MONTHLY STATUS REPORT

Engineering & Technical Services
June 2003

Table of Contents

Projects

N-NU500-000 Gemini Near Infrared Spectrograph (GNIRS) ................................................................. 2
N-NW 0 Monsoon ........................................................................................................................................ 3
N-NW 1 NEWFIRM ..................................................................................................................................... 5
Infrared R&D Program .............................................................................................................................

Departments

Electronic Design .................................................................................................................................. 6
Instrument Shop ...................................................................................................................................... 7

Central Engineering & Technical Services

Optics & Coatings Labs (NOCL) ............................................................................................................ 10
Optical Shop Schedule .......................................................................................................................... 11
Computer Services ................................................................................................................................. 12
Programming Group .............................................................................................................................. 13
Risk Management .................................................................................................................................. 16
N-NU 500-000 Gemini Near Infrared Spectrograph (GNIRS)

DESCRIPTION: The Gemini Near Infrared Spectrograph is a $4.2 million long-slit spectrometer that will be mounted on the Gemini South 8-meter Telescope on Cerro Pachon, Chile. It will operate from 1 to 5 um and will offer two plate scales and a range of dispersions. The instrument is scheduled for completion in mid-2003. See regular monthly reports on the web at http://www.noao.edu/ets/gnirs/.
N-NW 0 MONSOON

DESCRIPTION: The MONSOON Image Acquisition System is the NOAO solution for scalable, multichannel high-speed image acquisition system. Additional information can be found at the MONSOON website [http://www.noao.edu/ets/monsoon/](http://www.noao.edu/ets/monsoon/).

The initial focus of MONSOON is to develop an IR Laboratory Test Set for the RIO ORION Project. This capability will also support the RIO VIRGO and Rockwell HAWAII 2 family of FPAs, prove the MONSOON system concept and provide the baselinesystem for NEWFIRM implementation. This test set is composed of a Linux-Based Ghz PC, 1Gb/s FiberLink, Detector Head Electronics Chassis (DHE), one Master Control Board (MCB), one Clock & Bias Board (C&BB), and two 36 Channel IR Acquisition Boards (IRACQ), along with associated software.

<table>
<thead>
<tr>
<th>Oct '02</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sept '03</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DHE Chassis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLK &amp; BIAS Board</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36 CH IR ACQ Board</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Safety Verification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPGA Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional IR Lab System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software PDR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monsoon CDR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FY 03

<table>
<thead>
<tr>
<th>Budgeted Hours</th>
<th>13,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Capital</td>
<td>$100,000</td>
</tr>
<tr>
<td>Actual Hours</td>
<td>10,015.2</td>
</tr>
<tr>
<td>Actual Capital</td>
<td>$76,753</td>
</tr>
</tbody>
</table>

RESOURCE ISSUES

- Jerry Penegor continues to be heavily involved with GNIRS and NEWFIRM.
- Kaviraj Chopra, the EE Intern working on VHDL issues, graduated in June and is working part time through September.
- Peter Ruckle now available for programming, but still heavily involved with GNIRS.
- Gustavo Rahmer will be visiting in Tucson for about 2 weeks at the start of July.

RECENT ACCOMPLISHMENTS

- Reached major milestone in April: Bits to FITS demonstrated in lab system
- Data path from the PAN computer to the sequencer mpu and PAN decode logic on the Master Control Board and then to the peripheral boards has been verified to perform as expected. Data path from peripheral boards to the master control board and then to the PAN computer have been verified as functional. Data taking at maximum acquisition rates (80 MPix / sec across backplane and 50 MPix / sec across the fiber) using these paths has been reliably demonstrated.
- Sequencer mpu tests performed with the result that the sequencer mpu instruction set has been verified and test sequences run successfully but we are limited to half the expected time resolution (50 ns instead of 25 ns) because of a memory problem with the design. We'll go with this and fix the problem later as it doesn't restrict us for the current milestones.
- Systran boards that required the external clock have been successfully tested and prove that earlier problem with SYNC protocol definitely restricted to either one board and / or earlier firmware revision. In addition, to get the
Systran boards to work we had to run the master control board at 130% clock speed. The firmware in the FPGAs and the board logic performed without fault at this speed.

- We have identified various faults in manufacture of the IR acquisition boards (SN001 & SN002) and with the associated daughter boards. One board (SN002) has been tested with 18 channels and shows a nominal 3.5 ADU rms noise term on all working channels (there is still one channel that needs work). 36 channels have been acquired (33 working) reliably with slightly higher noise for the channels associated with the daughter boards. This essentially tells us that the board layout is good and we are progressing with data taking to determine the boards characteristics for linearity, cross talk, and frequency response. So far these data strongly support the notion that the two board required for Orion can be built with no modification to the current board design. We will put more effort into bringing the noise floor down next month.

- Issues with raw throughput of Master Control Board Bus resolved by modest coding re-design that partitioning 32 bit data word into 24 data bits and 8 control bits. This enables 1 clock per transfer instead of 3 clocks per transfer. Long-term solution to allow 32 bit data word will be re-visited later as necessary.

- Verified that data rates required for NEWFIRM (64 Mbytes per image) are sustainable within Linux; only one Linux-based PAN will be required.

- IR Acquisition boards have been tested with 72 channels (2 main and 2 daughter boards) in simultaneous operation. Currently the optimized boards deliver roughly 2-2.5 ADU rms per channel in this mode.

- CLK &Bias board verified to read and write voltages correctly. Will proceed to verify that range specifications and protections operate properly.

- General progress in creating and verifying operation of assorted hardware and software tools for testing Monsoon subsystems.

- Gustavo Rahmer continues to exercise the Master Control Board, verifying that the devices operate as expected and deliver clocks and biases with the values requested.

- Nick Buchholz and Phil Daley are concentrating on preparing for the Software PDR to be held July 1.

- Dave Sawyer, Dave Dryden, and Peter Moore have CCD prototype working well with preliminary noise and linearity tests at levels approaching the manufacturer’s specs for the AFE 9823 ADCs. Since Peter Onaka of the IfA is interested in these same parts, we are exploring a collaborative test effort.

- Kaviraj Chopra has completed modifications to the sequencer to address timing issues and to better utilize space within the FPGA.

**PLANS:**

- Continued Test of IR System.
- Continued Development of FPGA based logic in all 3 PCB assemblies. Focus on IR Acquisition needs.
- Operate an ALADDIN readout in the NOAO ALADDIN test dewar with Monsoon and confirm that Monsoon operation meets or exceeds prior operation within extant NOAO systems.
- Continued Development of MONSOON Software with focus on IR Test system needs.
- Continued Test of CCD Prototype System.
- Software PDR to be held on July 1, owing to schedule conflicts.
- Hardware CDR to be held in the September/October time frame.
- Develop/indentify/modify waveform definition language and create MPU sequencer compiler to enable efficient sequencer coding.
N-NW 1 NEWFIRM

DESCRIPTION: This is a multiyear project to develop a wide field, near infrared imager designed for use at the Cassegrain focus of the Mayall 4-M telescope. A draft of the concepts for this instrument can be found at http://www.noao.edu/ets/newfirm/newfcon.html.

<table>
<thead>
<tr>
<th>FY 03</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Hours</td>
<td>15,300</td>
</tr>
<tr>
<td>Budgeted Capital</td>
<td>$383,505</td>
</tr>
<tr>
<td>Actual Hours</td>
<td>9,558.3</td>
</tr>
<tr>
<td>Actual Capital</td>
<td>$22,515</td>
</tr>
</tbody>
</table>

GENERAL: A successful PDR was held as scheduled on June 4th and 5th, and permission was granted to proceed with the project as planned. The first steps to be accomplished on the plan are completion of the top assembly definition of the instrument and to deal with any remaining system interface issues. Also started is work on the electronics and software work packages, and ordering of the first set of optics from Janos. Project planning, scheduling and cost estimates show that the instrument can be built in 25 months for approximately $2.8M.

Andres Montane from NOAO-S is currently here for a two-week review of the instrument and to work with Ruben Dominguez on the Filter Wheel and Environmental Cover sub-assemblies. Ruben Dominguez is the engineering liaison between the north and south MIP groups for the project. Andres has also been asked to review the spring finger design of the lens cell groups of hardware.

We are in process of obtaining a second bid on the four remaining large optics, having already received a bid from Tinsley. We intend to place the order by the end of June.

Administratively, we have put into effect new charge numbers that correspond to post-PDR work, and have closed all N-NW1 charge numbers relating to the PDR and previous. The new charge numbers use the sequence N-NW2.

SCHEDULE:
A milestone schedule will be provided for the monthly reports starting next month.

ACCOMPLISHMENTS:
- Completed the PDR review.
- Started Top Assembly design task(s)
- Ordered first set of optics
- Started electronics work package tasks
- Started software work package tasks

PLANS:
- Order remaining optics by June 30th
- Start tasks on the Guider work package by June 30th
- Place the Monsoon hardware order by July 14th
- Start mechanical fabrication tasks in the Instrument Shop in August

Personnel Changes:
We have hired a mechanical engineering summer intern to assist with mechanical design and analysis.
Infrared R&D Program (K. M. Merrill)

- Al Fowler and Bill Ball have been testing our Science Grade Orion 1 module in the lab system. Noise problems with the electronics were found and ameliorated. The first "picture" of the readout was made, 8 columns at a time. Tests indicated that the ability to power down the outputs during integration can dramatically reduce "dark" current.

- The first Orion 2 readouts were delivered to RVS for testing and 15 of 24 wafers were probed. The results are very encouraging. Under the assumption that the newly designed column deselect circuitry works as intended, the yield of high quality "science grade" devices is much improved - Al Fowler and Michael Merrill had a telecon with Alan Hoffman and Peter Love of RVS to select wafers for further processing.

- Wafer probes of a selected wafer that, based on the measured currents, had several types of defects indicates that one can locate the defects during wafer probing and that the deselect feature is indeed working as intended. We expect an Orion 2 readout to be in our hands by mid-July for testing in our lab.
Electronic Design (D. Stover)

### Priority jobs / newly submitted

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>Acct No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete organization area &amp; tasks</td>
<td>finish spread sheet with efile locations then on to investigating the jobs with the &quot;unknown&quot; status (still continuing, I don't have all the efile locations yet)</td>
<td></td>
</tr>
<tr>
<td>SOLIS Guider revision</td>
<td>SNP 140 040</td>
<td>changes confirmed, made now in review, will be sent out 1st week of July</td>
</tr>
<tr>
<td>GNIRS</td>
<td>26 docs that I can finalize</td>
<td></td>
</tr>
<tr>
<td>SOLIS</td>
<td>66 docs that I can finalize</td>
<td></td>
</tr>
<tr>
<td>Documentation Wavefront</td>
<td>NNK 510 844</td>
<td>14 docs to create 10 to redline, on hold for more modifications on MNTN</td>
</tr>
<tr>
<td>Documentation WTTM</td>
<td>NNX 539 202</td>
<td>holding for a block of time</td>
</tr>
<tr>
<td>Parts and Vendors import &amp; input</td>
<td>NNW 051 900</td>
<td>Need to try to import data, input inventory items used on monsoon</td>
</tr>
<tr>
<td>Monsoon CCD Proto Sch update</td>
<td>NNW 053 907</td>
<td>still need to update BOM</td>
</tr>
<tr>
<td>New Firm Coldstation Boards</td>
<td>NNW 133 1B3</td>
<td>on hold for more information from Jerry, still no information</td>
</tr>
<tr>
<td>Monsoon IR Acq configuration update</td>
<td></td>
<td>waiting on input from Peter</td>
</tr>
</tbody>
</table>

### Finished items

- Slit masks for July Run
  - NNK 360 000
- Gemini MCAO documentation checkin
  - NNK 360 000
- Monsoon Bus Breakout Board
  - NNW 052 134 out for fabrication

### Ongoing jobs

- Library standards & Libraries
  - NNX 510 000
- drawing standards written
  - NNX 510 000

### Table

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>8011</th>
<th>9023</th>
<th>AL F.</th>
<th>COB</th>
<th>Cryo</th>
<th>gen instr</th>
<th>GNAAC</th>
<th>GNIRS</th>
<th>GONG</th>
<th>KP</th>
<th>Monsn</th>
<th>PHX</th>
<th>SOLIS</th>
<th>SQUIID</th>
<th>UNI</th>
<th>WIYN</th>
<th>WTTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>arch/incomp</td>
<td>35</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>assembly</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>38</td>
<td>10</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>0</td>
<td>4</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>complete</td>
<td>101</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>14</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>create</td>
<td>85</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>26</td>
<td>26</td>
<td>18</td>
<td>0</td>
<td>24</td>
<td>17</td>
<td>44</td>
<td>12</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>fabrication</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>finalizing</td>
<td>219</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>26</td>
<td>26</td>
<td>0</td>
<td>24</td>
<td>17</td>
<td>44</td>
<td>12</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>handoff</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>in review</td>
<td>53</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>3</td>
<td>21</td>
<td>0</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>incomplete</td>
<td>24</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>layout</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NDWB</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>not in hand</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>on hold</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>14</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>redlines</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>renegade</td>
<td>132</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unknown</td>
<td>457</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>33</td>
<td>1</td>
<td>364</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>15</td>
<td>9</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1147</td>
<td>0</td>
<td>5</td>
<td>41</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>152</td>
<td>68</td>
<td>531</td>
<td>23</td>
<td>55</td>
<td>46</td>
<td>92</td>
<td>27</td>
<td>31</td>
<td>25</td>
</tr>
</tbody>
</table>

**End of Document**
Instrument Shop (R. Repp)

Small Purchase Orders (Account Numbers, Vendors, Products Purchased, and Cost)

- NNC400-005, Precision Plating, Anodize .......................................................... $106.00
- NNC400-005, McMaster Carr, 1/4-20 by 4.5" Stainless Screws .......................... $47.74
- NNC400-005, McMaster Carr, Carbide Center Drills .................................... $48.08
- NNX210-080, Ideal Plating Company, Nickel Plate Meteorite Stand ................. $215.20
- SNG100-520, Laird Plastics, 6" diameter by 12" long Black Delrin .................. $152.30
- SNP140-110, McMaster Carr, Swivel Eyes and Lift Plate ............................... $44.72
- SNP140-110, McMaster Carr, Threaded Rod and Misc. Hardware ................. $158.97
- WWW420-200, EMJ, Steel Tubing for Positioner Cart ..................................... $46.80
- WWW425-200, Precision Plating, Anodize ...................................................... $65.72
- WWW425-200, Precision Plating, Anodize ...................................................... $66.14
- Total Non-shop expenses .............................................................................. $951.70

Hard Purchase Order: June 2003 (Non-Shop Accounts)

- Req Number 3118778, NNB900-005, Mid State Rigging, M1 Shop Move ..$6,000.00
- Req Number 3118779, NNB900-005, Mid State Rigging, M1 Shop Move ..$1,200.00
- Req Number 3118780, NNC400-005, Landmark Tool, Wire EDM Gear ....$1,022.00

In addition to these expenses, the Instrument Shop budget contributed money to purchase needed stock, software and supplies for all projects that are manufactured at our facility.

Instrument Shop Spreadsheet (page 2) at a Glance:

- 866 estimated hours of work in progress
- 392 hours in shop queue
- 3,779 hours of potential future projects for instrument shop (Includes NEWFIRM)

Projects Completed by Instrument Shop June 2003

- Three NIRI Grism Cells--Gemini (Harris)
- Tee Prototype Blower Mount for BTO--Gemini (Harris)
- Lens Slide Modifications—GONG (Harris)
- Turret Rebuild—GONG (Harris)
- Continuous and ongoing effort to design and upgrade new FTS  (Rath/Staff Shop)
- IRMOS Spider Adapter deemed finished—nice group effort by KPNO and ETS
- Tour of shop facilities/capabilities for RSBE orchestrated by Repp, Harris, Mills and Stein
- Misc. Details for HYDRA/WIYN (Stein/Harris/Reddell)
- Misc. SOAR Details (Stein/Reddell)
- OIWFS Modifications and Upgrades--GNIRS (Stein/Harris)

The NOAO Instrument Shop wishes to thank WIYN, GONG, GEMINI, FTS/NSO and KPNO for suddenly showering us with work. Seeing the shop queue return to barely-manageable levels will allow us to develop a strong finish to an otherwise grim year. We appreciate the opportunity to serve!
**Instrument Shop (cont.)**

<table>
<thead>
<tr>
<th>DRAWING NUMBER</th>
<th>DRAWING TITLE</th>
<th>PROJECT</th>
<th>INSTRUMENT Maker</th>
<th>PERSONAL QUEUE HRS (PQH)</th>
<th>ECD</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 DRAWINGS</td>
<td>NEWFRIM BUSHING TEST</td>
<td>NEWFRIM</td>
<td>RON HARRIS</td>
<td>4</td>
<td>8/30/2003</td>
<td>COMPLETE--PLATE NEEDS INSPECTION BY CADILLAC GAGE</td>
</tr>
<tr>
<td>89-GR-3121-2500</td>
<td>TEE PROTOTYPE BLOWER MOUNT FOR BTO</td>
<td>GEMINI</td>
<td>RON HARRIS</td>
<td>0</td>
<td>7/11/2003</td>
<td>ECD=DUE DATE WILL ship 7/7/03</td>
</tr>
<tr>
<td>MANY</td>
<td>MISC HYDRA DETAILS</td>
<td>HYDRA/WYN</td>
<td>RON HARRIS</td>
<td>0</td>
<td>N/A</td>
<td>ASSISTING JOHN STEIN</td>
</tr>
<tr>
<td>MANY</td>
<td>MISC SOAR DETAILS</td>
<td>SOAR</td>
<td>RON HARRIS</td>
<td>0</td>
<td>N/A</td>
<td>ASSISTING JOHN STEIN</td>
</tr>
<tr>
<td>N/A</td>
<td>QTY 4 TURRET MIRROR SHIPPING COVERS</td>
<td>GONG</td>
<td>RON HARRIS</td>
<td>12</td>
<td>7/11/2003</td>
<td>ASSISTING REPP AS NEEDED</td>
</tr>
<tr>
<td>N/A</td>
<td>M1 SHOP MOVE</td>
<td>LSST</td>
<td>RON HARRIS</td>
<td>0</td>
<td>7/18/2003</td>
<td>MATERIAL ORDERED</td>
</tr>
<tr>
<td>SKETCHES</td>
<td>FLAMINGOS ELECTRONICS RACKS</td>
<td>KPNO</td>
<td>RON HARRIS</td>
<td>60</td>
<td>8/15/2003</td>
<td>SAVI IS OUT FOR KNEE SURGERY</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>SICK LEAVE</td>
<td>DAVE BAUH</td>
<td>0</td>
<td>7/21/2003</td>
<td>SAVI IS OUT FOR KNEE SURGERY</td>
</tr>
<tr>
<td>N/A</td>
<td>MISC STAFF SHOP WORK</td>
<td>MAINLY NEO</td>
<td>STEVE RATH</td>
<td>160</td>
<td>7/31/2003</td>
<td>UPDATES TO FT/ST/WALK IN AND QUEUE WORK</td>
</tr>
<tr>
<td>N/A</td>
<td>M1 SHOP MOVE</td>
<td>LSST</td>
<td>ROGER REPP</td>
<td>80</td>
<td>7/18/2003</td>
<td>ACTUAL MOVE 7/9/03-7/11/03, ECD=MAIN SHOP CLEANUP</td>
</tr>
<tr>
<td>MANY</td>
<td>CAPTAIN BEARING MODULES FOR AZIMUTH AXIS</td>
<td>WIYN</td>
<td>ROGER REPP</td>
<td>160</td>
<td>8/15/2003</td>
<td>DRAWINGS IN HAND, EST IS PLACEHOLDER, ECD IS FIRM, QUOTE SOON</td>
</tr>
<tr>
<td>10 DRAWINGS</td>
<td>WRAP/RAF ASSEMBLIES</td>
<td>GONG</td>
<td>JOHN STEIN</td>
<td>32</td>
<td>7/15/2003</td>
<td>DRAWINGS COMING IN AS QUICK AS OTHERS ARE FINISHED</td>
</tr>
<tr>
<td>MANY</td>
<td>CABLEWRAP AND 1024 CAMERA MOUNTS</td>
<td>GONG</td>
<td>JOHN STEIN</td>
<td>120</td>
<td>8/14/2003</td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td>MANY</td>
<td>MISC IN SHOP HYDRA DETAILS</td>
<td>HYDRA/WYN</td>
<td>JOHN STEIN</td>
<td>198</td>
<td>8/30/2003</td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td>N/A</td>
<td>ASSEMBLY MODIFICATIONS &amp; FABRICATION</td>
<td>GNRS</td>
<td>JOHN STEIN</td>
<td>24</td>
<td>7/31/2003</td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td>S5-E200</td>
<td>SOAR ADAPTER WHEEL ASSEMBLY</td>
<td>SOAR</td>
<td>JOHN STEIN</td>
<td>16</td>
<td>7/31/2003</td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td>TOTAL HOURS IN SHOP 1/4/03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>866</td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td><strong>INSTRUMENT SHOP QUEUE</strong></td>
<td><strong>ESTIMATED HOURS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td>N/A</td>
<td>FIBER MOUNTS</td>
<td>SOLIS FDP</td>
<td>40</td>
<td>AWAITING GO AHEAD FROM JAKSHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>FIBER GUIDES/SOLIS</td>
<td>SOLIS FDP</td>
<td>80</td>
<td>AWAITING GO AHEAD FROM JAKSHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>WALL LINING</td>
<td>SOLIS FDP</td>
<td>40</td>
<td>AWAITING GO AHEAD FROM JAKSHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>AIR DUCT</td>
<td>SOLIS FDP</td>
<td>40</td>
<td>AWAITING GO AHEAD FROM JAKSHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>GONG PLASTIC MIRROR COVERS</td>
<td>GONG</td>
<td>8</td>
<td>AWAITING GO AHEAD FROM JAKSHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>GONG BAY AND CAMERA PANEL MODS</td>
<td>GONG</td>
<td>8</td>
<td>AWAITING GO AHEAD FROM JAKSHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>EARTHQUAKE PROTECTION ASSEMBLIES</td>
<td>GONG</td>
<td>80</td>
<td>80 HOURS IS PLACEHOLDER--NO DRAWINGS TO QUOTE FROM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>TURRET COV EM MECHANISM</td>
<td>GONG</td>
<td>80</td>
<td>80 HOURS IS PLACEHOLDER--NO DRAWINGS TO QUOTE FROM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>TURRET HEATER</td>
<td>GONG</td>
<td>16</td>
<td>AWAITING DESIGN TBD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL QUEUE HOURS: 7/4/03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>392</td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td><strong>ANTICIPATED UPCOMING PROJECTS</strong></td>
<td><strong>ESTIMATED HOURS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PLACEHOLDER FOR ANTICIPATED PART MODIFICATIONS</td>
</tr>
<tr>
<td>MANY-DEVELOPING</td>
<td>HYDRA LGUARD/3E</td>
<td>WIYN</td>
<td>180</td>
<td>AROUND TWO MONTHS FROM FAB--EST IS MILLER'S BEST GUESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>89-GR-3120-1100</td>
<td>FAST STEERING ARRAY ASSEMBLY/TEST</td>
<td>GEMINI</td>
<td>99</td>
<td>QUOTE SUBMITTED 5/23/03--RUMORS THAT WE HAVE IT 7/3/03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MANY-DEVELOPING</td>
<td>NEWFRIM</td>
<td>NEWFRIM</td>
<td>3500</td>
<td>MUCH WORK UPCOMING, MAYBE IN OCTOBER</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ETS Projects & Departments** 9  June 2003
### Optical Coating Laboratory (G. Poczulp)

#### Upcoming Coating Lab Projects

<table>
<thead>
<tr>
<th>Chamber</th>
<th>Coating</th>
<th>Contact</th>
<th>Received</th>
<th>Need Date</th>
<th>Planned Start</th>
<th>Estimated Duration</th>
<th>Planned Completion</th>
<th>Delivery Date</th>
<th>Account #</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTTM</td>
<td>Al</td>
<td>C. Corson</td>
<td>5/20/2003</td>
<td>2 days</td>
<td></td>
<td>Shop old coating, apply 800A Al</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three Lenses</td>
<td>MgF2</td>
<td>A. Potter</td>
<td></td>
<td>2 days</td>
<td></td>
<td>S-NZT06-002</td>
<td>Three lenses, both sides, peaked for 550 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Completed Coating Lab Projects

<table>
<thead>
<tr>
<th>Chamber</th>
<th>Coating</th>
<th>Contact</th>
<th>Received</th>
<th>Need Date</th>
<th>Actual Start</th>
<th>Actual Duration</th>
<th>Actual Completion</th>
<th>Delivery Date</th>
<th>Account #</th>
<th>Notes</th>
</tr>
</thead>
</table>

#### Upcoming Optical Shop Projects

<table>
<thead>
<tr>
<th>Contact</th>
<th>Received</th>
<th>Need Date</th>
<th>Planned Start</th>
<th>Estimated Duration</th>
<th>Planned Completion</th>
<th>Delivery Date</th>
<th>Account #</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. Wagner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S-N7400-320</td>
<td>Objective lens is final remaining element</td>
</tr>
</tbody>
</table>

#### Completed Optical Shop Projects

<table>
<thead>
<tr>
<th>Contact</th>
<th>Received</th>
<th>Need Date</th>
<th>Actual Start</th>
<th>Actual Duration</th>
<th>Actual Completion</th>
<th>Delivery Date</th>
<th>Account #</th>
<th>Notes</th>
</tr>
</thead>
</table>

Optics Lab & Optical Shop (G. Poczulp)

N-NX500-100
Shop clean up and reorganization continues with a large part of the effort this month dedicated to the mezzanine level. Two cabinets were replaced (the one that looked as if it would do a back flip off the balcony to the floor below was replaced with a more serviceable unit). Files from retired employees were culled for useful information and the bulk of the paperwork was discarded. Plans were made for the exchange of the lathe and mill in the machine shop area with better units that will soon be available from the instrument shop.

SOML High Bay Lease
Lapping on the secondary blank commenced this month and some hardware for the optical tests is being assembled on the 4m polishing machine table. Everything, at this point, appears to be working smoothly.

VPH Grating Development
N-NX517-200
A set of protective covers for the grating was designed and subsequently fabricated by the instrument shop. Both sides of the grating were coated with a soft MgF2 coating that was peaked for maximum transmission at 725nm. During the coating process the grating was heated to a maximum temperature of 50º C. After G. Jacoby inspected the coated grating, it was given to S. Andree during the construction of a suitable mount.

Volume Phase Holographic Grating 2 CSL photo by M. Hanna
Computer Services (C. Danielson)

- Make Beth a cd of Adobe Photoshop so she can load it on Rich G's pc
- Beth re: Larry's lapper
- Ming's pc continued
- John Andrew question re: Dave Rosin's new pc
- Talk to Beth about new PC to Ruben
- Larry D's Saab2 (new lapper)
- NG's broken lapper eggs work
- Backup of eggs & nttg
- Make new diag boot cd's
- Ming's connection problem from lapper to desktop
- Ming's other concerns
- Peter's request for pc for a few months
- John Andrew request about broken sound drivers
- Ruben's new pc - 2.4 GHz
- Dave Rosin's new pc
- New guest pc and set up for Marianne
- Problems with new w2k pc - same as JA broken video w/XP pc
- GSA lapper's load and configure
- Get GSA lapper ready for Risk manager
- Get GSA lapper to Jerry S for tests
- Get GSA lapper to carld for tests
- Email to Steve G re: port scans
- Talk to Frank re: gbw103 problem mapping drives
- Fix mapping drives problem
Programming Group (R. Marshall)

Behzad Abarreshi

- For the Monsoon CCD prototype, added enough features to Rabbit DHE (Detector Head Electronics) to allow changing system configuration on the fly via PAN (Pixel Acquisition Node), thus making it easier to fine-tune the system.
- During the June T&E installed and tested the latest version of the WTTM XY GUI.
- Ported the MPG router and necessary libraries to Solaris.
- Participated in NEWFIRM software group meeting.
- Participated in Hydra upgrade project meetings; specked out a Linux machine (on order), which will be the main development platform for Hydra, and later replace oatmeal as the Hydra machine at WIYN; installed Red Hat 9.0 on an old laptop, which will be an auxiliary machine for the Hydra project; started work on porting Hydra code from SunOS to Linux.
- Learned the basics of using GNU’s Autotools.

Nick Buchholz

- Continued minor debugging and modification of the common DHE hardware libraries for MONSOON.
- Began working with ORION2 ucodes to develop a New Version to turn off rows and columns.
- Continued developing the Presentation for the MONSOON software Review in June.
- Finalized some MONSOON software design decisions for presentation at the PDR.

Phil Daly

- June 2003 saw the successful completion of NEWFIRM PDR. Although we await the final report, the interim (verbal) draft said that the observation control software was in good shape. Subsequently, several planning meetings were held to kick-start the project - including a software group meeting to assign resources to different areas of the control system. Minutes were distributed to those present and Neil Gaughan, Ron Probst and David Sprayberry.
- A new machine was also placed on order (a AS-Lab Marquis, customized, desk-top workstation with dual 2.66 GHz Xeon processors, 1 Gb RAM, 120 Gb Raid Level 1 disk(s) etc etc). This machine will live in Room 111 for the foreseeable future and it comes shipped with Red Hat 9 by default. Accounts will be created for all s/w group members plus Greg Chisholm to test out the data products pipeline.
- That being so, I also took the time to upgrade my laptop to Red Hat 9 - plus all the updates, plus DRAMA, FITS etc etc. I also re-compiled the wiyn tree software (including GWC) using the latest 3.2.x gcc compiler.
- Now that 1 PDR is over, some time was also spent preparing the Monsoon PDR (although NCB has done the majority of the work).
- Also received some bad news from the lawyers: California regional office sent my green-card RIR application back to AZ DOL. AZ DOL disagrees with this decision but has no choice now but to supervise a further recruitment effort. An advert has been submitted to AZ DOL for approval and they must also approve all incoming resumes prior to NOAO interviewing any candidates ... we could be here a long time.

Shelby Gott

- Ok, this time the WIYN SES spare parts task is _really_ done. I used our new ALL-11 device programmer to make two copies of each EPLD in the SES dome control logic, and installed one set of copies in the SES. The other copies and the originals were added to the spare parts kit. The device programmer has been turned over to Mountain Electronics.
- Combined the CassIAS and WUFF test GUIs to make a preliminary version of a user interface for CassIAS/WUFF. Added some features requested by Pat, but I still need calibration values to convert between motor step units and something meaningful to users.
- Tested a Data Translation analog input module for Charles, and helped connect it to sensors he is using to investigate mechanical behavior of the telescope.
- Assisted ME in troubleshooting a failure of the PF/Mosaic ADC at the 4m. Configured NVRAM in the spare COPI encoder for installation in the #1 position.
- Continued work on the 2-meter guider by building the second of three circuit boards, a two-channel motor controller for the x-y stage. This board still needs firmware, which will be derived from the 4-m guider's GSMI firmware.

ETS Projects & Departments

June 2003
• Continued giving training sessions in microcontroller programming and circuit design to Bill Gillespie, who is working on a cloud detector / weather station to be installed on the roof of the admin. building.
• Met with John Donaldson and Tom Wolfe re the OCS rebuild. They gave me a list of tasks and priorities. The first of these were information-gathering items; finding out things that aren't well documented by examining the actual OCS hardware. Completed all of these during the last week in June. Additional tasks (fabrication of subassemblies, software mods) to be done later.

Bob Marshall

• Projects:
  • KPNO Backups: setup the backup disk for 'mocha'.
  • Installed 'rose' in the Admin. computer room. Setup an apache server on 'rose' and started the configuration.
  • Attended some NEWFIRM and MONSOON meetings.

• Operations:
  • Worked on navajo, the WTTM data acquisition system. Debugged the filter wheel problems at the WIYN T&E. Found that the serial port on navajo was bad. Setup 'fwmid' to run at boot ime. Cleaned up the navajo disks, removing obsolete files from Lab operations, simplified the symbolic links and software versions. Setup and verified the online backup disk.
  • Started working with obsinit, initially for 'navajo' and WTMM. Reviewed the scripts and made plans for updating obsinit so that 'navajo' can be moved to the computer room and all WTTM observer interaction is done via 'sand'.
  • WIYN - fixed the Linux 7.x printcap files.
  • Provided a bootable CD with "memtest86" for Dave Mills to test the memory on the 2.1-meter guider computer.

• Maintenance:
  • 4-meter: new encoder, TCS log files.
  • 2.1-meter: fixed the bordeaux mounts.

Dave Mills

• The main effort this month was completing, installing and testing the new guider software at 2meter and 4meter. Both machines were upgraded to RH7.2, as was the 2meter operator’s console. The 2m-guider computer was found to have an intermittent hardware fault, so I swapped in the spare.
• The other major effort was multiple test runs of the new cascade cameras from Roper. Tests at 4meter and WIYN produced good results. Preliminary analysis suggests that cascade CCD cameras can acquire 19-20th magnitude objects in 1sec integrations.
• The mosaic autofocus software was revised to use the new guider software infrastructure, and tested during checkout at the 4meter. The data indicates that adjusting both guide cameras so as to provide in/out focus images provides the best diagnostic. A focus delta of +-0.4 gives a signal capable of detecting 20+ micron focus shifts. On screen graphics show the recent history. We plan to try out the system in "advisory" mode at the next viable opportunity.

Peter Ruckle

• The GNIRS Acceptance Test plan is almost complete. There are a few things that need to be verified with testing the software before it will be ready. In the process of testing the AT plan, a few rough areas were identified and modified. The GNIRS software will be fully tested in the next month. The time scale will be dictated by how well things work according to the AT.
Risk Management (C. Gessner)

- There was an insect bite reported this month, OSHA record ability is pending a review of physician’s diagnosis and treatment records.
- Kitt Peak personnel responded to a car fire at the Steward 90 inch on the afternoon of June 27. The crew arrived at the scene found flames coming from the engine compartment of the car. The fire was extinguished with a fire extinguisher and the fast attack truck; there was no other damage. Frank Gidney will write an incident report for file. John Glaspey wrote up a summary of events that will be used to make our response even better.
- Continued to work on the Kitt Peak fire reduction strategy. Contract work is nearing completion; a final walk through is scheduled for July 2 with Complete Landscaping. It is worth including in this report, a list of fire mitigation efforts that was sent to our insurance broker this month:
  - The company - Complete Landscaping has made much progress in creating a thirty-foot defensible space around our critical structures
  - The 5000-gallon tender with our "mega" fire fighting foam machine is readied
  - CFO staff has retrofitted and readied a 500 gallon "buffalo" trailer with pump that would be used for portable foam fire fighting machines
  - Another 500-gallon trailer is also readied
  - CFO staff has constructed "portable sprinklers" and hoses for use on endangered buildings
  - Our water supply is about 700,000 gallons, more than what we had last year
  - We met with T.O. Nation DPS on June 16 and we were assured that we are their priority, we have toured our facilities and our fire fighting capabilities with them, provided them with emergency information, maps, contact information, GPS coordinates of our structures and we stressed their authority if they have to respond
  - I have been promised that the T.O. fire department will do their wild land fire training at Kitt Peak at least once a week. Depending their work with actual fires. Training consists of cutting brush and trees.
  - Monthly staff fire drills continue on the day shift
  - I am working with the T.O. fire department and the BIA to put into place a long-term strategy for hazard fuel reduction and wild land urban interface. Meaning a plan that would allow BIA funding for fire mitigation - protection of the T.O. Nation and more specifically Kitt Peak
  - Eleven Kitt Peak personal and three tenants completed the first offered course of wild land fire fighting training in January 2003
  - The Kitt Peak Emergency Manual was rewritten to simplify emergency response procedures
  - We now have a NOAO NSO Contingency Plan that has been distributed to key personnel and would be used in the event of an emergency
  - WIYN contracted the National Lighting Safety Institute to assess the present condition of lightning protection at the WIYN facilities. The report was received last week and management is considering suggested actions
  - Our fire warning signs continue to inform the public that we have an extreme fire danger, we continue to enforce no open flames on Kitt Peak
  - Fire alarms and fire extinguishers are inspected per NFPA code.

- Provided a safety and health review and inspection at NSO Sunspot, New Mexico on June 1 to June 4 10. Progress was noted in the report for their continuous improvement of the NSO safety program.
- Participated in a physical review of the procedure for removing the Mayall 4m Declination Drives and the potential re-aluminizing of the primary mirror. The physical review comprised of a systematic review of the draft written procedure. Most of the staff that will be involved participated. Presently, we are developing risk management aspects that will be included in the plan.
- Nine additional Tucson employees completed the American Red Cross First Aid and CPR class on June 6. Twenty-six Tucson employees have current certification through this offering.
- We received a second letter from the Arizona Industrial Commission – State elevator inspectors regarding the optics and instrument shop elevators. This letter details more requirements for the material lifts. We have requested a quote from Hotchkiss Elevator for the modifications detailed in the second letter. Requirements from the first letter have been completed.
- Our key card system continues to work with minimal problems. CFO and I have made key cards for summer students, contractors, visitor and collaborators. There is one issue that we are pursuing with the installer, the
exterior back door of La Quinta and the interior lobby doors are programmed to unlatch when approached from the inside due to specific modifications made by us to those doors. We have requested a quote to modify the doors so they wont unlatch by IR detection. The panic hardware will still be operable.

- Consulted on a number of risk management issues including security, eye and foot protection, workers compensation, security, Kitt Peak emergency telephones, bee mitigation, WIYN lighting protection, new procedures for WIYN instrumentation, signs and industrial hygiene.