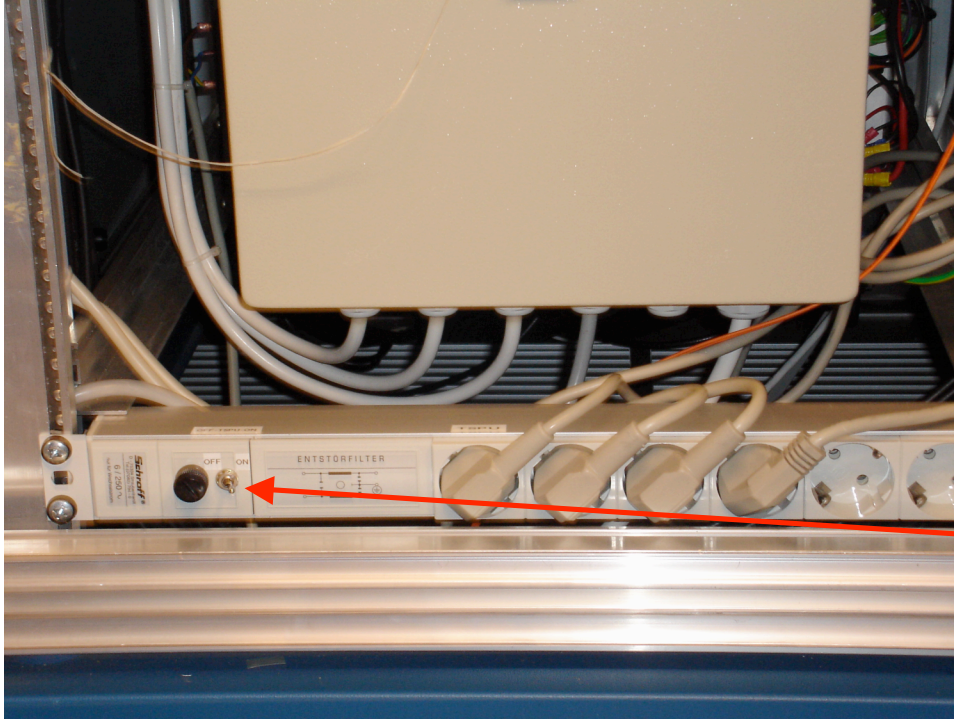


1) Setting up

- On ccrops, start **controlEvlbi**. This widget will give you information on what stations are connected to what SUs. Select or de-select stations, as needed. Currently all SUs are available for e-VLBI, apart from the two remaining units that do not have upgraded motherboards, or any units that happen to be converted to Mark5B. Check the whiteboard!
- After selecting the stations, make sure you can ping all interfaces and that none of the entries are red/purple. Check the MTU. The MTUs that are listed as default should be used, make sure that these default values are copied to the current values and applied to the interfaces (purple if not). If you make any changes (stations to different SUs, IP-addresses, default MTU sizes) make sure you press the “send to database” button to actually make these changes permanent (red if not). Normally, you should not have to change default values in the database.
- After you know what stations are connected to what SUs, **reboot these SUs**. And make sure the SU consoles are up and running (**start_su_consoles.sh**).
- Check if all **correlator processes are running**. Check the **status of the TSPU**. If any leds are red (see picture 1), re-start the processes (**start_evnl_32**). Make sure the red leds have disappeared, if not, re-start the processes again. If that does not help either (which happens very occasionally), power cycle the TSPU. For this you have to walk to the back of the DPUs, and toggle the little toggle at the bottom of the TSPU crate (see picture 2).



Picture 1: TSPU as it should look. Watch out for red leds at the positions of the arrows.



Picture 2: toggle for turning power to TSPU on/off

- If by any chance this does not help either, power cycle the whole crate by toggling the circuit breaker at the bottom of the crate. This is located in the fuse box on the backside, see picture 3. Note the string, the key is hanging from it and normally it is cleverly hidden on top of the box.

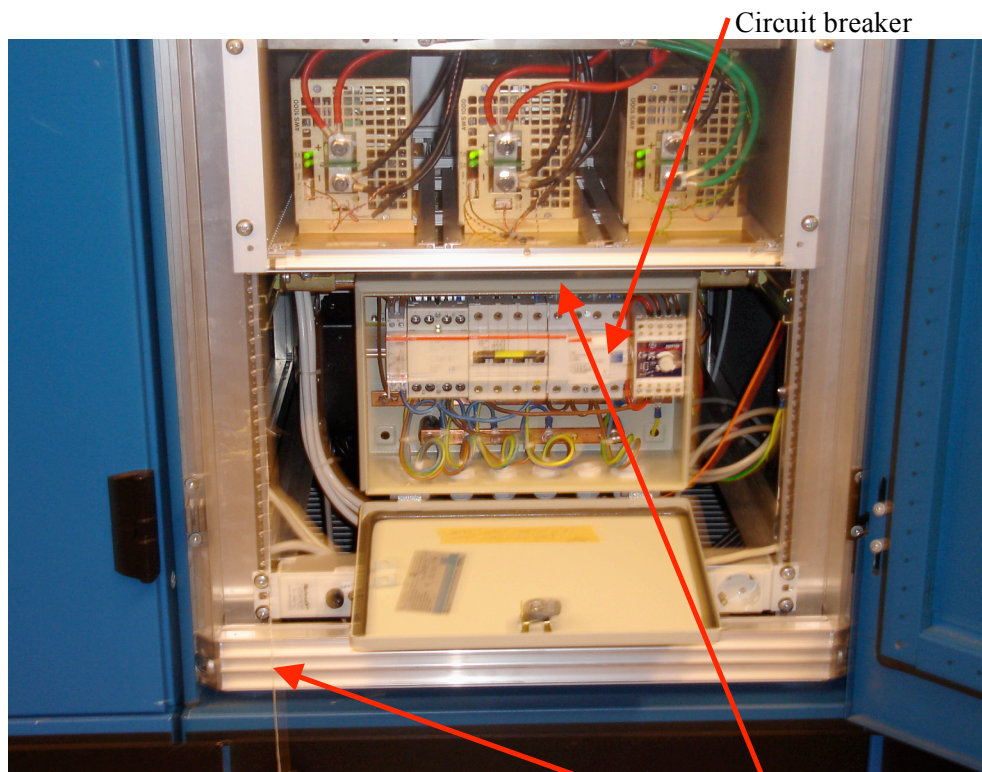


Figure 3: Fuse box of TSPU

string

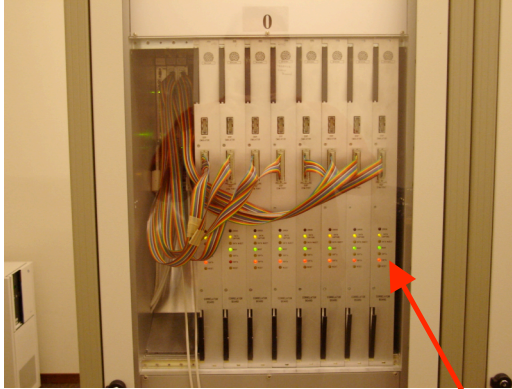
clever hiding place of key

- After power cycling, the processes should be re-started yet again. Make very sure it worked, if not you will only end up with YIKES. Also, turn on the **CCTV monitor**, when the correlator is integrating, the lowest (third) row of leds will blink (the number of blinking leds depends on correlator use).
- Start up **controlmk5**. Although nowadays this is not normally done, it is not a bad idea to reboot all local Mark5s that are going to be used. If you don't reboot, at least do an **EndM5** and **e-stop** on all units. After this, start the jivemark5a control code with **e-start**.
- Start up **controlstation**. It makes most sense to reboot all the remote Mark5s as well. Beware of accidentally rebooting or otherwise messing about with Mark5s at stations that are not participating. After reboot (or **e-stop**) and **e-start**, the debug output windows of the remote stations will also appear on the ccsops display. To prevent confusion they have a different color from the local windows.
- Make sure no remnants of a previous job are running by running **kill_procs.sh**. Check with **show_procs.sh**. This will give a list of processes on both ccsops and juw26. If any processes remain on juw26, ssh to juw26 and kill them (kill -9). Show_procs.sh will also give information on the usage of shared memory (equal to the output of the "ipc" command. *This is only relevant for juw26*. If any memory is still in use after the processes have been killed, remove it with **iperm -m <number>** or **iperm -s <number>**. Whether to use -m or -s can be deduced from the output of ipc.
- Start up the **correlator control software** with **start_procs.sh 6e 7e** etc, and start your job. And all should work... The latest version of start_procs.sh will take care that things like CRM_SERVO are set correctly.
- Start up fringe display. The data status monitor is started automatically with a new job nowadays, but it tends to get stuck at times and will need manual restarting (**data_status_monitor.sh**). This program gives a very useful instant system status overview, and this information is also made available on a web page.

2) When things go wrong

Some easy diagnostics:

- **SU console output:** even if the messages themselves are un-understandable, it is easy to determine when a unit has crashed simply by comparing the flow of messages. A stuck unit will look, well, stuck.
- **Mark5 debug output:** check for error messages
- **Data status monitor:** at-a-glance overview of data rate and weights (green when ok, red when not...)
- **Correlator room CCTV:** the correlator may not be integrating at all. Check the blinking leds (see picture).



- **Wrong TSPU status:** the infamous red leds (see first section)
- **SU control output:** commands that are sent by the correlator control code to the Mark5s (both local and remote) are echoed to this output. So, if you do a “reconnect” of a station, you will see messages like “in2net=connect:<ip address>” and “in2net=on” passing by. But also messages like “could not connect”, obviously indicating a problem with the internet connection. All the output is saved to logfiles, to be found in /ccs/var/log/su_control-<number>.log.
- **Controlmk5, controlstation.** The status of both local and remote Mark5s can be checked, one can also type in regular Mark5 commands (after pressing the “Control MARK5 Units at...” button at the top of the widget. The command “status?” will, in the new version, produce a human readable status message (like net2out:active).
- **controlEvlbi.** Are the stations online at all? Both data and control interfaces should be pingable.

General trouble shooting:

- **SU problems** (diagonal weights, frozen SUs): restart SU (fast and easy).
- **Mark5 problems:** leave system running, try to solve the problems with the one specific Mark5 and only restart SU when you are sure the Mark5s at both sides are up and running again, and that you can ping the remote Mk5.

Specific cases:

- **TRM leds of one SU blink green-yellow and/or red**

Diagonal weight (you will see that the servo error, in the controlEvlbi widget, is small and unchanging, but the leds are blinking anyway). Make sure the Mark5s involved are not stuck, restart SU.

Not a diagonal weight (large varying servo error). Try to click the button "reconnect evlbi" (click on SU widget, Medium Control button). Wait a bit, repeat if needed, this used (often) to do the trick, although that was in the time of TCP, when we still used the standard Mark5A control code.

If this did not solve the problem, and you still can ping the remote Mark5, you could reboot the remote Mark5 without stopping the job. After it comes up again and the Mark5 program is running, you should "reconnect evlbi", or if that fails, restart the SU. If this does not help, disconnect the local Mark5 from the job (click on the SU widget, press the abort button, you may have to do this several times), and reboot both local and remote units and the SU. After this, restart the SU.

- **TRM leds become red or Corn-stateish (and weights go to zero) and reconnecting evlbi does not help**

In controlEvlbi, press the network button of that station. After this, ping the data ip (if the ping does not respond immediately try it again a few times to make sure). If it pings ok, reconnect evlbi. If it does not ping, or the reconnect did not help, you will have to reboot the Mark5 units. If the remote Mark5 is not pingable at all, you will have to get the station operator to do it for you. When both local and remote Mark5s are up again and jivemark5a has started, restart the SU.

- **Even after a reboot, a station cannot be pinged.**

This is getting a bit more tricky. First log on to the local Mark5 that is used for that particular station. For this you open a window on ccops, type "ssh 10.88.0.###" where ### is 50 to 65 for units 0 to 15. You can find the ip addresses of the data interfaces of the stations in the controlEvlbi widget (press the "Edit Parameters" button). Try to ping some of the other stations (ping <ip address>). If this does work there must be a problem at the station or along the way, not locally at JIVE. You can do a tracepath, type "/usr/sbin/tracepath <ip address>", which will show how far the connection goes, and where it is broken. If the remote station can be reached, tracepath will list the hops and the number of hops. If not, it will give a message that it is waiting and eventually time out. This info can be useful to determine whether the connection is down at for example SURFnet or at the remote NREN or at the station itself. Of course, in the case of pure lightpaths (like to Jb, Cm and Wb) there is just one hop.

If the problem is with the local Mark5 (ping is impossible to other stations as well), change unit.

- **New case: thin client freeze**

This has happened once during e-VLBI, and made it impossible to switch between screens on ccops (physical and virtual screens). You will need to reboot the thin client (silvery box mounted under the table (operations table?)) by first turning it off by pressing the button until the green led becomes red (about 10 seconds), and starting it up again by pressing the button once again (shortly this time). After starting the thin client you need to log into ccops again. This may take some time (several minutes). If the screen stays blank for more than a couple of minutes, reboot the thin client again. After this, **everything** has to be restarted (see section 1). Make sure that you run **e-stop** for both local and remote Mark5s before attempting to restart them, and make sure that the **controlEvlbi**, **controlstation** and **controlMark5** interfaces are really and truly gone (kill_procs.sh will not remove them). You can check by typing "ps -deflgrep <process name>", and killing off any stragglers with "kill -9 <process id>".