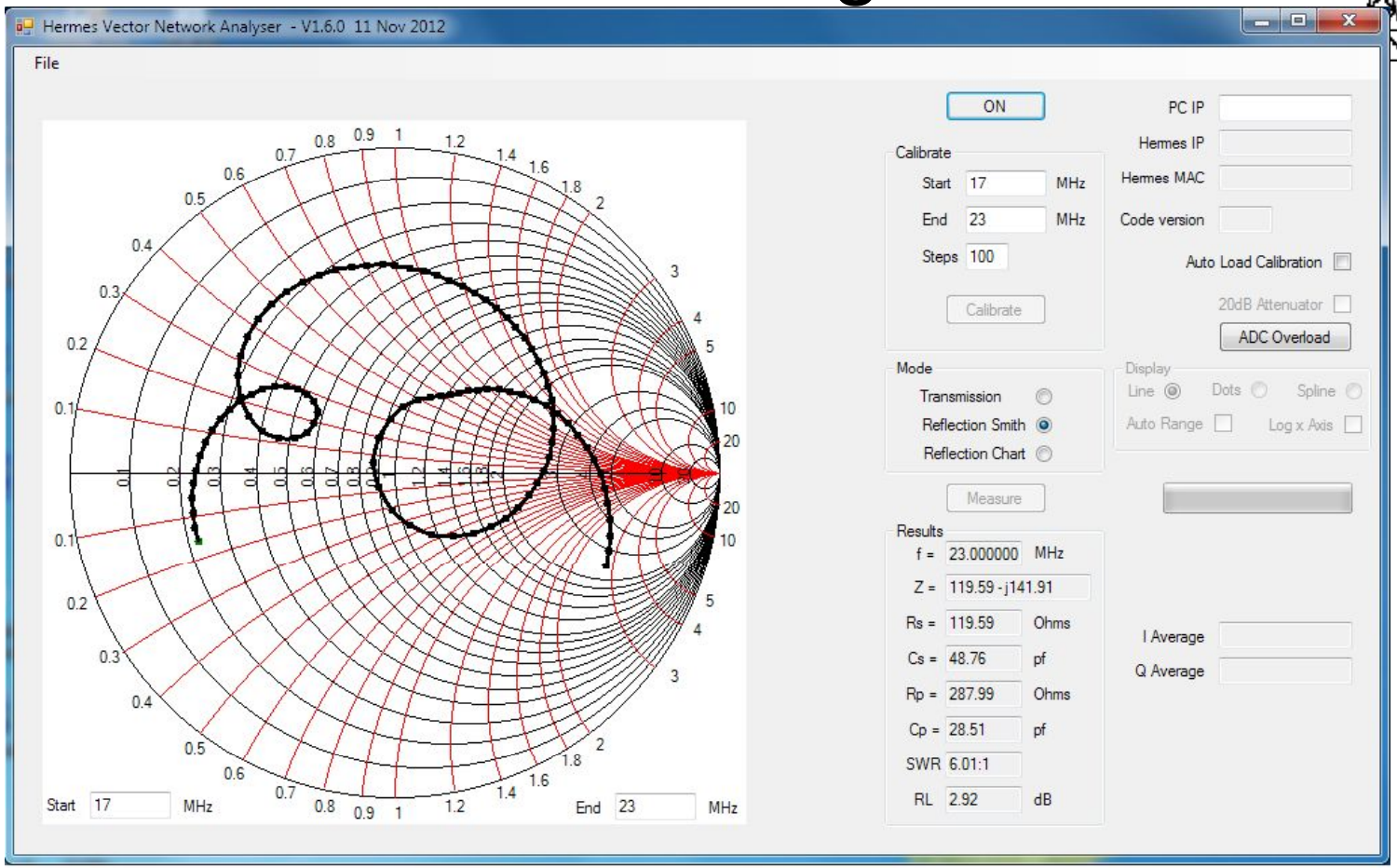
VNA Usage



Software by VK6APH

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More Information

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- G4VXE Blog: http://g4vxe.blogspot.co.uk/
- Windows guide to USB dongle install http://www.m9t.co.uk/
- Windows software http://rtlsdr.org/softwarewindows
- Linux software http://sdr.osmocom.org/trac/wiki/rtl-sdr
- Hermes: http://openhpsdr.org/wiki/index.php?title=HERMES
- Anan: https://apache-labs.com/
- VNA: http://openhpsdr.org/wiki/index.php?title=VNA