OTHERNET EXPERIMENT

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MOTIVATION

- Pursuit of personal interest in hamradio and SDR

- To Learn more about satcom through a hobby experiment

- Take advantage of a flash sale of Othernet Dreamcatchers announced on RTL-SDR.COM

https://www.rtl-sdr.com/othernet-dreamcatcher-on-sale-for-only-49/

BACKGROUND

- **Othernet Inc** is a broadcast data company that was previously known as Outernet.

- Othernet's goal is to provide **free access** to content from the web through satellites broadcast made available to all parts of the world.

- The project currently uses datacasting conventional geo-stationary communications satellites in the SES network over North America
  - SES is one of the major satellite operators in the world

- Service is expanding to Europe

EXPERIMENTAL SETUP

1. Purchased the Dreamcatcher Ku-Band (~12 GHz) Receiver

2. Followed the User Guide (Downloaded from the web)

3. Stabilized antenna pointing

   a. Mounted the LNB a tripod

   b. 3-D printed tripod adaptor

4. Enhanced reception SNR

   a. Horn antenna construction

5. Connected to Dreamcatcher using Wifi to access the applications
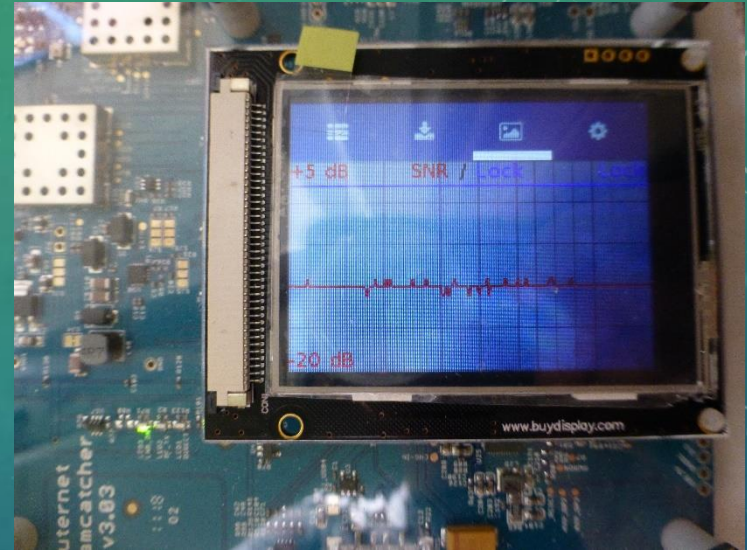
DREAMCATCHER RECEIVER

- **Features:**

- Resistive touch display

- WiFi USB dongle

- 13V/18V bias tee to power external LNB

- Two microSD slots; secondary microSD for content storage

- 1 GHz ARM processor

- 512 MB RAM

- Mainline Linux kernel support

- Dedicated packet reception LED

- 2.5 PPM high precision TCXO

- Requires 5V/2A via microUSB power source

- Dimensions 12 x 11.7 cm (4.7 x 4.6 in)

- Weight 3 oz (no peripherals)

Dreamcatcher v3.03

https://othernet.is/products/dreamcatcher-3-0

USER GUIDE

- Assemble the equipment (Dreamcatcher board, LNB, Cables, Wifi Dongle)

- Download the latest version (5.5) of the Skylark Program

- Flash the program on SD card

- Energize the Dreamcatcher with a two amp (or more) USB power adapter

- Access the Skylark Program using a computer through the Dreamcatcher's Wifi AP hotspot

- Login into the welcome screen

- Run the tuner app to begin the satellite setup process

- Using a horn around the Maverick LNB to improve SNR

The default tuner screen (Fig. 16) only has *Americas (SES-2) (Coverage in Fig. 17)* available at this time.


Status Screen

ANTENNA POINTING

- Othernet is broadcasting on SES-2 at 87 degrees West

- Find **elevation angle, skew, and magnetic azimuth** from a www.dishpointer.com

- Select a location with a **clear unobstructed view of the southern sky**

- Mount the LNB on a camera tripod with the appropriate skew angle set to 37.8 degrees counter-clockwise

- *Tuner App* from the computer's WiFi helps with adjustment
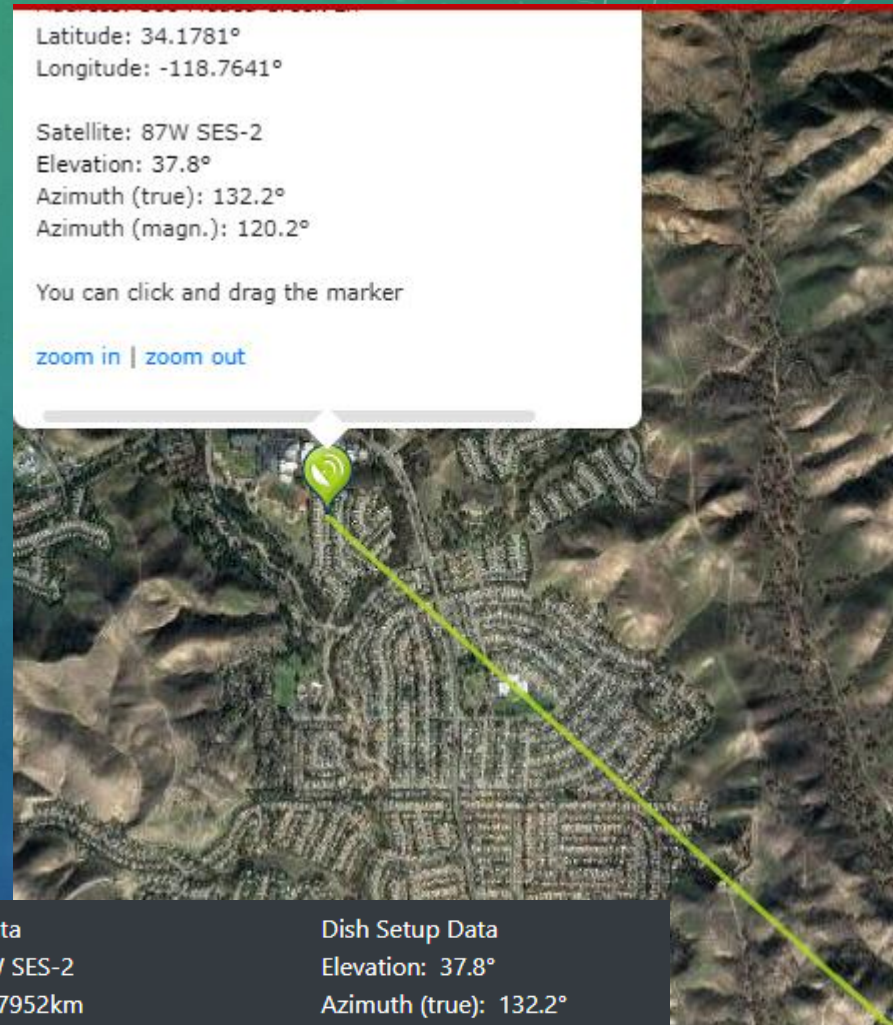
Latitude: 34.1781°
Longitude: -118.7641°

Satellite: 87W SES-2
Elevation: 37.8°
Azimuth (true): 132.2°
Azimuth (magn.): 120.2°

You can click and drag the marker

zoom in | zoom out

Your Location	Satellite Data	Dish Setup Data
Latitude: 34.1781°	Name: 87W SES-2	Elevation: 37.8°
Longitude: -118.7641°	Distance: 37952km	Azimuth (true): 132.2°
		Azimuth (magn.): 120.2°
		LNB Skew [?]: -37.8°

3D PRINTING THE LNB TRIPOD ADAPTER

- The method of taping LNB to the tripod is not very stable and hard to adjustment
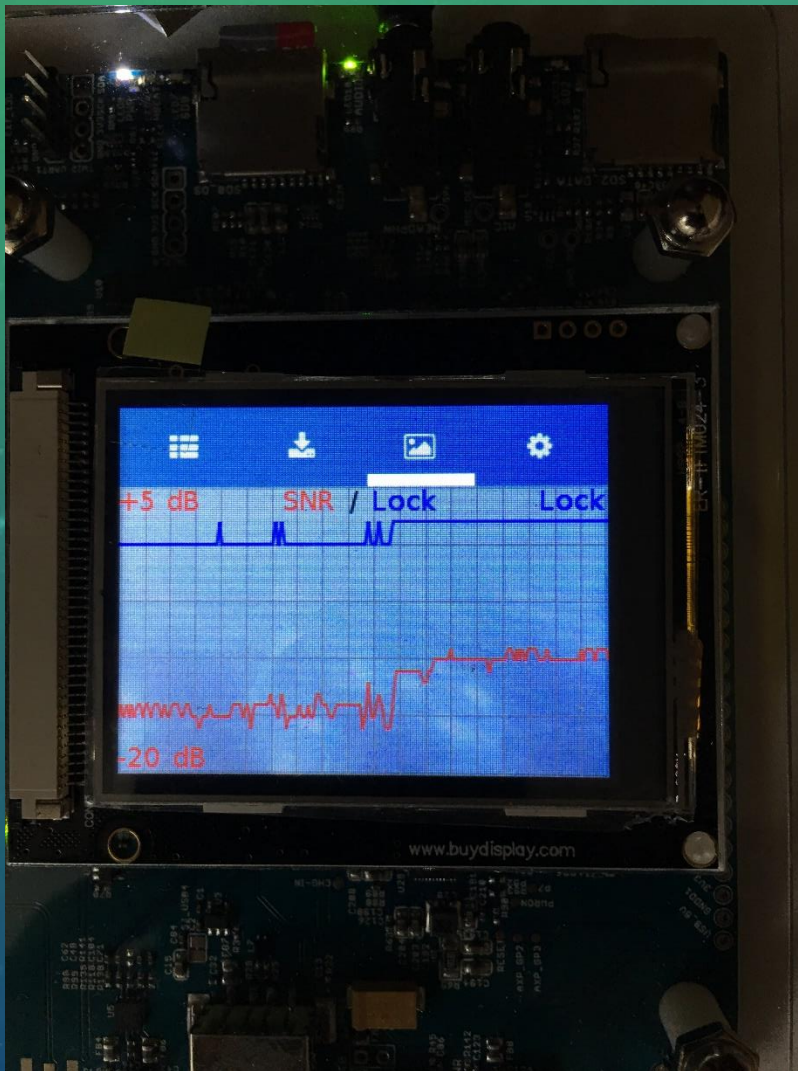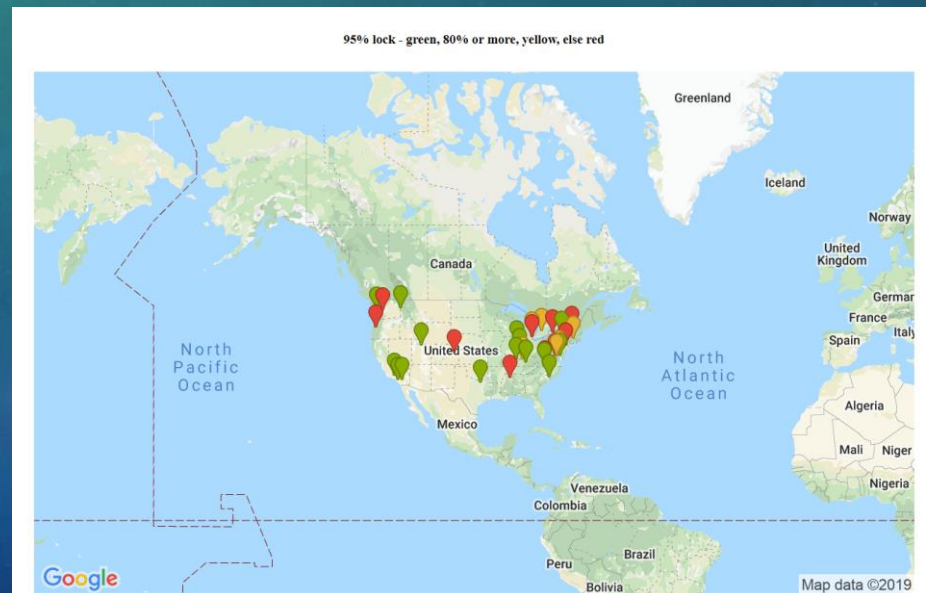

- 3-D printed an LNB adaptor for the tripod
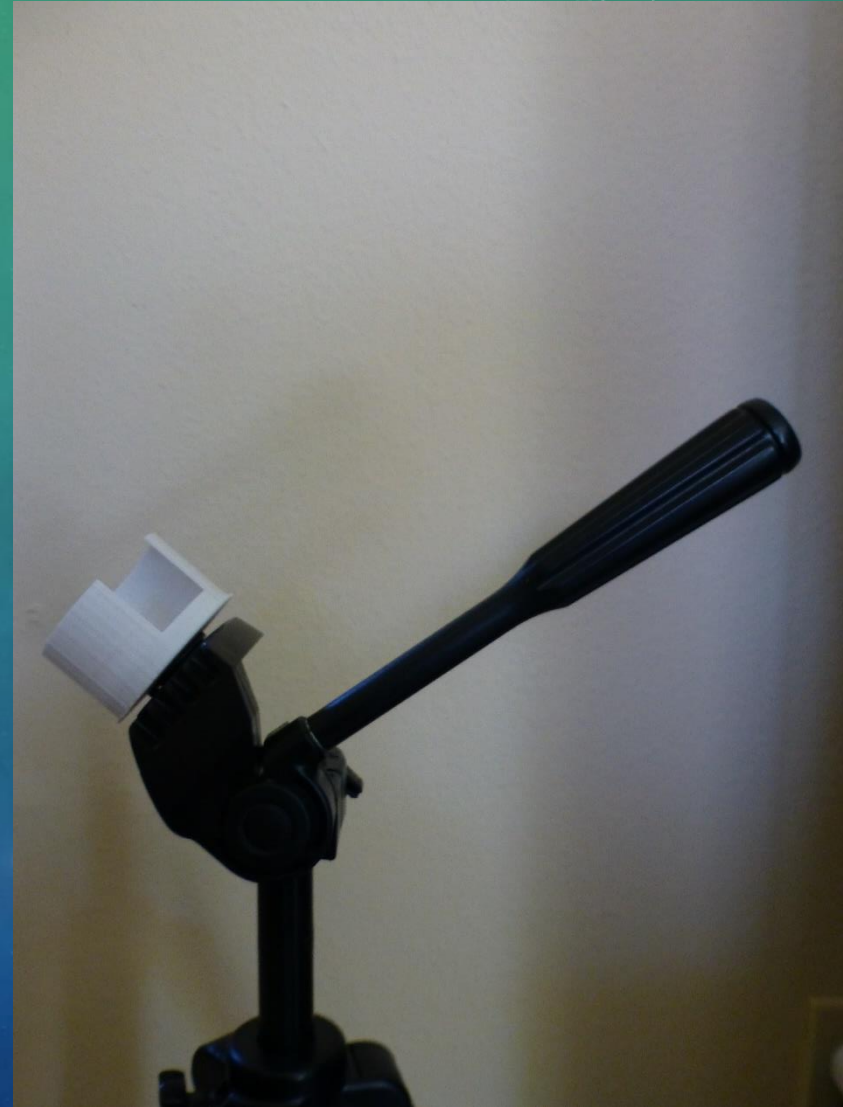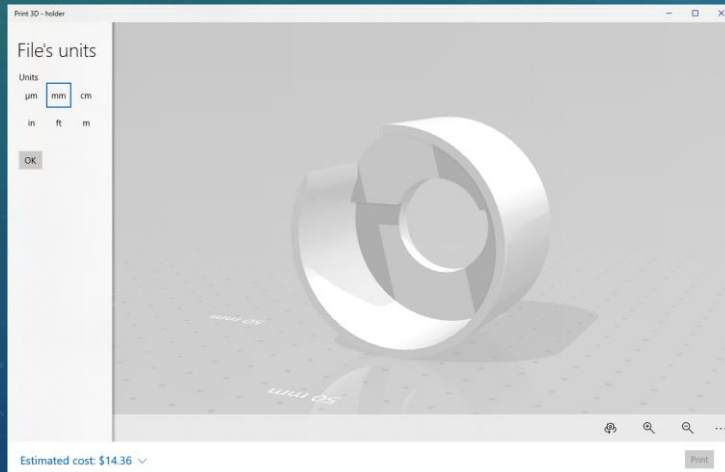
Construction	Finished Product	SNR Improvement
4" x 2" x 8" Aluminum Flashing (held together with duct-tape) kenbarbi		+4.5dB
1/4" grid "hardware cloth". The opening at the LNB is 2.5", the opening toward the sky is 5" in diameter and the cone is 8" from LNB to the outer opening. maxboysdad		+5dB
5" x 2.25" x 9" cardboard covered with aluminum foil AL0I		+5.25dB

- Use antenna techniques to enhance signal reception performance of Dreamcatcher

- Information taken from the document summarizing the following threads:

  - https://forums.othernet.is/t/increasing-gain-with-15-degree-cone/5258/

  - https://forums.othernet.is/t/free-supplies-for-cone-extension-experiment/5373/

  - https://forums.othernet.is/t/dreamcatcher-v3-02-feedback-thread/4997/

RECEPTION ENHANCEMENT TEST

- SNR improvement of 5-6 dB achieved with the homebrewed horn antenna!

- SNR went from less than -14 dB (not locking most of the time) to -9 dB (consistently locking)

SKYLARK APPLICATIONS

SUMMARY

- Successfully completed a very cool low-cost SATCOM hobby project.

  - Took several hours to setup and get working right

  - Learned more about SATCOM, antenna pointing, 3D printing, and horn antenna

- Dreamcatcher could be useful for getting **free** news, weather information while in remote areas with no Internet Service

- 3-D antenna adaptor STL file is available for sharing if anyone wants to attempt this project
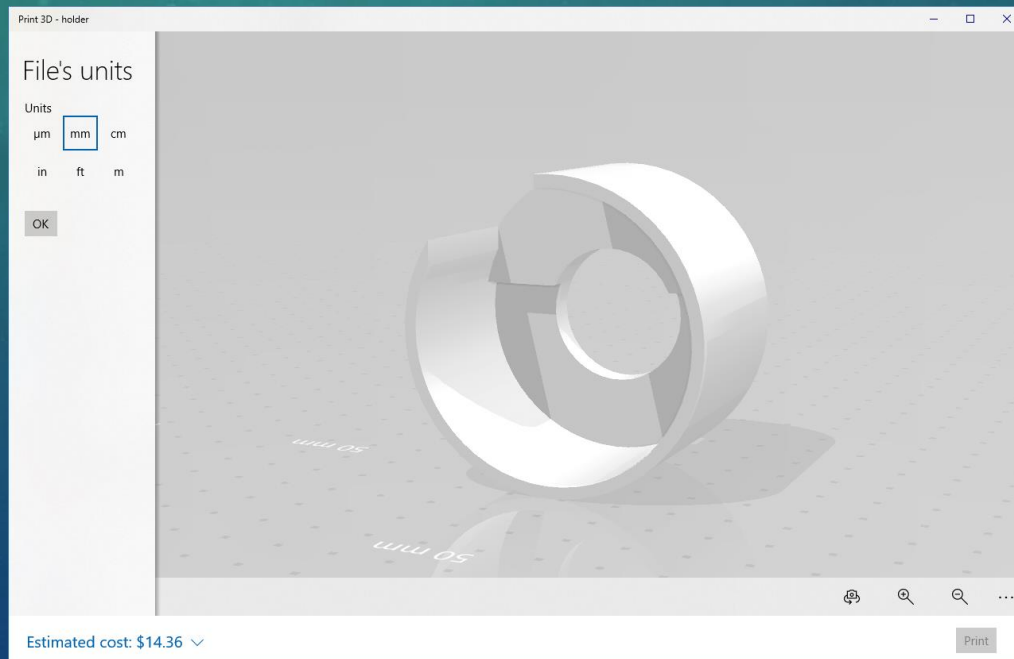
OTHER STUFF - WING OVER CAMARILLO (WOC)

- Assisted with public safety and emergency communications for WOC on August 17th

- Obtained an Amateur Extra License on August 12th!
- New Call Signal AJ6LA