

Senior Design Project in Electrical and Computer Engineering



Satellite Data Communications For Coast Guard Aircraft

Cadet 1/c Mike Teixeira

Advisor: LCDR Johnson

Project Sponsor: Commandant G-SEA



The Stellar ST2500 is a programmable satellite communicator to be placed on board CG aircraft.

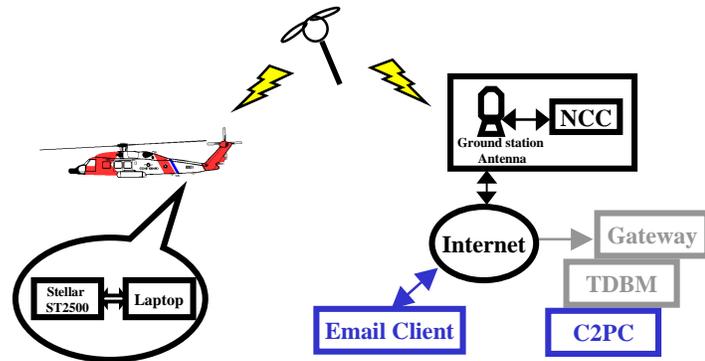
Project Background

Current High Frequency (HF) communication methods do not meet Coast Guard's aviation needs. Standard aviation communication should have both automated position reports for tracking and secure data messages. To meet these needs while gaining wider bandwidth and better reliability, the Coast Guard is looking to Commercial Satellite Communication (SATCOM).



System Information

The system includes a Stellar ST2500 satellite communicator and a laptop computer on board CG aircraft. The ST2500 has special programming capabilities to allow for user specific inputs and outputs. For example, the system has an on/off switch to save power and a panic switch for emergency message sending. Code for input/output and encryption is written in C and loaded to the communicator with special software.



This system architecture shows the satellite connection from ground to aircraft and vice versa.

Project Goal

This project will design and test aviation SATCOM using the Orbcomm LEO satellite system. Automatic position reporting is conducted by the programmable ST2500 communicator, sending the message in an email form. The encrypted report is then received by a ground gateway computer, processed, and placed in a CG database. The position reports within the database can be viewed at the command center using the Command and Control PC (C2PC).



The Orbcomm low earth orbiting satellite system.