



Team #3: Oil Spill Radar System



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Sponsored by: *Oceanography Department at Florida State University*

Overview

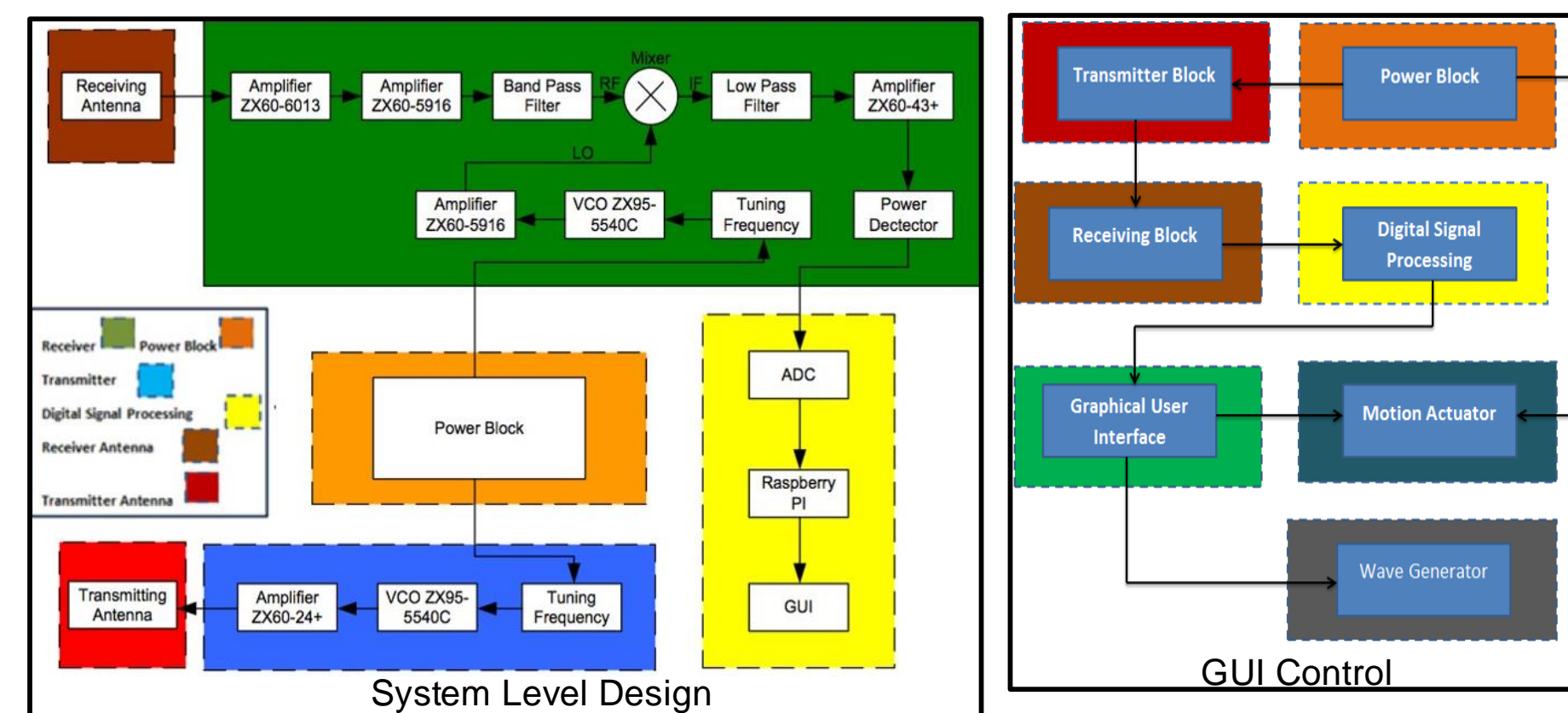
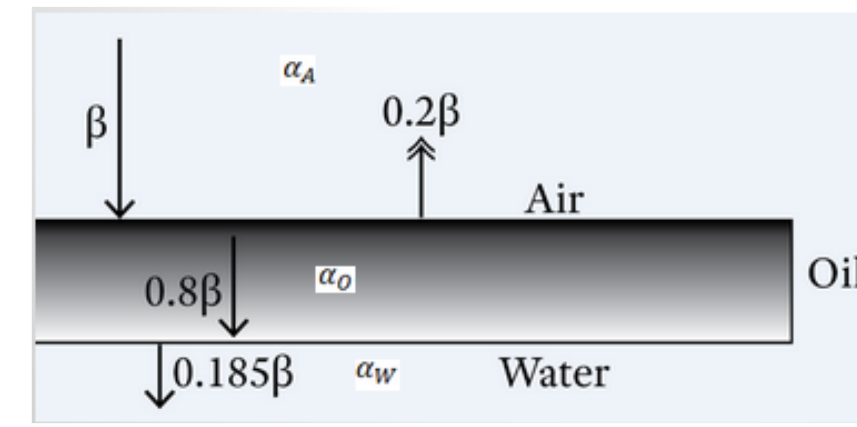
To Build a radar system that will assist The Florida State Department of Oceanography's research on oil spills. The project foundation work has been done by designing the analog system to transmit and receive a 5.4 GHz frequency signal. The goal for this years team was to develop a Graphical User Interface (GUI) needed to convert the return signal into digital information that can be used in the determination of the presence of oil. The GUI will also control a level arm and a wave generator.

For water, 80% of the signal is reflected water

For oil, 20% of the transmitted signal will be reflected at a normal

The signal will be attenuated through the oil so approximately 70% of the signal passing through will be reflected back

Based on the amplitude, the thickness of the oil can be measured.



Linear Actuator:

Controlled from the GUI to have a 30° to 60° range of motion and target a wave pool



Wave Generator:

Controlled to produce 2.8 cm, gravity style waves by inputting a frequency between 0-5 Hz



Budget

Items	Quantity	Per Unit	Total Price
Extension of USB Cable	1	\$10	\$10
Plastic for Weatherproof Boxes	1	\$28 per sheet	\$28
Raspberry Pi Upgrade	1	\$52.00	\$52.00
Expenses Total			\$90

Testing



Schedule



Transmitter:

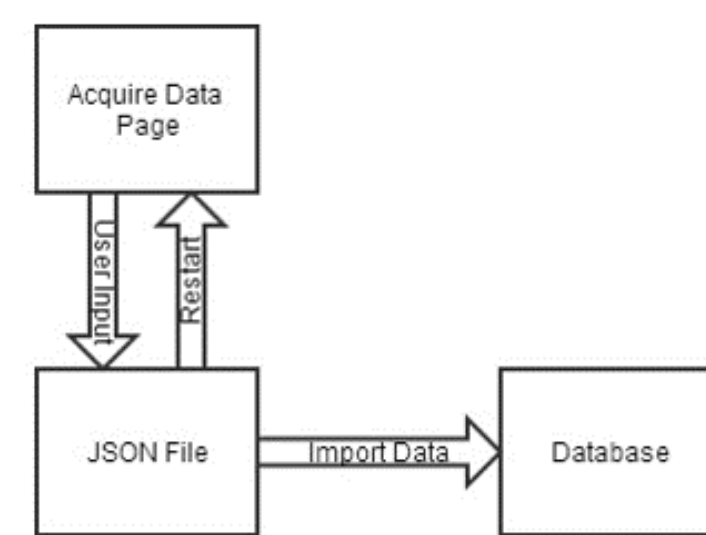
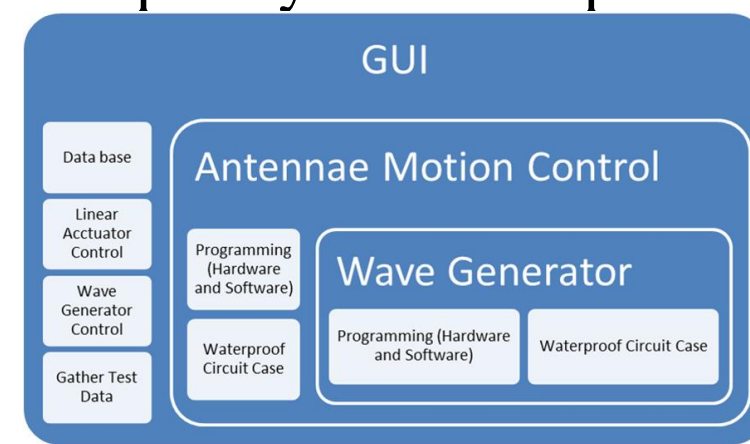
- Powered by 5 and 12 Volt rails, signal sent to parabolic reflector dish and horn antenna
- Voltage Controlled Oscillators generate two C-band Signals at 5.4 GHz

Receiver:

- Signal filters and signal mixer to eliminate noise and step down the signal to the range for digital signal processor to sample

GUI and Data Capture:

- Raspberry Pi uses General Purpose Output Pins and stores the information in the database
- Controls the angle of the linear actuator
- Controls the frequency of waves produced by the wave generator



Future Recommendations:

- Solder able or printable circuit board,
- Mounting antennas to the tower, Perfect the GUI page