



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

RTL-SDR.COM

RTL-SDR (RTL2832U) and software defined radio news and projects. Also featuring Airspy, HackRF, FCD, SDRplay and more

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MARCH 22, 2019

OTHERNET DREAMCATCHER ON SALE FOR ONLY \$49

Over on the Othernet website the Dreamcatcher hardware is [currently on sale for only US\\$49](#). This is the lowest we've ever seen it for sale.

If you weren't already aware, the [Othernet project](#) aims to bring live data such as news, weather, video, books, Wikipedia articles and audio broadcasts to the world via a free satellite service and cheap receivers. Although an internet connection provides the same data, Othernet's satellite broadcast is receivable in remote areas, will continue working in disasters, and costs nothing to continually receive roughly 200MB of data a day. The trade off is that the service is downlink only, so the data that you get is only what is curated by the Othernet team.

Currently the public service is in a test period and is only available in North America. Europe has come online recently too, however they write that the current version of Dreamcatcher that is for sale may not be optimal for receiving the EU signal.

While currently active, they write that the Othernet satellite service is not guaranteed to continue long term. However even if the service discontinues, the Dreamcatcher can still be used as a TX/RX capable LoRa radio. In a [previous post](#) we demonstrated a fun application with two Dreamcatchers and a LoRa chat application.



Othernet Dreamcatcher

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

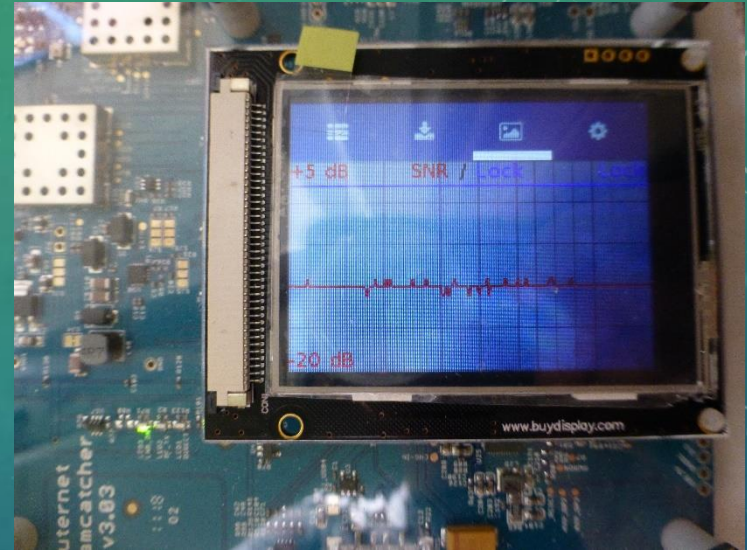
BACKGROUND

- **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



Included antenna:
Maverick MK1-PPL
approx. 3.8" x 2.5"
(shown to scale)

<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.

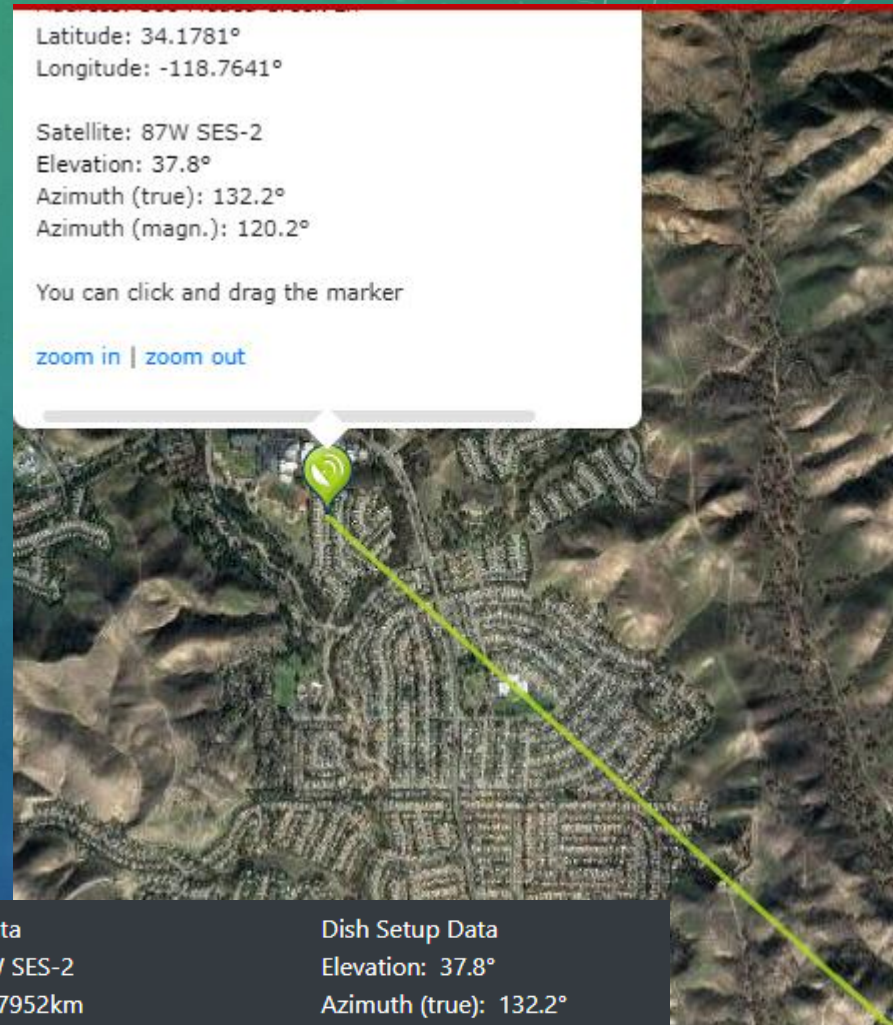


Lock	yes
Bit rate	17673 bps
Packet rate	20.70 pps
Foffset(post-AFC)	521 Hz
SNR	-6.00 dB
RSSI	-103 dBm
PER	0.001

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



Your Location
Latitude: 34.1781°
Longitude: -118.7641°

Satellite Data
Name: 87W SES-2
Distance: 37952km

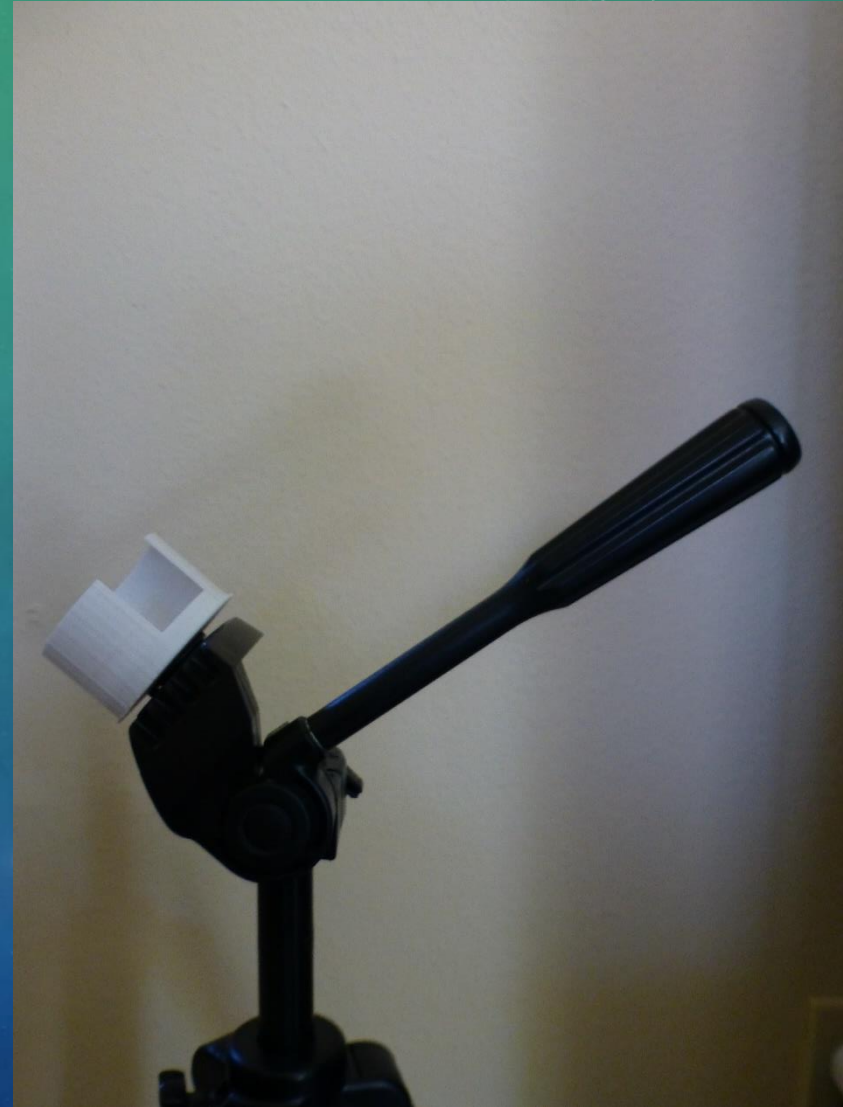
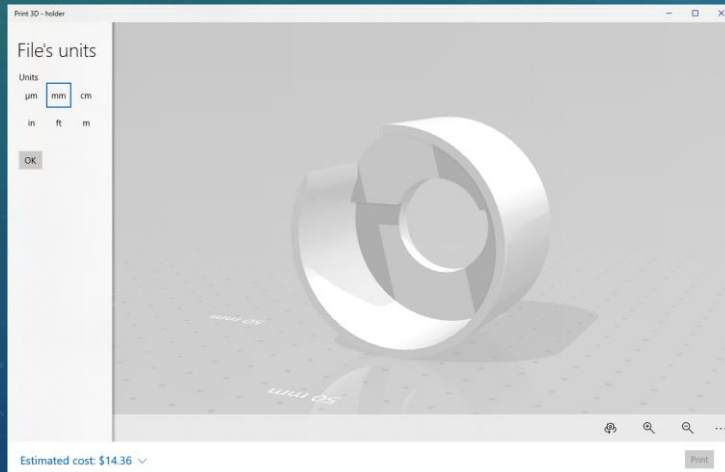
Dish Setup Data
Elevation: 37.8°
Azimuth (true): 132.2°
Azimuth (magn.): 120.2°
LNB Skew [?]: -37.8°

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

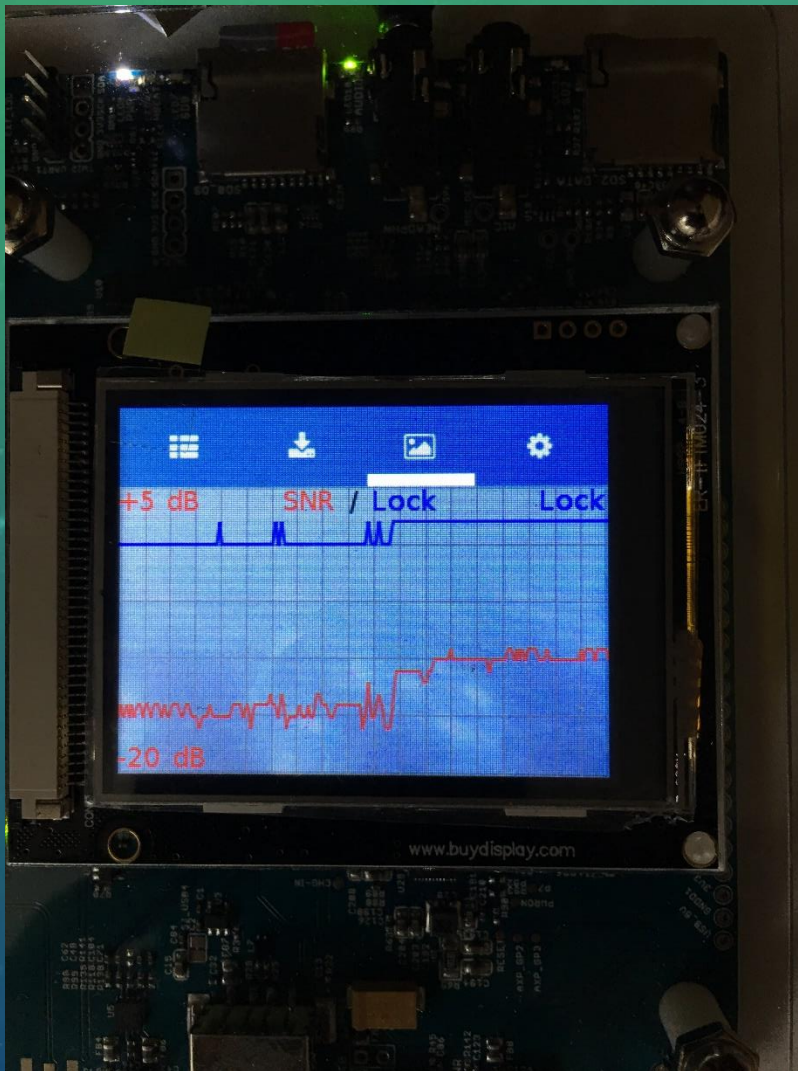


HORN ANTENNA ENHANCEMENT

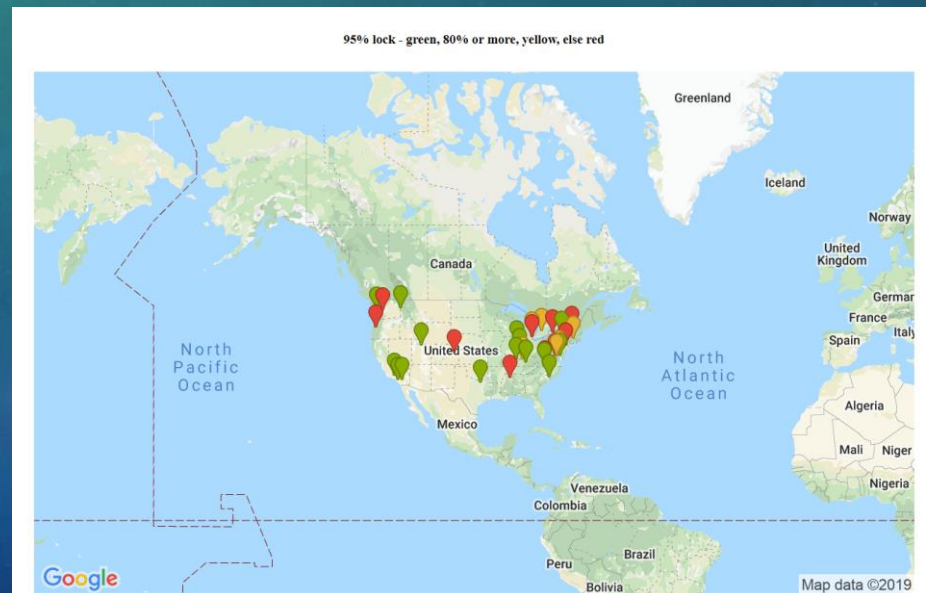
Construction	Finished Product	SNR Improvement
<p>4" x 2" x 8" Aluminum Flashing (held together with duct-tape)</p>  <p>kenbarbi</p>		+4.5dB
<p>1/4" grid "hardware cloth". The opening at the LNB is 2.5", the opening toward the sky is 5" in diameter and the cone is 8" from LNB to the outer opening.</p>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

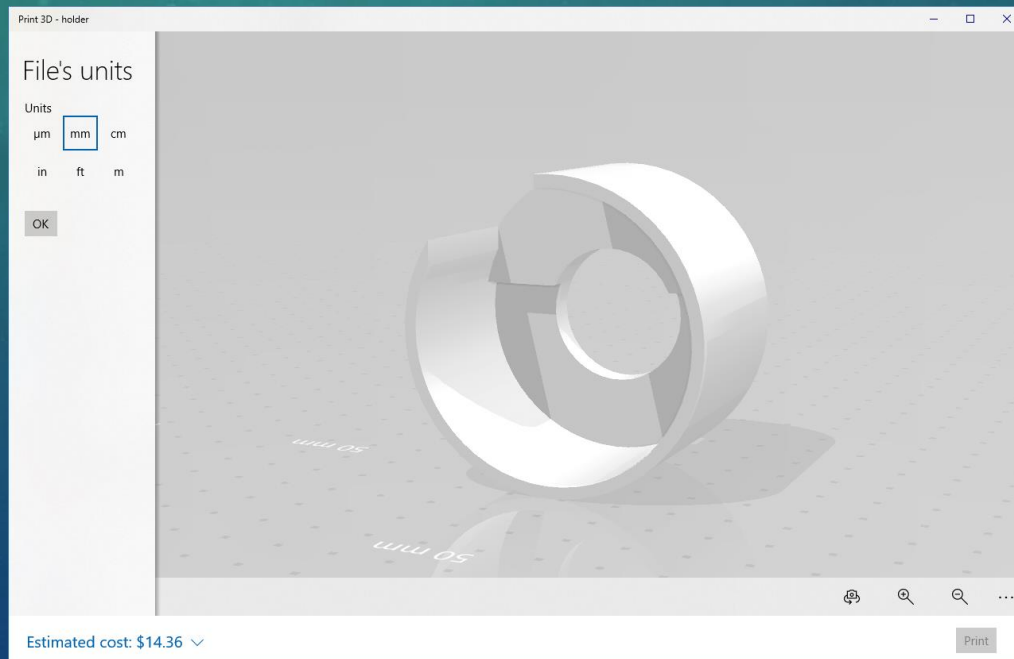
The screenshot displays the Skylark 5.5 application interface, which is a multi-windowed software application. The background is a dark blue space-themed wallpaper with satellite imagery and orbital paths.

- What's New:** A window showing a list of files with columns for Date, Time, and File. The files are primarily Amateur Radio (APRS/APFSAT) messages and weather data files.
- Radio:** A window titled "Radio" displaying "Othernet Satellite Radio" in blue text. It includes a play button and a progress indicator showing 2:56.
- Tuner:** A window showing technical data for a radio tuner. It includes tabs for "Satellite", "Custom", "LNB", and "Status". The "Status" tab is active, showing parameters like Stream, SNR, Lock, Bias, Frequency, and Packet Error Rate.
- Weather:** A window displaying a topographic map of a region. A location is marked with a green dot, and a data box shows coordinates (34.67° N, 120.40° W), wind speed (300° @ 21 km/h), and temperature (72.9 °F). The "earth" logo is visible at the bottom.
- News:** A browser window showing a BBC News article titled "Justin Amash: US congressman quits the Republican Party". The article includes a photo of Justin Amash and text discussing his decision to become an independent.

At the bottom right corner of the application window, the text "Skylark 5.5 (c) 2019 Othernet Inc." is visible.

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

