

MONTHLY STATUS REPORT

Engineering & Technical Services
March 2001

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N-NX 529-448 NEWFIRM

DESCRIPTION: This is the first year of 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>.

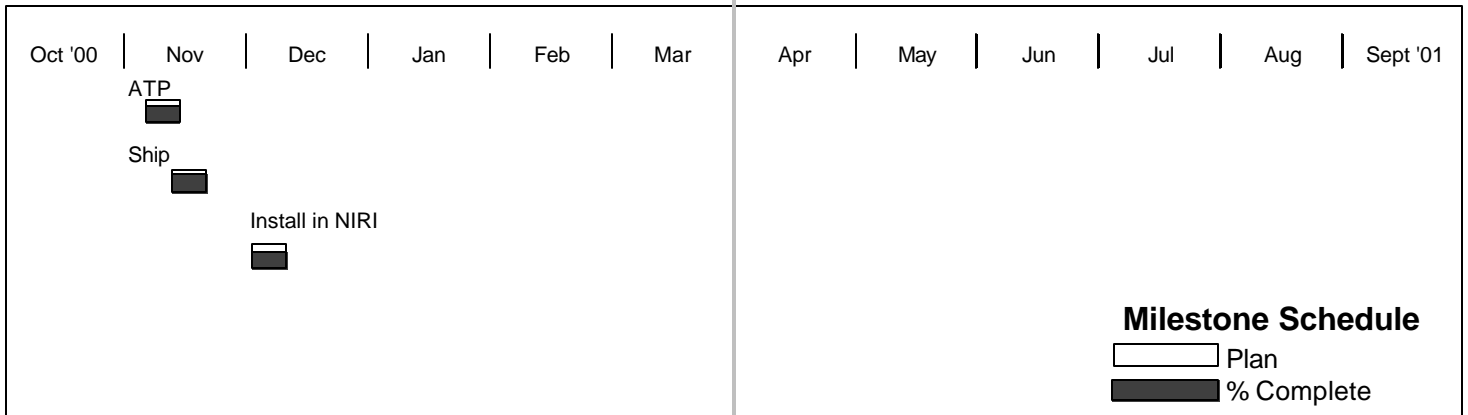
FY2001	
Budgeted Hours thru 3/01	875
Actual Expended Hours	457.5
Capital Expended	\$58,098

ACCOMPLISHMENTS:

- A study contract was put in place with Ball Aerospace. Ball is developing a straw man concept for the cass implementations of the instrument.
- Interviews were conducted for a project manager for Newfirm.

Z-ZUP44-200 GEMINI CONTROLLER 1f/Sec UPGRADE

DESCRIPTION: The 1F/sec upgrade is a project that will upgrade the GNAAC controller to meet the 1F/sec throughput specification. Both hardware and software modifications are required to the existing controller.



FY2001	
Budgeted Hours thru 3/01	656.25
Actual Expended Hours	1046.5
Capital Expended	\$8,757

ACCOMPLISHMENTS:

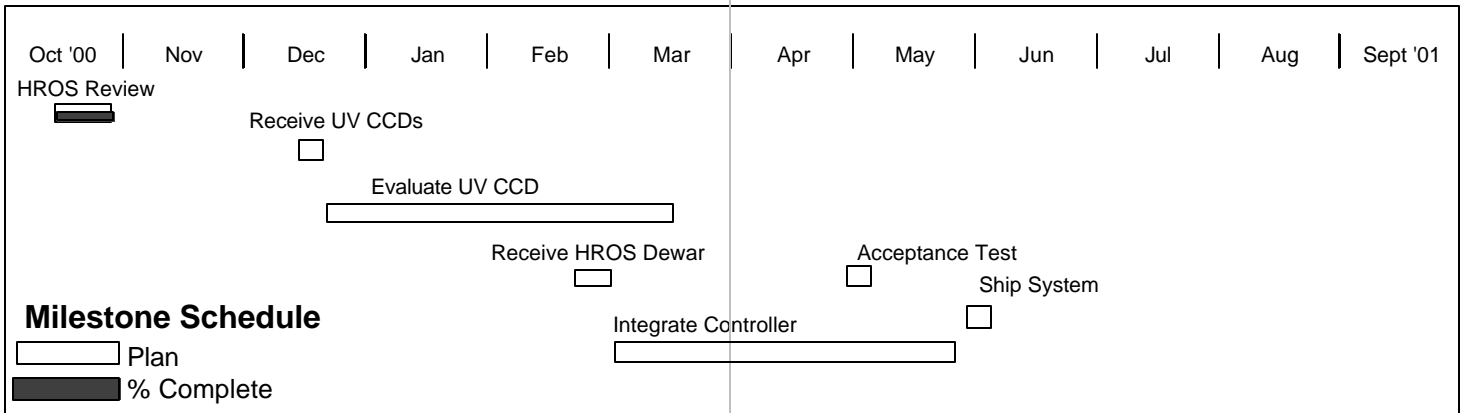
- The 1Frame/Sec Board reliability problems have been traced to poor board assembly quality exacerbated by a pcb warpage problem. Solution is to rework board, inspect, installed shield, and retest.
- S/N 21003 board has been reworked, inspected, tested at NOAO shipped to Hawaii, has passed tests in Gemini system in Hawaii. Currently installed in NIRI system.
- S/N 21004 has been returned by Gemini from Hawaii, has been tested in system and was found to be working properly in our system. It has passed inspection will continue to be tested. Appears to be functional. Will continue testing this week. Will be sent to Hawaii as spare so that S/N 21002 can be returned.
- S/N 21006 has been reworked, tested, and installed in GNIRS system and found to be functional.
- GNIRS system has been upgraded to 1 Frame/Sec capability.

PLANS:

- S/N 21001 returned from vendor rework, passed visual inspection, fails system test. Currently under debug. Estimated completion 4/15/01. Planned to be installed in Lab System.
- S/N 21002 Currently operational in NIRI in Hawaii. We will request that this board be returned to NOAO so that it can be reworked, inspected and tested. A replacement board will be sent to Hawaii prior to this return. Estimated to be complete 5/6/01. We plan to hold as spare.
- S/N 21005 returned from vendor rework, passed visual inspection, fails system test. Currently under debug. Estimated completion 4/15/01. We plan to hold as spare.

Z-ZUP44-3XX GEMINI CCD CONTROLLER INTEGRATION (GMOS)

DESCRIPTION: Investigation of CCDs provided by EEV, CCD Controllers provided by LEACH and GMOS camera provided by DAO. CCDs will be tested and installed in the camera. Software will be developed to integrate controllers to EPICS.



FY2001	
Budgeted Hours thru 3/01	0
Actual Expended Hours	433.5
Capital Expended	\$12,840

ACCOMPLISHMENTS:

- This account closed.

PLANS:

- A new number and fresh plan will be done for “bHROS” when things are firmed up.

PROBLEMS:

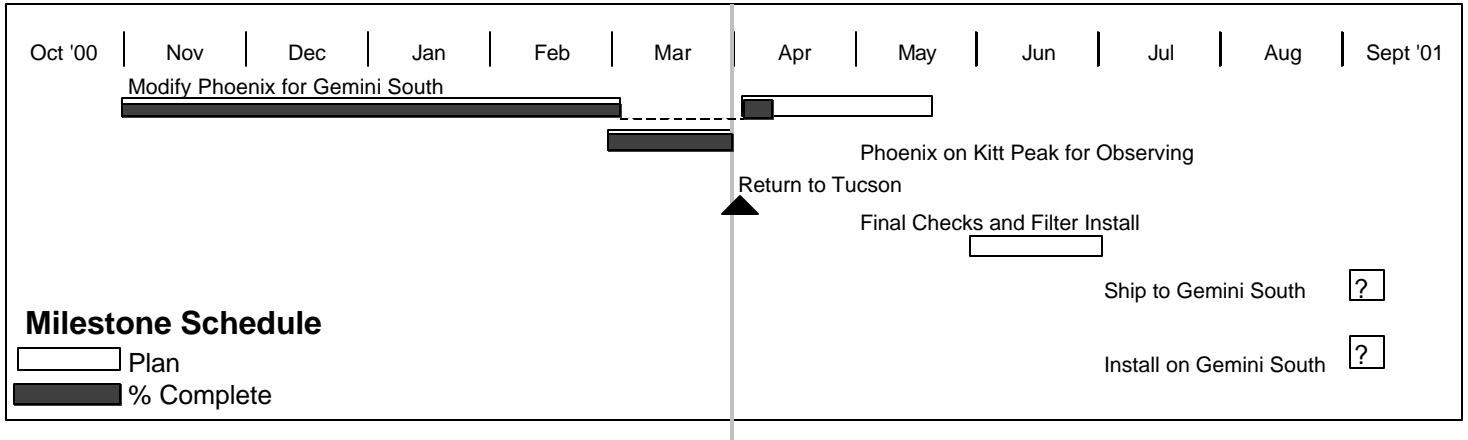
- No items.

SOLUTIONS:

- No items.

Z-ZUP44-5XX GEMINI MODIFICATIONS TO PHOENIX

DESCRIPTION: Modify, ship and install Phoenix on Gemini South.



FY2001	
Budgeted Hours thru 3/01	875
Actual Expended Hours	900
Capital Expended	\$23,314

Accomplishments:

- Completed a Kitt Peak observing run. The new array received excellent reports from the observers.
- The calibration mechanism design is complete and awaiting a design review prior to being sent to fabrication.
- Testing of the drive position indicators is in progress.
- Gemini has delayed delivery of the instrument. The new ship date is being negotiated.

Plans:

Mechanical

- Fabricate the calibration mechanism.
- Verify cryo connections and cold head status.
- Add chilled water connection to electronics rack.
- Design and fab shipping boxes.
- Install Gemini filter set.

Electrical

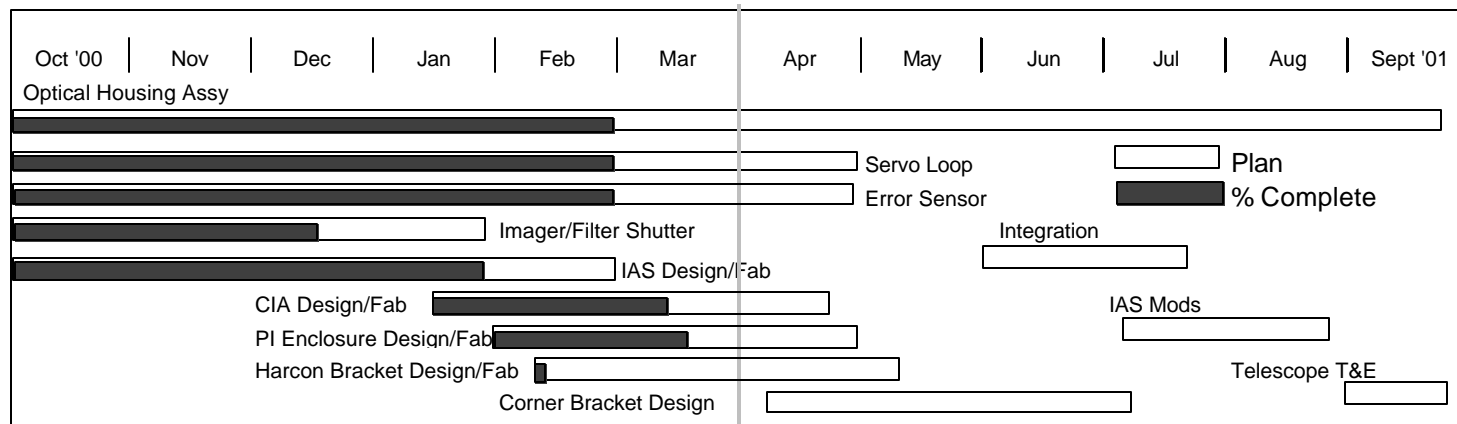
- Add remote on/off relay.
- Verify fiber connections are correct for Gemini.
- Change power supplies.

Software

- Sun stand alone code.
- TCS interface for header information.

N-NX539-202 WTTM

DESCRIPTION: The WTTM is a step to provide VIS-NIR adaptive optics to the NOAO/KPNO/WIYN community. A module will be developed in lab and then integrated into the WIYN IAS as a second port. It is designed for upgrades and will be commissioned in FY '02.



FY2001	
Budgeted Hours thru 3/01	4375
Actual Expended Hours	5682.5
Capital Expended	\$60,838

ACCOMPLISHMENTS:

- Machining of pick-off mirror mechanism parts ~95% complete.
- Beam splitter insert tool ready for anodizing.
- Beam splitter storage box detailed, ready for fab.
- Alignment procedure details received from vendor.
- WTTM bracket is 90% complete.
- Error sensor and alignment procedure ready for test assembly.
- IMA to mid element done, waiting for front element coating.
- Front element, 3-beamsplitter substrates and reworked prism sent for AR coatings.
- IM backlog managed, help from KPNO.
- Fibers received from coating vendor.

PLANS:

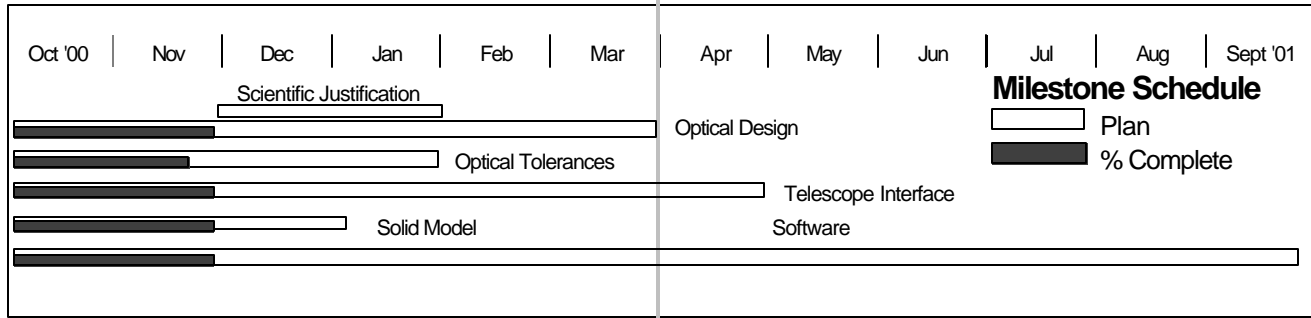
- Continue production of optical components, "real" IMA is next in NOCL.
- Detail CIA lenses and lens cells, and prism mount.
- Continue to design and detail beam splitter components.
- Complete pick off mirrors in NOCL.
- Finish testing of WTTM pickoff mirror mechanism downtown, send to mountain for software development.
- Detail PI case.
- Begin to finalize Harcon bracket design.

PROBLEMS:

- Balfrey has not yet delivered x-y stage; NOAO purchasing pursuing solution.
- M3 rework contract has slipped 2 weeks; NOAO is working with vendor to expedite process.

N-NX539-203 Next Generation Optical Spectrograph (NGOS)

DESCRIPTION: This is a conceptual design phase of a multi-year project to product a wide field, imaging spectrograph utilizing state-of-the-art technology, thus permitting high efficiency and spectral resolution over a wide field of view. It will be designed for use at the Cassegrain focus of the Mayall 4 meter telescope.



FY2001	
Budgeted Hours thru 3/01	1312.5
Actual Expended Hours	900
Capital Expended	\$11,749

ACCOMPLISHMENTS:

- No items.

PLANS:

- No items.

PROBLEMS:

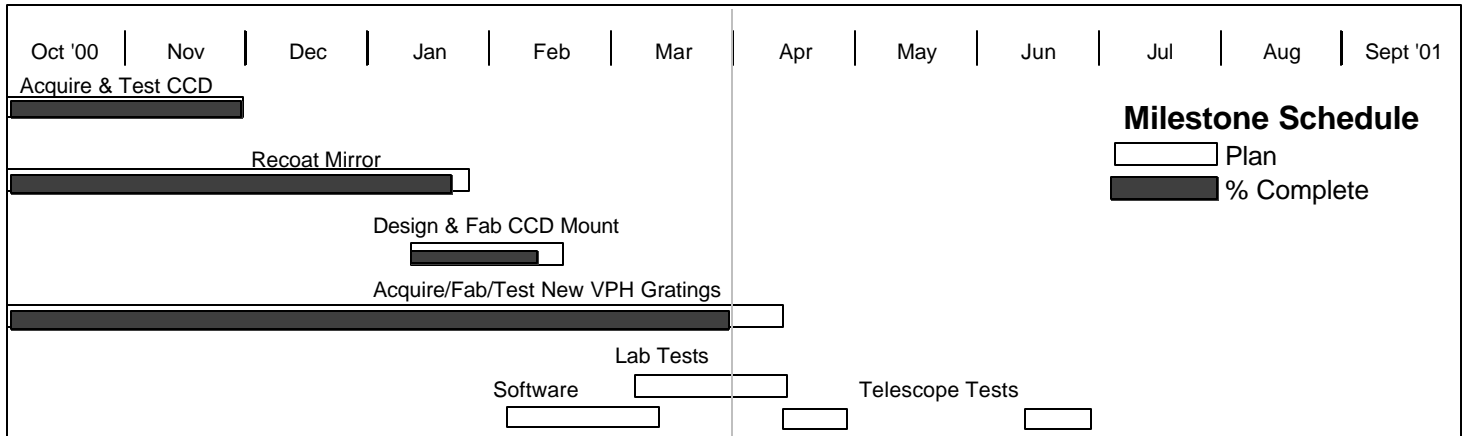
- Due to lack of assigned resources, effort will be reduced to optical design and tolerancing.

SOLUTIONS:

- Reduce scope of project, with resource allocation that will preserve existing accomplishments.

N-NX539-211 Cryo Cam Upgrade

DESCRIPTION: Recoat the Schmidt camera reflective mirror with a protected silver. Acquire and install a new LBNL Hi-Rho CCD. Acquire two new VPH prisms.



FY2001	
Budgeted Hours thru 3/01	1312.5
Actual Expended Hours	675.5
Capital Expended	\$21,887

ACCOMPLISHMENTS:

- New CCD mount design completed.
- Progress on VPH Grating.
- A 2Kx2K CCD was received from UC Santa Cruz.

PLANS:

- Install and test 2Kx2K CCD.
- More telescope test in April and then shared risk observing using new CCD.
- Continue work on VPH Grating.
- Shape and size field flattner lens.
- Modify grism cell holder.
- Weld tank inlet tubing.
- Fabricate CCD mount.
- Fabricate connector I/O plate.

PROBLEMS:

- No items.

SOLUTIONS:

- No items.

Design/Drafting – Electronics (D. Stover)

<u>Jobs in Process/submitted</u>	<u>Acct No</u>	<u>Est hrs</u>	<u>Accm.hr</u>	
Precision Reference (AI)	NNX 519 128	11.5		Sch done / Eng review & redline
CAMAC drawings to release	N-NK510-808	62		Shelby - corrections and old dwg revised
Gong documents to release	S-NP100-520	45		Going through to release all documents
GONG new docs for upgrade	S-NP100-750	79		completed 50% of this list
Solis Mount drawing	S-NT400-230	49		in review w/engineer, some redlines, 2 misc dwgs
GNAAC Support document	NNX 510 015	233		need to get the latest changes released
Library standards & Libraries	NNX 510 000	166		

Heads UP

SQIID asbly dwg/wiring diag/list	NNX 510 000			No information
Heater board				Waiting for Andy & Paul to review what it needs
Solis VSM cover driver brd				
Solis FTP bring more cards				

Phoenix Documentation

GNAAC & etc. Documentation

Temp Control	NNX 510 000	3		old (need to release) phoenix
NAAC A/D with Xilinx	NNX 510 000	8	127	Documentation to finish
ACE Pre Amp	NNX 510 000	2		
ACE House Keeping	NNX 510 000	2	66.5	
ACE ABC	NNX 510 000	2	69.5	
ACE PRCD	NNX 510 000	2	128.5	
ACE ADC	NNX 510 000	2	80	
ACE Data Transmitter	NNX 510 000	2	37.5	
ACE ADC MOD BP	NNX 510 000	2	55	
ACE PA BP	NNX 510 000	2	25	
Cable drawings	NNX 510 000	24		90%
WF Interface & dewar tmp snsrs	NNX 510 000	2		add notes to asby OBSOL
ACE Interface Jumper	NNX 510 000	2		add notes to asby
ACE Temp Control	NNX 510 000	2		add notes to asby
Quad Stepper Controller	NNX 510 000	2	8	Assembly docs, Need to release

Finished items

Solis VSM Galil Interface Brd	NNP 140 110	105.5		back from fab, need asbly dwg and release
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COMMENTS

The list Guillermo gave me for GONG worked out well and is about 50% of it was completed. This was just the hottest priority stuff the GONG so additions will be made as we work our way through the instrument. Feedback and document review has slowed due to the deployment of the upgrade. The task list for GONG worked well and I have been working on compiling a list for all other projects as well. Reorganization of electronic & paper files has resulted and their location is including in the list. This should help me to track drawing status, locations and break tasks into manageable chunks. The list has the ability to sort and filter to enable data extraction in a variety of combinations. I continue to study the capability of the software we are using and wish to start an internal user group again. The next release is due to arrive and we still have need to implement the features of the upgrade we receive in December. Since the amount of board work is slow this is a good time for groups to get documentation issues to me. However, I do have enough to keep me busy for a while.

Instrument Shop (R. Repp)

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

NNU541-200, Precision Plating, Anodize	\$95.40
NNU541-300, Precision Plating, Anodize	\$47.70
NNU580-310, MSC, Metric Sockets, Endmills/Drills (3 orders)	\$1,377.20
SNP140-110, EMJ, CRS Rectangle.....	\$292.24
SNP140-110, EMJ, Qty 2) 3 by 4 by 24” CRS.....	\$315.04
SNP140-110, Perfection Powder Coating, Paint Bracket	\$75.00
SNP140-110, McMaster, Hardware/Adhesives.....	\$483.55
ZZUP44-582, Precision Plating, Anodize	\$47.70
Total Non Shop Expenditures, March 2001	\$2,733.83

Hard Purchase Orders: March, 2001 (Non-Shop Accounts)

NNU580-310, Req Number 3118221, 3-5-01, Invar.....	\$908.00
SNP140-110, Req Number 3118222, 3-6-01, I-Beams/Channel.....	\$418.13
SNP140-120, Req Number 3118223, 3-12-01, Micrometer Heads.....	\$731.56
NNU580-310, Req Number 3118224, 3-13-01, Offner Heat Treat	\$825.00

Other News:

Ron Harris was reunited with NOAO on March 19. He is assigned to the GNIRS Project until its completion.
Lou Lederer will move from the SOLIS Project to GNIRS on May 1.
Rene Muhlberg will be retiring from NOAO on March 30. We will miss him here.

Instrument Shop Monthly Spreadsheet

Since 1995, all work in the shop has been tracked by using spreadsheets. Each major assembly is logged on a spreadsheet, and the information from the assembly sheets is passed on to one other spreadsheet entitled “Instrument Shop Work Sheet.” Any manager of project engineer who has work in the instrument shop, and wants to track it can use this sheet to help them know what stage their project is in. Since this is the first time some of the readers have seen this work sheet, a brief explanation of how the sheet works follows:

Name: The name of the instrument maker assigned to the project.

Project: Wherever possible, drawing numbers, and proper titles are included under this column.

Charge Number: The all mighty account number.

EST: The estimated time, (in hours) remaining on the project.

EST Start: The date the project was started, or is expected to start.

ECD: Estimated Completion Date.

Revised ECD: If a project is starting to fall behind schedule, a new ECD is established. There is a number before the date, that is the “revision number” of the changed ECD.

Date Complete: The date that the project is deemed fabricated “complete per drawing.” (There are often minor changes and revisions to any given assembly after it is deemed complete.)

Comments: Miscellaneous remarks about job progress, processes, etc.

Instrument Shop Excel sheet

Infrared R&D Program (K. M. Merrill)

Bill has modified the lab system to accommodate new pre-amp and AD boards for testing. Al and Nick are modifying code to utilize the new arrangement. Final Aladdin arrays will be tested and a new hybrid HgCdTe on Aladdin readout will be evaluated during the coming month(s).

Fowler and Merrill worked the ORION 2KX2K InSb initiative. Fowler, Merrill, and Starr attended at successful PDR at Raytheon on March 23. Fowler and Starr used opportunity to explore potential vendors for Orion test dewar with a number of firms in the area.

Merrill worked on report to Gemini on the status of 2KX2K devices at RIO for possible incorporation into a 4KX4K imager for Gemini MCAO.

Fowler, Ball and Sharp performed final tests on Abu. Abu is ready to ship to Gemini as soon as the mechanical interface is done and tested.

Continued planning for operating ORION muxes with the lab system. Muxes should be available in 6 months.

Optical Coating Laboratory (G. Poczulp)

Solis VSM Telescope

S-NP140-110

The enhanced silver coating vendor selection was finalized with a trip to Newport Thin Films Technology on March 19th. A likely coating date will be during the week of May 7th. It was determined that SOLIS needs to supply a handling band for M1 that will allow for the mirror to be cleaned while zenith pointing and then suspended in the coating chamber nadir pointing. A preliminary design of the handling band has been completed and fabrication will start early next month. M2 was successfully transported to the vendor for inspection of the mount that will be used in the coating chamber.

The optical testing of the VSM corrector lenses and Littrow lenses received from Janos is nearly complete. Several Littrow lenses show some departure from specified values of radius, central thickness and figure - the impact on performance will be evaluated early next month when testing is completed.

WTTM Fabrication

N-NX539-202

The error sensor convex paraboloid segments were coated with aluminum after being glued together in the proper orientation by the optics shop.

The shifted multi-layer broad band A/R coating that had been applied to the modified prisms by ZC&R was successfully removed by the optics shop. The prisms, along with the IMA front element and three beamsplitter substrates were sent to ZC&R for another attempt at A/R coating - this time with better defined specifications. A vendor search is in progress for the neutral metal beamsplitter coatings to be applied to the front surfaces of the three beamsplitters after they are returned from A/R coating.

Optics Excel sheet

Computer Services (C. Danielson)

- Added memory to the drafting machines
- Added cables to the main conference room
- Repaired broken fiber in room 34
- Nelson Z - old style internal SCSI cable
- Ed Stover returned Backpack cd reader
- New task list as of March
- Check out stock entry machine
- Check logs of servers
- Check on failure audit of user list
- Check with Jeremy re: Antivir for tpho and Heidi
- Check on order for anti virus updates
- 10 enet cat5 cables
- Consult on Cliff Toner's home pc
- Win2k upgrade for Barry Starr
- Heidi Verry request for machine quote
- enet cable for Earl S
- N Mills request for pc upgrade quote
- Randy Bennett's disk problems back
- Kathleen Carle question re: cleaner
- M Fleming questions/discussion
- Beth assist for Off2k number
- M Belton question on Win2k dialup
- Jeremy & Jaksha - pc move questions
- K McB question on motherboard order

Programming Group (R. Wolff)

Behzad Abareshi

1. Finished building NTP service for Mayall and 2.1 m telescopes. This included building a patch (ntpdateFix.o) that is loaded before ntpdate to prevent (otherwise harmless) errors that would have terminated the startup script. Also ran tests to find a reasonable frequency for calling ntpdate; 10 minutes seems pretty good. One night of T&E should be plenty for testing and a push to production.

2. Incorporated automatic time-source switching (IRIG-B / NTP) in wiyntcs. Based on my tests and feedback from Charles, the new wiyntcs will switch time sources when it detects a time-source failure lasting 30 to 40 minutes (during which Tpro's free-wheeling mode updates the clocks). There is a five-minute warning period prior to switching the time source (operator may abort the switch during this period).

Other modifications applied to wiyntcs: At startup, if NTP is present, wiyntcs year value is automatically set; otherwise the default is 2001. Also, the wiyntcs absolute time is now updated once a minute instead of 20 times per second. Saturday April 7 has been earmarked for T&E of the new wiyntcs.

3. Continued investigative work on the WIYN Hydra upgrade project: scoured CTIO's web site for information on Hydra; compared it with available information on WIYN Hydra; compiled a set of questions for Rolando; downloaded CTIO's Hydra simulator and installed it on my machine; emailed Rolando and explained my objectives in the upcoming trip to Chile, so that he could write up a little program to help me understand the problem(s) better.

4. Started looking at the TCS position calculation problem: went through correspondence (thanks to Shelby) between Jeff Percival and us, and also had a look at Jeff's "Telescope Pointing Machine" paper.

Side trip: I have installed bash on beet, in case anyone is interested. Feel free to grab the .bashrc in my home directory; nothing fancy, but it allows you to use setenv (besides export), which is nice if you have a lot of csh scripts.

Nick Buchholz

1. Completed rewrite of saver program for ORION(2048x2048) arrays. Still requires testing.
2. Revised new ucode to run Aladdin II array for Phoenix.
3. Fixed Phoenix first image crash problem.
4. Completed Linux tests for Data handling speed up.
5. Wrote proposal for upgrade of wildfire systems for Barracuda and Squid to speed up and allow handling of 2048x2048 arrays.

Phil Daly

As an exercise, I thought I'd account for my time this month with percentages (since 1 March 2001):

11% Overhead
67% WTTM
16% Optical/IR Controller
6% Vacation

The lion's share continues to be the WTTM project. Highlights this month include debugging the PCISC5 driver to cure sudden hang ups, full software control of the hardware power supplies etc, implementation of dynamic datuming on LVDT readback, partial implementation of the signal/noise algorithm, installing LabVIEW 6.0.2 (still crashes). The pacing item on this project is the X-Y stage, which is undergoing (yet) another delay due to the manufacturer smoking a controller card.

The optical/IR controller project (or whatever it's officially called) involved some discussion of ArcVIEW with (r. Wolff, n. Buchholz and b. Starr). I also took a look at the FibreXtreme SL240 card, installing it into the suntest-mpg machine and writing some code to talk to it. This was successful and with the existing FXSL code I believe that writing a driver for this device should be possible on a time-scale of about 4 weeks of effort. Note that the "old" driver shipped with the card contains

a library for which we have no source (the proprietary part) so figuring that out would be the hard part. That said, I've already created a dummy library for the PLX on-board controller, which appears to work OK.

So, I got in touch with Systran and asked them for the "current" SL240 driver. They are not prepared, at this time, to give me the source code (not really surprising) but I did say that we'd need a working driver by mid-April (we don't really, I just made that up). They have said that they now have someone working on the driver and can (probably) meet our mid-April deadline. Watch this space. IF they do, this will be a big benefit to the OIR/Controller project.

Shelby Gott

Put the WIYN Dust Monitor back in service: worked with Mountain Electronics to get the fiber serial link reassembled, replaced a dead battery in the particle counter, revised and improved the main program, dust.tcl, that collects the data, wrote a couple of handy GUIs to display dust concentrations past and present, and updated the documentation, which is at <http://moby.kpno.noao.edu/dust.html>.

Also assisted with troubleshooting problems with the 4-m pf corrector and an LVDT failure in the prime focus pedestal.

Bob Marshall

Project related work:

Finished the 'service' updates and installed the program on the mountain and downtown. Added a "search" variable to control the range of MSRs for the "open" command. Updated the WEB documentation.

This month's "mountain software inventory" project was "wiyn_page." Consolidated various versions of the code, added a page for the Filter/Shutter Assembly, updated the dust monitor display. I also removed some obsolete programs from the mountain computers.

Started to design the new TCS interface ("itcs") for the 0.9-meter. I have the preliminary specifications for the upgrade to the TCS and am designing a new interface which will work with the Mosaic CCD and with S2KB and ICE.

Maintenance:

4-meter: PMTC, ADC.

WIYN: PMS Thermal code.

Computers:

Cleaned up, archived, and deleted David Darras' files, removed his user accounts.

Installed CVS and related utilities on various machines.

Dave Mills

T&E time at the 2meter was used to checkout the new guider with Direct-CCD; it performed well. Also did some comprehensive guide star selection testing and some work on upgrading that procedure.

Re-implemented the FOPS auto-focus algorithm on the Linux system. Spent plenty of day-time tweaking but never actually got on sky during T&E. Looks good running from video though.

Rebuilt XFree4.0.2 + latest Matrox drivers to provide dual monitor and TV-out for the guider systems. This will let us have a regular desktop on screen 0 and the guider output on screen 1 (fed to TV-out). Hopefully this will also give better quality video- out than hacking XF86 modelines (the current method).

Rebuilt latest VNC for SunOS 4.1.4 (WIYN remote obs) to see if it fixes the occasional crash they experience.

Made some enhancements to the ADC code at the 4meter to avoid possible confusion in using "track" mode.

Continued developing control code for the 4meter wavefront camera. I now have a loadable shared library which implements tcl wrappers to the underlying C++ low level code. Image readout, temperature control, and binning are working now.

Peter Ruckle

The GNIRS CC is done and ready to be tested. The SAD database is not finished, but waiting for final determination of the values needed to be displayed.

Research is being done on the niri sequencer to see if it can be applied to the GNIRS system. It will probably be able to be used with minor changes to the SNL code.

We're waiting for the GMOS and niri instruments to become idle before we tackle a few known problems with them.

Richard Wolff

Presented the current software status at the GNIRS mid Fab review. The software at the lowest levels is pretty much complete. It needs cleaning up, additional documentation, interfaces to the EPICS layer for the Status and Alarm database, and the like. But the main work is done (pending verification and bug fixing, of course).

The GMOS CCD work is done, aside from supporting the Hilo acceptance tests and working on a couple known problems. The bHROS work has yet to begin.

Safety (B. Everett)

There were three injuries reported in March. The first involved an electronics technician who injured the palm of the hand while attempting to cut a bolt. Employee was treated and released for return to work with no lost time assigned.

The other two injuries occurred as the result of a motor vehicle accident. Two mountain employees in a government vehicle (#68) were stopped on AZ86 waiting to make a left turn onto AZ386 (Kitt Peak Road). A privately owned vehicle (POV) was traveling south on AZ386 and upon reaching the stop sign at the 86/386 intersection failed to stop and could not negotiate the turn onto AZ86. POV crossed eastbound lane of AZ86 and hit Gov. vehicle broadside on the driver's side carrying both vehicles into the ditch on the south side of AZ86. Tribal Police witnessed the accident and called for EMS. The employee driving (Emp #1) was airlifted from the scene and the employee passenger (Emp #2) was transported by ambulance. Both were transported to UMC. Emp #1 sustained broken ribs, and a bruised kidney and spleen. Employee was admitted to the hospital for two days for observation. Upon release, employee was instructed to remain off work until released by physician. Emp #2 sustained a concussion and whiplash. Employee was treated and released for home observation. Employee will be returning to work on light duty, Monday, 2 April 2001. The government vehicle sustained unrepairable damages and is currently awaiting disposition.

A police report was requested from Tribal Police on 19 March and was received on 28 March. However, the report was incomplete with information on POV and driver censored. Currently attempting to obtain full report. From information obtainable from the report, Emp #1 was not at fault and POV driver is being cited with numerous violations.

Routine inspections of downtown and Gong Farm facilities have produced no major safety findings.

In March, three mountain employees attended Bloodborne Pathogens Training provided by Waxie Sanitary Supply.