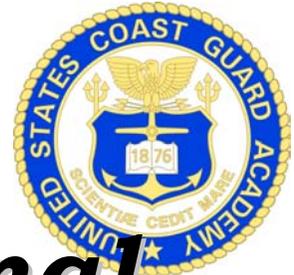




Senior Design Project in Electrical & Computer Engineering



Directional Signal Strength Meter for DGPS

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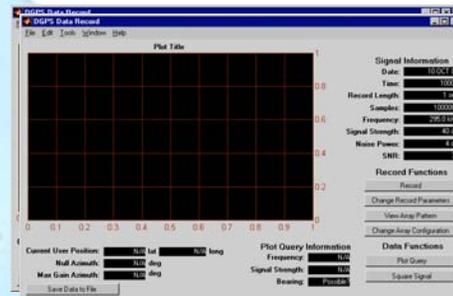
Sponsors: C2CEN/NAVCEN

Project Goals

- Design, build, and prove the concept of a portable directional signal strength meter
- Provide a tool for troubleshooting RF interference of current DGPS transmitter sites
- Use design to validate propagation prediction models used in coverage software

Using MATLAB®, initial software has been written to interface with Analog to Digital Converters and implement various DSP algorithms.

General Data Display Graphical User Interface



Project Background

The U. S. Coast Guard currently does not have the ability to validate propagation prediction models for Differential GPS beacon transmitters. This ability to validate a predicted coverage area is necessary in order to provide the mandated coverage required by the Nationwide Differential Global Positioning System (NDGPS).

Currently, a method to easily make directional field measurements of the signal strength radiated by a DPGS beacon transmitter does not exist. This results in having to use more resource intensive measurement techniques. The ability to quickly measure the signal strength of a transmission antenna has many more applications than just those associated with DGPS.

These algorithms read data in from an antenna array, process it, and display the strength of the signal of interest in the form of various graphical plots. A Graphical User Interface (GUI) has been designed to enter user input and display results.

Project Plan

- Become familiar with current system operation
- Calibrate and test new antennas and filters
- Integrate new hardware with existing software
- Verify the concept
- Add capability to scan all DGPS frequencies and bearings
- Develop code to log data to hard disk for future reference and analysis
- Develop, implement, and calibrate module to estimate signal strength
- Finish building the GUI
- Implementation and Testing Phase

