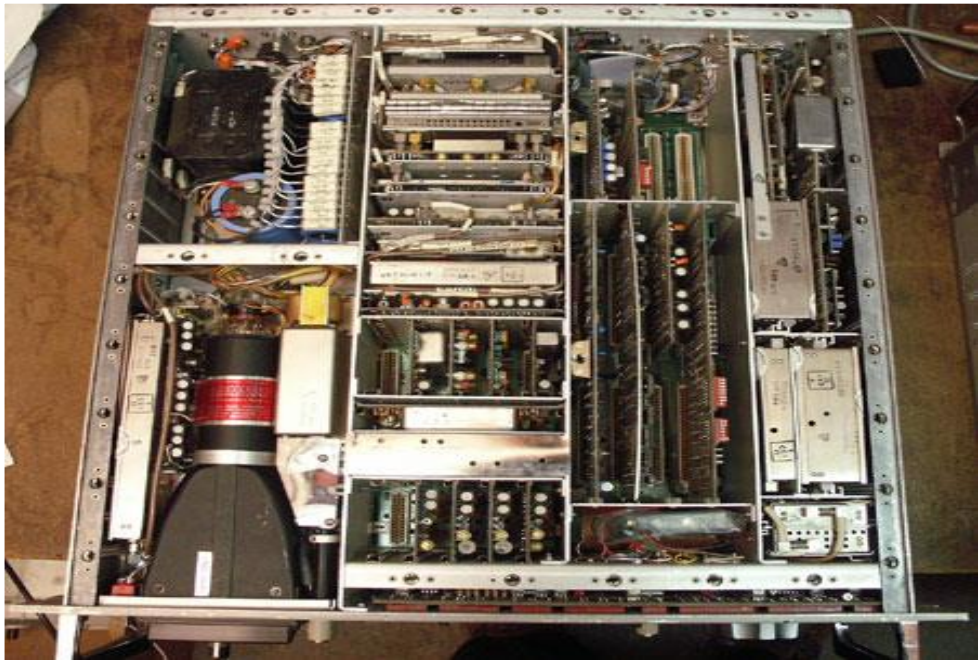
REMOTE SIGNAL MONITORING

Joe Jesson, W2JEJ
jejesson4@gmail.com

HISTORICAL - SWEPT-SPECTRUM PANARAMIC DISPLAY



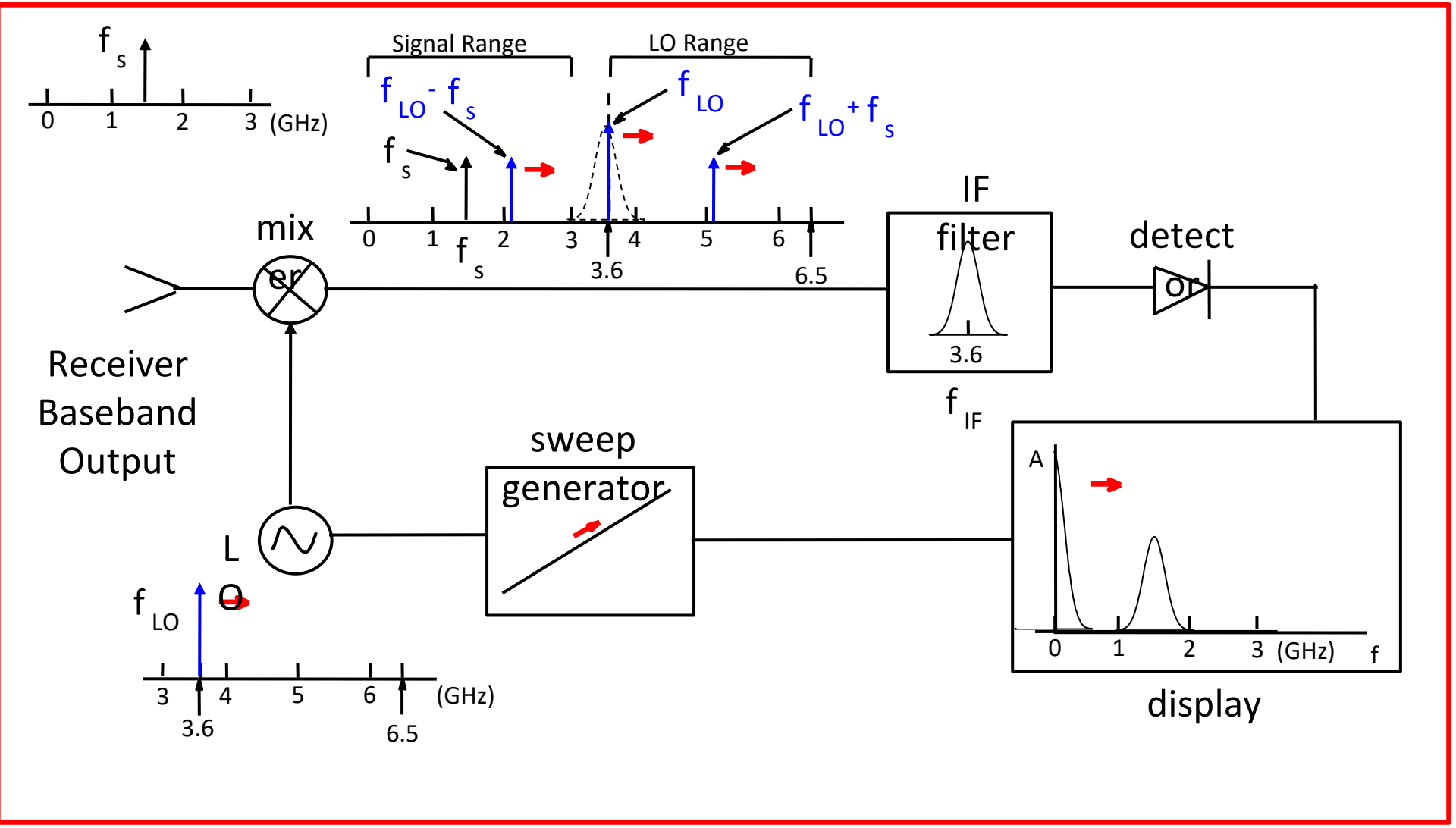
SWEPT-SPECTRUM PANARAMIC DISPLAY - TSCM

MASON A3 1971 Portable Intercept

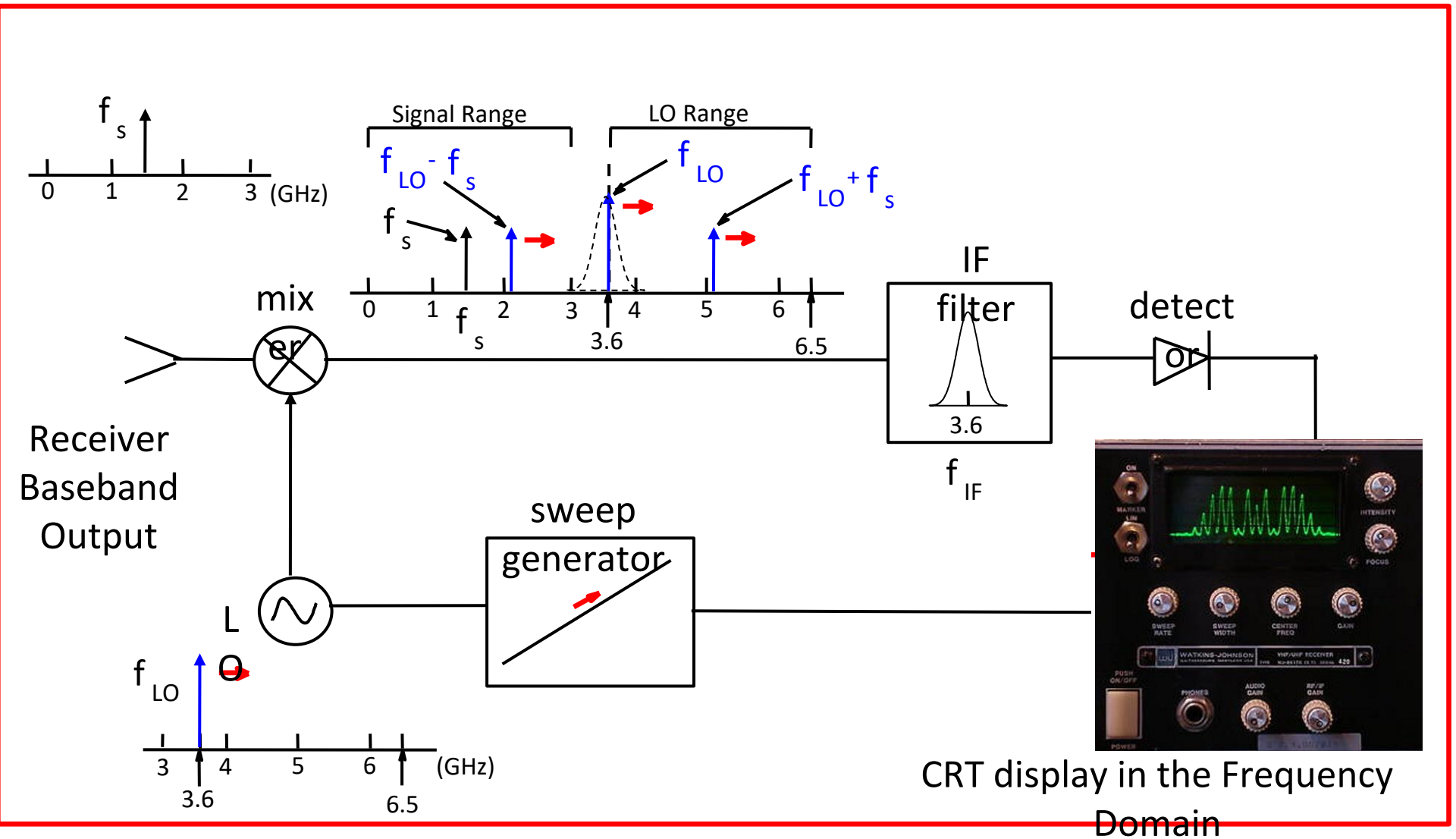
MASON MPR-1 Portable Intercept

http://www.cryptomuseum.com/df/mason/index.htm

SWEPT FREQUENCY DISPLAY



SWEPT FREQUENCY DISPLAY

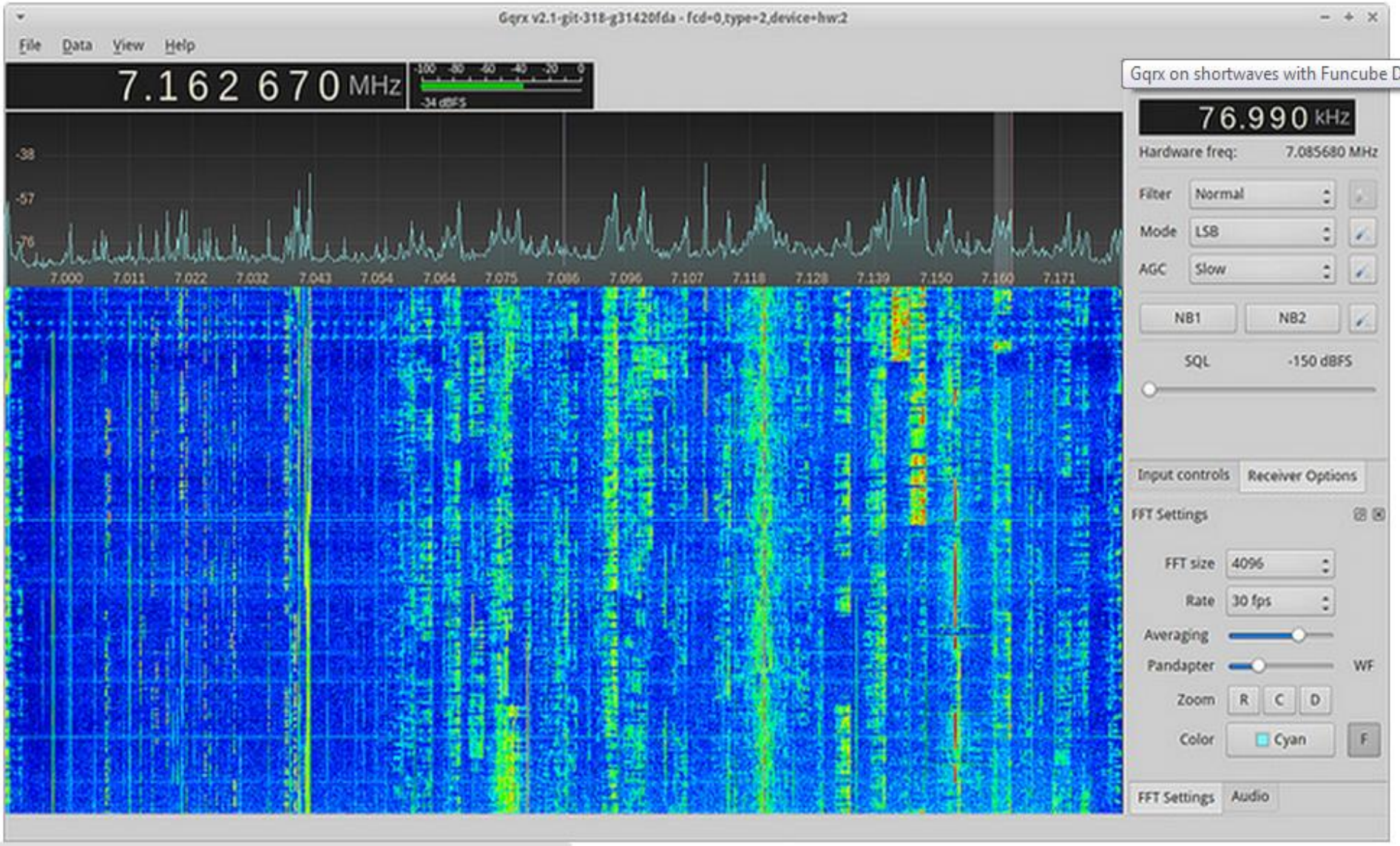


CRT display in the Frequency Domain

ANALOG SWEPT SPECTRUM DISPLAY

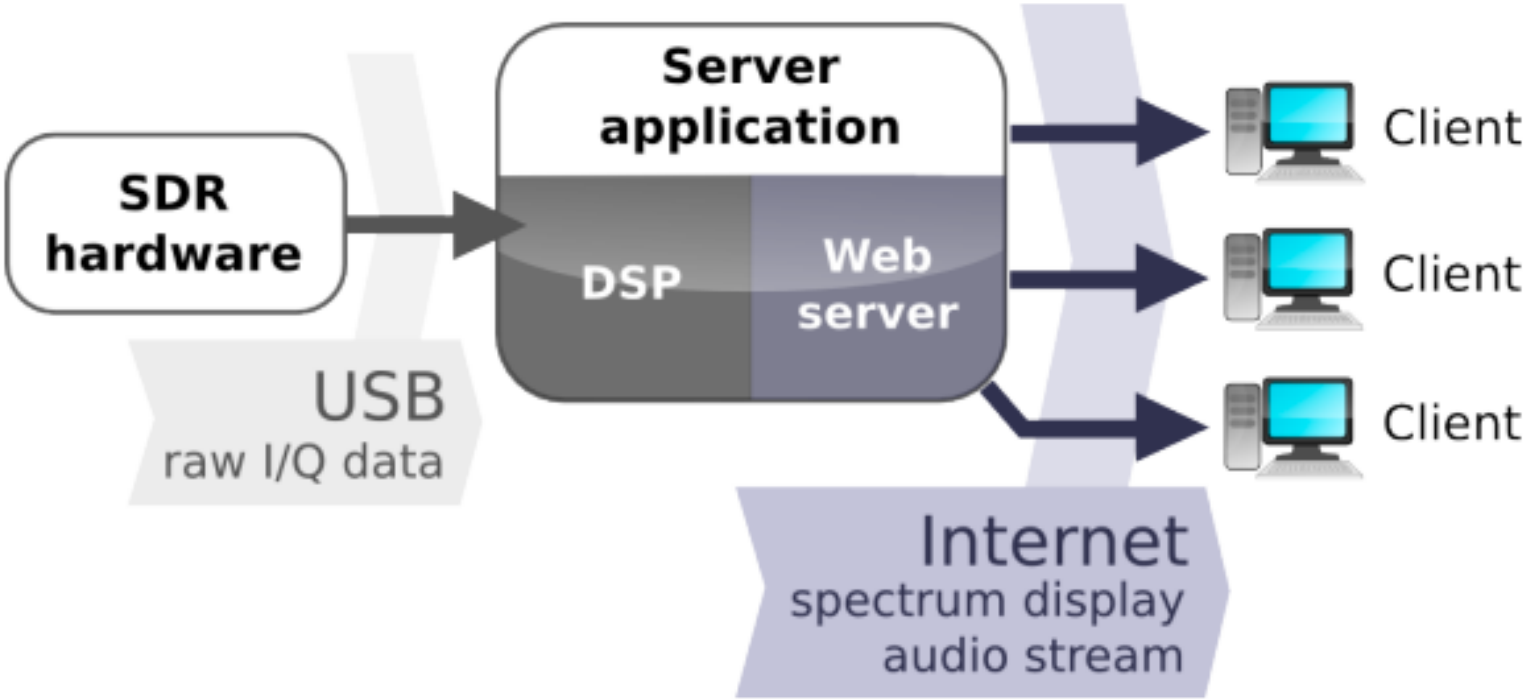
FOURIER TRANSFORM DSP SPECTRUM (1970's)

LINUX SDR APPLICATION, GQRX



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

STATE-OF-THE ART REMOTE MONITORING ARCHITECTURE



Retzler, A. (2015). OpenWebRX: SDR Web Application for the Masses. In *34th ARRL and TAPR Digital Communications Conference*. Verified 07/12/2023, https://blog.sdr.hu/repos/TAPR-DCC-2015-Talk-and-Paper/openwebrx-tapr-dcc-2015-paper.pdf

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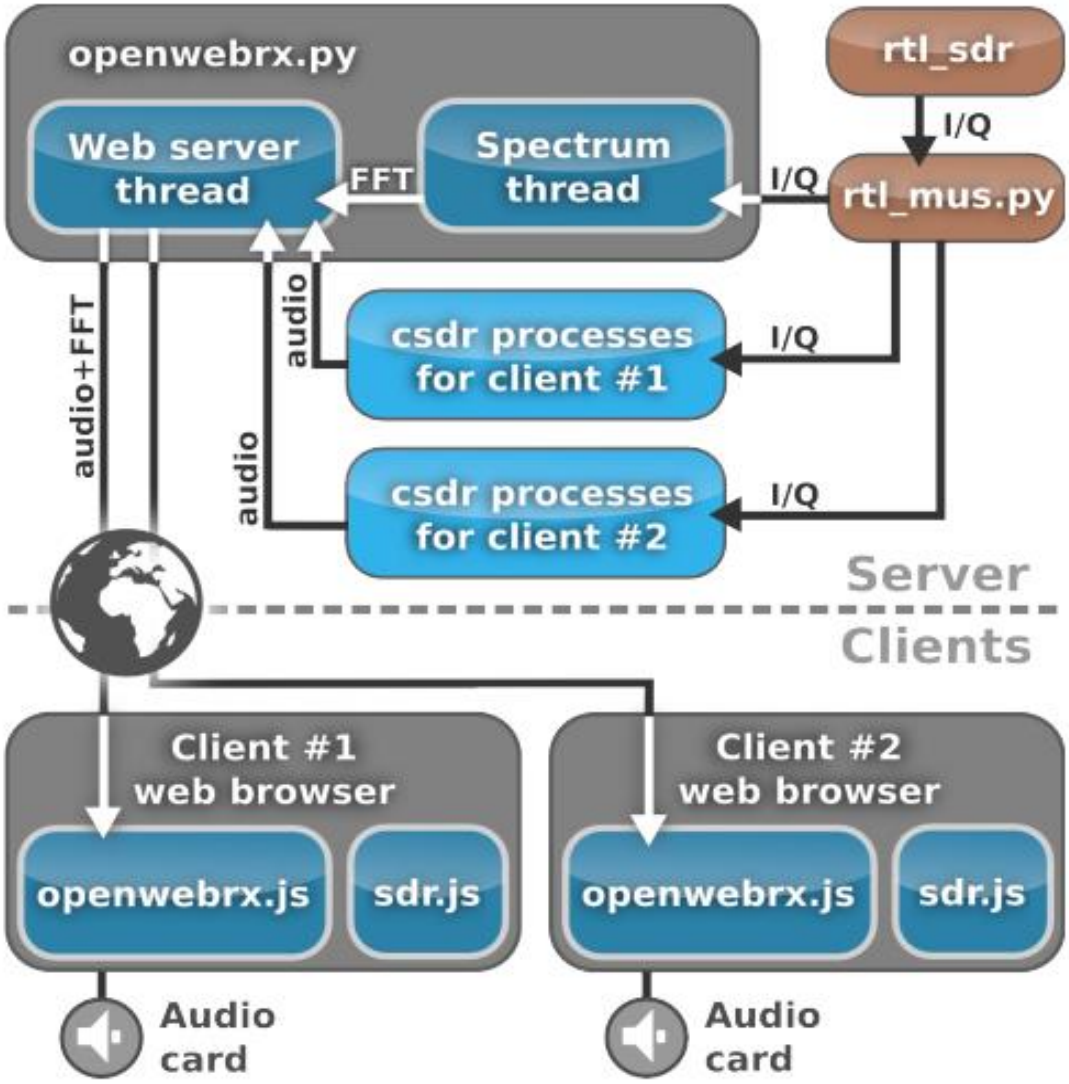
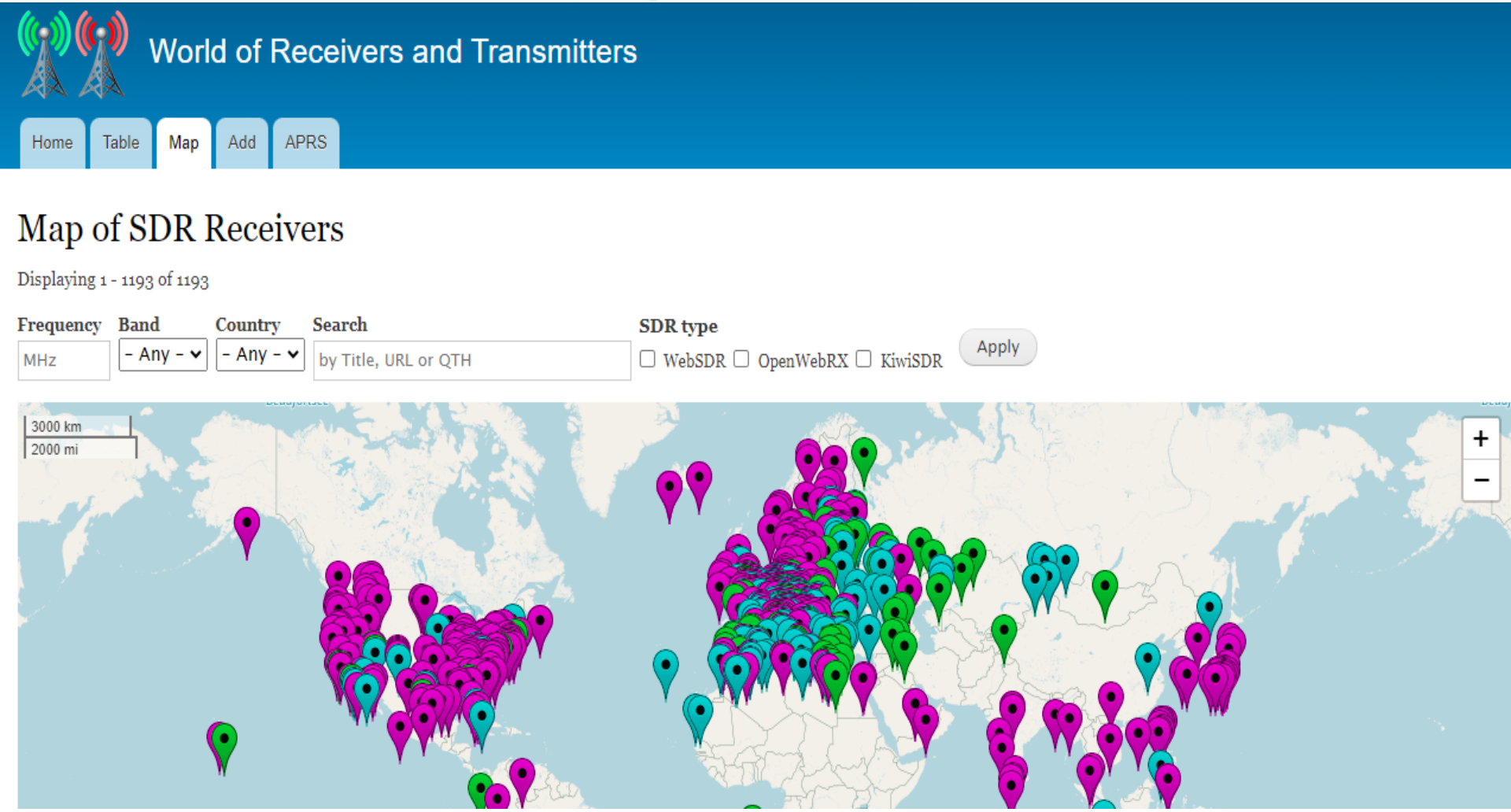


Retzler, A. (2015). OpenWebRX: SDR Web Application for the Masses. In *34th ARRL and TAPR Digital Communications Conference*. Verified 07/12/2023, https://blog.sdr.hu/repos/TAPR-DCC-2015-Talk-and-Paper/openwebrx-tapr-dcc-2015-paper.pdf

GLOBAL REMOTE SDR MONITORS

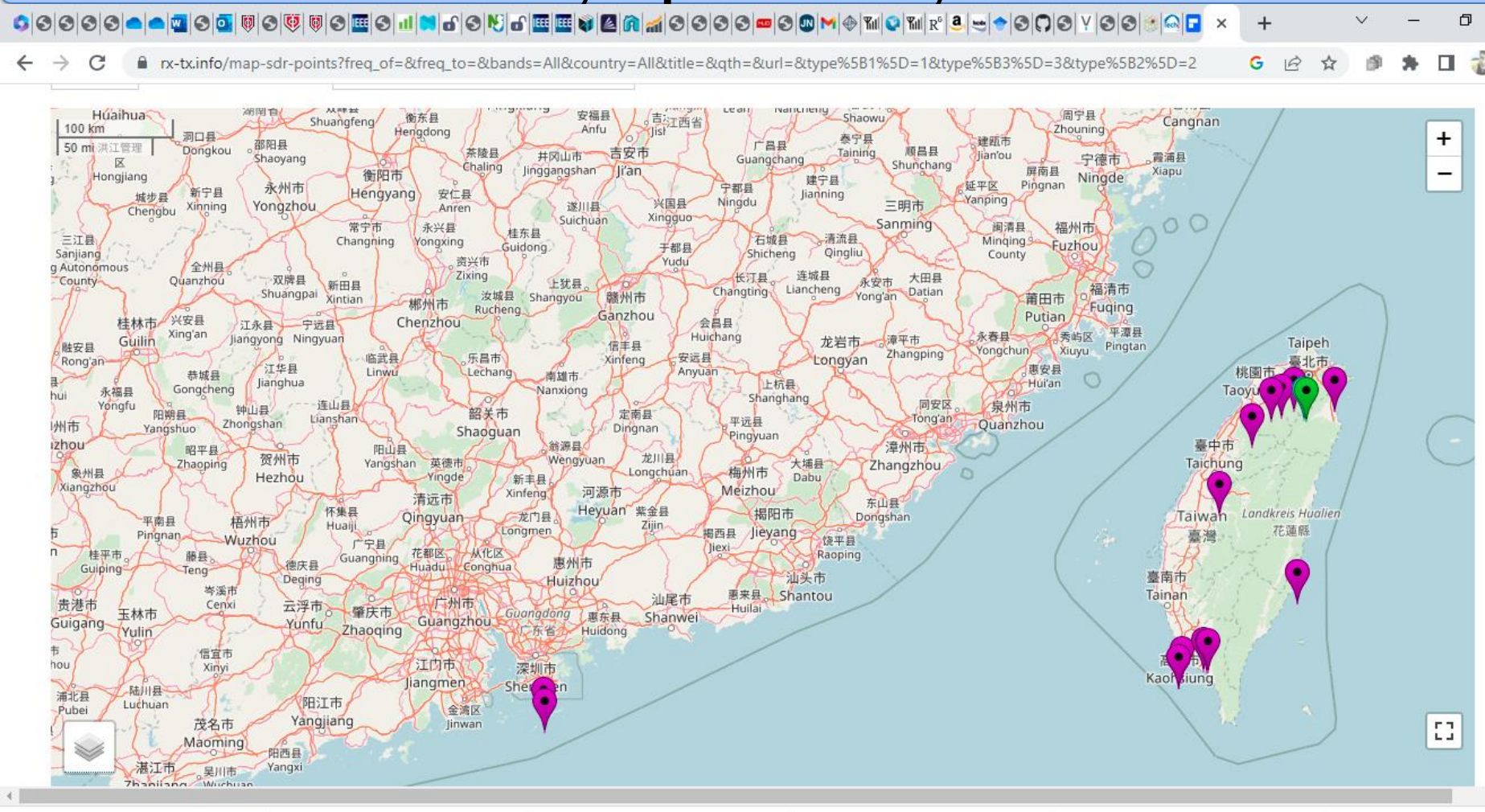
WebSDR, OpenWebRX, KiWiSDR



https://rx-tx.info/map-sdr-points

GLOBAL REMOTE SDR MONITORS

WebSDR, OpenWebRX, KiWiSDR



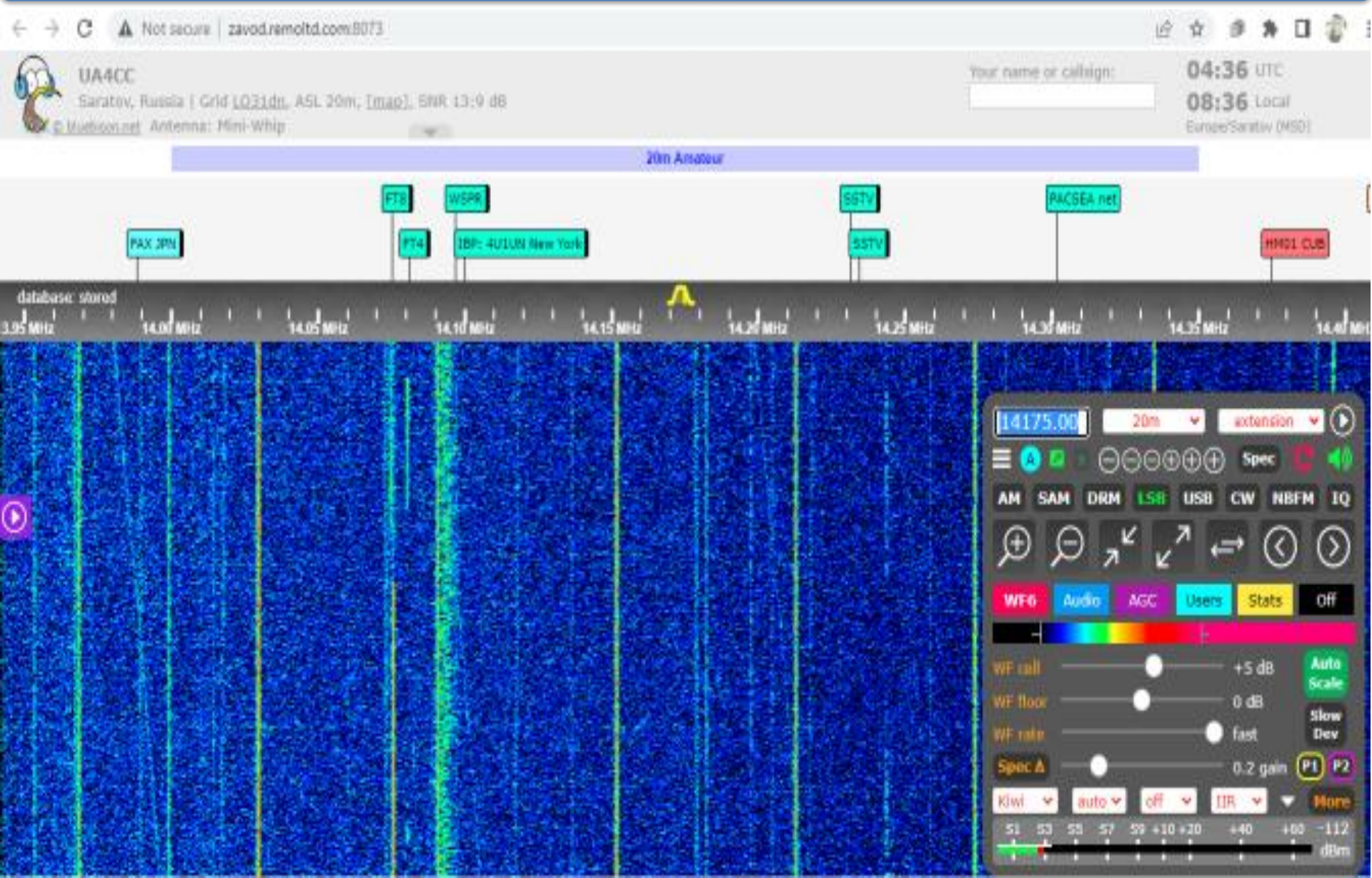
https://rx-tx.info/map-sdr-points

GLOBAL REMOTE SDR MONITORS

WebSDR

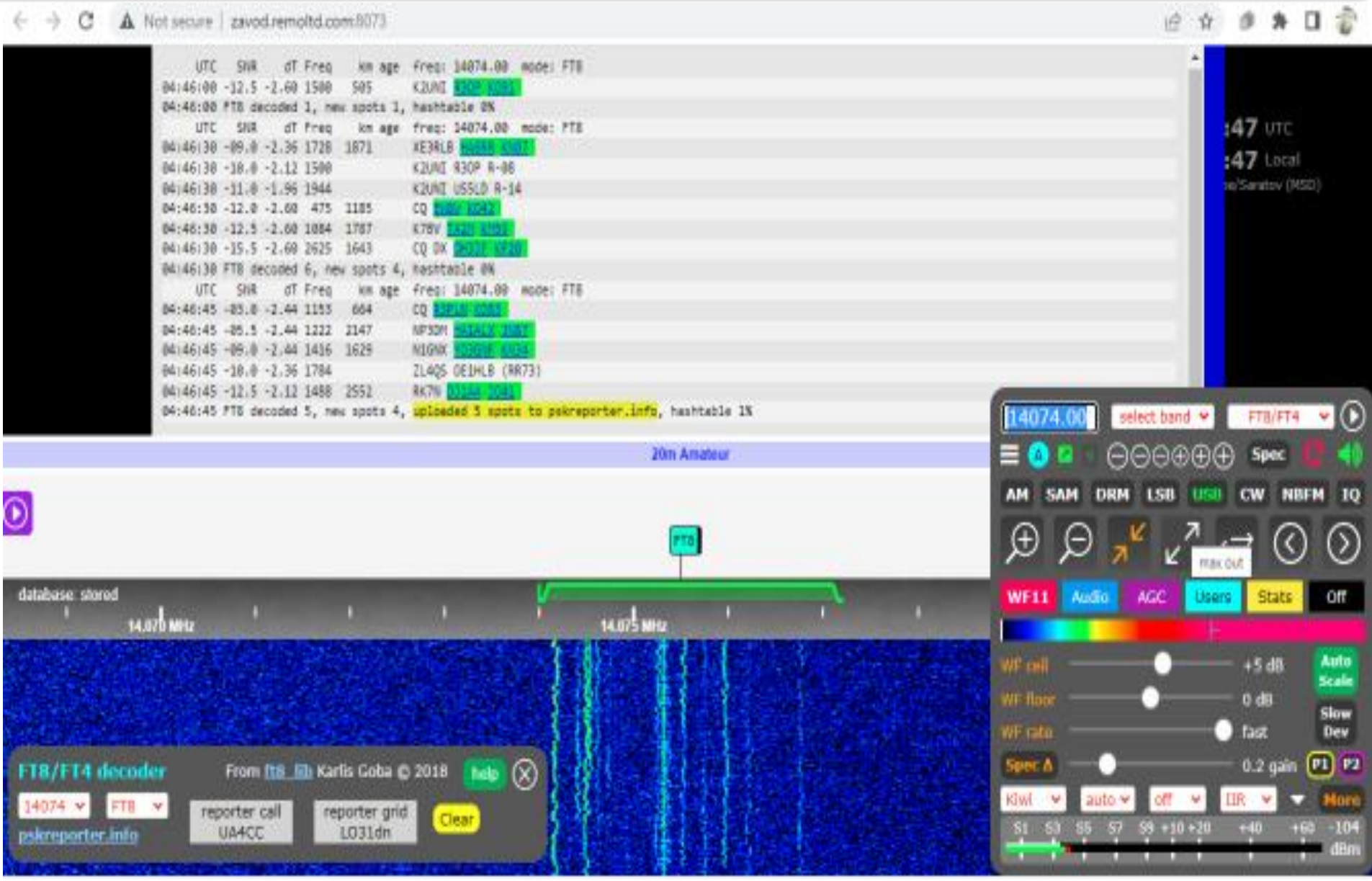
GLOBAL REMOTE SDR MONITORS

KiWiSDR



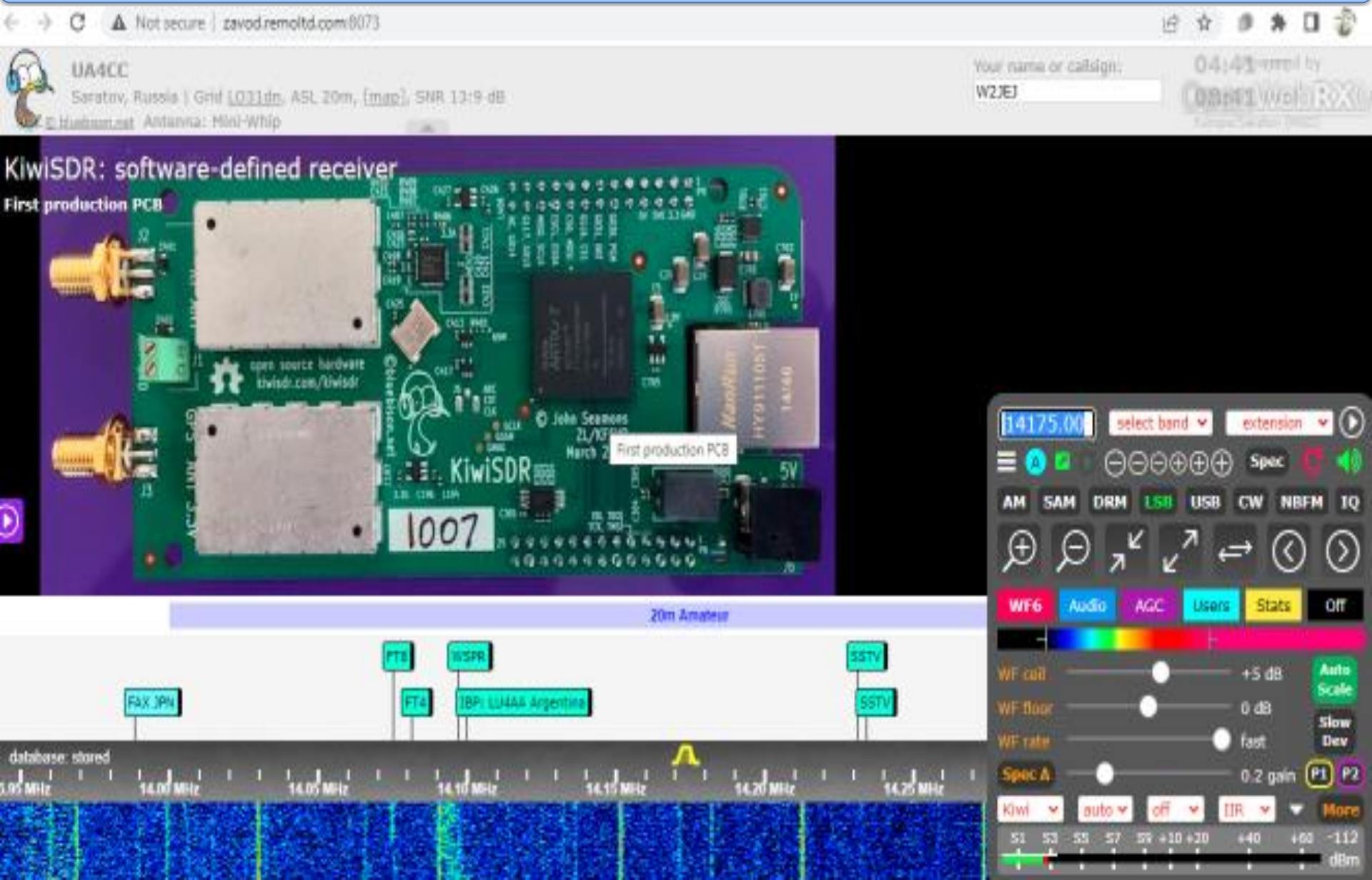
GLOBAL REMOTE SDR MONITORS

KiWiSDR DIGITAL FT8



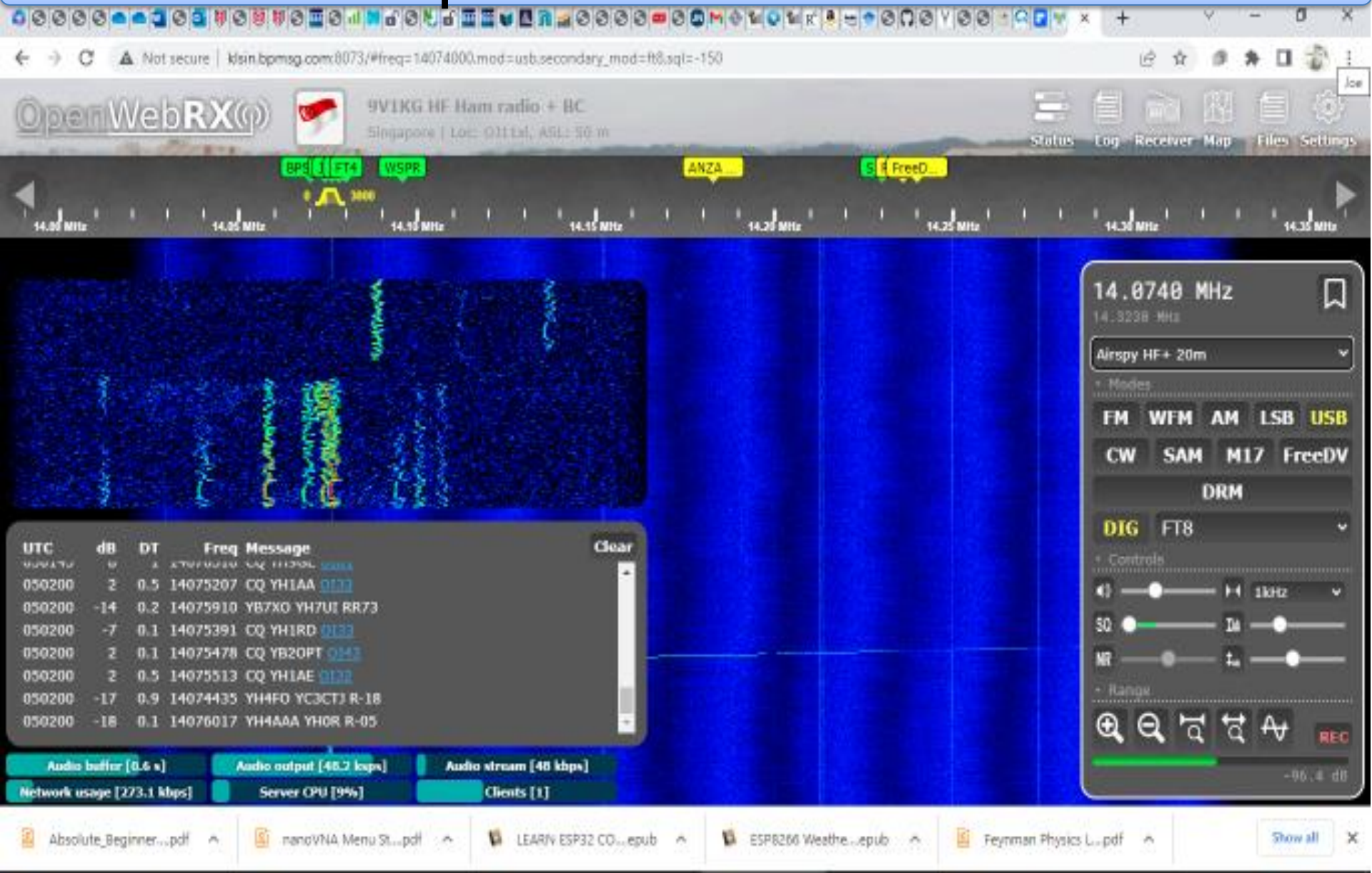
GLOBAL REMOTE SDR MONITORS

KiWiSDR HARDWARE



GLOBAL REMOTE SDR MONITORS

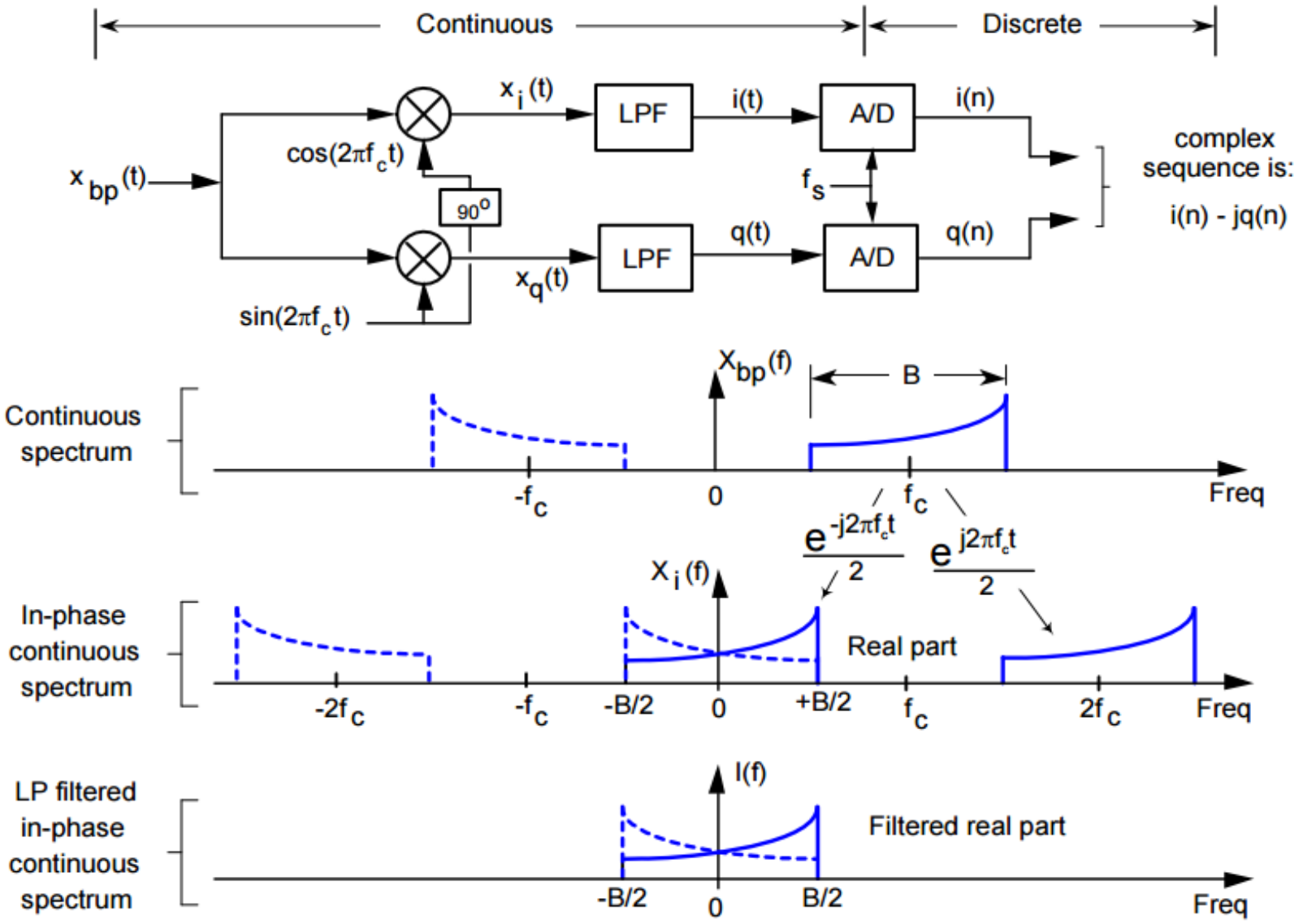
OpenWebRX DIGITAL FT8



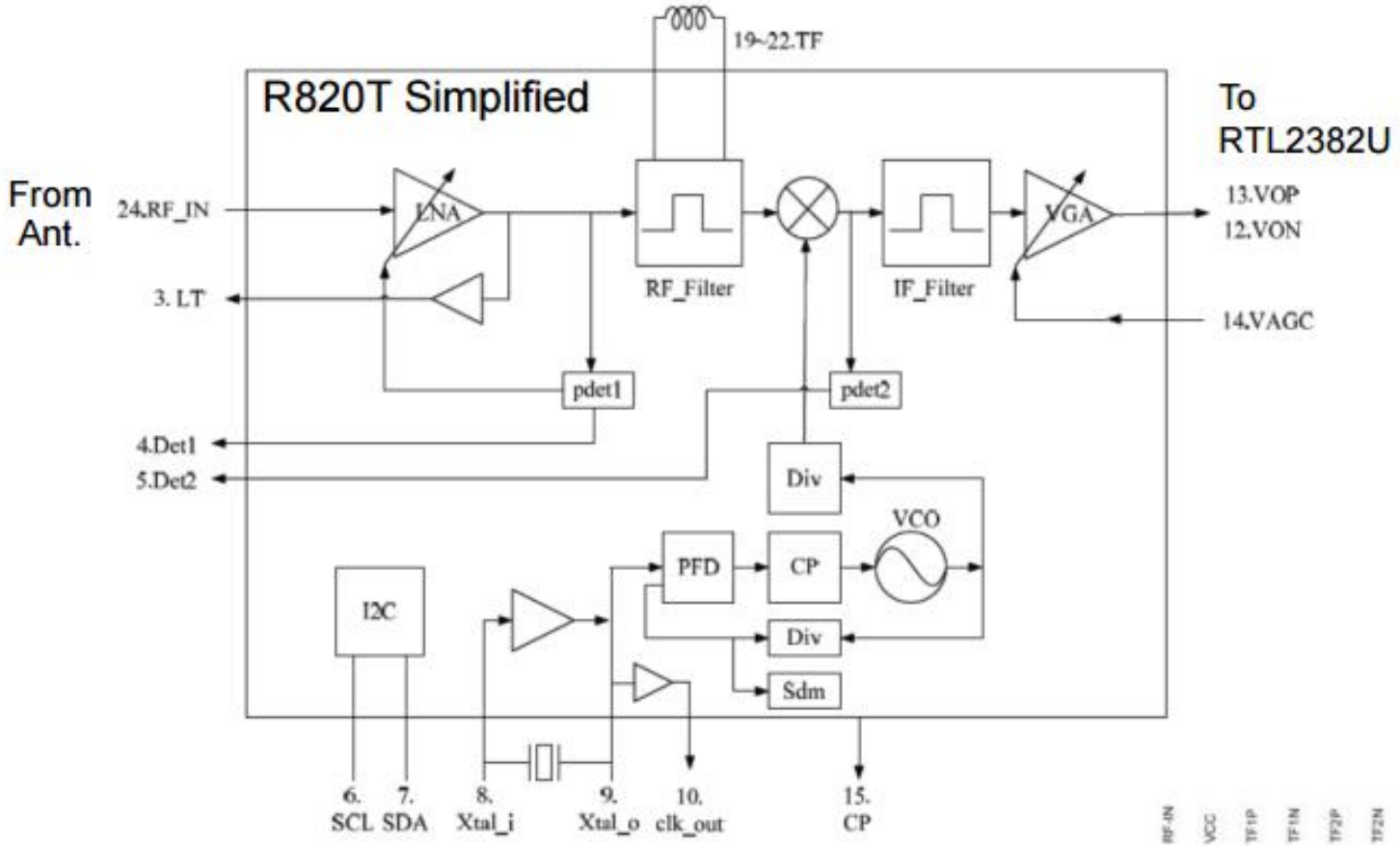
SDR - DVB-T TV TUNER (2012), BASED ON THE RTL2832U

- Bandwidth: Up to 2.4 MHz stable.
- ADC: RTL2832U 8-bits
- Frequency Range: 500 kHz – 1766 MHz (500 kHz – 24 MHz in direct sampling mode)
- Typical Input Impedance: 50 Ohms • Typical Current Draw: 270 – 280 mA

SIGNALING BASEBAND TO I & Q



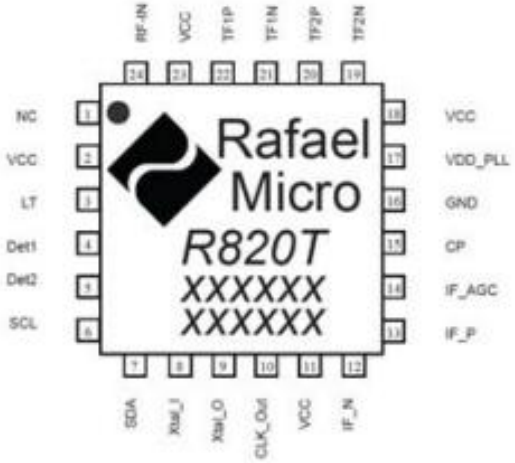
RF / IF IC, RAFAEL MICRO R820T



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



LOCAL HOST SET TO 146.46 MHz - N2RE DSRC

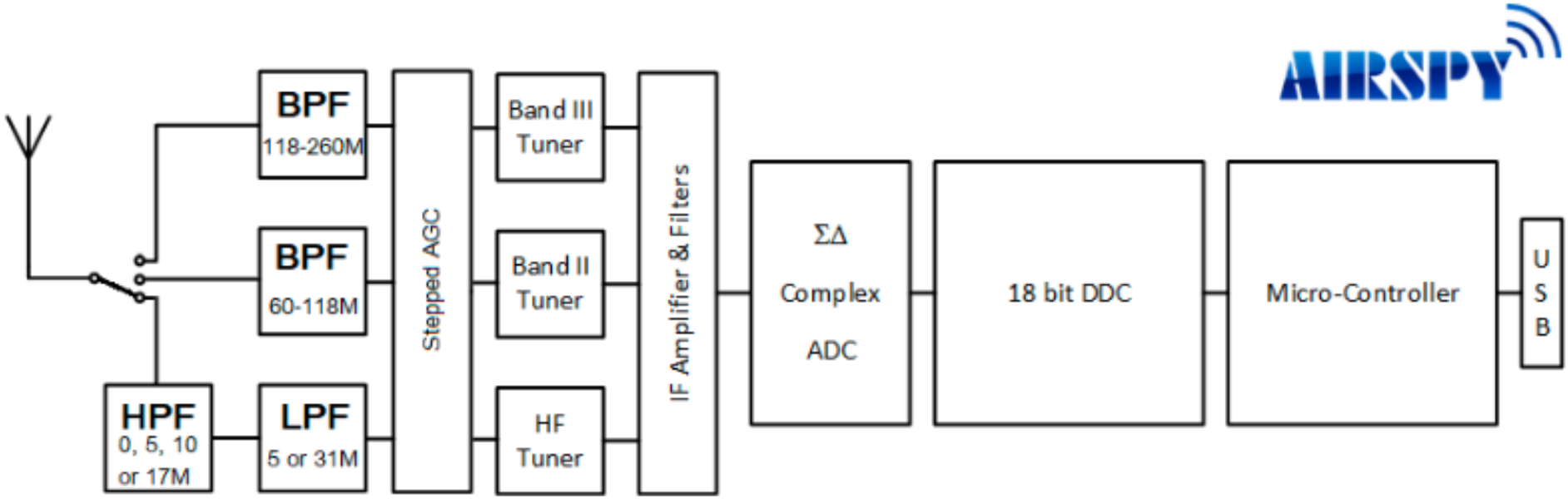
SDR - KiwiSDR WITH FPGA and CUSTOMIZED OPENWEBRX

http://kiwisdr.com/public/

http://kiwisdr.com/ks/using_Kiwi.html

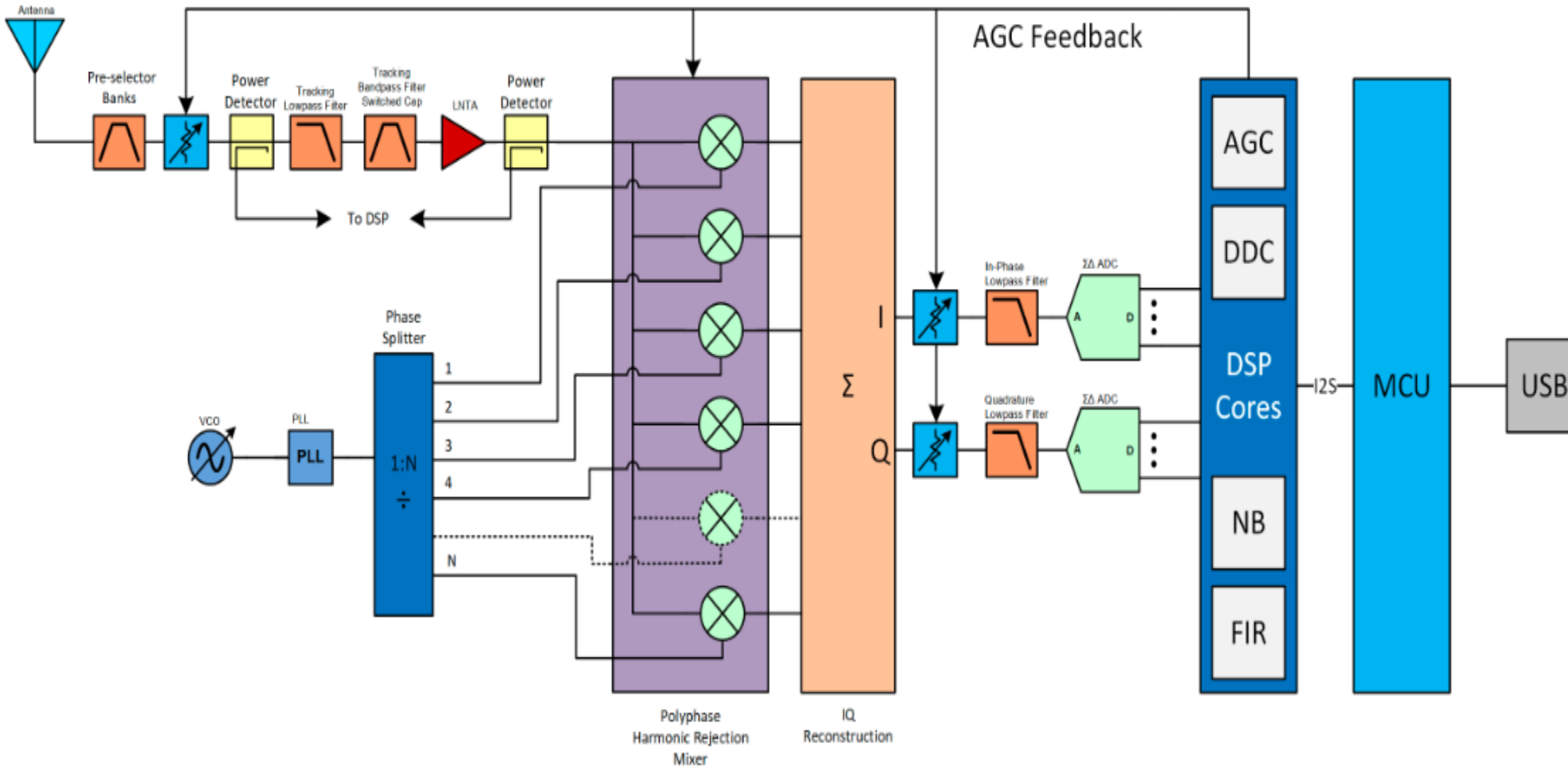
http://kiwisdr.com/

SDR - AIRSPY HF+ DISCOVERY



- HF coverage between 0.5 kHz .. 31 MHz
- VHF coverage between 60 .. 260 MHz
- Sensitivity: -140.0 dBm (0.02 µV / 50 ohms at 15MHz) MDS Typ. at 500Hz bandwidth in HF
- Sensitivity: -141.5 dBm MDS Typ. at 500 Hz bandwidth in FM Broadcast Band (64 – 118 MHz)
- Sensitivity: -141.0 dBm MDS Typ. at 500 Hz bandwidth in VHF Aviation Band (118 – 260 MHz)
- Linearity: +15 dBm IIP3 on HF at maximum gain
- Linearity: +13 dBm IIP3 on VHF at maximum gain
- Dynamic Range: 110 dB blocking dynamic range (BDR) in HF
- Dynamic Range: 95 dB blocking dynamic range (BDR) in VHF

SDR - AIRSPY HF+ DISCOVERY



OPENwebRX LINUX SOFTWARE OPTIONS

Raspberry Pi 3, 4

SD Complete Distribution Installation:
https://www.openwebrx.de/download/rpi.php

DragonOS Focal Live Disribution (My Favorite)

>150 SDR Applications, Frequently Updated
The Mother of All SDR Applications!
https://sourceforge.net/projects/dragonos-focal/

LiNUX Installation

https://www.openwebrx.de/download/ubuntu.php

DRAGONOS FOCAL APPS P1

- Aircrack-ng 1.6
- Airspy_ADSB
- Apache2
- Asterisk
- Auto137
- BladeRF ADSB w/ Dump1090 Mutability (/usr/src)
- BladeRF-Wiphy (usr/src/wiphy-build)
- Acarsdec w/ rtlsdr support
- Blue hydra
- Boatbod op25
- BTLE w/ hackrf (can be recompiled for bladeRF)
- CalypsoBTS w/ firmware + tools
- Cesium
- Chirp-daily (python2)
- Composable-SDR AppImage with SDRPlay support
- Crocodile Hunter (LimeSDR Mini support)
- CubicSDR
- DF-Aggregator w/ Offline capability
- Direwolf
- Dumphfdl
- DumpVDL2
- Esptool
- FALCON
- Fldigi
- GNU Radio 3.8
- Gpredict
- GQRX
- GQRX Scanner
- GR-ADSB
- GR-AIR-Modes
- GR-AOA
- GR-Correctiq
- GR-DECT2
- GR-DSD
- GR-FHSS_Utils
- GR-Foo
- GR-Grnet
- GR-GSM
- GR-ieee802-11 w/ HackRF Sink TX Flowgraph
- GR-ieee802-15-4
- GR-IIO
- Gr-Inspector (/usr/src)
- GR-Iridium
- GR-limesdr
- GR-Lora
- GR-Lora_SDR
- GR-Mixalot
- GR-NFC
- GR-NRSC5
- GR-NTSC-RC
- GR-Paint38
- GR-PDU_Utils
- GR-RDS
- GR-Sandia_Utils
- GR-Satellites
- GR-Smart_Meters
- GR-Soapy
- GR-Tempest
- GR-Timing_Utils

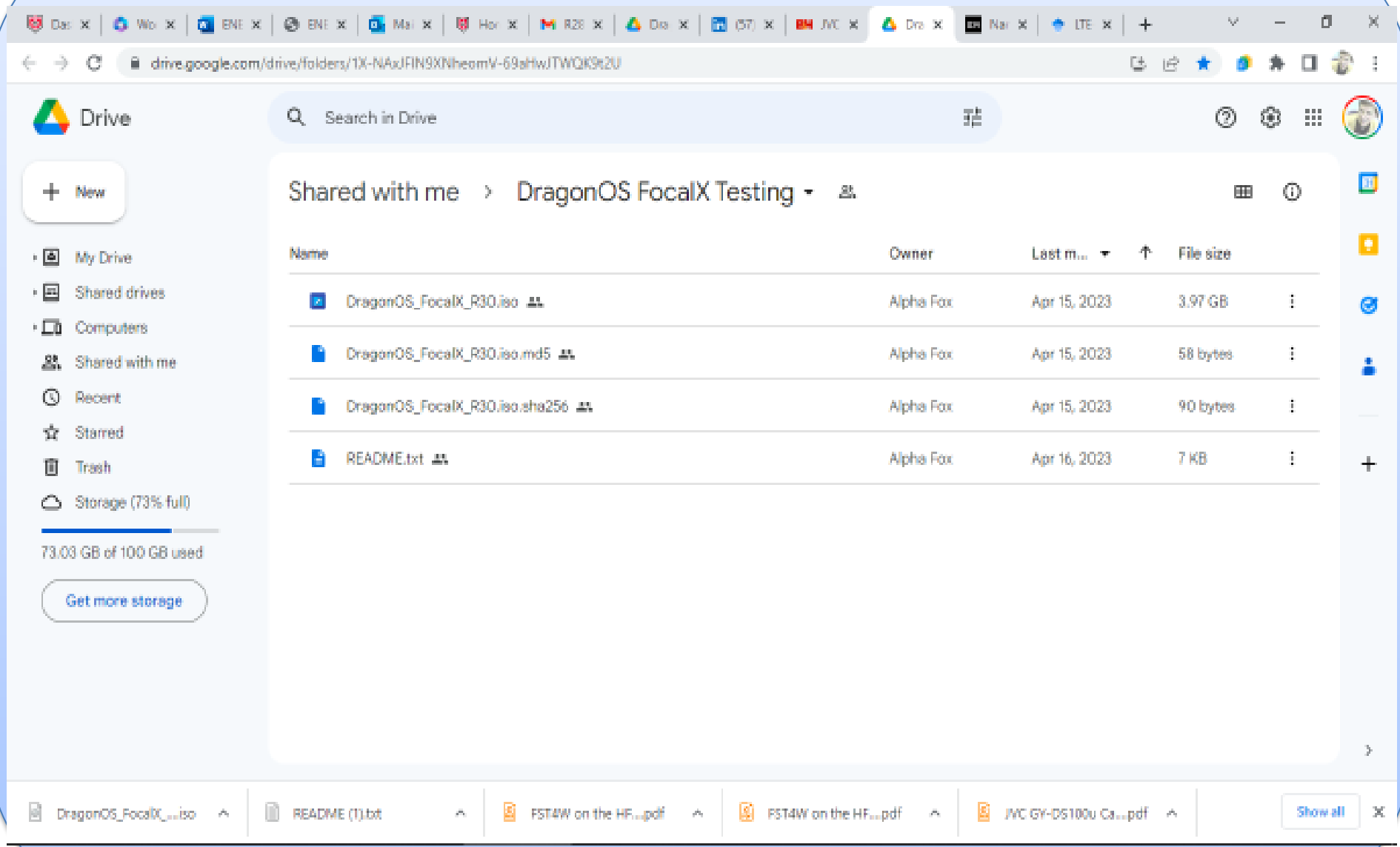
DRAGONOS FOCAL APPS P2

- gsm_scanner-GUI
- GSMEvil2
- HackTV GUI v2021-11-09
- Ham2Mon by lordmorgul
- IceCast2 (needs configured before starting)
- IMSI-catcher
- Inotify-tools
- Inspectrum 0.2.3
- Iridium-Toolkit
- IridiumLive
- JAERO
- Js8call
- JSquelch
- JTDX
- Kalibrate (HackRF)
- Kismet
- Kismet rest api
- Kisstatic2mobile w/ latest kismet support
- Kismon
- Larry Tetra Kit e9f93618
- LeanSDR/LeanDVB
- Libacars
- LibBladeRF 2.4.1 w/ xA5 support
- LibhackRF/hackRF tools 2021.03.1
- Libosmo-dsp
- LimeSuite
- Linrad
- LiquidSoap
- LTE-Cell-Scanner (v2 remains and supports RTLSDR, HackRF, BladeRF with CMake options)
- LuaRadio v0.10.0 w/ examples
- M17-Gnuradio
- Meshtastic Python API 1.2.58(standalone)
- Mirage (GitHub.com/RCayre/mirage)
- MMDVM
- Mmdvm-sdr by r4d10n
- MMDVMHost by g4klx
- Multimon-ng
- Nmap
- NOAA-Apt 1.3.1
- NRSC5 decoder for RTLSDR
- Nzyme
- OP25 "Boatbod" (GNU Radio 3.8/Python3 tst /usr/src/op25/)
- OpenWebRX 0.20.3
- Osmo-bsc
- Osmo-bts-trx
- Osmo-hlr
- Osmo-MGW
- Osmo-msc
- Osmo-NITB
- Osmo-nitb-scripts (@NotPike)
- Osmo-Sip-Connector
- Osmo-trx-lms (LimeSDR support)
- Osmo-trx-uhd
- Osmocom-BB tools in /usr/src
- Photonmap
- Probequest
- Pyadi-iio
- PyRtlSDR

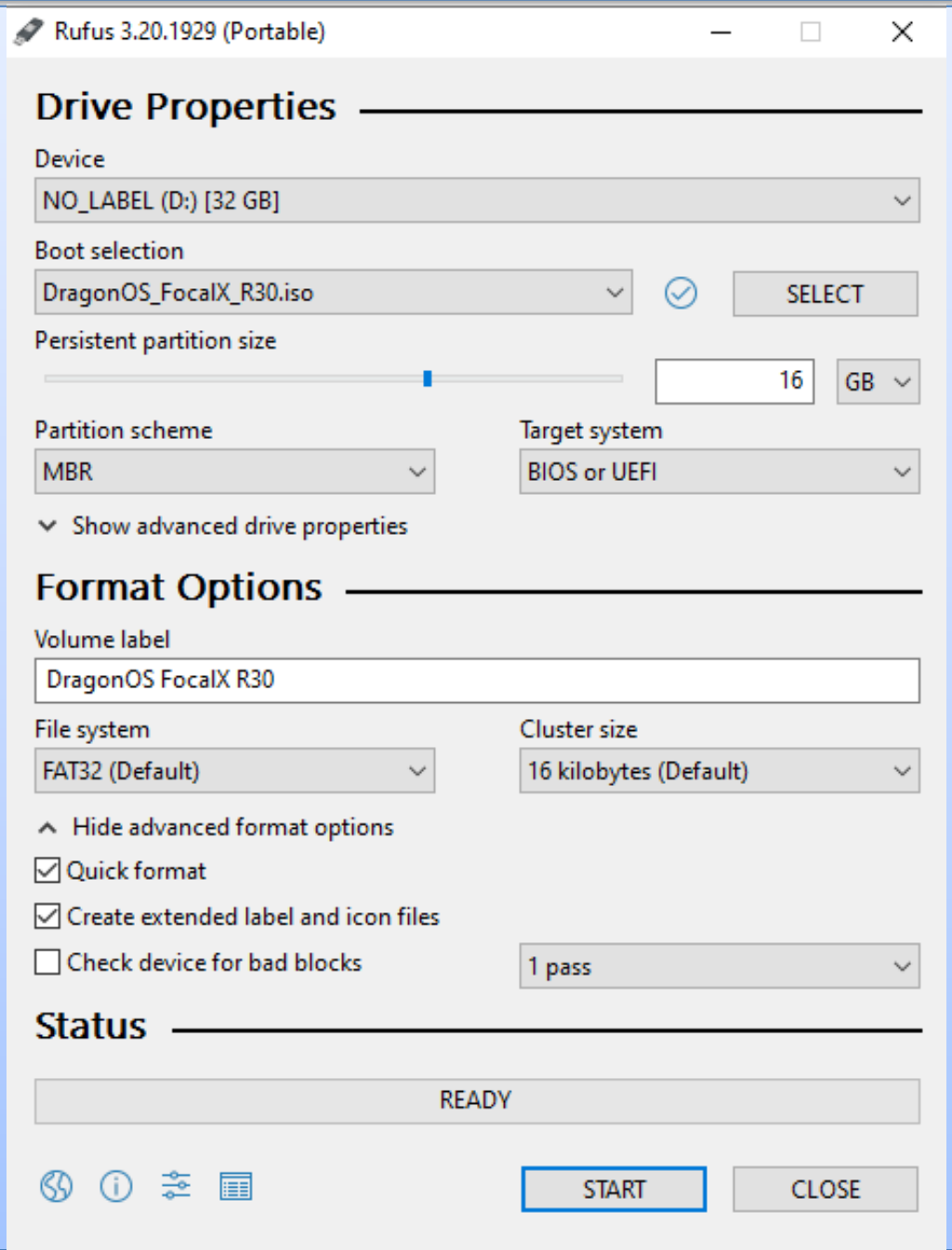
DRAGONOS FOCAL APPS P3

- PySDR 2.0 (Guide to SDR and DSP using Python)
- Qalculate
- Qfits for use with sattools
- QradioLink w/ MMDVM ability
- QspectrumAnalyzer
- Qsstv
- Qt-DAB
- RDF-Sim
- Retrogram-RTLSDR
- Retrogram-soapysdr
- Reveng
- RFcat
- RFCrack
- RFsoapyfile
- RMSViewer
- RSP TCP Server (SDRPlay support)
- RTL_433
- RTLSDR-Airband v4.0.1 (conf in /usr/src/)
- RX_Tools
- SatDump
- SDR++ w/ server capability
- SDR4space.lite w/ examples
- SDRAngel
- SDRReceiver
- SDRTrunk
- ShinySDR
- SigDigger
- Signal Server GUI w/ python3 virtual environment
- Signal Server N90ZB w/ Web Interface by Dr. Bill Walker
- Soapysdr modules
- Sparrow-WiFi w/ FALCON tools + wpapcap2john
- Splat!
- SpyServer (usr/src/spyserver-linux-x64)
- srsLTE-Sniffer (loop-catcher.sh in /usr/src/srsLTE-release_18_12/build/lib/examples)
- srsRAN
- Strf
- Tetra-kit "screen2tetra.sh" script in /usr/src/tetra-kit/recorder/wav
- Tetra-Kit-Player in /usr/src (needs npm installed)
- Trunk-Recorder
- Ubertooth 2020-12-R1
- Umurmur
- Universal Radio Hacker
- WFView from source
- wireguard
- Wireshark
- WSJT-X
- Yate/YateBTS w/ BladeRF xA4 improvements
- yellowShoes nrsc5 HD FM audio player
- Zenmap
- DSD-FME
- LTESniffer
- RF-Tools
- OpenBTS
- TempestSDR
- Ice9-Bluetooth Sniffer
- qFlipper
- sm_scanner-GUI

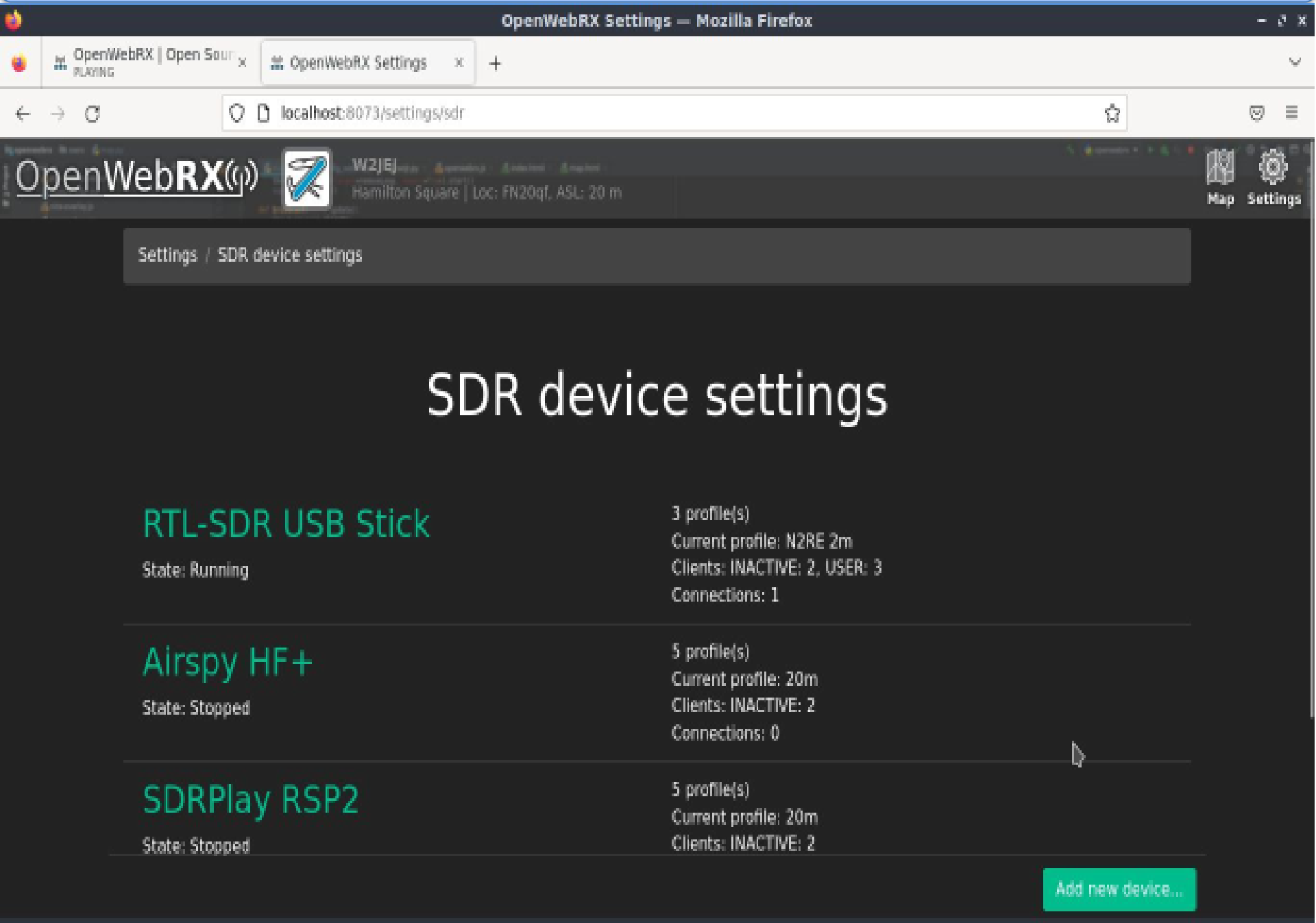
DragonOS Focal R30 Live Distribution – ISO Download



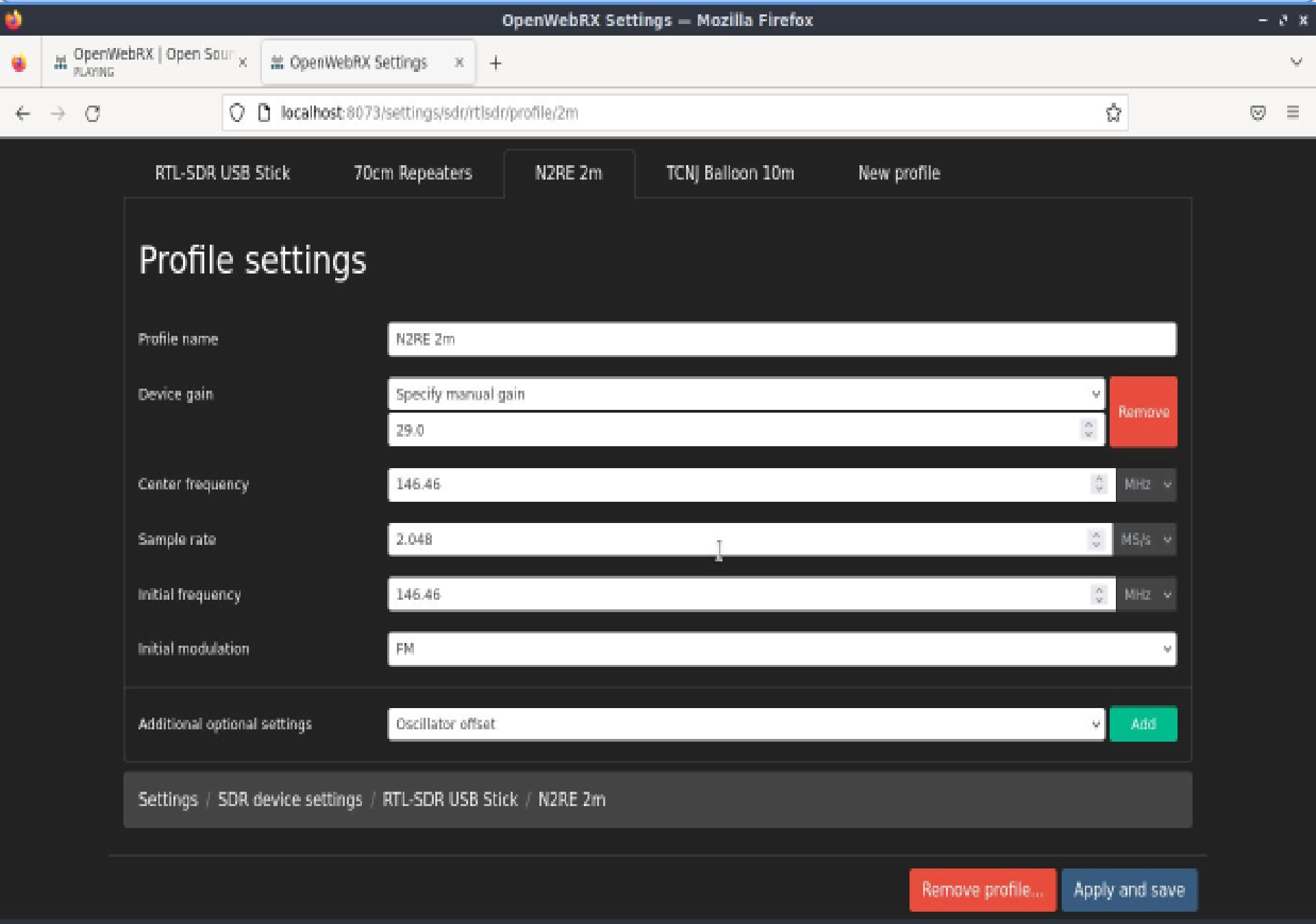
DragonOS Focal R30 Live Distribution – Live USB Prep



SDR DEVICE SETTINGS OPENWEBRX

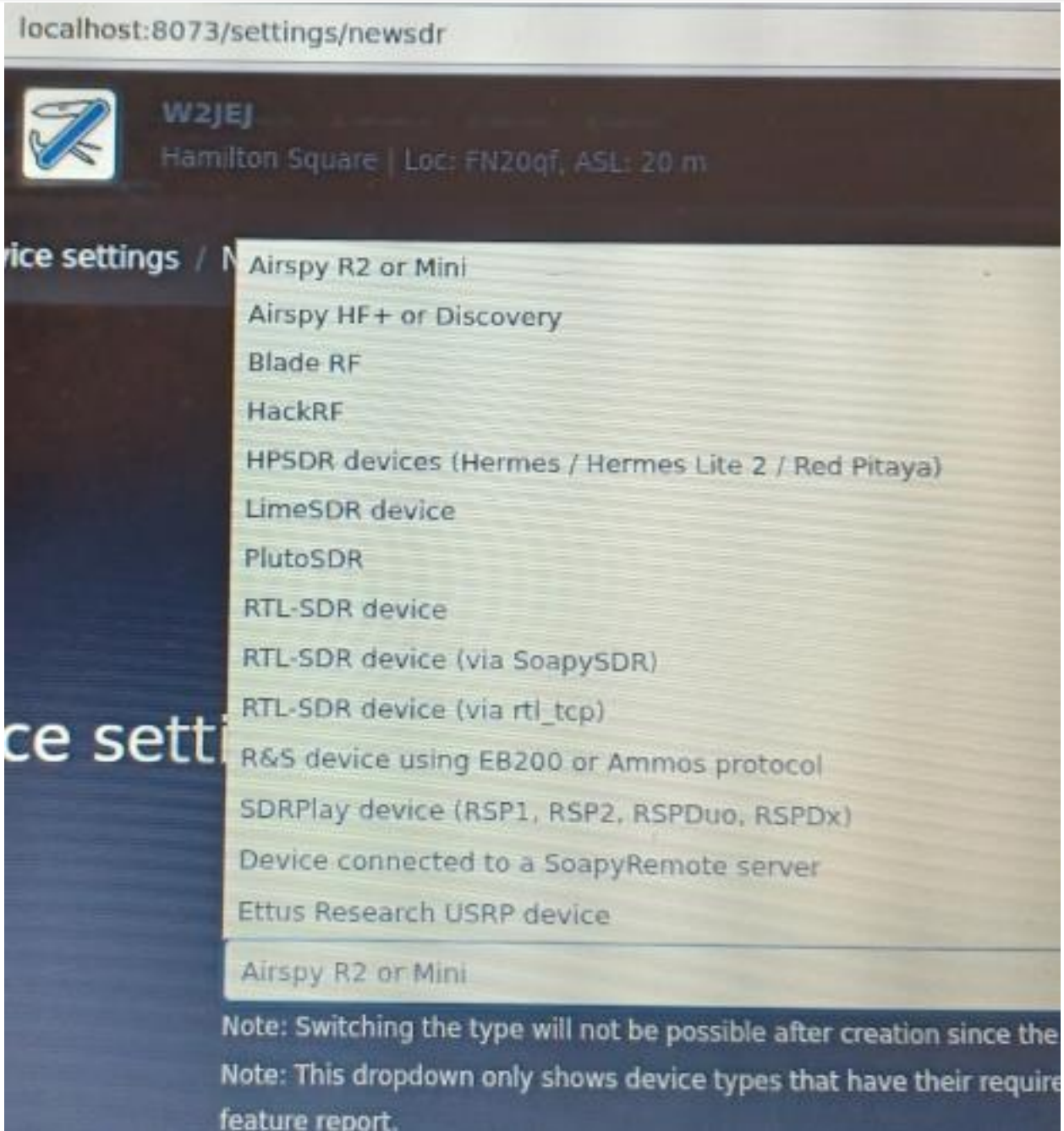


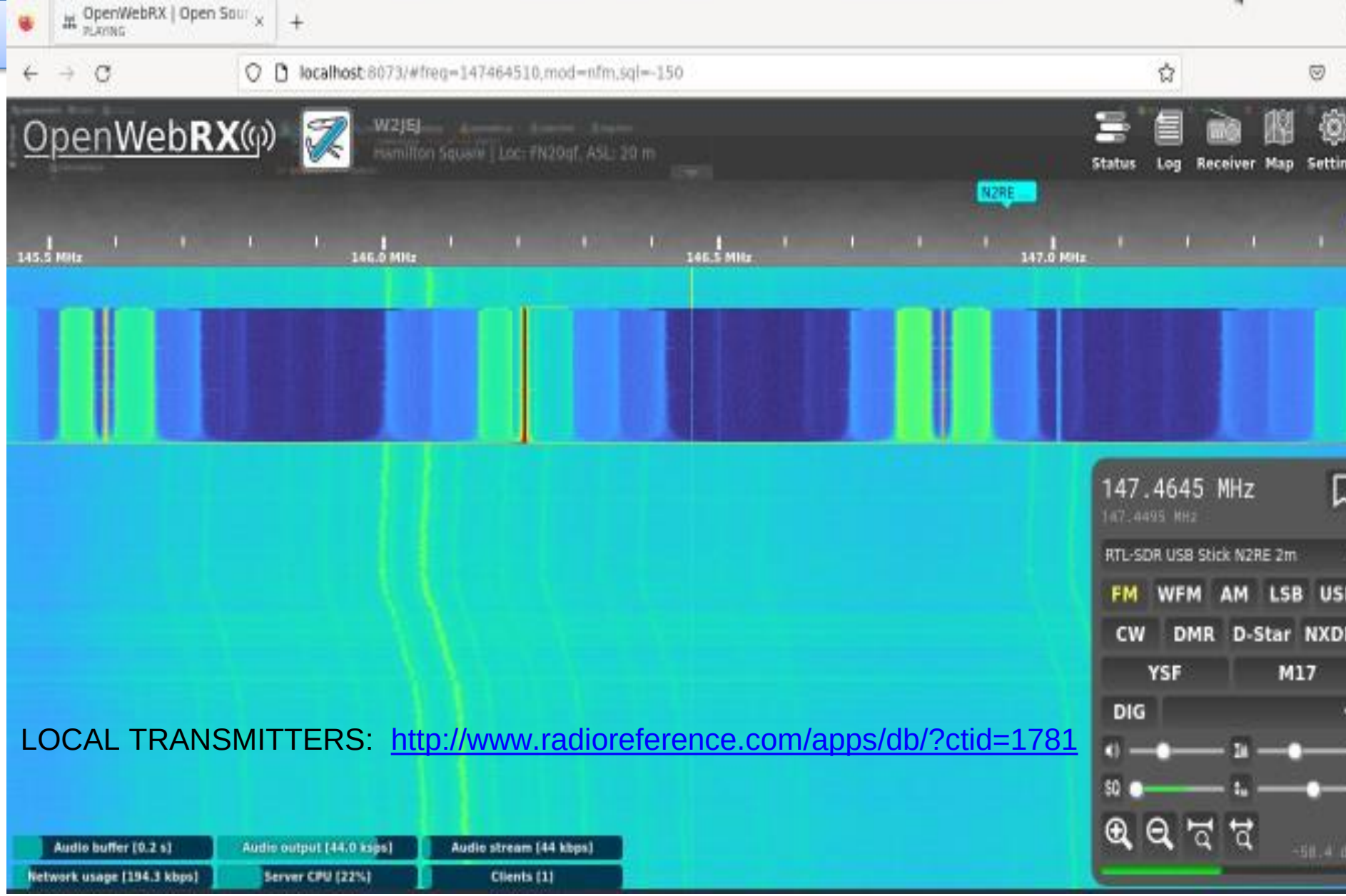
N2RE PROFILE SETTING 146.46 Mhz OPENWEBRX



DATA PROTOCOLS SUPPORTED in OpenWebRX V1.2

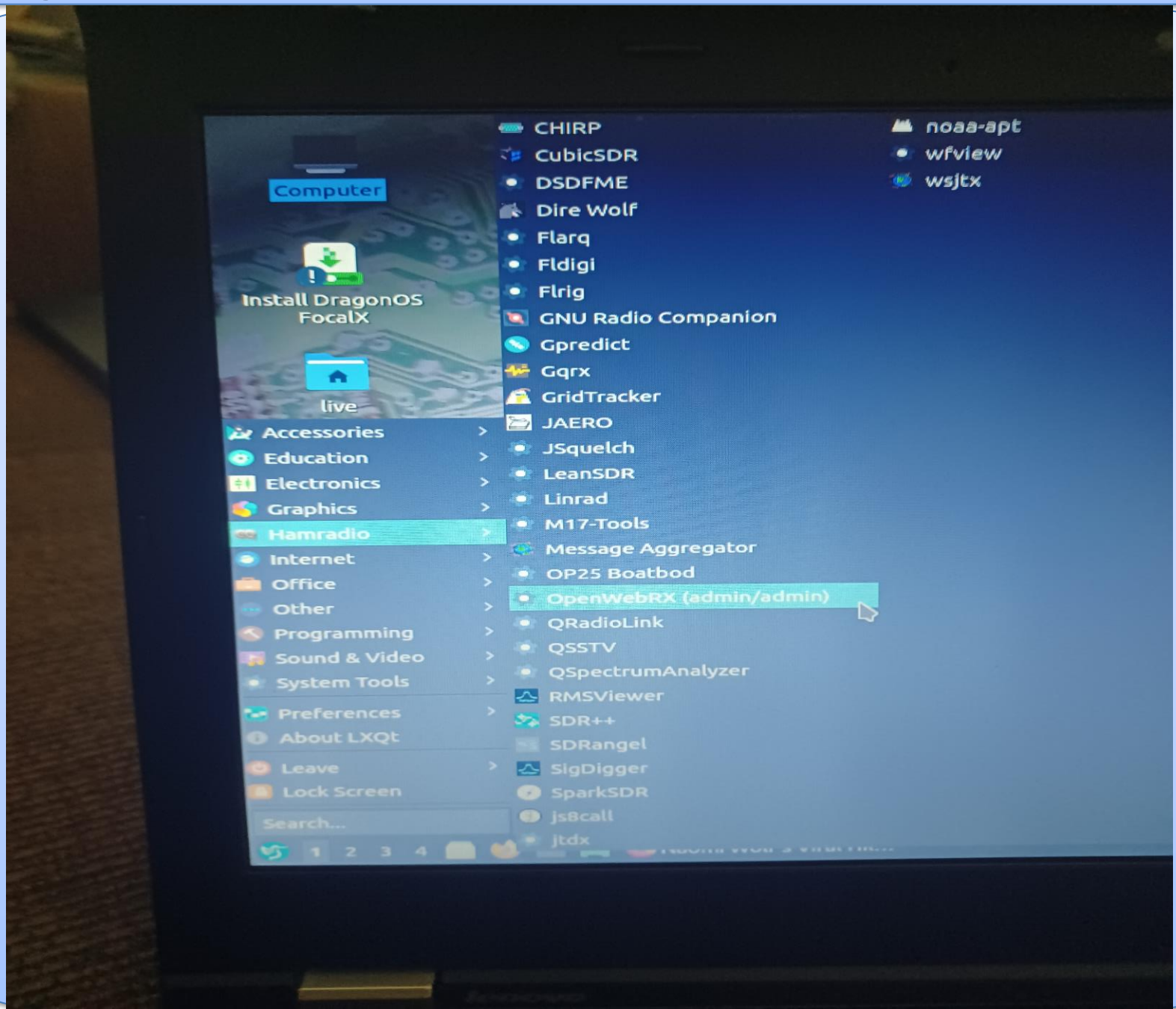
DIGITAL DEVICES SUPPORTED in OpenWebRX V1.2



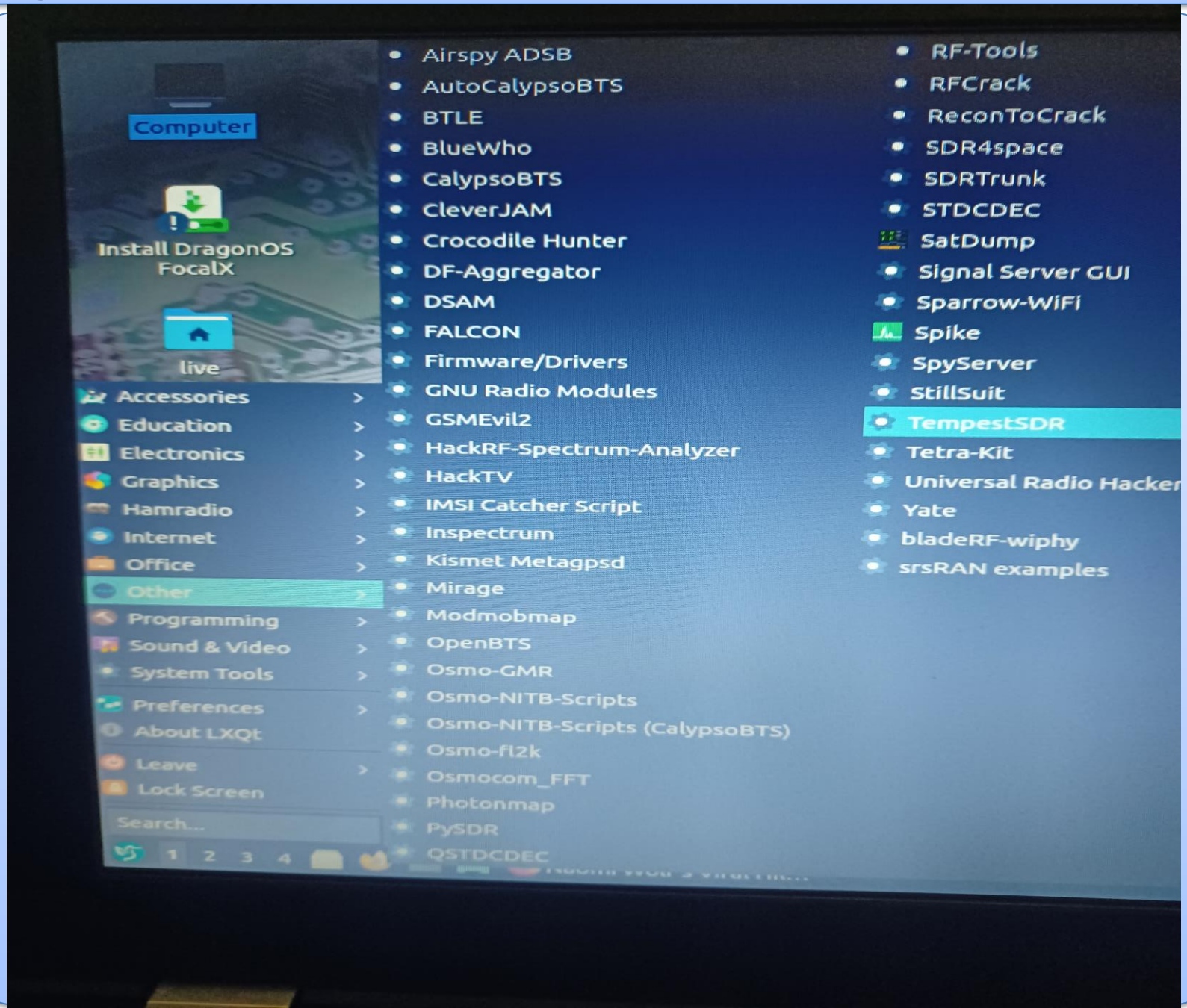


LOCAL TRANSMITTERS: http://www.radioreference.com/apps/db/?ctid=1781

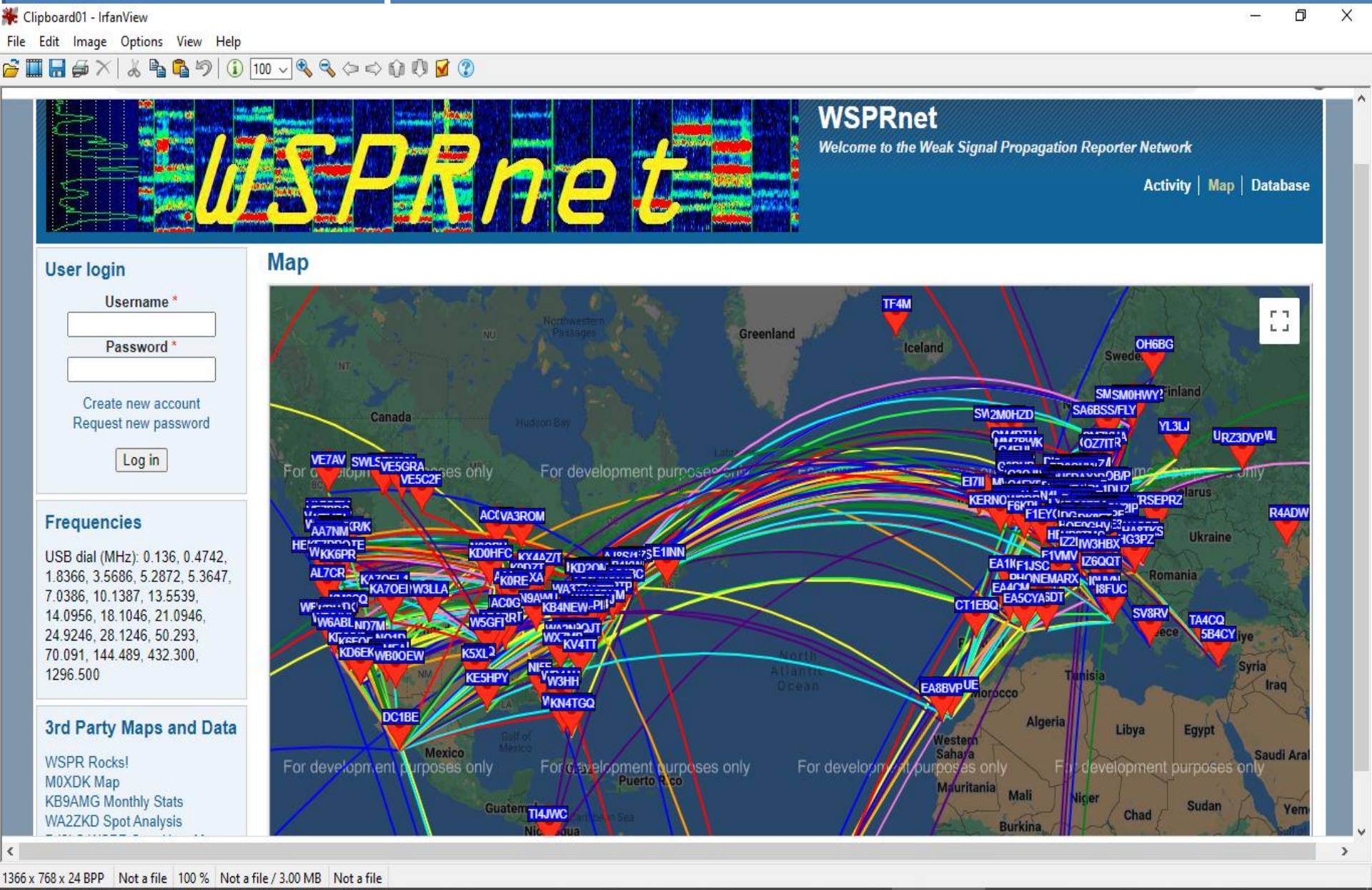
DragonOS Focal R30 Live Distribution – MY FAVORITE



DragonOS Focal R30 Live Distribution – MY FAVORITE



W2JEJ Reporter – Send to WSPRnet



WebSDR, OpenWedRx, KiWi

THE SARNOFF COLLECTION

WELCOME! Check for Hours

https://davidsarnoff.tcnj.edu/visit