

Monthly Status Report
Robert Stobie Prime Focus Imaging Spectrograph
September 2007

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This RSS monthly report summarizes the RSS status as of October 8, 2007.

Optics and Testing

- Repair of the UV loss problem. So far we have improved the UV throughput by factor of 5 and the visible throughput by 40%. Four of the 5 multiplets have been disassembled, cleaned, fitted with new O-rings and expansion bladders, reassembled, and refilled with lens fluid. Unfortunately, during reassembly of the fifth multiplet, the collimator triplet, one of the CaF₂ lenses was damaged and will need to be replaced.
 - After repair, the camera quartet has been returned to the specification, with the exception of a ~5% drop at 320 nm. This dip is similar to that in the repaired collimator doublet, but shifted 50 nm to the blue.
 - After repair, the camera triplet visible throughput is similar to the specification, but there is a UV drop-off starting at 400 nm, dropping 15% to 300 nm. All elements with STF multilayer coatings show drop-offs of this sort, while the field lens and singlets, which do not have multilayer coatings, do not show it. Thus we suspect that this is UV absorption in the multilayers, which is not seen in reflectivity curves. We are attempting to get a witness suitable for UV transmission testing from STF to verify this. If true, any repair would be time-consuming and risky, since it involves polishing off the existing coatings, so we do not recommend it as a way of recovering ~25% transmission in the deep UV.
 - The damage to the CaF₂ element in the collimator triplet ("OL5", the inside element of the triplet) resulted from a technician error in using the wrong kind of canned cleaning air, which thermally stressed the surface over a ~40 mm squared area on both surfaces. Since the damage is to both surfaces, and involves cracks which might propagate, the safest thing to do at this point is to fabricate a new lens. The damaged lens will be kept as a fallback in case of mishap to the replacement. Pilot Group will cover costs of replacing the lens: the resale value of the spare CaF₂ blank belonging to UW, the lens figuring, and the solgel coating on one surface.
 - OL5 replacement figuring: Janos, the original vendor, doubled their price and schedule, to \$3500/ 14-16 weeks, due to overbooked machines. Quotes were then obtained from all the previous bidders, resulting in a much better delivery from Tucson Optical Research Corporation: \$5000/ 6-8 weeks. TORC is very highly regarded, has a lot of experience with CaF₂, and a reasonable on-schedule performance. They also have test spheres which match our requirements to within specification. The blank should be shipped to TORC this week.
 - OL5 coating: A quote has been received from the original vendor, Cleveland Crystals, for \$7657/ 3-4 weeks, if we can find the shipping fixture. This is similar to the last time. However, Andrew Phillips at Lick Observatory is willing to do it with their cleanable solgel process, although he says it would not get quite the performance CC claimed for

theirs (minimum reflection 0.7% instead of 0.3%). We are still discussing it with him, since there is evidence that the CC coatings degrade over time to ~0.8% anyway. Lick says the December timeframe is good for them.

- Beamsplitter: Pilot Group is going ahead with the beamsplitter fixes: new bladder; drain and refill fluid. Drain and refill should work without disassembly since the fluid gap is much larger for the beamsplitter. We want to avoid disassembly, which would require a difficult and risky alignment step.

Mechanical.

- The sensor control electronics for the slitmask mechanism is being redesigned and rebuilt to achieve more reliable operation.
- The new grating rotation stage has been tested for flexure in the rotation direction and for side-play flexure in the bearing. The repaired old grating rotation stage has been received from PI. A side-by-side test of the new stage and of the repaired stage will be used to decide which one to use.
- The design of the baffle for the payload/ RSS interface has been completed.

Control

- Electronics box fixes: New, more robust electronics box brackets have been designed for the electronics boxes. External quotes for the machining are being obtained.
- Coding of the high level PCON control software is in progress.
- The spare RSS control system has been finished. It will be shipped to South Africa in the next month. A draft testing report is being circulated.
- The revised detector gain/ speed changes have been made and a new testing report is being produced.

Management

- The RSS schedule has been updated, and is attached to this report. The delivery of the optics to South Africa is even more uncertain, due to the CaF₂ element setback, which will result in a 3-6 month delay. It will be no earlier than January, 2008.
- The 2007 Quarter 2 Quarterly Management Report is in progress.

Activities for next month

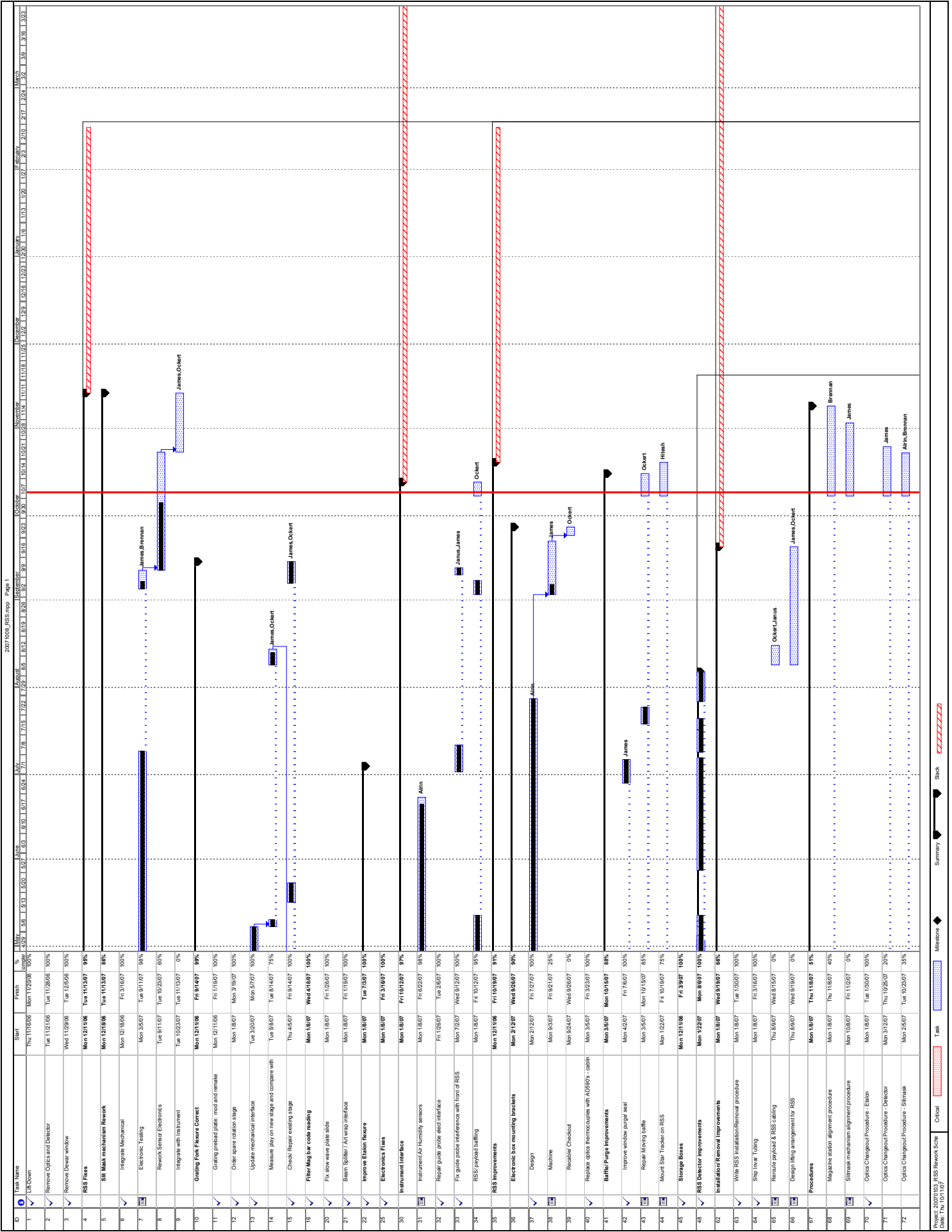
- Analysis
 - Work on analysis of polarimetric commissioning data.

- Optics
 - Figure replacement OL5 lens (TORC).
 - Decide on coating vendor for OL5.
 - Repair beamsplitter.

- Mechanical
 - Finish rebuild of slitmask sensor electronics.
 - Side-by-side test of the two grating rotation stages.
 - Design improved instrument installation and removal fixtures.
 - Repair the moving baffle.

- Control
 - Continue coding of PCON high-level control software, engineering controls, and PDET interaction.
 - Work on Fabry-Perot ring calibration software.

- Management
 - Ship alignment equipment to South Africa.
 - Ship spare Control system to South Africa.
 - Finish Quarter 2, 2007 Quarterly Management Report.
 - Attend SALT semi-annual meeting in Durban, South Africa.



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Project: 20070103_RSS Network Schem
Date: Thu 10/11/07

Critical

Task

Milestone

Summary

Stack

