



Senior Design Project in Electrical & Computer Engineering



Development of Loran-C “H-field” Navigation Receiver

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Project Background

The Federal Aviation Administration (FAA) has tasked several agencies to research the development of a Loran-C receiver that can be integrated with other navigation systems and be utilized on high dynamic platforms. By using such an integrated receiver, an aircraft can get accurate position information to make a non-precision approach to an airfield.



Project Plan

Currently, the Coast Guard Academy has an H-field receiver in a PC-104 form factor. Several people on the Loran Development team are working to develop and port the H-field receiver to digital down converter (DDC) technology for the Loran C flight tests scheduled in April. Loran C Receiver will be designed to allow for higher information processing speeds to accommodate the needs of a high dynamic platform. The development team is also testing a commercial receiver to compare the system results.



PC-104 Digital Loran Receiver (Actual Height 7")



Project Results to date

- We have completed a driving test of our receiver at high speeds and fast turns to test the tracking capability. Our concern was the Doppler effect on the Loran signal. Although relevant at those speeds, the receiver maintained stable operation during this test.
- We have obtained results from a preliminary flight test with our receiver. Optimal settings still being evaluated. *(See Fall Semester report for results)*
- Tested Locus, Inc. H-Field Loran receiver in driving tests at approximately 70 mph. The receiver seems to track adequately at those speeds.

Future Project Goals

- To test the DDC receiver in the Convair 580 to ensure system stability at speed of up to 250 knots.
- For next year, to investigate coupled integration methods for GPS.