



## Senior Design Project in Electrical & Computer Engineering



# DGPS Directional Signal Strength Meter

Cadet 1/c Chad R. Thompson

Advisors: Dr. Gross, Dr. McKaughan, LT Czerwonka, LT Nasitka

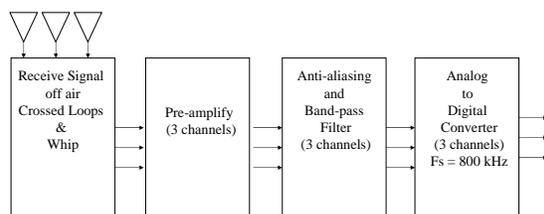
Sponsors: C2CEN and NAVCEN

### Project Background

Although software has been developed that can predict signal coverage, a method to accurately measure these signals has not been developed. The coverage software's predictions need to be validated to ensure nationwide coverage required by the National Differential Global Positioning System (NDGPS). Currently a DGPS signal strength meter has been developed that uses an antenna array to receive DGPS signals from a specified direction. The signal received by the array is processed and analyzed by a MATLAB® program. This digital back end of the system is still under construction.



Cadets Thompson and Novak with the antenna array



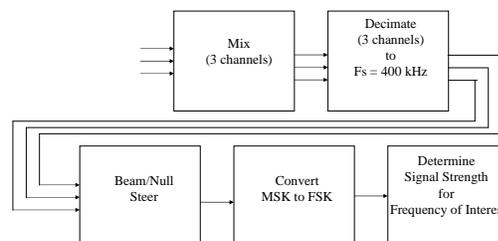
Block Diagram of Analog Front End

### Project Plan

The main emphasis of the directional signal strength meter will focus on developing the digital MATLAB® back end. This includes fine tuning electronic antenna pattern steering, and improving the algorithms that process the received signal. After the code is completed, the hardware portion of the meter needs to be redesigned into a portable system. At this point the meter will be used to validate the accuracy of the coverage prediction software.

### Project Goals

- Complete development and verify operation of the directional signal meter
- Use signal strength meter to collect data and analyze performance of coverage software



Block Diagram of Digital Back End