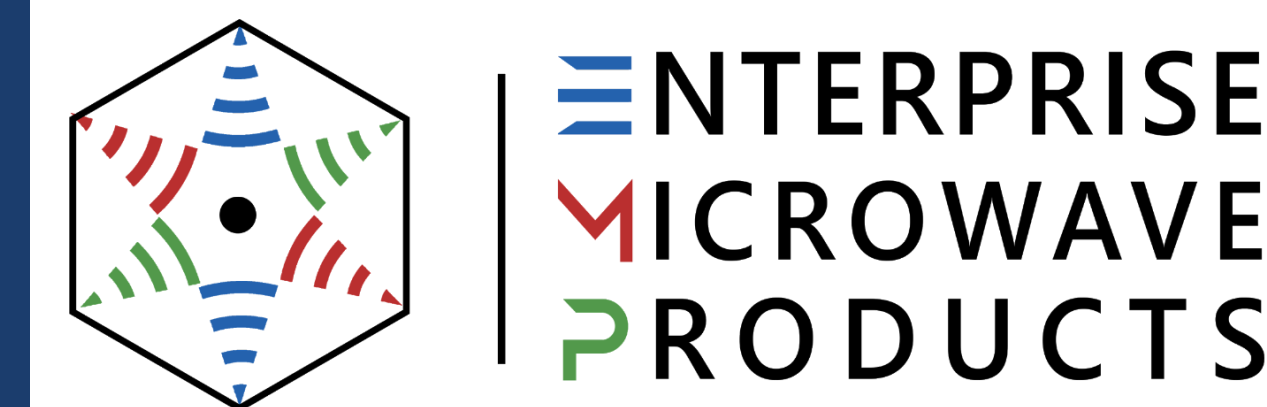




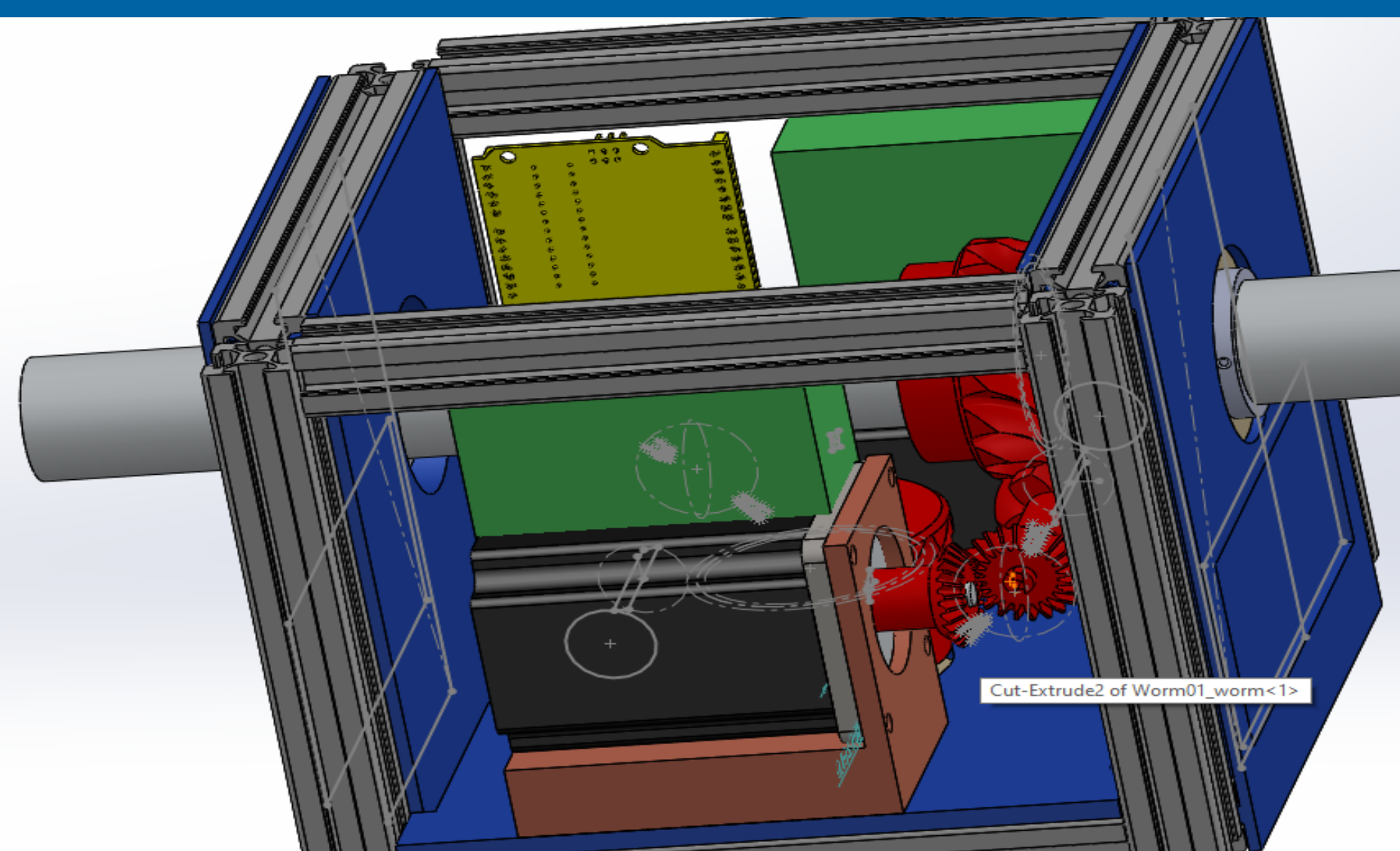
Auto-Adjusting P2P Microwave Link

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Background

The Point to Point Self Adjusting Microwave Link is a deployable system that gives companies, hobbyist and the military the ability to get a communication link up with little manual labor. This system must be capable of self-aligning, given an azimuth, to the transmitting site location without the need of having technicians do a manual path alignment. This system is motivated by the idea that while testing missiles, there can be negative results when radio links go down.



SOLIDWORKS CAD of Antenna Rotator

Future Plans

Further optimization of auto-alignment and testing with a mobile transmit station as a moving target.

Project Goal

Develop a auto-aligning microwave link, aligning to the highest RF peak power to maximize the link's efficiency. Consisting of a transmit site and receive site to establish an efficient microwave link.

Challenges

Securing of materials by contacting several different distributors and *time management*, juggling the different schedules, projects, and classes.

Milestones

Fall Quarter

- Week 1 - 2: Formation of ideas and teams.
- Week 2 - 3: Set-up of software for testing purposes and purchasing of required parts.
- Week 4: Development of basic code and hardware.
- Week 5: Completion of basic parts.
- Week 6 - 7: Assembly of both stations and testing of the link between the two of them.
- Week 8 - 9: Testing of the software with the both of the sites.
- Week 10: Optimization of alignment.

Materials

- National Instruments USRP 2920 Radio
- 2x 900 MHz 13dBi Flat Panel Antennas
- 12x 1ft 20mmx20mm Extrusions
- LabView 2019
- 2x Ball Bearing
- 2x Nema 23 Bipolar
- Arduino
- 2x Velleman TB6560



Figure 1. National Instruments USRP 2920 Radio

References

1. Singh , H. R., Kaur, H. & Monga, D. H. Automated Alignment of Microwave Antenna of Base Transceiver Station by utilizing hybrid sources . *Recent Advances in Circuits, Systems, Signal Processing and Communications* 141–146 (2016).
2. Hassan, A. K., Hoque, A. & Moldsvor, A. Automated Micro-Wave(MW) antenna alignment of Base Transceiver Stations: Time optimal link alignment. *2011 Australasian Telecommunication Networks and Applications Conference (ATNAC)* (2011). doi:10.1109/atnac.2011.6096675
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