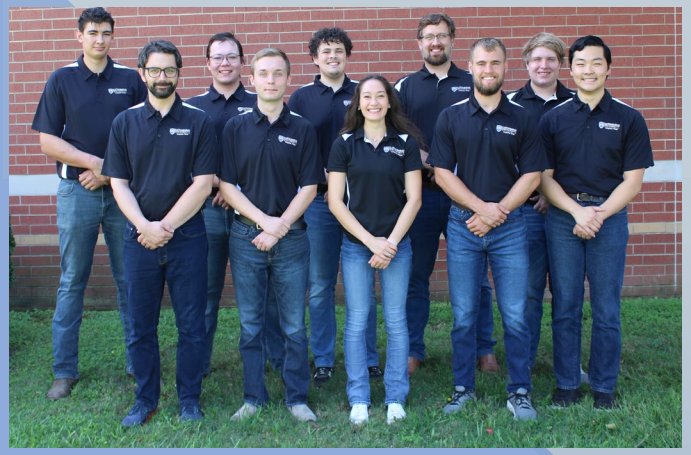


Front Row: Philip Waldecker, Alexander Haley, Hope Greenwald, Kaden Woodbury, Jared Nishimura
Back Row: Addison Culver, Samuel Kundt, Ethan Fawcett, Dr. Nathan Green (Faculty Advisor), David Melilli

Our Team

Team Lead: David Melilli

RF Sub-Team
Philip Waldecker (lead), Alexander Haley, Jared Nishimura

Mechanical Sub-Team
Hope Greenwald (lead), Addison Culver, Kaden Woodbury

Mechatronics Sub-Team
Ethan Fawcett (lead), Samuel Kundt, David Melilli

Project Description

The Starlink Tracking Antenna Reference System (STARS) team is designing and building a device to capture signals broadcasted by Starlink satellites. These signals can then be used for a wide range of applications including gathering positioning, navigation, and timing information. To accomplish this, the device will: predict the location of the satellites, determine the pointing direction to each satellite, select and point an antenna towards one of the satellites, and follow this satellite as it moves across the sky.

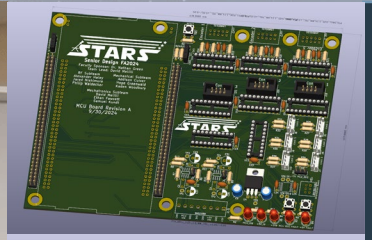
STARS

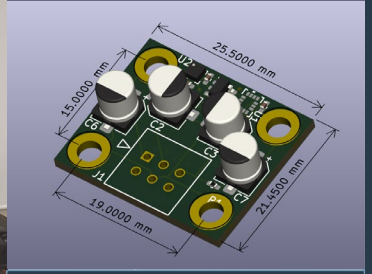
Starlink Tracking Antenna Reference Service

2023 – 2025
Senior Design

LeTourneau University

CTSi





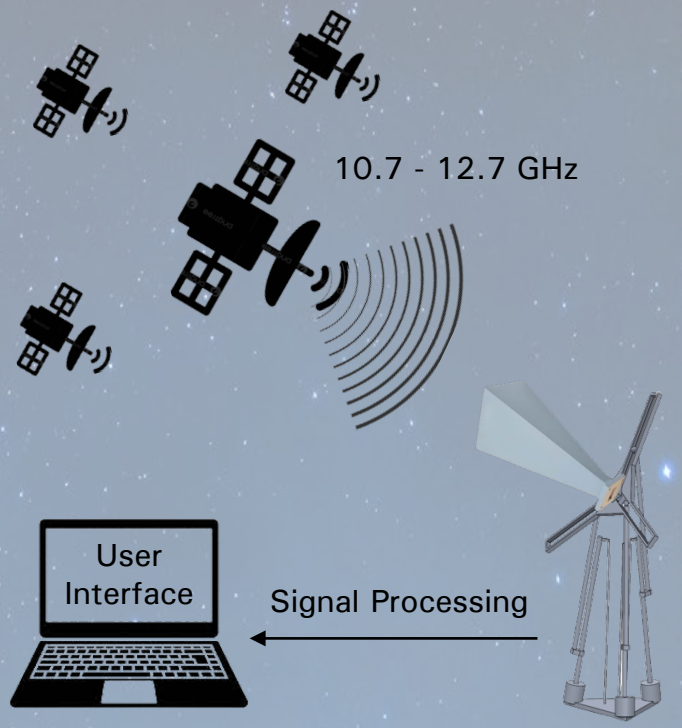
What We've Done

Project Background

Starlink satellites were designed to provide internet around the world, but researchers at UT Austin discovered how to use the signal produced by these satellites for positioning, navigation, and timing information (PNT). This is a major improvement over current PNT methods because the signals from low earth orbiting (LEO) satellites like Starlink are more precise, powerful, survivable, and jam-resistant.

Methodology

To capture the signal from these satellites, an antenna will be pointed at one of the satellites and follow it across the sky. The antenna will capture the signal and the Universal Software Radio Peripheral (USRP) will convert the signal into a data file for future processing. Additionally, the USRP can only capture a 40 MHz bandwidth of information, thus the user will select the range using the user interface.



Low Noise Block

Horn Antenna

USRP N210

Project Goals

- Design and build a functioning prototype that can steer an antenna to point towards any satellite in the sky
- Develop software to capture and analyze the signal and control the steering device
- Create a user interface to calibrate the device
- Write a final report to document our work and findings