

Latest SDR Applications

DVRA Meeting

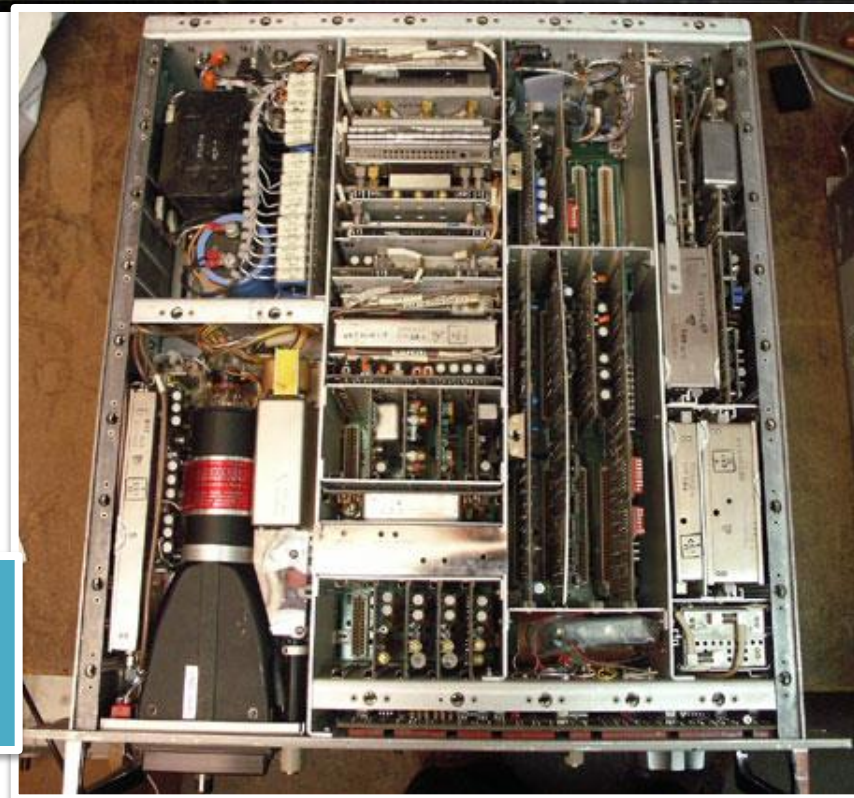
11/11/2015

Joe Jesson jejesson4@gmail.com

DUAL SDR RECEIVER DEMOED:

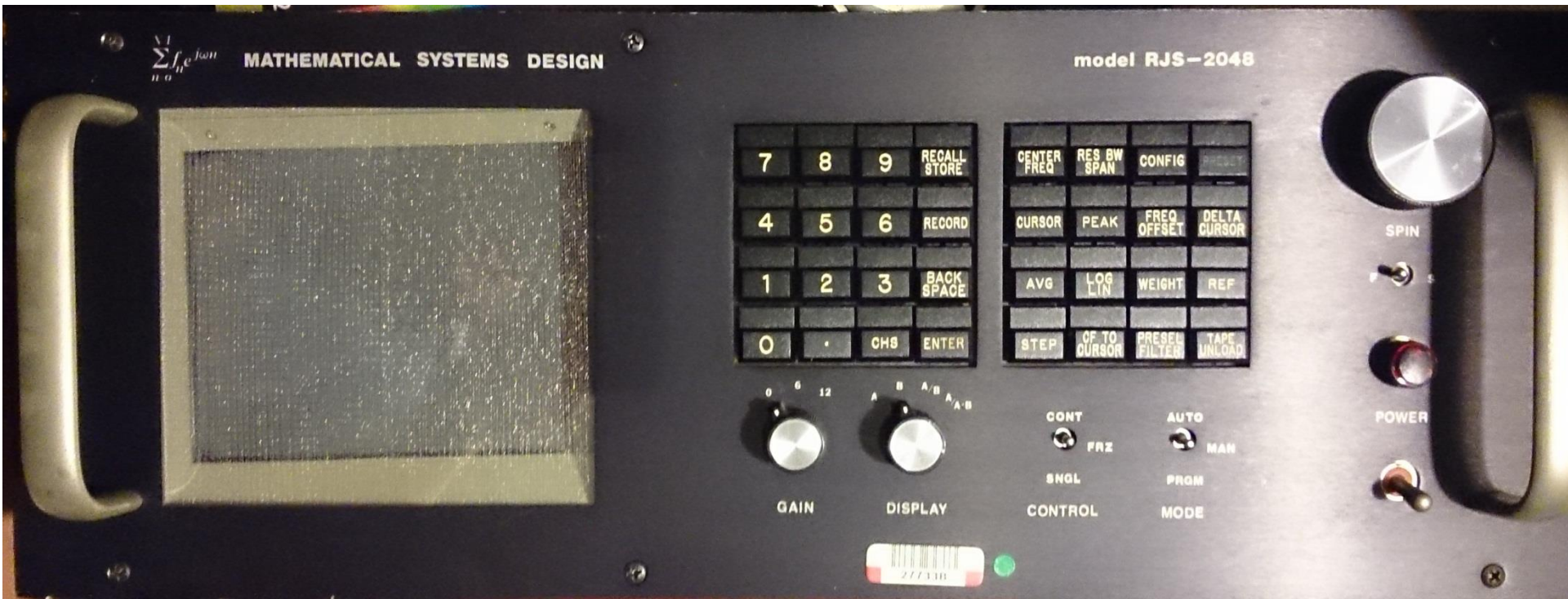
<http://www.starsandstripes4sale.com/SDR-Radio.html>

Spectrum Display, 1970's Watkins-Johnson



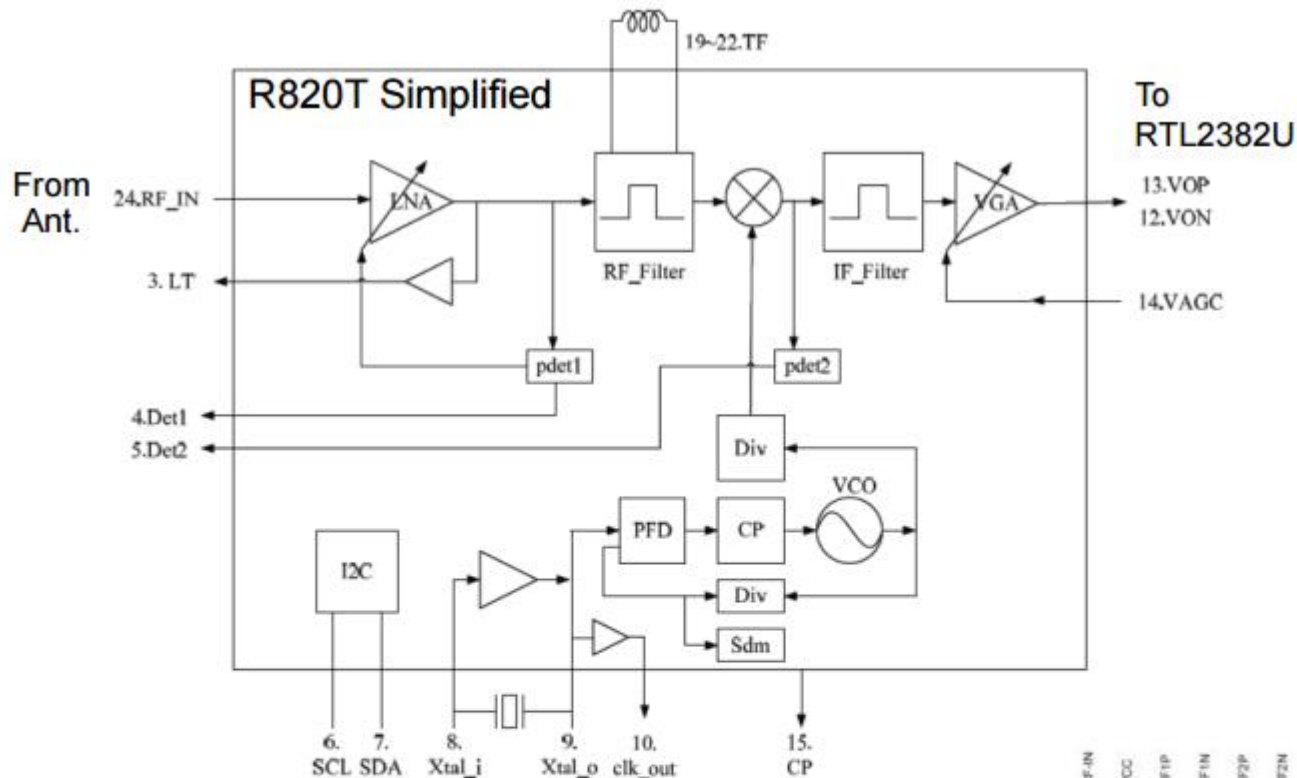
Expensive Gov't Swept Spectrum
Gold Flash Chassis to minimize Corrosion
\$10k- \$15K

Spectrum Display, 1980's, MATHEMATICAL SYSTEMS DESIGN - FFT



Expensive Gov't Fourier Spectrum
Data A/D Sampling, Tempest
\$15k

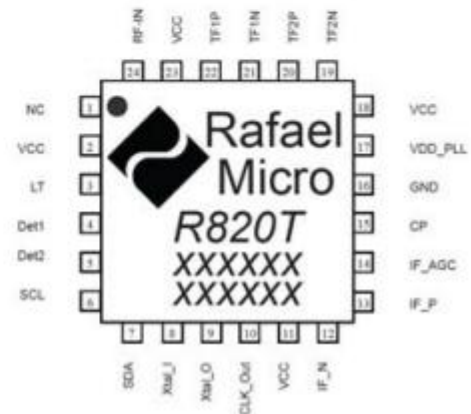
Spectrum Display, 2010's, R820 Tuner



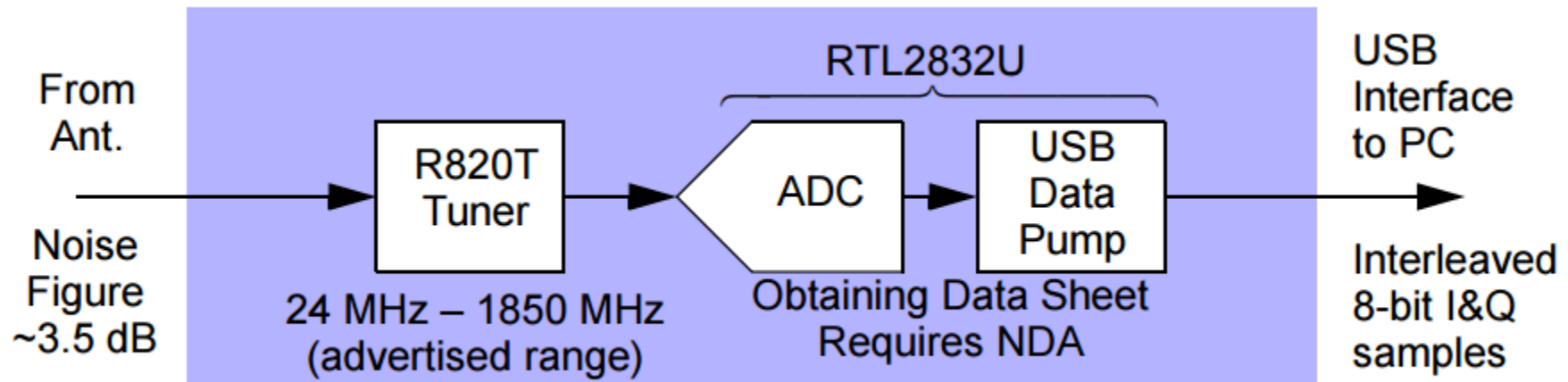
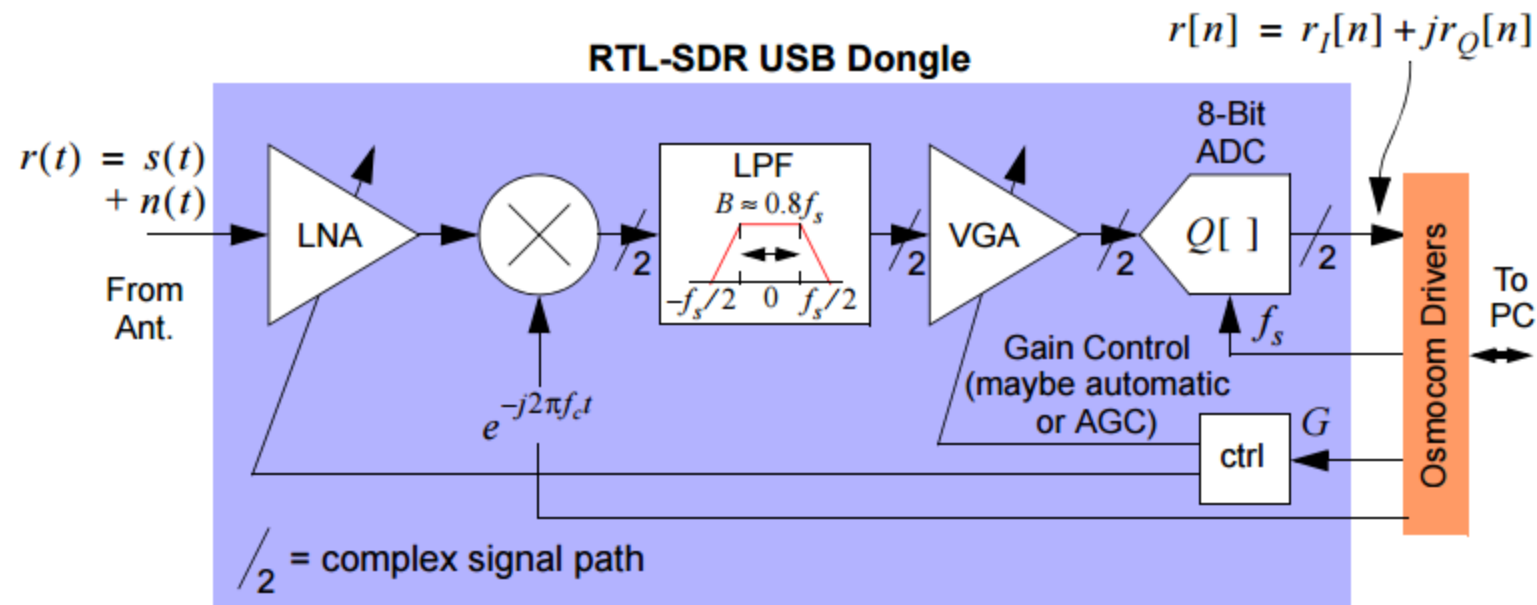
Typical figures

- Frequency range: 42 to 1002 MHz
- Noise figure : 3.5 dB @ RF_IN
- Phase noise: -98 dBc/Hz @ 10 kHz
- Current consumption: < 178 mA @ 3.3V power supply
- Max input power: +10 dBm
- Image rejection: 65 dBc

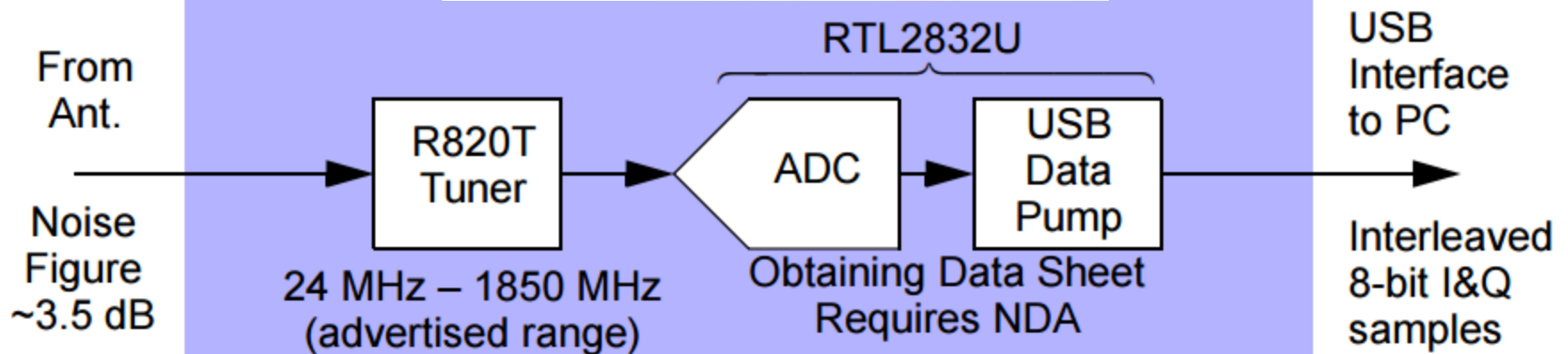
note: [dBm]=[dBuV on 75Ω] -108.75dB



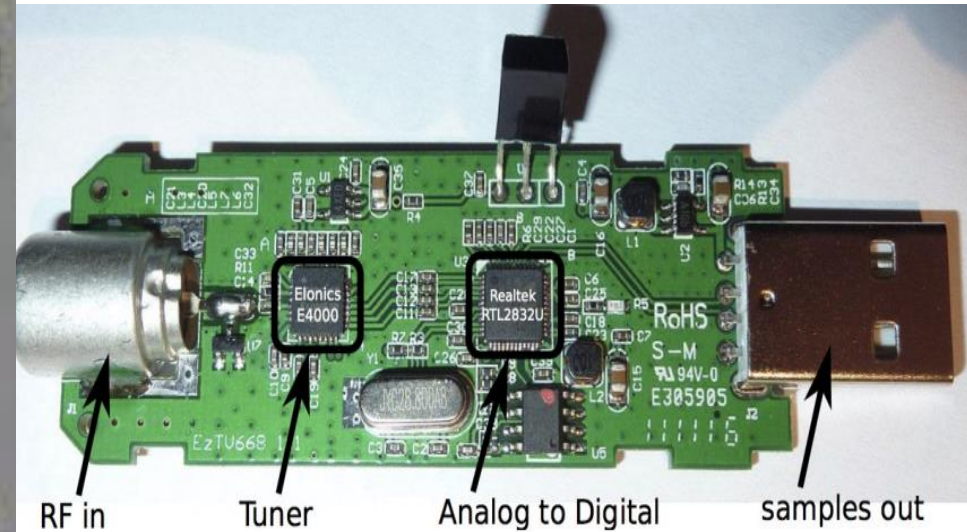
Spectrum Display, 2010's, R820 Tuner



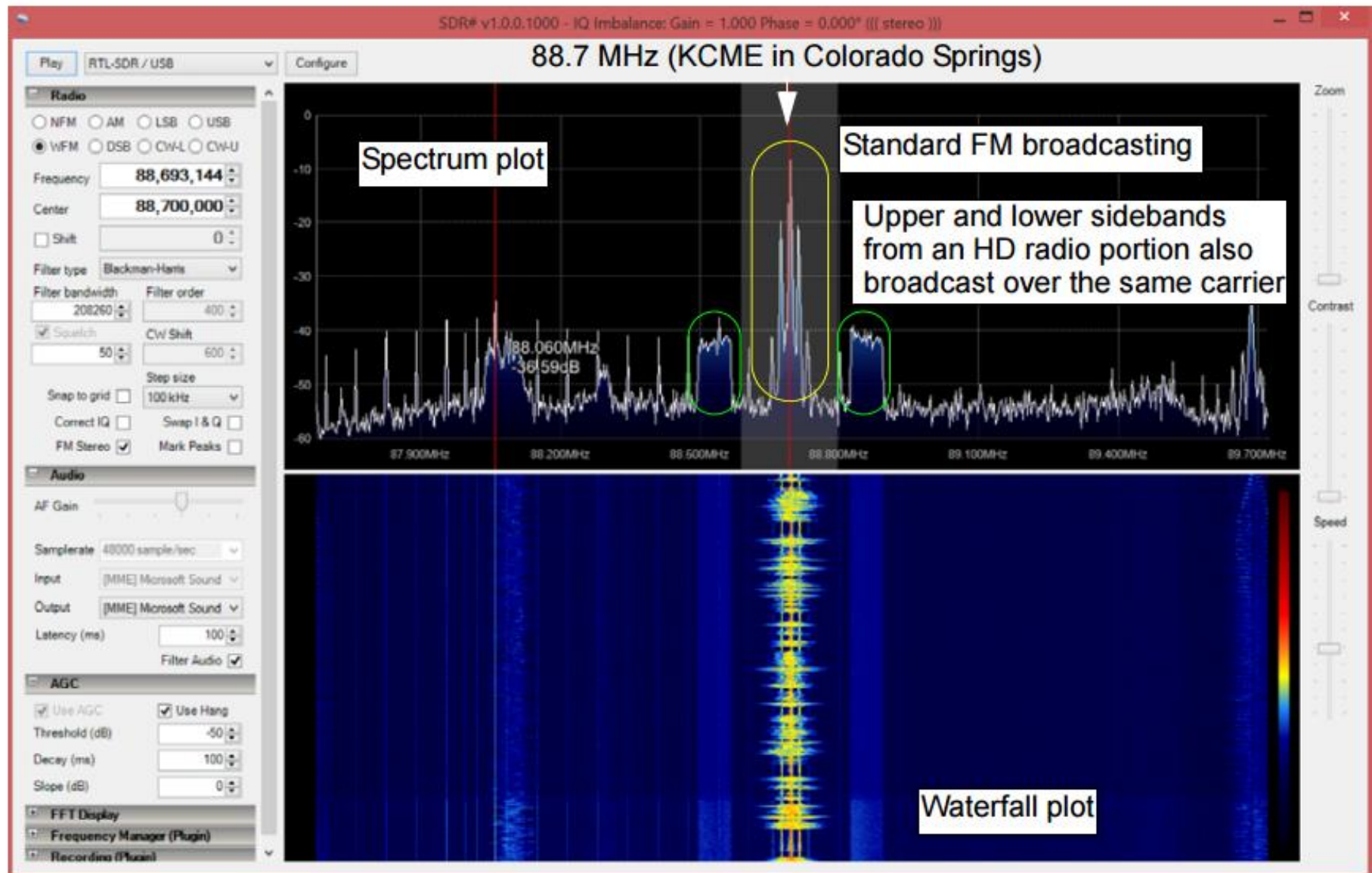
Spectrum Display, 2010's, R820 Tuner



Spectrum I/Q 2Mb, 2010's, R820 Tuners



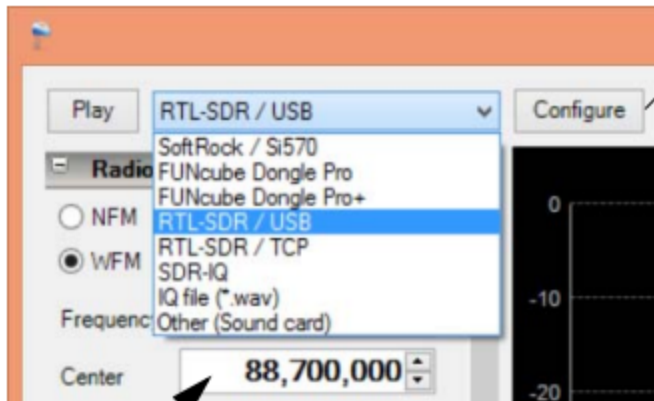
Spectrum Display and Baseband Software, SDR#



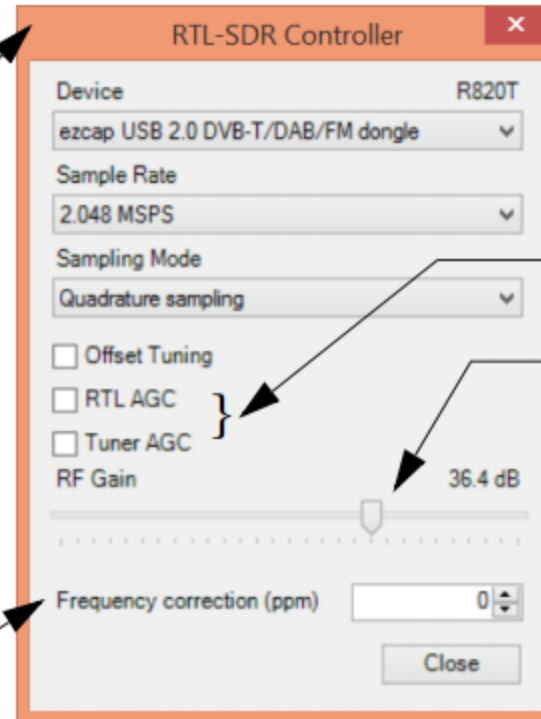
WINDOWS Based, MOST Popular

Spectrum Display and Baseband Software, SDR#

When SDR# opens be sure to select RTL-SDR/USB:



Once you click play you can tune to a center frequency by entering the value in Hz, with commas.



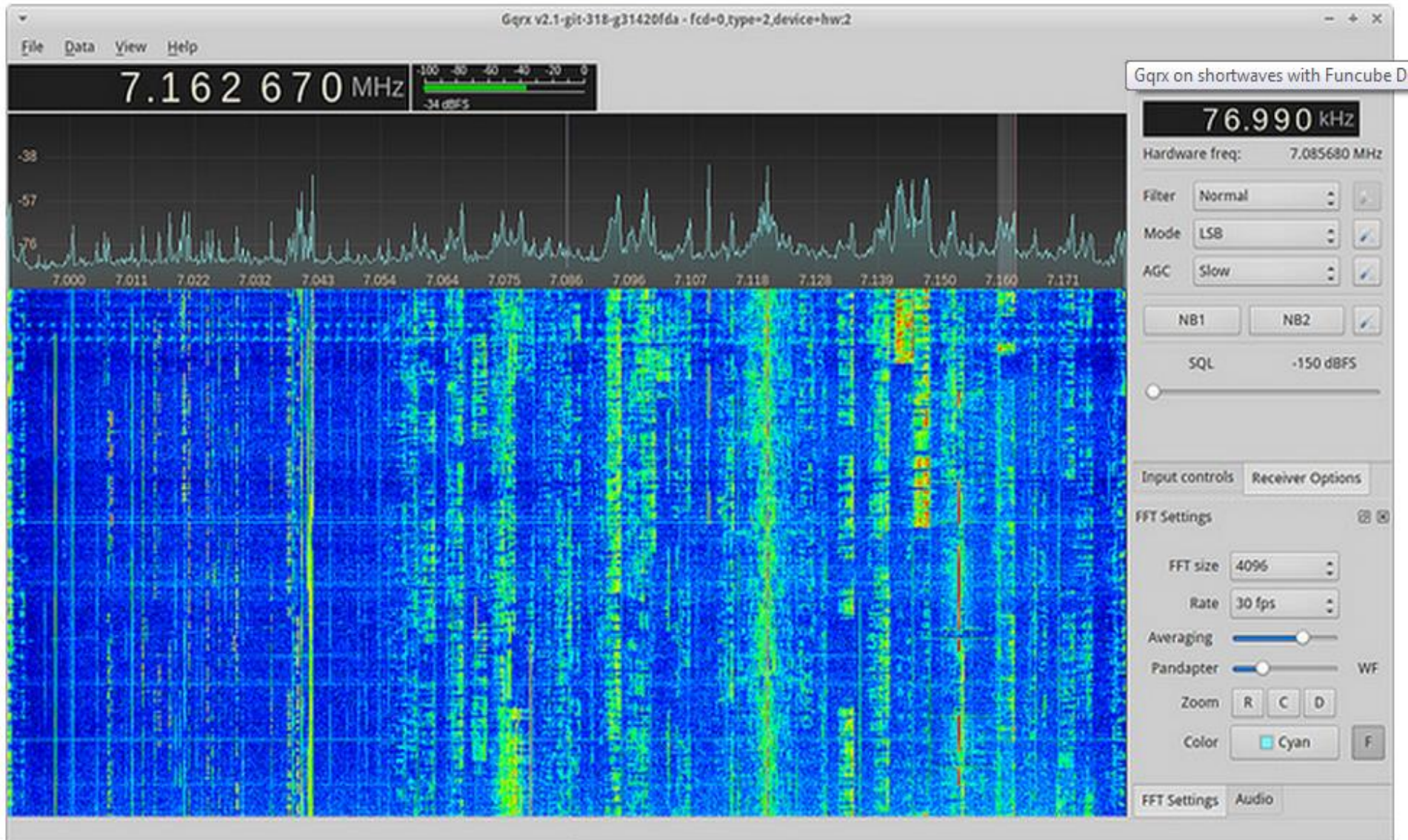
By default these are both checked. When unchecked you can then choose the RF gain manually

By tuning to a known station, such as NOAA WXM56 at 162.475 MHz, you can frequency correct the crystal time base in the RTL-SDR.

HOW TO INSTALL SDR#

<http://www.hamgoodies.co.uk/RTL%20R820T2%20Dongle%20Installation%20Guide.pdf>

Spectrum Display and Baseband SW, GQRX

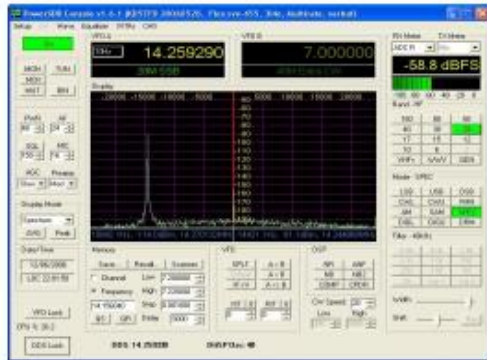


LINUX Based, Most Popular for Linux and available as LIVE Distribution USB
(Boots into UBUNTU And Pre-installed GQRX)

Spectrum Display and Baseband SW Options

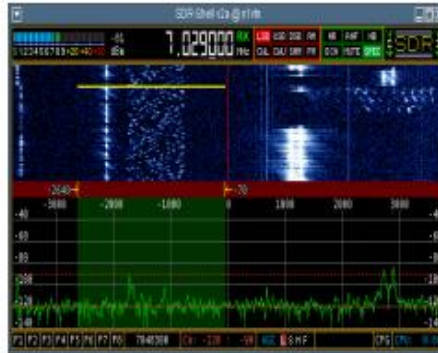
PowerSDR

<http://www.flex-radio.com>



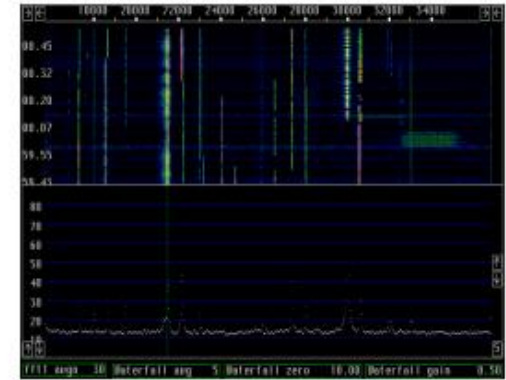
SDR Shell

<http://ewpereira.info/sdr-shell>



Linrad

<http://www.nitehawk.com/sm5bsz/linuxdsp/linrad.htm>



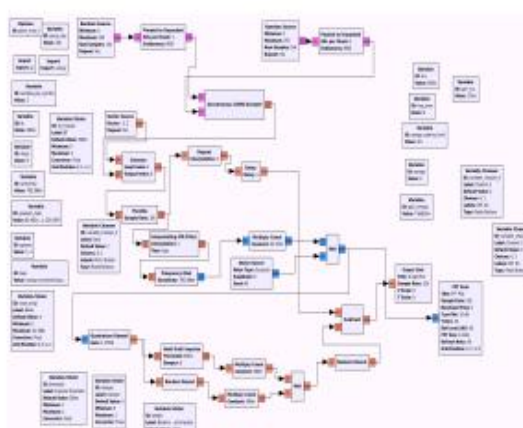
HDSDR

<http://www.hdsdr.de/screenshots.html>



GNU Radio

<http://gnuradio.org>



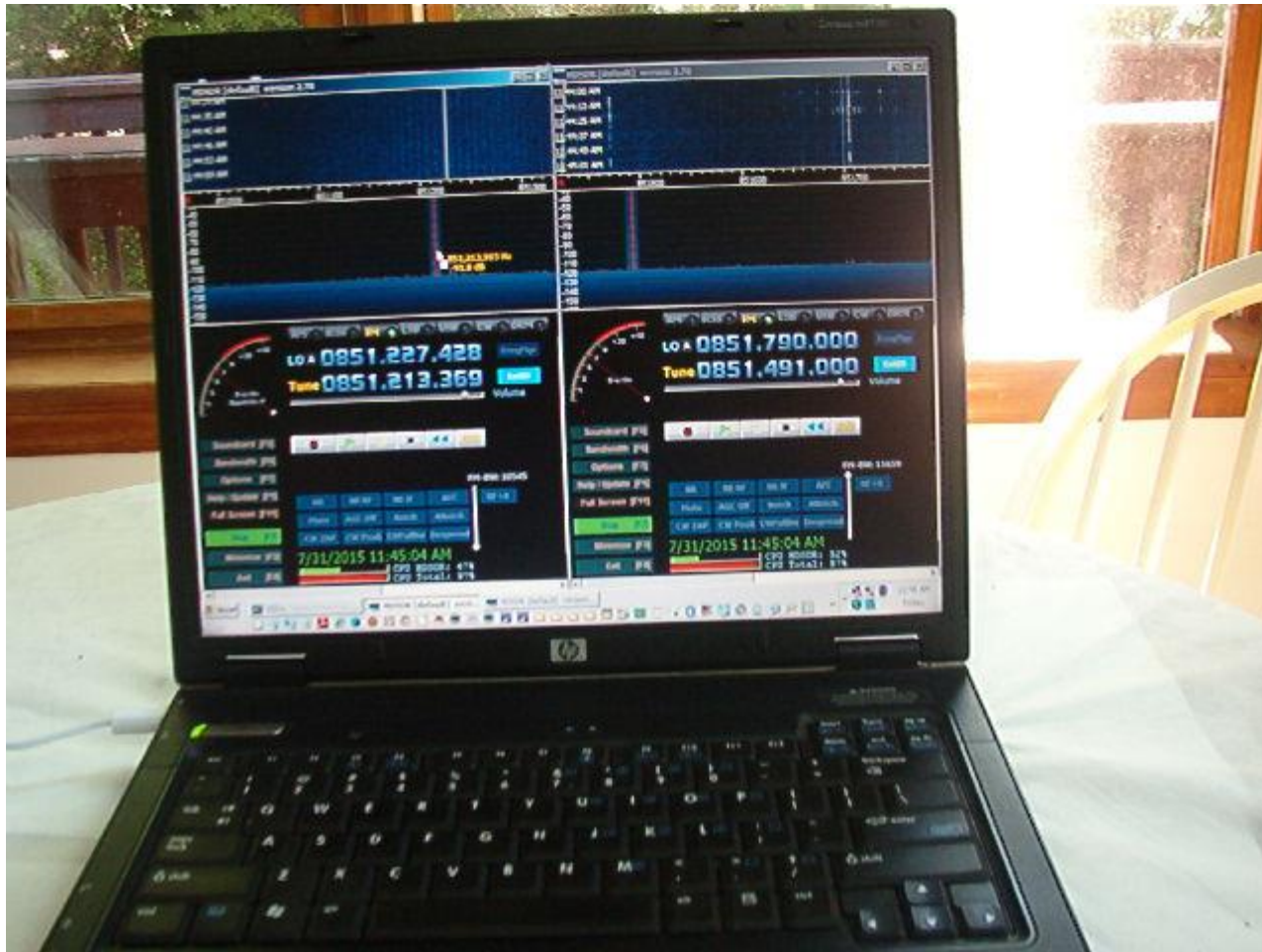
SDR Sharp

<http://sdrsharp.com/>



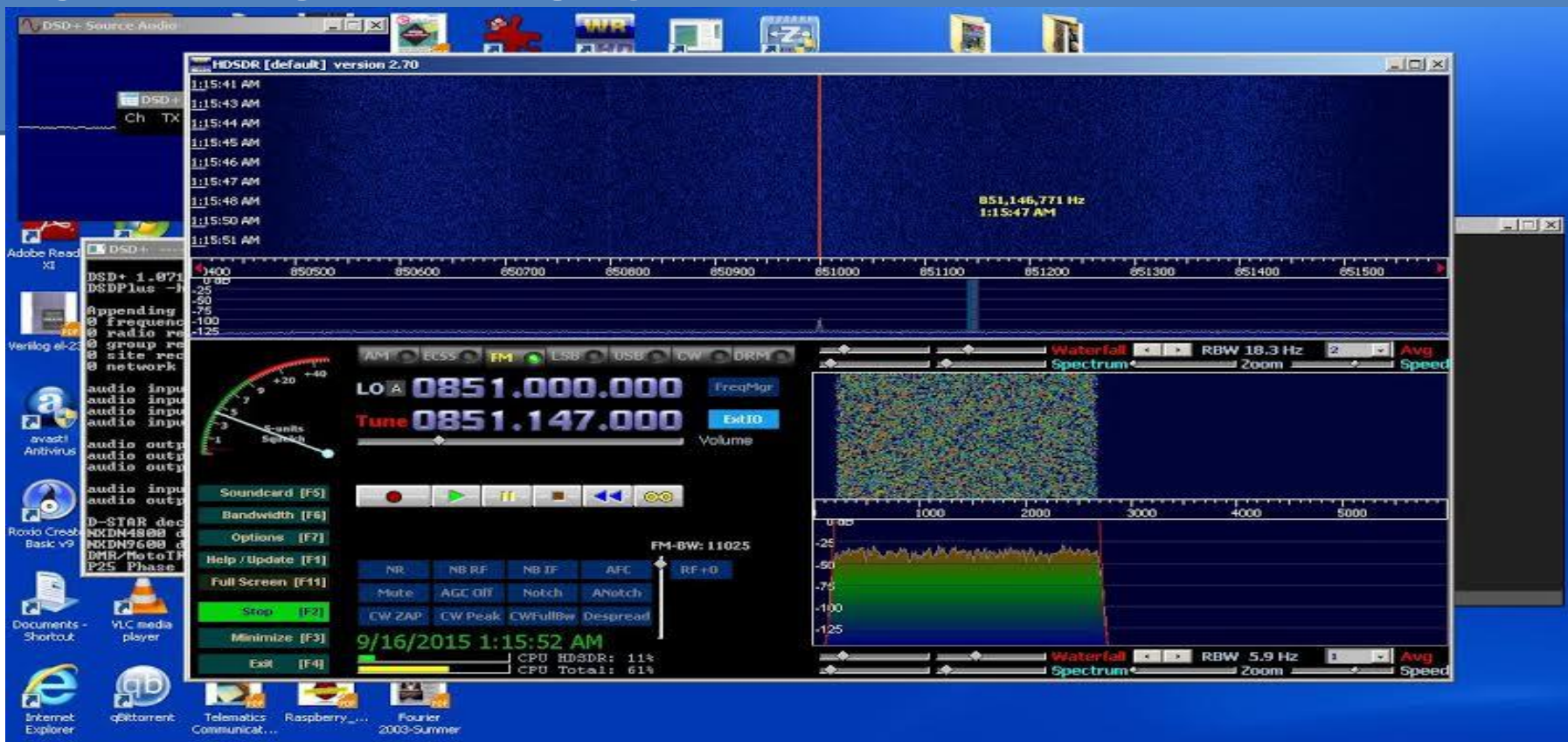
BEST LIST OF SOFTWARE: <http://www.rtl-sdr.com/big-list-rtl-sdr-supported-software/>

SDR DIGITAL VOICE



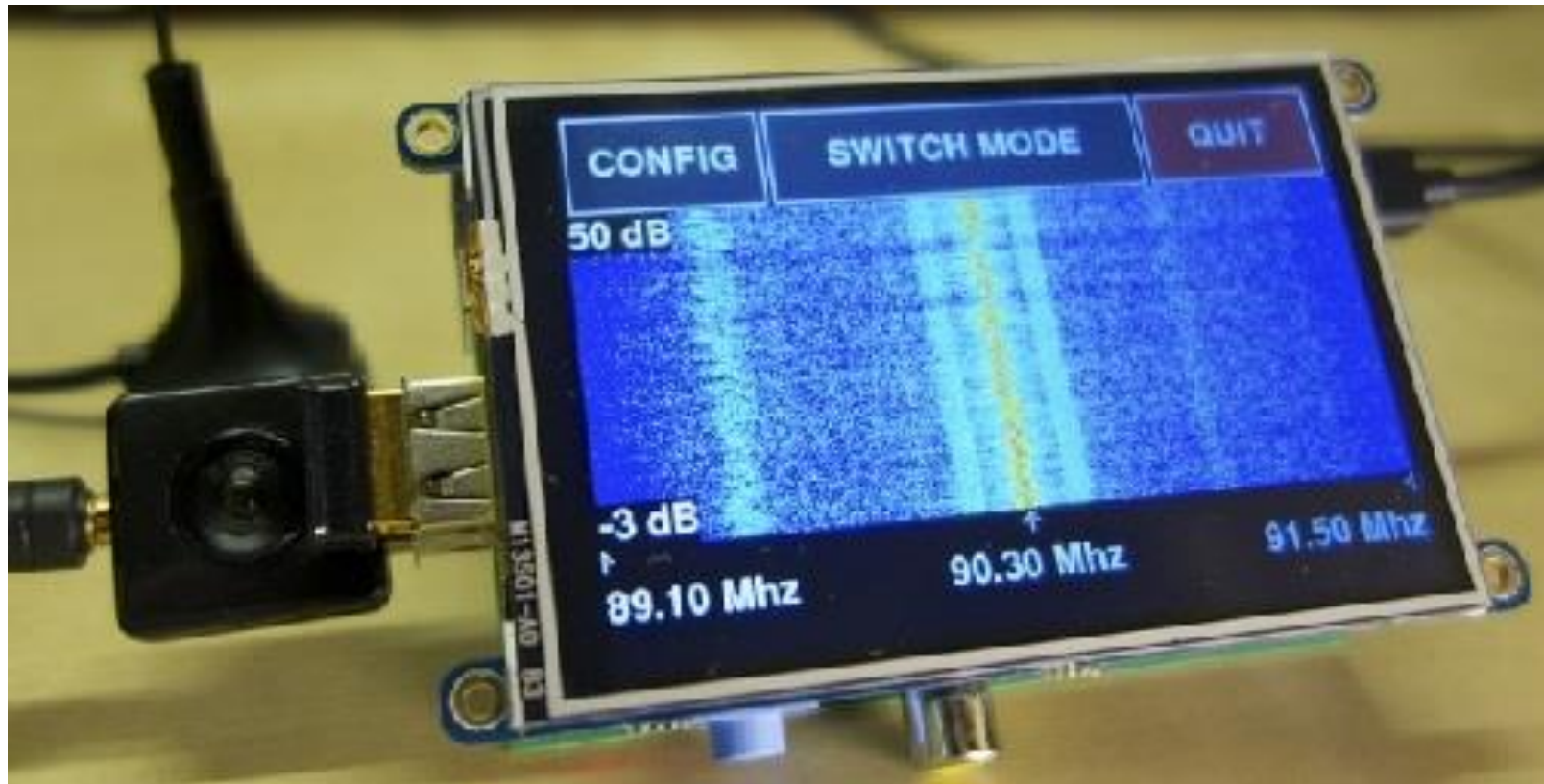
Digital speech
codex such as P25
phase 1,
DMR/MOTOTRBO,
Provoice, NXDN,
and X2-TDMA

SDR DIGITAL VOICE



Frequency	License	Type	Tone	Alpha Tag	Description	Mode	Tag	
453.52500	WPTY620	RM	103.5 PL	HT PD 1	Police Dispatch		FMN	Law Dispatch
460.07500	KNCS282	RM	103.5 PL	HT PD 2	Police Operations		FMN	Law Talk
460.45000	KNCS282	RM	103.5 PL	HT PD 3	Police Operations		FMN	Law Talk
458.22500	WPTY620	BM		HT PD 4	Police Tactical / Special Events		FMN	Law Tac
155.38500	KEE600	M		HT EMS Tac	Municipal EMS Tactical		FMN	EMS-Tac
154.37000	KEG513	M	103.5 PL	HT FD Off.	Fire Officers	FMN	Fire-Talk	
154.22000	KED409	BM	103.5 PL	HT FD 4 FG	Fireground Operations		FMN	Fire-Tac
453.18750	WPIW453	M		HT DPW	Water & Sewer		FMN	Public Works

LOCAL TRANSMITTERS: <http://www.radioreference.com/apps/db/?ctid=1781>



<https://learn.adafruit.com/freq-show-raspberry-pi-rtl-sdr-scanner/overview>