



Senior Design Project in Electrical & Computer Engineering



High Frequency Track Data Exchange (HFTDX)

Cadets: 1/c Champlin & 1/c Loya Advisors: LT Staier & LT Nasitka Sponsor: Commandant, (G-AVT)

Project Background

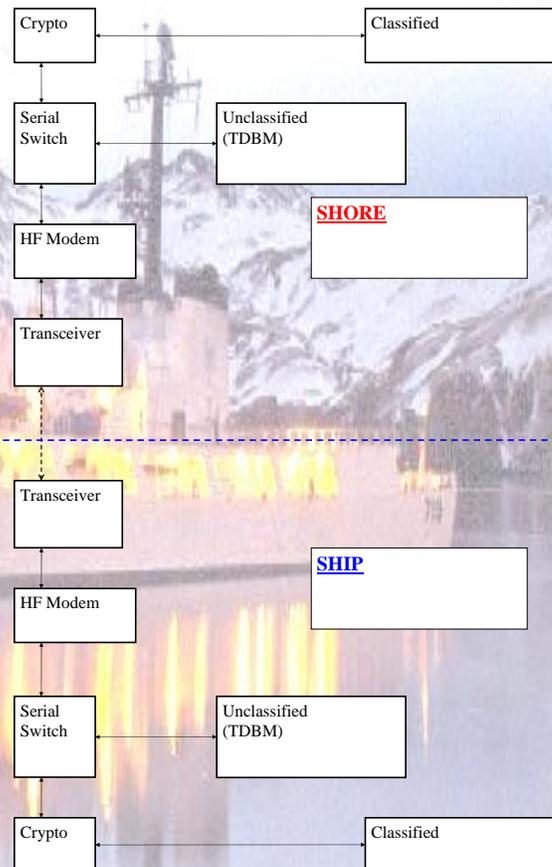
The Vessel Traffic System (VTS) in Valdez, AK tracks approximately 600 tanker ships every year in addition to fishing fleets and foreign deep draft vessels. These vessels are transporting 25% of the U.S. domestic oil production to the lower 48 states and foreign nations. With the recent events of terrorism against our nation we must take greater precautions to protect our national interests, including our economy.

The current VTS maintains a comprehensive picture of vessel movements in Prince William Sound and the Gulf of Alaska. This information is only disseminated to 17th District every 12 hours by email. Our project proposes to upgrade the current VTS in Valdez to allow communication with the Global Command and Control System (GCCS) used by Coast Guard and Navy vessels as well as other armed forces assets. This upgrade will allow the information from the Valdez VTS to be shared with other resources such as the Commander, 17th District, CG Pacific Area Intelligence, and the Alaskan Command integrated air-land-sea defense at near real time speeds.

Project Accomplishments

Our project to date has focused on the design of a communication channel suitable for moving the Valdez track data to Coast Guard 110' patrol boats. Our cost constraints resulted in the use of High Frequency Data Exchange (HFDX) as the means of data transmission, as these components are already in place aboard the Valdez area 110' patrol boats.

We were presented with the problem of mixing classified and unclassified systems due to the space constraints aboard the cutters which prevented the addition of a separate HFDX system for our purposes. To allow for this, we have created a design, diagramed at the right, which uses a serial splitter prior to the cryptographic equipment to send received data to both the classified and unclassified computers. This results in the classified computer getting unencrypted classified info and garbled track data which it should drop, while the unclassified track data computer gets encrypted garbage it should drop as well as the needed track data.



Project Plan

We plan to complete work on the communications channel and use any remaining time and resources to begin work on the software issues involved with moving from the PAWWS track data format to some transmission format usable by the on board software available to the cutters.