

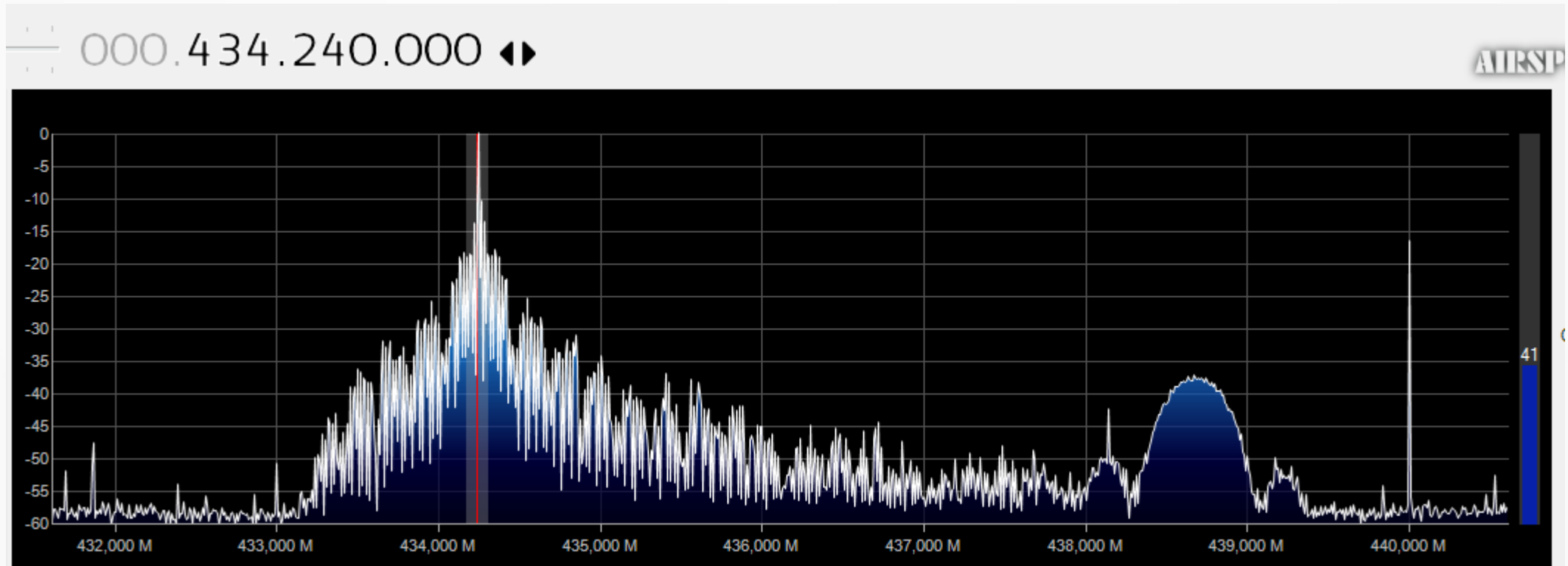
AM en FM Televisie signalen ontvangen met GNU Radio

**VERON VHF-dag 2019
2019-03-23, Apeldoorn
Rob Hardenberg PE1ITR**

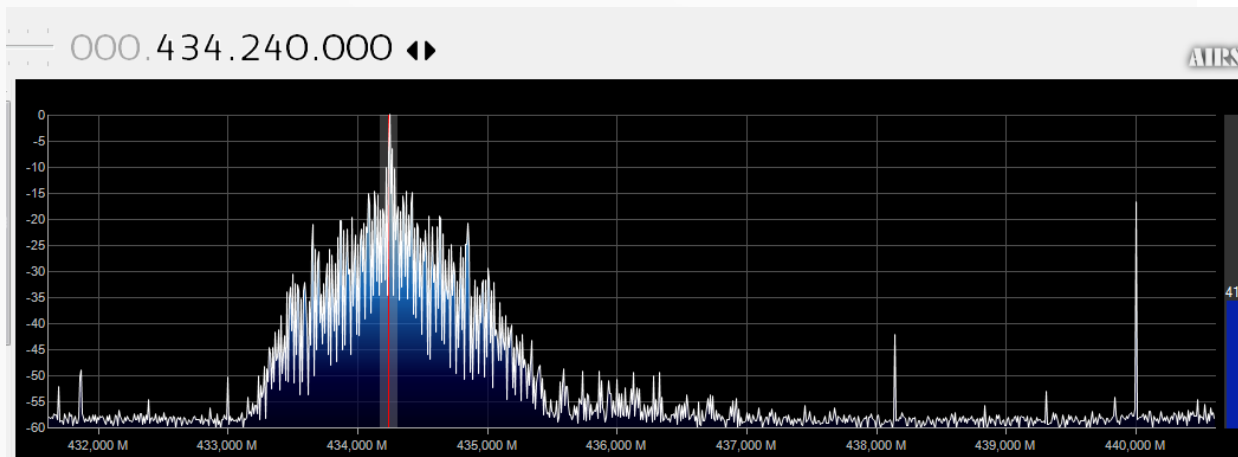
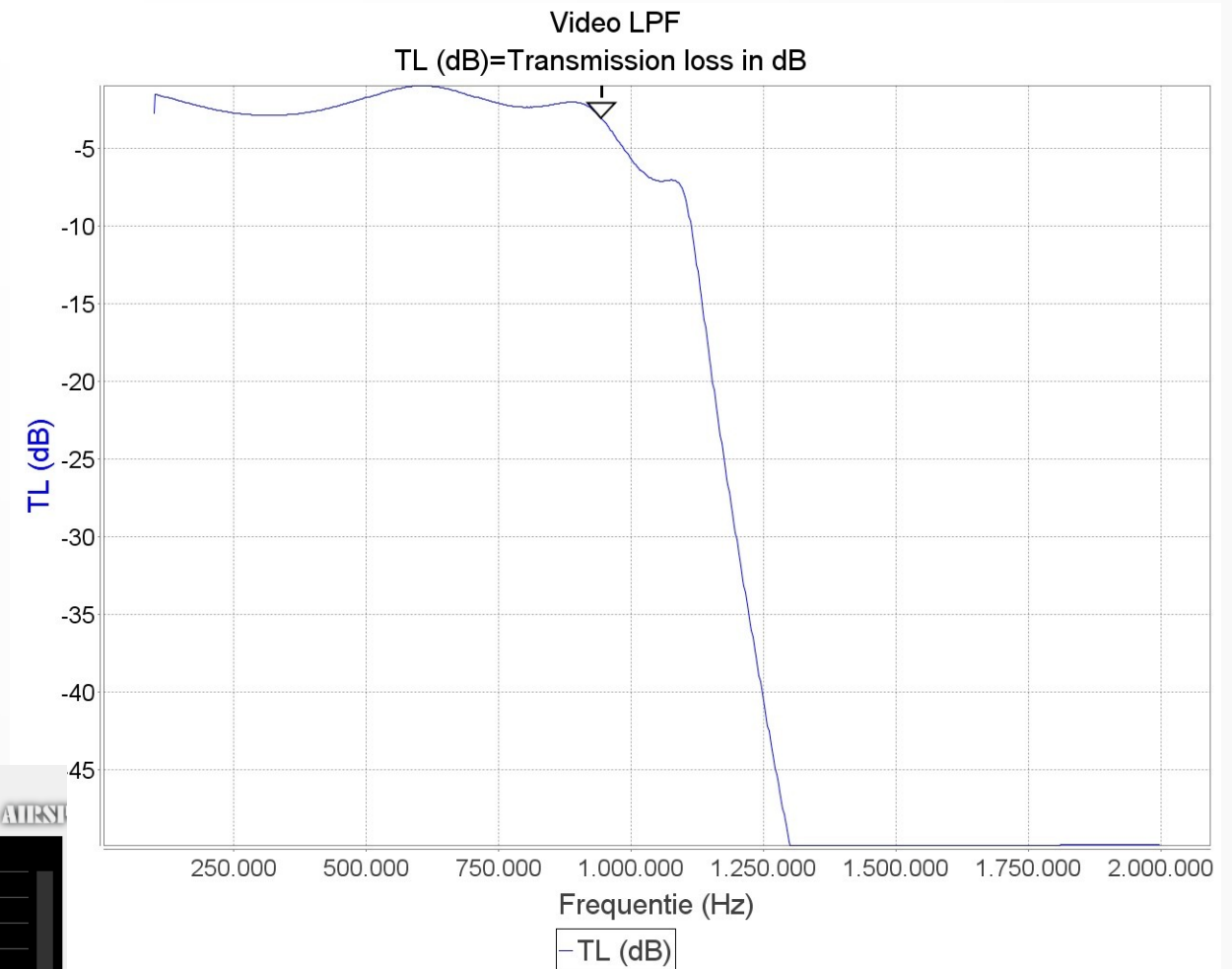
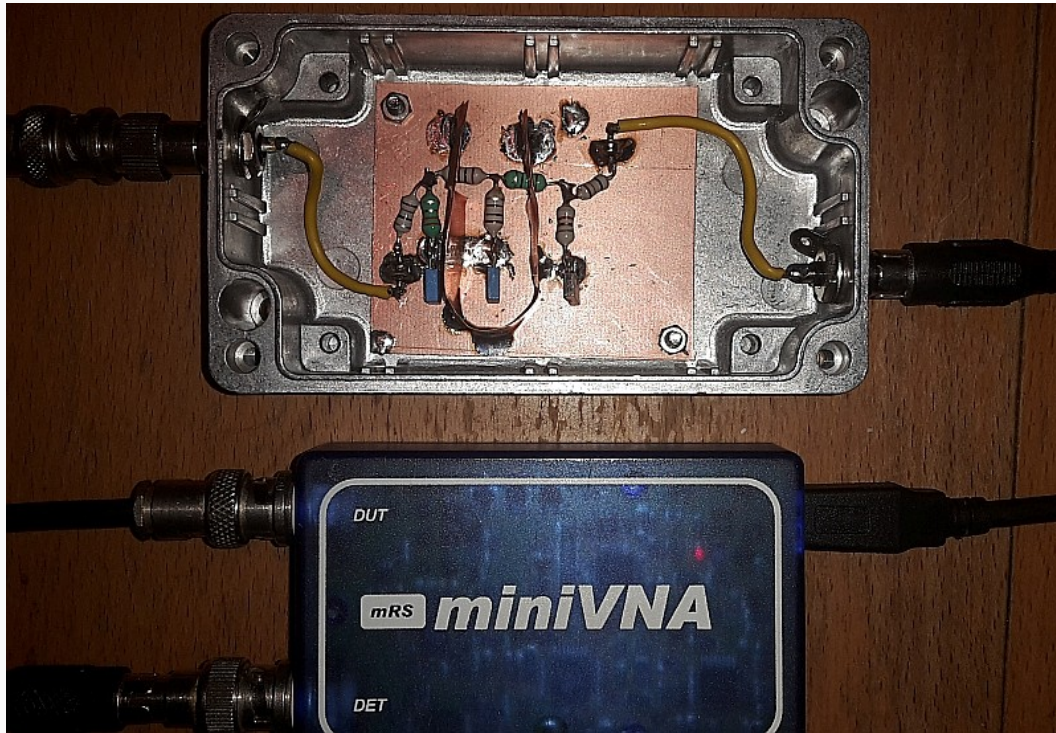
Aanleiding

- De ATV contest winnen. ← Code lezen.
- Veel stoorsignalen op 70cm band. ← Deze onderdrukken.
- TV sharp voldeed niet helemaal op 70cm.
- Filters gemaakt in analoge techniek, maar smaller en meer flexibiliteit gewenst.
- Experimenteren met SDR techniek

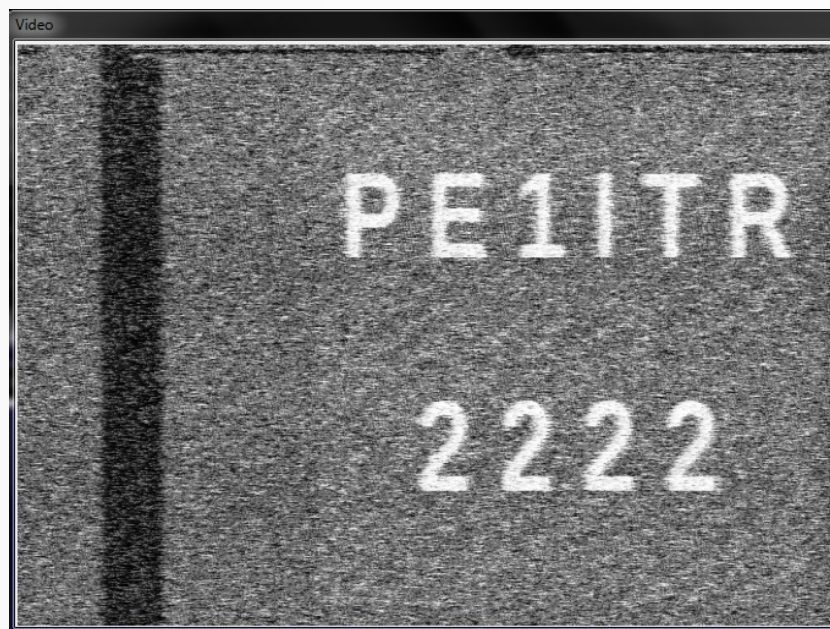
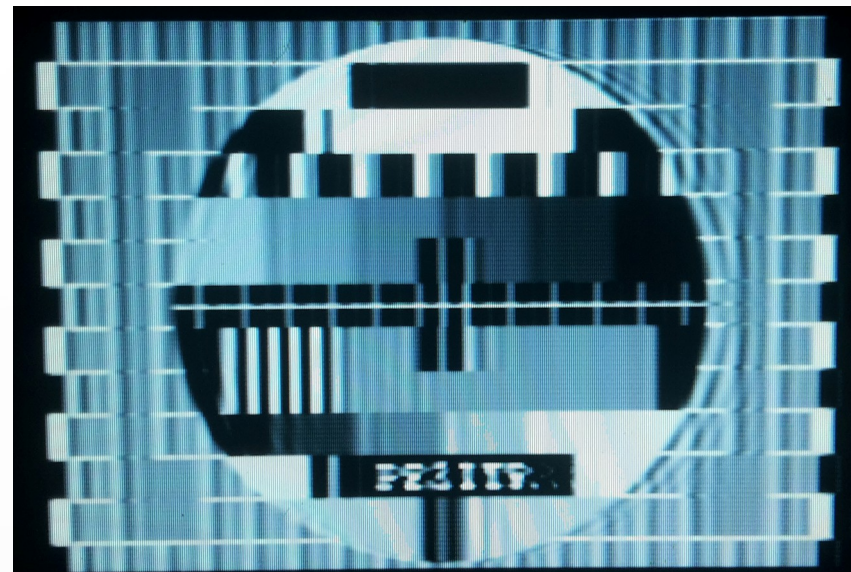
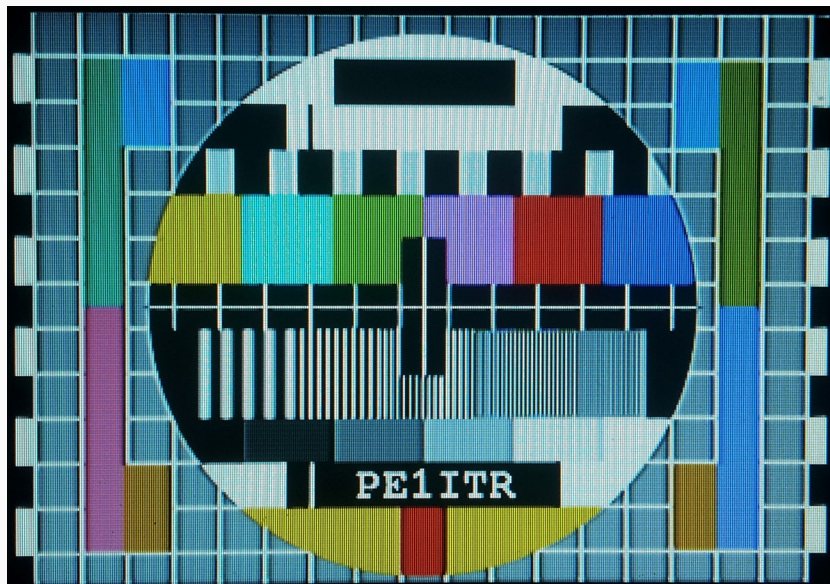
C3F modulatie



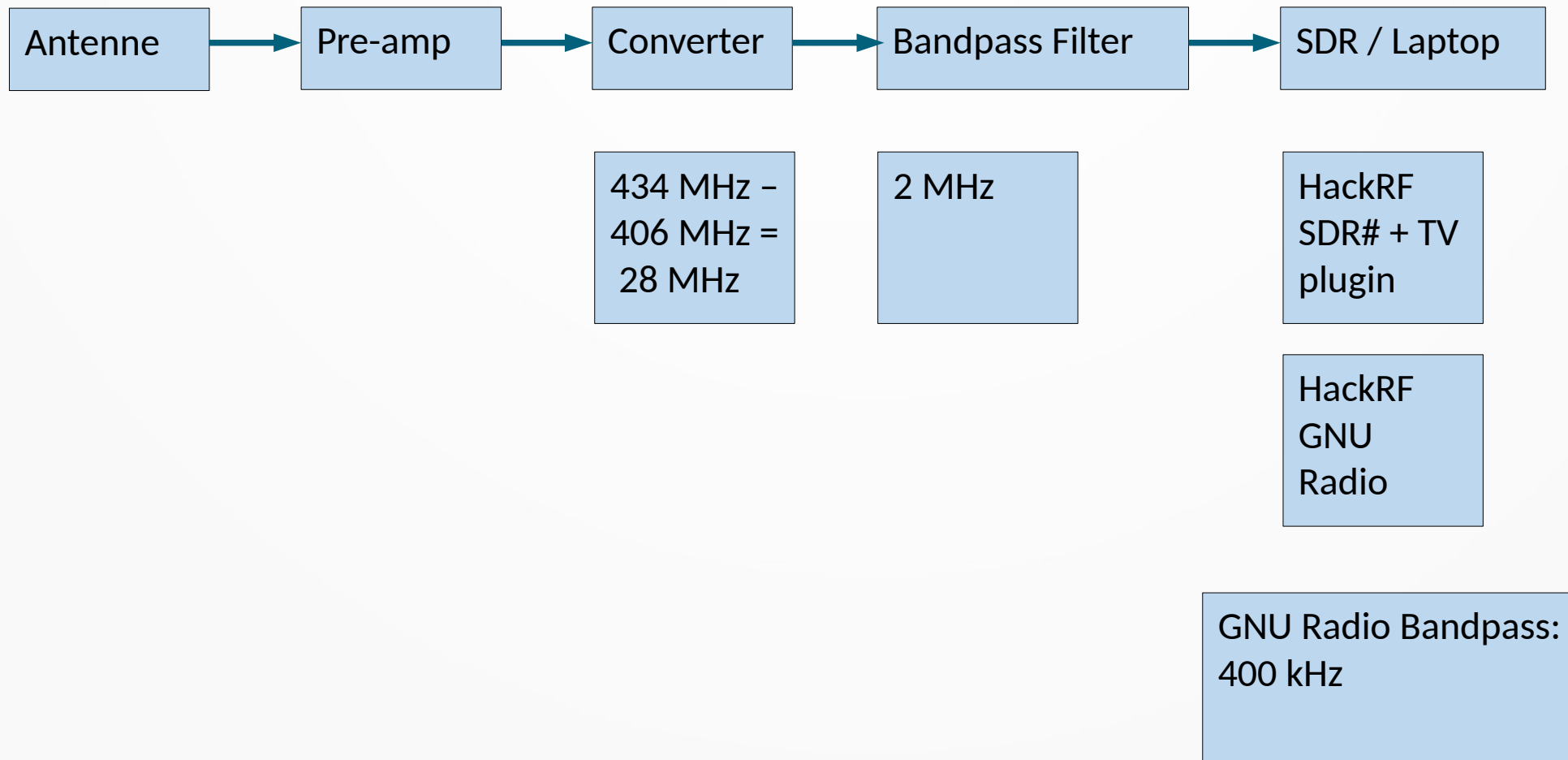
Zender Setup → SATV



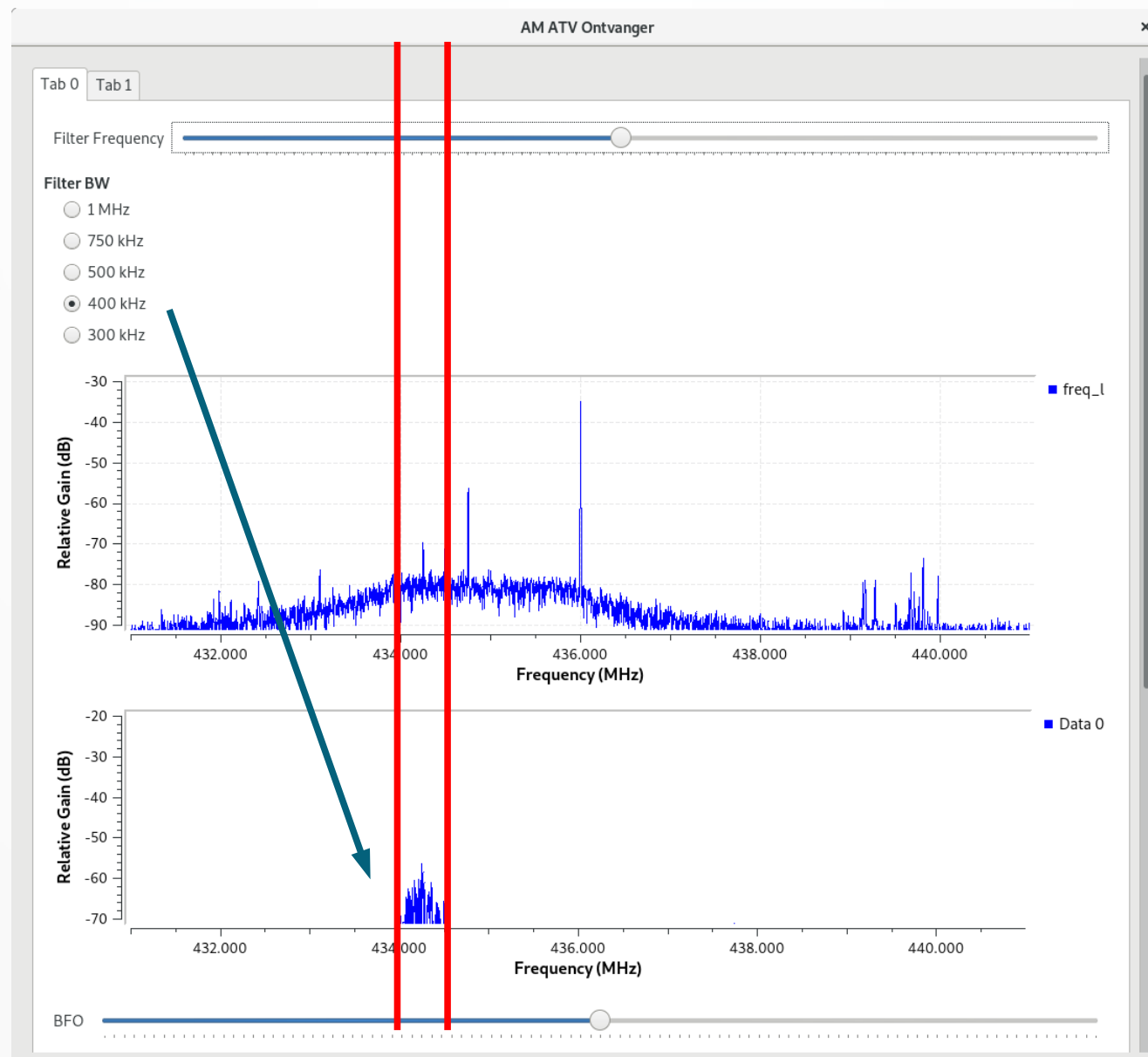
SATV



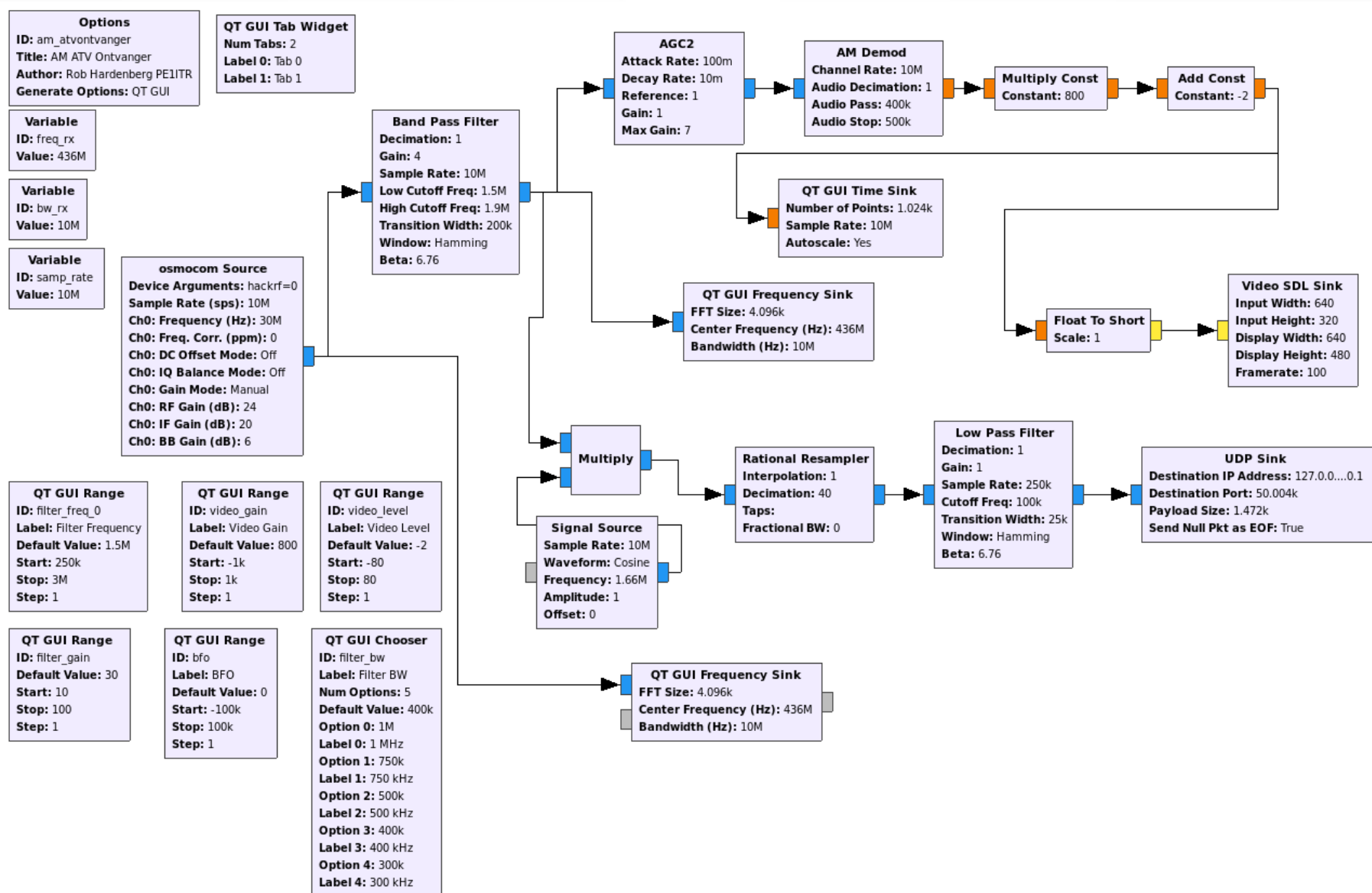
Ontvanger setup



Spectrum op 70cm



GNU Radio – blokschema AM



GNU Radio - scherm

The screenshot displays the GNU Radio GUI for an AM ATV receiver. The interface is divided into several sections:

- Block Diagram:** Located on the left, it shows a signal flow starting from a 'Signal Source' block (Sample Rate: 10M, Waveform: Cosine, Frequency: 1.66M, Amplitude: 1, Offset: 0). This signal passes through a 'Multiply' block and then a 'QT GUI Range' block (ID: filter_gain, Default Value: 30, Start: 10, Stop: 100, Step: 1). The signal then goes through another 'QT GUI Range' block (ID: filter_bw, Default Value: 0, Start: -100k, Stop: 100k, Step: 1) and a 'QT GUI Chooser' block (ID: filter_bw, Label: Filter BW, Num Options: 5, Default Value: 400k, Option 0: 1M, Label 0: 1 MHz, Option 1: 750k). The final output is connected to a 'QT GUI Frequency Plot' block (FFT Size: 4096, Center Frequency: 435.474 MHz, Bandwidth: 400k).
- Control Panel:** Located at the top right of the block diagram area, it includes a 'Filter Frequency' slider and a 'Filter BW' section with radio buttons for 1 MHz, 750 kHz, 500 kHz, 400 kHz (selected), and 300 kHz.
- Frequency Plots:** Two plots are shown. The top plot, labeled 'freq_l', shows 'Relative Gain (dB)' on the y-axis (ranging from -90 to -30) versus 'Frequency (MHz)' on the x-axis (ranging from 432.000 to 440.000). It displays a spectrum with a prominent peak at approximately 435.474 MHz. The bottom plot, labeled 'Data 0', shows 'Relative Gain (dB)' on the y-axis (ranging from -70 to -20) versus 'Frequency (MHz)' on the x-axis (ranging from 432.000 to 440.000). It displays a zoomed-in view of the peak at 435.474 MHz, with a value of -21.55 dB.
- Terminal:** At the bottom left, it shows the command 'Executing: /usr/bin/python2 -u /home/rhardenb/gr-atvontvanger/am_atvontvanger.py' and the output: 'SDL screen_mode 32 bits-per-pixel', 'SDL overlay_mode 842094169', 'gr-osmosdr v0.1.4-127-g4d83c606 (0.1.5git) gnuradio 3.7.13.4', 'built-in source types: file fcd rtl_tcp uhd hackrf rfspc redpitaya', 'Using HackRF One with firmware 2017.02.1', and '0000000'.

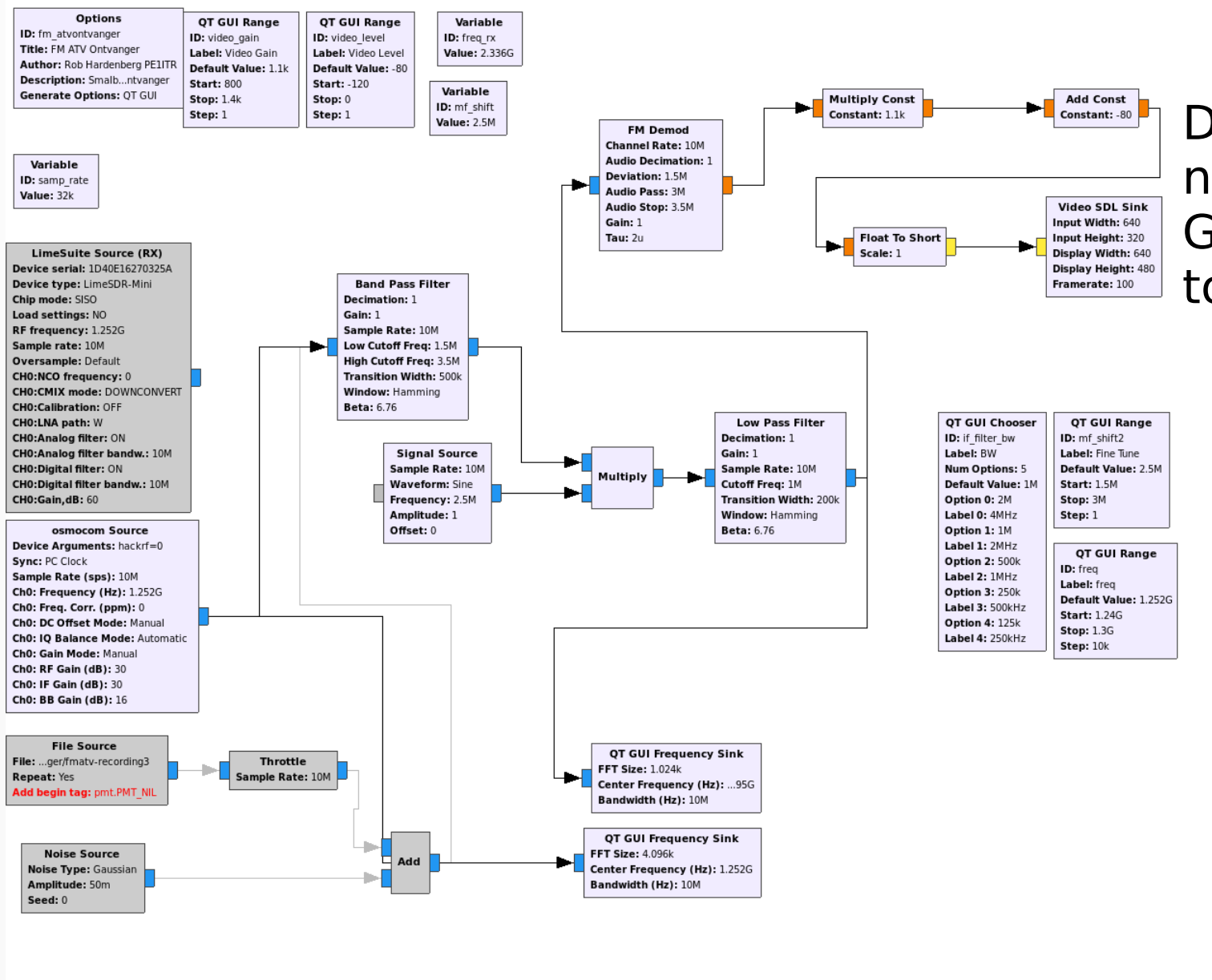
Filmpje Verschil TV sharp en GNU Radio setup: <https://youtu.be/4ZagENrm4k0>

This video shows a GNURadio implementation of an Analog AM Television demodulator at very narrow bandwidth.

It is used for amateur television contesting where we exchange in picture a "secret" control code.

The same spectrum recording is first played in TVsharp (= the old method) and second in GNURadio

GNU Radio blokschema FM



Deze setup werkte niet goed.
Geen verbetering tov TVsharp

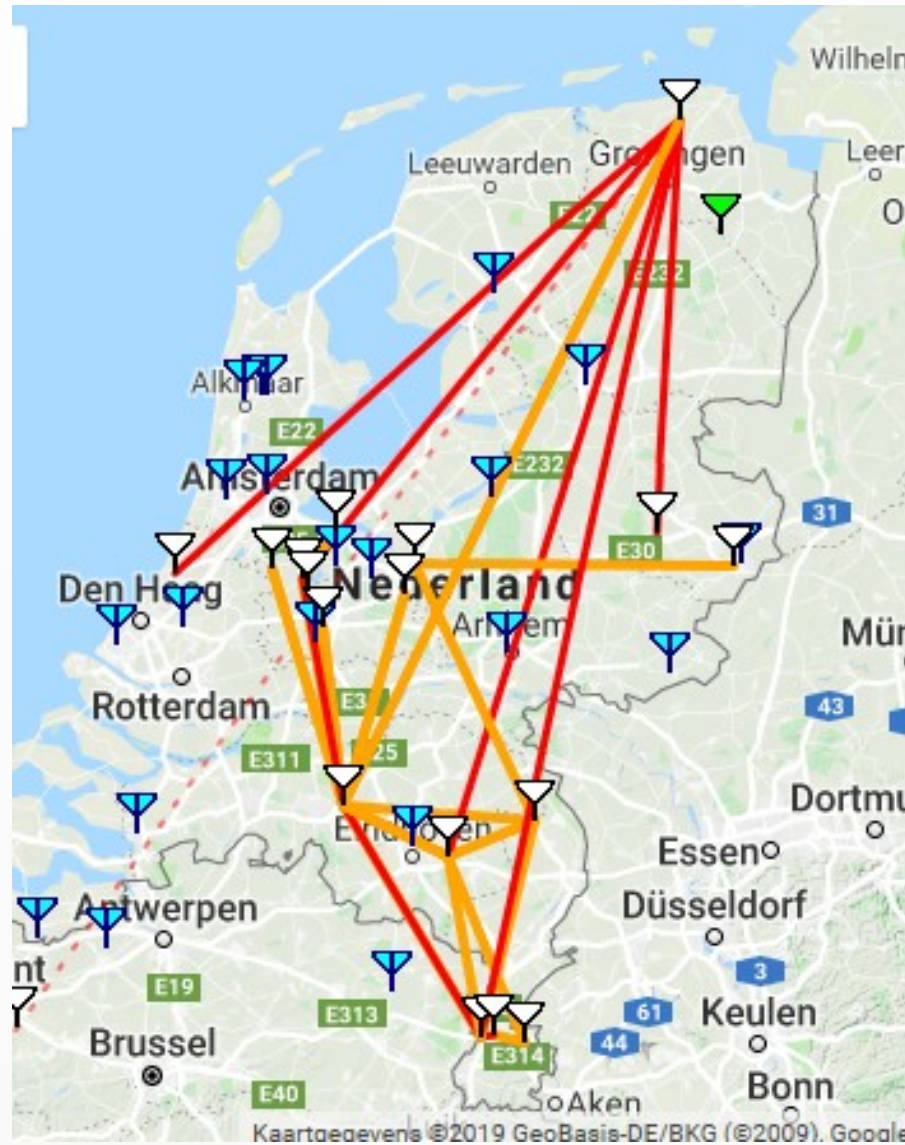
DEMO met bestand

GNU Radio opstarten

ATV Contest 9/10 maart 2018 bij PI4GN



Resultaat



Filmpje met Stations: <https://youtu.be/9DHAx8R-nvY>



Einde

- Bedankt voor uw aandacht
- Vragen?