



Satellite Communications With Serenity

Lesson 2: Tracking Satellites with Gpredict

In this lesson you will learn to use the Raspberry Pi computer to to:

- To track a satellite
- Know when a satellite enters your line of sight.

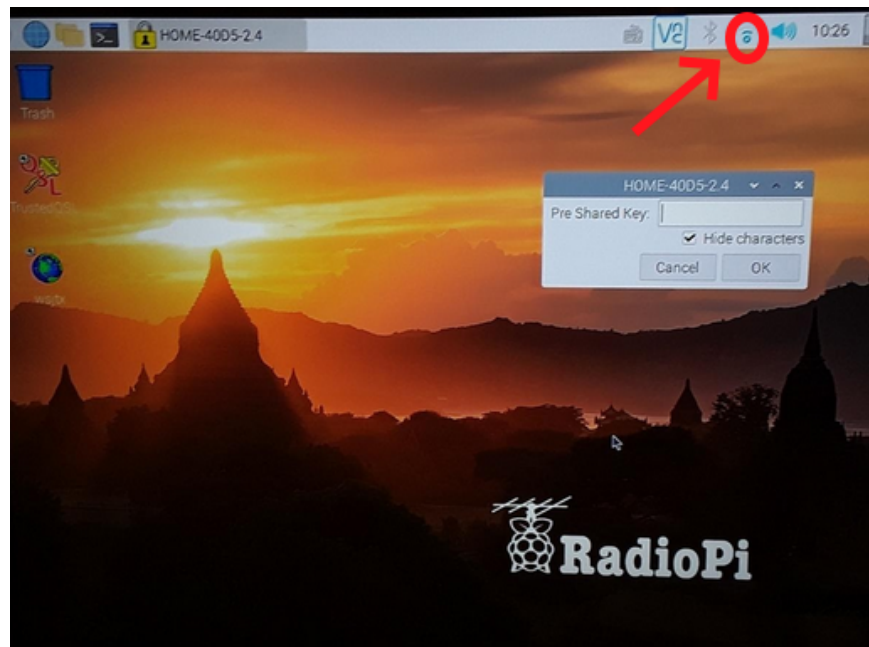
Many satellites use communication modes that require them to be in your line of sight (above your horizon) in order for you to acquire data from them or use them for communication purposes.

What you need

- Hardware and software assembled in Lesson 1
- Your location in Latitude and Longitude
- Your elevation above sea level (in meters)

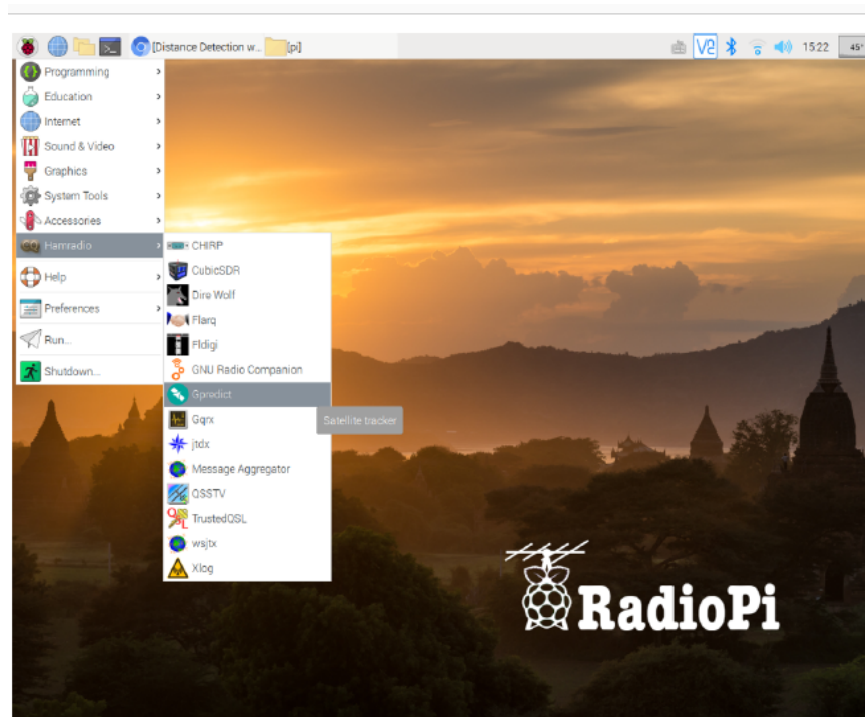
Step One – Connecting Raspberry Pi to the Internet

- Boot up your RadioPi system that you built in Lesson 1.
- In the upper right corner of the RadioPi home page click on the Wi-Fi icon.
- Select your Wi-Fi from the dropdown menu. When asked, type your password into the appropriate location.



Step Two – Starting the satellite tracking program

- To start gPredict, click on the start button, navigate to ham radio, and select Gpredict.

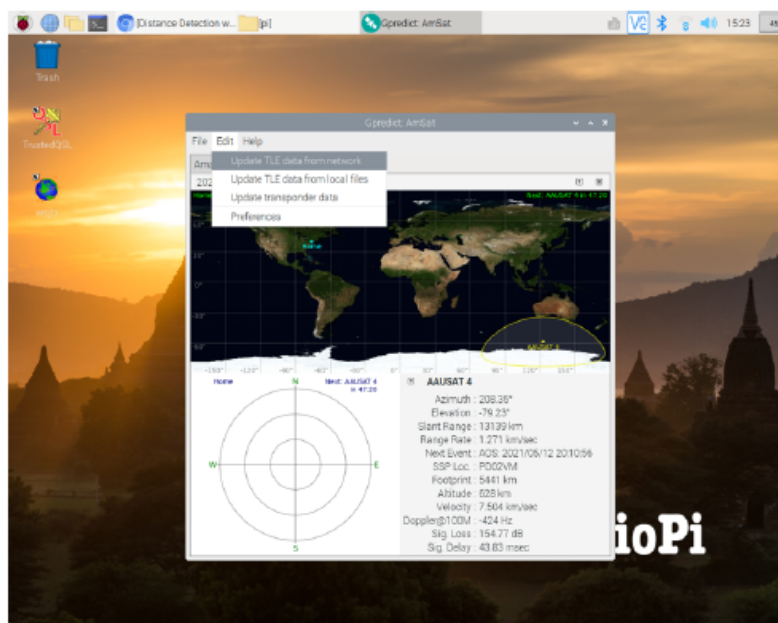


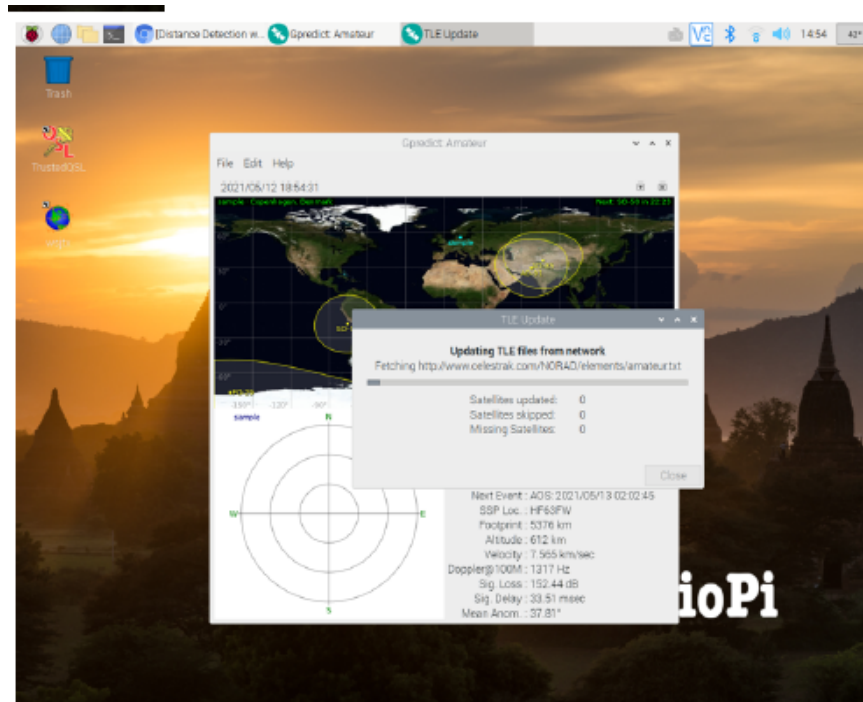
Step Three – Updating TLEs in Gpredict

For gPredict to work correctly we need to update the two line elements or TLEs. TLEs are created by the Space Force Delta 18 (formerly the 18th Space Wing) using their sophisticated radar tracking system. This system is how we know where to look for a satellite.

- To update the TLEs
 - o Click Edit on the program menu
 - o Select update TLEs from Network.

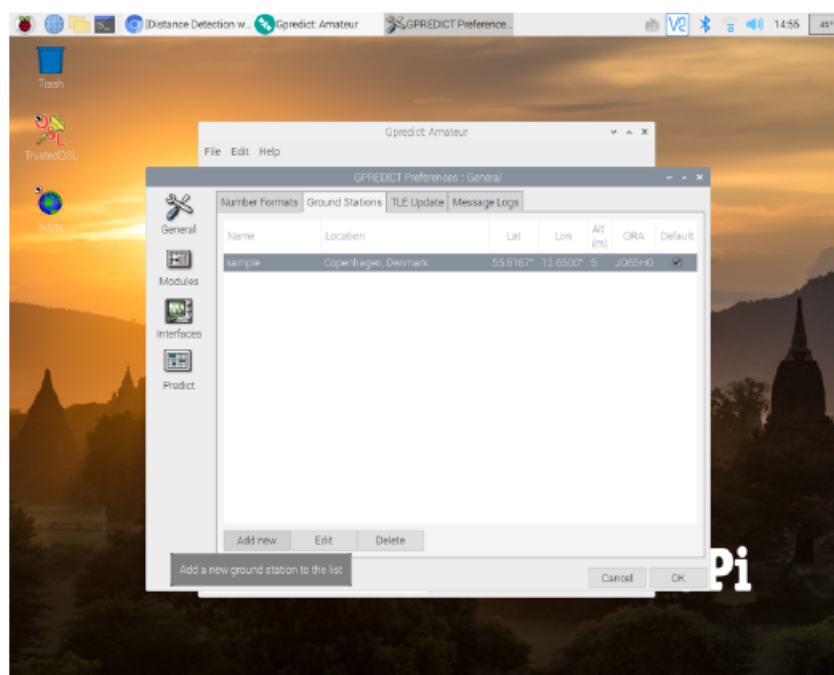
The program will connect to the Internet and update the data. It is important to do this step each time you run gPredict as the orbits of satellites can change!



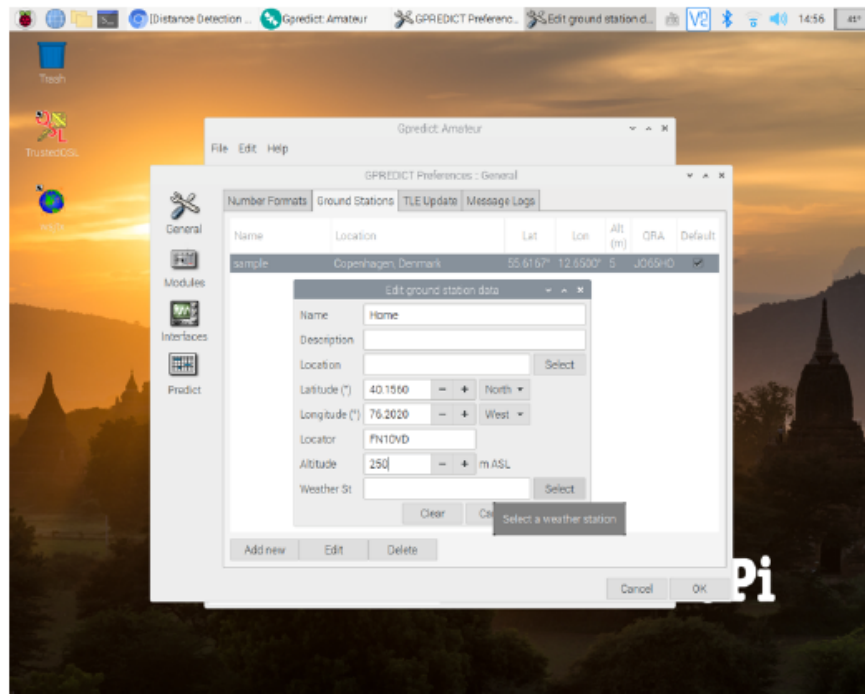


Step Four – Creating your ground station.

- Under Edit select Preferences. On the tabs across the top of this screen, choose **Ground Stations**. At the bottom of the list click **Add New**.



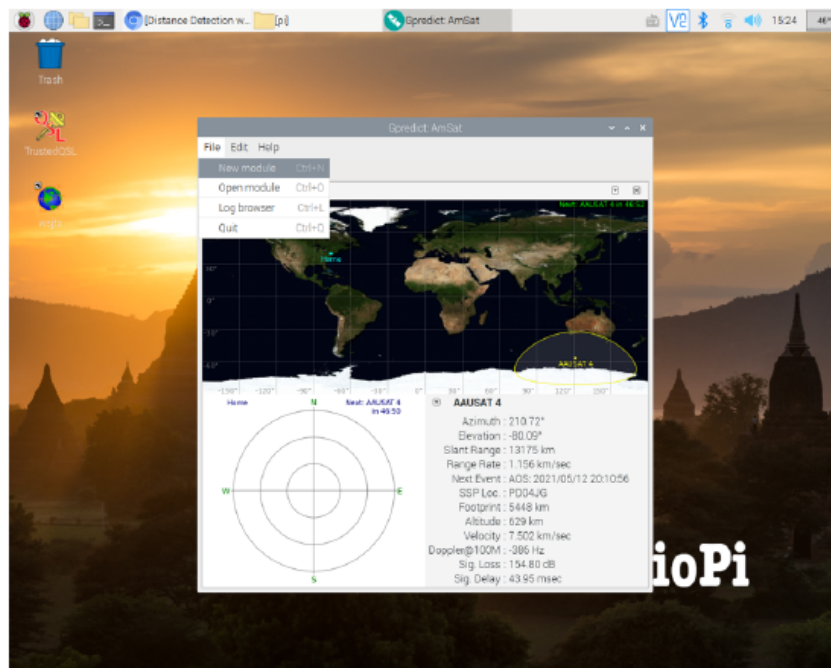
- Fill out your information including location name, latitude/longitude, etc. Don't forget to look for your local weather station at the bottom of the list. This will help in dealing with radio interference from the station. Click **Ok** when done.



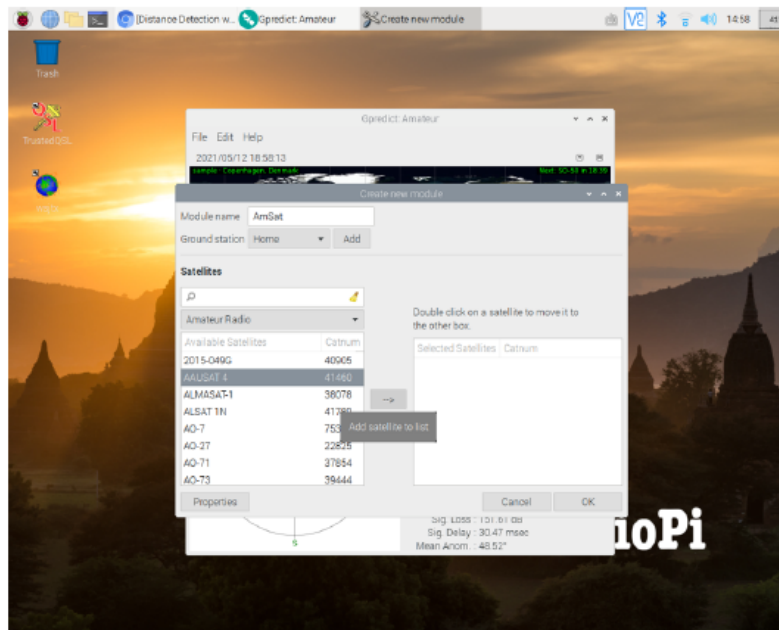
Step Five – Create your tracking module

This is a handy way to get to your presets when you restart gPredict.

- Under **File** select **New Module**.

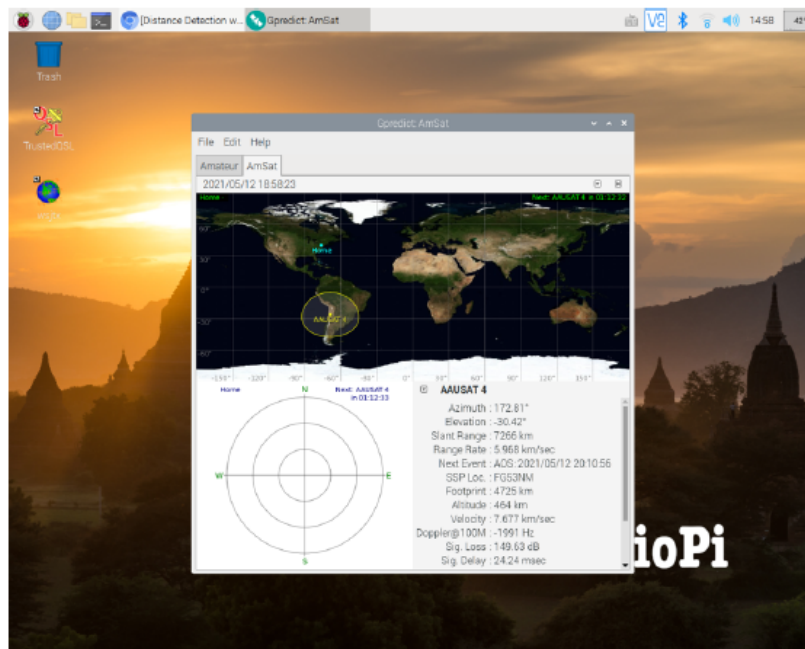


- Once the dialog box comes up, type a name for your module. In our case we called it AmSat.
- Next choose your ground station. You can have multiple ground stations in one system by clicking the **Add** button and selecting them from the list. For now, we suggest using only one ground station.
- Finally, select the satellites you wish to track from the list (there are a lot). Click on the right arrow to add them to your list. When you are done click **OK**.



Step Six – Verify it all works

- You should now see a tab with your Module name.
- On the display will be your ground station and the satellites you have chosen. When a satellite is overhead, it should also appear on the screen in the lower left – the one that looks like a radar.



Congratulations! You are now tracking satellites. Practice adding new satellites to your Module or creating multiple ground stations.