

# Advanced Topics in Computer Networks



## Semester project presentation

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**Project title:** FM station and receiver

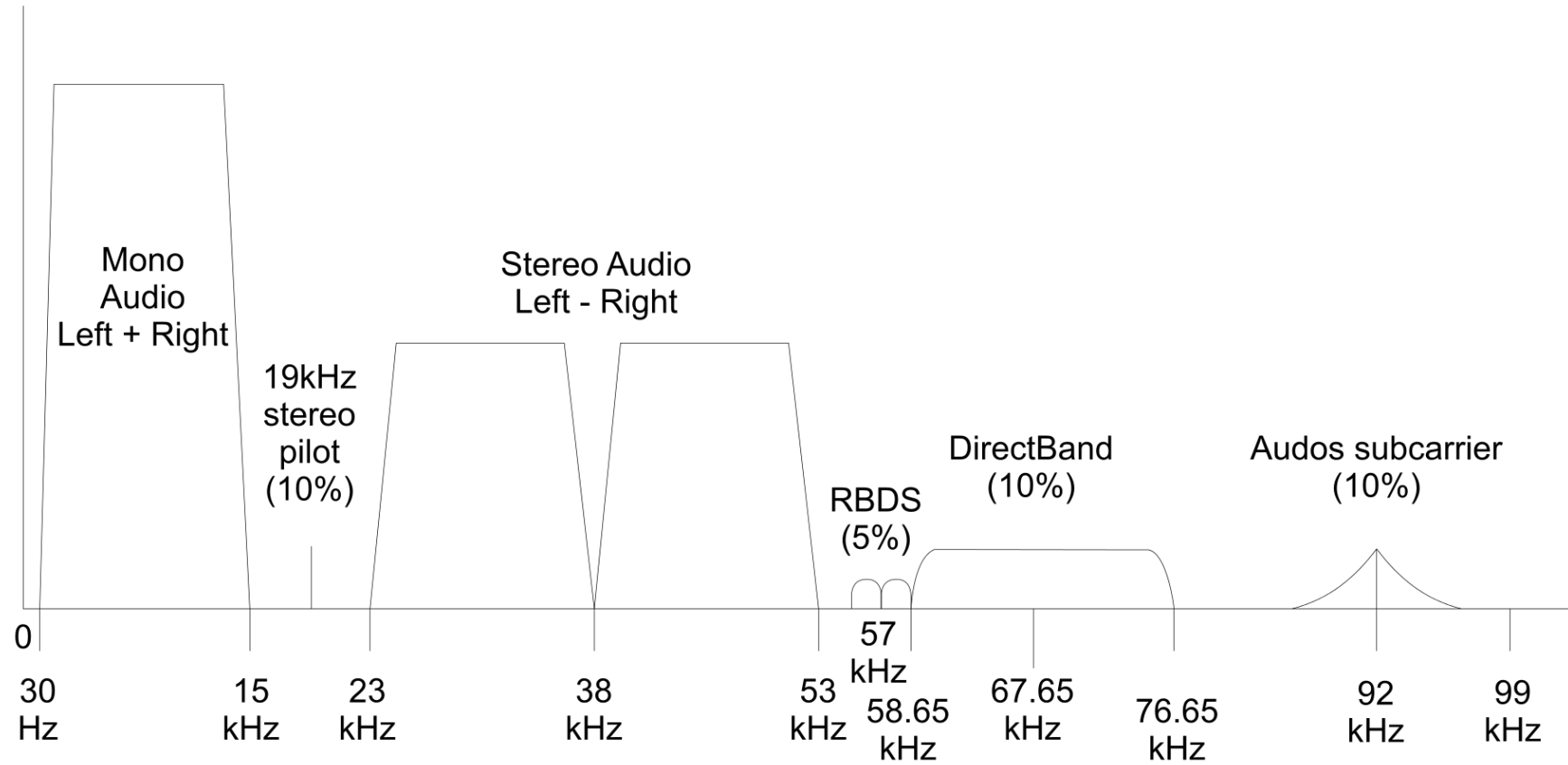
**Objectives:** The objective of our project was to create an FM station and an FM receiver using as input 2 Adalm Pluto SDR devices. Also, we had to be able to decode the FM-RDS packets.

Extra objective: Implement a Stereo FM receiver and transmitter.

**Implementation process:**

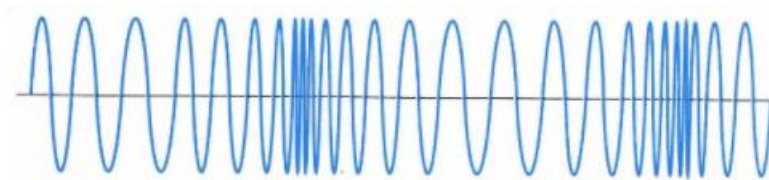
1. Build the FM receiver and make it able to listen to our local existing FM radio frequencies.
2. Build the FM radio transmitter on the second device and achieve communication between the two components.
3. Add all the RDS setting to the receiver from the existing radio stations.
4. Add all the RDS setting to the transmitter and configure it.
5. Implement the STEREO mode on the receiver from existing stereo stations.
6. Implement the STEREO mode on the transmitter and configure it.

# FM broadcasting



# Hardware and software that we used

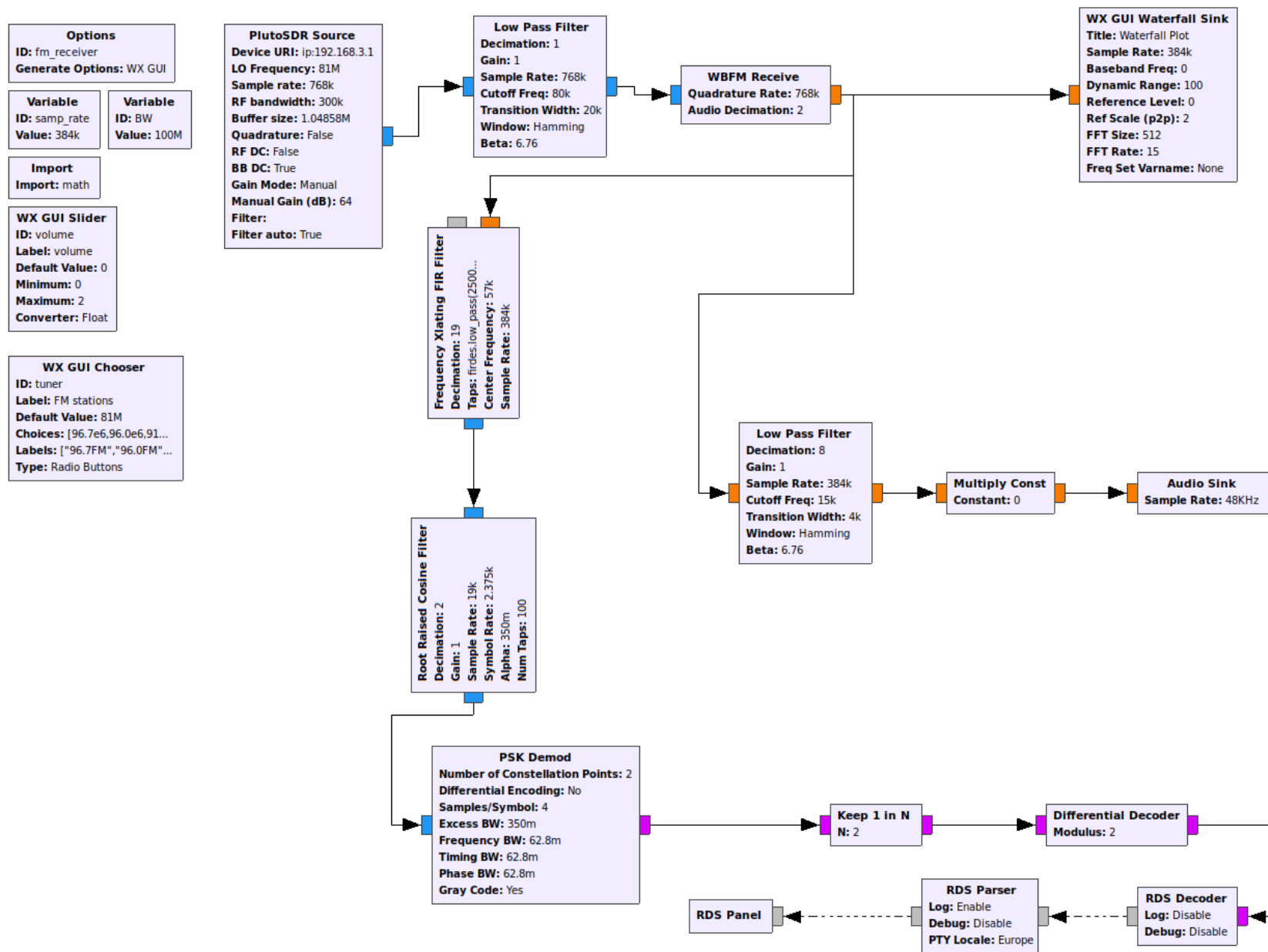
## Hardware:



## Software:



# FM receiver with rds



# FM station with rds

**Options**  
ID: FM\_station  
Generate Options: WX GUI

**WX GUI Chooser**  
ID: transmit\_frequency  
Label: FM stations  
Default Value: 81M  
Choices: 80M, 81..., 83M, 84M  
Labels: 80.0FM,...0FM, 84.0FM  
Type: Radio Buttons

**WX GUI Slider**  
ID: volume  
Label: volume  
Default Value: 1  
Minimum: 0  
Maximum: 3  
Converter: Float

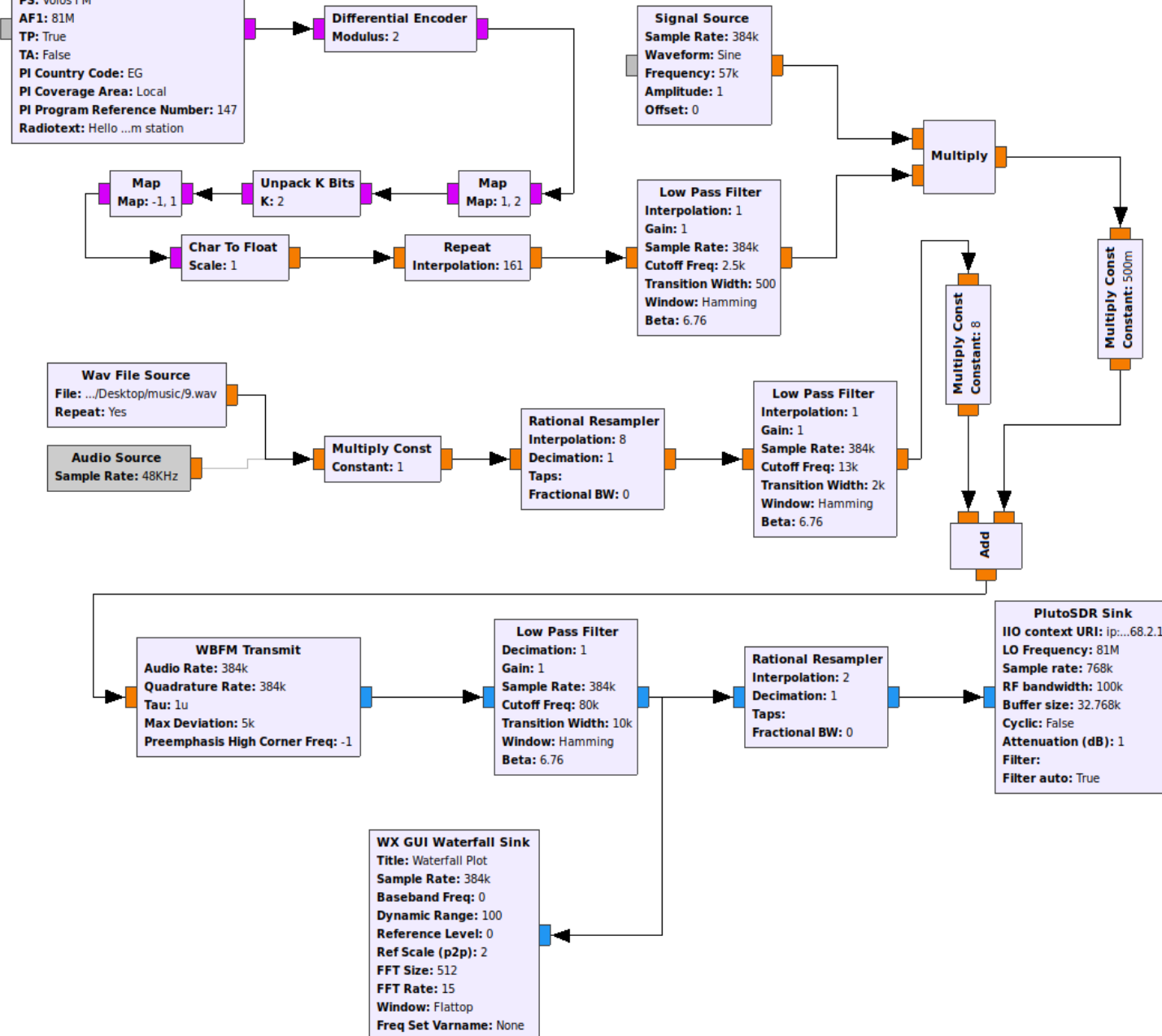
**Variable**  
ID: outbuffer  
Value: 0

**Variable**  
ID: sample\_rate  
Value: 384k

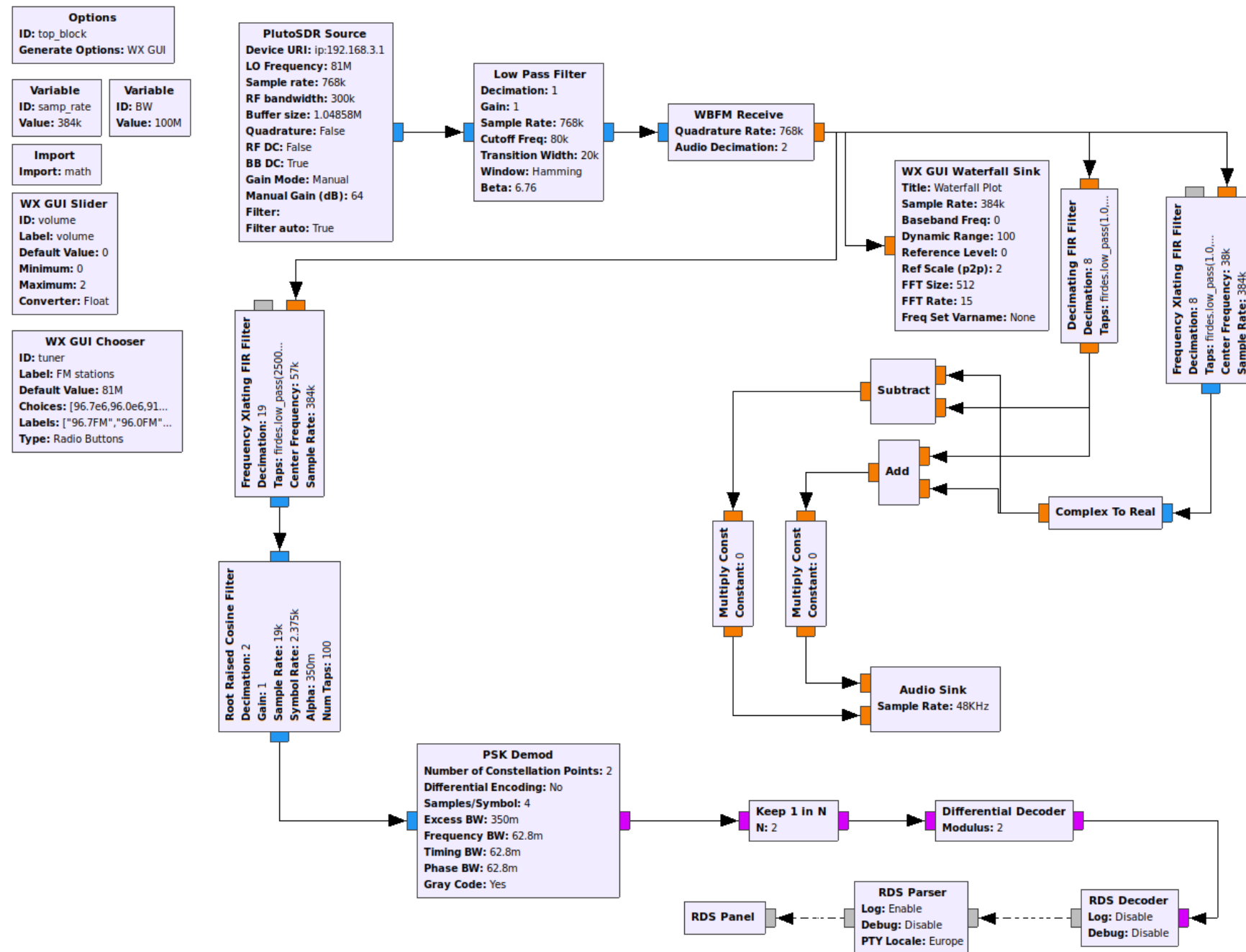
**WX GUI Slider**  
ID: rds\_gain  
Default Value: 500m  
Minimum: 0  
Maximum: 3  
Converter: Float

**WX GUI Slider**  
ID: signal\_gain  
Default Value: 8  
Minimum: 0  
Maximum: 40  
Converter: Float

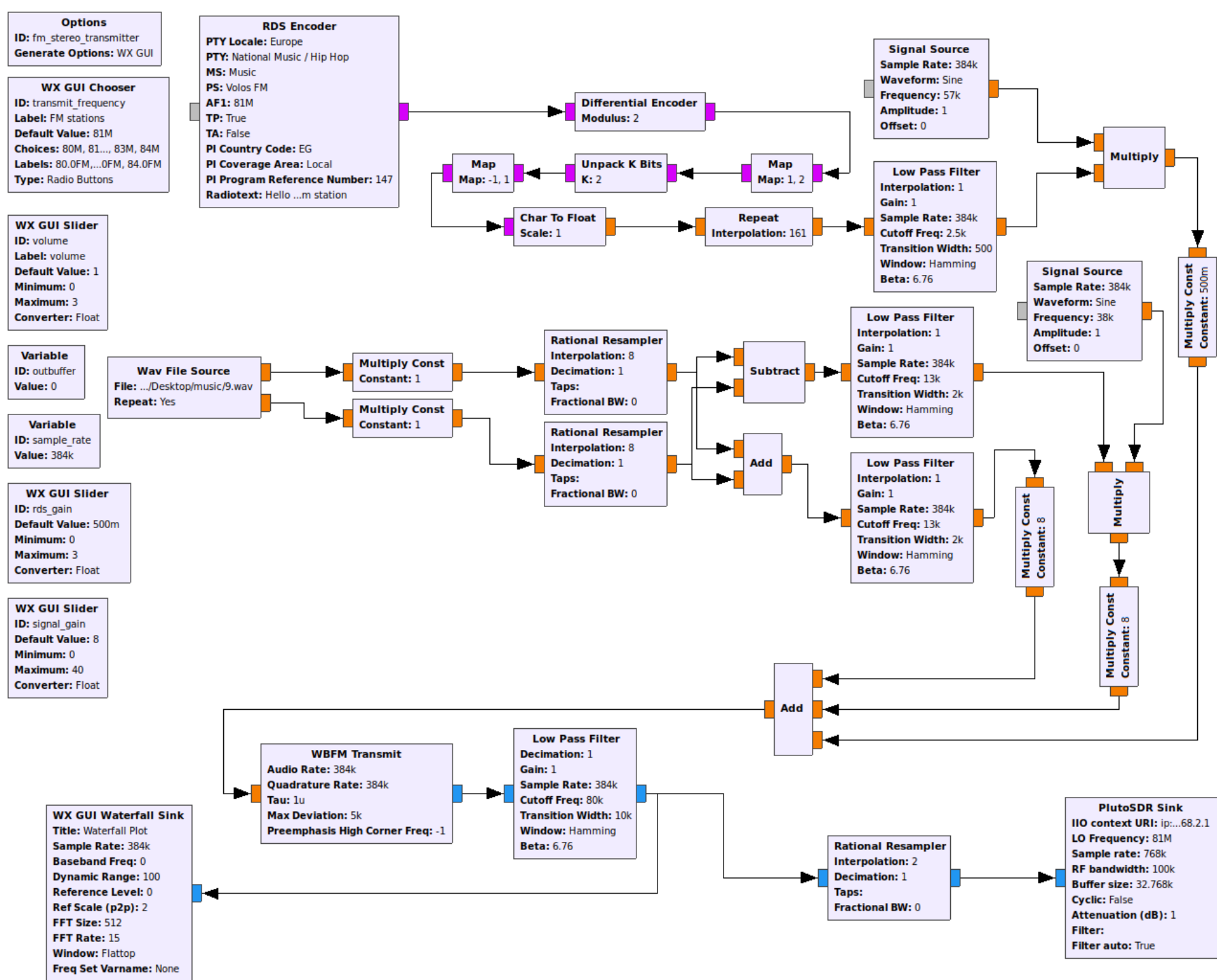
**RDS Encoder**  
PTY Locale: Europe  
PTY: National Music / Hip Hop  
MS: Music  
PS: Volos FM  
AF1: 81M  
TP: True  
TA: False  
PI Country Code: EG  
PI Coverage Area: Local  
PI Program Reference Number: 147  
Radiotext: Hello ...m station



# Stereo FM receiver with rds

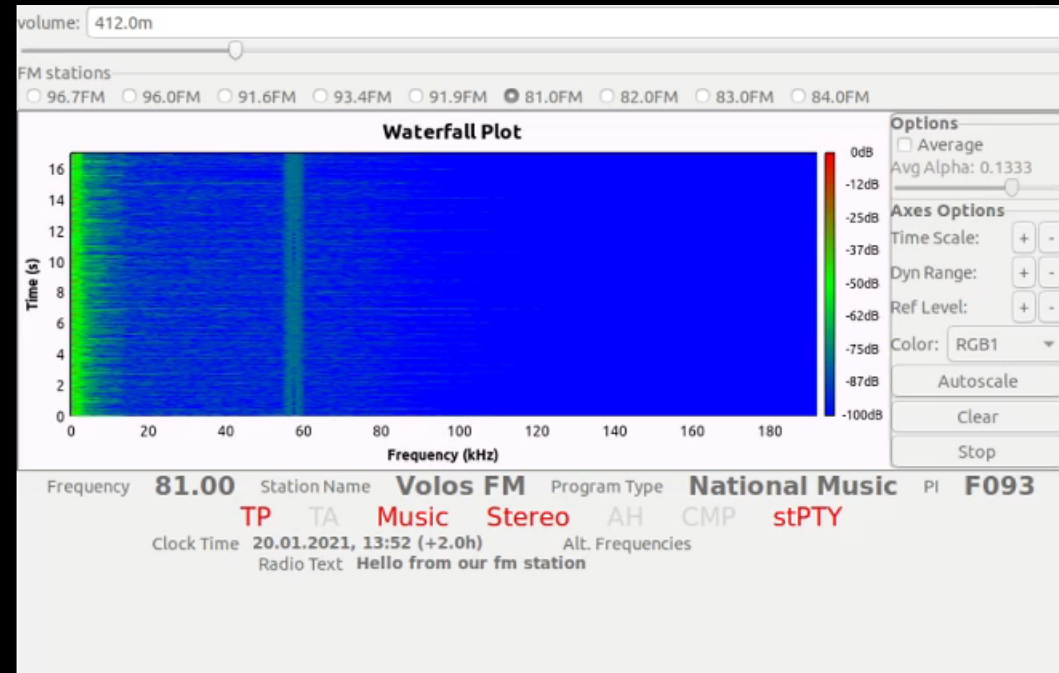
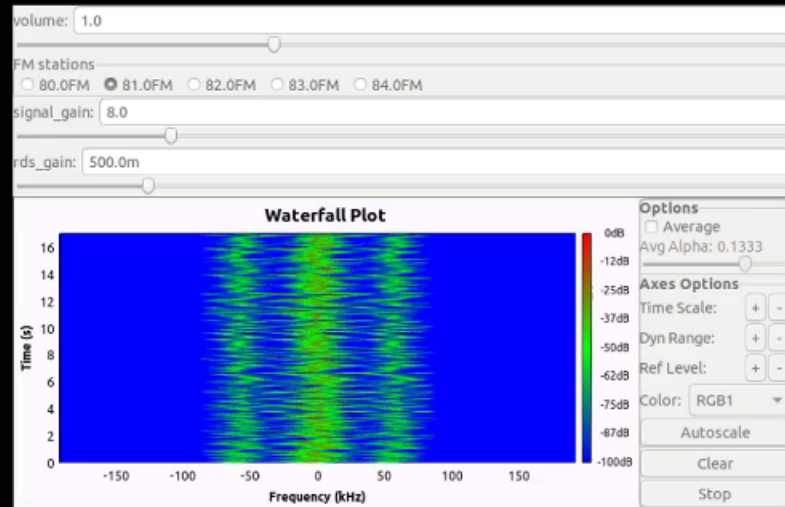


# Stereo FM station with rds

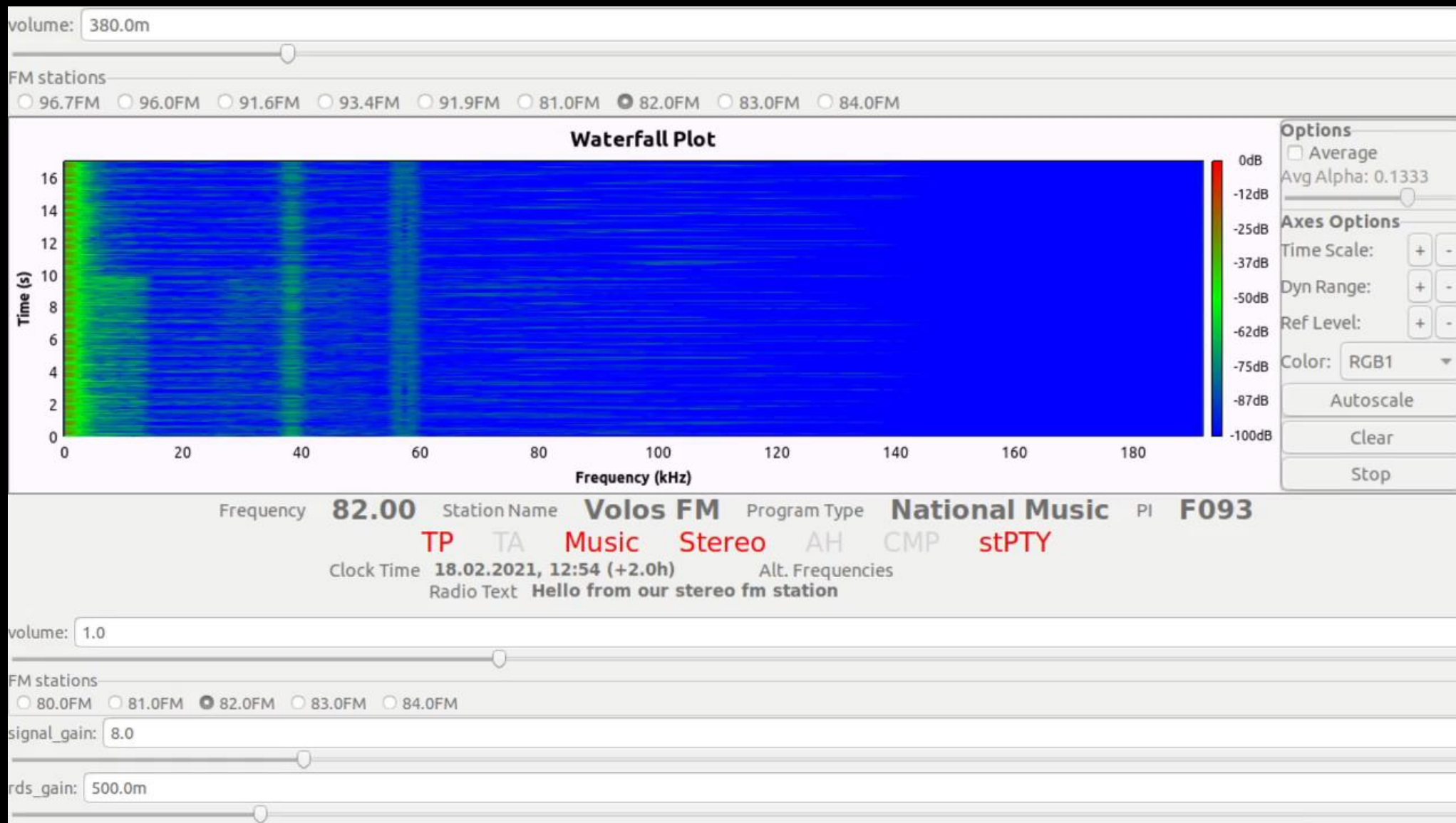




# FM station and receiver with rds demo



# Stereo FM station and receiver with rds demo



Any Questions ?