

RF BEACON AND SPECTRUM MONITORING SYSTEM COMPONENTS

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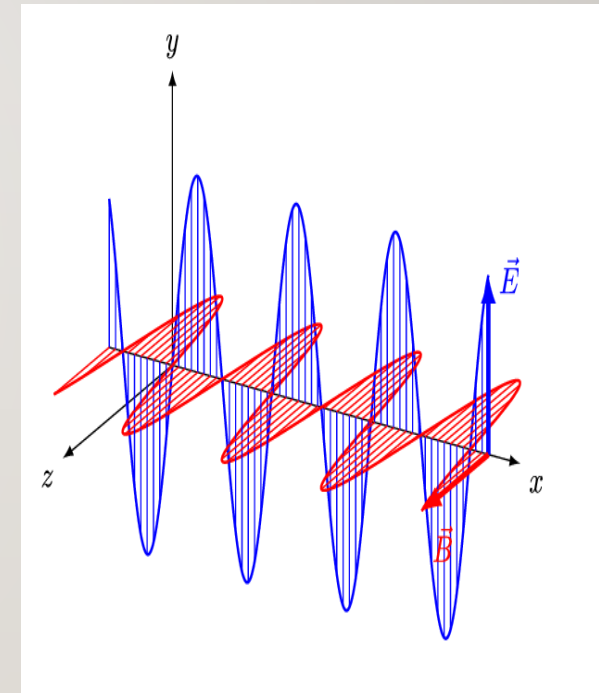
WHAT IS THE PROJECT ABOUT?

- **Generating RF signals.**
- **Modulating the generated signals.**
- **Filtering the generated signals.**



WHAT IS RF SIGNALS?

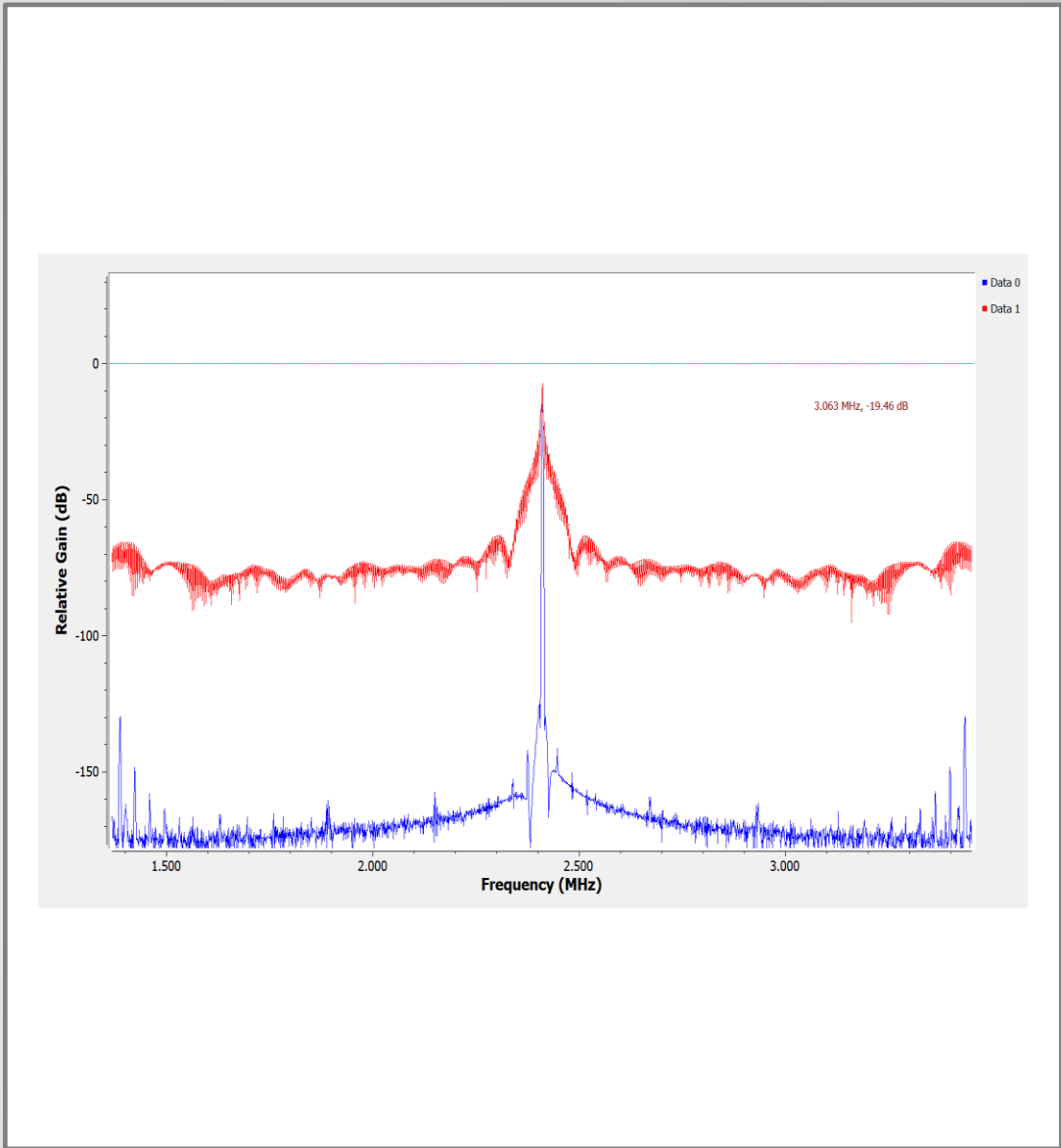
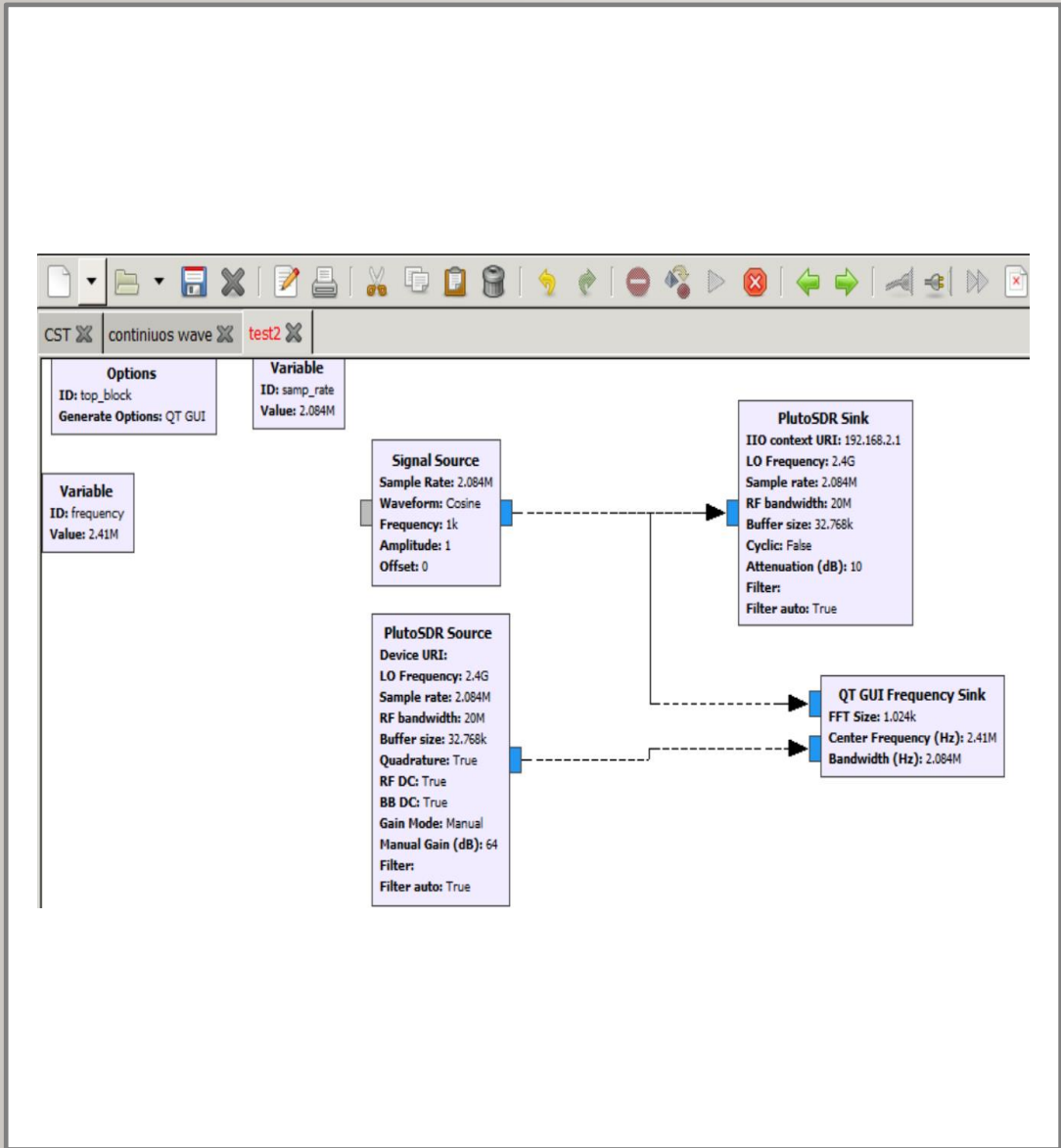
- RF signals are essentially Electromagnetic signals.
- They propagate through space, which enables wireless communication.
- The amplitude of the RF signal indicates the strength of the signal.
- They propagate with EM frequency range of 3KHz-300GHz.



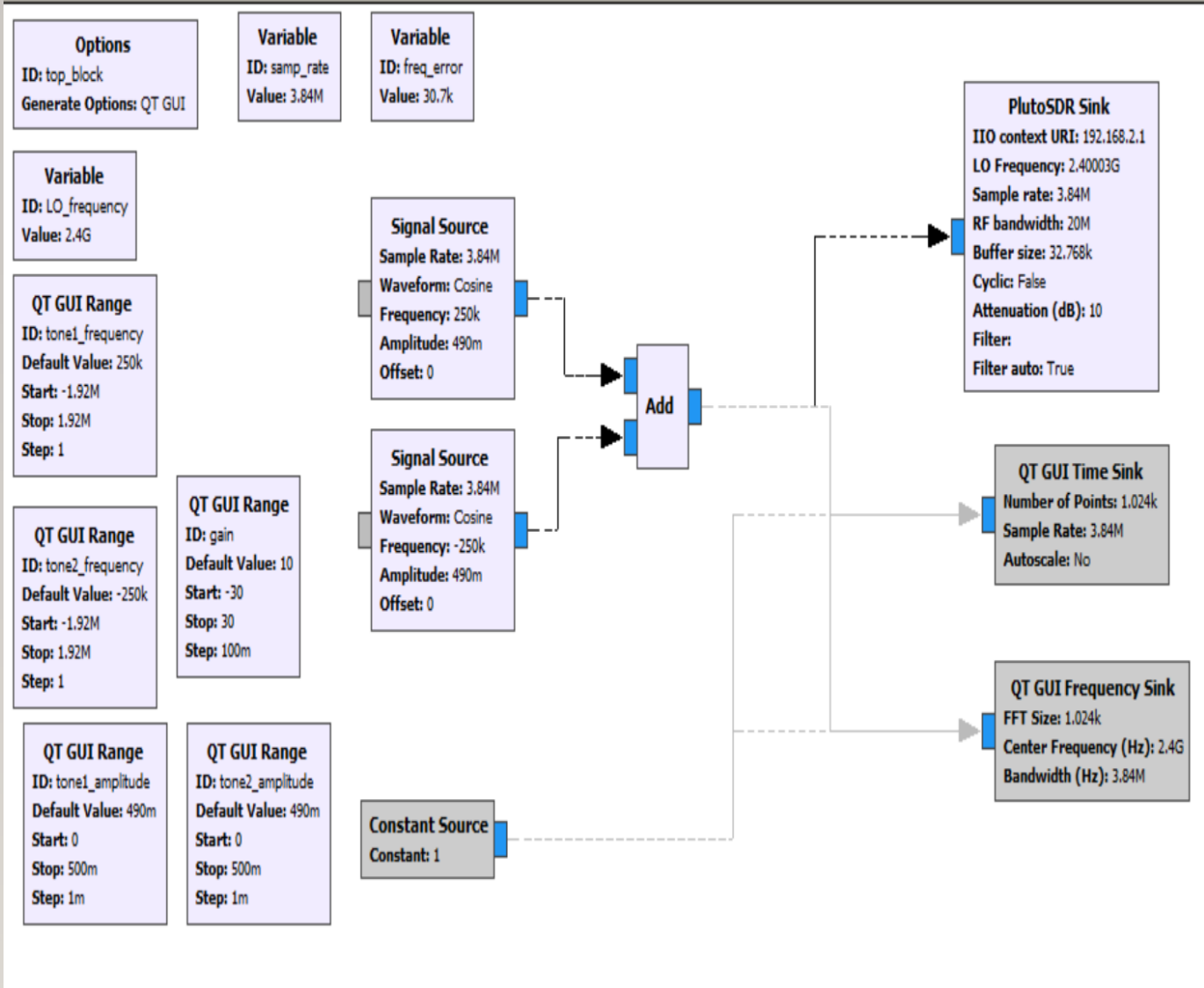
SIGNAL GENERATION

- Generation of a simple continuous signal.
- ADALM-PLUTO frequency synthesizer.
 - ❖ generate signals between 300-3.8GHz.
- Use of GNU Radio.
 - ❖ Build and run SDR.
 - ❖ Perform signal processing application.





TWO TONE TEST



- To measure and confirm the linearity of the SSB signal.
- Two signals of different size but not harmonically related.
- Two signals of frequencies (975Hz-1250Hz).

Filter DesignGuide

File Tools View



Current Schematic: bandpass filter [designguide_lib.bandpass filter.schematic]: 1
SmartComponent: DA_LCBandpassDT1

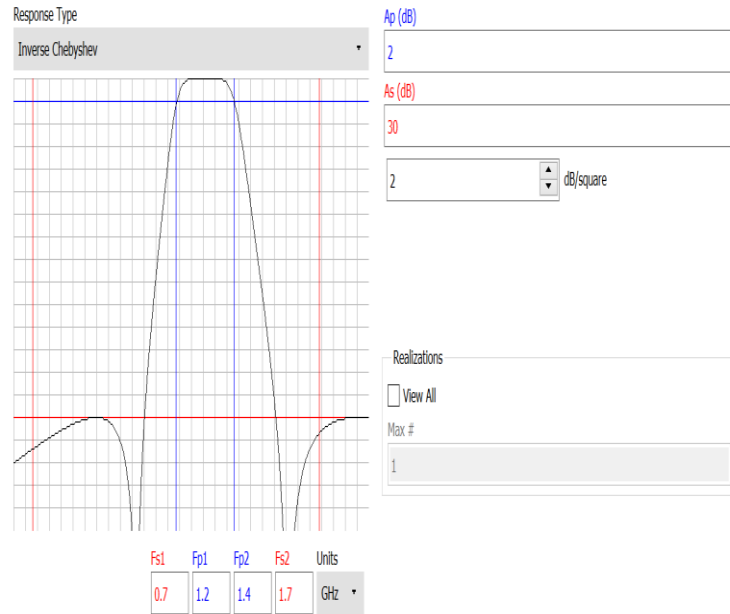
Current Design: schematic
SmartComponent Capability: Design, Simulate, Yield, Display

Overview Filter Assistant Simulation Assistant Yield Assistant Display Assistant

Impedances
Source: 50 Load: 50
First Element: Parallel

Order (N): 3

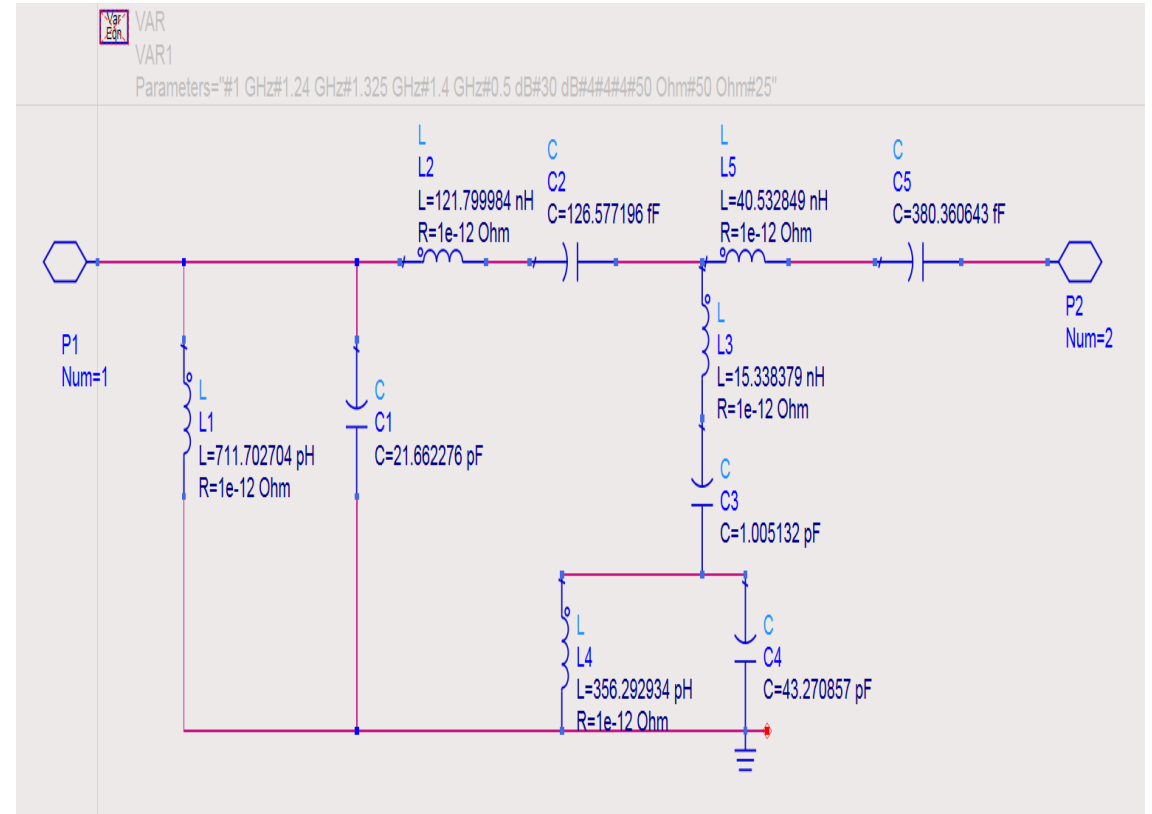
Design Information
Order: 3
Minimum Insertion Loss: 0.0000



Design

Redraw

Help



GENERATING THE MESSAGE

- Use of Python Programming Language.
- 8 letter message (represent the Location).
- Source Encoding – compress information.
- Convolutional Encoding.
- Interleaving Encoding.
- Merge with a synchronised vector.



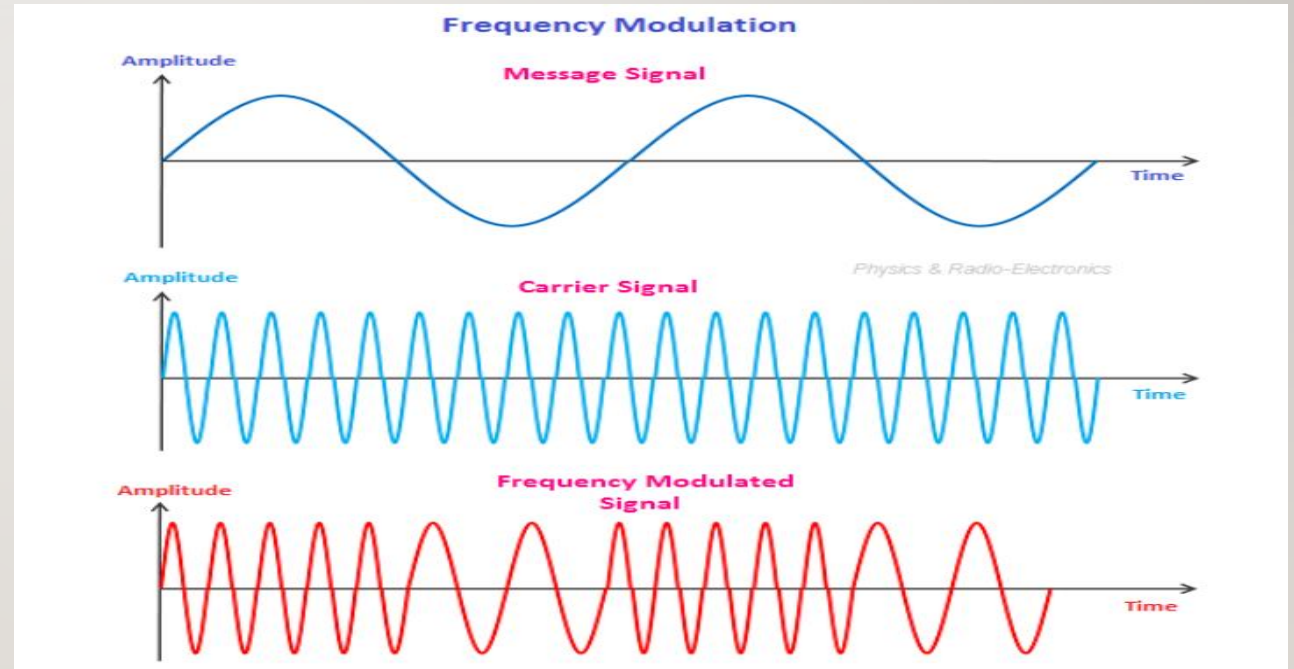
MODULATION OF THE SIGNAL

- **What is signal modulation?**

Process of varying properties of the Periodic waveform.

- **FSK signal modulation.**

Uses a pair of discrete frequencies to transmit a binary number.



FUTURE PLAN

- Achieve signal modulation using GNU Radio.
- Fabricate and build the band-pass filter.
- Test the system using a receiver.