E1.05 – Satellite Antenna Array

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Project Overview

This project focuses on developing a 4 dual-band Yagi antenna array to enhance satellite communication capabilities for Texas State University. In collaboration with the Physics Department's "Space Lab", it will be designed to:

- Provide dual-band functionality
- Provide higher gain than single antennas
- Offer Texas State University students with the opportunity to communicate with satellite and send up their own satellite

Features and Requirements

Features

- A gain > 10, greater than a single antenna
- Ability to uplink on the 2m band and downlink on the 70cm band
- Lightweight and sturdy construction
- Gamma matching for fine tuning frequency

Requirements

- Gain must be greater than individual antenna
- Weight must be under 40lbs

D1 Results & D2 Goals

- Successfully simulate 2m/70cm bands in HFSS
- Constructing a functioning dual-band Yagi antenna
- Perform successful test transmissions on both bands

- Complete all antennas
- Correctly phase antennas
- Complete mount and install at location
- Communicate with LEO satellites

Acknowledgments

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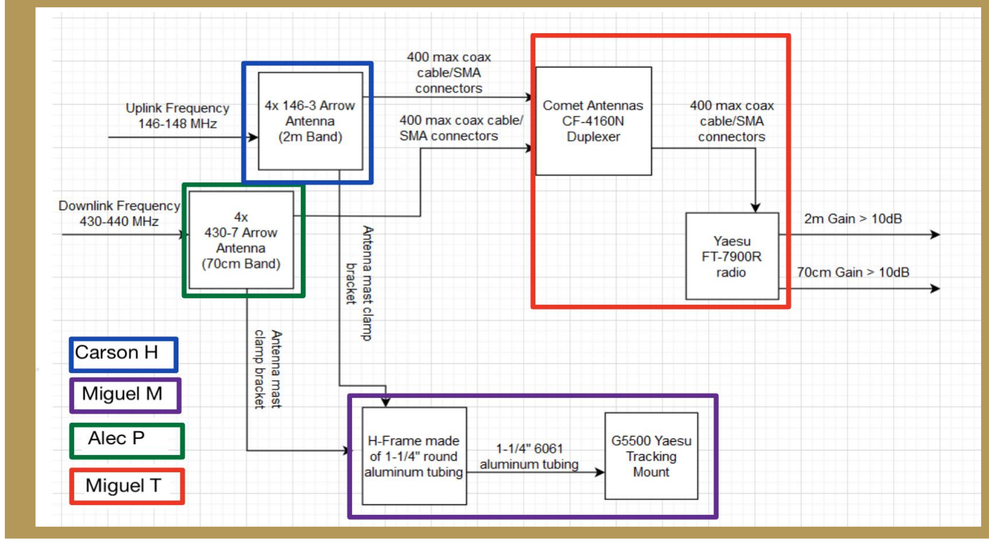
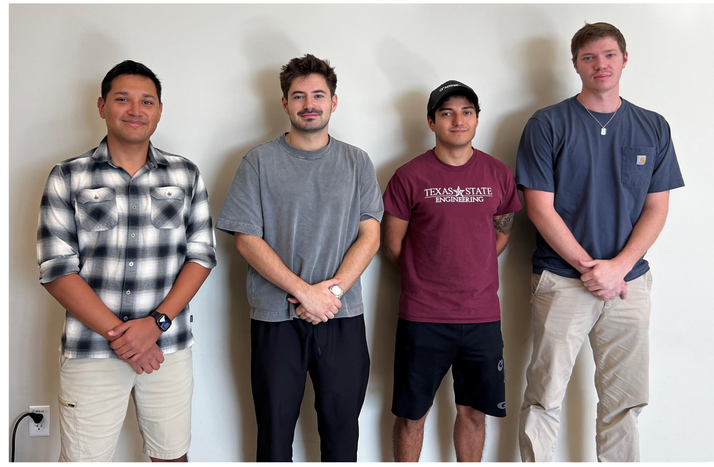
Sponsor: Dr. Cecil Compeau
Physics Department Collaborator: Mr. Evan Jellison

Top Level Block Diagram



Meet the Team



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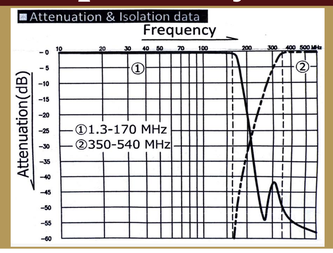
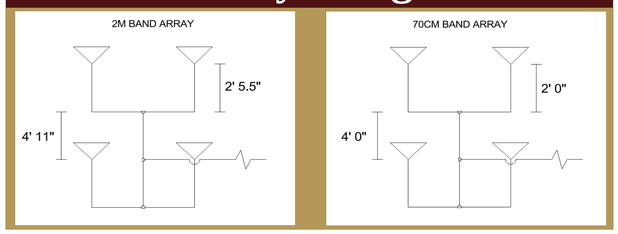
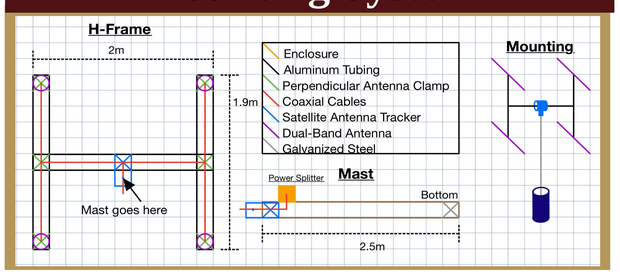
Duplexer System



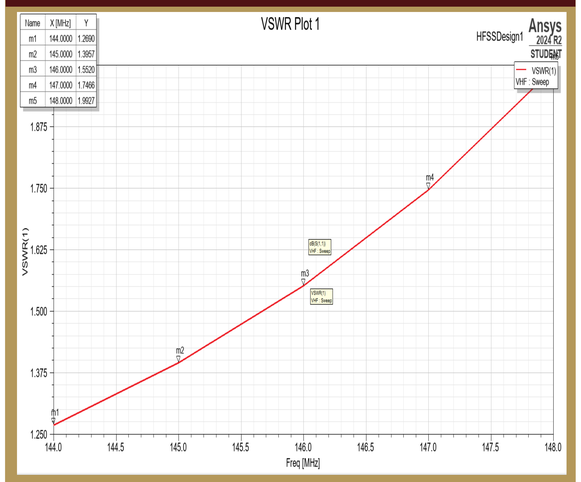
Array Design

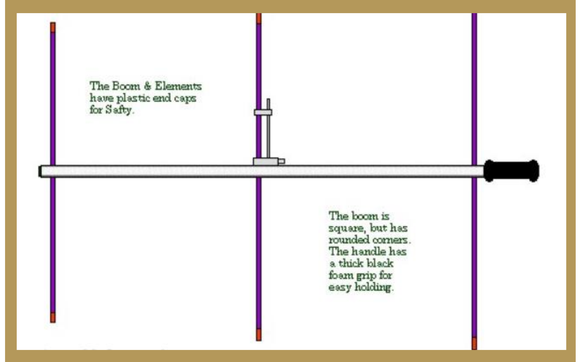


Mounting System



2m Band





70cm Band