



## Senior Design Project in Electrical & Computer Engineering



# Automatic Position Reports For C.G. Aircraft

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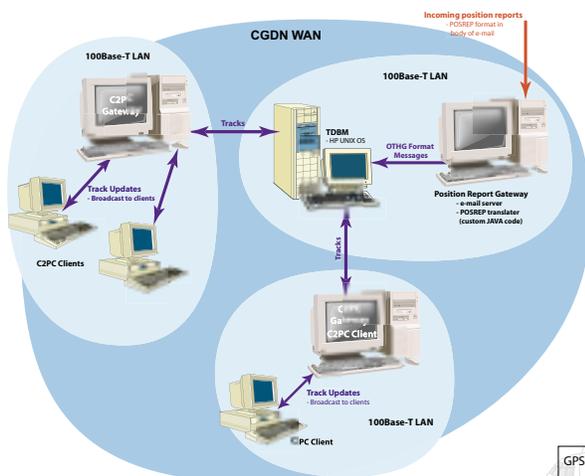
### Project Background

An automated position report system allows OPCENTER personnel to keep track of Coast Guard aircraft in real time as well as allowing flight crews to focus on their missions. A prototype system was developed and tested last year using the ORBCOMM satellite system for automated reporting of aircraft locations. The aircraft SATCOM unit automatically reports the aircraft's position to a dedicated ground station. The information is sent to the network control center (NCC) and then across the Internet where it is collected by the Position Report (POSREP) Gateway. The data for this system has been collected and analyzed and the results are included in the table to the right.

### Results from the ORBCOMM system in minutes

Aircraft	Delay Time to NCC	Delay Time to Gateway	Average Time Between Reports
HC1501	2.3	2.2	7.6
HC1713	35.5	35.5	22.2
HC1717	2.6	2.7	8.3
HC1719	3.4	3.6	9.8
HH6001	12.7	12.9	11.6
HH6026	10.0	10.2	11.2

### Shore Architecture for POSREP Distribution



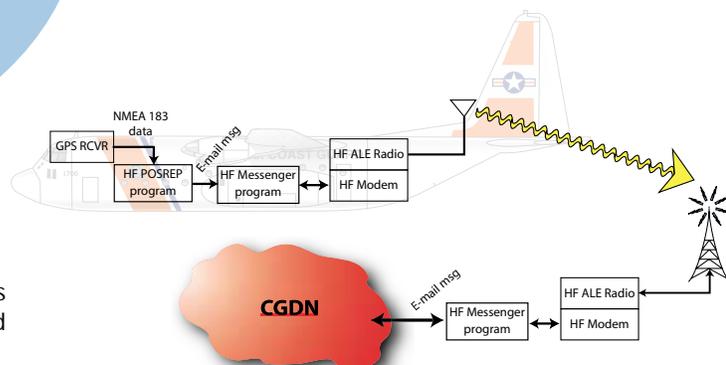
### Project Goals and Objective

- Validate system performance
- Integration of HF ALE position reports into the system to include Alaska and Hawaii in the coverage area
- Migrate the current system from the Internet to the Coast Guard private network

### HF ALE System

The existing HF radio is modified or replaced to an ALE capable radio. An HF data modem is connected to the HF ALE radio. Reports are sent using a combination of Coast Guard written software and commercial software (HF Messenger from Rockwell-Collins). HF Messenger provides the interface to the HF ALE radio acting as an e-mail server to send and receive e-mail via the HF data link.

The HF gateway is established by connecting a computer running HF Messenger to both an HF radio and a terrestrial network. Position reports are sent via this channel across the Coast Guard Data Network to the POSREP Gateway.



HF Position Report Architecture