

Monthly Status Report  
Robert Stobie Prime Focus Imaging Spectrograph  
February 2011

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This monthly report summarizes the RSS status as of March 10, 2011.

### **Optics and Testing**

- Beamsplitter. Alan Schier at Pilot Group has agreed to hand-carry the polarizing beamsplitter to SALT in mid-March, and to meet with operations and maintenance personnel there to discuss care and handing.

### **Mechanical.**

- Mass and Center of Gravity. The instrument was temporarily put on the hoist to measure its current mass and COG. The articulation home sensor was damaged in the process, and has since been replaced and recalibrated satisfactorily.
- Mounting pads. The three kinematic mount pads have been fabricated at UW, and will be delivered to SALT on 22 Mar. The 9 safety mounts pads have been designed and will be fabricated at SALT.
- Articulation sag. The two alternative solutions to the articulation sag problem have been tested initially, described below. The first method is the preferred one, since it does not require stepping the motor against the detent, for which it was not designed. The second method, preloading the motor before removing the detent, is a backup in case the first cannot be made to work.
  - In the first method, the encoder value is recorded before starting the next move. After the detent command is issued, the encoder is monitored, and if it departs by more than a minimum value, an articulation move back to the original position is commanded, and this is repeated if necessary until the detent is out, ready for the move to the next station. It was found that not enough steps are taken in correction before the detent is out far enough that the sag still occurs. An investigation of the stepping trajectory revealed that the acceleration/ deceleration values are currently too low to allow this. The method will be retried after increasing these parameters.
  - An inclinometer device is to be mounted to the camera, so that the direction of gravity is known prior to a station move. The articulation motor would be pre-torqued against gravity before removing the detent to remove the sag. The inclinometer had not been received in time for this test, but an interim solution was to briefly pull the detent, enough to see which way it sagged, then re-insert it before the detent was fully removed. A 1000-step preload was then applied with the detent in, then articulation to the next station proceeded. This succeeded in removing the sag, demonstrating that a software preload

does work in principle. The inclinometer has now been received and is being installed. This method will then be re-demonstrated using the inclinometer input as originally planned.

- Articulation brake. The brake on the articulation motor failed closed. Investigation showed that it had an interference which was dragging since installation, which finally caused the failure. The brake has been repaired and this problem is not expected to recur.
- Guide Probe. The RSS guide probe, reworked and with a new focus sensor, has been fit checked on the instrument. A number of interference problems were found with the slitmask mechanism (also reworked since last on the telescope). These have all been corrected. A new hard stop which will prevent over-travel of the slitmask magazine into the guider envelope, causing potential damage, will be fitted.
- Slitmask. The relay board which controls insertion of the slitmask was found to have burned out. The cause of this is unknown. The board has been successfully replaced with a spare. The previously installed fusing did not prevent this from happening, it was apparently too slow. A change of fuse value is under consideration.
- Etalons. An etalon changeout fixture has been designed and fabrication begun. A test of it is hoped to be completed pre-lift.

### **Control/ PIPT**

- The PCON TCS software which will facilitate high level OCS control of the instrument is under test. The high-level GUI tabs supporting definition of the detector configuration and observation procedure have been successfully modified to resemble the mechanical configuration tab.

### **Management**

- Schedule. A schedule of RSS tasks through Acceptance is attached to this report. The scheduled RSS lift date is now 28 Mar, 2011.
- Documentation. A document describing instrument position angle limitations imposed by the rotator limits is under development. This is required for PI planning of MOS masks and of longslit observations of extended objects.

## Activities for next month

- Optics
  - Carry UV calcite beamsplitter to South Africa. (Pilot Group)
  
- Mechanical
  - Fix remaining articulation “play.” (SALT, UW)
  - Fabricate 9 safety mount pads. (SALT)
  - Fabricate and test etalon change-out tool. (SALT, UW)
  
- Control
  - Test the new PCON/ TCS high-level control software. (SALT)
  - Continue with work on remaining control software PCON and OCS pre-lift and commissioning tasks. (SALT)
  - Work on control documentation improvements. (UW, SALT)
  
- Management
  - Continue work on PA Visibility, Stray light, and Flexure Test Results documents. (UW)

ID	Task Name	Start	Finish	% Complete	Timeline																														
					Nov '10	Dec '10	Jan '11	Feb '11	Mar '11	Apr '11	May '11																								
					10/31	11/7	11/14	11/21	11/28	12/5	12/12	12/19	12/26	1/2	1/9	1/16	1/23	1/30	2/6	2/13	2/20	2/27	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29
1	SALT Pre-Lift Work	Mon 7/13/09	Mon 3/28/11	99%	[Task bar spanning from 7/13/09 to 3/28/11]																														
2	Control System Fixes	Mon 7/13/09	Fri 3/19/10	100%	[Task bar spanning from 7/13/09 to 3/19/10]																														
9	Optics Preps	Mon 7/13/09	Fri 12/17/10	99%	[Task bar spanning from 7/13/09 to 12/17/10]																														
10	Filter holders	Mon 7/13/09	Tue 4/20/10	100%	[Task bar spanning from 7/13/09 to 4/20/10]																														
11	Filter barcodes	Mon 10/12/09	Tue 4/20/10	100%	[Task bar spanning from 10/12/09 to 4/20/10]																														
12	FP Calibration system	Thu 4/1/10	Wed 6/23/10	100%	[Task bar spanning from 4/1/10 to 6/23/10]																														
13	Install Grating Fork Mod	Mon 10/4/10	Fri 12/17/10	100%	[Task bar spanning from 10/4/10 to 12/17/10]																														
14	Testing	Mon 7/13/09	Wed 3/16/11	99%	[Task bar spanning from 7/13/09 to 3/16/11]																														
15	Fabry-Perot Calibration	Mon 7/19/10	Fri 7/23/10	100%	[Task bar spanning from 7/19/10 to 7/23/10]																														
16	HR Repair	Thu 8/5/10	Wed 9/8/10	100%	[Task bar spanning from 8/5/10 to 9/8/10]																														
17	HR Calibration	Thu 11/4/10	Fri 11/5/10	100%	[Task bar spanning from 11/4/10 to 11/5/10]																														
18	Functional Testing	Mon 9/7/09	Thu 12/23/10	100%	[Task bar spanning from 9/7/09 to 12/23/10]																														
19	Flexure Tests	Mon 12/6/10	Fri 12/10/10	100%	[Task bar spanning from 12/6/10 to 12/10/10]																														
20	Resolve Mechanical Shift	Mon 10/11/10	Fri 10/22/10	100%	[Task bar spanning from 10/11/10 to 10/22/10]																														
21	Mechanism Reliability - I	Mon 7/13/09	Fri 4/30/10	100%	[Task bar spanning from 7/13/09 to 4/30/10]																														
22	Dolly Modifications	Thu 4/1/10	Wed 7/21/10	100%	[Task bar spanning from 4/1/10 to 7/21/10]																														
23	Mechanism Reliability - II	Thu 7/22/10	Wed 3/16/11	95%	[Task bar spanning from 7/22/10 to 3/16/11]																														
24	Kinematic Mount Evaluation	Thu 12/16/10	Fri 12/17/10	100%	[Task bar spanning from 12/16/10 to 12/17/10]																														
25	Thermal Testing	Mon 3/7/11	Tue 3/8/11	0%	[Task bar spanning from 3/7/11 to 3/8/11]																														
26	Lift Preps	Tue 12/28/10	Mon 3/28/11	95%	[Task bar spanning from 12/28/10 to 3/28/11]																														
27	RSS guide probe	Tue 12/28/10	Mon 3/28/11	95%	[Task bar spanning from 12/28/10 to 3/28/11]																														
28	Reroute payload & RSS cabling	Tue 1/4/11	Mon 3/28/11	95%	[Task bar spanning from 1/4/11 to 3/28/11]																														
29	Improve lifting arrangement for RSS	Tue 12/28/10	Mon 3/28/11	95%	[Task bar spanning from 12/28/10 to 3/28/11]																														
30	SALT Software	Mon 7/13/09	Fri 3/25/11	98%	[Task bar spanning from 7/13/09 to 3/25/11]																														
31	PCON/ TCS Communications	Mon 7/13/09	Mon 3/14/11	98%	[Task bar spanning from 7/13/09 to 3/14/11]																														
32	ATP Document	Mon 7/27/09	Fri 8/7/09	100%	[Task bar spanning from 7/27/09 to 8/7/09]																														
33	PCON/PDET test on hardware	Mon 8/10/09	Fri 11/26/10	100%	[Task bar spanning from 8/10/09 to 11/26/10]																														
34	PCON software wishlist	Mon 11/8/10	Fri 3/18/11	95%	[Task bar spanning from 11/8/10 to 3/18/11]																														
35	Acceptance Test	Mon 3/21/11	Fri 3/25/11	0%	[Task bar spanning from 3/21/11 to 3/25/11]																														
36	Simulator Commissioning upgrades	Mon 11/9/09	Wed 3/16/11	97%	[Task bar spanning from 11/9/09 to 3/16/11]																														
37	UW Prelift Engineering	Fri 10/2/09	Mon 10/25/10	100%	[Task bar spanning from 10/2/09 to 10/25/10]																														
42	Documentation	Mon 8/10/09	Fri 3/18/11	91%	[Task bar spanning from 8/10/09 to 3/18/11]																														
43	High Level maintenance	Mon 9/27/10	Fri 3/18/11	50%	[Task bar spanning from 9/27/10 to 3/18/11]																														
44	Control System Software	Mon 8/10/09	Thu 12/9/10	100%	[Task bar spanning from 8/10/09 to 12/9/10]																														
45	Control System hardware	Mon 12/6/10	Tue 3/15/11	30%	[Task bar spanning from 12/6/10 to 3/15/11]																														
46	Magazine installation, Lift	Mon 3/7/11	Fri 3/18/11	0%	[Task bar spanning from 3/7/11 to 3/18/11]																														
47	UW at SALT	Mon 11/8/10	Wed 11/17/10	100%	[Task bar spanning from 11/8/10 to 11/17/10]																														
54	Beamsplitter UV Throughput Repair	Mon 9/14/09	Fri 3/18/11	99%	[Task bar spanning from 9/14/09 to 3/18/11]																														
55	Repair wedges	Mon 9/14/09	Fri 5/28/10	100%	[Task bar spanning from 9/14/09 to 5/28/10]																														
56	Realign/ Reassemble	Mon 5/31/10	Fri 9/17/10	100%	[Task bar spanning from 5/31/10 to 9/17/10]																														
57	Monitor alignment, for bubbles	Mon 9/20/10	Fri 1/7/11	100%	[Task bar spanning from 9/20/10 to 1/7/11]																														
58	Deliver to SAAO	Mon 3/14/11	Fri 3/18/11	0%	[Task bar spanning from 3/14/11 to 3/18/11]																														
59	RSS onto telescope	Fri 3/18/11	Thu 4/14/11	0%	[Task bar spanning from 3/18/11 to 4/14/11]																														
60	Install Beamsplitter	Fri 3/18/11	Mon 3/21/11	0%	[Task bar spanning from 3/18/11 to 3/21/11]																														
61	Functional Testing	Mon 3/21/11	Mon 3/28/11	0%	[Task bar spanning from 3/21/11 to 3/28/11]																														
62	Pre-Lift review	Mon 3/28/11	Mon 3/28/11	0%	[Task bar spanning from 3/28/11 to 3/28/11]																														
63	Lift	Mon 3/28/11	Mon 3/28/11	0%	[Task bar spanning from 3/28/11 to 3/28/11]																														
64	Functional Testing	Tue 3/29/11	Thu 3/31/11	0%	[Task bar spanning from 3/29/11 to 3/31/11]																														
65	On-Telescope Acceptance Testing	Fri 4/1/11	Thu 4/14/11	0%	[Task bar spanning from 4/1/11 to 4/14/11]																														
66	RSS Team Commissioning	Mon 11/9/09	Thu 7/7/11	61%	[Task bar spanning from 11/9/09 to 7/7/11]																														
67	Review Commissioning Proposals	Thu 4/1/10	Wed 7/28/10	100%	[Task bar spanning from 4/1/10 to 7/28/10]																														
68	Spectroscopy End-to-End	Fri 4/15/11	Thu 4/28/11	0%	[Task bar spanning from 4/15/11 to 4/28/11]																														
69	PCON Commissioning procedures	Mon 3/28/11	Fri 4/22/11	0%	[Task bar spanning from 3/28/11 to 4/22/11]																														
70	PIPT/ OCS Commissioning upgrades	Mon 11/9/09	Mon 4/18/11	80%	[Task bar spanning from 11/9/09 to 4/18/11]																														
71	MOS End-to-End	Fri 4/29/11	Thu 5/12/11	0%	[Task bar spanning from 4/29/11 to 5/12/11]																														
72	Fabry-Perot Spectroscopy End-to-End	Fri 5/13/11	Thu 5/26/11	0%	[Task bar spanning from 5/13/11 to 5/26/11]																														
73	Linear Polarimetry End-to-End	Fri 6/24/11	Thu 7/7/11	0%	[Task bar spanning from 6/24/11 to 7/7/11]																														
74	MOS Linear Polarimetry End-to-End	Fri 6/24/11	Thu 7/7/11	0%	[Task bar spanning from 6/24/11 to 7/7/11]																														
75	High-Speed Spectroscopy End-to-End	Fri 6/24/11	Thu 7/7/11	0%	[Task bar spanning from 6/24/11 to 7/7/11]																														
76	Consortium Commissioning Project Continuation	Fri 4/29/11	Thu 7/21/11	0%	[Task bar spanning from 4/29/11 to 7/21/11]																														
77	Analyse, Write Up Tests	Fri 4/29/11	Thu 7/21/11	0%	[Task bar spanning from 4/29/11 to 7/21/11]																														
78	Acceptance Review	Thu 7/21/11	Thu 7/21/11	0%	[Task bar spanning from 7/21/11 to 7/21/11]																														
79	SALT Advanced Commissioning	Fri 6/24/11	Thu 7/7/11	0%	[Task bar spanning from 6/24/11 to 7/7/11]																														
80	Circular, All-Stokes Pol End-to-End	Fri 6/24/11	Thu 7/7/11	0%	[Task bar spanning from 6/24/11 to 7/7/11]																														
81	Nod-and-Shuffle Spect End-to-End	Fri 6/24/11	Thu 7/7/11	0%	[Task bar spanning from 6/24/11 to 7/7/11]																														