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**Installing gr-radio\_astro**

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This will install the spectrometer program *spectrometer\_w\_cal.grc* as well as other useful radio astronomy GNURadio programs from the *gr\_radio\_astro* repository in GitHub.

**NOTE:** The instructions on this page will install files for Ubuntu 22.04. If you are using Ubuntu 20.04 LTS, click [here](https://wvurail.org/dspira-lessons/gr_radio_astro_Installation_Ubuntu20) for the installation.

Complete the following steps:

1. Open a *Terminal* window. This can be found in the *Show Applications* waffle in the lower left corner of the screen.

**NOTE:** Most of the commands we use are entered in a *Terminal* window. We recommend adding the *Terminal* to your Favorites to be accessed easily.

1. If you have not already done so during the GNURadio installation, install the gnuradio external python dependencies and SDR drivers by typing the following and hit enter:

sudo apt install gnuradio gr-osmosdr airspy python3-h5py python3-ephem git cmake liborc-0.4-dev -y

1. In the terminal type and enter:

git clone https://github.com/WVURAIL/gr-radio\_astro.git

1. Switch to the gr-radio\_astro directory: cd gr-radio\_astro
2. Type and enter: git branch to verify that you are on the “main” branch. If you are NOT on the main branch, then type and enter: git checkout main.
3. Make a build directory: mkdir build, and then move to it: cd build
4. Then run the following in the build directory:
5. cmake ..
6. make
7. sudo make install
8. To check that the installation was successful, type and enter cd to get to the home directory. Run the program in Gnuradio:
   * In a terminal window type gnuradio-companion
   * Open the *spectrometer\_w\_cal.grc* program as follows from the File menu:

File –> Open –> gr-radio\_astros –> examples –> DSPIRA –> *spectrometer\_w\_cal.grc*

* + Plug an Airspy radio, with the LNA attached, into the USB port. Run the program by hitting the start triangle (“execute the flowgraph”) on the menu bar at top. If no errors occur, you are all set!

Occasionally the files in gr\_radio\_astro may change. Complete the following to update these files.

**How to Update files from the gr-radio\_astro Repository**

1. Open the terminal window.
2. From your home directory (cd ), go to the gr-radio\_astro folder: cd gr-radio\_astro
3. Type git status. Check the “On branch …” statement at the top. You want to be in the “main” branch. To get there, type git checkout main.
4. Type git pull.
   * If a warning message shows up about local changes made that could overwrite files, type git stash.
   * Then type git pull again.
5. Change to the build directory: cd build
6. Type rm -rf \*. **NOTE:** Make sure you are in the build directory before typing rm -rf \*!
7. Then run the following:
8. cmake ..
9. make
10. sudo make install
11. The update is complete.

**To Run the \_\_spectrometer\_w\_cal.grc\_\_ program in Gnuradio After Updating:**

1. In a terminal window type gnuradio-companion.
2. Close any previous version of spectrometer\_w\_cal.grc that might be open in Gnuradio.
3. Open the new version of spectrometer\_w\_cal.grc from the folder /gr-radio\_astro/examples/DSPIRA/
   * under File select Open;
   * Navigate to the gr-radio\_astro folder.
   * Under examples open DSPIRA; then select spectrometer\_w\_cal.grc.
4. Connect an Airspy SDR to a USB port, and start the program running (Hit the black triangle at the top middle ribbon bar.)

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* [Installing Ubuntu](https://wvurail.org/dspira-lessons/Ubuntu_Installation)
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