

# **User's Guide to Setting Up and Using Othernet Dreamcatcher v3.05 Running Skylark 5.8 - Revised for Reduced Bandwidth and New European Satellite**

(April 2, 2021) Best Practices from Multiple Forum Members  
Compiled by Ken Barbi @kenbarbi



## **Introduction**

This User's Guide is designed for users who purchased components from Othernet to set up their equipment using a **WiFi capable** Windows, Linux or Apple computer. It is a collection of the best advice from multiple Forum Members as to how to operate a Dreamcatcher v3.05 running Skylark 5.8 Software. We try to make it clear, but if you have questions, please post them on the Forum at <http://forums.othernet.is/>

**For the latest additional information not included in this User's Guide, go to the Official Othernet Wiki Pages at <http://forums.othernet.is/t/wiki-pages-for-the-othernet-dreamcatcher/5314>**

With the March 2021 changes in Bandwidth from 800 kHz to 200 kHz and a new European satellite (Eutelsat 8WB at 8W), pre-programmed Americas and EU satellite detail is **no longer correct**. Setup requires a new installation as described in this User's Guide because the defaults in the Skylark 5.8 program have not been revised. It also is harder to achieve Frequency Lock requiring a more detailed Section III - Step 2 Fine Tuning of your receiver. Some Forum Members are reporting difficulty using the older Maverick Single: LO LNB. Forum members using a more frequency stabilized LNB have had good success.

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*The page numbers shown are for the PDF version **when printed from the Adobe Acrobat Reader***

*If you are using a Dreamcatcher v3.03 running Skylark 5.8, I have added a marker at the beginning of each affected paragraph that looks like this **Look at Annex D for v3.03 differences #?** It alerts you to look at Annex D for unique features of the Dreamcatcher v3.03. The Dreamcatcher v3.03 has a different board construction, and includes a Touch Screen.*

Note: An **internet connection is not required** for this set up except for 2 steps: 1) Downloading the Skylark OS (**Section I - Step 4**), and 2) Connecting to a Local Router as a WiFi Client (**Section IV - Step 3**).

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## Section I - Purchase, Unpack, and Assemble

**Step 1.** The Dreamcatcher v3.05 is not available for purchase, but may be available from some Forum Members.

- a. **The Dreamcatcher v3.05 Board** came with an EDUP USB WiFi dongle (Fig. 1), a F-type female to F-type female Adapter Connector, and a Universal Single LNB (Fig 2).



Dreamcatcher v3.05 Board with Shipped Components



Fig. 1 EDUP USB WiFi Dongle



Fig. 2 Universal Single LNB - Dual LO: 9750/106000 MHz

b. You **don't need** anything else. The Dreamcatcher Board has a permanent 9 inch cable with a male F-type connector at the end to connect to the LNB. You can use the F-type female to F-type female Adapter Connector to connect to a longer cable going to the LNB if you plan remote your LNB.

**Step 2.** Purchase the following from an electronics store:

- a. **5.1 vdc 2 Amp (or more)** Regulated USB Power cube (the voltage and current rating **is extremely important**) with a micro USB plug a one end. See Annex A for additional information.
- b. Short length (less than 4 feet) high quality USB to micro USB charging/sync cable. See Annex A.
- c. High quality fast micro SDHC or SDXC card sized between 4 and 128 GB for the Skylark program - - a micro SD larger than 16 GB is unnecessary and not required, but can be used. See Step 5 below for more information on recommended micro SD cards.
- d. If you plan to remotely connect your Dreamcatcher away from you LNB, purchase the required length of low-loss RG6 cable with F-connectors at both ends. *(Othernet performed a functional test of all Dreamcatcher Boards with Skylark, WiFi, and reception from a live signal coming through a bare LNB over ten feet of RG-6 and three feet of RG-58. Some users have successfully sited their antennas up to 500 feet away from the Dreamcatcher.*

**Step 3. Assemble the equipment.**

- a. Connect the F-type male LNB connector attached to the Dreamcatcher Board to the female F-type connector on the LNB. You don't need to be outside pointing to a satellite at this point. If you are using the new Bullseye LNB, connect to the green F-type connector. See Annex F for more information on LNBs.
- b. Mount the LNB on some sort of stand or tripod so it points toward the satellite when you take it outside - - see **Section III - Acquiring the Satellite** for information on how to find the satellite.
- c. Plug the WiFi Dongle into the female USB receptacle on the left side of the Dreamcatcher Board.
- d. Connect the micro USB charging/sync cable to the USB Power Plug on the lower left side

of the Dreamcatcher Board. Wait until **Section II** to energize the Dreamcatcher.

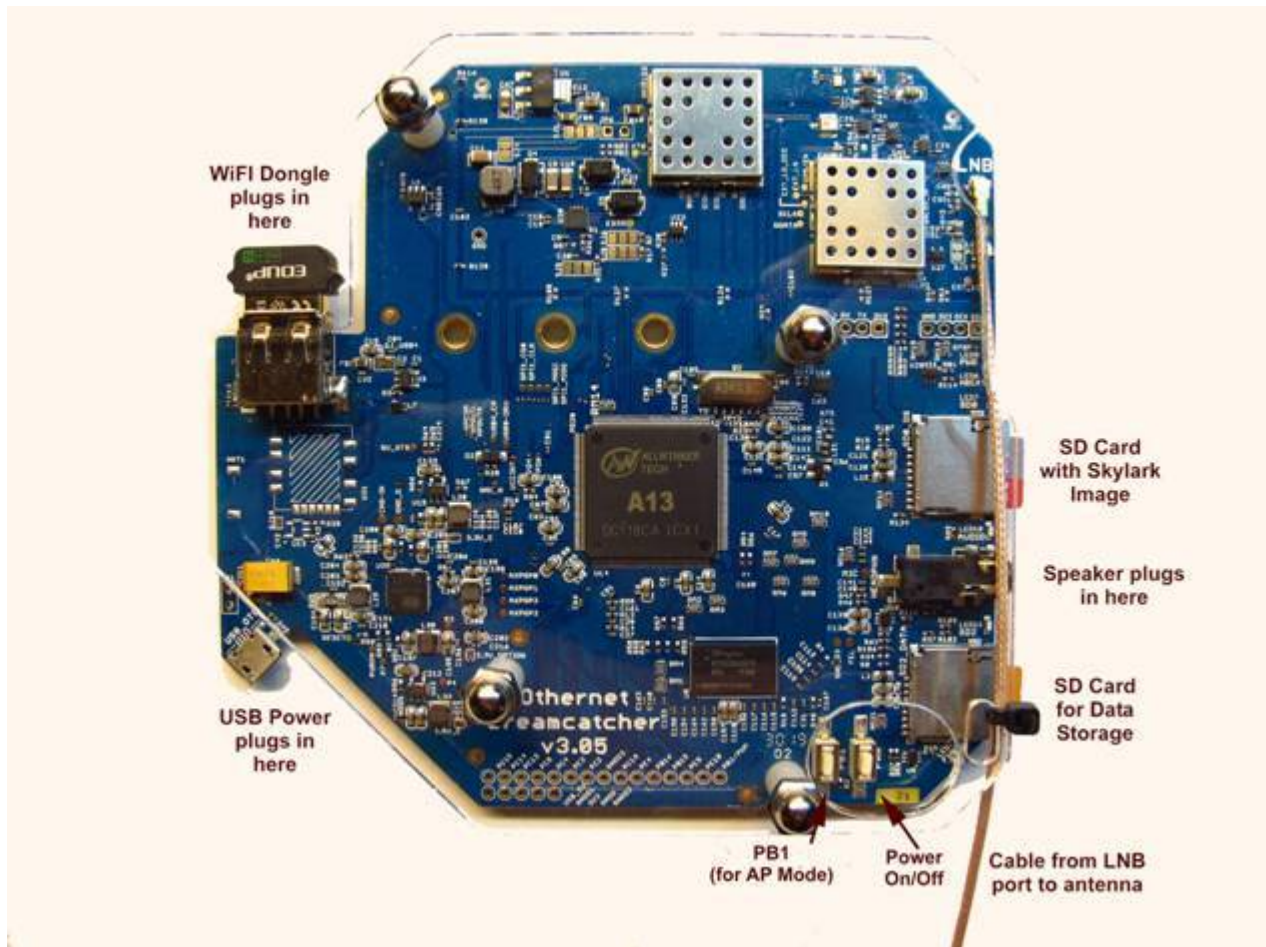


Fig. 4 Dreamcatcher v3.05 with Connections Identified **Look at Annex D for v3.03 differences #1**

**Step 4.** Download the latest version of Skylark 5.8 for Dreamcatcher which is located at <https://forums.othernet.is/t/software-downloads/7456> It is called *skylark-dc-2003041129.img.gz*

Unzip the .gz file to an image file with any standard ZIP File program such as 7-Zip available at: <https://www.7-zip.org/>

**Step 5:** Make sure you use a high quality fast micro SD card for the Skylark OS. Recommended size is 16GB since the Skylark OS automatically cleans old files, so never fills up. Don't skimp on quality here, as some users have discovered inexpensive micro SD cards don't last. Some recommended micro SD cards are: Strontium Nitro 32GB Micro SDHC Memory Card, SanDisk Ultra or Extreme, and Kingston.

When you write the Skylark image on a new micro SD card, the act of writing the image takes care of the partitioning and formatting the card correctly for Skylark. There is no need, ever, to try to partition or format the micro SD card manually, before or after writing an image. In the specific case where the micro SD card already had an older version of Skylark on it, refer to Step 8 below.

**Step 6.** Write the Skylark image file to a micro SD card with an image writing program such as Etcher (Fig.5) available at: <https://www.balena.io/etcher/> which is cross platform compatible or



Win32DiskImager (Fig. 6) available at: <https://win32diskimager.org/>



Fig. 5 Balena Etcher

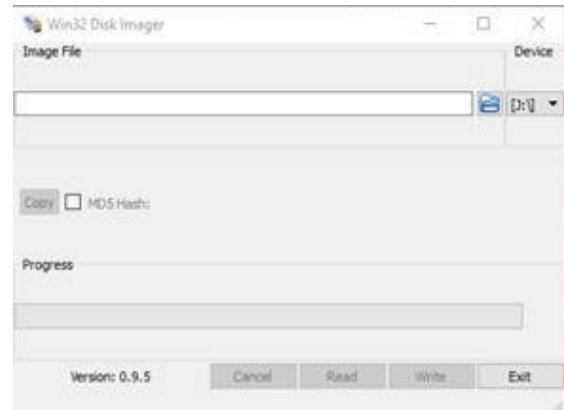


Fig. 6 Win32 Disk Imager

**Step 7. Insert the micro SD card** with the Dreamcatcher Skylark image into the Dreamcatcher Board's SD0\_OS which is the micro SD card holder half way up on the right side of the board. If you use a computer to look at the micro SD card with its newly written image before you insert it, it will appear to have 1 formatted sector and 2 unformatted sectors.

**Step 8. Updating Previous Versions of Skylark** - Upgrading to Skylark 5.8 just requires a re-write of the micro SD card if the micro SD card already had an older version of Skylark on it. Writing the new image preserves the old Tuner and Network configurations; and downloaded files. The micro SD card will have 5 partitions on it from the previous install and initialization, however, only 1 will appear formatted. When you insert the micro SD card into some computers, you may get error messages for the 4 unique Skylark partitions which you should ignore, and proceed to re writing the micro SD cards as in Step 6 above.

**Optional Step 9. Over the Air (OTA) Update** Skylark has a feature to allow older Skylark versions to be updated by a preliminary test for OTA. The procedure is attached to this document as Annex E. *It is not being used for Skylark 5.8 but will be in the future.* Eventually, it should happen as an automatic satellite download.

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## Section II - Energize Dreamcatcher Setup

**Step 1. Energize the Dreamcatcher for its first time startup** by plugging a **2 Amp (or more) USB power cube** into an AC outlet. Don't forget, if you are using too small a power cube, the board's lights will blink and look correct, but there won't be enough power to run the Dreamcatcher WiFi or its satellite receiver correctly. Use a short length USB to micro USB charging/sync cable. Many Forum Members have good performance from IHome, DeWalt and FuseBox cables. See Annex A for more details on Power Cubes and USB Cables. Connect the LNB to the Dreamcatcher.

**Step 2. Access the Skylark Program** by using your computer operating through its WiFi to connect to the Dreamcatcher's Othernet WiFi Hotspot also called an Access Point. At this point you can alternatively use a tablet or SMART Phone to continue the setup, but the procedure is illustrated with a Windows computer. **Wait no more than 5 minutes** for the Skylark program to install itself for the first time so that the WiFi components can become operational.

**Step 3.** To be able to access the Dreamcatcher's Othernet WiFi Hotspot, you should be **within 10**

feet of the Dreamcatcher.

**Step 4. Find the Othernet WiFi Hotspot** by going to your computer's WiFi TAB; selecting and connecting to **Othernet** (Fig. 7). For the rest of the Sections II & III of this procedure, you will be accessing the Dreamcatcher thru this Othernet WiFi Hotspot.

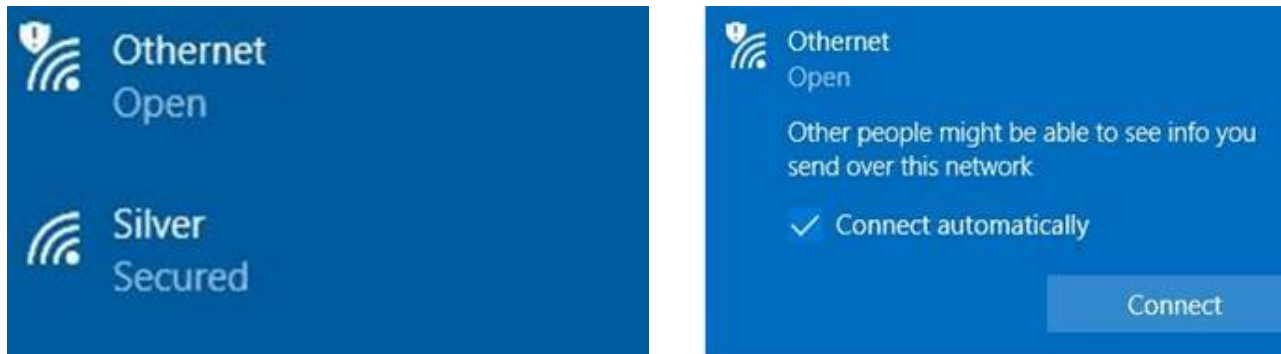


Fig. 7 Finding Othernet WiFi Hotspot on a Windows Computer

**Step 5. Wait another 5 minutes before you open your Web Browser** for the Skylark Program to finish initialization housekeeping functions. Then type (in the URL TAB) [10.0.0.1](http://10.0.0.1) and you will see the Skylark Guest Logon Screen (Fig. 8). **Look at Annex D for v3.03 differences #2**

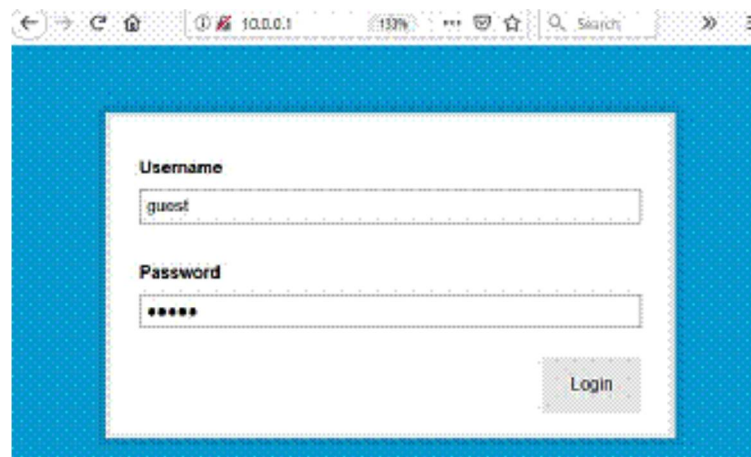


Fig. 8 Skylark Guest Logon Screen

**If you don't see the Guest Logon screen** (Fig. 8) on your computer, or you don't see an Othernet Hotspot, something is wrong. First thing to check is if the green LED light on the EDUP WiFi dongle is blinking green. In any case, the next step is to power the Dreamcatcher **OFF** then **ON** (referred to as a Power Cycle) with 1 minute of rest in between for 4 times. You must be able to connect to the Othernet Hotspot to proceed. **If a problem still persists and your Dreamcatcher is power on, do a Factory Reset as described here (Section IV - Step 6) using the PB1 Button to perform a Function 3 operation. If this fails to fix the problem, re write the Skylark image to the micro SD card as in Section I Steps 5 - 8. If this still fails to fix the problem, use a new micro SD card and start over again.** If you still have no response you may have insufficient power to the Dreamcatcher or a bad Dreamcatcher board.

The Dreamcatcher v3.05 Board has a power button located on the bottom right which you press for 10 seconds to activate a complete shutdown. Do not simply unplug power as that may corrupt the

micro SD card.

## Unique Problems Encountered After Updating Previous Versions of Skylark

Upgrading to Skylark 5.8 just required a re-write of the micro SD card if the micro SD card already had an older **working** version of Skylark on it as mentioned in Section I Step 8. Because old session cookies may be retained in your Web Browser, the new version of Skylark may not come up properly the first time you boot the Dreamcatcher. This is caused by old session cookies cached by your Web Browser clashing with the new version of Skylark which doesn't recognize them. Wait for 2 minutes following the first power on of the Dreamcatcher with the new image while you are looking at your browser, then clear cookies. In most browsers, a **Ctrl+F5** will clear site data and cookies. This is the easiest/fastest fix, but a reliable alternative is to Power Cycle the Dreamcatcher by turning it off, then back on. ***If you use the Ctrl+F5 right after powering it up, Power Cycle (turn on and off) the Dreamcatcher. If it still doesn't come up, do 4 more Power Cycles.***

Sometimes carrying-over old configuration files cause problems. Do a **Factory Reset** as described here (**Section IV - Step 6**) using the PB1 Button to perform a Function 3 operation. If this fails to fix the problem, re write the Skylark image to the micro SD card as in Section I Steps 5 - 8. ***If this still fails to fix the problem, use a new micro SD card*** and start over again.

**Step 6.** To access all the full administrative features of Skylark, you will need to logon with Username **othernet** and Password **othernet** (Fig. 9) - - it is case sensitive. The Guest Logon will not allow you full access to the **Network or Tuner Apps**.

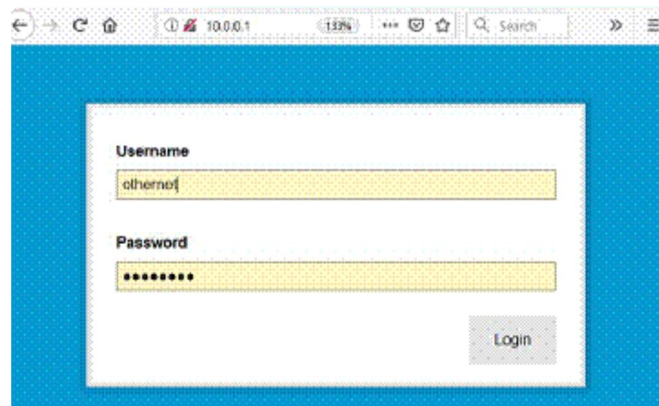


Fig. 9 Skylark Logon Screen for full feature Administrative Control

**Step 7.** You will now see the Skylark Welcome Screen (Fig. 10). When it pops up, you may also hear a bell.





Fig. 10 Skylark Welcome Screen

**Step 8.** Open the Applications Icon (Fig. 11) on the top left to reveal Skylark Apps (Fig. 12).



Fig. 11 Click on the blue icon to bring up the Applications Icons

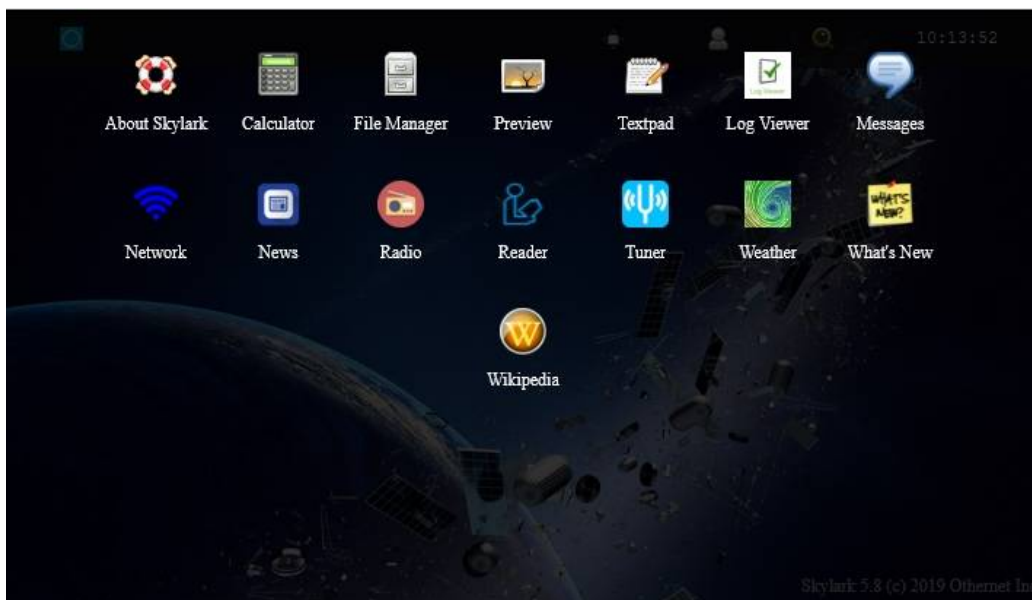


Fig. 12 Skylark Applications Icons

The workings of these Application Icons is contained in Section VII - Skylark Content.

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### Section III - Acquiring the Satellite

Open the **Tuner Icon** on the Skylark Applications Icons (Fig. 12) to run the **Tuner App** to begin the satellite setup process.



The default tuner screen (Fig. 13) shows *Americas* with a *Frequency* of *12.1032* and *Beam Type* of *164* (*Coverage of SES-2 87W* is shown in Fig. 18).

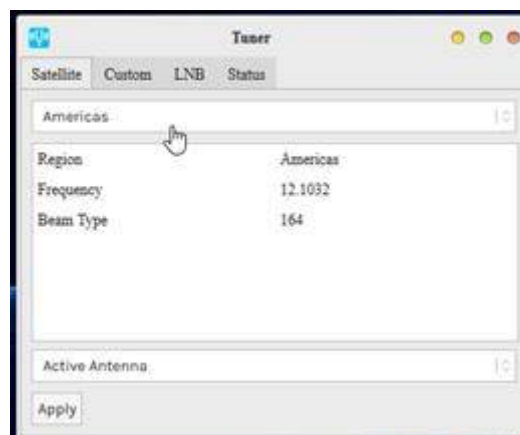


Fig. 13 Tuner Screen with 4 Tabs

Make sure your LNB TAB (Fig. 13b) has your installed LNB type selected - - either Single LO or Dual LO. The default LNB (Fig. 13b) is the *Dual LO: 9750/10600 MHz*. The Dreamcatcher v3.05 was shipped with the Dual: LO LNB 9750/10600 MHz. The older Maverick Single: LO 10750 MHz was shipped with the Dreamcatcher v3.03 and would be selected as *Single LO: 10750 MHz*, **however some Forum Members have not been able to achieve lock with the Maverick LNB on the new frequencies**. If you use the new Bullseye Dual: LO LNB (soon to be shipped with a New Dreamcatcher and currently available in the Othernet Store), select it as a Dual LO: 9750/10600. Make sure to use the green F-type connector of the Bullseye on the LNB. See Annex F for more information on LNBs.

If you change the LNB selection, make sure to go back to the Satellite TAB (Fig. 13) and **click APPLY**.

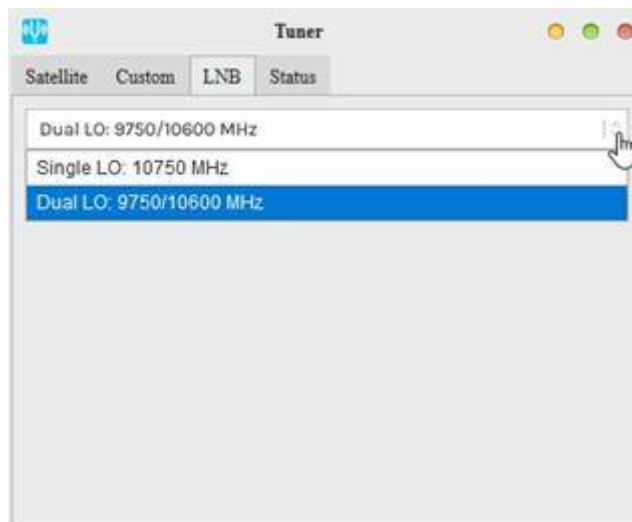


Fig. 13b Tuner LNB Selections

**Tuner Status** (Fig. 15) will appear blank when you go to the **Status TAB** because the LNB has not been pointed toward the satellite nor tuned to receive a signal.

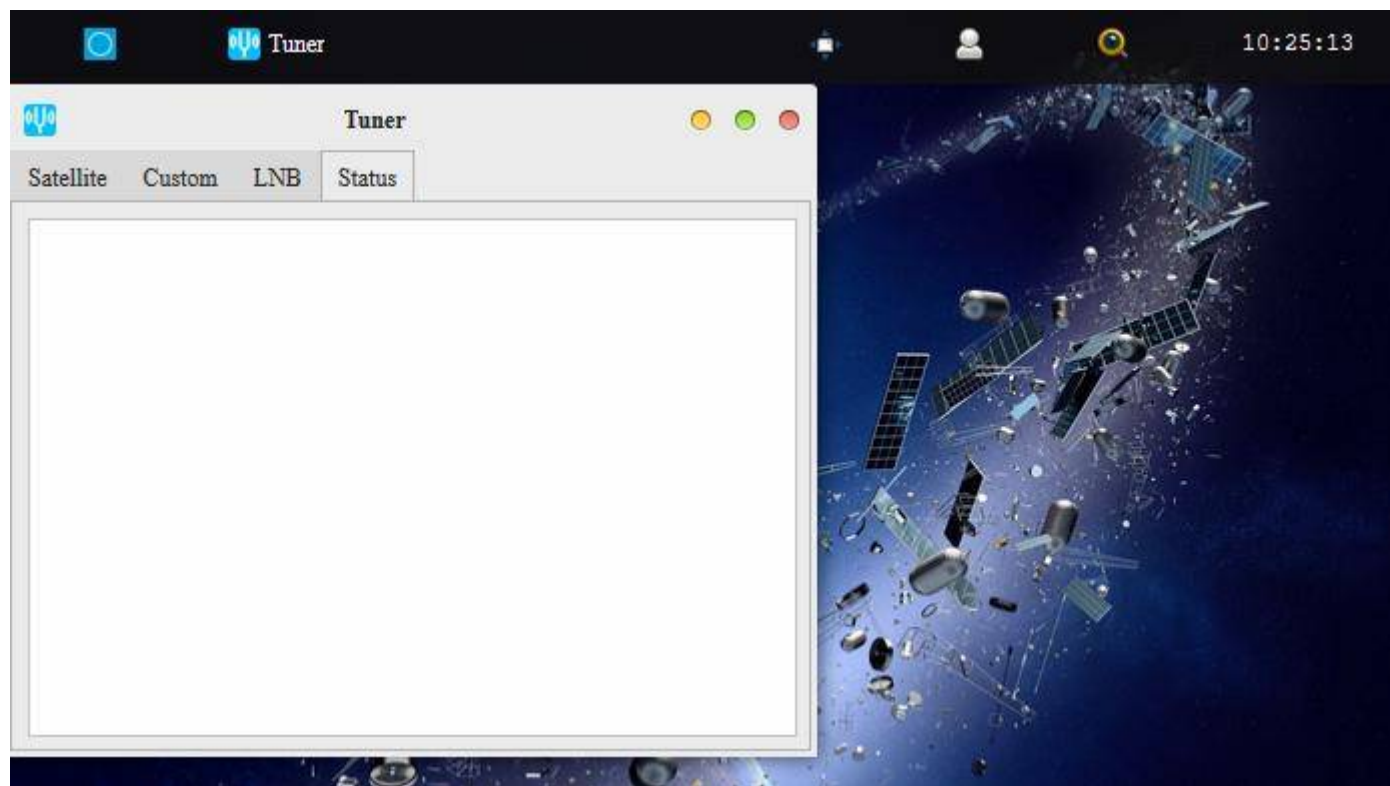


Fig. 15 Tuner Status TAB – Blank with no Signal

However, you can verify that the LNB is electrically connected and working properly. In the **Log Viewer Application** (Fig. 16) there is a TAB called *Diagnostics* which will confirm in (Fig. 17) at the very bottom of the screen the presence of your Bias-T voltage which powers the LNB.

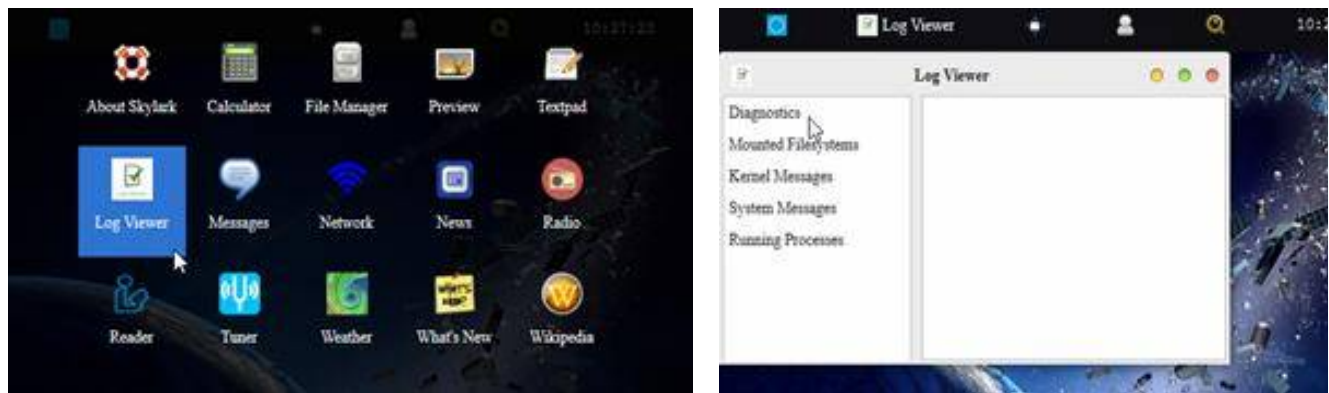


Fig. 16 Applications Screen showing **Log Viewer App-Left (and the Diagnostics TAB-Right)**

If you see any Bias-T error messages at the bottom of the TAB in Fig. 17, you have a power problem to address before going any further. Your most likely problem is too small a USB power cube or too thin a USB to micro USB charging cable. Make sure the thin RF cable connection between the Dreamcatcher Board and the LNB hasn't broken under the black wire wrap (do a continuity check on the connectors). This has been reported by some Forum Members.

If everything looks good, you are now ready to proceed on.

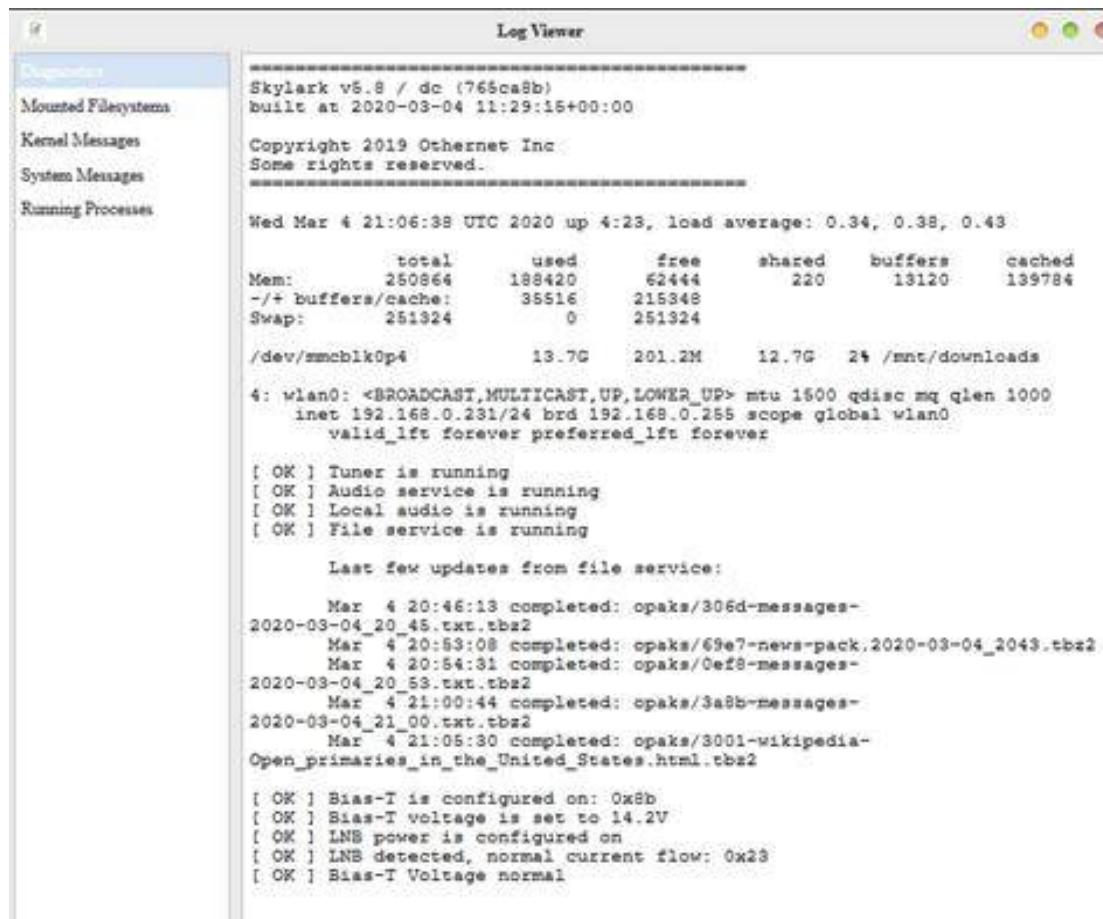


Fig. 17 Diagnostics Showing Normal Bias-T Operation



## Satellite Footprints

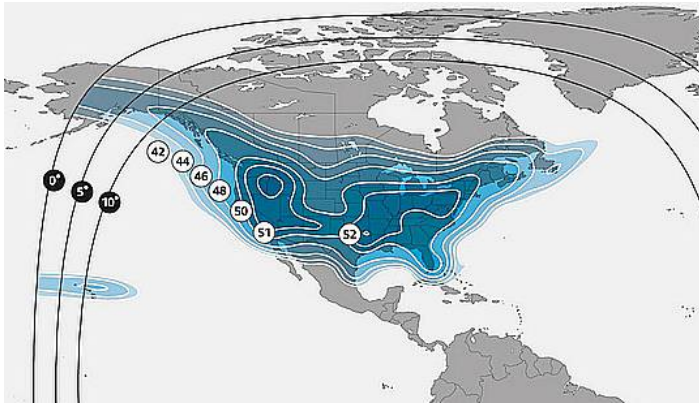


Fig. 18 Americas SES-2 (87W) Ku-band

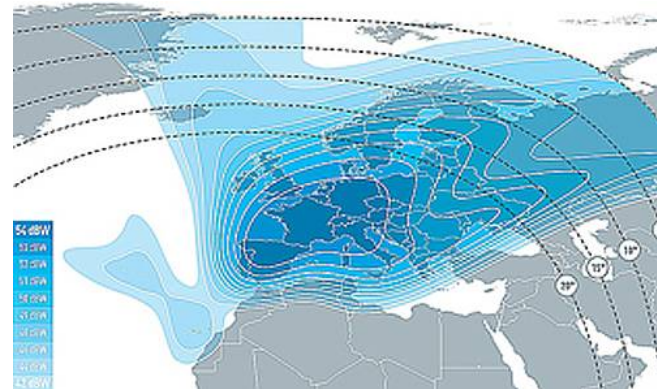


Fig. 19 Eutelsat 8WB (8W) Europe Ku-band

As a result of the reduction in downlink bandwidth in March 2021 and a change in the European Satellite, you must set up your satellite differently in both North America and Europe. There is an automated and a manual method for doing this described below in Step 2, but first we need to find the correct aim for the LNB - - **elevation angle, skew, and magnetic azimuth**.

**Step 1. Finding elevation angle, skew, and magnetic azimuth.** In North America, Othernet is on SES-2 on their Ku-band North America Beam (87W), and in Europe it is on Eutelsat 8WB (8W) Ku-band Europe.

### Step 1a. Using Dishpointer.com

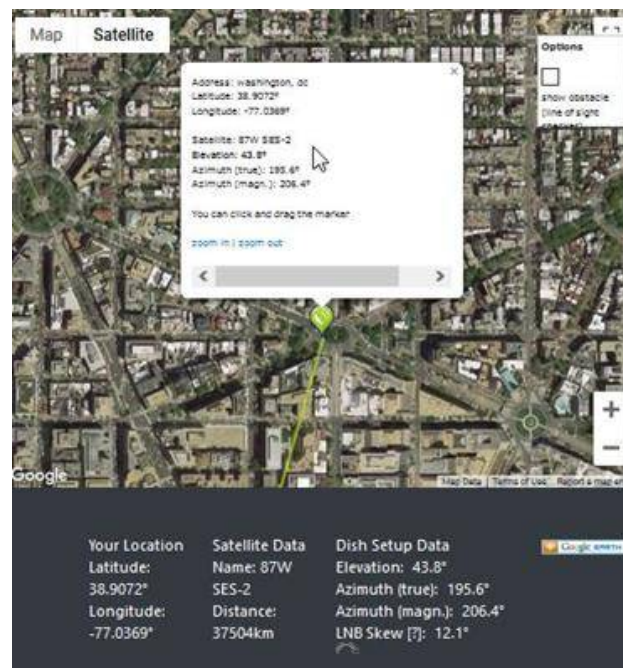


Fig. 20 Locating SES-2 in Washington, DC

Based on where you are, find your **elevation angle, skew, and magnetic azimuth** from a site such as <http://www.dishpointer.com> (Fig. 20). For your first satellite acquisition effort, select a location with a **clear unobstructed view of the equatorial sky**. (Later, once you confirm your system is working, you can try to find a better more permanent location. Many people are able to operate thru windows or off balconies with partially obstructed views.)



Example: For Washington, DC, mount the LNB on a camera tripod with the appropriate skew angle set to 12.1 degrees clockwise (more on skew below). Using a magnetic compass chose the *Azimuth (magnetic.)* to get a sight line on close in objects which you can use to point your LNB towards the satellite at 206.4 degrees magnetic. If you use a cellular phone, you may have to use *Azimuth (true)* to get a sight line.



**Tips on Point your LNB** Using an Adjustable Sliding Bevel and a carpenter's level to get a precise elevation angle (EA) of 43.8 degrees for Washington, DC, set on the LNB, I do the following: **In the picture, the obtuse angle inside the Adjustable Sliding Bevel is 180 degrees - EA degrees or  $180 - 43.8 = 136.2$  degrees with the vertical side of the Adjustable Sliding Bevel**

**perfectly perpendicular to the ground.** If you were in Churchill, Manitoba, Canada, with an EA of 23 degrees, the obtuse angle would be  $180 - 23 = 157$  degrees.

Skew allows you to match your LNB's horizontal/vertical orientation with the satellite's horizontal/vertical orientation to maximize signal strength.

When you set the skew, make sure you rotate the LNB so that skew angle is pointed directly overhead. Skew is given in degrees either clockwise (CW) or counterclockwise (CCW). If the reported LNB Skew direction for your location is shown clockwise, you stand behind the LNB looking at the satellite and rotate the LNB clockwise until you arrive at that number. For Washington, DC, you set the skew to 12.1 degrees by turning the LNB in a clockwise direction. Viewing the same satellite on the same longitude, but from South of the equator, result in an opposite rotation skew angle.

Skews less than 10 degrees CW or CCW don't make much difference, but if you live on the far edge of a satellite beam, skews may approach 30 degrees which is significant. Use the Skew for your location that <http://www.dishpointer.com> provides.

**Step 1b. Using Satellite Calculator for Othernet Beams.** Forum Member @Tysonpower developed an App called *Satellite Calculator for Othernet Beams* Fig. 21 that is available at @Tysonpower's web site <https://tynet.eu/storage/downloads/Othernet%20Satellitecalc-2021.html>, <https://forums.othernet.is/t/software-downloads/7456> or in the Othernet **downloads:///Uploads** folder Fig. 22 if you had been previously connected to an Othernet satellite. Since you are probably not connected to the satellite yet, you must download the App from the internet. The app is written as an HTML file and will run in Skylark as a native html program (whether you are connected to a satellite or not), or on with any other Java equipped browser on your computer. You can download it to your computer and run it from there.

After you select the satellite you want to find, you insert your Latitude in **digital degrees** (such as 43.2456 degrees if you are North of the equator, or -43.2456 if you are South of the equator) and your Longitude in **digital degrees** (making sure if you are in a West Longitude you enter a minus sign). It will report back your **magnetic heading**, elevation, and skew. Both North America SES-2 (87W) is set as Americas (SES2 87W), and Eutelsat 8WB (8W) is set as (Europe [Eutelsat 8W B]) in the App.

# Satellite Calculator for Othernet Beams

Please Enter your Position in latitude North / longitude East and select a desired Othernet Satellite Beam before you click calculate.

Satellite Beam

Americas (SES2 87W) ▾

Latitude (N)

Americas (SES2 87W)

Europe (Eutelsat 8W B)

Longitude (E)

Note: Use minus to enter W Longitude or S Latitude

Calculate

Point your LNB to the following Position:

Heading(Mag):

Elevation:

Skew:

Made by [tynet.eu](http://tynet.eu) with the help of a lot of caffeine

Fig. 21 Satellite Calculator for Othernet Beams

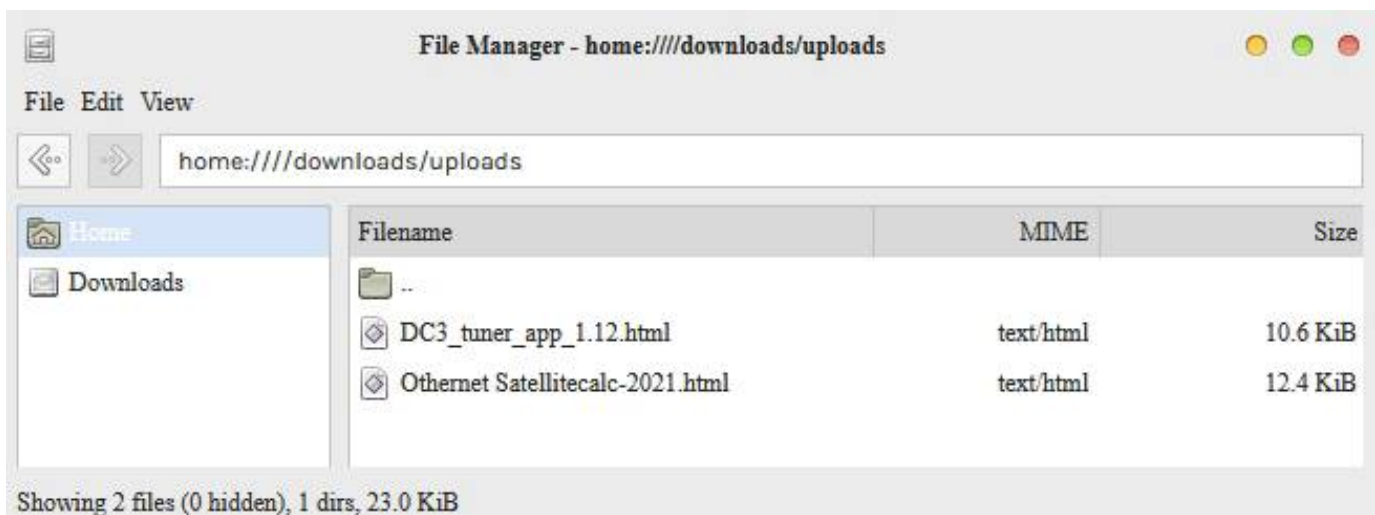


Fig. 22 File Manager Location to find **DC3 Tuner App** and the **Satellite Calculator for Othernet Beams App** (when you select one of these files, open it with the Reader APP choice)

## Step 2. Selecting the Correct Satellite and Tuning To It

Forum member @Tysonpower has developed an App for Skylark to Automatically Tune and Find the Correct Operating Frequency for your LNB shown in Fig. 21a. You can download it from @Tysonpower's web site [https://tynet.eu/storage/downloads/DC3\\_tuner\\_app\\_1.12.html](https://tynet.eu/storage/downloads/DC3_tuner_app_1.12.html), <https://forums.othernet.is/t/software-downloads/7456> or if you had been connected to an Othernets satellite before find it in the **downloads:///uploads** Folder Fig. 22. You must use log on **Othernets** (Guest won't work) to continue.

**Tuner App & Frequency Finder**

**Manual Tuning**

This little App allows you to set the Custom Beam Frequency and Beantype to find the correct Settings fast. You can update the EU and US Beam Settings of your DC3 with the ones that are delivered by this Software as well by using the "Save to DC" Button.

Frequency: 12.0894 Beam type: 36

Other Beams:

Americas: 12.0894 Ghz - Type 36  
Europe: 12.6231 Ghz - Type 36

Save to DC3

Save +5khz -5khz

**Autotune**

Enter how many 10khz steps you want to search over and under the center Frequency of your Custom Beam to find a initial Lock.  
If a initial Lock is found the Frequency Compensation of the SX1280 is used to calculate the right Frequency. Click the Start Autotune Button to let the Software search for a Frequency, it will stop if it got a Lock on the Satellite.

Autotune Status

Steps: 10 State: Standby  
Frequency: 12.0000 Ghz  
Lock: 0 - 0%

Start AutoTune

**Tuner Status**

status packets Read: 0

Waiting for Status...

**Current Settings**

Below are the Beam Settings that the DC3 has currently saved, use the Button to refresh and query the infos again.

Used Settings

US Beam  
EU Beam  
Custom

Refresh

Version 1.11 - Made by [tynet.eu](https://tynet.eu) with the help of a lot of caffeine

Fig. 21a Tuner App & Frequency Finder Version 1.12

In North America on SES-2 Freq is 12.0894 GHz & Beam Type is 36

In Europe on Eutelsat 8WB Freq is 12.6231 GHz & Beam Type is 36

If you chose not to run the APP from **downloads:///uploads** Folder or have never been connected to an Othernets satellite, install the APP in your Skylark program. You must use log on **Othernets** (Guest won't work) and upload it from your computer to your Skylark Program micro SD card or external micro SD card. Fig. 21b shows the initial File Manager TAB before ever being connected to an Othernets satellite - - the **downloads:///uploads** is not present. Keep in mind if you upload the file into the **home:///directory** on your Skylark Program micro SD card, it gets deleted when you reboot your Dreamcatcher so you would have to reinstall it, so an external SD card is the best solution to keep it permanent. After you select Upload, you will be directed to Browse your computer to find the correct file to upload.

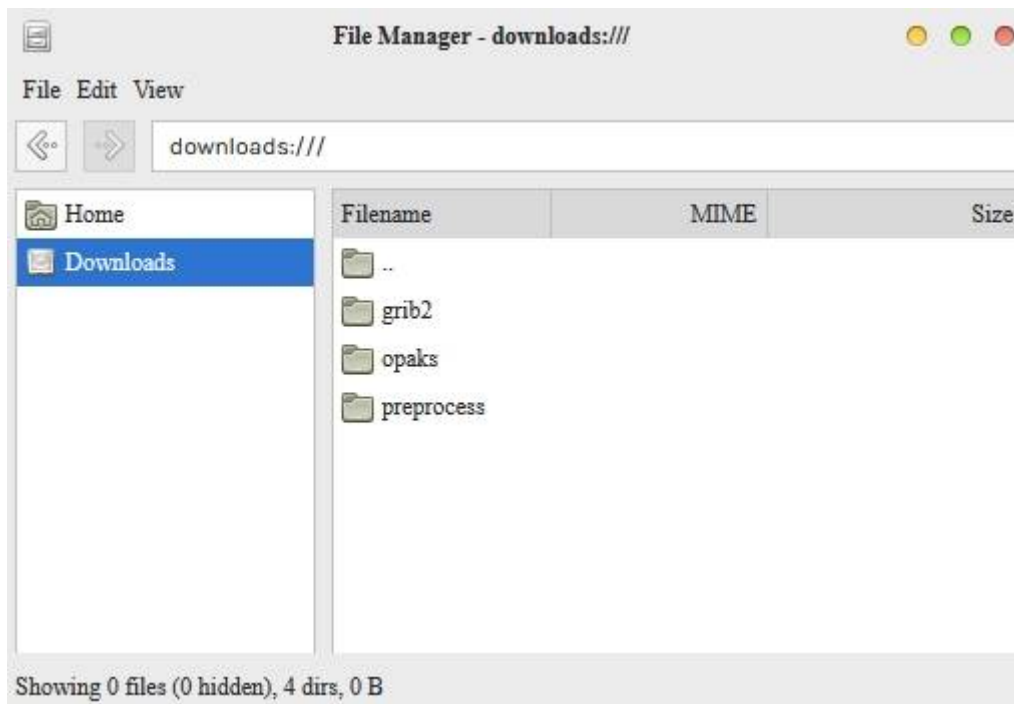
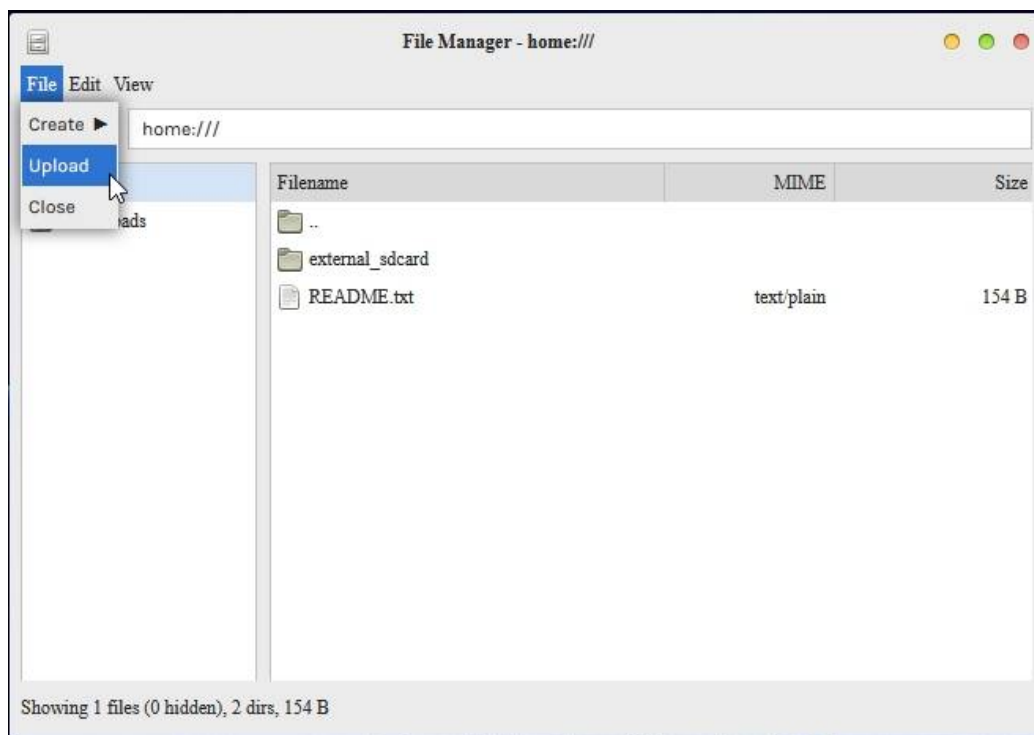


Fig. 21b Initial File Manger TAB before ever being connected to an Othernet Satellite



*Note: You will need to find the file to upload on your computer after you click the Upload TAB*

**Step 2a - Automatic Frequency and Beam Type Selection.** Before you do anything else, go back to Fig. 13a, in the satellite list and - **select Custom then click Apply.** You must start this process with a Custom Satellite selected. You can no longer select the Americas or EU satellite settings because after a reboot, they **revert** to the old default values and retune to those values when rebooting.

In Panel 1 of Fig. 21a, **type in** your Frequency and Beam Type as shown for Americas or Europe. Save the frequency and beam values by clicking the **Orange Save button** on the bottom left of



Panel 1. Because you started in the Custom Satellite mode, this new Frequency and Beam Type get automatically saved in the Custom TAB. If you get a signal (Fig. 23 showing a good connection), you are done. All the settings are automatically saved and will continue work after a reboot so long as you selected **Custom then click Apply** above.

**Manual Tuning**

This little App allows you to set the Custom Beam Frequency and Beamtype to find the correct Settings fast. You can update the EU and US Beam Settings of your DC3 with the ones that are delivered by this Software as well by using the "Save to DC" Button.

Frequency: 12.0894      Beam type: 36

**Other Beams**

Americas: 12.0894 Ghz - Type 36  
Europe: 12.6231 Ghz - Type 36

Save to DC3

Save    + 5khz    - 5khz

Panel 1 of Fig. 21a Manual Tuning

**Tuner**

Satellite   Custom   LNB   Status

Custom  
Americas  
EU  
Custom  
Beam type

Active Antenna

Apply

**Tuner**

Satellite   Custom   LNB   Status

Frequency (GHz)  
12.0894

Beam Type  
36

Fig. 13a **Reset** Satellite Frequency and Beam Type

If you get no signal in the Status TAB Fig. 23, proceed to the **Autotune** setup in Panel 2.

### Step 2b - The Autotune Setup

Here's where it might get a bit difficult if the Bias-T voltage is OK, you sited your LNB correctly, and you selected the Custom Satellite with the correct Frequency and Beam Type. Because Othernet is now using a narrower bandwidth (reduced from 800 kHz to 200 kHz), it is more difficult to select the correct operating frequency for each LNB since they all have different local oscillator (LO)



frequency stabilities. Even if you correctly site your antenna, you may not be able to receive until you fine tune the Dreamcatcher's operating frequency. (It is also possible that you have not sited your LNB correctly, so check that again.)

*Even on paper, the packets won't appear with a frequency offset greater than 25% (50 kHz). So far we've noticed that 25 kHz of offset is a pretty reliable window. It is said the Maverick will work - - **but some Forum Members have been unable to achieve lock with it.** The offset is probably just much farther out. Please keep in mind that most commercially available DTH LNBs are specified to a 1,000,000 Hz offset (aka +/- 1000 kHz). See Annex F for more information on LNBs.*

*The Maverick Single LO: 10750 MHz was shipped with Dreamcatcher 3.02Q - - one of the first units we were using on the KU band. It has a stability of  $\pm 1$ Mhz. With the Dual LO 9750/10600 MHz LNB, shipped with Dreamcatcher 3.05, it has a stability of  $\pm 200$  Khz. The Bullseye Dual LO LNB (soon to be released with a new Dreamcatcher Version and currently available in the Othernet Store), has a stability of  $\pm 10$  Khz and operates as a Dual LO: 9750/106000 MHz in Skylark.*

Rechecking the Panel 1 of Fig. 21a settings to make sure you have set the correct values for Frequency and Beam Type for your location, and have clicked the **Orange Save button** on the bottom left of Panel 1 which puts those values into your Custom Satellite TAB. Go to Panel 2 of Fig. 21a - - you should see either 12.0894 or 12,6232 and Beam Type 36. Select the orange button **Start Auto Tune** which will start to tune to whatever frequency you set. When you run it, it takes some time to complete, so watch its Autotune Status timer. When successfully completed, it will say **Got a Lock at 12.08931 GHz, new Frequency set: 12.089331 GHz** as in this example. If you don't get a lock, increase the steps button to 20, and retune as this widens the tuning range. The **new Frequency set:** will be **automatically saved** to your Skylark program as a Custom Satellite setting, so even if you reboot your Dreamcatcher, it will remain in effect.

### Autotune

Enter how many 10khz steps you want to search over and under the center Frequency of your Custom Beam to find a initial Lock.

If a initial Lock is found the Frequency Compensation of the SX1280 is used to calculate the right Frequency. Click the Start Autotune Button to let the Software search for a Freuquency, it will stop if it got a Lock on the Satellite.

Autotune Status		
Steps	State:	Standby
<input type="text" value="10"/>	Frequency:	12.0000 Ghz
	Lock:	0 - 0%

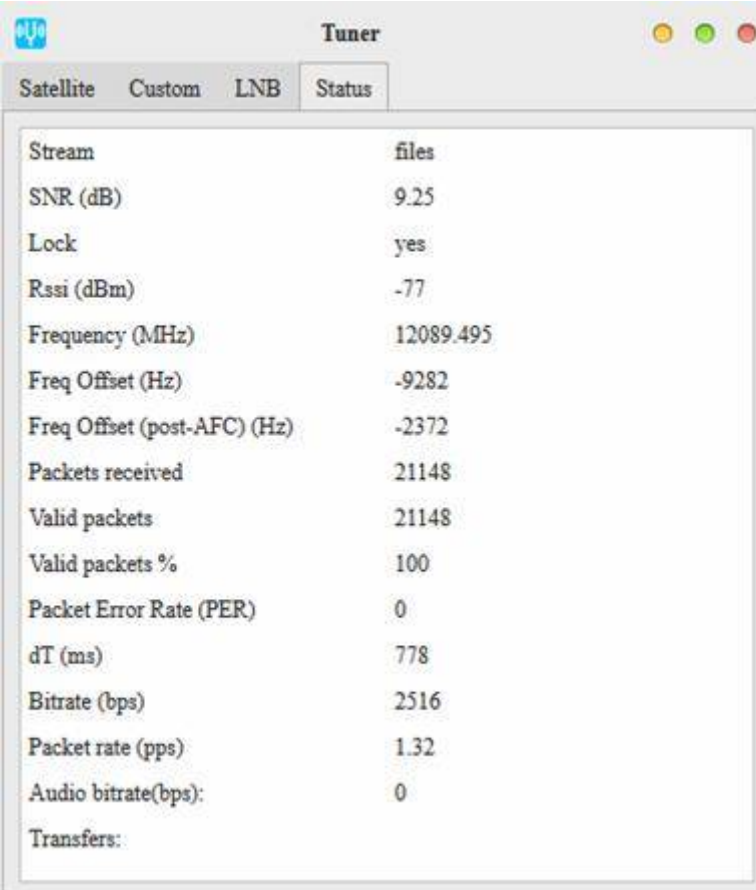
Start AutoTune

Panel 2 from Fig. 21a **Autotune**

**Step 3.** Once you have set the Dreamcatcher's Tuner App & Frequency correctly, **slowly physically move your LNB horizontally and vertically to maximize the SNR (dB) making it as large (less negative) as possible.**

The Tuner Status screen in Fig. 23 will show the *SNR (dB)* line fluctuating at a value **above -14 dB** (sometimes as high as + 10 dB), the Lock line saying **yes**, and the *Rssi (dBm)* line fluctuating at a

value between **-60 and -95 dBm**. Lower Rssi levels such as -100 dBm may carry signal, but the Dreamcatcher is not sensitive enough below -95 dBm. On the top of the Tuner Status Screen, you will see what type file is being downloaded at that moment - - either *audio* or *files*. At the very bottom of the screen you will see what file is being downloaded or just finished downloading at any time. This picture represents a successful connection at latitude 39 deg N longitude 76 deg W in mid afternoon with an accurately pointed LNB, and a fine tuned LNB. Additionally, LED 6 will be **fast blinking dim green if data packets are detected**.



The screenshot shows a window titled "Tuner" with four tabs: "Satellite", "Custom", "LNB", and "Status". The "Status" tab is selected, displaying a list of signal parameters and their values.

Parameter	Value
Stream	files
SNR (dB)	9.25
Lock	yes
Rssi (dBm)	-77
Frequency (MHz)	12089.495
Freq Offset (Hz)	-9282
Freq Offset (post-AFC) (Hz)	-2372
Packets received	21148
Valid packets	21148
Valid packets %	100
Packet Error Rate (PER)	0
dT (ms)	778
Bitrate (bps)	2516
Packet rate (pps)	1.32
Audio bitrate(bps):	0
Transfers:	

Fig. 23 Tuner Running Correctly on SES-2 at Latitude 39 degrees N

#### Step 4. Dreamcatcher Placement

In your final setup, it is recommended to place your Dreamcatcher a few feet away from any RF generating sources (good example being a WiFi Access Point). Degraded download performance and system lock-ups have been reported when the Dreamcatcher was located too close to a WiFi Access Point. In some situations, AC power pick-up on the charging cable has caused problems. AC pick up problems can be reduced by using a ferrous choke around your power cord. One method of determining interference problems after you have acquired satellite access, is to look at the % valid packets and packet rate shown in Fig. 23. It should show close to 100% *Valid packets*, with a *Bitrate (bps)* approximately 2,500 in North America on SES-2 (87W), and in Europe on Eutelsat 8WB (8W).

Valid packets	118828
Valid packets %	100
Packet Error Rate (PER)	0
dT (ms)	759
Bitrate (bps)	2512
Packet rate (pps)	1.33

### **Optional Step 5. Cones and Horns to Improve SNR**

Several users living on the fringe of SES-2's and Eutelsat's ERIP area have discovered using a cone or horn around the LNB improves SNR by as much as 6 dB in some cases being the only way to close the link. The cones and horns being used are 8 inches tall with an upper diameter of 4 inches (either in diameter, or 4 inches by 4 inches square), and a lower diameter of 2 inches (either in diameter, or 2 inches by 2 inches square). Both martini shakers, collapsible stainless steel drinking cups, and solid aluminum or garden mesh wires are being effectively used. *Pringles potato chips tubes (which are aluminum lined) also work well and allow you a snack while sighting your LNB.* Check Annex C by @wbrown for more detailed design information.



**Optional Step 6 - Free-to-Air Antennas.** Connect your Dreamcatcher to an outside **free-to-air (FTA) Ku-Band LNB/dish antenna** using the Othernet Dual LO LNB. The Dreamcatcher Board is powerful enough to operate at least to 400 feet of RG6 cable - maybe more! The only caveat is you **cannot use** a DiSEqC switch in series with your outside LNB/dish. Depending on the length of your cable, you may not be able to use a standard FTA antenna motor such as a STAB-HH90 or Sadoun DG-280. Some Forum Members have successfully used the STAB-HH90 at 125 feet.



If you chose to use the Maverick Single LO LNB as your FTA LNB, your FTA must be tuned to 9750 - 10750. If you chose to use the Othernet Dual LO LNB as your FTA LNB, your FTA must be tuned to 9750 - 10600. Many stock FTA LNBs work with Skylark using the Tuner Setting for the Maverick LNB, but Forum Members have experienced some difficulties achieving lock with them.

There is a comprehensive discussion in Will Brown's paper (Annex C) discussing the use of old Dish and Direct TV LNBs/parabolic dishes, and Circularly Polarized LNBs.

**Optional Step 7 - Inline Satellite Amplifier** Many use a *Pico Digital LA-2150D Series Satellite IF Inline Amplifier* which adds 20 dB of additional signal gain and a significantly improves SNR and Rssi. If you are running longer stretches of 75 ohm cable, this is a way of accommodating loss.

## Section IV - Connecting the Dreamcatcher to Your Local Router by WiFi as a Client

In order to use the Network App, you must use logon **Othernet**

**Step 1.** On the Applications Screen (Fig. 24), open the Network Icon to run the **Network App**.



Fig. 24 Applications Icons showing **Network App**

**Step 2.** The default Network Screen (Fig. 25) is set to **Create a Hotspot** called **othernet** with no password.



Fig. 25 Default Network Screen

**Step 3.** Open the **WiFi Client** TAB (Fig. 26), and fill in your Access Point Name and Password. You cannot connect to a WiFi Client network that does **not broadcast a SSID**, but you can connect

to a WiFi Client network with complex (8 or more element passwords such as *Uwp!820@*). **Your network must be connected to the internet** to perform this step. **A word of caution** here because once your Dreamcatcher is connected to the internet, it reports back to Othernet's Chicago , Illinois , USA , headquarters its location. **If stealth is required** in your country, do not perform this step. If you still want to connect your Dreamcatcher to you local network, block the outgoing signal in your router. Different routers have methods of doing that.

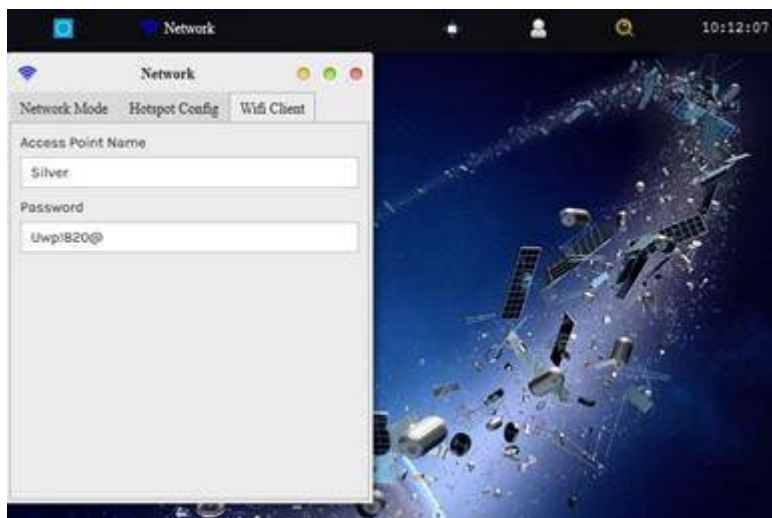


Fig. 26 WiFi Client Screen

After entering your Access Point Name and Password, go back to the Network Mode TAB (Fig. 27) and select **Connect to a WiFi router**. Then **Click Apply and Reboot**. At this time you will lose the WiFi connection between your computer and Othernet's WiFi Hotspot as the Dreamcatcher connects to your local WiFi as a client, and gets assigned an IP address by your router. Sometimes it could take up to 2 or 3 minutes for the changes to load, so be patient. If you **mistype** your Access Point Name or Password, the Dreamcatcher will connect, but you won't see it when you try to access it as in Step 4 below. To regain access to the Dreamcatcher, proceed as in Step 6 below to go back to the Hotspot mode, then redo this step.

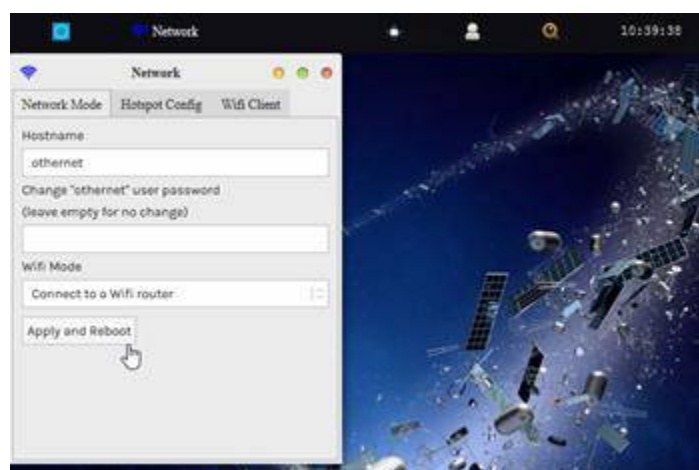


Fig. 27 Network Mode TAB ready to Connect to a WiFi router instead of Create a hotspot  
**Click Apply and Reboot**

Keep in mind that when connected to a WiFi router, reconnecting to it after **a power failure** presents a unique problem - - the reason is most Routers take longer to boot up than the Dreamcatcher.



As a result, the Dreamcatcher is trying to reconnect to the Router before the Router is ready to accept a connection and assign a Client IP address. The Dreamcatcher **must be the last device** to power up after a power failure.

**Step 4.** You will be connected to Dreamcatcher's Skylark Program through your local WiFi from your router. You can go to any computer on your router's network, and use any Web Browser to access Skylark through its newly assigned IP address, or by typing [my.othernet.is](http://my.othernet.is) (which requires an internet connection to work). **If you cannot find the Dreamcatcher's IP address using your router** or [my.othernet.is](http://my.othernet.is), suggest you use a shareware program such as Angry IP Scanner (<https://angryip.org>) (Fig. 27a) for Windows, MAC, and Linux; or Advanced IP Scanner <https://advanced-ip-scanner.com> **Look at Annex D for v3.03 differences #5**

If for some reason, your Dreamcatcher did not get assigned an IP address on your Client Network, the application of the Connect to a WiFi router command **may have failed**. Power Cycle the Dreamcatcher 3 or 4 times. If you still don't get an IP address assigned, return to the AP Hotspot mode as in Step 6 below, and start over with Section IV Step 1.

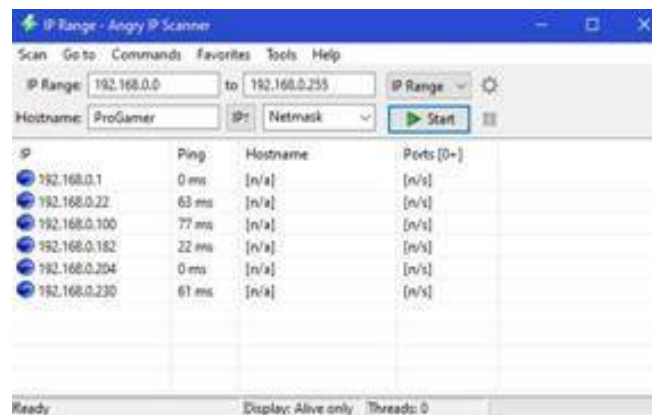


Fig. 27a Angry IP Scanner Results  
Showing the New IP Address for  
Dreamcatcher as 192.168.0.230

Another update implemented in Skylark 5.5 was that of receiver IP lookup. For those on Linux, Android, MacOS or iOS, you should also be able to access the receiver on you LAN by going to <http://othernet.local> For Windows users, this may work if you already have Bonjour Services installed; if not, Bonjour Services can be installed using this installer from Apple at: [https://support.apple.com/kb/DL999?viewlocale=en\\_US&locale=en\\_US](https://support.apple.com/kb/DL999?viewlocale=en_US&locale=en_US)

**Step 5. Changing the administrator user password and the othernet WiFi HotSpot password** is sometimes required if you are sharing your Client connection, and don't want anyone to gain administrative access to your Skylark program or connect to your Dreamcatcher.

**Administrator Password Change** Go back to the Network Mode TAB and enter a new password as shown in Fig. 29. Once the password is changed, everywhere where you had entered "othernet" as a password, you will use the newly established password **a\*3Bx54** Once changed and **Applied and Rebooted**, the new password will not show up in that block but it has been changed. If you want to change it again, redo this step.



Fig. 29 Network Mode TAB Showing Method for Changing Othernet Admin Logon Password  
**Click Apply and Reboot when Finished**

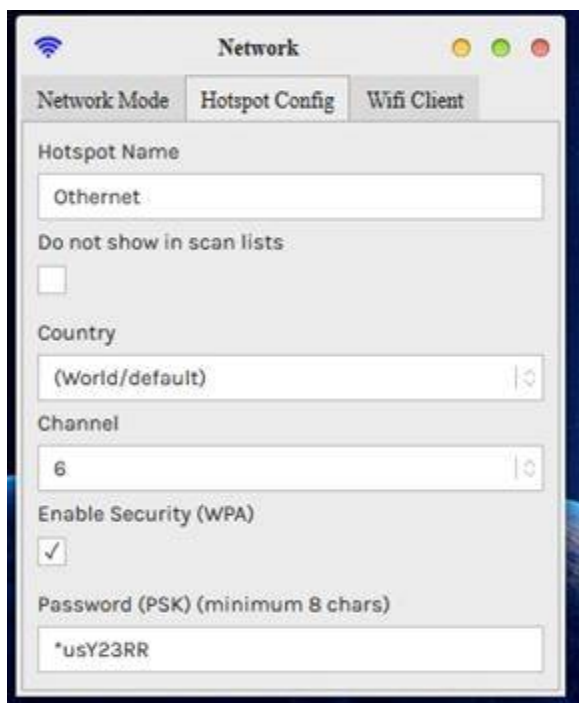


Fig. 29a Network Mode TAB Showing Method for Changing Othernet Hotspot Password  
**Click Apply and Reboot when Finished**

**Othernet WiFi HotSpot Password Change** If you want to protect your WiFi HotSpot of the Dreamcatcher, add a password **\*usY23RR** to protect it by going to the *Hotspot Config TAB (Fig. 29a)*. Don't forget to go back to the Network Mode TAB to click APPLY.

**Step 6.** The Dreamcatcher v3.05 has an **important new process using the PB1 Button** to return to the Hotspot mode after you leave a network. Looking at the Dreamcatcher board pictured on the next page - - to enable a return to the AP Mode, press PB1 once. LED 1 will light solid green. After about 7 seconds, all the LEDs will glow solid and the **Dreamcatcher will reboot into the AP Mode.**

**This function is important** if you leave a network and have to reenter a new network name and password, or if you incorrectly entered your own network information. After you initiate this option, you must completely restart **Section IV** from the **Othernet WiFi Hotspot**, and reconnect to your local router by WiFi as a Client. Make sure your satellite and LNB selections did not change - - they should remain the same. **Look at Annex D for v3.03 differences #6**

**What Else Does The PB1 Button Do?** You **do not push** the Power On/Off Button **at all** when using the PB1 Button. The PB1 Button cycles thru three Functions (which used to be selectable on the Touch Screen on the Dreamcatcher v3.02Q and V3.03) selecting the one of your choice **rebooting the Dreamcatcher into the AP mode each time.**

*Function 1:* Switches the Dreamcatcher to the AP mode and Reboots into the AP mode.

*Function 2:* Resets the configuration - - any WiFi configurations, AP/STA mode

settings, hostname changes, password changes, beam selection, custom beam settings, LNB selection - all of that. **BUT** it does **not** clear downloaded files from storage. Then it Reboots into the AP mode.

*Function 3:* Does everything Function 2 does, *plus* it clears all downloaded files as well. This is a **FACTORY RESET**. Then it Reboots into the AP mode.

- If you press PB1 exactly once, LED1 turns on and flashes a "1" pattern: Long green, long green, then repeating. This action selects *Function 1* rebooting the Dreamcatcher into the AP mode. com

- If you press PB1 again (for a second time within about 7 seconds of the first press), LED1 now flashes a "2" pattern: Long green, short green, long green then repeating. This action selects *Function 2* resetting and rebooting the Dreamcatcher into the AP mode.

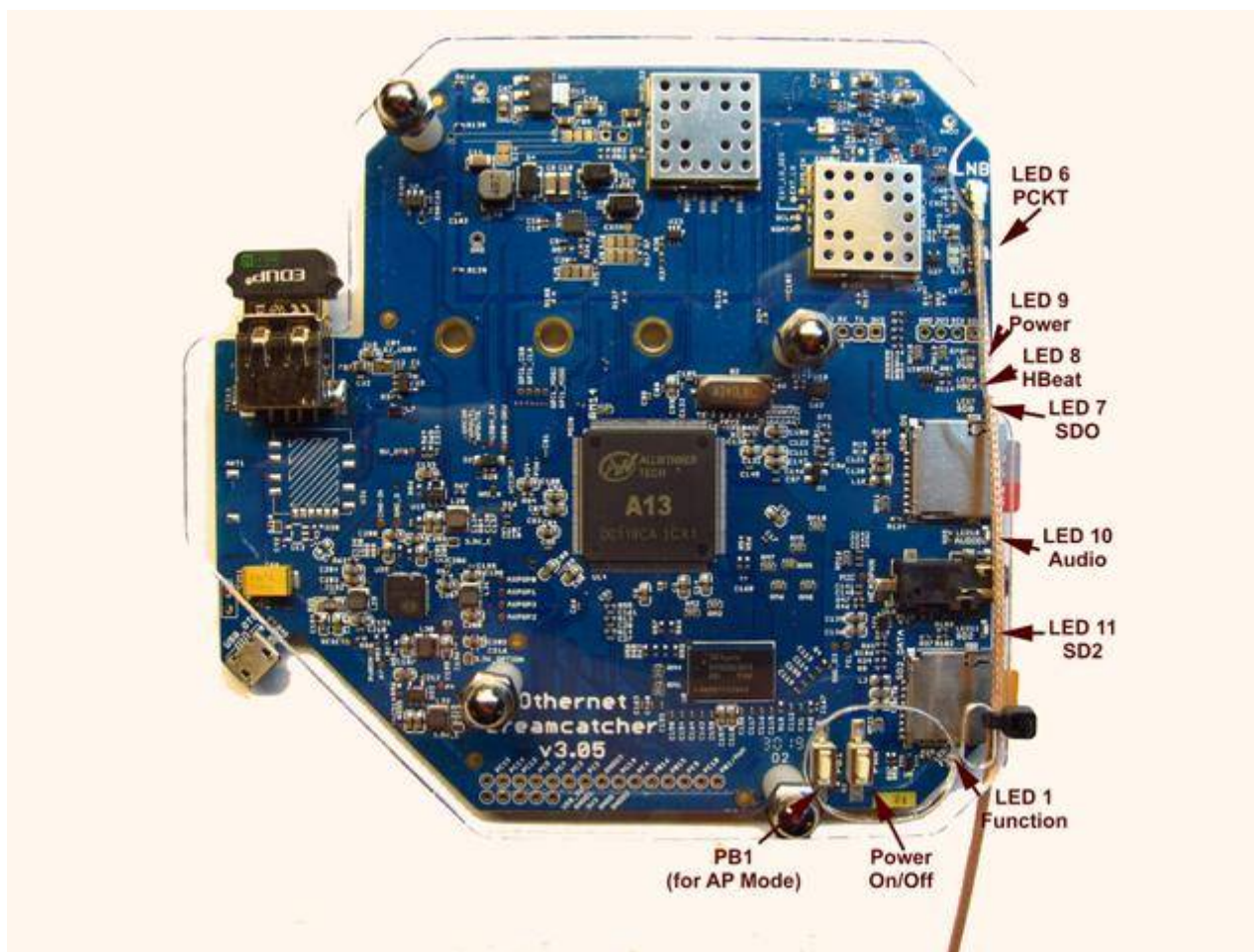
- If you press PB1 again (for a third time within about 7 seconds of the second press), LED1 now flashes a "3" pattern: Long green, short green, short green, long green, then repeating. This action selects *Function 3* resetting and clearing all the downloaded files; and rebooting the AP mode. This is a **FACTORY RESET**.

- If you press PB1 again (for a fourth within about 7 seconds of the third press), the LED1 turns off and **selects NO FUNCTIONS**. This gives you a way to cancel out of selecting one of the functions.

- When LED1 is flashing functions 1, 2 or 3, and you do not press PB1 within 7 seconds, that specific function takes effect. **Only 4 quick pushes in the 7 second window** cancels out a Function.

**Properly connected and operating, the Dreamcatcher v3.05 with an external micro SD card installed, will display the following LEDs**

***Look at Annex D for v3.03 differences #4***



Design	Color	Name	Function	Normal Operation	Receiving Packet
LED 1	Green	Function	PB1 Presses	Off	
LED 6	Green	PCKT	Receiving packets	On fast blinking dim green	
LED 7	Green	SDO	Shows read/write activity on either SD Card	On blinking green	
LED 8	Green	HBeat	Reports status to Chicago	On blinking green	
LED 9	Blue	Power	OFF/ON indicator	On solid blue	
LED 10	Green	Audio	Blinks if audio is present	On blinking green	
LED 11	Green	SD2	Blinks if SD card is active	On blinking green	
EDUP	Green	WiFi	Green if WiFi is on	On blinking green	

LED Table

**Step 7.** In some installations, a **WiFi repeater** is desirable. Most Dreamcatcher installations can reliably connect with your existing WiFi device to your router, however, low WiFi signal levels do cause unexpected disconnects requiring you to manually reboot the Dreamcatcher. Many users install their Othernet gear outside their residence in open area such as gazebos, decks, sheds, garages, etc. In these situation a WiFi repeater assures reliability of Othernet reception. Install the repeater as **far as possible from your WiFi**, and **as close as possible to your Dreamcatcher**.

**Step 8.** Alternate Connectivity Approach is to use a **USB to Ethernet Network Adapter** instead of going through the Othernet WiFi Hotspot or Network Client approach. Be careful, **NOT ALL** USB to Ethernet Network Adapters work both natively under Skylark and Armbian. Specifically a TP-Link



TL-UE300 works properly.

This Ethernet Dongle is natively supported, so works out of the box. Just replace the EDUP WiFi Dongle (Fig. 1) with the Ethernet Dongle. **Make sure you set Skylark to run in the default WiFi Hotspot mode.** The downside of this approach is you need to determine the actual IP address as in Section IV Step 4 using your router or another program.

**Step 9. Calls** The apps, when they make a “call” to the Skylark server over WiFi, show a rotating “progress bar” indicator of sorts. They vanish when the call successfully complete. Tuner app, for example, makes this call about once every second. The Wikipedia app makes it only once, when you open the app. The Log Viewer app makes it every time you click on a label in the left column.

Sometimes while this call is being made, we may experience a temporary connection loss over WiFi. That causes the call to fail, and the “rotating plus” associated with that call just hangs around. Meanwhile, an app like the Tuner app might give up on the failed call, and initiate another one. Every time this failure happens you accumulate another “rotating plus”.

These are really just showing failed calls. If too many of them are accumulating, you should check you WiFi signal. If you only see them accumulate every once in a while, the easiest way to clean them up is logout and log back in. They serve as a kind of record of WiFi connectivity loss.

**Optional Step 10.** Forum Members also use **Port Forwarding** options on their network routers to be able to see the Dreamcatcher remotely. *To be able to grant full access to all of Skylark's functions, you will need to Port Forward two different ports illustrated by an Asus RT-AC68U router. Port 80 gives access to the Skylark screen, and port 8090 gives access to Skylark's Radio.* This is how I am able to view my Dreamcatcher from remote computers away from home. Not all internet providers allow Port Forwarding, Virtual Private Networks (VPN) don't always Port Forward, and older routers do not always have a Port Forwarding option. I use an Asus RT-AC68U connected to my internet provider and port forward my Othernet terminal. I feed a second Asus RT-AC68U (daisy chained) to provide VPN protection for the rest of my network.

Port Forwarding List (Max Limit : 64)							
Service Name	External Port	Internal Port	Internal IP Address	Protocol	Source IP	Edit	Delete
HTTP Server	80		192.168.0.22	BOTH			
HTTP Server	8090		192.168.0.22	BOTH			

**Step 11. Dreamcatcher Reporting Status to Headquarters** The Skylark program has a function that reports your Dreamcatcher's data back to Othernet. Once your Dreamcatcher is running and connected to your local area network, Skylark reports the program's “heartbeat” via the internet (if you have an internet connection) to Othernet's Chicago, Illinois, USA, headquarters on a world map with colored balloons (Green being SNRs above -16 dB). The status screen can be viewed at <https://status.othernet.is> which renews every 30 seconds and is shown here in Fig. 25c. You can scroll in and out with your mouse wheel and move the map around by clicking on it and moving your mouse. Sometimes your mouse might not work correctly in Firefox without disabling the Logitech setpoint plugin. This reporting amounts to about 1.6 MB/day of data with your Dreamcatcher reporting in every 5 minutes. **It cannot be disabled in Skylark.** If you want to block it with your router or Pi-hole, look for [telemetry.othernet.is](https://telemetry.othernet.is), and block it. You can also block your Dreamcatcher's IP entirely by firewalling it within your router, or use a Virtual Private Network (VPN) to completely block your location being detected. This may be a **Stealth Issue** in your



country.

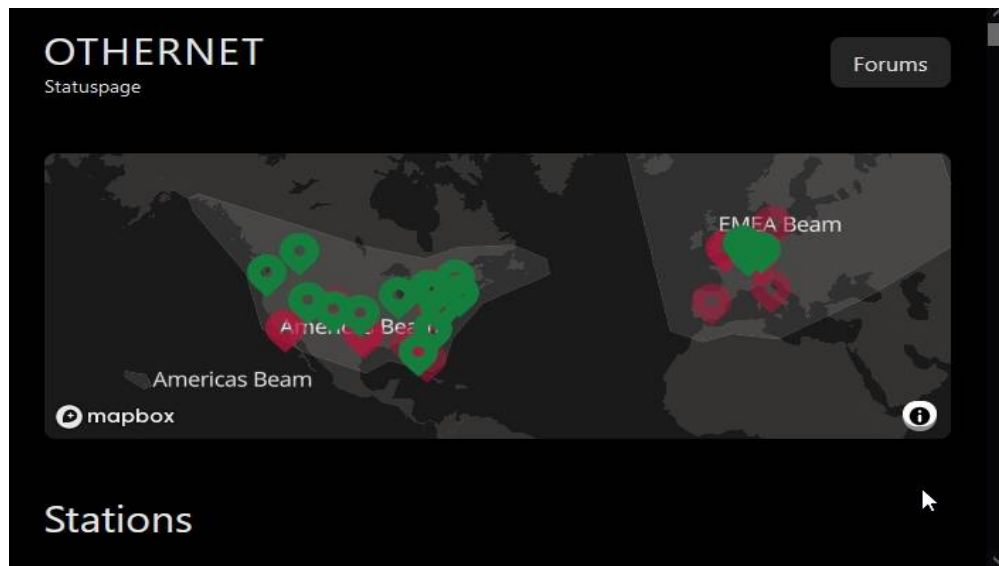


Fig. 25c Status Report

Features:

- Interactive Map, zoom in and out or drag the Map as you like
- Fast Update of 30s, instead of the 5min interval before
- Markers in Red or Green (SNR > -16db)
- Click on a Map Marker to view a few infos of the Client
- Table with more Information about the Stations
- The Table row of the selected Marker will be marked so you can find it
- Clicking a Table row will toggle the marker Popup in the Map
- Satellite Beam coverage marked on the Map
- Rewritten Telemetry backend, status page also on HTTPS now

## Section V - Additional Storage

**Step 1.** A micro SD data card **of any size** can act as additional storage. Make sure to use a fast high quality micro SD card formatted **FAT32**. Plug it into the Dreamcatcher Board's SD2\_DATA which is the SD card holder on the bottom right of the Dreamcatcher Board. You should **not plug and unplug** the micro SD card while the Dreamcatcher is writing to the micro SD card as it may cause a writing error. LED 11 blinks fast green when the micro SD card is being written to. **In Skylark, you cannot upload files from your computer to the additional storage device; and you cannot delete previously uploaded files - - you must remove the micro SD card and use your computer.** If you use a micro SD card larger than 32 GB, make sure it is **FAT32** formatted - - 64 and 128 GB micro SD cards come exFAT formatted which **will not work**. Micro SD cards up to 64 GB have been tested and work fine.

**Step 2.** It has been randomly observed that - - no boot occurs if a micro SD card is installed in the data slot. Some boards work and others don't. If this occurs in your setup, (with the power on) temporarily remove the second micro SD card in the data slot while Skylark boots, then push it back in.

**Step 3.** Additional storage can also be provided by installing a FAT32 formatted USB Flash Drive or hard drive plugged into a passive hub (Fig. 30) along with the EDUP WiFi Dongle (Fig. 1). Both a micro SD card and an external storage device can be used simultaneously under Skylark. Again, make sure the USB Flash Drive and hard drive are FAT32 formatted. I suggest you use Rufus 2.17 to FAT32 format large *micro SD cards and USB Flash Drives* available at <https://rufus.ie/downloads/> For FAT32 formatting of hard drives, I suggest you use AOMEI Partition Assistant available at <https://www.disk-partition.com/download-home.html> and externally power it.



Fig. 30 I-tec Passive Hub

By adding additional storage, the Dreamcatcher's Skylark program will be able to periodically copy downloaded files to one of the storage devices *each time you remove/reinsert the external storage device or reboot your Dreamcatcher*. This function preserves files so you won't lose them when you re format the SD\_OS card, or update Skylark to a newer version. Keep in mind you will be storing approximately 2 GB of data per month, so a large micro SD card or flash drive is desirable. *(The micro SD card used with the Skylark operating system automatically gets cleaned of old files hourly, so it never fills up. The files cleaned are erased and not saved. That is why I recommend only a 16 GB micro SD card for the Skylark program.)*

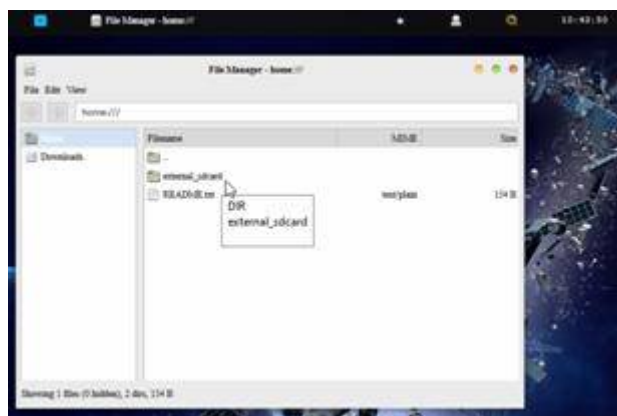


Fig. 31 Accessing Files on Additional Storage

**Step 4 - Installing and Running The Rachel Data Base and Other Programs** Access to files on additional storage devices is done by going to the **File Manager App** (Fig. 31) on the Applications Screen.

Access the **External\_sdcard** folder (Fig. 32) and go to the file you want to run in Skylark. Several Forum Members run the Rachel Data Base, videos, music, and pictures. When you select a file to access, choose Skylark's Reader program (Fig. 33) to view it as Rachel is shown in Fig. 34. You can alternately select the file, and *Download it to your computer* (Fig. 35) to view it.

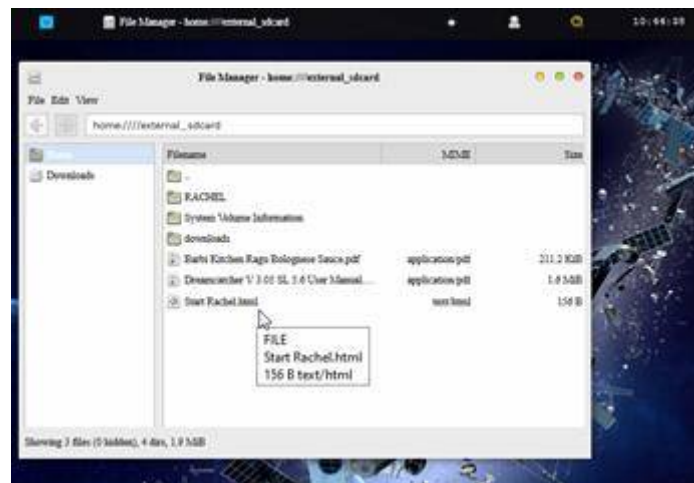


Fig. 32 Select the file you want to run e.g. *Start Rachel.html*

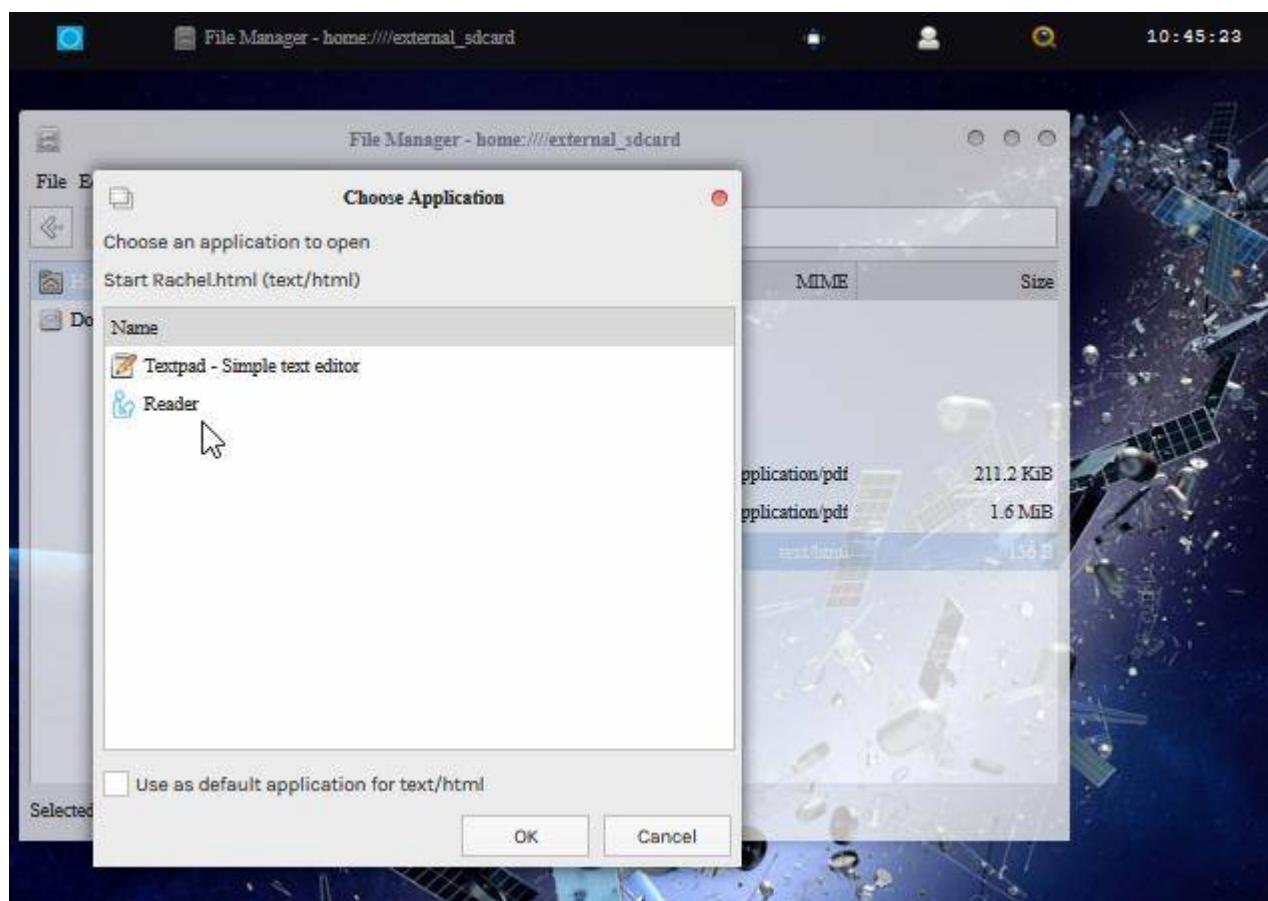


Fig. 33 Choose Skylark's Reader Program

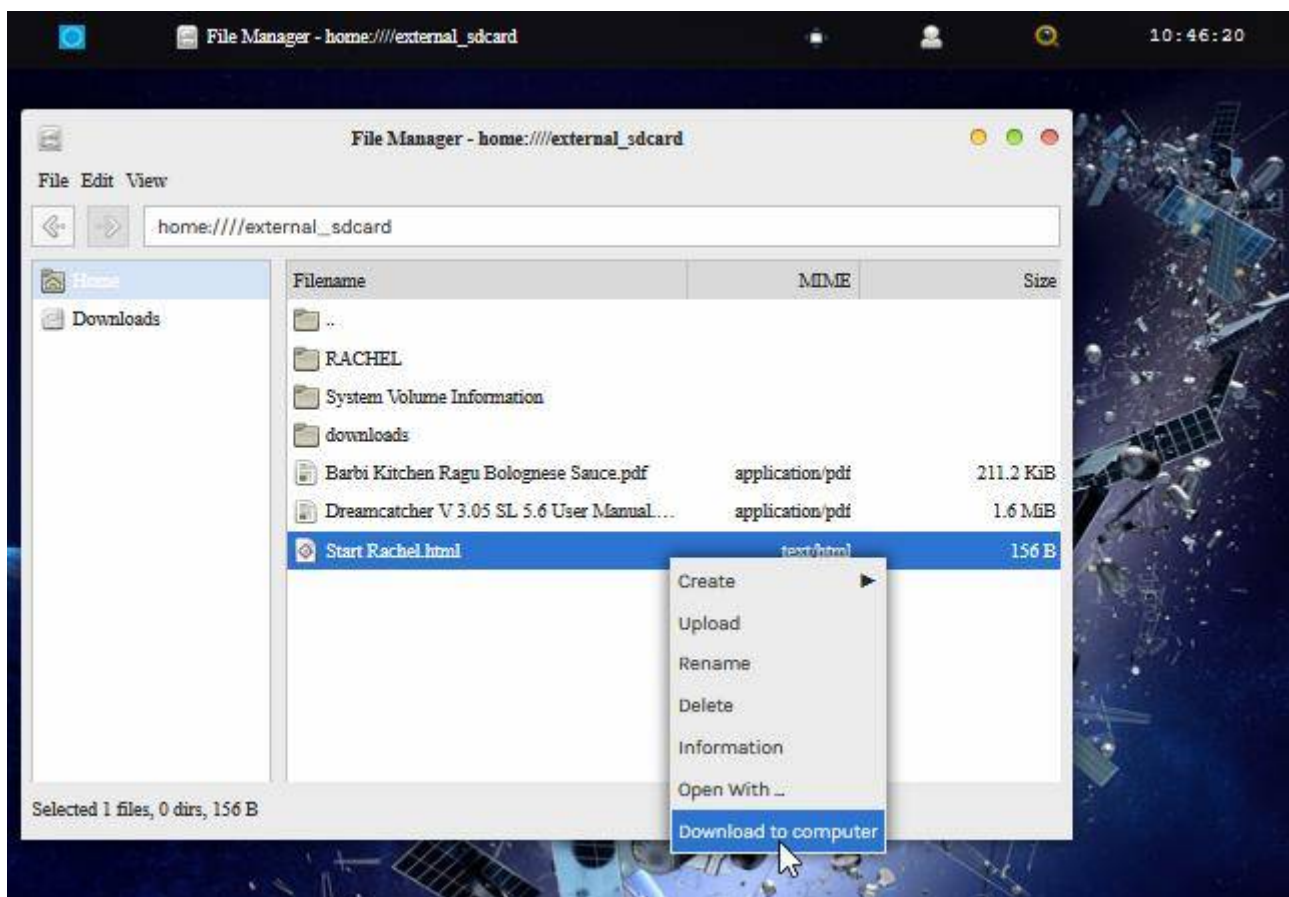
Fig. 34 Rachel's *Start Rachel.html* file viewed in Skylark's Reader Program

Fig. 35 Download to Computer



## Section VI – Printing and Othernet Satellite Radio

**Step 1. *Printing*** frames from the Skylark data is possible if you use a **Firefox Browser**. *MS Explorer, Opera, and Chrome don't work properly in the Windows world.* The technique is very simple. Right click on the frame you want to print, as in Fig. 36, select *This Frame* to pop up the *Print Frame* drop down, and then select *Print Frame*. It will print fully in as many pages that are necessary.



Fig. 36 Printing Frames Using Firefox Browser

**Step 2. *Othernet Satellite Radio*** is available by either use of the native Skylark App, or plugging a standard 3.5 mm stereo speaker into the speaker output plug on the Dreamcatcher Board. Audio is not stored in Skylark - - it is a live event. ***Othernet Satellite Radio*** was broadcasting continuous Voice of America (VOA) News until January 2021. Reduced bandwidth resulted in its suspension. If new content is added, it is reported on the Forum at <https://forums.othernet.is> In the Interim 5 minute VOA newscasts are being uploaded daily. See **Section VII Skylark Content** under ***Files Manager*** for details.

**Method 1 - - Native audio/sound** is found in the Radio App shown in Fig. 37.

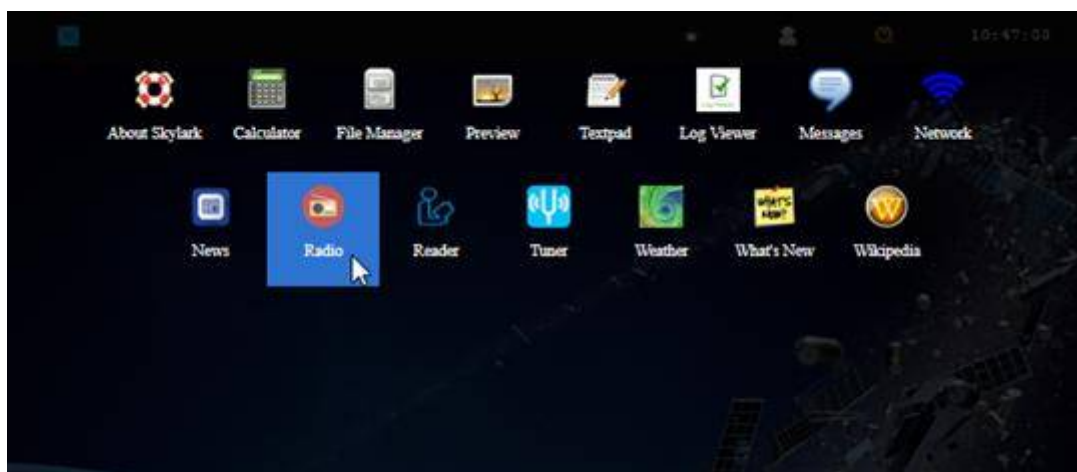


Fig. 37 Radio Application Icon

Fig. 38 Radio Icon Screen with MP3 Player selected for listening to **Othernets Satellite Radio**

Play **Othernets Satellite Radio** directly here by clicking on the "play bar" shown in Fig. 38, or select [Othernets Satellite Radio](https://www.videolan.org/vlc/) and open it in a new browser window. You can also run it with VLC (<https://www.videolan.org/vlc/>) RealPlayer or Windows Media Player if you copy your network URL to the player.

**Method 2 - - Use of a speaker** plugged into the standard 3.5 mm stereo output plug. Some users connect the speaker output to an *FM Player Transmitter* so they can tune to **Othernets Satellite Radio** on a standard FM radio. If you use a device that requires external power from a USB cord, make sure to power it from a separate power source. The Dreamcatcher power budget **cannot** support it.

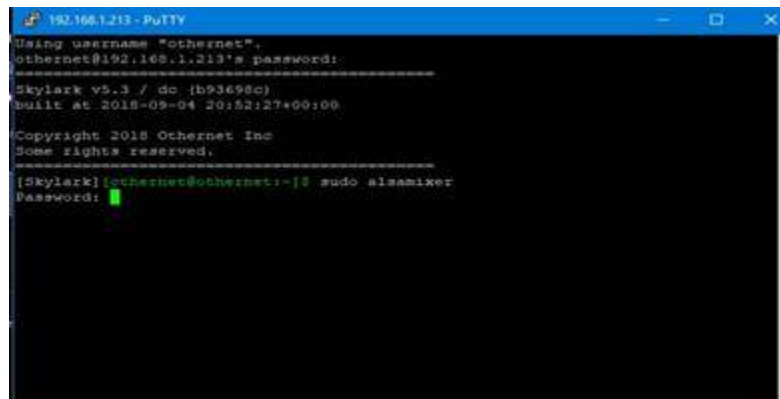
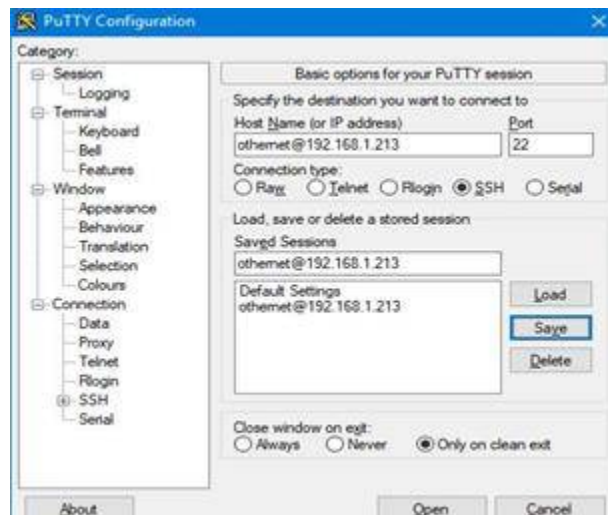


FM Player Transmitter

**Step 3. Increasing the Volume of the Othernets Satellite Radio** can be accomplished "on the fly" with a software modification to Skylark that *only remains in effect as long as you do not reboot the Dreamcatcher*. This change will have **no effect** on the Native audio/sound mentioned in Method 1.

**Look at Annex D for v3.03 differences #7**

**To make this adjustment** use a program like PuTTY (available from <https://putty.org>) to gain access to Skylark through its Secure Socket Shell (SSH) by entering your IP Client address (192.168.1.213 in this example) into PuTTY. You can do this from an Othernet WiFi Hotpot if that's how you are connected, or as a Client in this example.



Logon with Password: *othernet* (Or your changed password done in Section IV - Step 5.)

Then type *sudo alsamixer*

Then enter Password: *othernet* (Or your changed password done in Section IV - Step 5.)

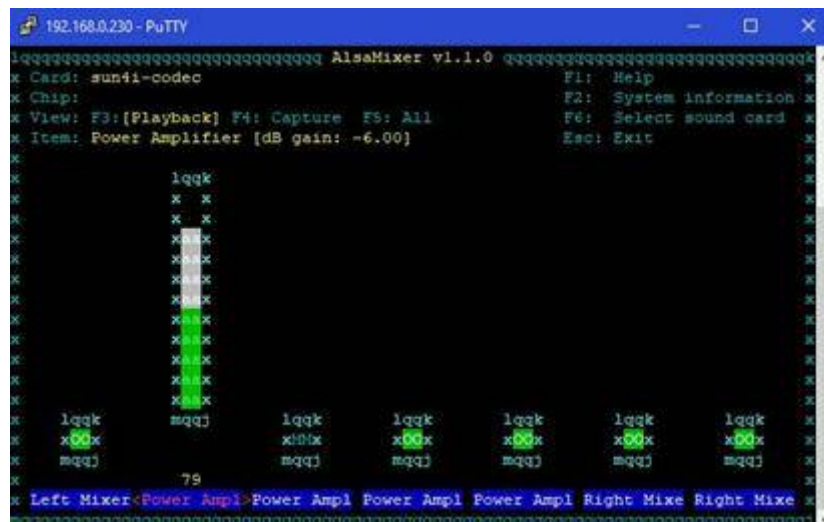


The following control screen appears - - with **<Left Mixer>** in red as the default.

Using your computer keyboard's right arrow key, cursor to the right until the bottom label on second vertical bar turns red and **<Power Amp>** appears - -



Using the UP arrow, move the green bar up to increase the volume from -24 dB (default) - - up to -6 dB or what you like.





## Section VII - Skylark Content

This is a new section of the User's Guide being developed to discuss the various features of Othernet Content. It will provide more information regarding how the App Icons work, and what they provide. To access Skylark Content, you only need to logon as Guest shown in Fig. 8.



Fig. 39 Skylark's 15 Applications Icons

### ***File Manager -***

#### *VOA News Summary Audio Feed*

Forum members @Cheaha and @caveman99 developed a method of providing an automatic Daily 5 Minute VOA audio news feed. You must open the *File Manager Icon* and cursor down to *Uploads* to find it. Select the audio/mpeg file you want and play it.

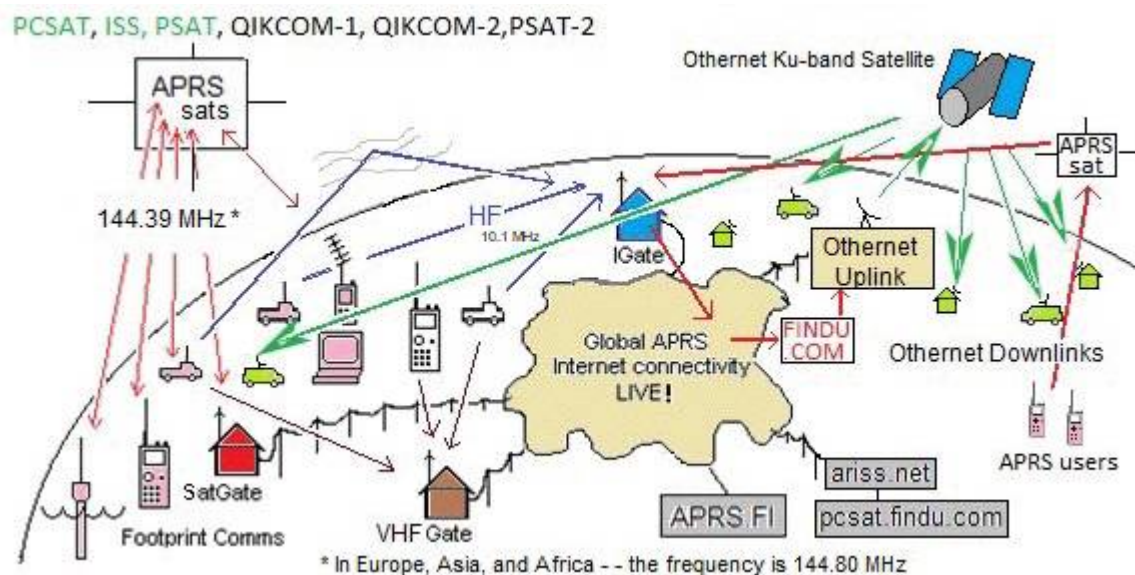


Location of Daily VOA 5 Minute News Summaries

## Messages -

### Automatic Packet Reporting System (APRS) Function in Skylark

As in previous versions of the Skylark operating system, reception of Automatic Packet Reporting System (APRS) messages continues. Licensed amateur radio operators can send messages to Othernet to be broadcast if they include the word OUTNET or OTHER (both case sensitive) anywhere in the body part of their message. If a ham is able to get the message to an iGate, then Othernet takes it and relays it over both beams (North America and Europe ). All Othernet users can read these messages - - you don't need to be a ham to receive and read the messages.



### Non-APRS General Messages

In your Messages Icon you'll now see a few strange, non-APRS messages. Those were sent directly from Othernet Headquarters.

This is how it works: Create a new topic on the Forum Page <https://forums.othernet.is/> On the Forum page, select the category MESSAGES. Enter your message in the title of the topic. The

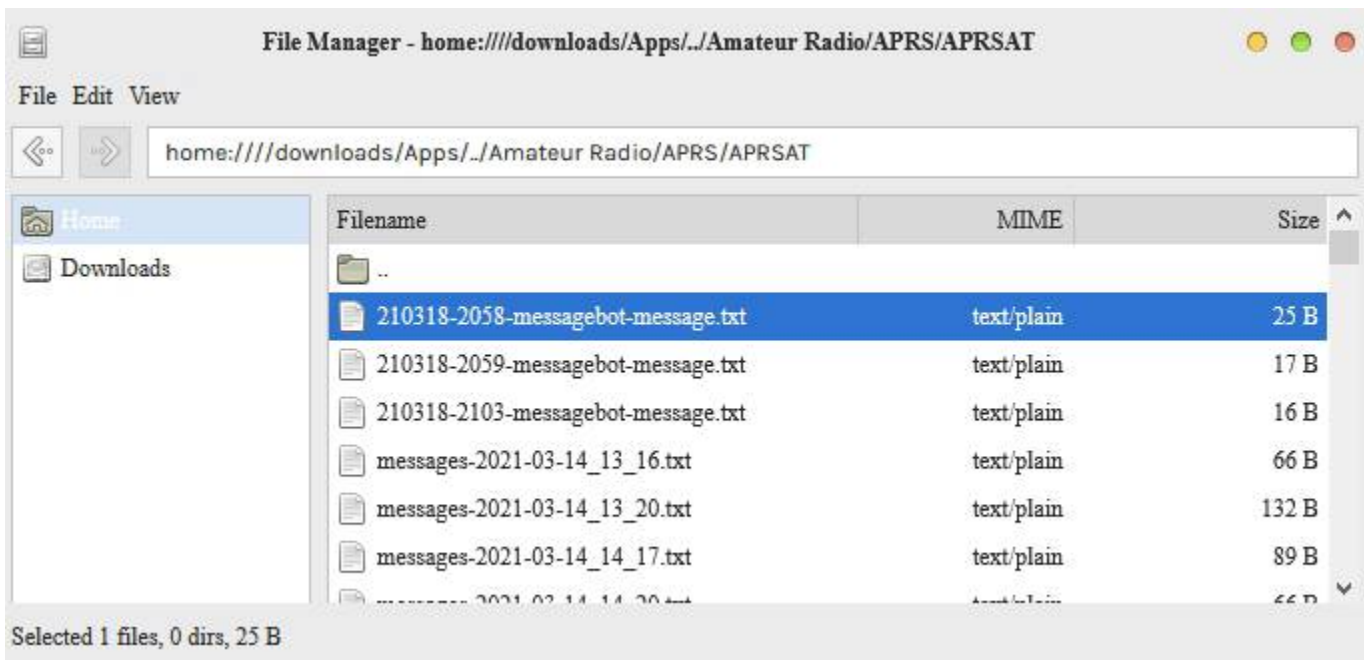
character limit for titles is 200 characters, so that is the maximum length of your message. Add a period (or any random character) to the body of the text. The body of the topic is not broadcast.

Wait about a minute, maybe two. Check the Messages App Icon on Skylark.



Messages			
Date	Time	From	Message
3/19/2021	8:36:00 PM	thomslk from the forums, not via ...	thomslk from the forums, not>This new message feature is great!
3/19/2021	7:49:00 PM	Cheaha from the forums, not via A...	Cheaha from the forums, not>Finally got my Bullseye LNB. Let's see if
3/19/2021	3:50:00 PM	KD4NFS-8 via APRS	KD4NFS-8>RV4P8P,WIDE1-1,WIDE2-2,qAR,W4LCO-1:'mPl XR/'"3
3/19/2021	3:50:00 PM	KD4NFS-8 via APRS	KD4NFS-8>RV4P8P,WIDE1-1,WIDE2-2,qAR,W4LCO-1:'mPl BR/'"3
3/19/2021	3:50:00 PM	KD4NFS-8 via APRS	KD4NFS-8>RV4P8P,WIDE1-1,WIDE2-2,qAR,W4LCO-1:'mPl!~R/'"

Your username is appended to the message. You can also look at the following directory under File Manager: **home:///downloads/Apps/./Amateur Radio/APRS/APRSAT**



After a message is broadcast, the bot will mark the topic as closed. The topic is also marked as unlisted, so that messages do not overload the main forum page.

## News -

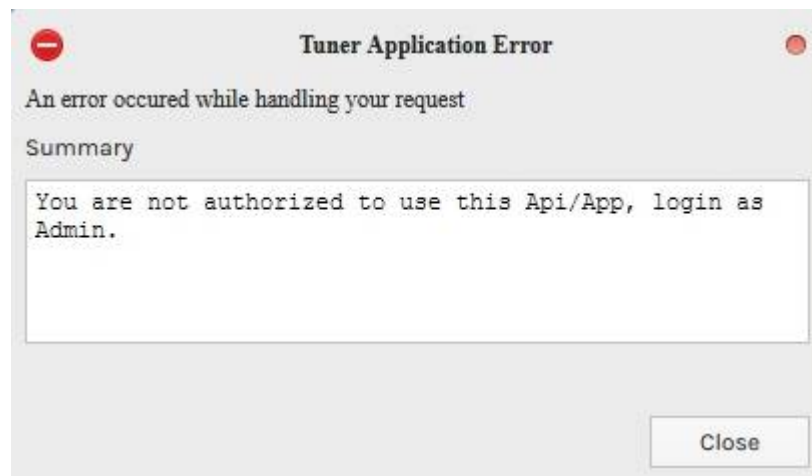
The News delivered by Othernet originates in Real Simple Syndication (RSS) feed from various news organizations. Currently, Othernet is including 16 different feeds in 5 different languages. Among them are Al Jazeera, BBC, Deutsche Welle, Voice of America, and Associated Press. Surprisingly, many stories are so new, you won't have heard them on your local radio or TV.



Sample News Feed

**Tuner -***Viewing the Tuner App When Using Logon Guest*

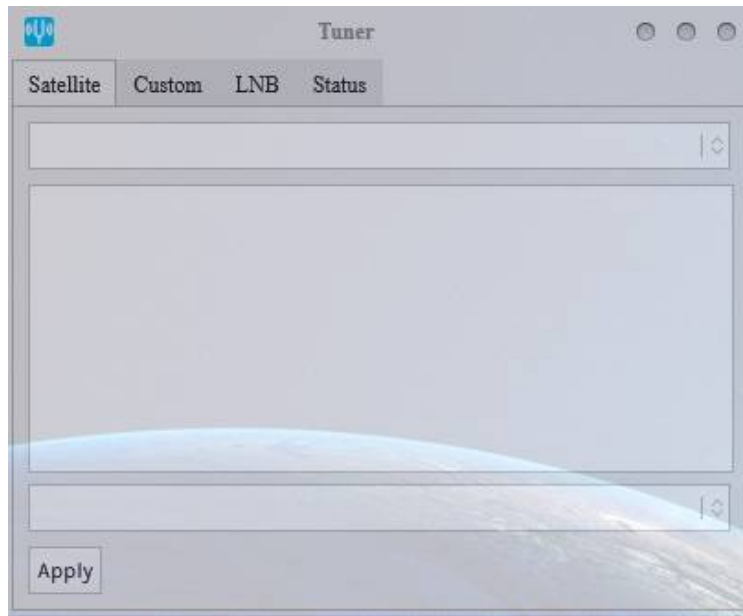
When looking at the Tuner App Icon using logon **Guest**, you will get this Tuner Application Error message:



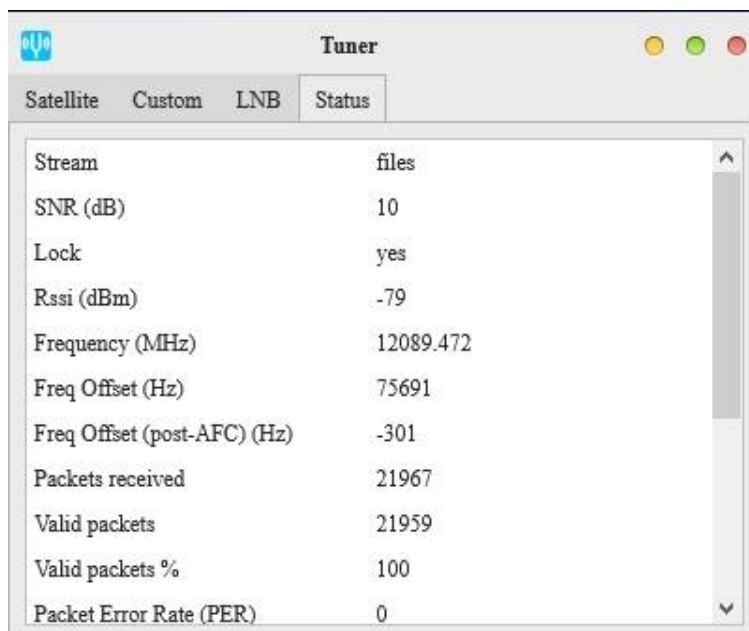
Tuner Application Error Message

Select **Close** and you will see a grayed out TABS in the Tuner App. If you click on the Satellite, Custom or LNB TABS, they will all appear empty. However, if you select the Status TAB, it will show current Tuner information..





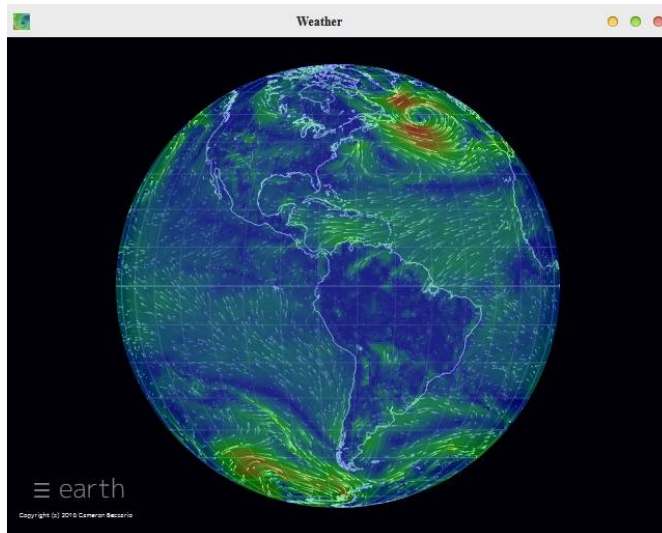
The Tuner App appears grayed out, but if you select the Status TAB you will get current Tuner information



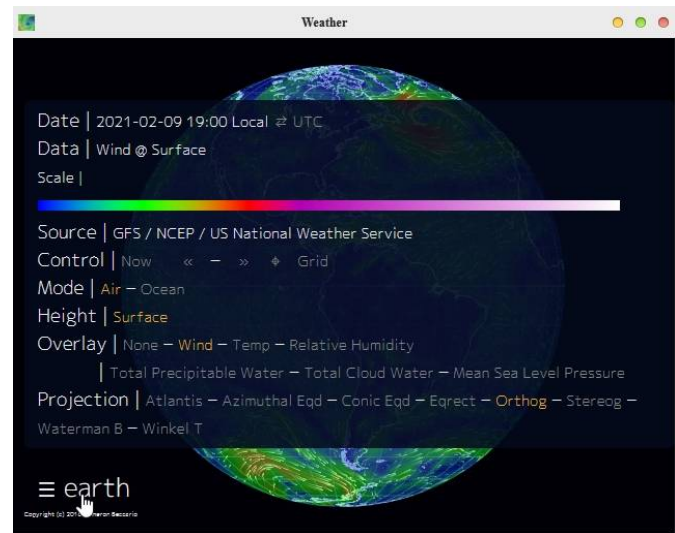
The Status TAB will display current Tuner Information

### **Weather -**

National Oceanographic and Atmospheric Administration (NOAA) world wide weather is reported in the Weather Icon. The source is the *GFS / NCEP / US National Weather Service*. The data is refreshed two times per day. To see weather in your location, move your mouse pointer into the earth and hold down the right mouse button to rotate the globe. If you have a touch screen, you can touch the globe and rotate it with your finger, and zoom the display by squeezing open 2 fingers on the screen or touch pad.



Initial Weather Image of Active Weather



Detail Revealed when the EARTH Button is Pressed

When you click on the EARTH Button on the lower left of the screen, you will be sent to a default view, but can change it as necessary - -



**What's New -**

**Wikipedia -**

## Section VIII - Viewing Skylark Content from Your Computer

Last year, @alberto developed a very useful HTML program that allows your computer's web browser to pull data from the Skylark program running on your Dreamcatcher. Here is what the HTML program looks like pulling data off a Dreamcatcher connected to a local WiFi router at address 192.168.0.213

The screenshot shows the Othernet web browser interface. The address bar displays the file path: `file:///D:/Temp/Amateur Radio/Ken O: 50%`. The browser title is "Othernet". The main content area is titled "Latest Othernet News! \*\*\*\*\*Wind&Weather\*\*\*\*\* Radio". Below this, there are three sections:

### Index of /FS/get/downloads:/News/

Name	Modified	Size
Parent directory	-	-
News/	17-Mar-2021 01:13	[DIRECTORY]
2021-03-28-28.Voice of America - English.Sonny Side of Sports.html	28-Mar-2021 17:18	4.3k
2021-03-28-28.Voice of America - English.VOA Newsweek (2 Minute).html	28-Mar-2021 17:17	4.4k
2021-03-28-28.Voice of America - English.Sonny Side of Sports.html	28-Mar-2021 17:17	7.4k
2021-03-28-28.Voice of America - English.VOA Newsweek (2 Minute).html	28-Mar-2021 17:16	593
2021-03-28-28.Voice of America - English.VOA Newsweek (2 Minute).html	28-Mar-2021 17:16	563
2021-03-28-28.Voice of America - English.VOA Newsweek (2 Minute).html	28-Mar-2021 17:16	677
2021-03-28-28.Voice of America - English.Sonny Side of Sports.html	28-Mar-2021 17:15	660
2021-03-28-28.Voice of America - English.VOA Newsweek (2 Minute).html	28-Mar-2021 17:15	4.1k

### Wikipedia Articles:

### Index of /FS/get/downloads:/Wikipedia/

Name	Modified	Size
Parent directory	-	-
Wikipedia.html	28-Mar-2021 17:22	285.5k
Andy Gandy.html	28-Mar-2021 09:26	191.4k
List of Attack on Titan episodes.html	28-Mar-2021 08:59	234.7k
Eric Andre.html	28-Mar-2021 08:39	176.8k
VFC on ABC.html	28-Mar-2021 08:12	237.6k
Mag. reduction system.html	28-Mar-2021 07:53	163.1k
Scottie Scheffler.html	28-Mar-2021 07:37	146.9k
The Bear's Must Die.html	28-Mar-2021 07:19	156.9k
Shirley.html	28-Mar-2021 06:57	160.8k

### OtherNet APRS Messages:

### Index of /FS/get/downloads:/Amateur Radio/APRS/APRSAT/

Name	Modified	Size
Parent directory	-	-
messages-2021-03-28 17:00.txt	28-Mar-2021 17:00	325
messages-2021-03-28 16:55.txt	28-Mar-2021 16:55	236
messages-2021-03-28 16:50.txt	28-Mar-2021 16:50	65
messages-2021-03-28 16:00.txt	28-Mar-2021 16:00	328

## Typical Application of Alberto's Program Showing Weather, Radio News, Wikipedia Articles and Messages

You would create the following HTML program for your own device if your Dreamcatcher's IP address was 192.168.0.213. To personalize it even more, you could add other Content such as the VOA News Briefs from `home:///downloads/uploads` using the same format. The section at the top pulling Weather data has a set of orthographic numbers -76.56,38.55,3048 which identifies your physical location on Earth (-76.56 is a West Longitude, 38.55 is a North Latitude being Washington, DC) and magnification (3048) of the weather data you'll see. If you reduce the magnification from 3048 to a lower number, such as 1048, you zoom out. A magnification of 3048 is the closest you can zoom in. If you were in Paris, you would set the orthographic numbers to 2.35,48.86 (Paris' Longitude of 2.35 East and Latitude of 48.86).

```

<HTML>
<HEAD>
<title>Othernet</title>
</HEAD>
<body>
<H1> Latest Othernet News!
<a href="http://192.168.0.213/packages/skylark/Weather/data/#current/wind/surface/level/orthographic=-76.56,38.55,3048" i
<a href="http://192.168.0.213:8090/" target="_blank"> Radio</a>
</H1>
<iframe src="http://192.168.0.213/FS/get/downloads:/News/?dd" height="300" width="99%"></iframe>
<H1>Wikipedia Articles:</H1>
<iframe src="http://192.168.0.213/FS/get/downloads:/Wikipedia/?dd" height="300" width="99%"></iframe>
<H1>OtherNet APRS Messages:</H1>
<iframe src="http://192.168.0.213/FS/get/downloads:/Amateur Radio/APRS/APRSAT/?dd" height="300" width="99%"></ifr
</body>
</html>

```

## ANNEX A

### More on Power Cubes and Cables

#### POWER CUBES

Forum Members' experience varies with some USB power cubes. Once the power required by the Dreamcatcher exceeds 1 amp dc, the voltage delivered to the Dreamcatcher Board by **some** USB power cubes rated at 2.4 amp dc decreases below 5 vdc to a level not sufficient to provide the 13 - 14 vdc Bias-T the LNB requires, or run the Dreamcatcher. Most home USB power cubes won't work correctly. f



A reliable power option is to use a **Regulated** Raspberry Pi power supply which has a larger tolerance for low voltage from the usb cable (it just throttles itself) which means a constant output voltage not dependent on load. They come in various sizes, however I prefer to use a Regulated 5.25 vdc 2.4 amp Raspberry Pi charger. Dreamcatcher browns out when there's low voltage - and the main cause of Dreamcatchers not working normally is bad power. Make sure the power cube has a micro USB plug at one end. Newer power cubes come with C-type connectors which are not compatible with the Dreamcatcher.

The Dreamcatcher is an energy hungry device drawing 1.1 amps at 5 vdc, so don't be surprised if your gear doesn't work with undersized power supplies.

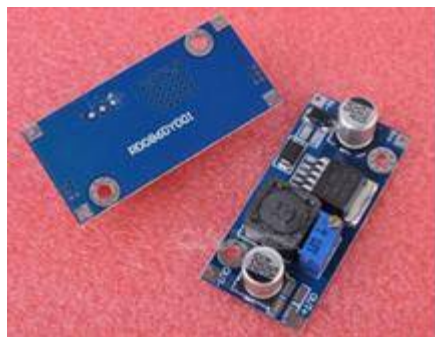
To make sure you are supplying sufficient voltage, measure the input at the micro USB connection to the board with a VTVM. The plus and minus are at either end of the plug.

#### BUCK CONVERT

Another viable solution to powering the Dreamcatcher is to use a *buck converter*. Simply put, a buck converter is a DC-to-DC power converter which steps down voltage (while stepping up current) from its input (supply) to its output (load). Specifically, the one I have used steps voltages



from 6 to 26 vdc on the input (supply) side **down to 5.25 vdc** at a maximum of **3 amps** on the output (load) side. This current is plenty to run the Dreamcatcher, and the 5.25 vdc is well within the Dreamcatcher's operational range that goes up to 5.5 vdc.



What makes it most useful is you can use any dc voltage power cube to run the Dreamcatcher - - you don't have to use a USB power cube which may be hard to find with the required voltage and current capability.

My Dreamcatcher runs off a 12 vdc power cube drawing 0.3 amps on the input (supply) side. The output (load) going into the Dreamcatcher is 5.35 vdc (a bit higher than it's spec) drawing 1.1 amps.

An example from <http://Newegg.com> costs \$3 complete with a standard USB plug to connect to the Dreamcatcher.

## CABLES

When selecting a USB to micro USB cable, select one less than 4 feet long that is relatively thick. These cables usually use larger gauge wire - - AGW 22 or 24. Price is also a method of choosing the best cable. Generally the more costly the cable - - the better it will be. Often cables marked as "quick charging" do a fine job running the Dreamcatcher. Many Forum Members have good performance from IHome, DeWalt and FuseBox cables.

---

## ANNEX B

### Trouble Shooting

This Annex is written to help find the cause of problems occurring after **you previously successfully set up** your Dreamcatcher. *Most times when the Dreamcatcher v3.05 fails, a **simple reboot** by shutting down the Dreamcatcher by powering it off then on (referred to as a **Power Cycle**) will work, but if it **does not restore** Skylark 5.8, follow these guidelines.*

#### **Problems Operating in the AP Mode**

*No display of 10.0.0.1 in browser*

- Make sure Othernet AP Hotspot is **still broadcasting** - - if not, go to **LAST RESORT** and select **Function 1 with the PB1 Button to return the Dreamcatcher to the AP Mode**, then, redo Section II Step 4 making sure your computer is **still connected** to the Othernet HotSpot - - if not, reconnect it and continue with Section II Step 5.

- If problem persists, go to **LAST RESORT** and select **Function 3 with the PB1 Button to do a **Factory Reset** and start over again.**

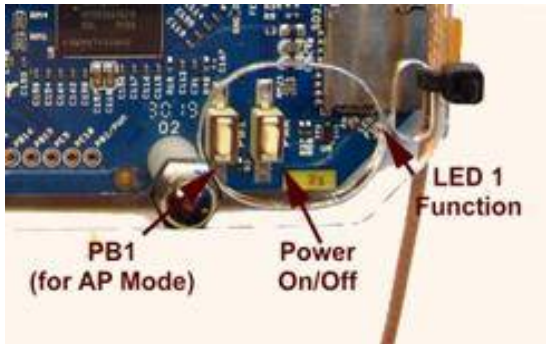
*Display available in browser, but no signal is being downloaded (Tuner App Status Screen Blank)*

- Check presence of Bias T voltage as in Fig. 17. If Bias T voltage is deficient, check LNB selection to make sure it is still set up as in Section II Step 8 to the **correct satellite**, and to the **correct LNB** either the Single LO: or Dual LO: LNB. Correct as necessary. Also make sure your wire connection between the Dreamcatcher Board and the LNB hasn't broken under the black wire wrap (do a continuity check).

- Redo the Fine Tuning of the Operating Frequency routine found on page 14 with more diligence.

- If problem persists, go to **LAST RESORT** and select **Function 3 with the PB1 Button to do a Factory Reset** and start over again.

### ***Problems Operating as a Network Client***



*No display of Skylark on assigned local IP address in browser*

- Make sure Dreamcatcher **did not revert** to the AP mode by seeing if AP Hotspot Othernet came back on line. If it reverted, redo Section IV to connect the Dreamcatcher to your network.

- If your computer is **still connected to the same Network** you set Skylark to operate on as in Section IV Step 3, and your Network WiFi **password did not get changed** to that of your router, go to **LAST RESORT** and select **Function 3 with the PB1 Button to do a**

**Factory Reset** and start over again.

*Display of Skylark in browser, but no signal is being downloaded (Tuner Status Screen Blank)*

- Check presence of Bias T voltage as in Fig. 17. If Bias T voltage is deficient, check LNB selection to make sure it is still set up as in Section II Step 8 to the **correct satellite**, and to the **correct LNB** either the Single LO: or Dual LO: LNB. Correct as necessary. Also make sure your wire connection between the Dreamcatcher Board and the LNB hasn't broken under the black wire wrap (do a continuity check).

- If problem persists, go to **LAST RESORT** and select **Function 3 with the PB1 Button to do a Factory Reset** and start over again.

*My.othernet.is does not find your Dreamcatcher's IP address*

- It is possible you **are not connected to the Internet** or you are on a different Client Network. Verify you have an Internet connection on your router, and that you connected to the correct Client Network.

### ***Last Resort***

This process uses the **PB1 Button** on the Dreamcatcher v3.05 to reset files.

### ***Problems Reconnecting to a Client Network After a Power Failure***

An AC power failure to the Router and Dreamcatcher create a unique problem for the Dreamcatcher to reconnect to the Router. The reason is most Routers take longer to boot up than the Dreamcatcher. As a result, the Dreamcatcher is trying to reconnect to the Router before the Router is ready to accept a connection and assign a Client IP address. The Dreamcatcher **must be the last device** to power up after a power failure.

---

## **ANNEX C**

### **LNB Enhancements**

**by Will Brown @wbrown**

Scope

The document provides a consolidated reference of techniques to enhance signal reception performance of your Dreamcatcher (as of this writing, v3.03, running on Ku band satellite SES-2 for North America ). This document does not include information about where Othernet service is available, how to setup or otherwise use your equipment.

## Background

The Dreamcatcher operates using a bare LNB (Low Noise Block Downconverter) to receive signals transmitted from a satellite (SES-2 for North America as of this writing). The signal being transmitted is notionally strong enough across the United States (contiguous 48 states) to be received using only a bare LNB (eg no dish antenna) and correct aiming/alignment. Due to weather patterns (heavy clouds, rain), geographical influences and nearby RF pollution sources, the Dreamcatchers signal reception performance may be increased using a “horn” or “cone” over the LNB. Alternately, an appropriately chosen dish antenna (“satellite dish”) may be employed.

## How Much is Good Enough?

If you're reading this with the intent of improving your reception, or generally “make it better”, be aware that “making it better” beyond what's “good enough” doesn't provide any benefit. A SNR of -about -13dB is required for lock and signal reception and decoding. The SNR value tends to fade during bad weather (rain fade). If, during times of bad weather, your Dreamcatcher has a good SNR ( $> -13\text{dB}$ ), and retains lock, then there is nothing to do -your setup already has enough margin.

*There is a minimum SNR required for demodulation. After accounting for margin due to weather, there is no additional benefit to having better SNR.* – Syed, May 2018

## Sources and Attributions

Information taken from 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/>

Each design is denoted with the creators Othernet Forum Username in the “Construction” column. All information provided per-row is created and owned by the username listed.

## LNB Cones / Horns


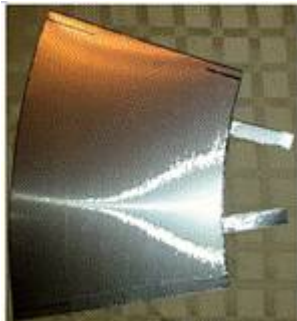



This section collects the various designs created and tested by Othernet Forum Members. In most if not all cases, the received signal strength (RSSI) is not changed with the addition of the horn or cone. It is only the Signal to Noise Ratio (SNR) that is improved. Therefore, RSSI performance is not listed, rather only SNR improvements. SNR Improvements listed are the values reported by the Forum Members during their own tests. The following table serves as a rough guide to assist in the creation of such a device. The exact performance depends on several factors (construction technique, alignment with LNB, precision of aiming at the desired satellite) and therefore the values listed below serve only as a reference.




Construction	Finished Product	SNR Improvement
--------------	------------------	-----------------



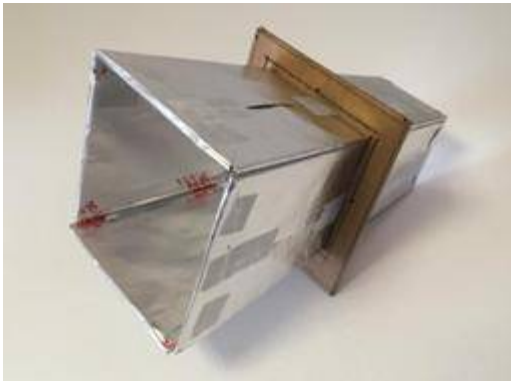
Construction	Finished Product	SNR Improvement
<p>Collapsed metal rings, approx 2" diameter</p> <p>@kenbarbi</p>		+2dB
<p>7.7cm diameter x 11 cm tall tin-can. We had to cut approximately 0.2 cm from the bottom to remove the floor of the can. We slotted the sides 1.8 cm wide by 8 cm deep to accommodate the LNB mounting hardware</p> <p>@maxboysdad</p>		+2dB





Construction	Finished Product	SNR Improvement
<p>1-gallon paint can</p>  <p>@maxboysdad</p>		+2dB - +3dB
<p>16 oz Styrofoam cup covered in aluminum duct-tape</p>  <p>@thomslik</p>		+2.5dB

Construction	Finished Product	SNR Improvement
<p>Pringles potato chip can</p> <p>@kenbarbi</p>		+3dB
<p>2.5" at the narrow end and 3.5" at the wide end, pattern expanded from the 12-oz soft-drink cup. The shield is cut from 0.019" aluminum sheet</p>  <p>@maxboysdad</p>		+3dB to +3.5dB
 <p>@Konrad_Roeder</p>		+3.5dB

Construction	Finished Product	SNR Improvement
<p>7" funnel from an auto-parts store, lined inside-and-out with aluminum duct tape</p> <p>@maxboysdad</p>		+4dB
<p>4" x 2" x 8" Aluminum Flashing (held together with duct-tape)</p>  <p>@kenbarbi</p>		+4.5dB

Construction	Finished Product	SNR Improvement
<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>4" x 2" x 8" Used heavy corrugated cardboard, covered each section with heavy duty aluminum foil and used thin metallic duct tape to join the 4 sections. Towards the smaller end, I left a couple of inches unattached all around allowing enough flexibility to slip over the LNB.</p> <p>@dschre</p>		+5dB



Construction	Finished Product	SNR Improvement
<p>5" x 2.25" x 9" cardboard covered with aluminum foil</p> <p>@AL01</p>		+5.25dB
<p>5" x 2.25" x 9" Wire mesh</p> <p>@thomslik</p>		+7dB

## Dish Antennas

Though the intent of using the Dreamcatcher is to simply aim a bare LNB at the transmitting satellite, some Forum Members have successfully implemented dish antennas:

*This YouTube video shows you how to adapt a linear LNB (like the one for Outernet) onto a dish previously used for DishNetwork or DirecTV. These use circular-polarized LNBs. The LNB needs to be swapped out. This video shows you how: How to convert and install a old trashed DTV satellite dish to a FTA Dish*

- Konrad\_Roeder  
May 2018

Construction	Finished Product	SNR Improvement
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An example from Forum Member Barefoot\_Mike (March 2016) looks like this.



(not listed)

@Barefoot\_Mike

18" DirecTV dish with Maverick Mk1 LNB. A new LNB bracket was purchased, which had the same angle as the LNB that came with the DirecTV dish. The dish was mounted indoors.



@wbrown



Indoor dish setup as compared to a bare Maverick Mk1 LNB mounted outdoors:

**Dish w/Maverick Mk1**  
SNR improved 10-13dB  
RSSI improved 6-7dBm

**Dish w/LNB 18 (circular)**  
SNR improved 7-10dB  
RSSI improved -2dBm  
(RSSI is worse)

*Outdoor dish performance is roughly +6dB better than mounted indoors.*

A more detailed writeup of the indoor dish shown above is [here](#).

## Circular Polarized LNBs

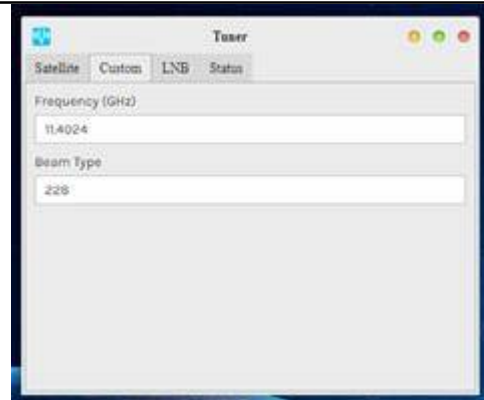
Circular polarized LNBs may be used with some reduced sensitivity. The LO (local oscillator) frequency of the LNB must be noted, and an appropriate adjustment made in the Dreamcatcher for it to work.

Here is a table showing a DirectTV LNB 18 vs the Maverick Mk1 supplied (as of 2019) with the DC 3.03:

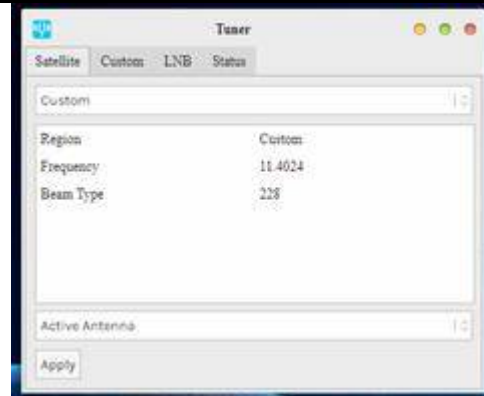
LNB Type	LO	DreamCatcher "Freq"	DreamCatcher "Beam"
Maverick Mk1	10.750	11.9024	228
LNB 18	11.250	11.4024	228

To make this change, logon to the Dreamcatcher as user "othernet" (default password "othernet"). Open the Tuner app.

Go to the "Custom" TAB and enter the Frequency and Beam Type.



Now go to the "Satellite" TAB. The first line is a drop-down selection (it says "Custom" in the image to the right). The entries available are "Americas" and "Custom". Select "Custom". Then click the "Apply" button.

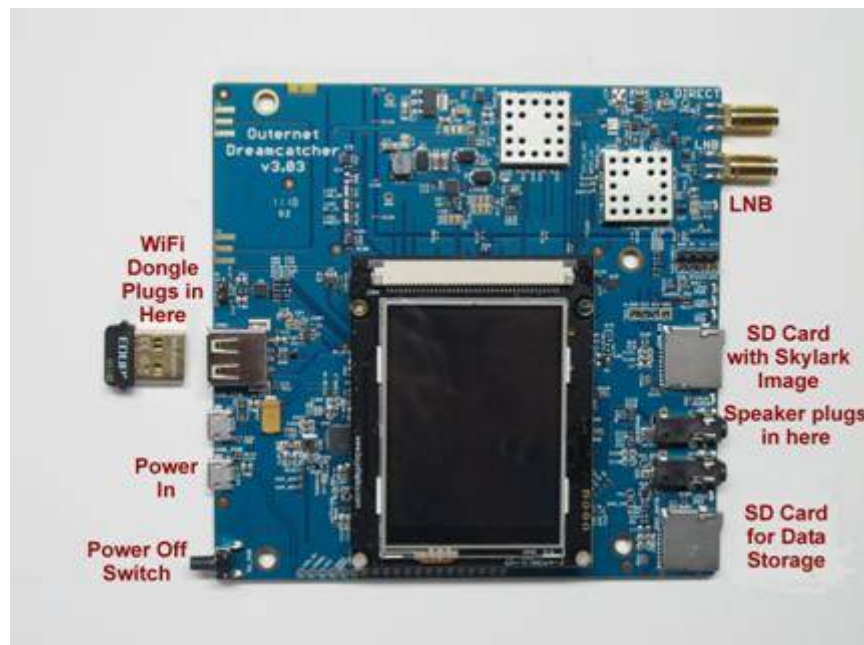


After making the above changes, reboot the Dreamcatcher either with a power-cycle or by using the "Reboot" selection on the utility menu on the touch-screen.

## ANNEX D

### Dreamcatcher v3.03 Unique Features

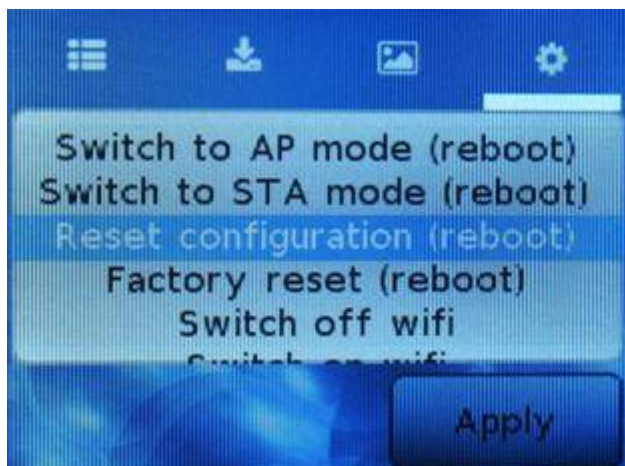
***Look at Annex D for v3.03 differences #1***



Dreamcatcher v3.03 Board

### ***Look at Annex D for v3.03 differences #2***

Step 5. **Wait another 5 minutes before you open your Web Browser** for the Skylark Program to finish initialization housekeeping functions. Then type (in the URL tab) [10.0.0.1](http://10.0.0.1) and you will see the Skylark Guest Logon Screen (Fig. 11). You will also see the Touch Screen Summary page (Fig. 5) showing an Access Point mode connection to IP address 10.0.0.1.



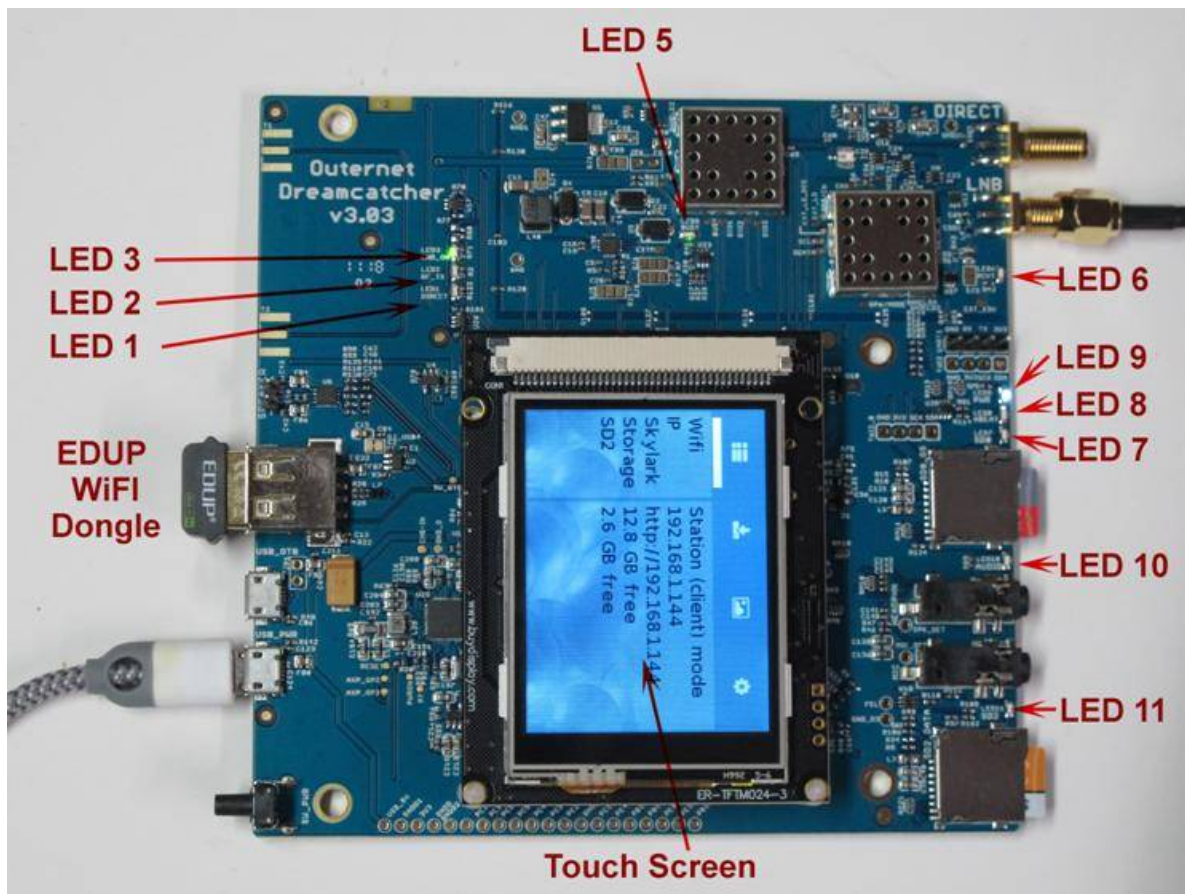
Touch Screen Summary Page

Touch Screen to *Reset configuration (reboot)*

### ***Look at Annex D for v3.03 differences #4***

Properly connected and operating, the Dreamcatcher v3.03 with an external micro SD card installed, will display the following LEDs

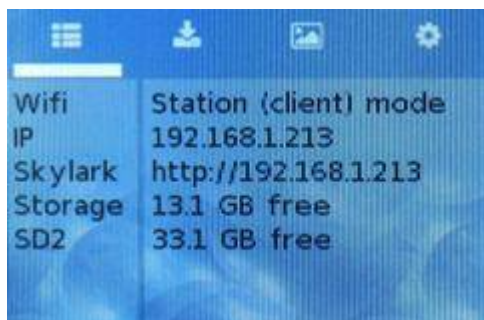




Design	Color	Name	Function	Normal Operation	Receiving Packets
LED 1	Green	Function	PB1 Presses	Off	
LED 6	Green	PCKT	Receiving packets	On fast blinking dim green	
LED 7	Green	SDO	Shows read/write activity on either SD Card	On blinking green	
LED 8	Green	HBeat	Reports status to Chicago	On blinking green	
LED 9	Blue	Power	OFF/ON indicator	On solid blue	
LED 10	Green	Audio	Blinks if audio is present	On blinking green	
LED 11	Green	SD2	Blinks if SD card is active	On blinking green	
EDUP	Green	WiFi	Green if WiFi is on	On blinking green	

LED Table

### Look at Annex D for v3.03 differences #5

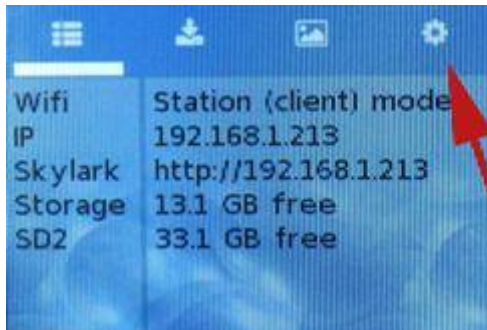


Step 4. You will be connected to Dreamcatcher's Skylark Program through your local WiFi from your router. You can go to any computer on your router's network, and use any Web Browser to access Skylark through its newly assigned IP address, or by typing [my.othernet.is](http://my.othernet.is) (which requires an internet connection to work). **If you cannot find the Dreamcatcher's IP address using your router or [my.othernet.is](http://my.othernet.is)**, suggest you use a shareware program such as Angry IP Scanner (<https://angryip.org>) (Fig. 27a) for

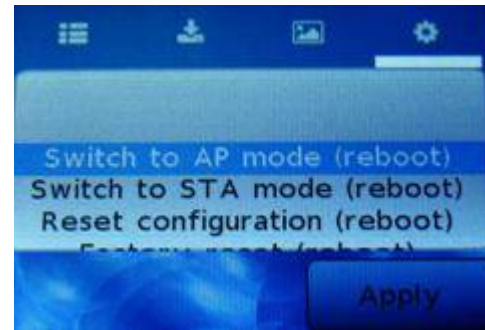
Windows, MAC, and Linux; or Advanced IP Scanner (<https://advanced-ip-scanner.com>). You can also look at the Touch Screen to find the assigned IP address.\_

### Look at Annex D for v3.03 differences #6

Step 6. Skylark has an **option using the Touch Screen** to return to the Hotspot mode after you leave a network. Illustrated here on the *Touch Screen Summary Page* is the old WiFi network information. If you click on the far right wheel icon, you will be able to go back to the Othernet Hotspot mode by selecting **Switch to AP mode (reboot)**. You will not be able to re enter a new WiFi network name or password from the Touch Screen. To do that, you have to use the browser with Skylark and repeat Step 3 above. Your satellite and LNB selection will remain unchanged.



Touch Screen Summary Page



Touch Screen Return to Hotspot

### Look at Annex D for v3.03 differences #7

Step 3. **Increasing the Volume of the Othernet Satellite Radio** can be accomplished “on the fly” with a software modification to Skylark that *only remains in effect as long as you do not reboot the Dreamcatcher*. This change will have **no effect** on the Native audio/sound mentioned in Method 1.

**There are 2 ways make this adjustment.** The **first method** is by using the Dreamcatcher Touch Screen to Increase/Decrease the volume at the audio output plug or Mute it. (Fig. 37).

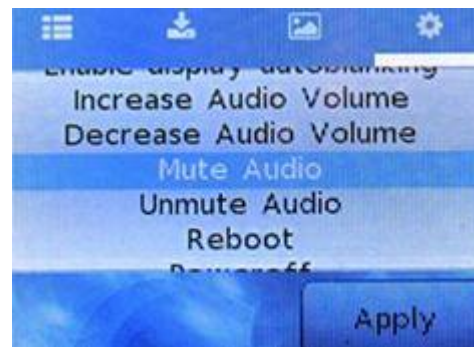


Fig. 37 Touch Screen for Adjusting Audio Levels

## ANNEX E

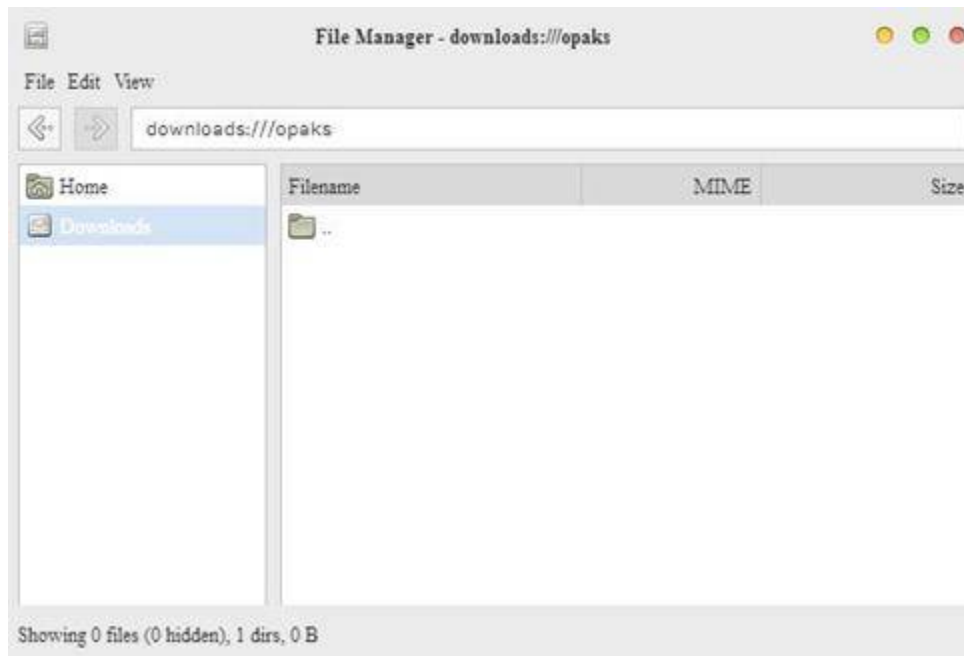
### Preliminary Test for OTA

You can use an Over the Air (OTA) file to update your via the Web User Interface (webUI) – there is

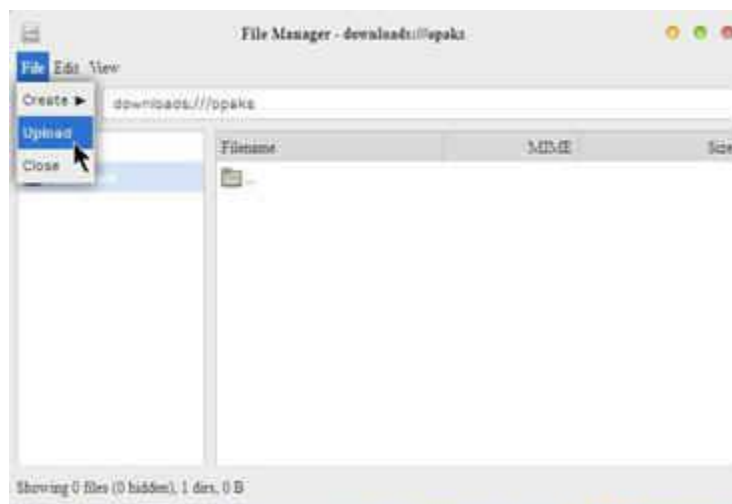
no need to remove the micro SD card from the Dreamcatcher. **At this time, there are NO OTA files for Skylark 5.8.**

To use this method:

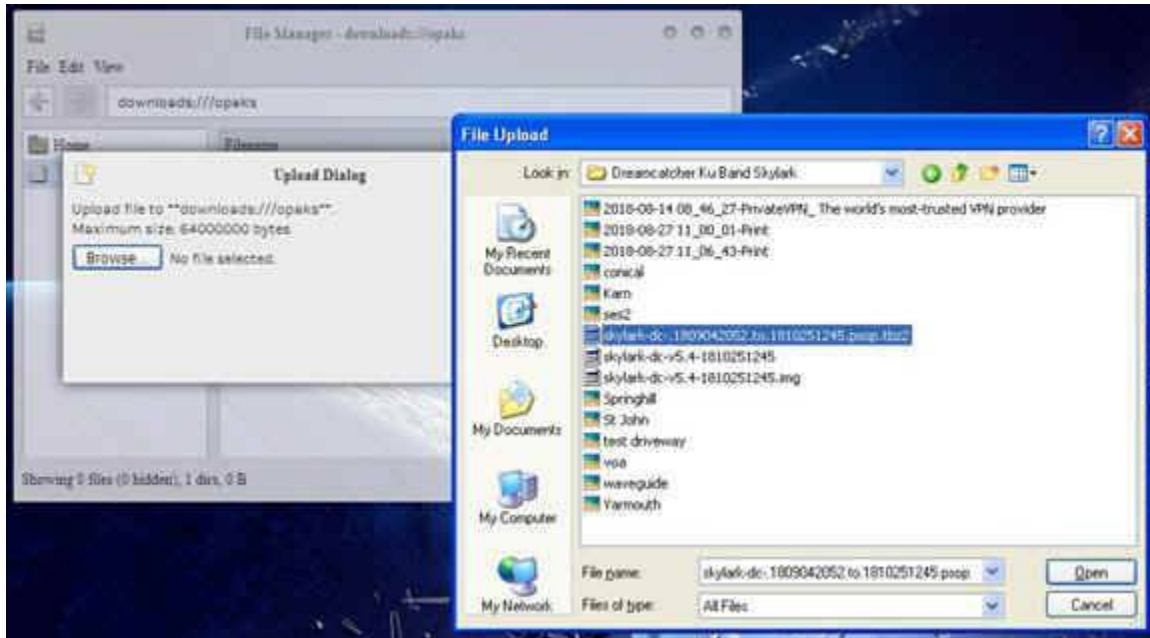
- a. Download the update file that looked like this for the Skylark 5.3 to 5.4 upgrade [skylark-dc-1809042052.to.1810251245.psop.tbz2](#) from Othernet's Achieves to your computer. DO NOT extract it or process it in any way.
- b. Logon to Skylark as the "othernet" user (logon as "guest" WILL NOT WORK).
- c. Open File Manager App.
- d. In File Manager, in the left-most pane, select "Downloads" and then in the right-side pane, double-click the "opaks" folder to enter it.



- e. In the File Manager app menu bar, select "File" -> "Upload". This will open up the file upload dialog, and your normal OS file selection dialog; select the update file you downloaded to your computer in step "a". Click Ok/Open etc (as per your OS) to begin the upload.



Then select the .tbz2 file to upload, and just click **Open** - - nothing else needs to be clicked.



f. The update file will be uploaded to the “opaks” folder, and from there, Skylark OS will automatically start processing the update.

g. **Be patient.** The update process will take 15 - 20 minutes to complete! **Do NOT reboot** your Dreamcatcher during this process **or change any other settings.** During this process, it will appear as though nothing is happening, but don't despair - - **it is working.**

h. After the update process is complete, the Dreamcatcher will automatically reboot into the new version of Skylark. You will need to refresh your WEB browser to see the new Skylark version.

i. If the process fails, just use the normal micro SD card burning process **Section I Step 4** as before to fix things.

## ANNEX F

### Low Noise Block (LNB) Devices

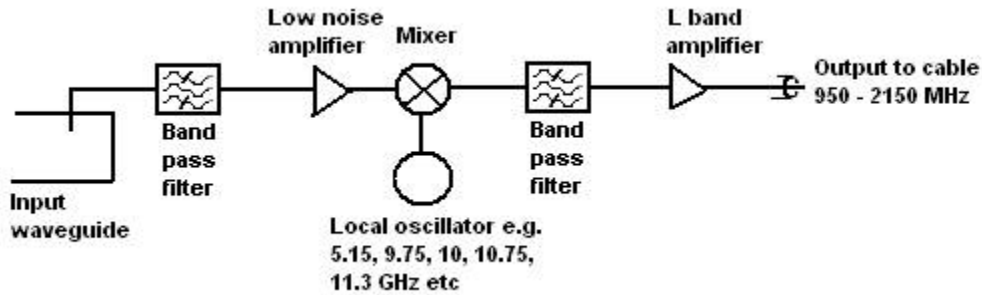
An LNB has two important functions: it's a low-noise amplifier, meaning that it takes the extremely weak satellite signal and amplifies it. It's also a block down converter, meaning it takes the signals on the super-high satellite frequencies and converts them to lower frequencies. Both functions are important in order to deliver a satellite signal. Ku Band satellites broadcast between 10.7 - 12.75 GHz.

Because Othernet is now using a narrower bandwidth (reduced from 800kHz to 200 kHz), it is more difficult to tune to the correct operating frequency for each LNB since they all respond a little differently. Some LNBs do not have sufficient local oscillator (LO) stability.

Keep in mind that (even on paper) the data packets won't appear with an offset greater than 25%



(50 kHz) in Othernet. So far we've noticed that 25 kHz of offset is a pretty reliable window. It is said the Maverick will work - - **but some Forum Members have been unable to achieve lock with it.** The offset is probably just much farther out. Please keep in mind that most commercially available DTH LNBs are specified to a 1,000,000 Hz offset (aka +/- 1000 kHz).



**The Maverick Single LO LNB** - The Maverick was shipped with the Dreamcatcher v3.02Q, the first unit being used on the KU band system. It has a LO frequency stability of +/- 1 MHz. If you use the Maverick LNB for Othernet, you must select: Single LO: 10750 MHz. If you use it as your FTA LNB, your FTA must be tuned to 9750 -10750 MHz.



**The Universal Dual LO LNB** - This LNB was shipped with the Dreamcatcher v3.05 and has a LO frequency stability of +/- 200 kHz. If you use it for Othernet, you must select: Dual LO: 9750 - 10600 MHz. If you use it as your FTA LNB, your FTA must be tuned to 9750 - 10600 MHz.



**The Bullseye Dual LO LNB** - This LNB (soon to be shipped with a New Dreamcatcher and currently available in the Othernet Store), has a LO frequency stability of +/- 10 kHz, Noise factor of 0.5 dB. It is very stable with temperature variations. In Skylark, it will operate as a Dual LO: 9750-10600 MHz. Connect to your Dreamcatcher from the green F connector. The second red output connector provide a 25 MHz reference signal for other uses not related to Othernet. If you use it as your FTA LNB, your FTA must be tuned to 9750 - 10600 MHz.

