

RTL-SDR a \$20 Microwave Rx

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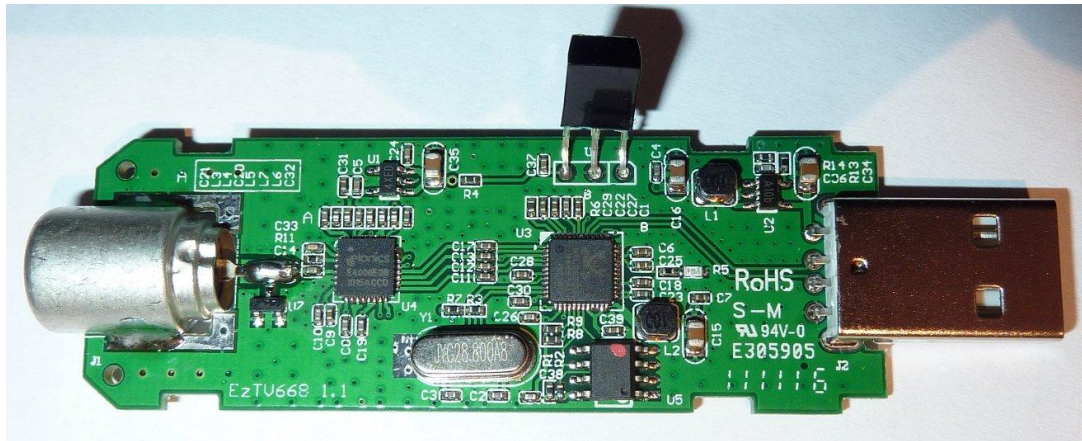
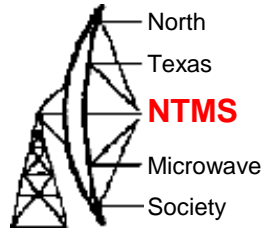
NTMS
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Mini-Conference

RTL-SDR

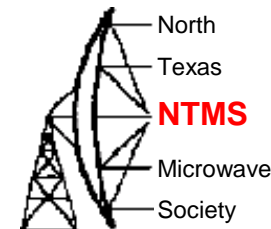


- The RTL-SDR starts out life as a mild mannered Terrestrial Digital Video Broadcast DVB-T USB adapter
- Antti Palosaari developed a driver hack that opened up direct access to the I-Q samples from the device
- Now with the right software this stick will receive all kinds of signals

RTL-SDR

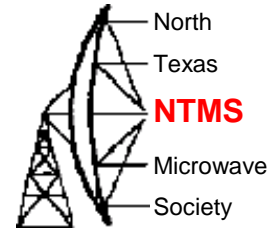


RTL-SDR, What is it?



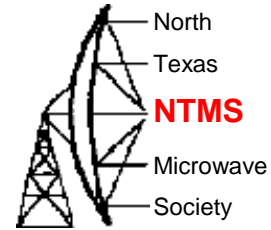
- Self contained USB Dongle
- Cheap - \$20-\$35
- Wideband - up to 2MHz display bandwidth
- Typ. Rx range 52 to 2210 MHz gap: 1106 to 1247
- Available from eBay
- Free software for Window and Linux
- Similar to Funcube Dongle but different
 - RTL2832/RTL2832U backend with 8-bit ADC
 - Not 24 bit ADC like Funcube
 - Much faster sampling, up to 3.2 MSPS
 - No embedded PNP driver

RTL-SDR Available Hardware



VID	PID	tuner	device name
0x0bda	0x2832	all of them	Generic RTL2832U (e.g. hama nano)
0x0bda	0x2838	E4000	ezcap USB 2.0 DVB-T/DAB/FM dongle
0x0ccd	0x00a9	FC0012	Terratec Cinergy T Stick Black (rev 1)
0x0ccd	0x00b3	FC0013	Terratec NOXON DAB/DAB+ USB dongle (rev 1)
0x0ccd	0x00d3	E4000	Terratec Cinergy T Stick RC (Rev.3)
0x0ccd	0x00e0	E4000	Terratec NOXON DAB/DAB+ USB dongle (rev 2)
0x185b	0x0620	E4000	Compro Videomate U620F
0x185b	0x0650	E4000	Compro Videomate U650F
0x1f4d	0xb803	FC0012	GTek T803
0x1f4d	0xc803	FC0012	Lifeview LV5TDeluxe
0x1b80	0xd3a4	FC0013	Twintech UT-40
0x1d19	0x1101	FC2580	Dexatek DK DVB-T Dongle (Logilink VG0002A)
0x1d19	0x1102	?	Dexatek DK DVB-T Dongle (MSI DigiVox? mini II V3.0)
0x1d19	0x1103	FC2580	Dexatek Technology Ltd. DK 5217 DVB-T Dongle
0x0458	0x707f	?	Genius TVGo DVB-T03 USB dongle (Ver. B)
0x1b80	0xd393	FC0012	GIGABYTE GT-U7300
0x1b80	0xd394	?	DIKOM USB-DVBT HD
0x1b80	0xd395	FC0012	Peak 102569AGPK
0x1b80	0xd39d	FC0012	SVEON STV20 DVB-T USB & FM

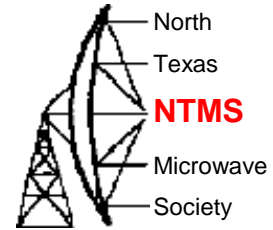
RTL-SDR Available Tuners



Tuner	Frequency range
Elonics E4000	52 - 2200 MHz with a gap from 1100 MHz to 1250 MHz (varies)
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)

- Elonics E4000 is favored and the EZ-CAP device is most common for the RTL-SDR
- Elonics is now bankrupt so grab on while you can

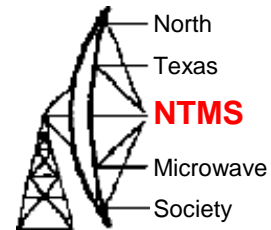
PAL Connector



- Most devices have PAL RF connectors
 - An adapter may come in handy

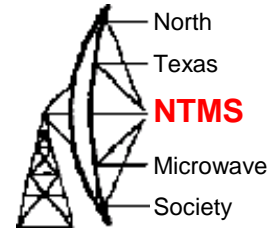


RTL-SDR Software

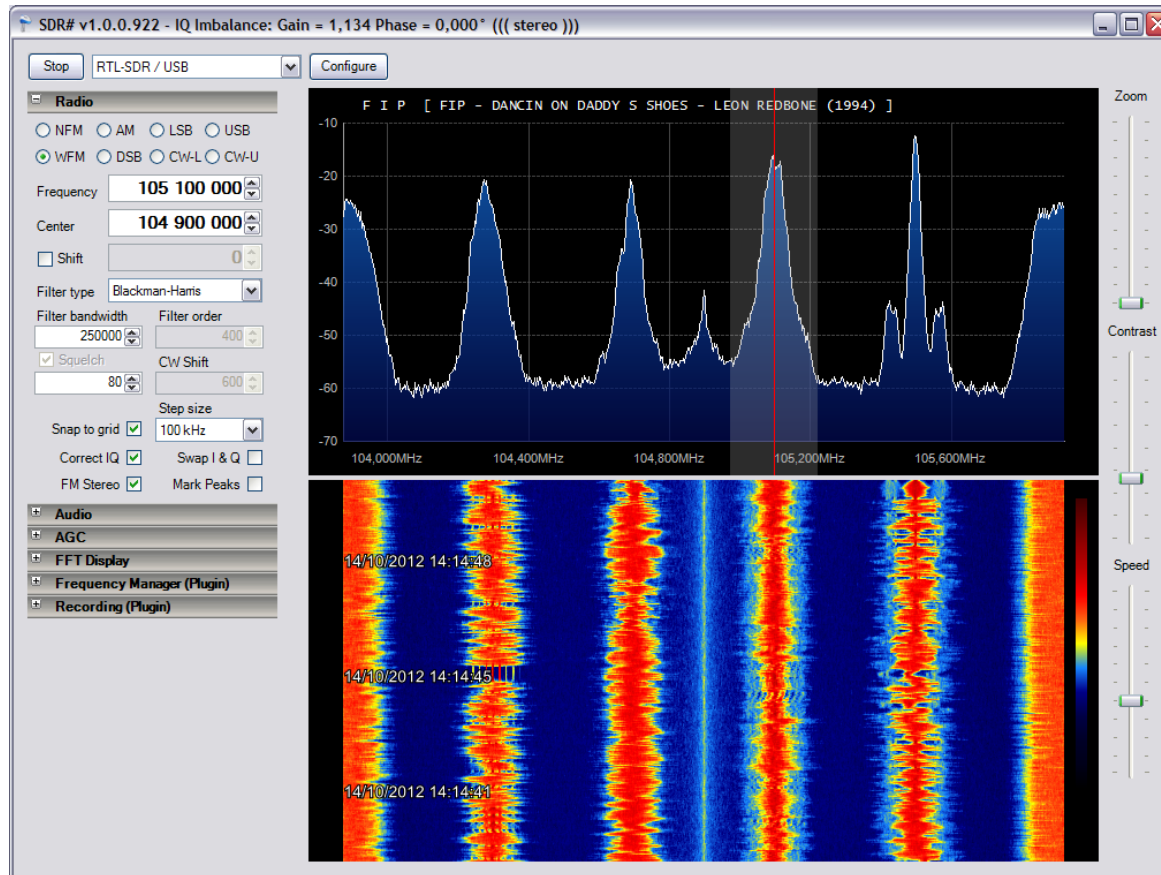


SDR#	SDR GUI	gqrx (original)	SDR GUI
gr-pocsag	GRC Flowgraph	airprobe	GSM sniffer
multimode RX	GRC Flowgraph	gr-smartnet (WIP)	Trunking RX
simple_fm_rvc	GRC Flowgraph	gr-air-modes	ADS-B RX
python-librtlsdr	Python Wrapper	Linrad	SDR GUI
pyrtlsdr	Python Wrapper	gr-ais (fork)	AIS RX
rtlsdr-waterfall	Python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

SRD#



- Simple to install Window version available



Resources



- <http://sdr.osmocom.org/trac/wiki/rtl-sdr>
- <http://rtlsdr.org/softwarewindows>

- <http://ossmann.blogspot.ca/2012/10/hackrf-jawbreaker.html>