



Senior Design Project in Electrical & Computer Engineering



Accuracy Study of SAM v. TOT Timing Control for Loran-C

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Project Background

Currently there are two methods of Loran-C timing control, Time of Transmission (TOT) and System Area Monitoring (SAM). In this project we will determine which method is more accurate so that the Coast Guard can provide better Loran service to the nation's maritime and aviation communities. SAM



A Loran antenna

control uses one monitor site for each Loran chain. This site determines the signal error at its position then sends corrections to all transmitters in the chain. This provides excellent accuracy near the site at the expense of the surrounding areas. TOT control uses separate control sites for each transmitter.

Right now the U.S. uses SAM control. We will predict what the accuracy of Loran under TOT control will be and compare it to the current accuracy under SAM control.

Project Plan

We will use MATLAB® to create a model that predicts the accuracy of the Great Lakes Loran chain under TOT control. Then we will compare the accuracy of the TOT method with existing accuracy data for the SAM method. This will allow us to determine which method is more accurate.



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Project Deliverables

- A MATLAB model which simulates the accuracy of Loran throughout the Great Lakes chain using TOT control.
- Analysis of accuracy using the SAM control method.
- A comparison of our models TOT accuracy prediction to the SAM data.



A solid state Loran-C transmitter

Project Goal

The goal of this project is to determine whether TOT control is more accurate than SAM so that the Coast Guard can make an informed decision on which method to use. To do this, we will use existing data to analyze the accuracy of SAM control, then compare it with the predicted accuracy of TOT control based on our model.