Australia's National
Science Agency

OBSERVING WITH BIGCAT

Quick Start Guide

V 1.3, October 2025

Acknowledgement of Country

CSIRO acknowledges the Traditional Owners of the lands, seas and waters of the area that we live and work on across Australia and pays its respects to Elders past and present. CSIRO recognises that Aboriginal and Torres Strait Islander peoples have made, and will continue to make, extraordinary contributions to Australian life including in cultural, economic, and scientific domains.

Contents

1 Before you start

1. make sure you have VNC access (see info box below)
2. Schedule file prepared and deployed (which should store it on skull ~/sched)
3. Log into the ATCA observing portal and check-in / announce your plans (https://ca-ops.atnf.csiro.au/jPORTAL/login)
4. familiarize yourself with the key differences to CABB observations listed below
5. All the good information in the ATCA users guide is still valid, **except the bits for CABB** : https://www.narrabri.atnf.csiro.au/observing/users_guide/html/atug.html .

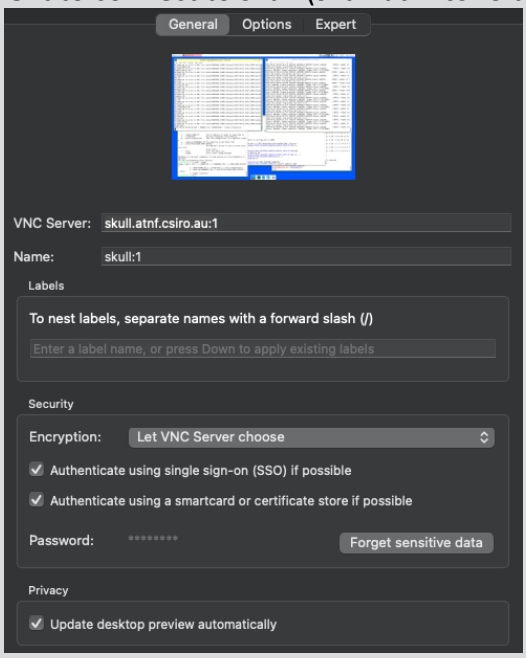
Access the VNC

Accessing the Telescope for remote observations remains largely unchanged to before.

Please read through the instructions here:
https://www.narrabri.atnf.csiro.au/observing/rem_obs.html

The only difference is that now skull is used instead of xbones.

- IF you are outside the CSIRO VPN, open the SSH tunnel via venice, using your ATNF Linux credentials to access it:
  ssh your_username@venice.atnf.csiro.au -L 5901:skull.atnf.csiro.au:5901
- Sometimes a SSH tunnel is even needed when inside the VPN, depending of the network zone you are in
- use your preferred VNC client to connect to skull (skull.atnf.csiro.au:1)



2 Key differences to CABB

While the experienced ATCA observer will find their way around BIGCAT quickly, there are a few differences. Some of them are currently in development and will be available soon (e.g. VIS), while others are not necessary anymore or have disappeared completely.

Here is a list of differences between observing with BIGCAT and CABB that are relevant:

Here are the key differences a user familiar with CABB will experience when using BIGCAT:

- Client based CAOBS – you can kill the client or run your own. As long as the server is ticking over, it does not matter what happens to the CAOBS client window
- No CACOR GUI, the correlator(s) is (are) controlled via terminal(s).
- No delay and amplitude calibration by the user. The user may do a phase calibration to check phases are stable and aligned. But at this stage we recommend that users do not calibrate. The delay and amplitude calibrations are system inherent and regularly maintained by observatory staff.
- Currently there is no VIS and no assistance. We are working on this, please be patient We recommend users keep an eye on SSPD to assess the data quality.

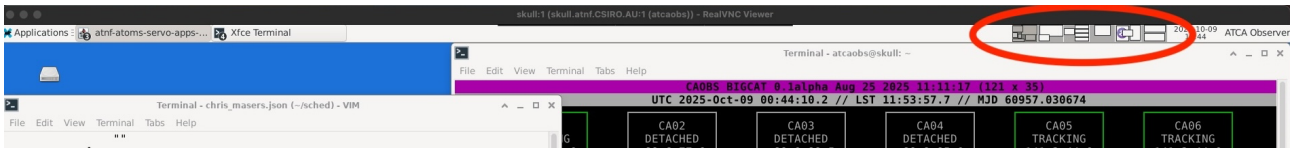
3 Step by step guide

Before continuing from here, please log into the Skull VNC (see the info box above regarding VNC access).

3.1 Finding your way around the different VNC desktops

Once you accessed the Skull VNC, you will find that there are 6 virtual desktop windows.

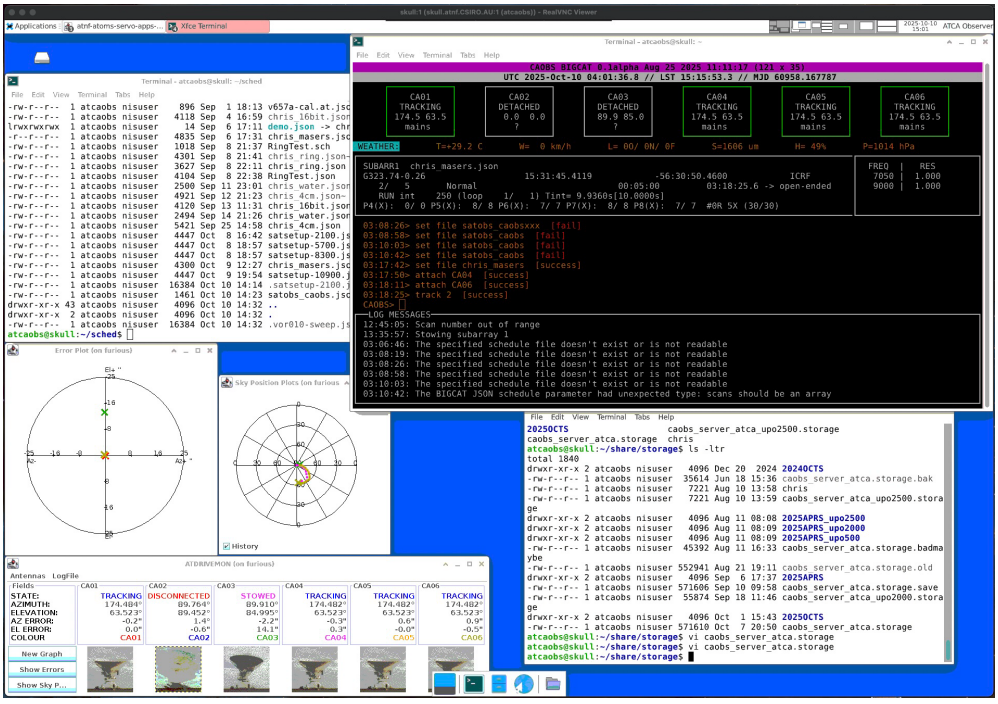
You can jump between them on the right side of the top menu bar:



As an observer, you generally only need to check desktop 1-4

3.1.1 Virtual Desktop Window 1: CAOBS and ATDRIVEMON

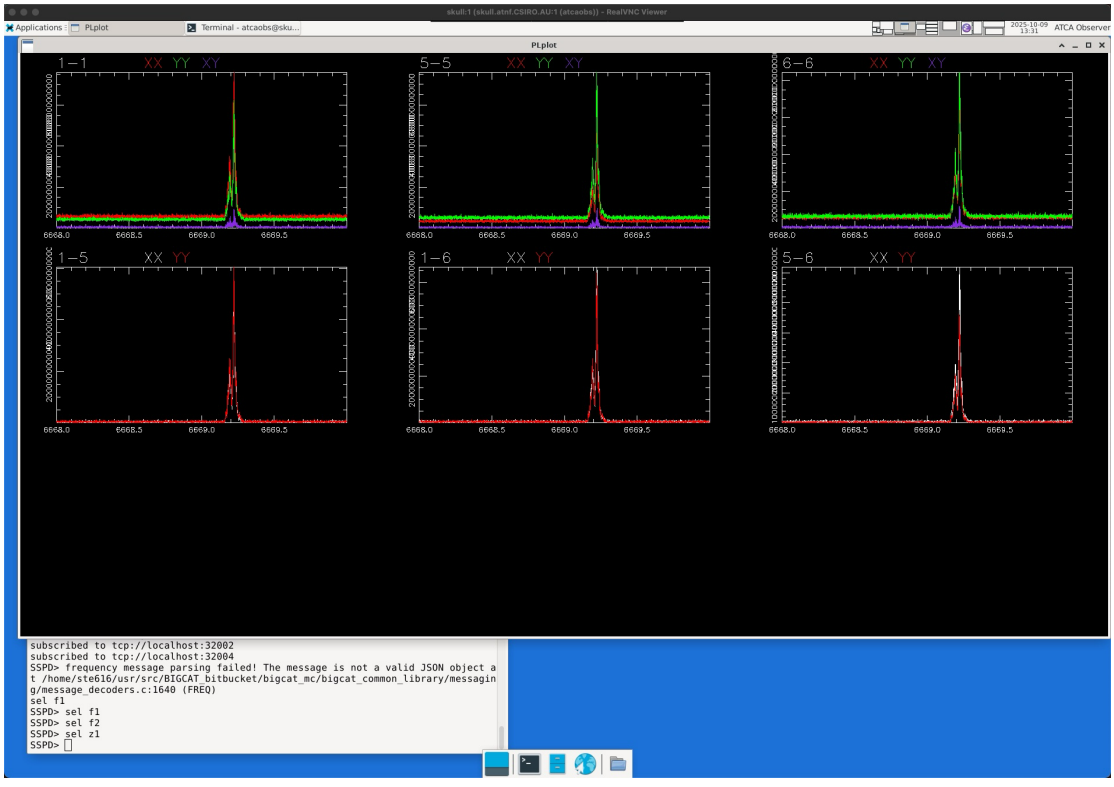
On the first desktop you will find CAOBS, ATDRIVEMON and some terminals:



This is where you control the array and load files and so on. Like in the old days with CABB. There is no VIS yet and ASSISTANCE is still being re-implemented into the new environment. But CAOBS has a lot of additional information and options.

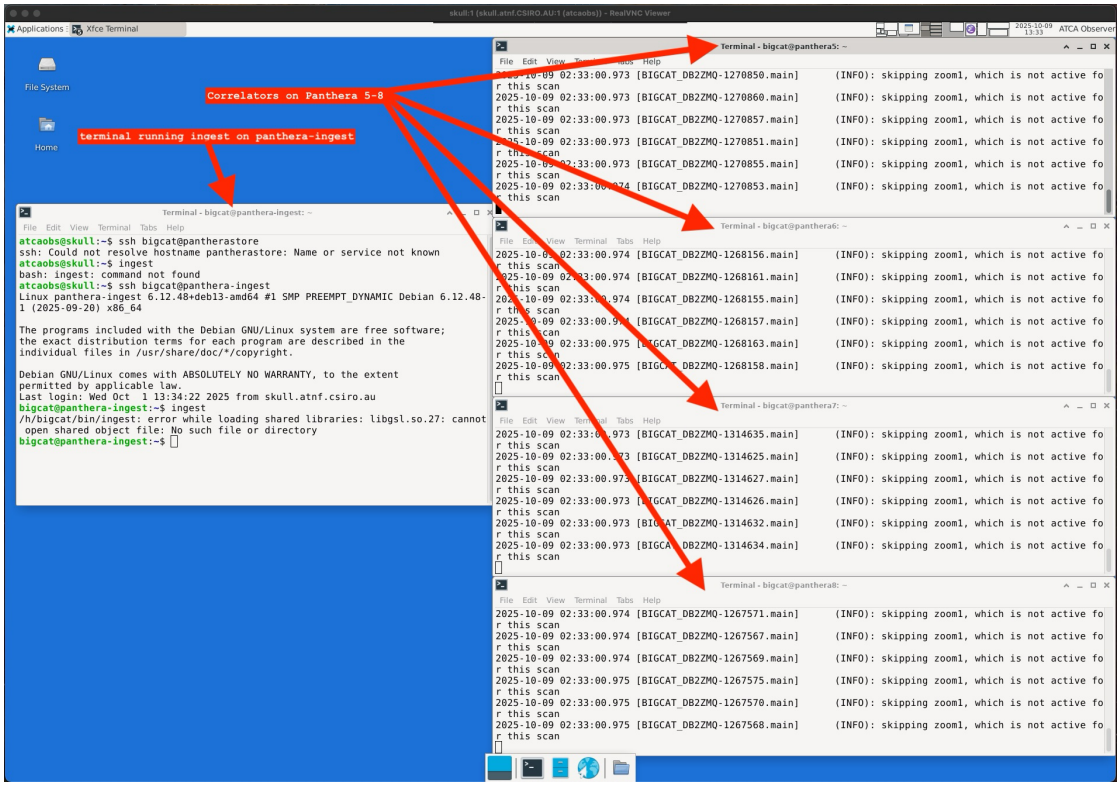
3.1.2 Virtual Desktop Window 2: SSPD

On the second virtual desktop you will find SSPD with the plots and a terminal to control it:



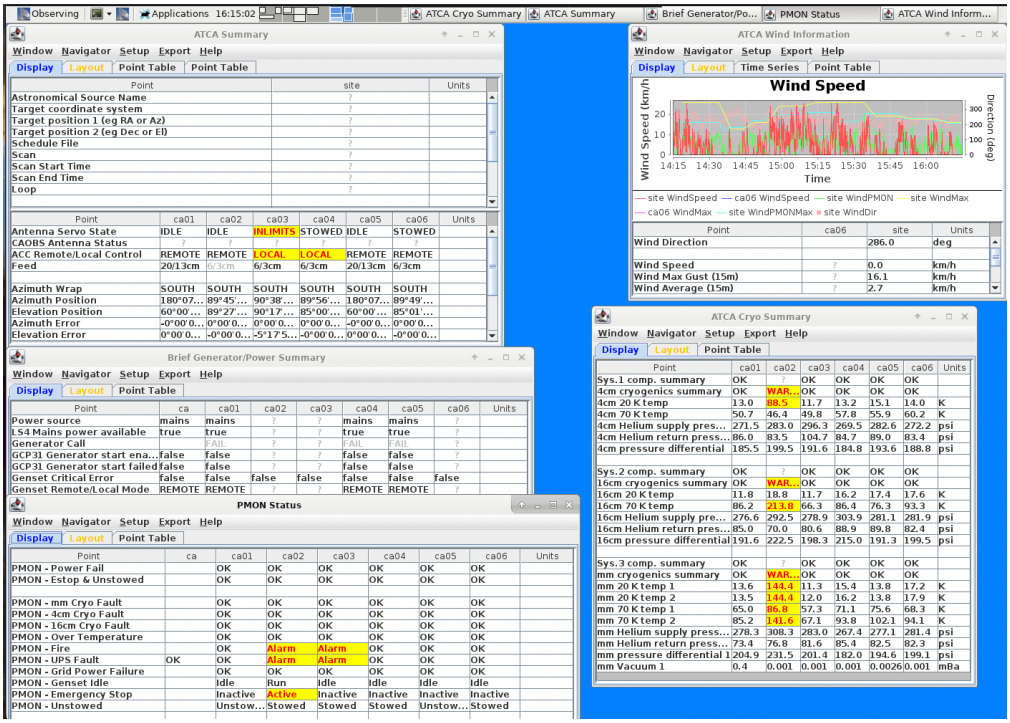
3.1.3 Virtual Desktop Window 3: Correlators and Ingest

On the third virtual desktop to the right, you have the four terminals controlling the correlators running on four different GPU servers. To the left, there is a single terminal controlling Ingest, which writes the data from the correlators to file.



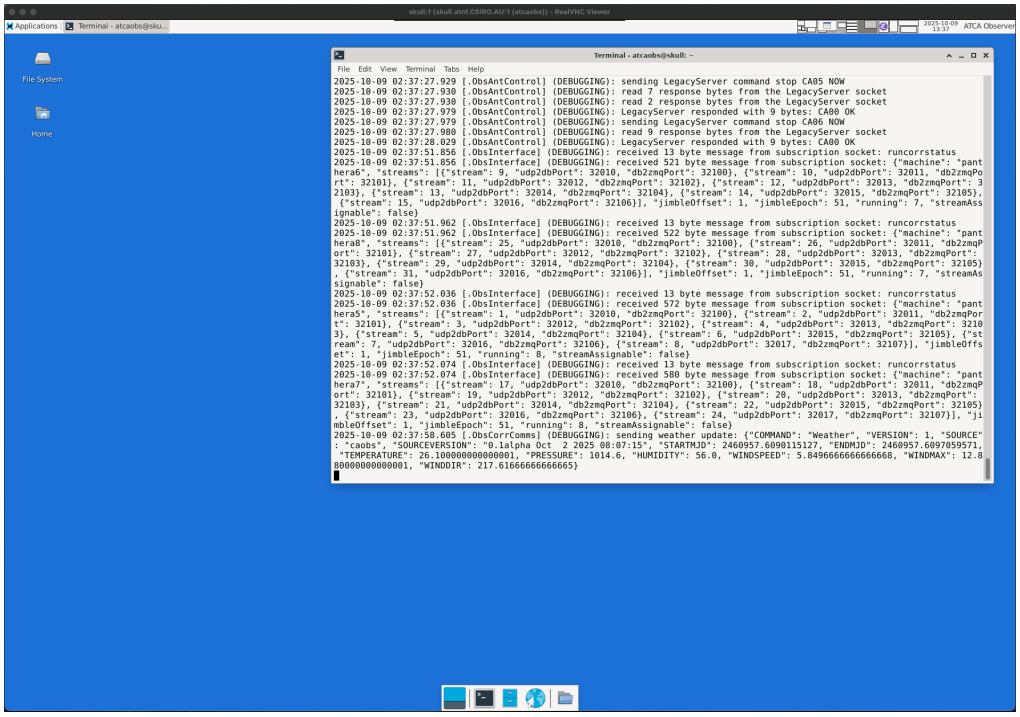
3.1.4 Virtual Desktop Window 4: Monica

On this desktop you have different GUI Windows with various monitoring points. Here you keep an eye on the weather, generators, cryogenics, or anything you want to monitor on the array.



3.1.5 Virtual Desktop Window 5: CAOBS Server (OEs only!)

On this desktop one can find the CAOBS server terminal. Do not interact with this one, unless you know what you are doing. To stop it: CTRL C, to restart: up arrow, or: caobs_server -C

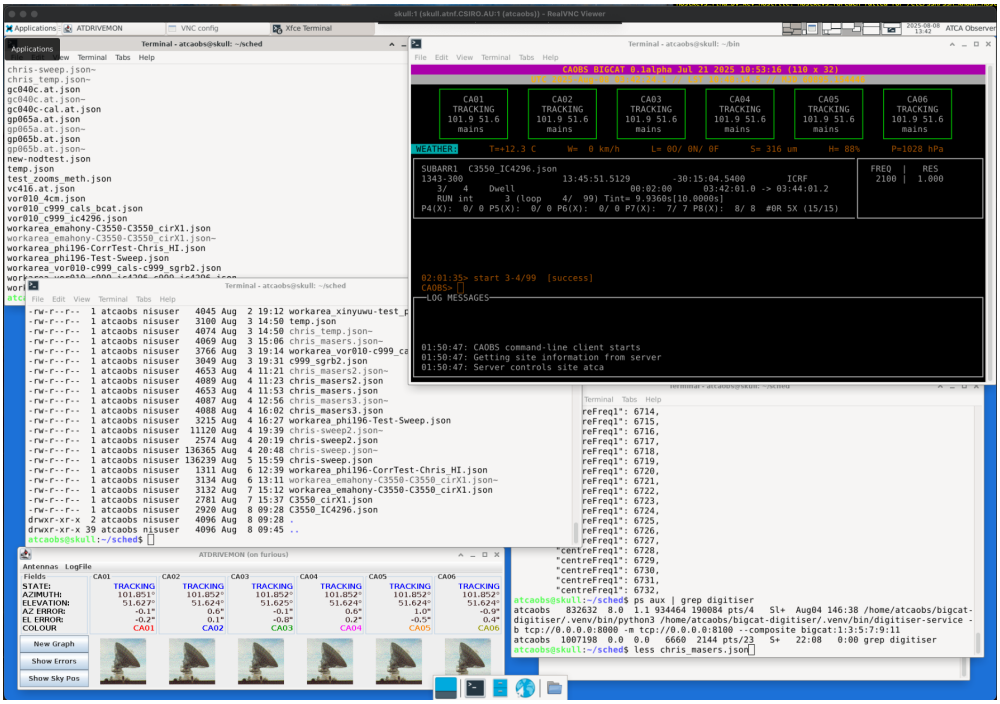


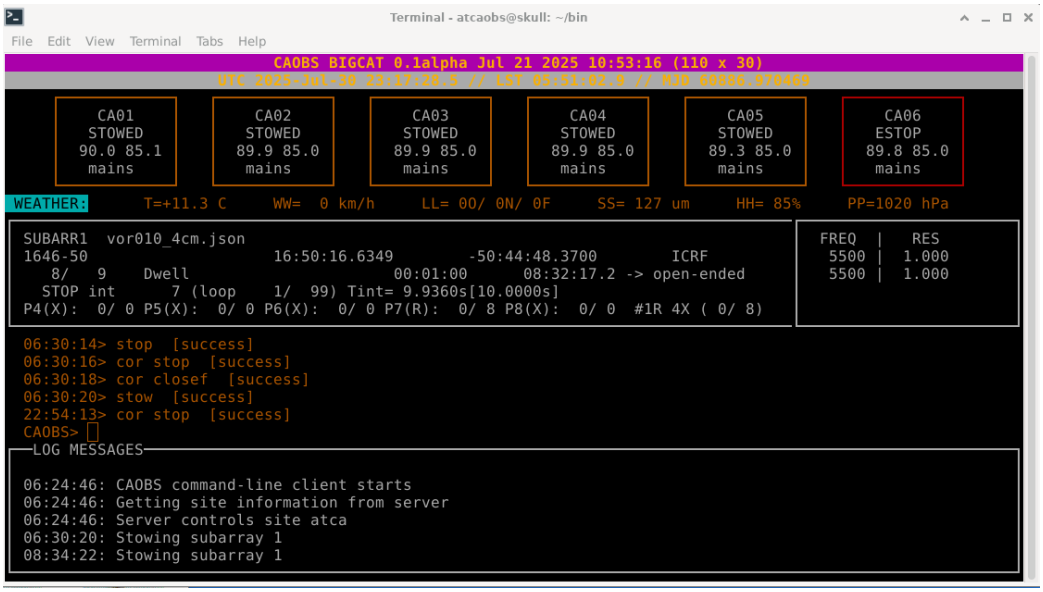
3.1.6 Digitiser Utils [DO NOT TOUCH - OBSERVATORY STAFF ONLY]

Utilities for the control of the BIGCAT digitisers. Do not touch this one, unless authorised to do so

3.2 Step by Step Guide

1.) log into the skull VNC and find the CAOBS client on the first virtual desktop:





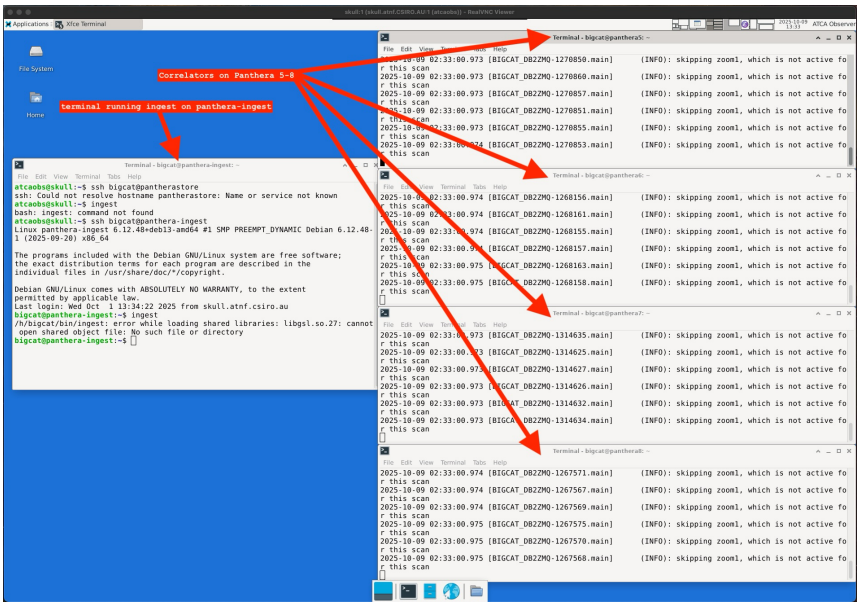
2.) load your schedule file in CAOBS. → CAOBS will confirm with [success] if the file has been loaded correctly:

If loading your file in CAOBS fails

If loading your schedule file in CAOBS fails, open a terminal on skull and check that your prepared schedule file is in the correct folder location on skull, which is ~/sched.

If it is not there, copy it manually or ask observatory staff for help.

3.) On the third virtual desktop, in the terminal on the left check that ingest is running, and on the four terminals on the right, that the correlators on Panthera 5, 6, 7 and 8 ticking over:



What to do if ingest or one / all of the correlator(s) is / is / are not running

- If ingest is not running, start it by typing ingest in the terminal to the lef
  ```
  bigcat@panthera-ingest:~$ ingest
  ```
- If one or more of the correlators are not running, restart them by typing: start_correlator in the relevant terminals on the right. E.g.: to start the correlator on Panthera 5:
  ```
  bigcat@panthera5:~$ start_correlator
  ```
- Each Panthera machine should have a correlator ticking over

4.) go back to CAOBS and tell it to track a source in your schedule:

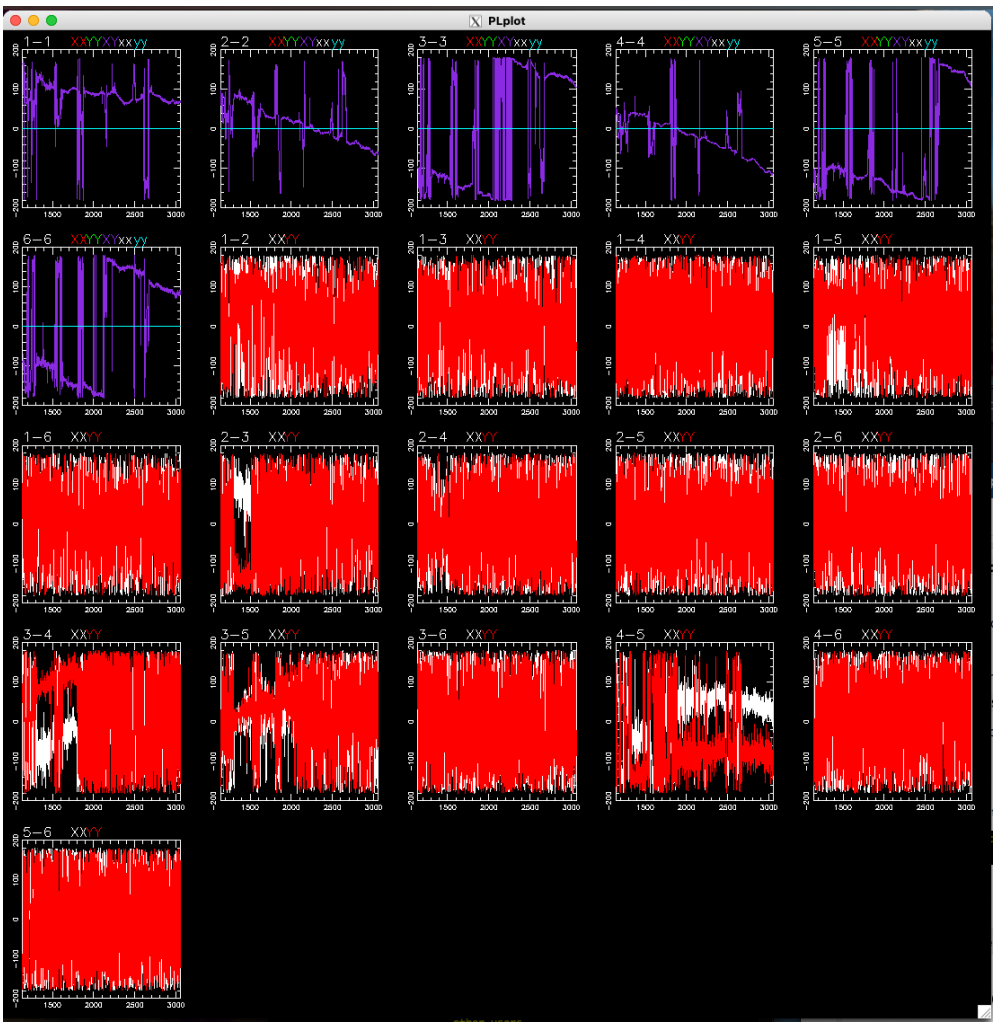
```
04:36:45> track 1  [success]
CAOBS>
```

5.) On the Second virtual desktop check if sspd is running.

If SSPD is not running yet, you can start it from a terminal:

```
atcaobs@skull:~$ sspd -c localhost -s 1
```

Once on source and after a little while, the plot window will start updating like the old SPD in the CABB ear, just much faster:



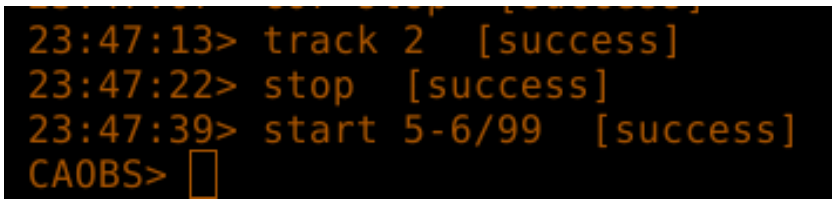
SSPD

To change what you see, it is very similar to the old SPD

- check phases: SSPD> pha -200 200
- to check amplitudes: SSPD> am
- to change from f1 to f2: SSPD> sel f2

6.) Once you are content, that it all works, type stop in CAOBS, and then you can start your observations by typing:

CAOBS> start x-y/nn, where x is the first scan number, y is the last scan number and nn is the number of iterations.



Once started, go back to SSPD and check that it all looks good.

7.) Once finished, find the directory where the data was written to on Panthera Ingest:

cd into your directory, you can convert it to ADSM by running convert_adsm.py in your directory:

That is it…. ☺

Good luck with your observations.

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