



RaspiNOAA V2 Setup Instructions

RaspiNOAA-V2 | V3.0 Build:12-M2 4 Image Released May 2024

Vince VE3ELB (Prebuilt Software Disk Image)

<http://qsl.net/ve3elb/RaspiNOAA>

Raspberry NOAA V2 (Raw Core Software) -- V3.0 Released November 2023

<https://github.com/jekhokie/raspberry-noaa-v2>

Thanks to Jekhokie for the great software.

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NOTE: To avoid errors when extracting the file please use 7-Zip

<https://7-zip.org/>

I recommend using a A1 or A2 Class 16GB SD Card or higher.

Write/Burn RaspiNOAA V2 Disk Image to your SD card using one of the following software.

Raspberry Pi Imager:

<https://www.raspberrypi.org/software/>

Etcher:

<https://www.balena.io/etcher/>

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Start by configuring the raspberry pi.

Step 1: IF your SD Card is larger than 16GB Open Terminal and type the following command.

- `sudo raspi-config`
- Select option 6: Advanced Options
- Select A1: Expand Filesystem

Reboot the Pi.

Step 2: Open Terminal and type the following commands. (Lets make sure everything is up to date.)

- `sudo apt update && sudo apt upgrade -y`
- Do you want to continue [Y/n] Y
- Enter

Step 3: Open the Application Menu (THIS STEP IS VERY IMPORTANT)

- Preferences
- Raspberry Pi Configuration
- Go to the Localisation Tab
- Set your Location and Timezone

MUST REBOOT before moving to step 4.

RaspiNOAA V2 Setup Instructions:

Step 4: Go to folder.

- /home/pi/raspberry-noaa-v2/config

Step 5: Right click on, and edit settings.yml file in text editor. Save file once done.

- settings.yml

Change the following settings to get you up and running:

Station Lat/Lon/Alt: (Use 8 digits.)

- latitude: 43.698286
- longitude: -79.435966
- altitude: 0.0

NTP Configurations:

- ntp_server: DO NOT ADD ANY LEAVE BLANK

##Test Setting:

- test_gain: 15.7
- test_sdr_device_id: 0
- test_enable_bias_tee: true
- test_freq_offset: 0

##Receiver Setting:

- receiver_type: 'rtlsdr'

Select which receiver method to use ('rtlsdr' | 'airspy_mini' | 'airspy_r2' | 'hackrf' | 'sdrplay' | 'mirisdr')

##Decoder Setting:

- noaa_decoder: 'wxtoimg'

Select which decoder method to use for noaa ('wxtoimg' or 'satdump')

- meteor_decoder: 'meteordemod'

Select which decoder method to use for meteor ('meteordemod' or 'satdump')

Satellite Setting: NOAA 15, 18 , 19

- noaa_schedule: true
- noaa_sdr_device_id: 0
- noaa_freq_offset: 0
- noaa_enable_bias_tee: true
- noaa_gain: 15.7
- noaa_sun_min_elevation: 10 -- (Summer 10 , Winter 0)
- noaa_sat_min_elevation: 30

Satellite Setting: METEOR M2-3, M2-4

- meteor_m2_schedule: true
- meteor_m2_sdr_device_id: 0
- meteor_m2_freq_offset: 0
- meteor_m2_enable_bias_tee: true
- meteor_m2_gain: 15.7
- meteor_m2_schedule_sun_min_elevation: 0 -- (Summer 0, Winter -90)
- meteor_m2_sun_min_elevation: 0
- meteor_m2_sat_min_elevation: 30
- meteor_m2_80k_interleaving: false (72k-False , 80k-True)

USER Info: Please fill in your information

- ground_station_location: ' Station ID | Location'
- antenna_information: ' Antenna Type'

Discord Link:

- discord_noaa_webhook_url: 'USER Discord Webhook'
- discord_meteor_webhook_url: 'USER Discord Webhook'

Save the file and exit

Note: Images can be viewed via:

- Raspberry Pi web browser 127.0.0.1
- Home network raspberry pi ip address Exp: 192.168.x.x
- Online outside your home network you must have a Discord account and input your webhook into the settings.yml file. Create an account at: <https://discord.com/login>

Discord webhook video: <https://www.youtube.com/watch?v=fKksxz2Gdnc>

Step 6: Open terminal and type the following commands.

- cd raspberry-noaa-v2/
- ./install_and_upgrade.sh
- ./scripts/schedule.sh -x -t (Deletes all existing and future satellite scheduled passes and restarts fresh)
- exit

Done. Reboot and you are ready to capture.

Changing the Frequencies for Meteor M2 Series Satellites:

- /home/pi/raspberry-noaa-v2/scripts/common.sh

Any changes made to the settings.yml file you MUST run the following commands for them to take effect.

- cd raspberry-noaa-v2/
- ./install_and_upgrade.sh

Changing the satellite elevation in the settings.yml file you MUST run the following commands for them to take effect. (noaa_sat_min_elevation: 30 ||| meteor_m2_sat_min_elevation: 30)

- cd raspberry-noaa-v2/
- ./install_and_upgrade.sh
- ./scripts/schedule.sh -t -x (Deletes all existing and future satellite scheduled passes and restarts fresh)

To manually update the TLE data run the following commands.

- cd raspberry-noaa-v2/
- ./scripts/schedule.sh -t -x (Deletes all existing and future satellite scheduled passes and restarts fresh)

To Fix your pass conflicts manually via the web browser in the "admin" Tab. Just click on the X of unwanted pass conflicts to delete them. Web: 127.0.0.1

You can also have them done automatically with the following settings.

- select_best_overlapping_passes: true
- select_meteor_pass_over_noaa: true

The webpage can be viewed on any computer or device within the same network via the raspberry pi network ip address. Exp: 192.168.1.xx

To get the raspberry pi network ip address open terminal and input this command.

- ifconfig

Raspberry NOAA V2 currently supports the following SDR Devices.

- [RTL-SDR](#) | [RTL-SDR Blog V3/4](#) | [AirSpy R2](#) | [AirSpy Mini](#) | [HackRF](#) | [SDRplay](#) | [MiriSDR](#)

To test the RTL Dongle:

Open terminal type the following command.

- `rtl_test -t`

If the RTL is found and working you should get a message like this.

Found 1 device(s):

0: Realtek, RTL2838UHIDIR, SN: 00000001

Using device 0: Generic RTL2832U OEM

Found Rafael Micro R820T tuner

Supported gain values (29): 0.0 0.9 1.4 2.7 3.7 7.7 8.7 12.5 14.4 15.7 16.6 19.7
20.7 22.9 25.4 28.0 29.7 32.8 33.8 36.4 37.2 38.6 40.2 42.1 43.4 43.9 44.5 48.0 49.6

Note the supported gain values for the RTL Dongle listed above or in terminal when you run `rtl_test -t`. DO NOT exceed these gain values as you may damage the RTL Dongle or Overload the SDR Software.

In testing I found these RTL gain settings worked best for me. However everyone's setup is different so you will have to adjust gain a few times to get the right setting for you..

NO LNA - Gain set between 40.2 - 44.5

With LNA - Gain set between 7.7 – 19.7

To delete images, audio files and video files manually. Go to "/srv" folder to free up storage space.

RaspiNOAA V2 has been setup to automatically delete audio files after each pass and image files older than ten days everyday at midnight.

- `/srv`

Last thing you can run the raspberry pi headless. Setup VNC or Teamviewer to view and control the pi remotely.

You can now reboot the raspberry pi one last time. All done now you wait for the image captures.

RaspiNOAA V2 Was Built on a Raspberry Pi 4B and Tested and worked 100% on the Raspberry Pi 3B+ and Pi 4B

I take no credit for any of the software,

This image was compiled to help others who wanted to try Raspberry NOAA V2.

I am not responsible for any damages caused to your equipment.

Enjoy,

Vince VE3ELB

RaspiNOAA Discord: <https://discord.gg/5wggAF3KdF>

RaspiNOAA Facebook: <https://www.facebook.com/groups/797451681497121/?ref=share>

APT Discord: <https://discord.gg/MWceuQfYam>

APT Facebook: <https://www.facebook.com/groups/Satellite.apr.group/?ref=share>

I recommend that all users join the facebook and discord groups and as you can get help and support for RaspiNOAA V2 - Raspberry NOAA V2 from the users.

Disclaimer:

This RaspiNOAA V2 Image automatically uploads decoded images to the following Discord servers. VE3ELB and APT discord servers for sharing purposes only. Please be kind and keep sharing as we do. Thank You, 73.

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Other useful Installed Software:

SatDump - CubicSDR - SDR++ - Gqrx:

SDR software defined radio receiving software.

Satvis Satellite Maps (In passes Page):

Interactive satellite tracking map with live active pass information.

Day and Night Grayline Map (In passes page):

Active Day and Night map in satellite passes page. Map automatically refresh every 5 minutes.

KlaTrack:

Simple program that plots the elevation of upcoming satellite passes and then updates it in real time.

Gpredict:

Real time satellite tracking and orbit prediction application.

HamClock:

A full featured desktop program showing accurate time, geography, time zone, solar activity, sunrise and sunset times, Maiden-head locators, beam heading, beacons, news headlines, and other timely information.

Gparted:

Disk partition editor for graphically managing your disk partitions.

Disk Usage Analyzer:

Disk space analyzer shows how your disk space is being used.

ScreenShot:

An easy way to take images of your screen or individual program windows.

Conky:

Raspberry Pi desktop system monitor and information widget.

WebCord:

Discord desktop app for linux.

Audacity:

Easy to use audio editor with numerous features.

Snapdrop: (<https://snapdrop.net/>)

Local file sharing via your web browser between computers on the same network.

Syncthing:

A continuous file synchronization program. It synchronizes files between two or more computers in real time