

You will be unable to access the computer unless you send your Public key to whomever is in charge of the radio scope

Linux:

Located: ~/.ssh/id\_rsa.pub

Generate with: ssh-keygen

MacOS:

Above commands should work too

Windows:

Lol

# Starting the Telescope

reber:1 (jjtobin) - TigerVNC

Applications Places Firefox Web Browser

Wed 23:07

Currently the button is red so no power to telescope. Click on red button and it will turn green showing power to scope

Configuration  
Schedule  
Network  
E-mail  
Hangouts  
SMS  
Account  
System Time  
Language  
Logs  
Data  
Event Log  
Help

Outlet Name	Status	Control
Telescope Control and Amp Power	Off	
1420MHz Noise Source	Off	

Outlet On Outlet Off Outlet On, UIS Reset function is Off

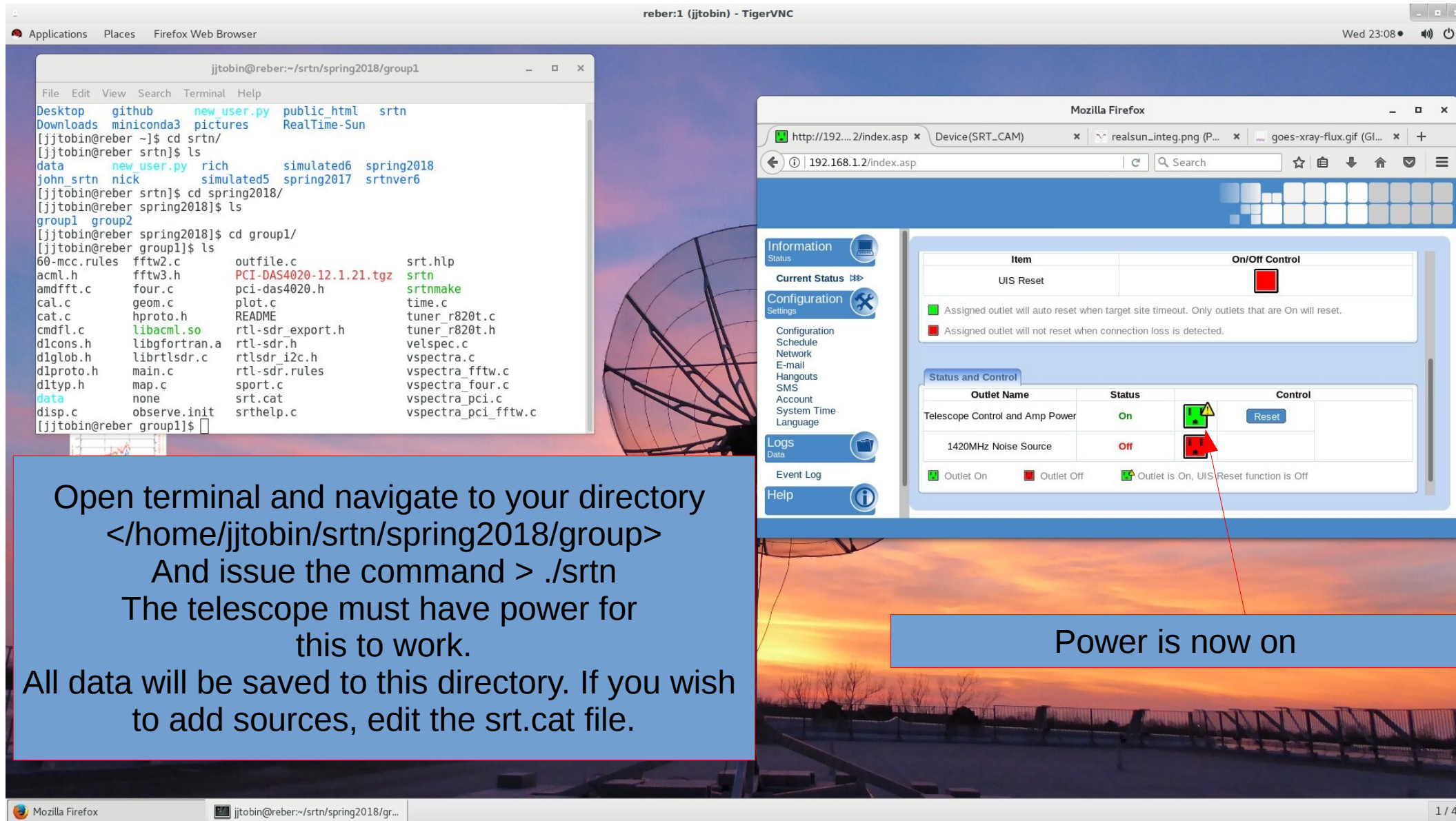
This is the noise source diode. Turning this on will turn on the power to the diode, sending high power noise to the receiver. Only use when calibrating

realsun\_integ\_9-4.png  
goes-xray-flux\_9-7.png  
realsun\_integ\_9-7.png  
realsun\_integ\_9-9.png  
goes-xray-flux.gif  
realsun\_integ\_9-18.png

Mozilla Firefox

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# Finding right directories and turning on telescope










The image shows a terminal window and a web browser interface for controlling a telescope. The terminal window displays the user's navigation to the directory `~/srtm/spring2018/group1` and the execution of the `./srtm` command. The web browser shows the `192.168.1.2/index.asp` page, which includes a status section with a table of outlets and their current states.

**Terminal Output:**

```
jjtobin@reber:~/srtm/spring2018/group1
File Edit View Search Terminal Help
Desktop  github  new_user.py  public_html  srtm
Downloads miniconda3 pictures RealTime-Sun
[jjtobin@reber ~]$ cd srtm/
[jjtobin@reber srtm]$ ls
data      new_user.py  rich      simulated6  spring2018
john srtm  nick      simulated5  spring2017  srtmver6
[jjtobin@reber srtm]$ cd spring2018/
[jjtobin@reber spring2018]$ ls
group1 group2
[jjtobin@reber spring2018]$ cd group1/
[jjtobin@reber group1]$ ls
60-mcc.rules  fftw2.c      outfile.c      srt.hlp
acml.h         fftw3.h      pci-das4020-12.1.21.tgz  srtm
amdfft.c       four.c       pci-das4020.h  srtmmake
cal.c          geom.c       plot.c         time.c
cat.c          hproto.h    README        tuner_r820t.c
cmdfl.c        libacml.so   rtl-sdr_export.h  tuner_r820t.h
dicons.h       libgfortran.a  rtl-sdr.h       velspec.c
diglob.h       librtlsdr.c  rtl-sdr_i2c.h   vspectra.c
dlproto.h      main.c       rtl-sdr.rules   vspectra_fftw.c
dltyp.h        map.c        sport.c         vspectra_four.c
data           none         srt.cat        vspectra_pci.c
disp.c         observe.init  srthelp.c      vspectra_pci_fftw.c
[jjtobin@reber group1]$
```

**Web Browser Interface:**

The web browser shows the `192.168.1.2/index.asp` page. The **Information** section displays the **Current Status** of the system. The **Configuration** section includes a table of outlets and their status.

Outlet Name	Status	Control
Telescope Control and Amp Power	On	      



# Control Window

reber:1 (jjtobin) - TigerVNC

Applications Places srtm

jjtobin@reber:~/srtm/spring2018/group1

```
File Edit View Search Terminal Help
dlcons.h      libgfortran.a  rtl-sdr.h      velspec.c
diglob.h      librtlsdr.c    rtl-sdr_i2c.h  vspectra.c
diproto.h     main.c         rtl-sdr.rules  vspectra_fftw.c
dltyp.h       map.c          sport.c        vspectra_four.c
data         none          srt.cat        vspectra_pci.c
disp.c       observe.init   srthelp.c      vspectra_pci_fftw.c
[jjtobin@reber group1]$ ./srtm
Found Rafael Micro R820T tuner
R828 Array[11] = 108
DivNum: 4 ; DivNum <= 5: 128
MixDiv = 32
LO Freq = 56000000
VCO_Freq = 1792000000
VCO_Fra = 6400
Nint = 31
R828 Array[11] = 132
DivNum: 0 ; DivNum <= 5: 0
MixDiv = 2
LO Freq = 1423926000
VCO_Freq = 2847852000
VCO_Fra = 25452
Nint = 49
gain_set 1f
```

clear stow azel npoint beamsw freq offset record cmdfl cal help exit

2.4MHz IF  
Tsys 125 smax 38  
0.2-2.2MHz IF  
fs 86.38K pwr 683.5  
av. spectrum  
fs 85.49K pwr 683.5

Sooner\_Station 35.2N 97.4  
cmd 267.6 23.6 deg  
azel 267.5 23.5 deg  
offsets 0.0 0.0 deg  
ra 6.5 hr 11.4 deg  
2018:102:04:13:17 PC  
UT Apr 12 LST 11.08 h

Source: G200  
06:28:30 11:29:08 2018  
visr 43k/s l=200 b= 0  
integ= 37 sec

Freq 1420.406 MHz  
I.F. 1.200 MHz  
BW 2.000 MHz  
RESOL 9.375 kHz

Item  
UIS Reset

Assigned outlet will auto reset when target site timeout. On  
Assigned outlet will not reset when connection loss is detected

Outlets and Control

Outlet Name	Status
Scope Control and Amp Power	On
1420MHz Noise Source	Off
Outlet On	Outlet Off

Verbose

Issue this command

This new window pops up.  
This is what controls the telescope

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# Ins and outs of the control window

This is the command bar.  
These buttons issue commands  
To the control window

Displays the header information  
All of this gets written to the saved file

Timeline of power in receiver.  
In arbitrary Y units. X units  
are time

Molleweide projection of the sky (az and el)  
0deg az is north going clockwise  
Careful with transiting sources.  
This window is clickable to send telescope  
there

The screenshot shows the 'srtn' control window with a command bar at the top containing buttons: clear, stow, azel, npoint, beamsw, freq, offset, record, cmdfl, cal, help, exit. Below the command bar are three small plots: '2.4MHz IF', '0.2-2.2MHz IF', and 'av. spectrum'. To the right of these plots is a text area displaying station and source information. At the bottom is a large Molleweide projection of the sky with various sources labeled. A terminal window on the left shows command-line output, and a Firefox browser window on the right shows a web interface with a table of outlet statuses.

Station Information:

- cmd 267.6 23.6 deg
- azel 267.5 23.5 deg
- offsets 0.0 0.0 deg
- ra 6.5 hr 11.4 deg
- 2018:102:04:13:17 PC
- UT Apr 12 LST 11.08 h

Source Information:

- Source: G200
- 06:28:30 11:29:08 2018
- visr 43km/s l=200 b= 0
- integ= 37 sec
- Freq 1420.406 MHz
- I.F. 1.200 MHz
- BW 2.000 MHz
- RESOL 9.375 kHz

Outlet Name	Status
Scope Control and Amp Power	On
1420MHz Noise Source	Off
Outlet On	Outlet Off

# Commands

reber:1 (jytobin) - TigerVNC

Applications Places srtn

Wed 23:13 •

reber:1 (jytobin) - TigerVNC

File Edit View Search Terminal Help

dlcons.h libgfortran.a rtl-sdr.h velspec.c  
d1glob.h librtlsdr.c rtl-sdr\_i2c.h vspectra.c  
d1proto.h main.c rtl-sdr.rules vspectra\_fftw.c  
d1typ.h map.c sport.c vspectra\_four.c  
data none srt.cat vspectra\_pci.c  
disp.c observe.init srthelp.c vspectra\_pci\_fftw.c

[jytobin@reber group1]\$ ./srtm  
Found Rafael Micro R820T tuner  
R828 Array[11] = 108  
DivNum: 4 ; DivNum <= 5: 128  
MixDiv = 32  
LO Freq = 56000000  
VCO\_Freq = 1792000000  
VCO\_Fra = 6400  
Nint = 31  
R828 Array[11] = 132  
DivNum: 0 ; DivNum <= 5:  
MixDiv = 2  
LO Freq = 1423926000  
VCO\_Freq = 2847852000  
VCO\_Fra = 25452  
Nint = 49  
gain\_set 1f

clear stow azel npoint beamsw freq offset record cmdfl cal help exit

2.4MHz IF  
Tsyst 125 smax 38  
0.2-2.2MHz IF  
fs 86.38K pwr 683.5  
av. spectrum  
fs 85.49K pwr 683.5

Source: G200  
06:28:30 11:29:08 2018  
vlsr 43km/s l=200 b= 0  
integ= 37 sec  
Freq 1420.406 MHz  
I.F. 1.200 MHz  
BW 2.000 MHz  
RESOL 9.375 kHz

Sooner\_Station 35.2N 97.4

Item  
UIS Reset

Assigned outlet will auto reset when target site timeout. On  
Assigned outlet will not reset when connection loss is detected

Is and Control

Outlet Name	Status
Scope Control and Amp Power	On
1420MHz Noise Source	Off
Outlet On	Outlet Off

goes-xray-flux.gif

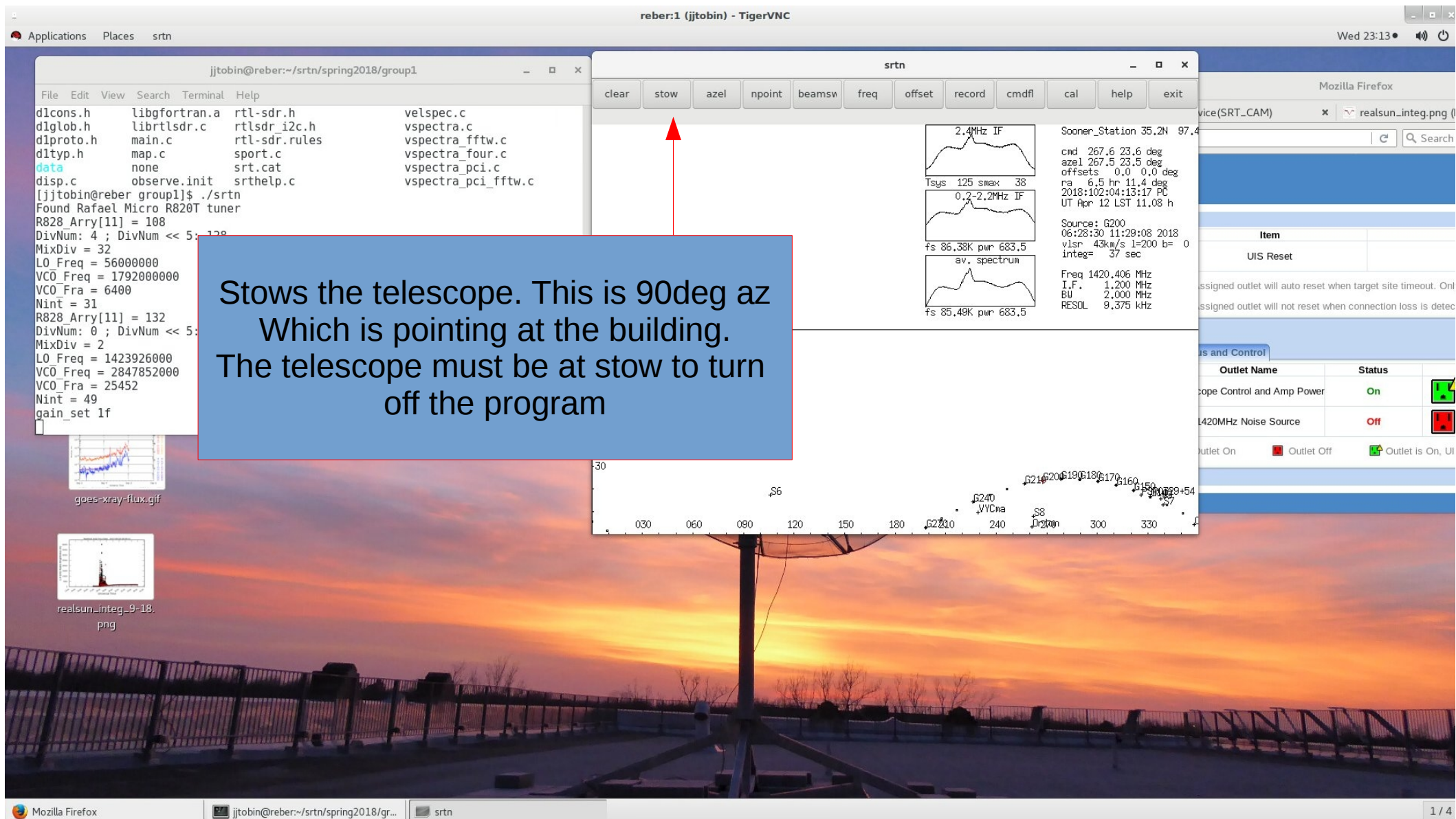
realsun\_integ\_9-18.png

30 030 060 090 120 150 180 210 240 270 300 330

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# Commands



# Commands

The screenshot displays a desktop environment with a terminal window, a control panel, and a background image of a radio telescope at sunset.

**Terminal Window:** The terminal shows the user `jjtobin` at the prompt `jjtobin@reber:~/srtn/spring2018/group1`. The command `./srtn` has been executed, displaying the following output:

```
Found Rafael Micro R820T tuner
R828 Array[11] = 108
DivNum: 4 ; DivNum <= 5: 128
MixDiv = 32
LO Freq = 56000000
VCO_Freq = 1792000000
VCO_Fra = 6400
Nint = 31
R828 Array[11] = 132
DivNum: 0 ; DivNum <= 5:
MixDiv = 2
LO Freq = 1423926000
VCO_Freq = 2847852000
VCO_Fra = 25452
Nint = 49
gain_set 1f
```

**Control Panel:** The control panel, titled `srtn`, features a menu bar with buttons: `clear`, `stow`, `azel` (highlighted with a red arrow), `npoint`, `beamsw`, `freq`, `offset`, `record`, `cmdfl`, `cal`, `help`, and `exit`. Below the menu, there are three plots: `2.4MHz IF`, `0.2-2.2MHz IF`, and `av. spectrum`. To the right of the plots, the following data is displayed:

```
Sooner_Station 35.2N 97.4
cid 267.6 23.6 deg
azel 267.5 23.5 deg
offsets 0.0 0.0 deg
rs 6.5 hr 11.4 deg
2018:102:04:13:17 PC
UT Apr 12 LST 11:08 h

Source: G200
06:28:30 11:29:08 2018
vlrs 43k/s l=200 b= 0
integ= 37 sec

Freq 1420.406 MHz
I.F. 1.200 MHz
BU 2.000 MHz
RESOL 9.375 kHz
```

**Background Image:** The background image shows a radio telescope dish pointing towards the sky at sunset. The sky is a mix of orange, yellow, and blue. The telescope is a large, white, parabolic dish mounted on a metal structure.

**Other Elements:** A blue text box in the center of the screen contains the text: "Sets a specific az el for the telescope. Useful for calibration or trailing". In the bottom right corner, there is a status bar with the text "1 / 4".



# Commands

reber:1 (jttobin) - TigerVNC

Applications Places srtn Wed 23:13

jttobin@reber:~/srtn/spring2018/group1

```
File Edit View Search Terminal Help
dlcons.h      libgfortran.a  rtl-sdr.h      velspec.c
dlglob.h      librtlsdr.c   rtl-sdr_i2c.h  vspectra.c
dlproto.h     main.c        rtl-sdr.rules  vspectra_fft.c
dltyp.h       map.c         sport.c        vspectra_four.c
data         none          srt.cat        vspectra_pci.c
disp.c        observe.init  srthelp.c      vspectra_pci_fft.c
[jttobin@reber group1]$ ./srtn
Found Rafael Micro R820T tuner
R828_Arry[11] = 108
DivNum: 4 ; DivNum <= 5: 128
MixDiv = 32
LO_Freq = 56000000
VC0_Freq = 1792000000
VC0_Fra = 6400
Nint = 31
R828_Arry[11] = 132
DivNum: 0 ; DivNum <= 5:
MixDiv = 2
LO_Freq = 1423926000
VC0_Freq = 2847852000
VC0_Fra = 25452
Nint = 49
gain_set 1f

```

clear stow azel **npoint** beamsw freq offset record cmdfl cal help exit

2.4MHz IF  
Tsfs 125 smax 38  
0.2-2.2MHz IF  
fs 86.38K pwr 683.5  
av. spectrum  
fs 85.49K pwr 683.5

Sooner\_Station 35.2N 97.4W  
cnd 267.6 23.6 deg  
azel 267.5 23.5 deg  
offsets 0.0 0.0 deg  
rs 6.5 hr 11.4 deg  
2018:102:04:13:17 PC  
UT Apr 12 LST 11:08 h  
Source: G200  
06:28:30 11:29:08 2018  
vlrs 43k/s l=200 b= 0  
integ= 37 sec  
Freq 1420.406 MHz  
I.F. 1.200 MHz  
BU 2.000 MHz  
RESOL 9.375 kHz

Item  
UIS Reset

Assigned outlet will auto reset when target site timeout. On  
Assigned outlet will not reset when connection loss is detected

Is and Control

Outlet Name	Status
Scope Control and Amp Power	On
1420MHz Noise Source	Off
Outlet On	Outlet Off

goes-xray-flux.gif

realsun\_integ\_9-18.png

25 Npoint map used for focus.  
After you calibrate, point at the sun.  
Constructs a 2D gaussian fit on the Sun. It will plot the fit once finished  
Input the az and el offsets into the offset command

S6  
030 060 090 120 150 180 210 240 270 300 330

1420MHz Noise Source

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# Commands

The screenshot displays a computer interface for a radio telescope system. The background is a photograph of a radio telescope dish at sunset. Overlaid on this are several windows:

- Terminal Window (Left):** Shows a shell prompt `jjtobin@reber:~/srtm/spring2018/group1` and a list of files including `dlcons.h`, `libgfortran.a`, `rtl-sdr.h`, `velspec.c`, `diglob.h`, `librtlsdr.c`, `rtlsdr_i2c.h`, `vspectra.c`, `dlproto.h`, `main.c`, `rtl-sdr.rules`, `vspectra_fftw.c`, `dltyp.h`, `map.c`, `sport.c`, `vspectra_four.c`, `data`, `none`, `srt.cat`, `vspectra_pci.c`, `disp.c`, `observe.init`, `srt.help.c`, `vspectra_pci_fftw.c`. Below the list, it shows the execution of `./srtm` and various configuration parameters like `Found Rafael Micro R820T tuner`, `R828 Arry[11] = 108`, `DivNum: 4 ; DivNum <= 5: 128`, `MixDiv = 32`, `LO Freq = 56000000`, `VC0_Freq = 1792000000`, `VC0_Fra = 6400`, `Nint = 31`, `R828 Arry[11] = 132`, `DivNum: 0 ; DivNum <= 5: 128`, `MixDiv = 2`, `LO Freq = 1423926000`, `VC0_Freq = 2847852000`, `VC0_Fra = 25452`, `Nint = 49`, and `gain_set 1f`.
- srtm Window (Top Right):** A control interface with buttons: `clear`, `stow`, `azel`, `npoin`, `beamsw` (highlighted with a red arrow), `freq`, `offset`, `record`, `cmdfl`, `cal`, `help`, `exit`. It also displays three plots: `2.4MHz IF`, `0.2-2.2MHz IF`, and `av. spectrum`. To the right of the plots, it shows source information: `Sooner_Station 35.2N 97.4W`, `cmd 267.6 23.6 deg`, `azel 267.5 23.5 deg`, `offsets 0.0 0.0 deg`, `ra 6.5 hr 11.4 deg`, `2018:102:04:13:17 PC`, `UT Apr 12 LST 11:08 h`, `Source: G200`, `06:28:30 11:29:08 2018`, `vlsr 43km/s l=200 b= 0`, `integ= 37 sec`, `Freq 1420.406 MHz`, `I.F. 1.200 MHz`, `BU 2.000 MHz`, and `RESOL 9.375 kHz`.
- Firefox Browser Window (Right):** Shows a page titled `realsun_integ.png` with a search bar and a table with columns `Item` and `UIS Reset`.
- Blue Text Box (Center):** Contains the text: 

Beamswitching method.  
While observing, switches on and off  
Source by a beamwidth. Good for  
Faint targets
- Bottom Window:** A plot showing a spectrum with various peaks labeled with numbers like 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330.



# Commands

reber:1 (jttobin) - TigerVNC

Applications Places srtn

Wed 23:13 •

jjtobin@reber:~/srtn/spring2018/group1

File Edit View Search Terminal Help

dlcons.h libgfortran.a rtl-sdr.h velspec.c  
d1glob.h librtlsdr.c rtl-sdr\_i2c.h vspectra.c  
d1proto.h main.c rtl-sdr.rules vspectra\_fftw.c  
d1typ.h map.c sport.c vspectra\_four.c  
data none srt.cat vspectra\_pci.c  
disp.c observe.init srthelp.c vspectra\_pci\_fftw.c

[jjtobin@reber group1]\$ ./srtn  
Found Rafael Micro R820T tuner  
R828 Array[11] = 108  
DivNum: 4 ; DivNum <= 5: 128  
MixDiv = 32  
LO Freq = 56000000  
VCO\_Freq = 1792000000  
VCO\_Fra = 6400  
Nint = 31  
R828 Array[11] = 132  
DivNum: 0 ; DivNum <= 5:  
MixDiv = 2  
LO Freq = 1423926000  
VCO\_Freq = 2847852000  
VCO\_Fra = 25452  
Nint = 49  
gain\_set 1f

clear stow azel npoint beamsw freq offset record cmdfl cal help exit

2.4MHz IF  
Tsyst 125 smax 38  
0.2-2.2MHz IF  
fs 86.38K pwr 683.5  
av. spectrum  
fs 85.49K pwr 683.5

Sooner\_Station 35.2N 97.4  
cnd 267.6 23.6 deg  
azel 267.5 23.5 deg  
offsets 0.0 0.0 deg  
rs 6.5 hr 11.4 deg  
2018:102:04:13:17 PC  
UT Apr 12 LST 11:08 h  
Source: G200  
06:28:30 11:29:08 2018  
vlrs 43k/s l=200 b= 0  
integ= 37 sec  
Freq 1420.406 MHz  
I.F. 1.200 MHz  
BU 2.000 MHz  
RESOL 9.375 kHz

Changes the frequency. Listed in MHz  
Defaults to 1420.406 MHz (21 cm)  
Good alternative is 1421MHz for solar

goes-xray-flux.gif

realsun\_integ\_9-18.png

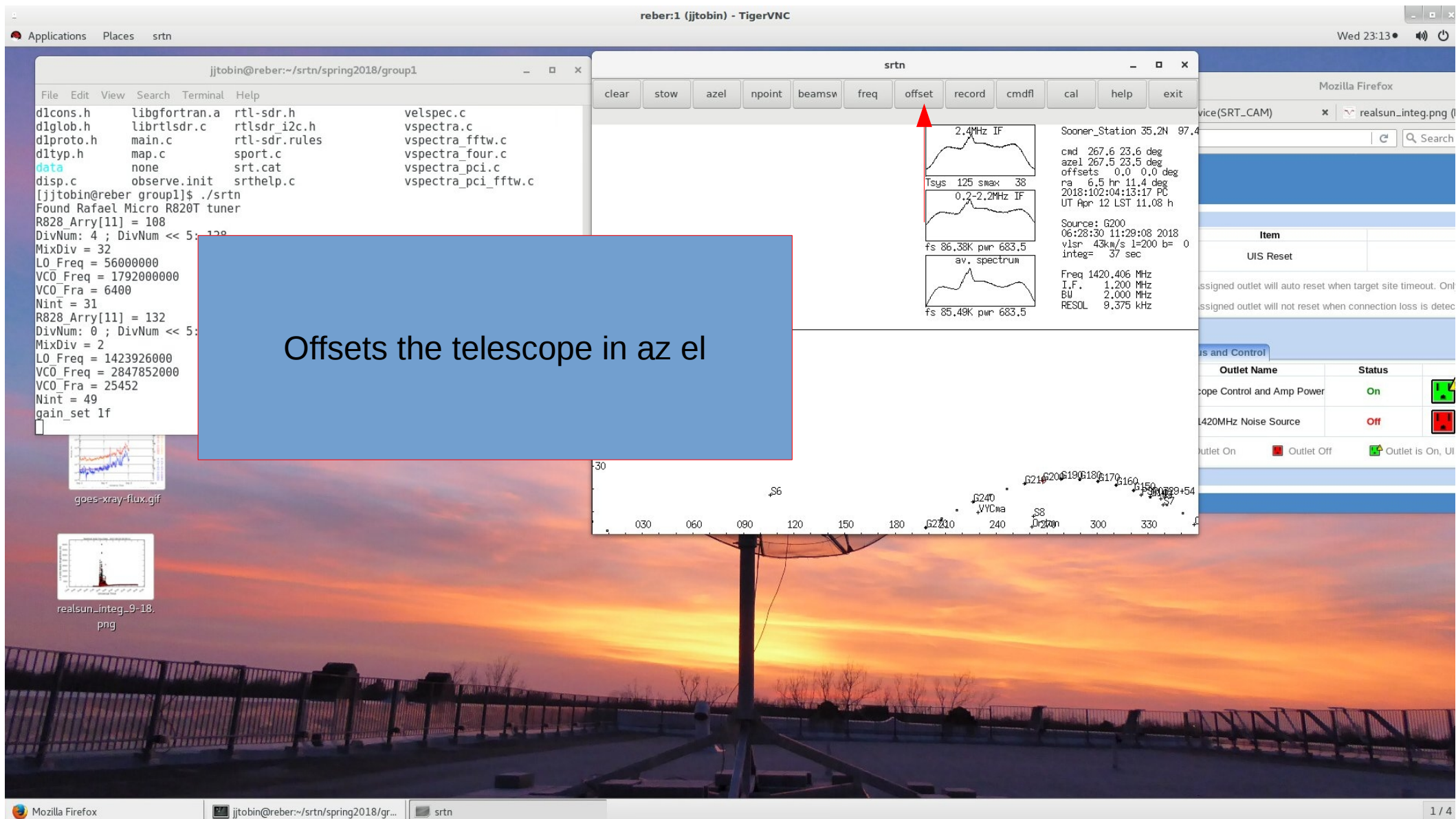
30  
030 060 090 120 150 180 210 240 270 300 330

Outlet Name Status  
Scope Control and Amp Power On  
1420MHz Noise Source Off  
Outlet On Outlet Off Outlet is On, UI

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# Commands



# Commands

reber:1 (jjtobin) - TigerVNC

Applications Places srtn Wed 23:13

jjtobin@reber:~/srtn/spring2018/group1

```
File Edit View Search Terminal Help
dlcons.h      libgfortran.a  rtl-sdr.h      velspec.c
dlglob.h      librtlsdr.c   rtl-sdr_i2c.h  vspectra.c
dlproto.h     main.c        rtl-sdr.rules  vspectra_fftw.c
dltyp.h       map.c         sport.c        vspectra_four.c
data         none          srt.cat        vspectra_pci.c
disp.c        observe.init  srthelp.c      vspectra_pci_fftw.c
[jjtobin@reber group1]$ ./srtn
Found Rafael Micro R820T tuner
R828_Arry[11] = 108
DivNum: 4 ; DivNum <= 5: 128
MixDiv = 32
LO_Freq = 56000000
VCO_Freq = 1792000000
VCO_Fra = 6400
Nint = 31
R828_Arry[11] = 132
DivNum: 0 ; DivNum <= 5:
MixDiv = 2
LO_Freq = 1423926000
VCO_Freq = 2847852000
VCO_Fra = 25452
Nint = 49
gain_set 1f

```

srtn

clear stow azel npoint beamsw freq offset record cmdfl cal help exit

2.4MHz IF  
Tsys 125 smax 38  
0.2-2.2MHz IF  
fs 86.38K pwr 683.5  
av. spectrum  
fs 85.49K pwr 683.5

Sooner\_Station 35.2N 97.4W  
cnd 267.6 23.6 deg  
azel 267.5 23.5 deg  
offsets 0.0 0.0 deg  
rs 6.5 hr 11.4 deg  
2018:102:04:13:17 PC  
UT Apr 12 LST 11:08 h  
Source: G200  
06:28:30 11:29:08 2018  
vlrs 43k/s l=200 b= 0  
integ= 37 sec  
Freq 1420.406 MHz  
I.F. 1.200 MHz  
BU 2.000 MHz  
RESOL 9.375 kHz

Record the data to a file.  
File name limited to < 30 chars

goes-xray-flux.gif

realsun\_integ\_9-18.png

30 030 060 090 120 150 180 210 240 270 300 330

S6 G210 G215 G220 G225 G230 G235 G240 VVCma S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26 S27 S28 S29 S30 S31 S32 S33 S34 S35 S36 S37 S38 S39 S40 S41 S42 S43 S44 S45 S46 S47 S48 S49 S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79 S80 S81 S82 S83 S84 S85 S86 S87 S88 S89 S90 S91 S92 S93 S94 S95 S96 S97 S98 S99 S100

Outlet Name Status

Scope Control and Amp Power On

1420MHz Noise Source Off

Outlet On Outlet Off Outlet is On, UI

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# Commands

The screenshot displays a desktop environment with a terminal window, a software interface, and a background image of a radio telescope.

**Terminal Window:** The terminal shows the user `jjtobin` at the prompt `reber:1 (jjtobin) - TigerVNC`. The user is in the directory `~/srtn/spring2018/group1`. The terminal output shows the execution of the `./srtn` command, which displays various system parameters and settings, including:

- `Found Rafael Micro R820T tuner`
- `R828 Array[11] = 108`
- `DivNum: 4 ; DivNum <= 5: 128`
- `MixDiv = 32`
- `LO Freq = 56000000`
- `VC0_Freq = 1792000000`
- `VC0_Fra = 6400`
- `Nint = 31`
- `R828 Array[11] = 132`
- `DivNum: 0 ; DivNum <= 5: 128`
- `MixDiv = 2`
- `LO Freq = 1423926000`
- `VC0_Freq = 2847852000`
- `VC0_Fra = 25452`
- `Nint = 49`
- `gain_set 1f`

**Software Interface:** The `srtn` window displays three plots and a list of parameters. The plots are:

- 2.4MHz IF:** A plot showing the intermediate frequency spectrum.
- 0.2-2.2MHz IF:** A plot showing the intermediate frequency spectrum.
- av. spectrum:** A plot showing the average spectrum.

The parameters listed on the right are:

- Source: G200
- 06:28:30 11:29:08 2018
- vlr 43k/s l=200 b= 0
- integ= 37 sec
- Freq 1420.406 MHz
- I.F. 1.200 MHz
- BU 2.000 MHz
- RESOL 9.375 kHz

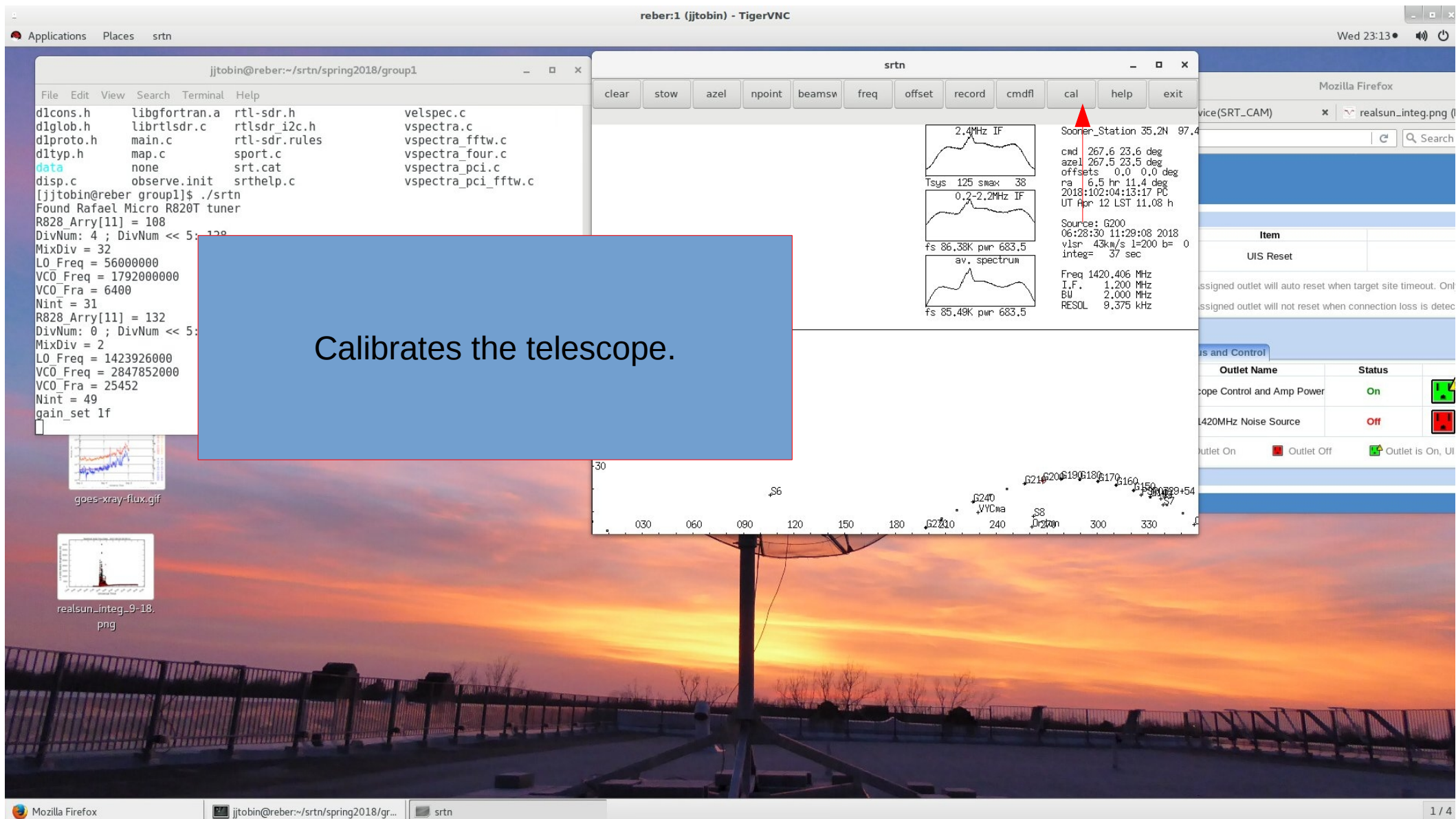
**Background Image:** The background image shows a radio telescope dish pointing towards the sky, with a sunset or sunrise in the background.

**Text Overlay:** A blue box with white text reads:

Allows automation  
Read in a command file.  
Check documentation for examples



# Commands



# Commands

The screenshot shows a Linux desktop environment with a terminal window, a graphical application window, and a web browser window. A blue text box is overlaid on the terminal window.

**Terminal Window:** The terminal window shows the user `jjtobin` at the prompt `reber:1 (jjtobin) - TigerVNC`. The user has executed the command `./srtm` in the directory `~/srtm/spring2018/group1`. The output of the command is as follows:

```
Found Rafael Micro R820T tuner
R828 Array[11] = 108
DivNum: 4 ; DivNum <= 5: 128
MixDiv = 32
LO Freq = 56000000
VCO_Freq = 1792000000
VCO_Fra = 6400
Nint = 31
R828 Array[11] = 132
DivNum: 0 ; DivNum <= 5:
MixDiv = 2
LO Freq = 1423926000
VCO_Freq = 2847852000
VCO_Fra = 25452
Nint = 49
gain_set 1f
```

**Graphical Application Window:** The graphical application window, titled `srtm`, displays three plots: `2.4MHz IF`, `0.2-2.2MHz IF`, and `av. spectrum`. The `2.4MHz IF` plot shows a peak at approximately 125 MHz. The `0.2-2.2MHz IF` plot shows a peak at approximately 86.38 MHz. The `av. spectrum` plot shows a peak at approximately 85.49 MHz. The application also displays a list of parameters: `Source: G200`, `06:28:30 11:29:08 2018`, `vlsr 43km/s l=200 b= 0`, `integ= 37 sec`, `Freq 1420.406 MHz`, `I.F. 1.200 MHz`, `BU 2.000 MHz`, and `RESOL 9.375 kHz`. A red arrow points to the `help` button in the application window.

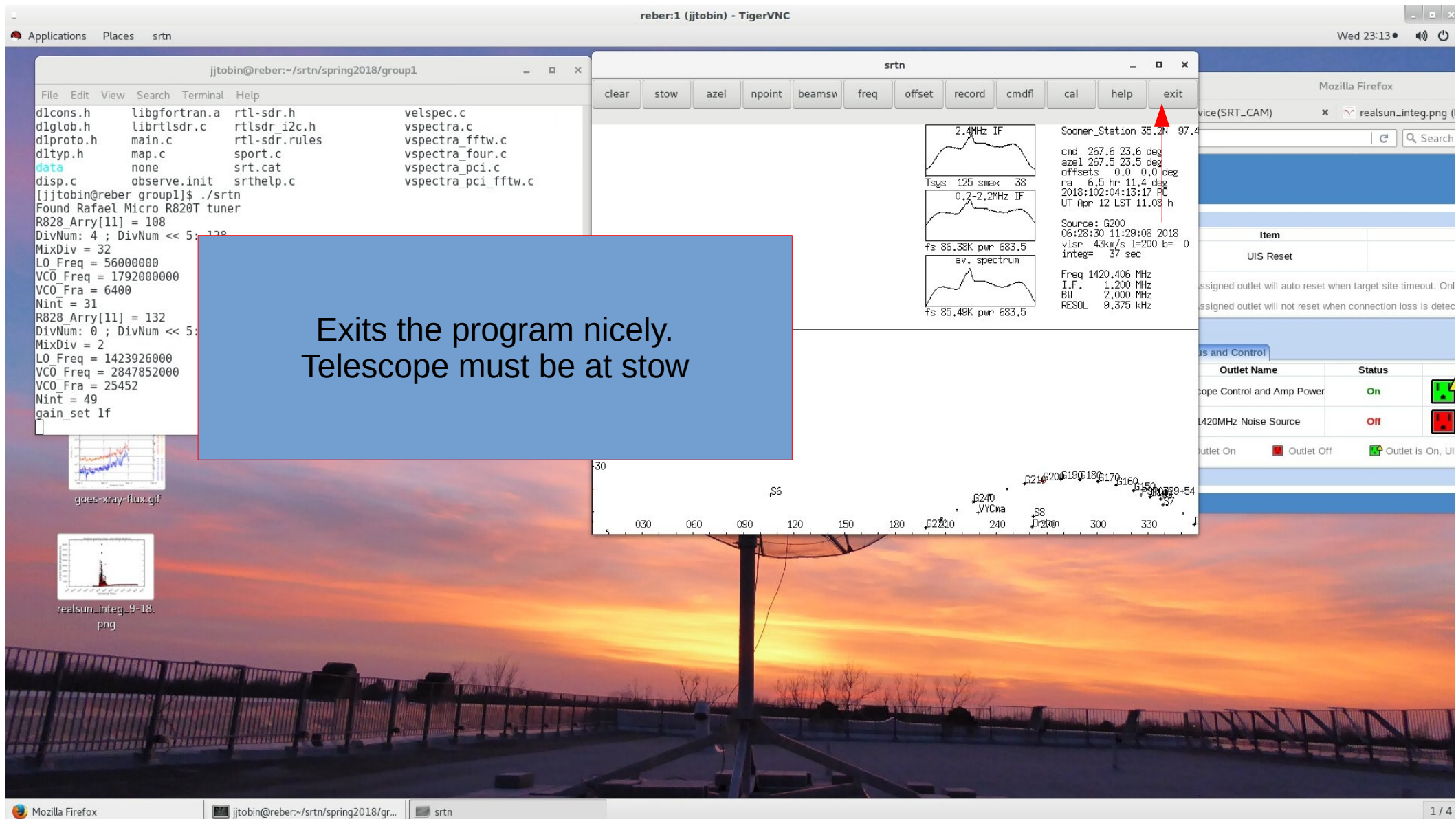
**Web Browser Window:** The web browser window, titled `realsun_integ.png`, displays a plot of `realsun_integ.png`. The plot shows a peak at approximately 1420 MHz. The browser also displays a table of outlet names and their status:

Outlet Name	Status
Scope Control and Amp Power	On
1420MHz Noise Source	Off
Outlet On	Outlet Off

**Blue Text Box:** A blue text box is overlaid on the terminal window, containing the text: `Displays a help message for every command`.

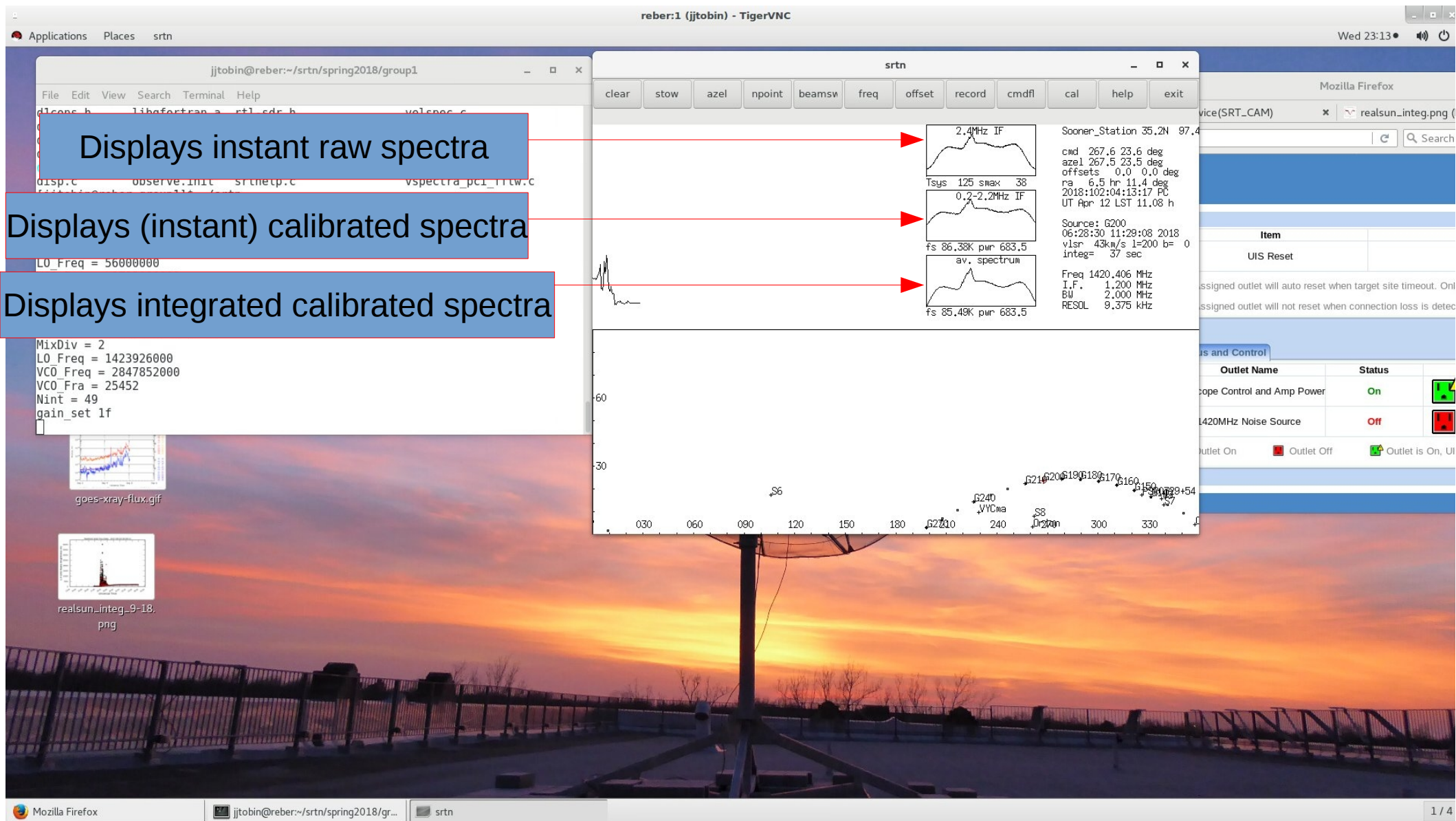


# Commands





# Display windows for the telescope.



## Calibrating the telescope

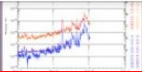
## Move to clean region

# Click cal

Place van calibrator  
(or turn on noise diode)

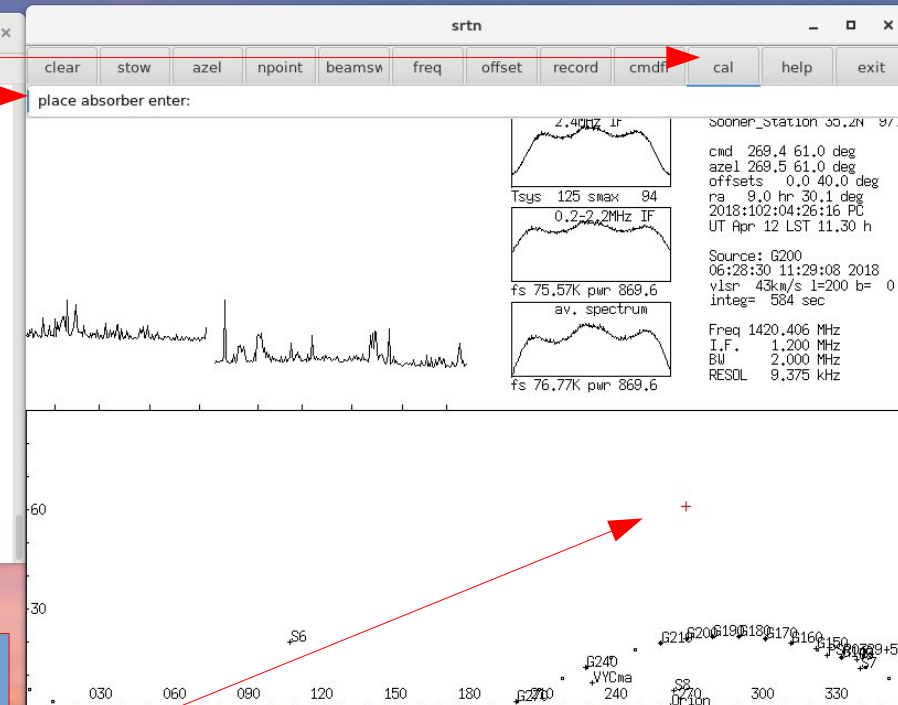
Click on “place absor.” and hit enter  
Wait about 14 seconds for it to finish

```
VC0_Fra = 25452
Nint = 49
gain set 1f
```

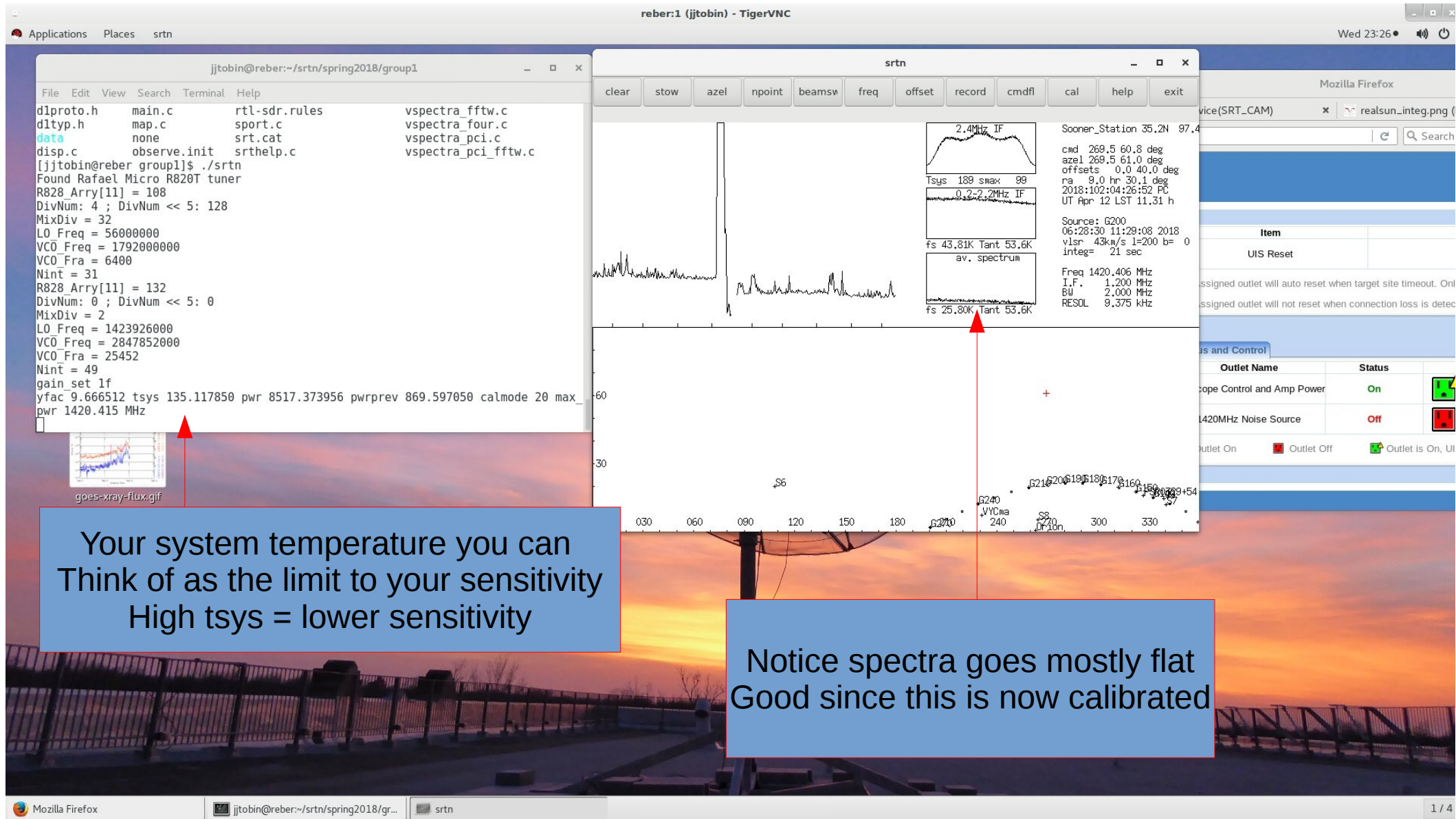


Clean region away from most sources.  
Suggested to be  $> 30^\circ$  from sun  
Also be  $> 15^\circ$  from galactic plane

## Turn on noise diode



# Verifying Calibration





# Observing

reber:1 (jytobin) - TigerVNC

Applications Places srtn

jjtobin@reber:~/srtn/spring2018/group1

```
File Edit View Search Terminal Help
dlproto.h    main.c      rtl-sdr.rules  vspectra_fftw.c
d1typ.h      map.c        sport.c        vspectra_four.c
data         none         srt.cat        vspectra_pci.c
disp.c       observe.init srthelp.c      vspectra_pci_fftw.c
[jytobin@reber group1]$ ./srtn
Found Rafael Micro R820T tuner
R828 Array[11] = 108
DivNum: 4 ; DivNum <= 5: 128
MixDiv = 32
LO_Freq = 56000000
VCO_Freq = 1792000000
VCO_Fra = 6400
Nint = 31
R828 Array[11] = 132
DivNum: 0 ; DivNum <= 5: 0
MixDiv = 2
LO_Freq = 1423926000
VCO_Freq = 2847852000
VCO_Fra = 25452
Nint = 49
gain set 1f
yfac 9.666512 tsys 135.117850 pwr 8517.373956 pwrprev 869.597050 calmode 20 max
pwr 1420.415 MHz
```

srtn

clear stow azel npoint beamsw freq offset record cmdfl cal help exit

2.4MHz IF  
Tsys 127 smax 34  
0.2-2.2MHz IF  
fs 59.74K Tant -8.2K  
av. spectrum  
fs 58.11K Tant -8.2K

Sooner\_Station 35.2N 97.4  
cmd 268.7 20.6 deg  
azel 268.5 20.5 deg  
offsets 0.0 0.0 deg  
ra 6.5 hr 11.3 deg  
2018:102:04:28:10 PC  
UT Apr 12 LST 11.33 h  
Source: G200  
06:28:30 11:29:08 2018  
visr 43km/s l=200 b= 0  
integ= 20 sec  
Freq 1420.406 MHz  
I.F. 1.200 MHz  
BW 2.000 MHz  
RESOL 9.375 kHz

Item  
UIS Reset

Assigned outlet will auto reset when target site timeout. On  
Assigned outlet will not reset when connection loss is detected

Outlet Name Status  
Scope Control and Amp Power On  
1420MHz Noise Source Off  
Outlet On Outlet Off Outlet is On, UI

Spectrum

click to write postscript file exit

64.0K 40.0K 32.0K 16.0K 0.0K  
-220-200-180-160-140-120-100-80-60-40-20 0 20 40 60 80 100 120 140  
VLSR (km/s)  
1421.2 1421.0 1420.8 1420.6 1420.4 1420.2 1420.0 1419.8 1419.6  
Frequency (MHz)

After integrating for 20s on G200  
This is the spectra  
You can click on the upper image  
To open up a better plot (left)  
You can write to postscript

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# Ending observations

When finished make sure to stow telescope  
Turn off the program  
Turn off the power to telescope and noise diode  
Leave screen just like this when finished

reber:1 (jjtobin) - TigerVNC

Wed 23:07

Mozilla Firefox

http://192.168.1.2/index.asp x Device(SRT\_CAM) x realsun\_integ.png (P... x goes-xray-flux.gif (Gl... x

192.168.1.2/index.asp

UIS Reset

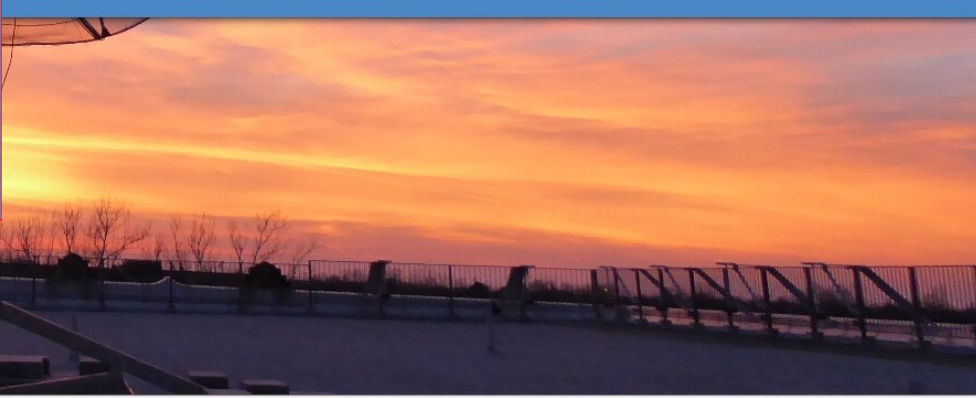
Assigned outlet will auto reset when target site timeout. Only outlets that are On will reset.

Assigned outlet will not reset when connection loss is detected.

Status and Control

Outlet Name	Status	Control
Telescope Control and Amp Power	Off	
1420MHz Noise Source	Off	

Outlet On Outlet Off Outlet is On, UIS Reset function is Off



Mozilla Firefox

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