seadas session handbook

This brief document explains how to conduct a pulsar observation with the Sardinia Radio Telescope by using the observing tool named **seadas.** It is organized as an "Expanded check list", i.e. a sequence of actions named and illustrated in details (whenever necessary).

A) Before the session starts, copy your schedule and setup files in the machine **viewer01,** in the directory:

/home/pulsar/scheds/[your project code]

B) Unstow the antenna (if stowed)

Please find the computer **viewer03:** it's the left computer in the row of desks you find in front of you as enter the control room. In it a full screen vnc window is open on the machine where is running **discos,** the SRT general control console. In this vnc, find the shell named **operatorInput** and give the following commands:

antennaReset
setupXXX (where XXX is the code of the requested receiver: PPP (P-Band), LLP (L-Band), PLP (LP-Dual), CCB (C-Band), KKG (K-Band))
goTo=*,87.9d

B1) Pointing (**C-Band** and **K-Band** receivers **ONLY**)

Observations with the **C-Band** and **K-Band** receivers require Pointing and Focus calibrations (**K-Band** only). In the **operatorInput,** give the following commands:

project=[the project code]
asSetup=S
setLO=LO_frequency (where LO_frequency is the first numerical argument of the keyword **Receiver** in your setup file)

setSection=0,*,730.000000,*,*,*,*
setSection=1,*,730.000000,*,*,*,*

chooseRecorder=MANAGEMENT/CalibrationTool
(NB a file is saved with the obtained results if this command is executed; if not results are not saved but the outcome of the procedure is not affected)

Open a terminal and give the command
calibrationtoolclient MANAGEMENT/CalibrationTool
(graphic tool for displaying plots)

Pointing calibration

Clear previous pointing offsets by giving in **operatorInput** the command:

azelOffsets=0d,0d
track one of the following sources 3c48, 3c295, 3c84, 3c123, 3c286, 3c345, NGC7027 (see table in appendix A for their coordinates) by giving the command:

track=source_name

then the command for executing the cross scan on the tracked source:

crossScan=HOR,0.5d,00:00:20

In both Azimuth and Elevation, poining offsets must be **less than 10%** of the beam width, namely < 0.0014deg in K band, < 0.0046deg in C band. **TAKE NOTE OF THE VALUES.** The expected plot in **calibrationtoolclient** should be a gaussian curve. If so, the calibration procedure is finished abd proceed with the focus calibration; if not, repeat the **entire procedure.** If the shape of the displayed curves keeps being different from a gaussian shape, clear the pointing offsets by giving in **operatorInput** the command:

azelOffsets=0d,0d

then proceed with the **focus calibration.**

Focus calibration (K-Band only)

Clear previous focus offsets by giving in **operatorInput** the command:

clearServoOffsets

track one of the following sources 3c48, 3c295, 3c84, 3c123, 3c286, 3c345, NGC7027 by giving the command:

track=source_name

then execute the calibration with one of the commands below, accordingly to the receiver:

focusScan=60,00:01:00

The first argument is 3x the wavelength in mm;

Measured offsets should be not larger than **a few tenths of mm** with respect to the zero. **TAKE NOTE OF THE VALUES.** The expected plot in **calibrationtoolclient** should be a gaussian curve. If so,

the calibration procedure is completed;if not, repeat the **entire procedure.** If the shape of the displayed curves keeps being different from a gaussian shape, clear the pointing offsets by giving in **operatorInput** the command:
clearServoOffsets

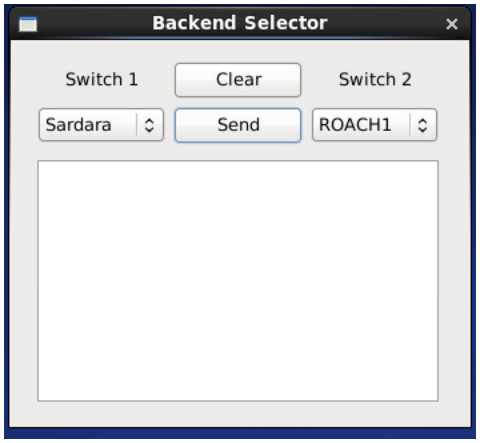
Whatever are the outcomes of the pointing and focus calibrations, close the **CalibrationTool** window, then give the command:

chooseRecorder=MANAGEMENT/FitsZilla

Now proceed to section C).

C) Send the receiver's signal to the backends to be used for the data acquisition

1) In the vnc on discos console (it runs on viewer03) find the window displayed in the picture below:



If you don't find it, open it following the procedure in point 2), otherwise go to point 3)

2) open a window and give the commands:

```
cd
cd SAB
python sabc.py
```

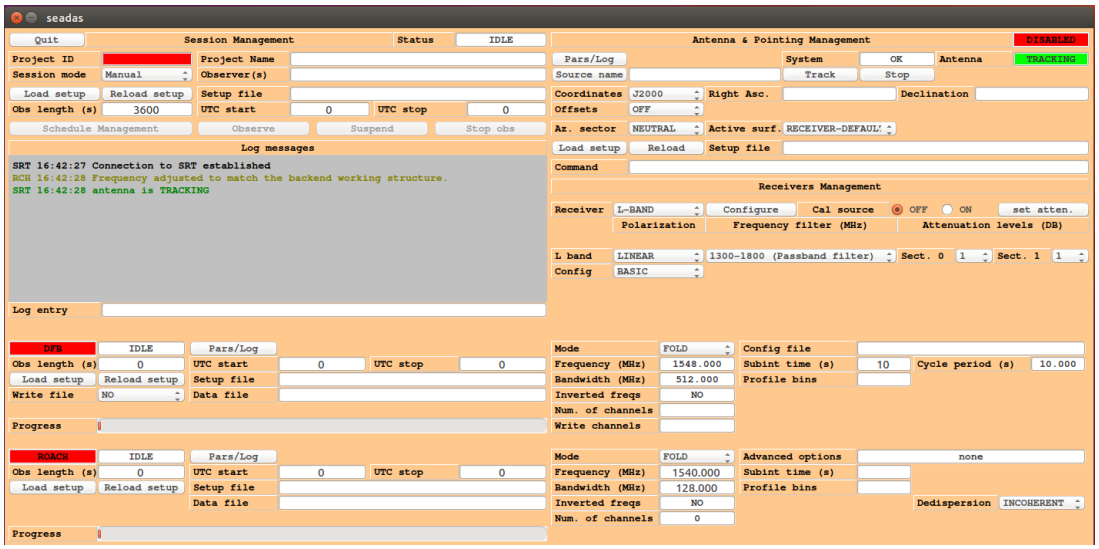
3) If the DFB is needed, select it in the combo box on the left side of the "Send" button. If the LEAP cluster is needed, select "ROACH1" in the combo box on the right side of the "Send" button. Once the desidered backends have been selected, press button "Send".

D) Launch seadas

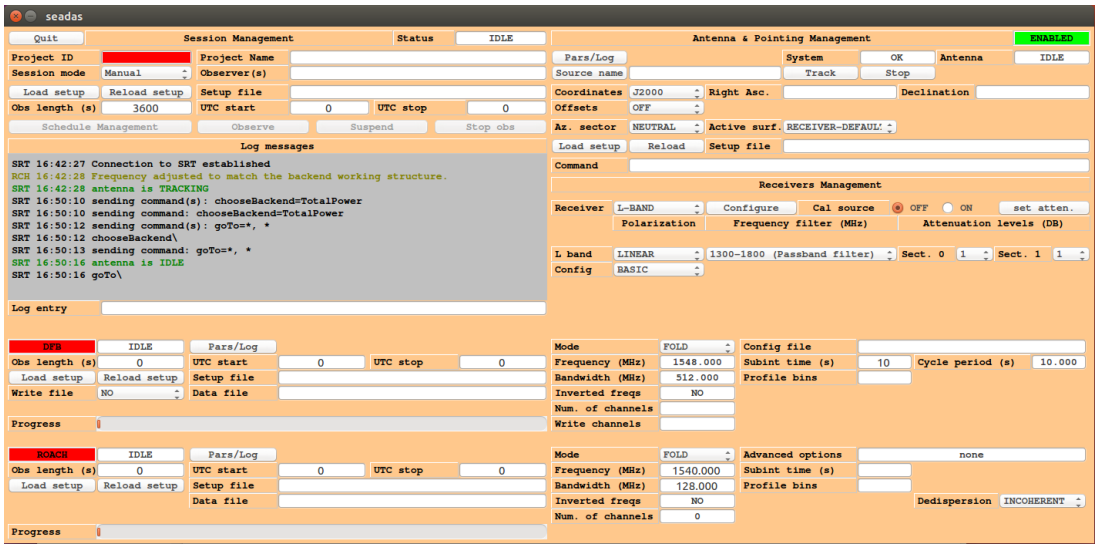
Please find the computer **viewer01:** it's the rightmost computer in the row of desks you find in front of you as enter the control room.

1) Log in with the user name **pulsar** (ask staff for password). If another user is already logged in, simply switch to the user **pulsar.**

2) Open a shell and type the command:
seadas
The following window appears:



3) Enable the antenna control by clicking on the red button at the top right corner of the window: it displays the word: **DISABLED**). Wait for it to become green and to display the word **ENABLED**, as in the picture here below:



E) Backends control:

Please follow instructions for those section only that are related to the backend(s) you need for your project, otherwise skip them.

E1) DFB operations:

1) open a shell on **viewer01**
2) type the command:
   vncviewer psrdfb:2 (ask staff for password)
2b) if the above command fails, give the command:
    vncviewer 192.168.200.155:2
3) if not already running, in a terminal in the vnc window type the command:

dfbcontroller

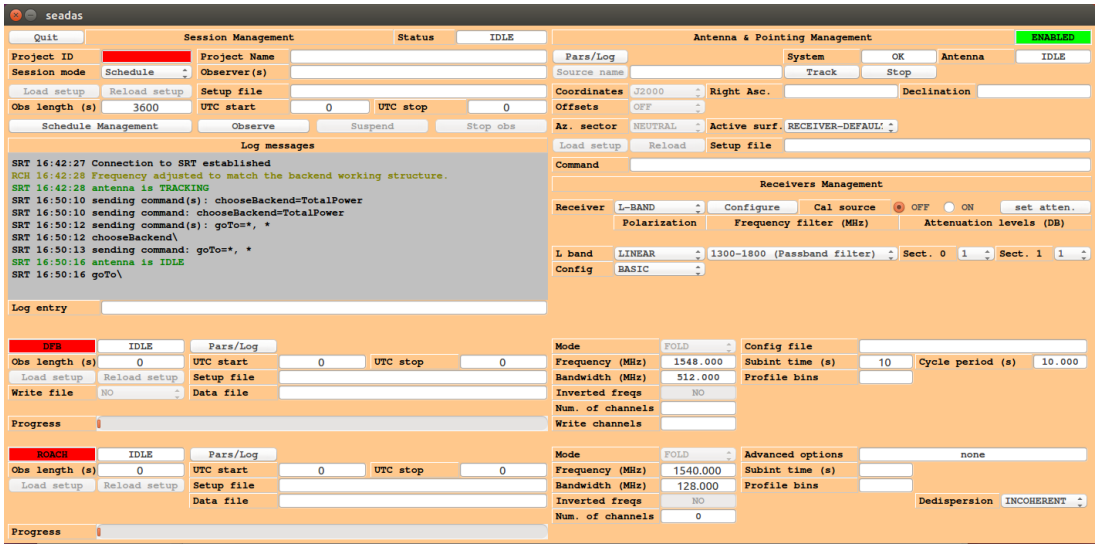
E2) Leap cluster operations

1) open a shell on **viewer01**
2) type the command:
   vncviewer leap0:2 (ask staff for password)
2b) if the above command fails, give the command:
    vncviewer 192.168.200.220:2
3) if not already running, in a terminal in the vnc window type the command:

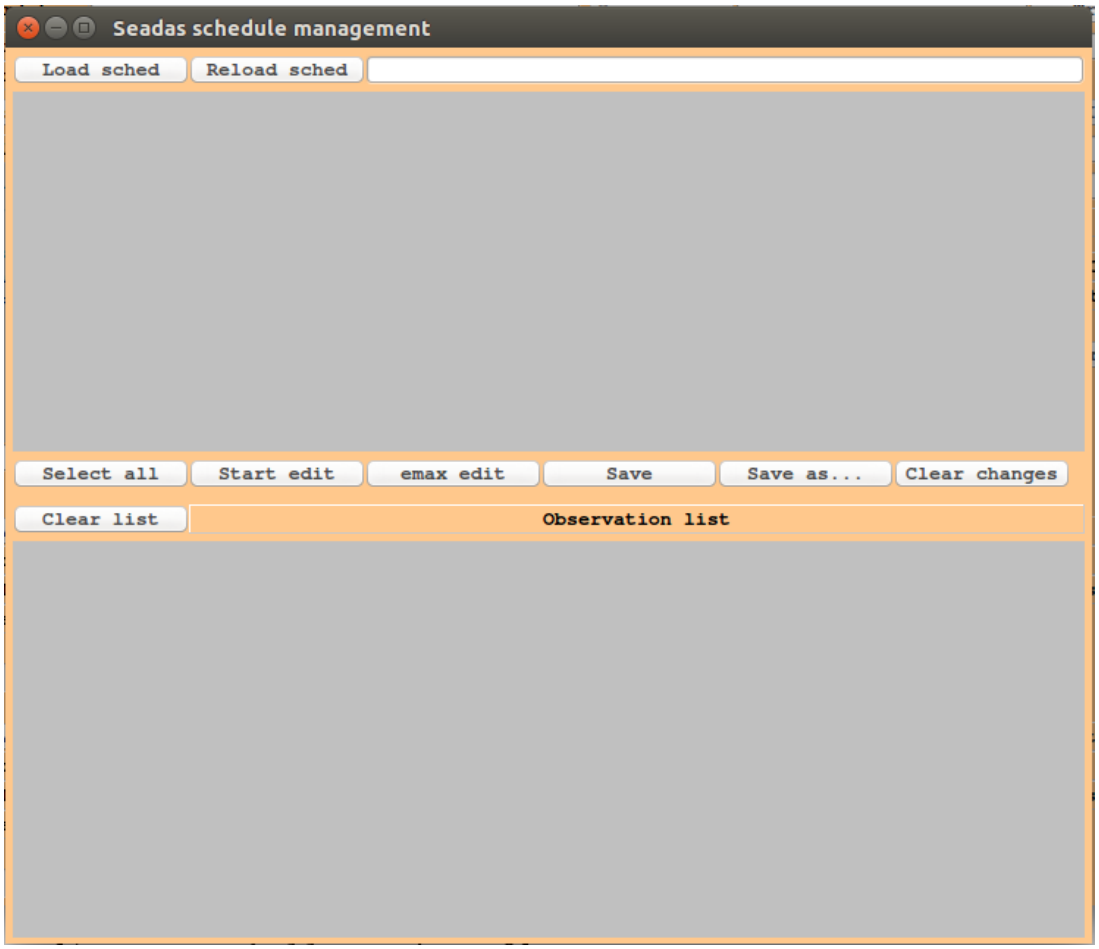
/home/user/seadas/bin/leapcontroller

F) Load your schedule

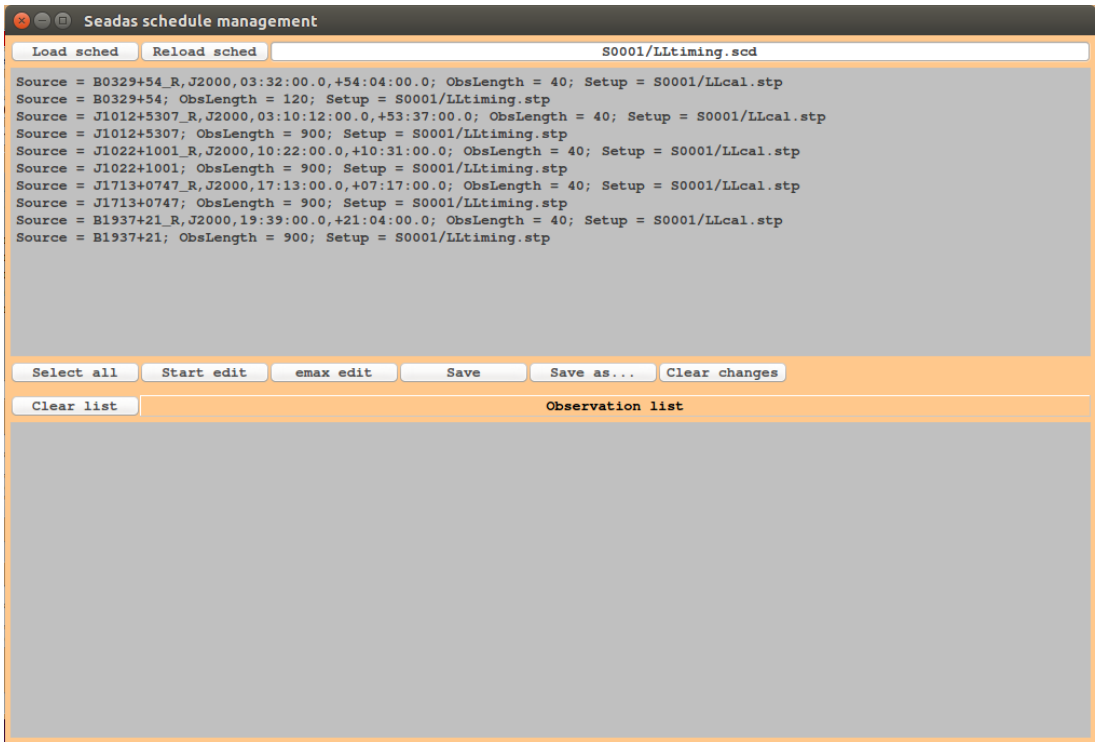
1) set **seadas** into schedule mode by selecting the item **SCHEDULE** in the combo box named **Session mode** near the top left corner of the window. This action enables the button **Schedule management** placed short below the **Session mode** combo box, as in the figure here below:



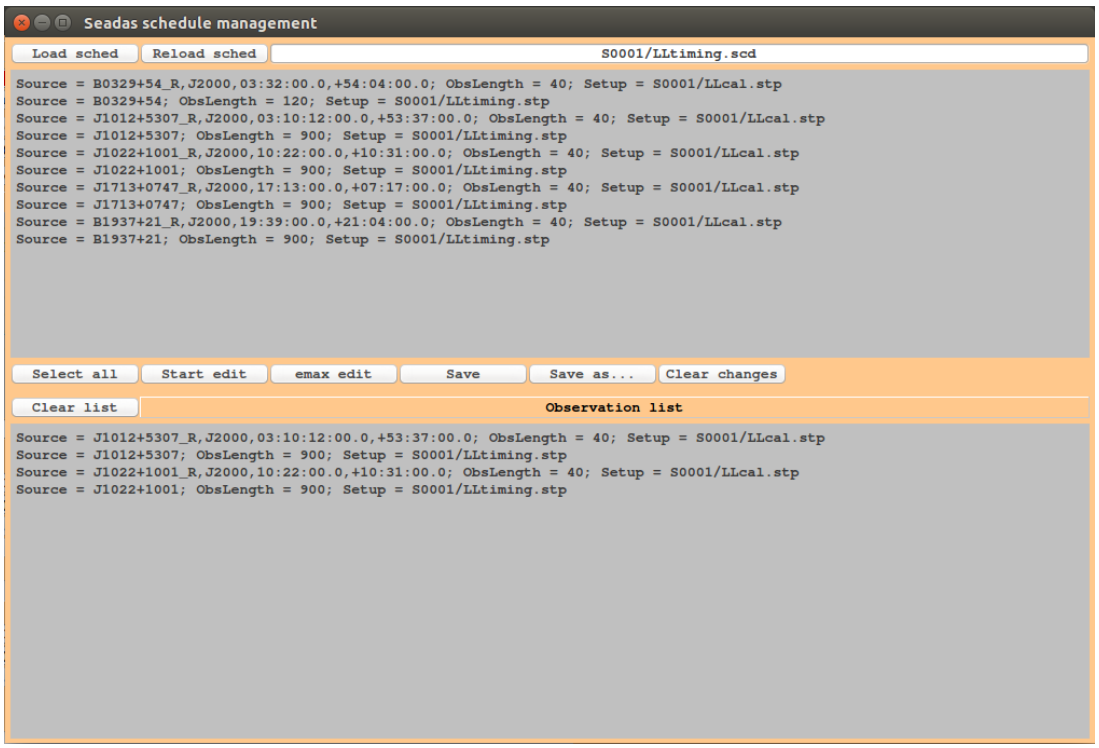
2) click the button **Schedule management.** The schedule management window pops up:



3) load your schedule by clicking on the **Load sched** button placed at the top left corner of the window. The selected schedule will be displayed in the upper frame of the window:



4) select the lines that contain informations on the observations you want to do, by clicking on them with the mouse left button. The entire schedule is loaded by clicking on the **Select all** button, the leftmost on the buttons row between the two frames. The selected lines will appear in the bottom frame of this window, named **Observation list:**



Lines in the **Observation list** frame can be cut by clicking on them with the mouse left button, and pasted by clicking the mouse mid button after placing the cursor on the new position for the previously cut line (a cut line can be pasted more than once). The whole **Observation list** can be cleared by clicking the **Clear list** button.

5) once the observing list is ready, click the **Observe** button, placed at the very right of the **Schedule management** button in **seadas** main window.

G) While the schedule is running you can:

1) **rearrange your observation list**
In schedule mode, **seadas** reads only one row at once among the ones displayed in the **Observation list** frame. The row is always the first one from the top and, when read, it's removed from the frame. All other rows in the **Observation list** frame can be deleted and/or changed of order among themselves and/or with respect to newly added rows. Moreover in the **Observation list** frame, rows can be added from different schedule files.

2) **suspend the schedule execution at the end of the current observation**
A click on the **Suspend** button, placed at the very right of the **Observe** button, interrupts the execution of the schedule at the end of the current observation. The schedule can be recovered by clicking again the button **Observe.**

3) **interrupt your observation**
By clicking on the **Stop obs** button, placed at the very right of the **Suspend** button, the current observation and the schedule execution are interrupted. The interrupted observation is restored in **Observation list** frame at the top of the displayed rows; the schedule can be recovered by clicking again the button **Observe.**

4) **Tune the signal's attenuation levels**
In the **Receiver Management** frame, located in **seadas** main window, right column, at the right of the log messages frame, find the combo boxes labelled **Sect. 0** and **Sect. 1.** Select the opportune attenuation level for both sections, the press the button **Set attens .** If you're acquiring both bands of the **LP receiver ,**you will find two couples of these combo boxes, one for each band.

5) **Close seadas without affecting the current observation**
If for any reason seadas is closed, or it crashes, the observation keeps going as if nothing happened. You can follow the data acquisition progress by looking at **dfbcontroller** and/or **leapcontroller** (depending on the backends you're using), and ckeck the source tracking in **discosCondole** TUIs. Once the data acquisition is completed by all involved backends, you can relaunch **seadas** as explained in section C).

H) Session closure

1) close the vnc window on the leap cluster (if opened)
2) close the vnc window on the DFB (if opened)
3) close seadas
4) log out of viewer01
5) on **viewer03,** in **operatorInput** shell (the same where the antenna unstow commands have been given), park the antenna by giving the following commands:

antennaPark
servoPark
asPark

Appendix A — Sources list for pointing and focus calibrations

Name	RA (J2000)	DEC (J2000)
3c48	**01 37 41.2996**	**+33 09 35.0791**
3c84	**03 19 48.1598**	**+41 30 42.1141**
3c123	**04 37 04.3753**	**+29 40 13.819**
3c286	**13 31 08.2883**	**+30 30 32.9621**
3c295	**14 11 20.467**	**+52 12 09.52**
3c345	**16 42 58.81003**	**+39 48 36.9995**
NGC7027	**21 07 01.8**	**+42 14 10**