CSE310 Software Defined Radio Project

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I. Mini RF Jammer

A. Background

There are cases when wireless systems need to be forcefully shut down. For instance, restricting the use of wireless systems is necessary for the military due to security threats. In order to disrupt wireless connections, Radio Frequency Jamming is used. RF Jamming is one of the simple methods that defeat wireless systems. It can forcefully disable wireless connections of nearby devices that use radio frequency by sending out overpowering signals to nearby, which drowns out the regular wireless frequencies and nullifies the nearby wireless connections.

B. Experiment and Equipment

Install GNURadio 3.7.11 on Windows 10 OS.

C. Future Implementations

For jamming LTE connection, our mobile devices use LTE Band A, a dual-band. Because our SDR device has one antenna, it is not possible to jam LTE. We can improve it by having another device that can transmit different frequencies simultaneously so that it can jam the LTE successfully. Also, we can create the software to jam specific jamming ranges for future implementation.

D. Figures

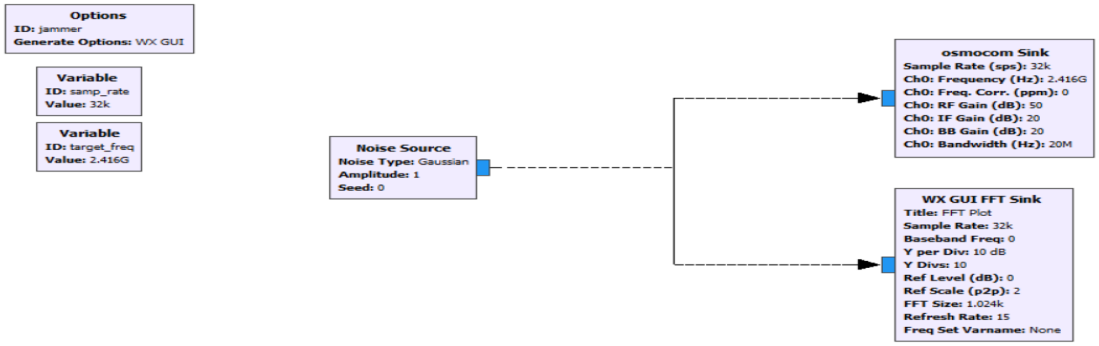

Fig. 1. Flow Graph of GNU

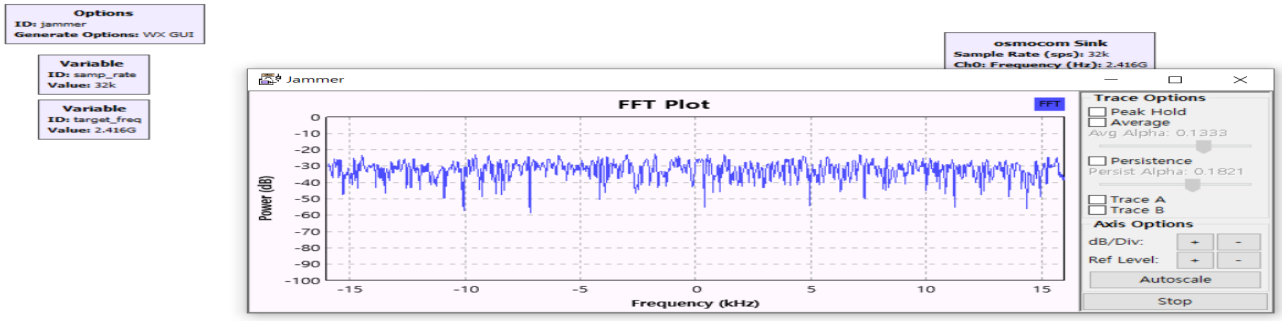

Fig. 2. FFT Graph

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II. FM Radio Receiver

A. Background

Radio broadcasting using frequency modulation (FM) launched in the United States after Edwin Armstrong's invention in 1933. The wide-band FM is now used worldwide, providing accurate reproduction of the sound over broadcast radio. FM radio stations' radio frequencies can be intercepted in the air with SDR devices such as Hackrf One. This way, radio stations can be accessed easily.

B. Experiment and Equipment

Install GNURadio 3.7.11 on Windows 10 OS.

C. Future Implementations

Currently, we have only implemented receiving radio signals. One of the extensions to this project is transmitting radio signals by using SDR Transceivers. If we have multiple transceivers, communication between two devices under a specific frequency can be done.

D. Figures

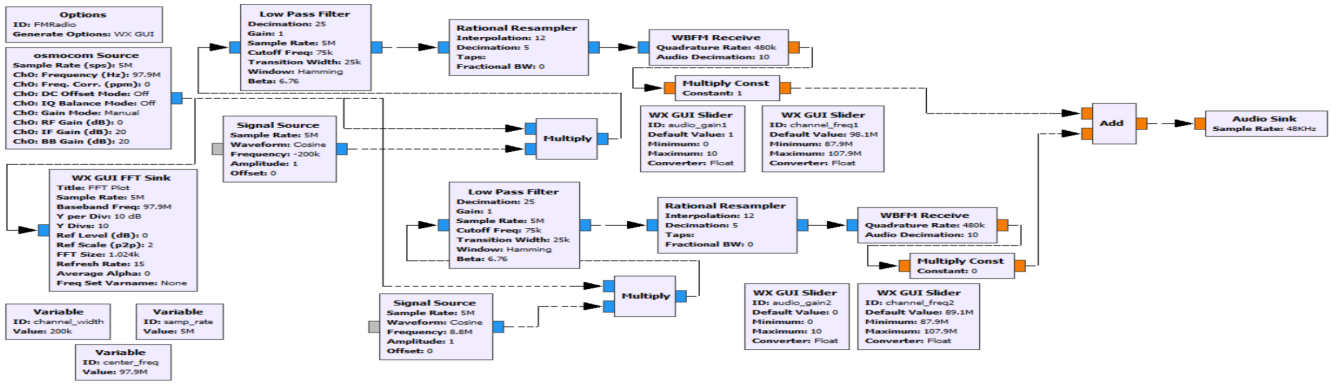

Fig. 3. Flow Graph of GNU

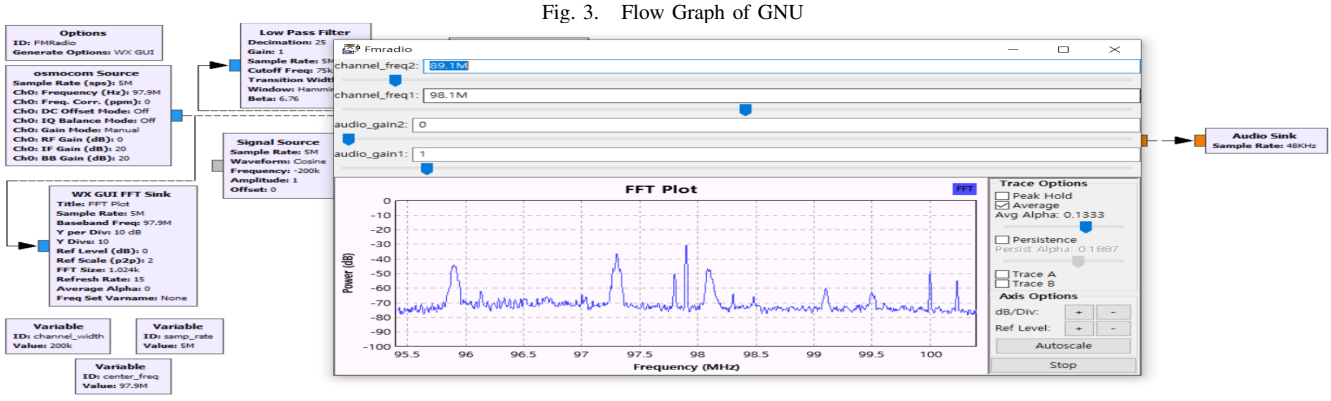

Fig. 4. FFT Graph

III. References

1. https://advancedpersistentjest.com/2017/04/17/signal-disruption-via-gnuradio/
2. https://greatscottgadgets.com/