

Posts in category Com-1

Com-1 Day 6 - 22 March 2017

The Com-1 team accomplished several tasks today.

A substantial fraction of the team worked with LBTO staff to place vibration damping pads under the feet of the compressor. Peter and Thomas then completed pumping of the compressor, cooling lines, and cryostat. They did not feel obliged to complete the pumping of Earth's atmosphere initiated the day before by Tom. Cooling began at 12:50. They did this using Florian's scripts, which worked well.

Kalyan, Luca, Rosalie, and Tom measured the SX GWS "zero-angle offset". This is the amount by which the bearing must be rotated to be "square" with the bench. They made the measurement by applying precise coma-free pointing offsets to M2 and locating the spots with star enlargers. They made two measurements. The first gave an offset of $+1.27^\circ$ and the second one $+1.34^\circ$.

Kalyan tested his multi-star acquisition script using the RR spot. It works.

Lars and Thomas worked on partially blocking the airflow through the HWS CCD-39 electronics, with the goal of keeping the internal temperature above the point where the Little Joe units start to fail (the famous "aurora" effect). Lars also used cold spray to identify which components are sensitive.

Lars completed debugging of the remote bench lighting mechanism.

Florian worked with Steven Hooper to get the TCS simulator Virtual Machine running. This will allow us to debug and test things without having to connect to the telescope itself (a real benefit when working from Heidelberg).

Florian also acquired derotator trajectories from the TCS preset and applied them to the DX GWS.

Posted: 2017-03-23 01:17
Author: [Tom Herbst](#)
Categories: [Com-1](#)
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Com-1 Day 5 - 21 March 2017

Tuesday began somewhat dramatically with the planned switchover from grid power to the generator (due to electrical pole work). At precisely 8:00 as promised the lights went off and the alarms went on. About 30 seconds later, the generators restored (apparently) full function. Mike Wagner reports no unusual problems.

In preparation for this, Lars and Tom switched off the turbo-molecular pump that is pumping the compressor. They switched it back on 20 minutes later when it seemed certain that things were stable.

At 9:00, the day crew were completing installation of the RR. As soon as we returned to zenith, Lars completed the SX SigAmp replacement (both GWS and HWS). We installed Baby ARGOS and removed the front panel on SX. In the meantime, Kalyan, Rosalie, and Maria looked at the DX rim lamps with the DX GWS. They saw rings of light at each lamp when conjugated to ground (=14m or 100m above telescope). Thinking about this...

Leroy and Tom took the opportunity to test the long 400 micron fiber on SX (to GWS ref source) using the facility OTDR (optical time-domain reflectometer). This device should spot any serious problems, such as a break or severe damage. Their initial test showed no obvious issues. We could see the connector between the 40m and 5m fibers without difficulty. Leroy and Tom will do another measurement of power throughput when we go to horizon.

The red laser (<5 mW) is much brighter on the PCam than Baby ARGOS (max 15 mW, and we were at max). We suspect that the long pass filter in front of the HWS/PCam is doing its job. Note also that we have a 400 micron fiber with ST on one end and FC on the other. We also have ST-ST and ST-FC couplers. We can thus connect the red laser and the Ocean Optics with a full, 400um run of fiber. Before, we were using a 3m, FC-FC fiber 200um in diameter for this. Actually, we are still using this fiber, since the red ThorLabs laser is really bright.

Naming Contest: Come up with a good name for the red Thorlabs laser!

Kalyan and Rosalie are working on improving the laser spot in preparation for testing the centering and spiral search scripts. We tested them and they both work using SE 9,10,11, all placed at the 9 o'clock position. We were affected somewhat by vibrations and put the telescope on oil. The algorithms used the average of 10 frames.

Lars and Tom installed the AVT camera, running power and ethernet temporarily from the rear to the front of the cover. With Rosalie's assistance, we focused the camera. We still have to tidy up the cables before turnover.

Lars is working on the bench lighting. He found the source of the fault: a bad relay. We have a spare. Kalyan and Lars installed the DX HWS CCD-39 to demonstrate that it is working in its final mount location.

The mountain staff performed a power throughput test on the SX GWS reference fiber. We have 5db of loss from top to bottom. This is about 70% loss.

NOTE ADDED NEXT DAY: The mountain crew measured the DX fiber and found -5.4 db. This is more than likely due to the mismatch of fiber diameters (400 vs 62.5 um), and the fact that both sides are the same indicates that the fibers are probably Ok.

Jacopo, Luca, Peter, and Thomas arrived around dinnertime. Dinner was a mix of Asian, Indian, Mexican, and Charred Meat.

Posted: 2017-03-21 16:28 (Updated: 2017-03-22 17:24)

Author: [Tom Herbst](#)

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Com-1 Day 4 - 20 March 2017

The mountain crew will be installing the RR on SX this morning. Because of our problems with the faint signal on the last day of PC-2, Tom and Lars verified the short fiber at the Barilotto. Lars could easily see the 20 micron pinhole light up when Tom injected light into the fiber with his keychain flashlight. Tom noted that the ST-ST coupler on the 5m fiber was almost falling off (it was removed with the fiber and stored in the same bag). In any case, it was not firmly connected.

Tom went up on the scissor lift to clean and check the fiber connections (LBT has a nice little green fiber cleaning tool in Computer Room B - ask Mike Wagner). After returning to zenith, we cabled up Baby ARGOS and removed the front cover panel in anticipation of today's activities. Afterward, Kalyan and Tom began pumping the compressor on level 4.

The really good news is that Lars and Florian appear to have identified (but not solved) the problem with the CCD-39's. It appears to be purely a temperature issue for the readout electronics. After a large number of tests, Lars is convinced that grounding is not the issue. The less good news is that there is no easy, obvious solution for keeping the SciMeasure boxes warm without causing a bunch of negative side effects. We are still deliberating...

We did not get on to our main activities until almost 13:00, due to Alfio's FLAO tests running longer than expected. In any case, shortly thereafter, Kalyan and Tom went up into the dome and worked with Rosalie down in the control room to locate the Baby ARGOS spot. It had moved significantly due to the installation of the new retro-reflector brackets. We finally found it, centered, and optimized the collimation (with the help of John Hill - thanks!) at about 15:15. For the remaining hour until handover, Kalyan and Rosalie worked to get pupils from the GWS (which succeeded).

The relative dimness of the Baby ARGOS spot remains a mystery. We turned the laser up to maximum power and removed the inline diffuser between the laser and the long fiber. We could see the (focused) spot easily on a wax-paper screen, and even relatively dimly at the first lens of the collimator (diameter ca. 5 cm). Nevertheless, even when well focused Baby ARGOS is very far from saturating the PCam, even in a 2.5 second exposure. We noticed this reduced throughput on the 2nd last day of PC-2. Tomorrow with the assistance of Mike Wagner, we will do an OTDR test on the long fiber. This can reveal breaks and regions of extra loss. We will also check the 5m fiber this way.

Tom's crackpot theory on this is that the long pass filter in front of the PCam/HWS cuts off the 520 nm light from Baby ARGOS. We could not recall from PC-1 whether the laser saturated the PCam. Kalyan notes that the GWS pupil images were bright but not too bright. Nowhere near saturating, but plenty bright enough to do the centering and spiral search tests etc. Of course, there is no LP filter in front of the GWS.

Lars completed the SigAmp exchange on the DX side. Just before leaving the telescope, we checked on the compressor on Level 4 - all is well.

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Author: [Tom Herbst](#)

Categories: [Com-1](#)

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Com-1 Day 3 - 19 March 2017

Team 2:

Kalyan, Rosalie, and Tom arrived at LBT just before 14:00. After storing groceries, they went up to Level 6 to assist Florian and Lars with the CCD-39. Tom installed the bracket for the AVT cheerio-cam and verified proper operation from the control room (there was a slight glitch, due to the Pathfinder PC being set to a fixed IP). After handover at 16:35, Kalyan worked on software checks, while Tom and Rosalie prepared Baby ARGOS and performed the retro-reflector Barilotto swap.

Dinner was split between Team 1 and Team 2, and although an hour or two apart, they both had barbecued steak.

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Author: Tom Herbst

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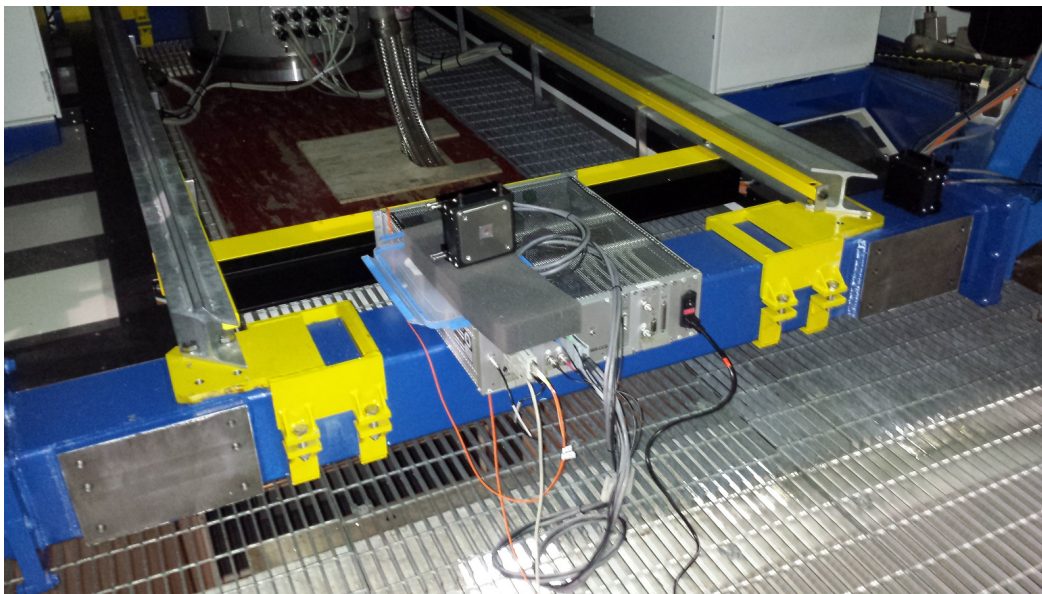
Comments (0)

Com-1 Day 2 - 18 March 2017

This is day 2 of Com-1, with Florian and Lars on the mountain and Kalyan, Rosalie, and Tom on the way (Category is Com-1).

CCD-39

Removed CCD-39 electronics from the F-SX cabinet for testing. In the morning all test series has been succesfull with the following scenarios:

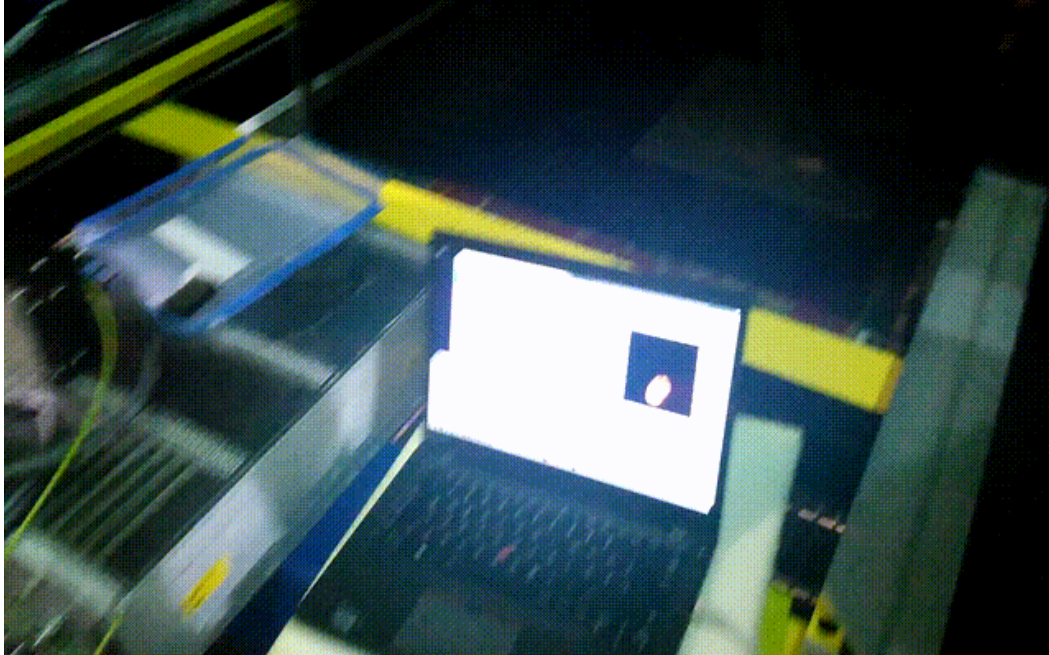


- Electronics and camera head on the visitor gallery (VG).
 - Power over VG outlet.
 - Fiber and serial over instrument path.
 - **Success** in all modes.
- Electronics and camera head on the visitor gallery.
 - Power over F-SX cabinet.
 - Fiber and serial over instrument path.
 - **Success** in all modes.
- Electronics and camera head before LN on the platform.
 - Power over F-SX cabinet.
 - Fiber and serial over instrument path.
 - **Success** in all modes.
- Electronics and camera head on the LN base frame.
 - Power over F-SX cabinet.
 - Fiber and serial over instrument path.
 - **Success** in all modes.

Since we could not find any problem, we went for a lunch break. Job done ! Afterwards we tried the dx head with the following scenarios:

- Electronics installed inside the F-DX and camera head on the LN base frame.
 - Fiber and serial over instrument path.
 - **Fail** in all modes.
- SX Electronics from before and camera F-DX head on the LN base frame.
 - Power over F-SX cabinet.
 - Fiber and serial over instrument path.
 - **Fail** in all modes.
- SX Electronics and camera F-SX head on the LN base frame - from the morning setup.
 - Power over F-SX cabinet.
 - Fiber and serial over instrument path.
 - **Fail** in all modes.

Now as expected everything failed. We suspected luci and pepsi, but that didnt work out - complete confusion.
Lars installed a ground cable between head and the electronics - F-SX parts



As you can see on the video the ground cable has to be close to signal and video cable to prevent a ground loop.

We also tried the dx head in the same setup and we saw that dx head is more sensitive for disturbance. After while the head was less sensitiv and worked as good as the sx head.

Tomorrow we will start checking again the dx electronic together with the dx head.

After a long day it was time for some steak dinner ...



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Author: [Florian & Lars](#)

Categories: [Com-1](#)

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