Monthly Status Report
Robert Stobie Prime Focus Imaging Spectrograph
June 2007

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This RSS monthly report summarizes the RSS status as of July 9, 2007.

Optics and Testing

- Progress toward a repair of the UV loss problem:
  - A successful fluid expansion bladder composed of polyethylene LDPE has been constructed.
  - Draining and refilling of the multiplets is underway, starting with the collimator doublet. For the first drain/ refill, the procedure is as follows: After draining the cell of the old (LL5610) fluid, flush it a couple times, recycling the alcohol. Then change the alcohol and flush it a couple more times. Measure the transmission in the UV of the used alcohol to see how much of the old fluid it contains, and then flush again depending on the results. This should give us a quantitative measure of the UV attenuation that we could expect when the cell is refilled with the new fluid (an upper limit, anyway). Once it's sufficiently flushed, put the cell in a vacuum to (gently) boil off the residual alcohol. Then refill with LL3421 fluid at atmospheric pressure.

- The failed field flattener coating has been polished off at Janos, the surface recoated at Spectrum Thin Films, and the element shipped to Pilot Group for a final transmission measurement. An improved water-resistant overcoat was applied to the new coating. Transmission and reflectivity measurements of a sample with our AR coating plus the overcoat verified that the overcoat does not degrade the AR performance or transmission. A fused silica witness with our coating/ overcoat is being supplied with the part for our testing.

Mechanical

- Etalon mechanism. A modification to the etalon seating fixture has been devised to improve the etalon flexure during an observation. Machining is complete.

- The guidance probe is being modified to eliminate interference which prevented its use in some parts of the field of view. The parts on the probe that interfered (and included strain reliefs for the fibers) have been redesigned, manufactured and test fitted.

Control

- Electronics box fixes: New, more robust electronics box brackets have been designed for the four electronics boxes. A design review has been held, with some suggested changes.

- Detector work continues:
  - Anomalous CCD full well: A change to the current four gain/ speed choices is under investigation, in which the BRIGHT/ FAST mode uses low sensitivity, and FAINT/FAST uses high sensitivity but a lower gain. We are evaluating the noise and gain before proceeding with a modification.
  - An improved temperature control method is being implemented. Breadboard testing is complete. We have designed a permanent solution, and have components on order, delivery date ~19th July. The solution will allow for remote control of servo control variables such as temperature set-point etc.
  - Earth-loop /chevron pattern tests: Tests done in the lab indicate that at gains of 1e/ADU in both FAST & SLOW readout speeds, the chevron pattern is undetectable by eye in the displayed image, even when applying a very aggressive lookup table. The pattern becomes visible at gains of around 0.3e/ADU

- Coding of the high level PCON control software is in progress. The execution engine has been optimized, and the TCP connection code has been made much simpler and more reliable. However, implementation of the TCS interaction is being postponed until after Janus Brink returns from leave.

Management

- The RSS schedule has been updated, and is attached to this report. The ship date of the optics from California is now 20 July, with a possible one-week slip. This shipment will include the field flattener.

- The 2007 Quarter 1 Quarterly Management Report was finished.

Activities for next month

• Analysis
  - Work on analysis of polarimetric commissioning data.

• Optics
  - Complete draining/ refilling of multiplets; remeasure transmission.

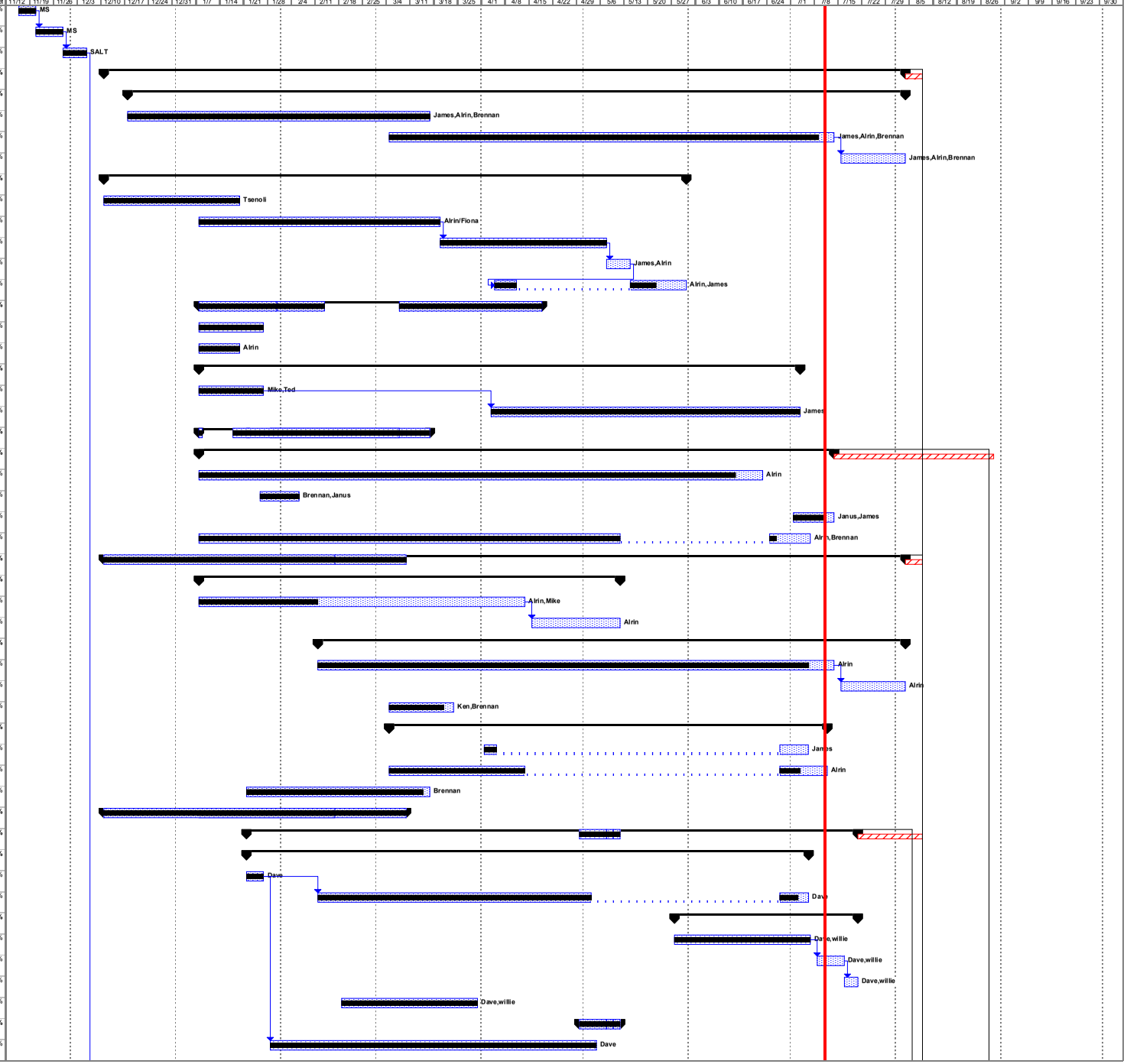
• Mechanical
  - Finish testing the reworked slitmask mechanism.
  - Repair old grating rotation stage (PI). Test flexure of new stage.
  - Design improved instrument installation and removal fixtures.
  - Review optics and instrument installation/ removal procedures.
  - Work on baffling improvements for the moving baffle and filter insertion seal.
  - Complete reworked guide probe assembly plus some other improvements on the cabling and routing.

• Control
  - Continue coding of PCON high-level control software, starting with engineering controls, and then proceeding to PDET interaction.
  - Integrate CCD improved temperature control, in parallel with the reinstallation of the field flattener lens in the cryostat if necessary.

• Detector
  - Finish testing of detector readout mode modifications to improve full well.
  - Complete temperature control modifications.

• Management
  - Ship optics and alignment equipment to South Africa.
  - Start Quarter 2, 2007 Quarterly Management Report.

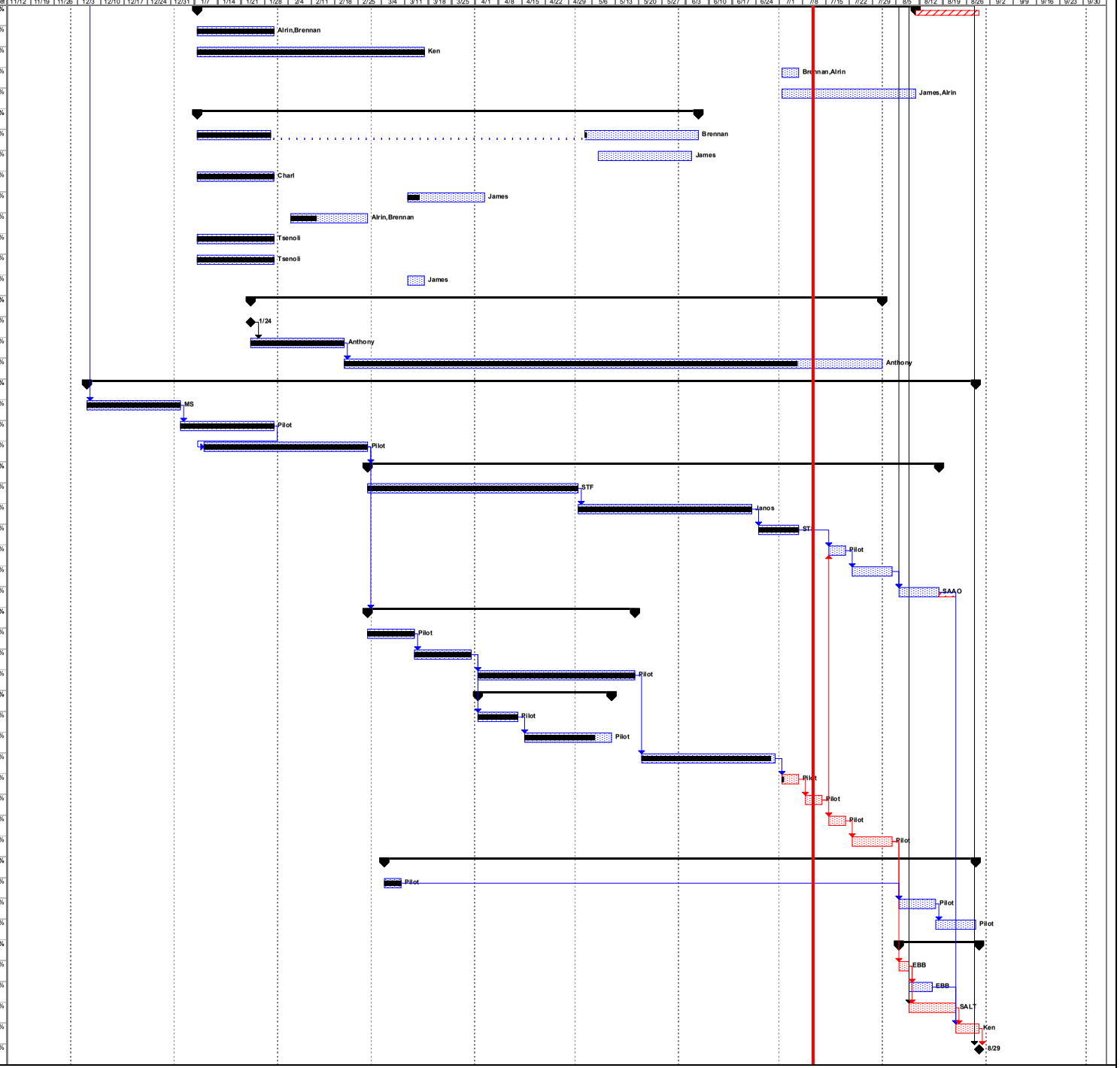
ID	Task Name	Start	Finish	% complet
1	Lift-Down	Thu 11/16/06	Mon 11/20/06	100%
2	Remove Optics and Detector	Tue 11/21/06	Tue 11/28/06	100%
3	Remove Dewar window	Wed 11/29/06	Tue 12/5/06	100%
4	**RSS Fixes**	**Mon 12/11/06**	**Fri 8/3/07**	**94%**
5	**Slit Mask mechanism Rework**	**Mon 12/18/06**	**Fri 8/3/07**	**89%**
6	Integrate Mechanical	Mon 12/18/06	Fri 3/16/07	100%
7	Electronic Testing	Mon 3/5/07	Fri 7/13/07	95%
8	Integrate with Instrument	Mon 7/16/07	Fri 8/3/07	0%
9	**Grating Fork Flexure Correct**	**Mon 12/11/06**	**Thu 5/31/07**	**91%**
10	Grating preload plate: mod and remake	Mon 12/11/06	Fri 1/19/07	100%
11	Order spare rotation stage	Mon 1/8/07	Mon 3/19/07	100%
12	Update mechanical interface	Tue 3/20/07	Mon 5/7/07	100%
13	Measure play on new stage and compare with	Tue 5/8/07	Mon 5/14/07	0%
14	Check/ Repair existing stage	Thu 4/5/07	Thu 5/31/07	60%
15	**Filter Mag bar code reading**	**Mon 1/8/07**	**Wed 4/18/07**	**100%**
19	Fix slow wave plate slide	Mon 1/8/07	Fri 1/26/07	100%
20	Beam Splitter / Ar wrap interface	Mon 1/8/07	Fri 1/19/07	100%
21	**Improve Etalon flexure**	**Mon 1/8/07**	**Tue 7/3/07**	**100%**
22	Design	Mon 1/8/07	Fri 1/26/07	100%
23	Machine	Wed 4/4/07	Tue 7/3/07	100%
24	**Electronics Fixes**	**Mon 1/8/07**	**Fri 3/16/07**	**100%**
29	**Instrument Interface**	**Mon 1/8/07**	**Fri 7/13/07**	**93%**
30	Instrument Air Humidity sensors	Mon 1/8/07	Fri 6/22/07	95%
31	Repair guide probe elect interface	Fri 1/26/07	Tue 2/6/07	100%
32	Fix guide probe interference with front of RSS	Mon 7/2/07	Fri 7/13/07	75%
33	RSS/ payload baffling	Mon 1/8/07	Fri 7/6/07	92%
34	**RSS Improvements**	**Mon 12/11/06**	**Fri 8/3/07**	**75%**
35	**Rework Articulation Fall Arrestor**	**Mon 1/8/07**	**Fri 5/11/07**	**28%**
36	Design	Mon 1/8/07	Fri 4/13/07	36%
37	Implement	Mon 4/16/07	Fri 5/11/07	0%
38	**Electronic box mounting brackets**	**Mon 2/12/07**	**Fri 8/3/07**	**84%**
39	Design	Mon 2/12/07	Fri 7/13/07	95%
40	Machine	Mon 7/16/07	Fri 8/3/07	0%
41	Replace optics thermocouples with AD590's - cablin	Mon 3/5/07	Fri 3/23/07	80%
42	**Baffle/ Purge Improvements**	**Mon 3/5/07**	**Wed 7/11/07**	**76%**
43	Improve window purge/ seal	Mon 4/2/07	Fri 7/6/07	38%
44	Repair Moving baffle	Mon 3/5/07	Wed 7/11/07	85%
45	Mount Star Tracker on RSS	Mon 1/22/07	Fri 3/16/07	95%
46	**Storage Boxes**	**Mon 12/11/06**	**Fri 3/9/07**	**100%**
49	**RSS Detector improvements**	**Mon 1/22/07**	**Fri 7/20/07**	**94%**
50	**Full well investigation**	**Mon 1/22/07**	**Fri 7/6/07**	**95%**
51	phase 1	Mon 1/22/07	Fri 1/26/07	100%
52	phase 2	Mon 2/12/07	Fri 7/6/07	95%
53	**temperature control**	**Mon 5/28/07**	**Fri 7/20/07**	**75%**
54	design mod	Mon 5/28/07	Fri 7/6/07	100%
55	manufacture & clean	Mon 7/9/07	Mon 7/16/07	0%
56	test	Tue 7/17/07	Fri 7/20/07	0%
57	upgrade vacuum valve	Mon 2/19/07	Fri 3/30/07	100%
58	**software/ firmware**	**Mon 4/30/07**	**Fri 5/11/07**	**100%**
62	crosstalk investigation	Mon 1/29/07	Fri 5/4/07	100%



Project: 20070103_RSS Rework Sche
Date: Thu 7/12/07

Critical Task Milestone Summary Slack

ID	Task Name	Start	Finish	% omplet
63	**Installation/ Removal Improvements**	**Mon 1/8/07**	**Fri 8/10/07**	**66%**
64	Write RSS Installation/Removal procedure	Mon 1/8/07	Tue 1/30/07	100%
65	Ship Invar Tubing	Mon 1/8/07	Fri 3/16/07	100%
66	Reroute payload & RSS cabling	Mon 7/2/07	Fri 7/6/07	0%
67	Design lifting arrangement for RSS	Mon 7/2/07	Fri 8/10/07	0%
68	**Procedures**	**Mon 1/8/07**	**Wed 6/6/07**	**51%**
69	Magazine station alignment procedure	Mon 1/8/07	Wed 6/6/07	41%
70	Slitmask mechanism alignment procedure	Tue 5/8/07	Mon 6/4/07	0%
71	Optics Changeout Procedure - Etalon	Mon 1/8/07	Tue 1/30/07	100%
72	Optics Changeout Procedure - Detector	Mon 3/12/07	Tue 4/3/07	20%
73	Optics Changeout Procedure - Slitmask	Mon 2/5/07	Tue 2/27/07	35%
74	Optics Changeout Procedure - Filter magazine	Mon 1/8/07	Tue 1/30/07	100%
75	Optics Changeout Procedure - Grating magazine	Mon 1/8/07	Tue 1/30/07	100%
76	Optics Changeout Procedure - Beam splitter	Mon 3/12/07	Fri 3/16/07	0%
77	**Software**	**Wed 1/24/07**	**Tue 7/31/07**	**87%**
78	SRD Review	Wed 1/24/07	Wed 1/24/07	100%
79	Write Software Design Document	Wed 1/24/07	Tue 2/20/07	100%
80	Implement	Wed 2/21/07	Tue 7/31/07	85%
81	**Optics Repair**	**Wed 12/6/06**	**Tue 8/28/07**	**80%**
82	Ship Optics -> Pilot	Wed 12/6/06	Tue 1/2/07	100%
83	Disassemble Cam, Coll Multiplets	Wed 1/3/07	Tue 1/30/07	100%
84	Transmission of Multiplets	Wed 1/10/07	Tue 2/27/07	100%
85	**Flattener Repair**	**Wed 2/28/07**	**Fri 8/17/07**	**79%**
86	Evaluation/ Clean Attempt	Wed 2/28/07	Tue 5/1/07	100%
87	Polish off coating	Wed 5/2/07	Fri 6/22/07	100%
88	Recoat	Mon 6/25/07	Fri 7/6/07	100%
89	Transmission	Mon 7/16/07	Fri 7/20/07	0%
90	Ship Optics -> SA	Mon 7/23/07	Fri 8/3/07	0%
91	Replace window; pumpdown	Mon 8/6/07	Fri 8/17/07	0%
92	**UV Throughput Repair**	**Wed 2/28/07**	**Fri 5/18/07**	**100%**
93	Measure Fluid Samples	Wed 2/28/07	Tue 3/13/07	100%
94	Investigate Grey Loss	Wed 3/14/07	Fri 3/30/07	100%
95	Fluid/ Bladder Compatibility Tests	Mon 4/2/07	Fri 5/18/07	100%
96	**Camera Triplet repair**	**Mon 4/2/07**	**Fri 5/11/07**	**83%**
97	Disassemble/ Inspect	Mon 4/2/07	Fri 4/13/07	100%
98	Repair	Mon 4/16/07	Fri 5/11/07	75%
99	Design/ Rebuild Bladders	Mon 5/21/07	Fri 6/29/07	95%
100	Drain/Replace Fluid	Mon 7/2/07	Fri 7/6/07	10%
101	Transmission of Multiplets	Mon 7/9/07	Fri 7/13/07	0%
102	Reassemble/ Align Cam, Coll	Mon 7/16/07	Fri 7/20/07	0%
103	Ship Optics -> SA	Mon 7/23/07	Fri 8/3/07	0%
104	**Beamsplitter Repair**	**Mon 3/5/07**	**Tue 8/28/07**	**23%**
105	Transmission	Mon 3/5/07	Fri 3/9/07	100%
106	Replace Fluid/ Bladder	Mon 8/6/07	Thu 8/16/07	0%
107	Ship -> SA	Fri 8/17/07	Tue 8/28/07	0%
108	**Reintegration**	**Mon 8/6/07**	**Wed 8/29/07**	**0%**
109	Reinstall optics	Mon 8/6/07	Wed 8/8/07	0%
110	Align Optics	Thu 8/9/07	Wed 8/15/07	0%
111	Reintegrate mechanisms, baffling	Thu 8/9/07	Wed 8/22/07	0%
112	Readiness Test	Thu 8/23/07	Wed 8/29/07	0%
113	Ready for Lift	Wed 8/29/07	Wed 8/29/07	0%



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