

Praktisch gebruik van de SDR in de shack.

voor de Vrienden Radio Amateurs van Ieper en omstreken.

Jan Allewaert
ON7XX

Hardware:



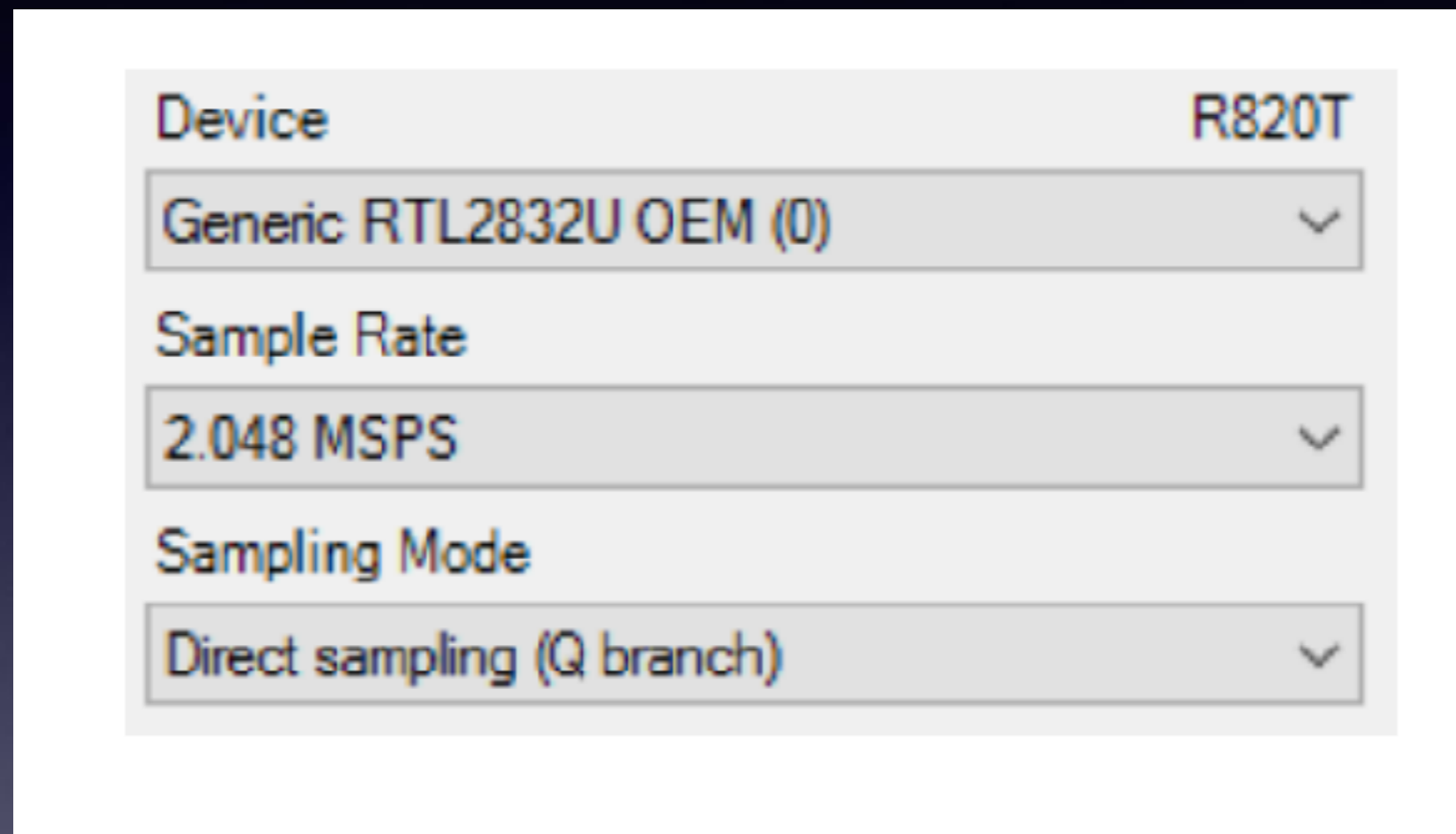
This is an RTL-SDR software defined radio receiver with RTL2832U ADC chip, 1PPM TCXO, SMA F connector, R820T2 tuner and aluminium case with passive cooling.

Tunes from 500 kHz to 1.7 GHz with up to 3.2 MHz (2.4 MHz stable) of instantaneous bandwidth. (HF mode works in direct sampling mode).

Perfect for use as a computer based radio scanner with free software like SDR#, HDSDR, SDR-Radio, Linrad, GQRX or SDR Touch on Android.

Works on Windows, OSX, Linux, Android and embedded Linux computers like the Raspberry Pi.

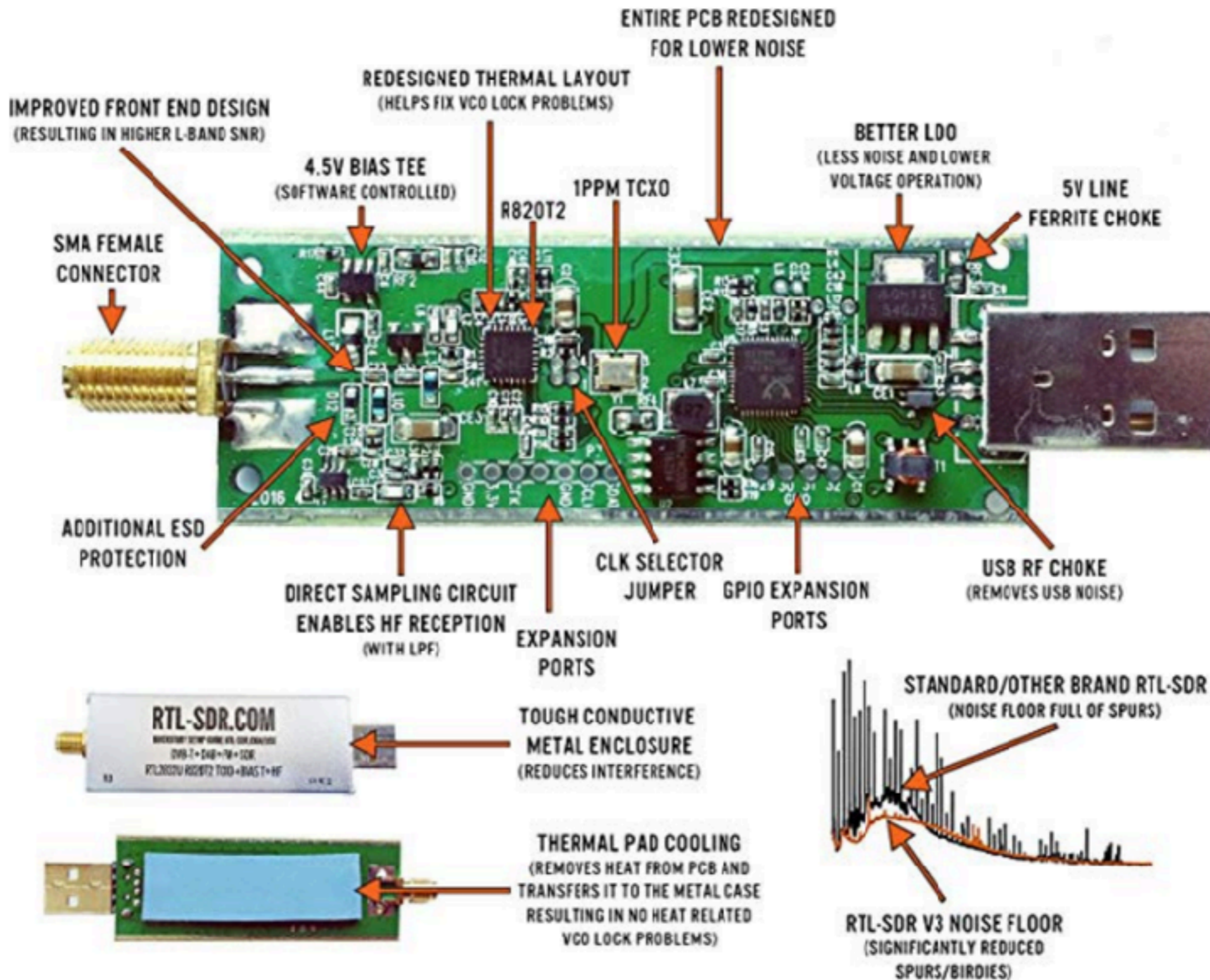
Direct sample mode mogelijk met de RTL SDR V3 voor HF bereik 0.5 - 30 Mhz



Deze instelling geldt voor ontvangst onder 30 Mhz.

Voor ontvangst boven 30 Mhz
Quadrature sampling gebruiken.

WHAT MAKES OUR RTL-SDR BETTER THAN OTHERS?



Bij gebruik van Windows

is het steeds noodzakelijk eerst de ZADIG Drivers te installeren op de PC

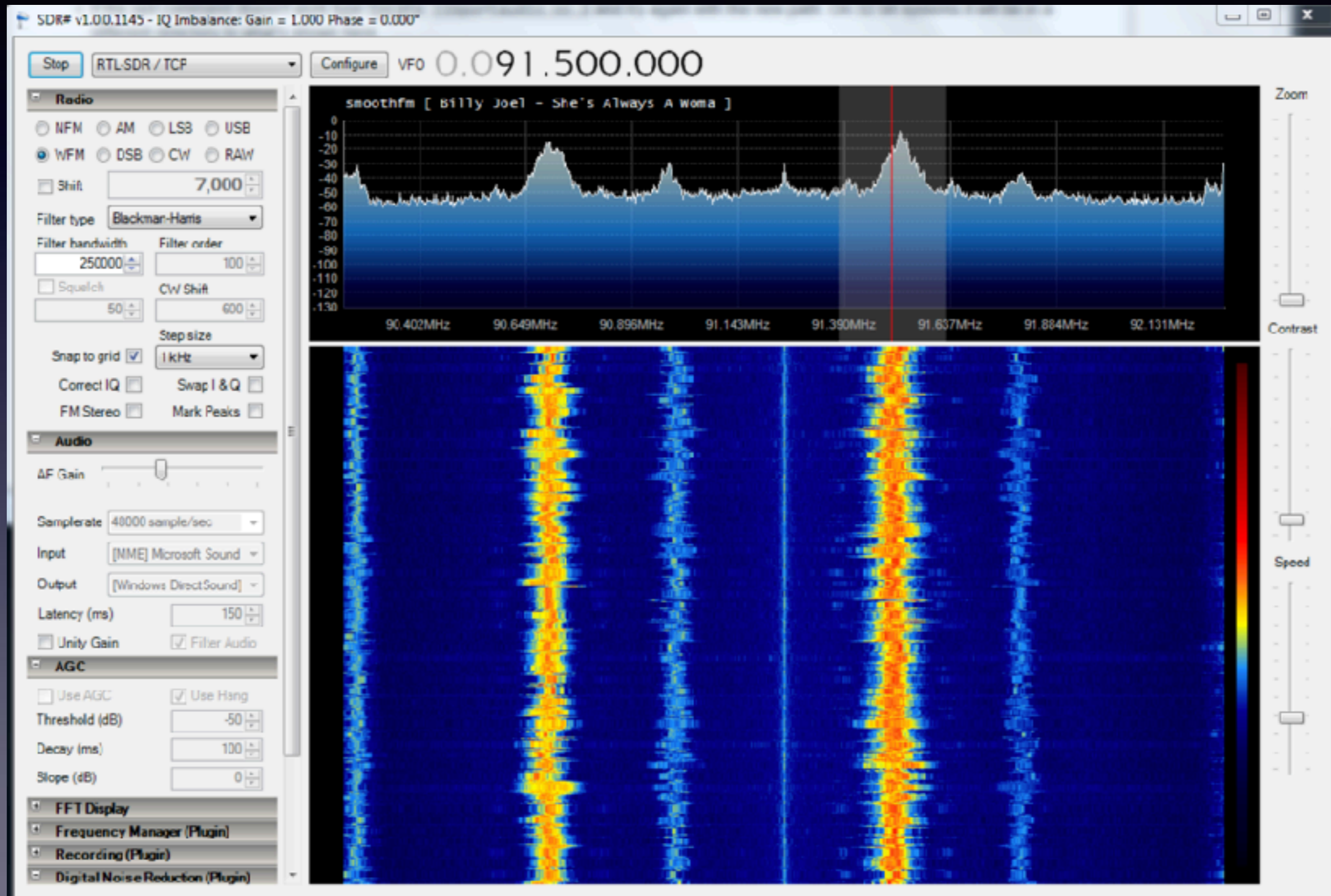
Zie hiervoor :

- <https://zadig.akeo.ie/> of
- <https://www.rtl-sdr.com/tag/zadig/> of
- http://www.wijkamp.com/sdr/files/001-w10_rtl-usb-820t_zadig.pdf

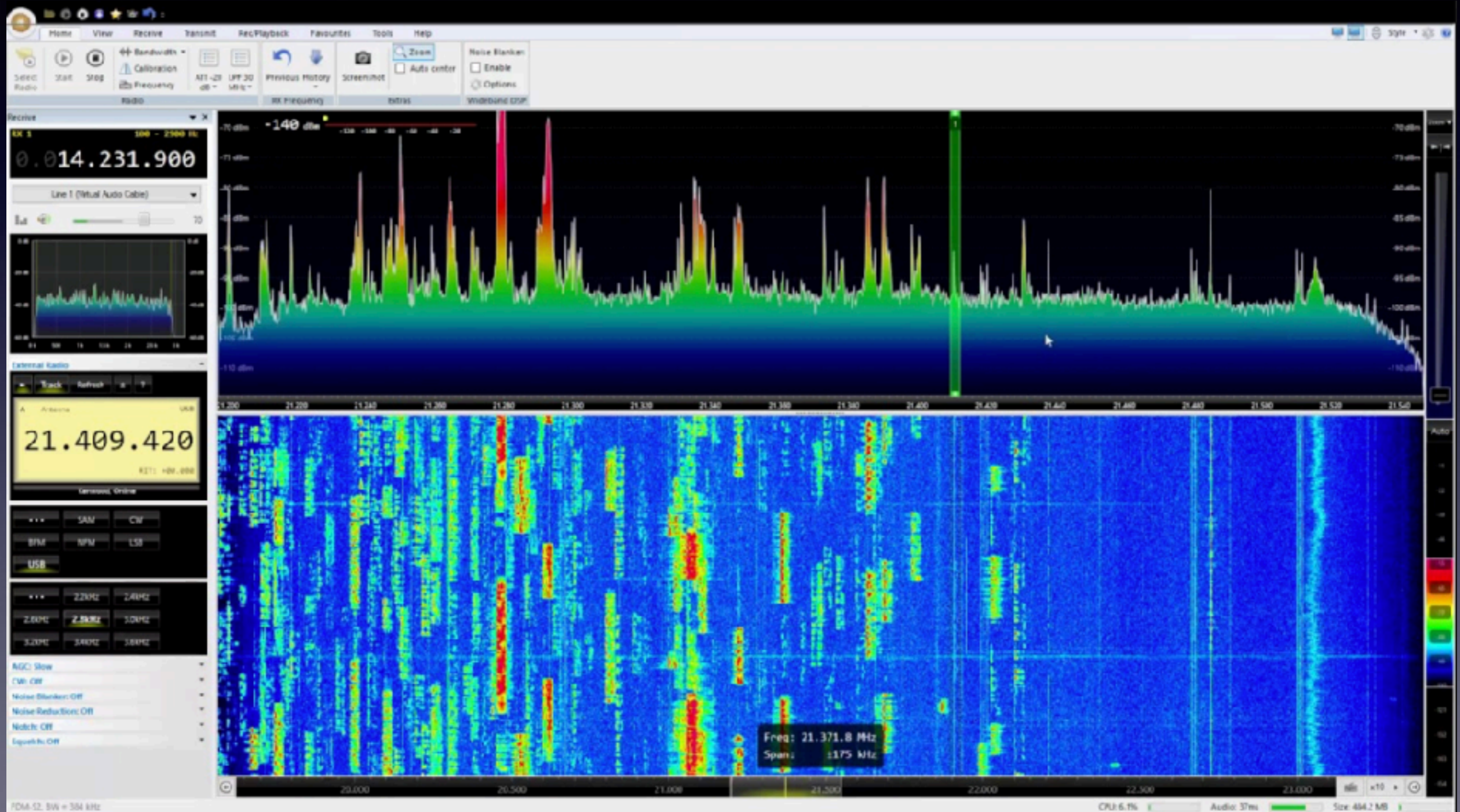
Software:

- SDRSharp (SDR#) geleverd met SpyServer software
- SDRConsole V3 (of V2) door Simon Brown auteur Ham Radio Deluxe
- HDSDR
- GQRX
- Cubic SDR

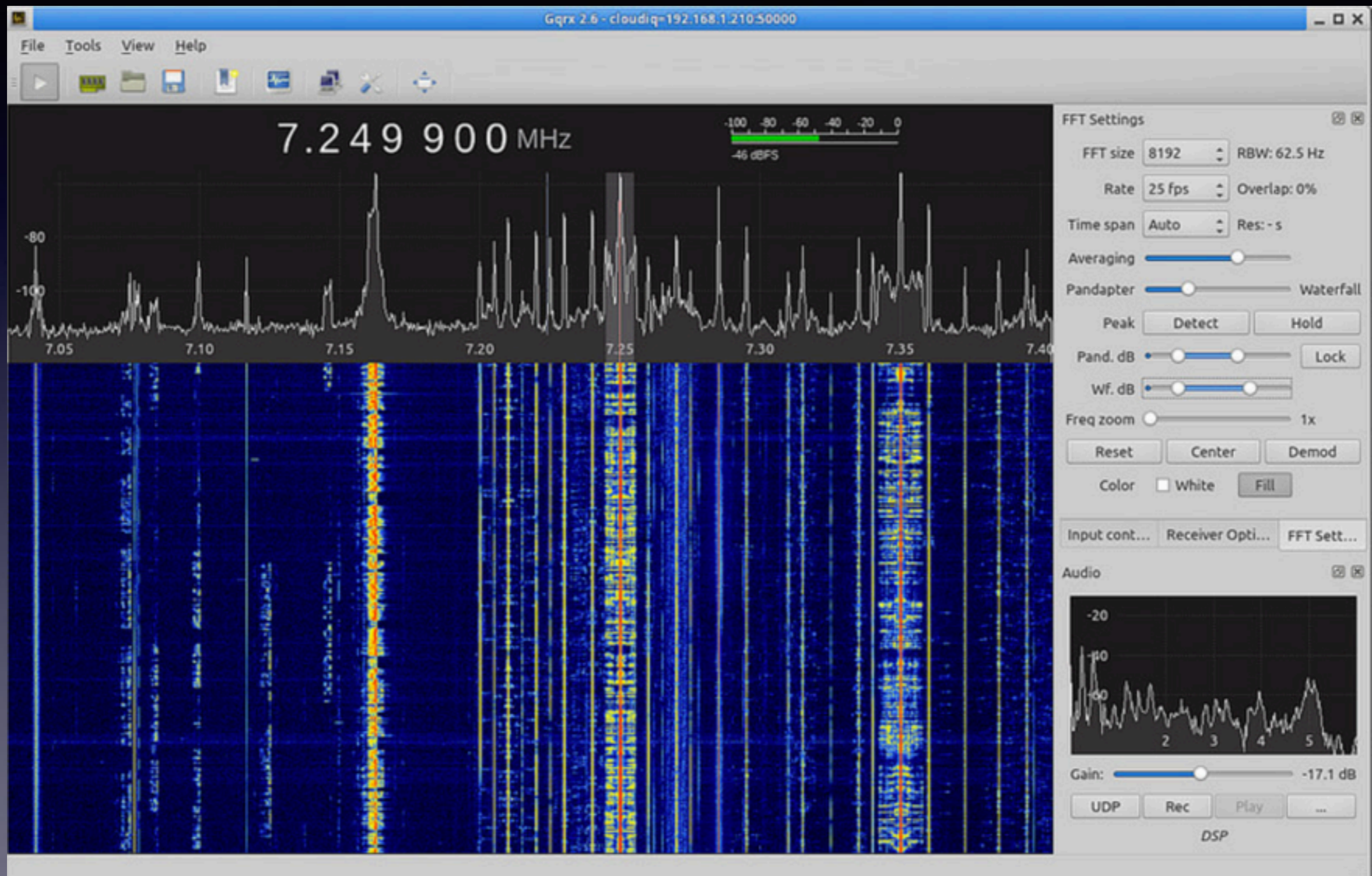
SDRSharp



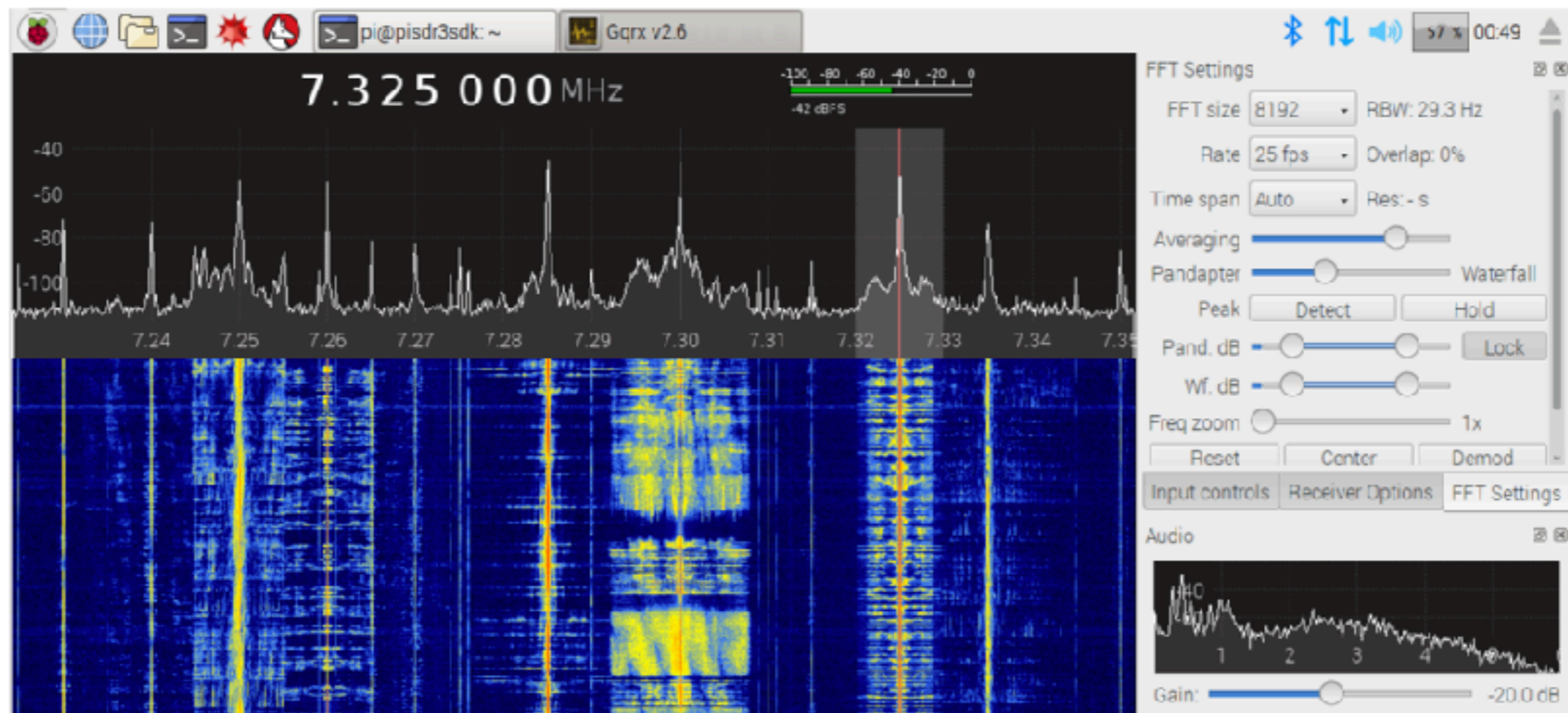
SDRConsole V3



GQRX



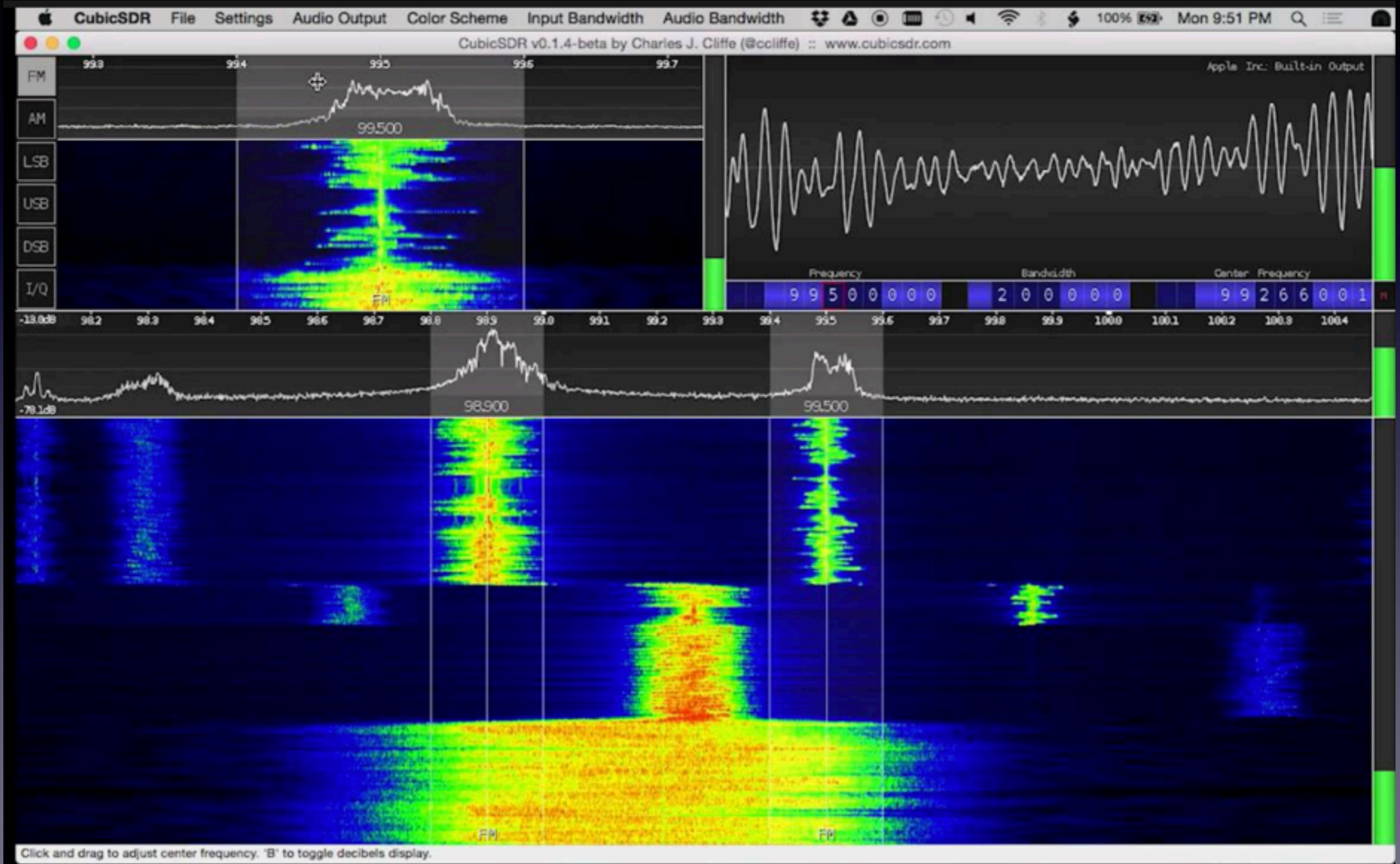
Gqrx SDR for the Raspberry Pi



Gqrx SDR is available as binary package for the Raspberry Pi 3 running Raspbian Stretch and other ARM v6 running a Debian Stretch based OS.

<http://gqrx.dk/download/gqrx-sdr-for-the-raspberry-pi>

Cubic SDR



Antenne - SDR - PC



CAT koppeling met transceiver wordt verder besproken

1. Bij gebruik van een en dezelfde antenne voor zender en SDR:

We moeten vermijden dat de RF uitgaande van de zender in verbinding komt met de gevoelige antenne ingang van de SDR.

Hiervoor zijn meerdere mogelijkheden.

<https://www.youtube.com/watch?v=nchpTOfdjol>

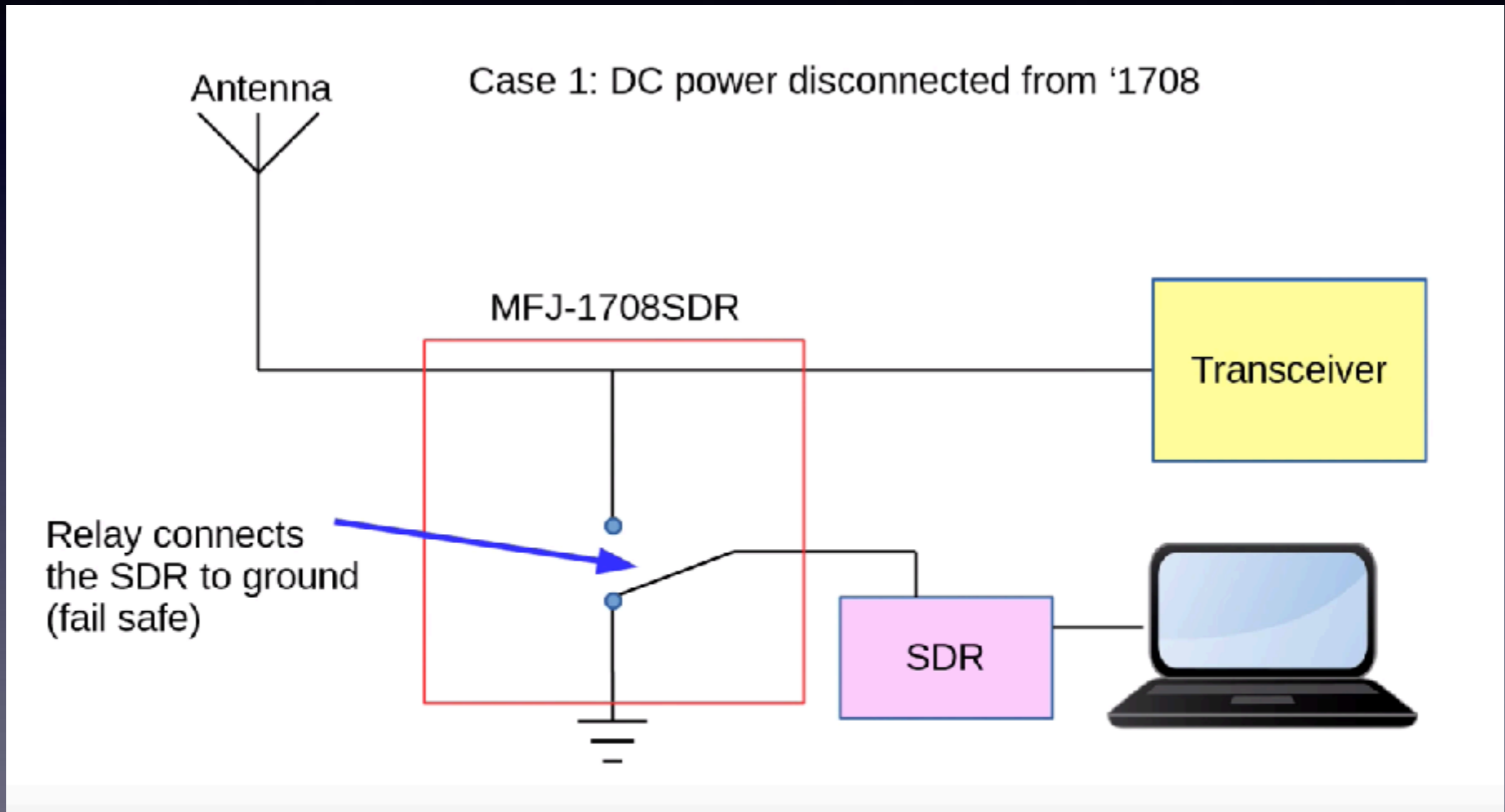
Manual antenna switch??

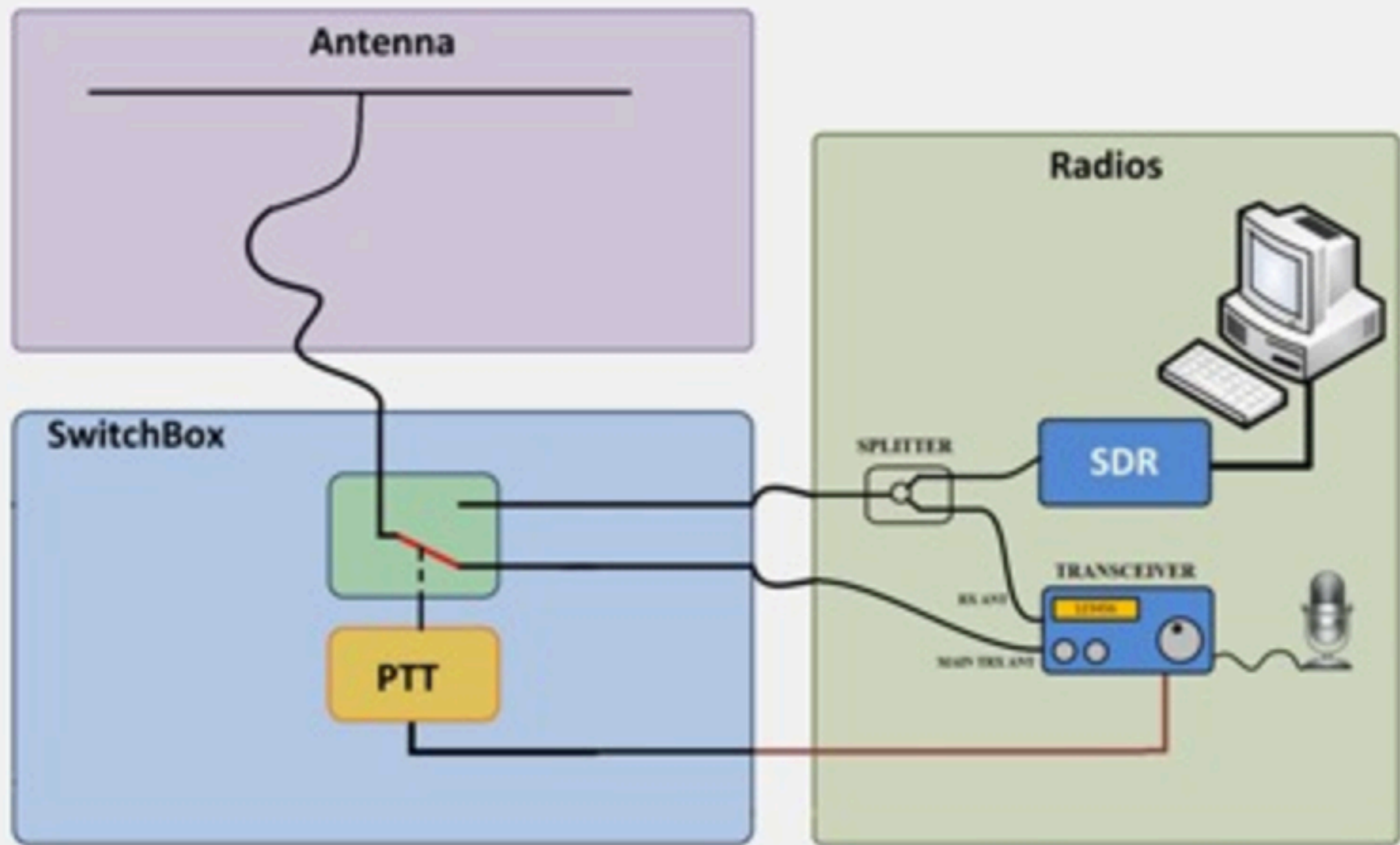


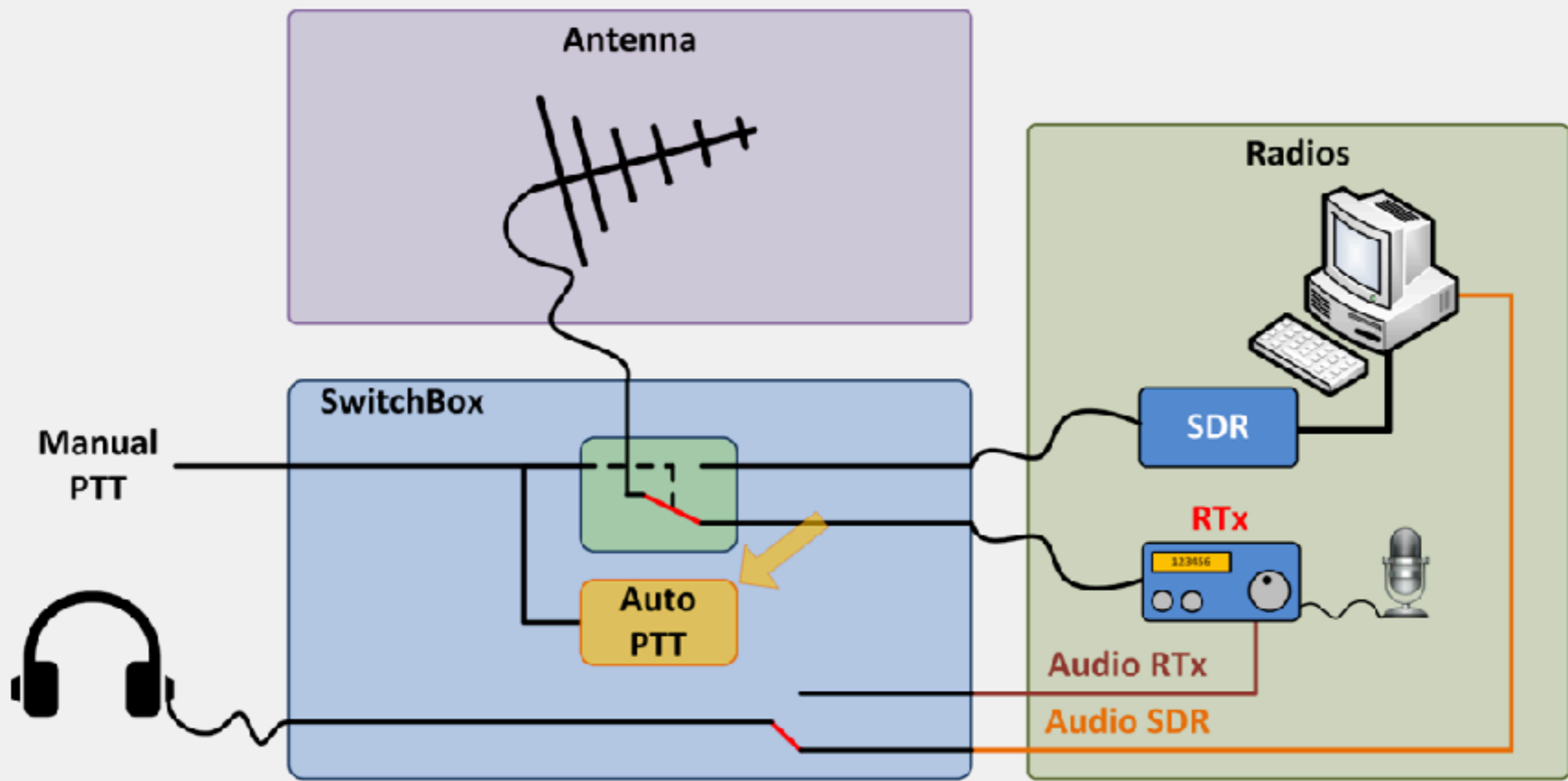
Or an antennne Switch Box?



Antenne - SDR - PC - Transceiver







2. Externe SDR-server gebruiken via Internet

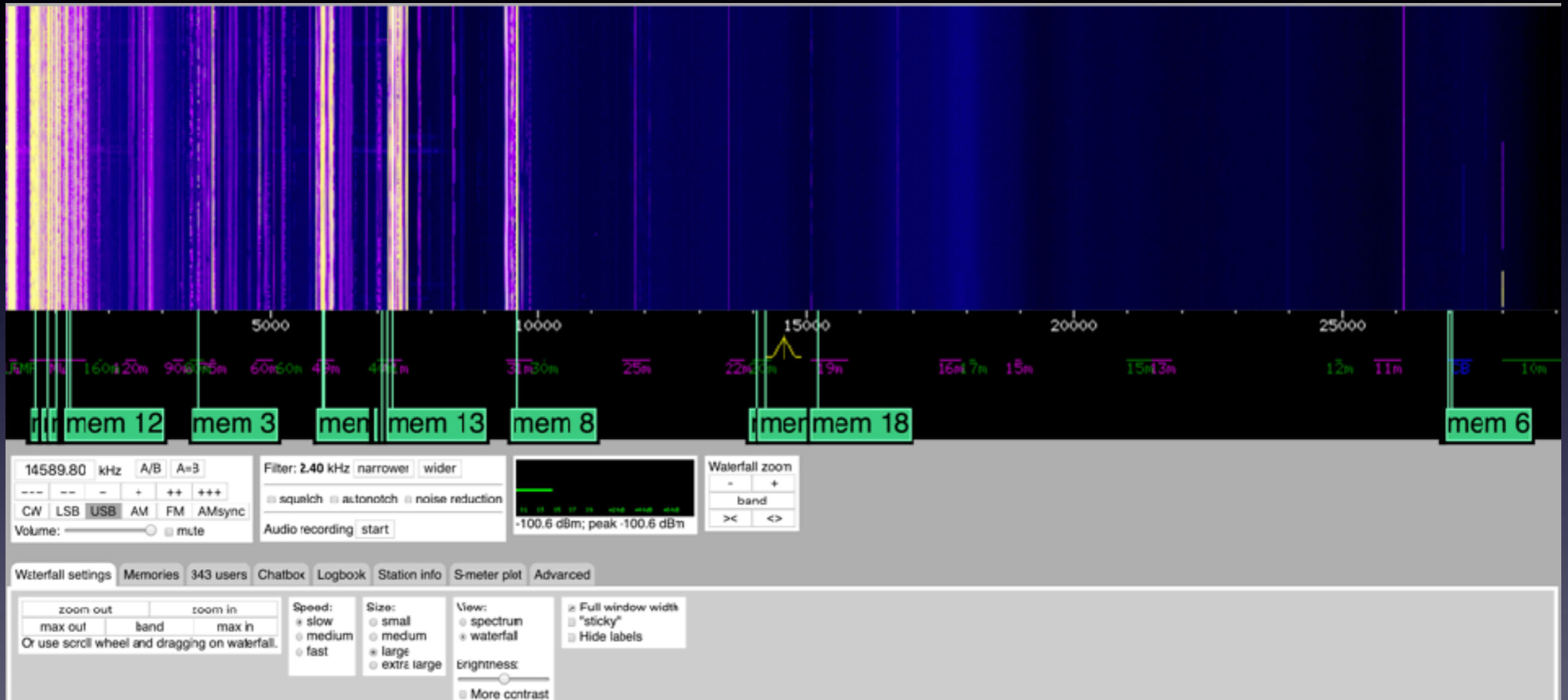
A WebSDR is a Software-Defined Radio receiver connected to the internet, allowing many listeners to listen and tune it simultaneously.

SDR technology makes it possible that all listeners tune independently, and thus listen to *different* signals.

This is in contrast to the many classical receivers that are already available via the internet.

- <http://www.websdr.org/> >> Univ. Twente
- <https://sdr.hu/> >> OpenWebRX project
- SpyServer >> enkel met SDRSharp

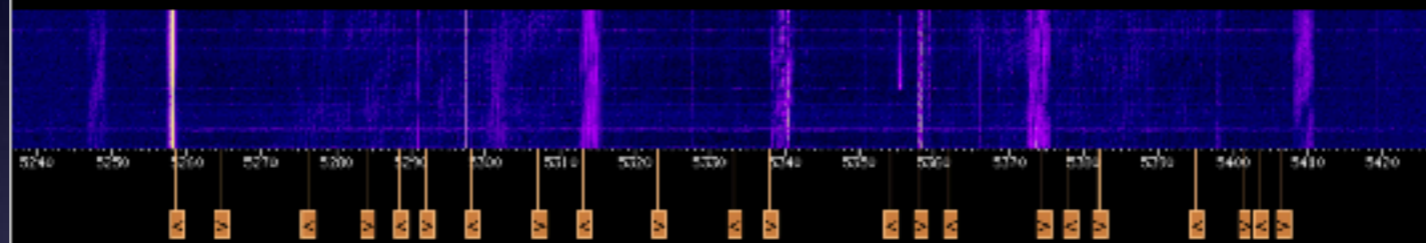
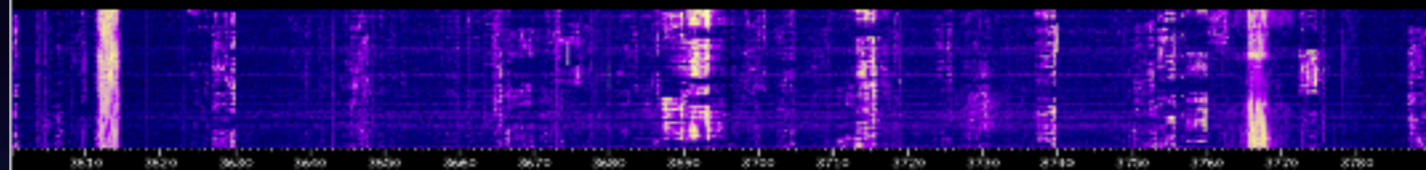
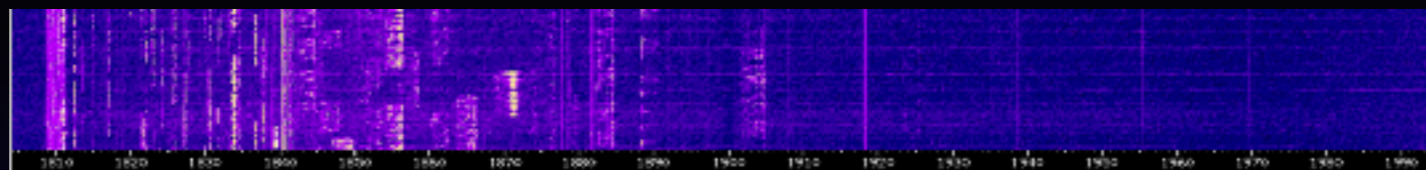
WebSDR



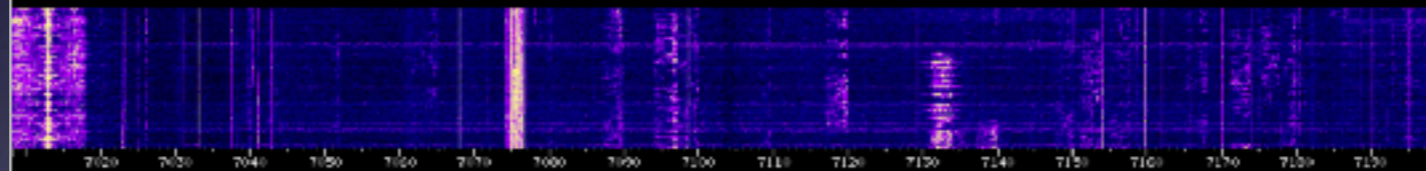
Het volledige HF spectrum is zichtbaar in een oogopslag.

WebSDR

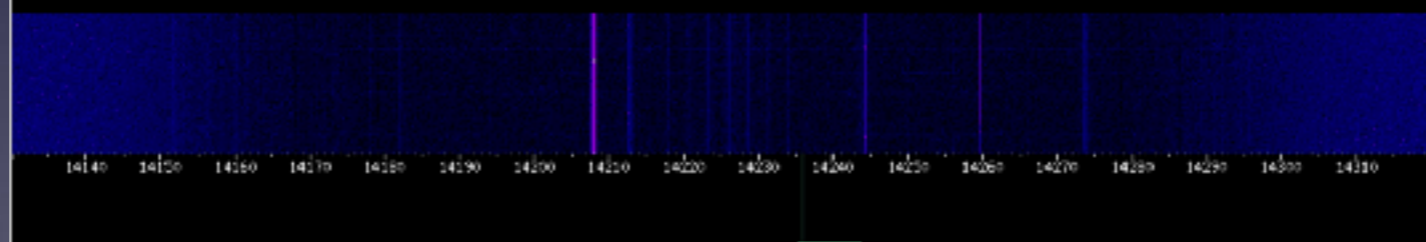
80 M



40 M



20 M



Voorstelling per frequentie band

Club WebSDR op 145.450 Mhz

OpenWebRX [VAUBAN ON7XX] Status Log Receiver

Vrienden Radio Amateurs Ieper en omstreken.

Receiver is operated by: jan.allewaert@gmail.com
Device: RTL-SDR on Raspberry pi 3B
Antenna: Diamond 2m 5/8 Antenna
Website: <https://www.qrz.com/db/ON7XX>

144.5 MHz 145.0 MHz 145.5 MHz 146.0 MHz 146.5 MHz

145.459,3 MHz
146.631,8 MHz

FM AM LSB USB CW
DIG

Speaker icon Volume slider IIR slider
SQ slider SSB icon 3D icon

Audio buffer [2.1 s] Audio output [44.6] Audio stream [49 kbps]
Network usage [196.3] Server CPU [36%] Clients [1]

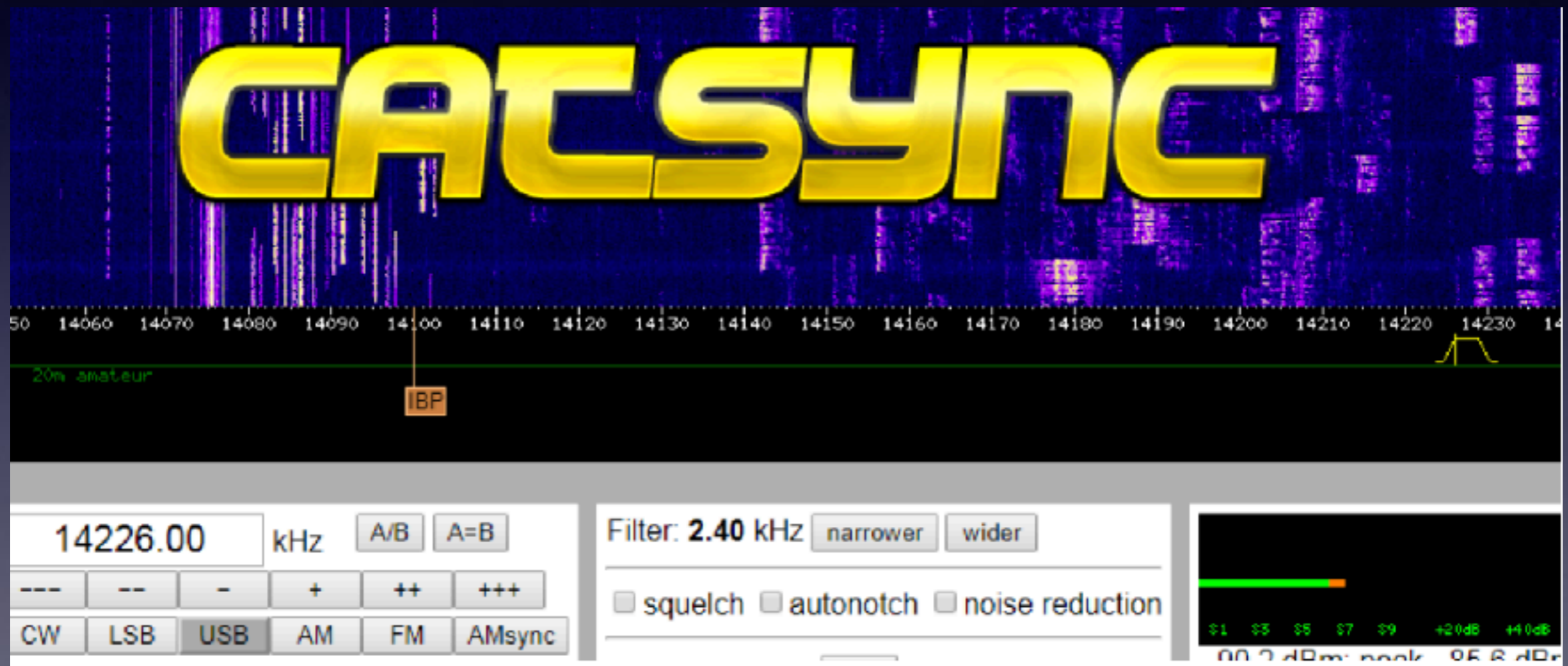
-65.3 dB

OpenWebSDR Server van onze club 145.450 Mhz



headless setup with SSH

CAT Synchronisatie Transceiver en SDR en PC



CATSync program

The CAT Tool for WebSDRs

CATSync allows you to synchronize public WebSDR receivers with your real rig connected via CAT control to your computer. It supports the classical WebSDR as well as Kiwi SDR interfaces:

Control any public WebSDR server by means of your real RIG...

Supports a wide number of RIG's (it uses the popular OmniRig engine)

Supports WebSDR and KiwiSDR browser based SDR receivers

Tune the VFO of your radio and see the web SDR follow in realtime !

Click on the WebSDR waterfall and retune your rig in realtime.

Synchronizes both, frequency and mode changes (CW, USB, LSB, AM, FM)

Listen to the same frequency as your rig via web SDR or vice versa

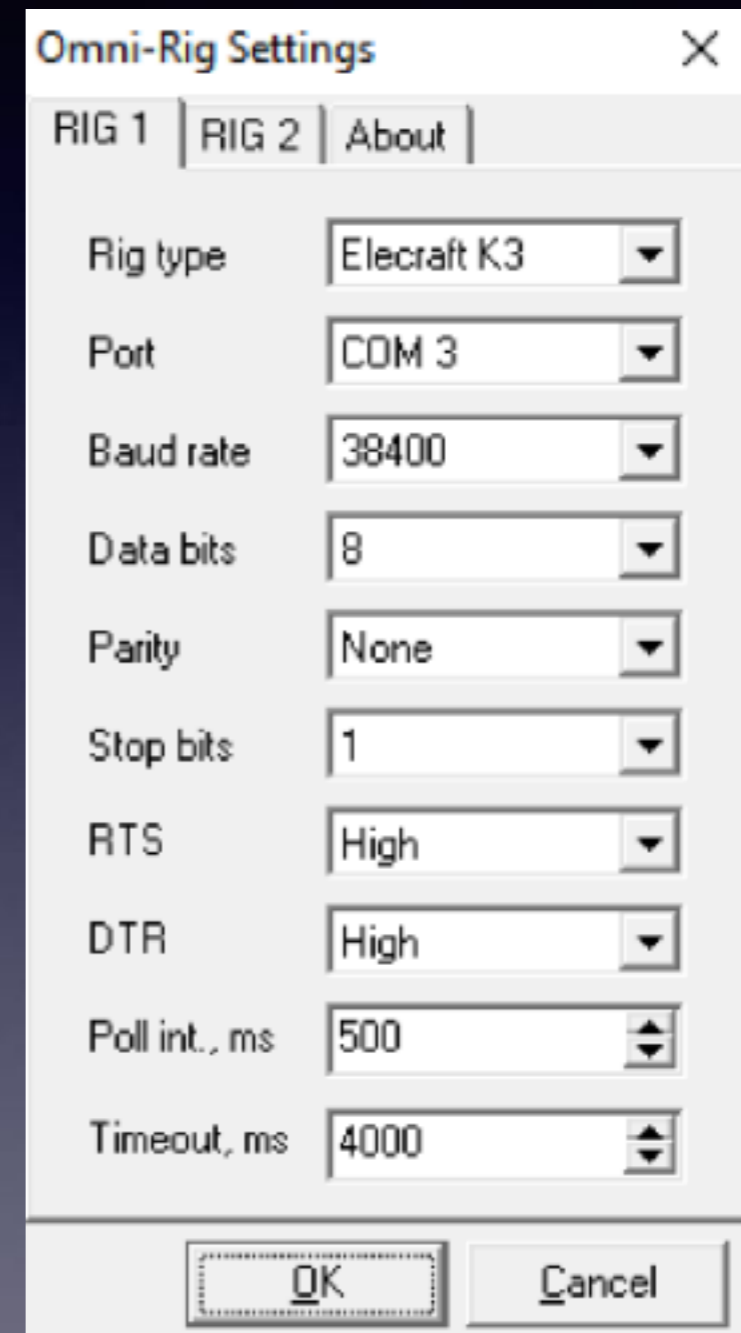
Ideally suited e.g. for people suffering from local QRM or working in nets

Can track RX or TX VFO (e.g. to find that split of a DX station) if radio CAT command set of your rig supports both independently

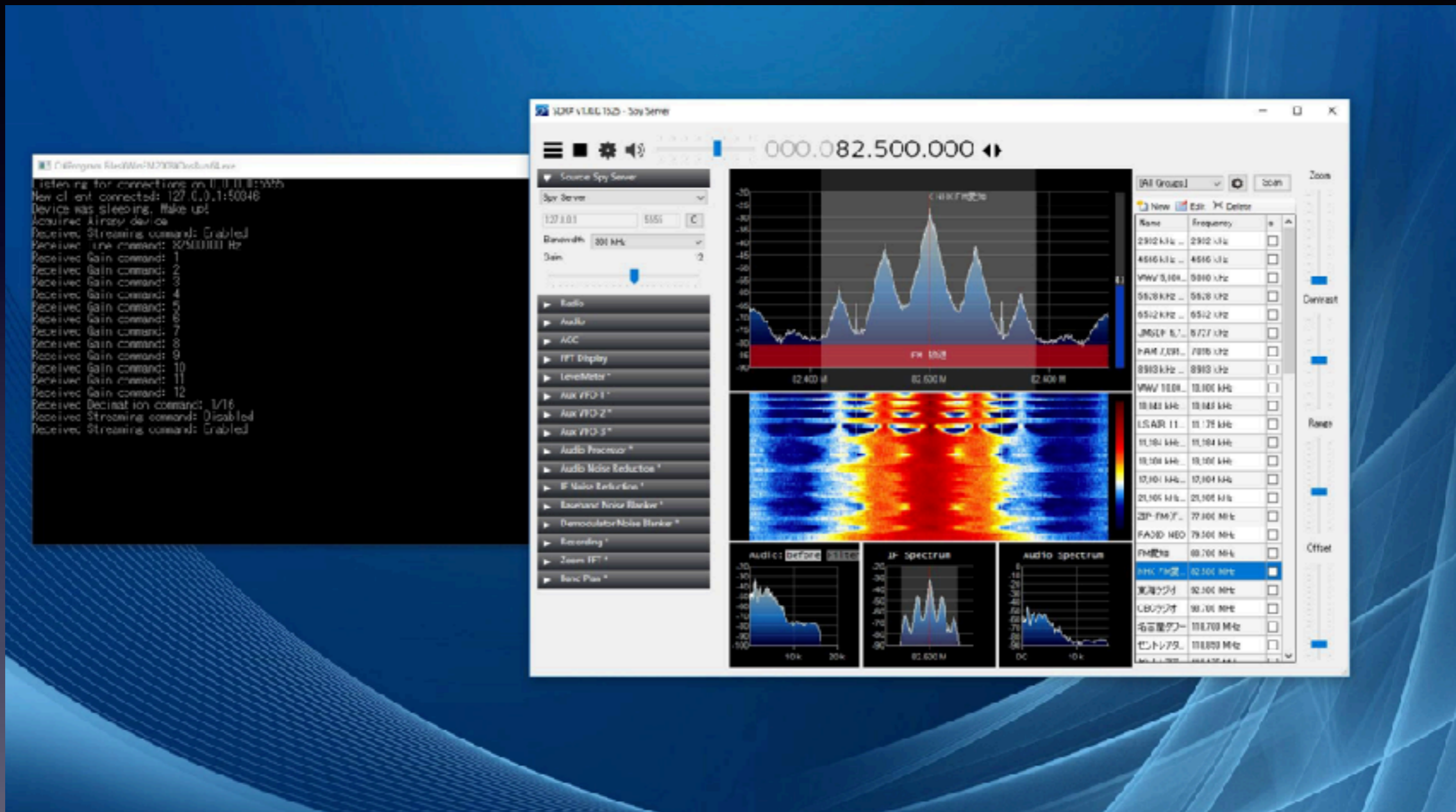
Can be interfaced with popular logging software using OminRig or via VSPE port splitter

CAT with OmniRig

<http://dxatlas.com/omnirig/>



SpyServer Program



<https://airspy.com/download/>

Airspy Servers

The screenshot shows the Airspy.com directory website. On the left, there is a list of servers with their IP addresses, call signs, and hardware types. On the right, a world map displays the geographical locations of these servers, marked with colored dots.

IP Address	Call Sign	Hardware
sdr //193.250.172.95:6666	Anonymous	Airspy Mini
sdr //109.164.114.15:6666	Tonja CK15DR, satcom, NOAA ...	Airspy R2
sdr //87.219.101.83:5556	EB4APL	Airspy R2
edr //95.103.249.120:5555	Anonymous	Airspy R2
sdr //80.229.173.194:55556	Paul MCEYT - UHF satcom RX	Airspy R2
edr //81.187.87.76 6003	Anonymous	RTL-SDR
sdr //80.229.173.194:55555	Paul MCEYT - Inmarsat 54W RX	Airspy Mini
edr //78.210.160.55:5558	SWL PIERRE MONTPELLIER FRANCE	RTL-SDR
sdr //81.187.87.76 6002	Anonymous	RTL-SDR
sdr //81.187.87.76 6000	Anonymous	RTL-SDR
sdr //92.62.226.78:5557	Mirek UK1JNB Moravany Lzechia Loc. JN7RHV RX 30MHz - 1500MHz	RTL-SDR
sdr //94.65.255.243:5556		Airspy R2

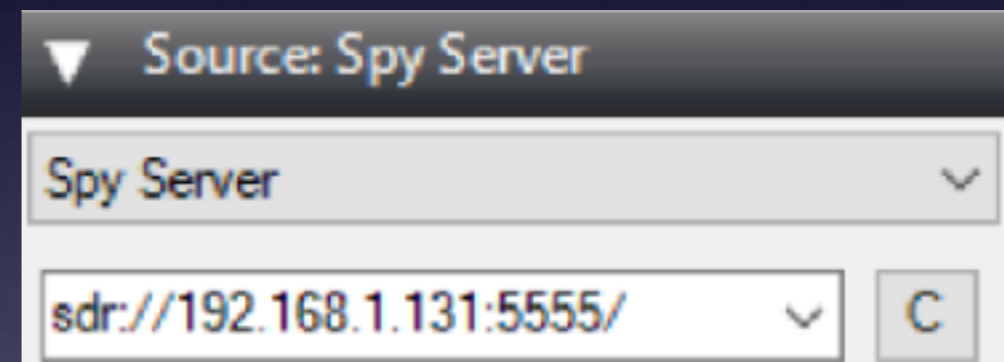
<https://airspy.com/directory>

SpyServer setup:

```
spyserver.config - Note...
File Edit Format View Help
# SPY Server Configuration File

# TCP Listener
#
bind_host = 0.0.0.0
bind_port = 5555
maximum_clients = 100

# Device Type
# Possible Values:
#   AirspyOne (R0, R2, Mini)
#   AirspyHF+
#   RTL-SDR
#
device_type = RTL-SDR
```



SETTING UP AND USING THE SDR#'s "SPYSERVER" REMOTE STREAMING SERVER with a RTL-SDR stick or with the new AIRSPY HF+ SDR receiver.

-download: client and spyserver software at <https://airspy.com/download/>

-read the howto : <https://www.rtl-sdr.com/rtl-sdr-tutorial-setting-up-and-using-the-spyserver-remote-streaming-server-with-an-rtl-sdr/>

-choose spyserver as source and use: `sdr://allewaert.redirectme.net:5555`

as server address in the SDR# client program (as shown on the picture)

-->How to connect?

Download, Unzip and Run SDR#
Select Source: Spy Server
Copy the URL in SDR#
Click Start (the little triangle)

-->Or you can buy a ready built SpyServer microSD Card for the Raspberry Pi 3

Go to the website of Mike Richards G4WNC :

<https://photobyte.org/product/spy-server/>

This setup gives you very good results and a much better S/N due to better DSP.

Port Forwarding op de Router bij opzetten van een Server.

Steeds een poort openzetten in je thuis router om toegang te kunnen verlenen aan een PC die wil connecten van buiten je thuisnetwerk. Hoe je dit doet verschilt van router tot router.

Probleem met veranderende IP Adressen. No-IP DUC programma is een mogelijkheid. (Al dan niet betalend)

Dit geldt voor elke server die je wil installeren. Ook bij video camera beveiliging ed.

Take Home Messages:

SDR verbinden met PC en locale antenne: compacte radio - dus enkel luisteren.

SDR verbinden met PC en transceiver: luisteren en zenden mogelijk. OmniRig voor CAT frequentie synchronisatie en Antenne Switch gebruiken als beveiliging voor antenne ingang van de SDR.

SDR en Transceiver fysisch scheiden. Principe van client-server toepassing. Het antenne probleem is meteen opgelost. Ofwel CATSync programma (simpel) of Server opzetten (ingewikkelder). Hiervoor meerdere mogelijkheden.

