Senior Design Project in Electrical & Computer Engineering

270' WMEC DCU UPGRADE

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Project Background

The data converter unit aboard the 270' Famous class cutters is used to consolidate the information provided from the anemometer, Doppler speed log, optical surveillance system (OSS), gyrocompasses, and fathometer. The Data Converter Unit (DCU) takes the different analog signals from these instruments, converts them into a digital signal in the form of data sentence that the Shipboard Command and Control System (SCCS) can read.

The problem with the current DCU is primarily its age. The circuitry is outdated and can no longer be ordered from the original company. All maintenance must be done at C2CEN by hand. This process is neither time nor cost effective. Also the data word provided by the current DCU is in Naval Tactical Data Standard (NTDS) which is no longer the preferred format. The preferred format for the SCCS is in National Maritime Electronics Association (NMEA) which is standard across the marine community.

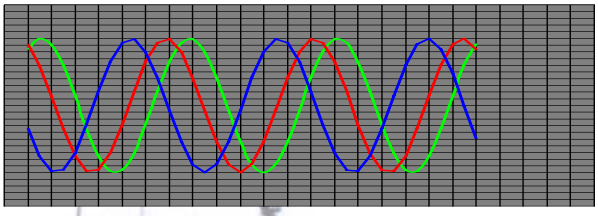

Fig: Example of a synchro signal which would represent a heading

Project Plan

The scope of this project will first be to identify and research the types of signal inputs for the DCU and the NMEA data sentences. This will ultimately lead to designing analog to digital converters for the synchro signals from the gyroscope. The prototype will then be built integrating the input from each signal, converting and compiling it into NMEA sentences and then sending the data to the SCCS. The last phase of this project will be implementing it aboard a 270' cutter to test the results.

Project Goals

- Design Analog to Digital Converters
- Build a prototype
- Implement on 270' WMEC