



*School of Engineering (BH075)*

*OENG1168 – Engineering Capstone Project*

*Part B*

# R820T INSTRUCTIONS FOR LINUX UBUNTU

## Table of Contents:

1. Linux Code
2. Code Breakdown
3. Other useful links

Tin Nguyen  
s3486352

## 1. Linux Code

```
sudo apt-get update
sudo apt-get install libusb-1.0-0-dev git cmake build-essential gnuradio gqrx-sdr
```

```
git clone https://github.com/keenerd/rtl-sdr.git
git clone https://github.com/keenerd/rtl-sdr-misc
cd rtl-sdr/
mkdir build
cd build
cmake ../ -DINSTALL_UDEV_RULES=ON -DDETACH_KERNEL_DRIVER=ON
make
sudo make install
sudo ldconfig
sudo cp ../rtl-sdr.rules /etc/udev/rules.d/
echo 'blacklist dvb_usb_rtl28xxu' | sudo tee --append /etc/modprobe.d/blacklist-
dvb_usb_rtl28xxu.conf
```

```
sudo udevadm control --reload-rules
sudo udevadm trigger
```

```
rtl_test -t
```

```
sudo apt-get install dvb-apps
cd /usr/share/dvb/dvb-legacy/dvb-t
more au-Melbourne
cp au-Melbourne ~
cd
scan au-Melbourne
```

```
sudo apt-get install python-imaging
rtl_power -f (.....:10k ish -g -i -e -c csv)
python heatmap.py x.csv
```

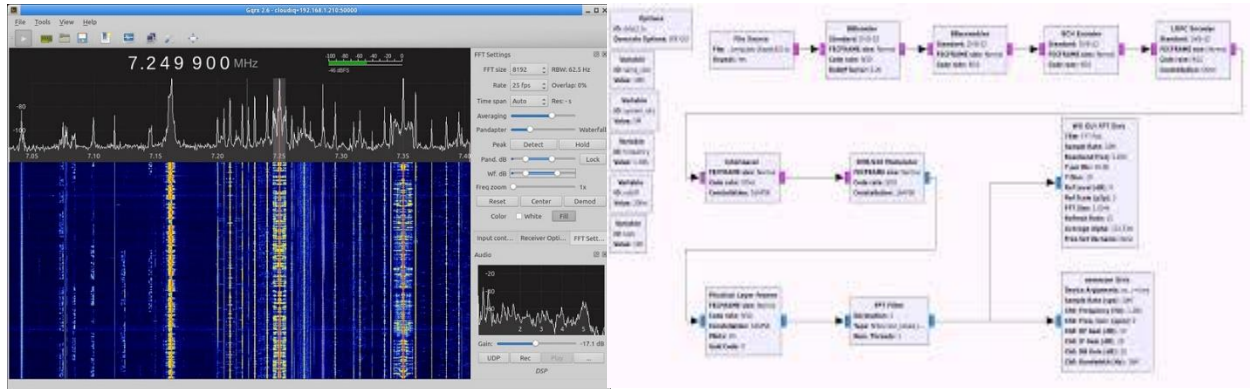
```
rtl_sdr -h
rtlsdr_set_dithering
```

## 2. Code breakdown

Lib usb: device firmware

Git: Github repository using a modified version to remove dithering.

GNURadio & GQRX: Software used to sample the R820T device.



Gnuradio is similar to Simulink but on linux.

### Windows Version:

SDRsharp equivalent to GQRX: <https://www.rtl-sdr.com/rtl-sdr-quick-start-guide/>

Matlab: <https://www.mathworks.com/hardware-support/rtl-sdr.html>,

[https://www.youtube.com/watch?v=QTvT\\_YSONmo](https://www.youtube.com/watch?v=QTvT_YSONmo)

-DINSTALL\_UDEV\_RULES=ON -DDETACH\_KERNEL\_DRIVER=ON & echo 'blacklist  
dvb\_usb\_rtl28xxu' | sudo tee --append /etc/modprobe.d/blacklist-dvb\_usb\_rtl28xxu.conf  
: Disables the ability to watch DVB-T to using SDR mode.

sudo udevadm control --reload-rules

sudo udevadm trigger

Instead of rebooting everytime quick workaround for reboot instructions:

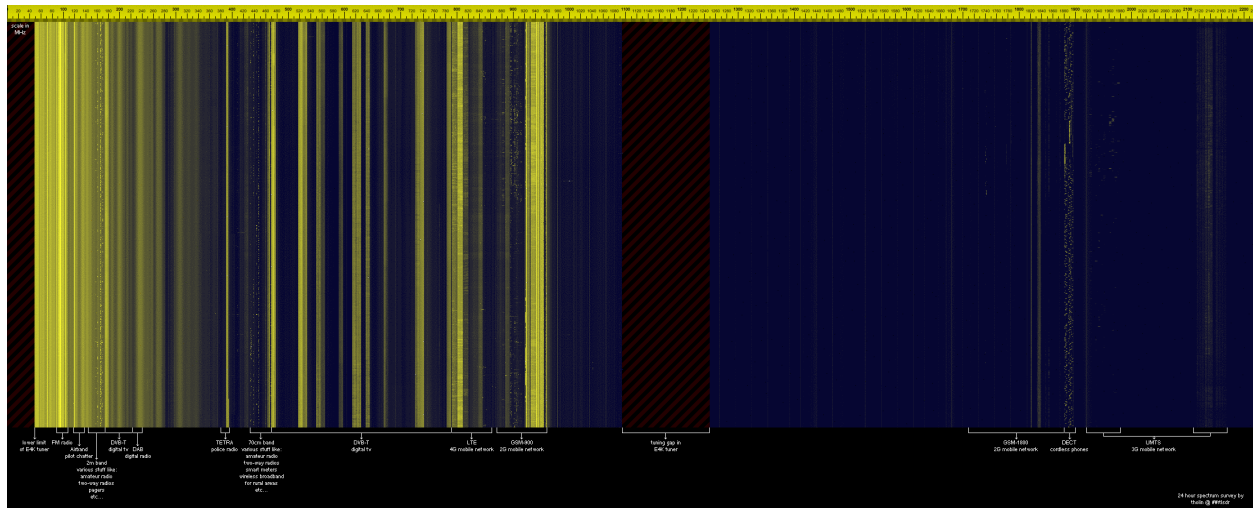
sudo apt-get install dvb-apps:

Enables to Watch DVB-T and quick search of frequencies world wide

Example:

<https://www.youtube.com/watch?v=asmCMmq06R0&list=LL21V9vuvwxKJiPnIPYK6DoA&index=15&t=34s>

RLT power & Heatmap.py: <http://kmkeen.com/rtl-power/>



Waterfall data collection: Make sure you copy heatmap.py in the RTL-sdr misc file into RTL-SDR-Build file for it to run since you are in that directory.

### 3. Useful Links

<https://coherent-receiver.com/support>

<https://github.com/RMIT-TIN-N-H/rtl-power-results-and-data/tree/master/presentataion>

Passive radar presentation and Excel file for Melbourne DVB-T transmission data.

<https://www.youtube.com/watch?v=-n1bRgVFafA&t=368s> (passive radar)

<https://ptrkrysik.github.io/>: Time synchronization

<https://eprints.usq.edu.au/31461/> 2016 thesis on R820T

R820T2 datasheet:

[https://www.rtl-sdr.com/wp-content/uploads/2013/04/R820T\\_datasheet-Non\\_R-20111130\\_unlocked1.pdf](https://www.rtl-sdr.com/wp-content/uploads/2013/04/R820T_datasheet-Non_R-20111130_unlocked1.pdf)

[https://www.rtl-sdr.com/wp-content/uploads/2013/04/R820T\\_datasheet-Non\\_R-20111130\\_unlocked1.pdf](https://www.rtl-sdr.com/wp-content/uploads/2013/04/R820T_datasheet-Non_R-20111130_unlocked1.pdf)