Technical Manager's Report

Magellan SAC & Council meetings

September 30-October 2, 2004, Cambridge, MA

Alan Uomoto
Document 04PM0007

Table of Contents

1. Introduction

Preparing for incoming instrumentation, including the F/5 focus, was an important part of last semester's work. Considerable effort was also spent in IMACS troubleshooting and upgrading guider capabilities.

We evaluated the workload and staffing at Magellan and found, not surprisingly, that the observatory is significantly understaffed. A close examination of provided observatory support and the required staffing level was done and discussed with the SAC in a mid-semester meeting.

2. New staff

A new telescope operator, Sergio Vera, was hired, bringing the telescope operator count to six, about right for two full-time telescopes. Nelson Ibacache, formerly on the assembly crew, has moved to operations as a mechanical assistant. A search is under way for an assistant telescope engineer.

The under-staffing at Magellan has been a much-discussed topic recently. The impact and remediation is discussed in the Operations section.

3. Observer information

SAC members are asked to convey the following to their Magellan users.

3.1 Advance notice to LCO

Observers are reminded that instrument setup forms, travel forms, and slitmask files should be submitted well in advance of their arrival. There have been some close calls recently.

3.2 Magellan mailing list

A Magellan mailing list is available for general discussions and information exchange. Go to http://mailman.ociw.edu/mailman/listinfo.

4. Construction

4.1 Baade ADC

The image corrector and atmospheric dispersion compensator system was installed at Baade in May 2004. Sub-arc second star images were obtained in the corners of the IMACS field of view. Motion control of the atmospheric dispersion component was demonstrated but automatic implementation has been deferred.

4.2 F/5 secondary

Support components to be bonded to the mirror prior to polishing are now in manufacturing at the OCIW machine shop and will be ready for installation in November 2004, the anticipated start date for work on the mirror.

4.3 F/5 rotator

A crew from SAO, with help from Frank Perez and Charlie Hull, examined and measured the Cassegrain instrument rotator at the Clay telescope in preparation for receiving the F/5 wide field corrector and ADC.

5. Repairs

5.1 IMACS

Installation of the Baade ADC required modifications to IMACS operations, including adjustments to the Shack-Hartmann active optics system and slitmask cutting software. Skip Schaller and Ken Clardy have made the appropriate changes.

5.2 Leaks in mirror support system

The primary mirror is supported by pneumatic cylinders. These cylinders have started leaking air and sufficient pressure is sometimes not be available to control the mirror. The leaks are fixed by applying silicone caulk and a repair program is under way.

5.3 Drive bearing failures

Some main drive bearings on the Clay telescope were running dry, causing one to fail. The cause may be the result of a change request made when the Baade bearings were found to have too much grease, making them hard to turn. One night was lost to this problem and all Clay telescope main drive bearings will be inspected and if necessary, repaired.

5.4 Next semester

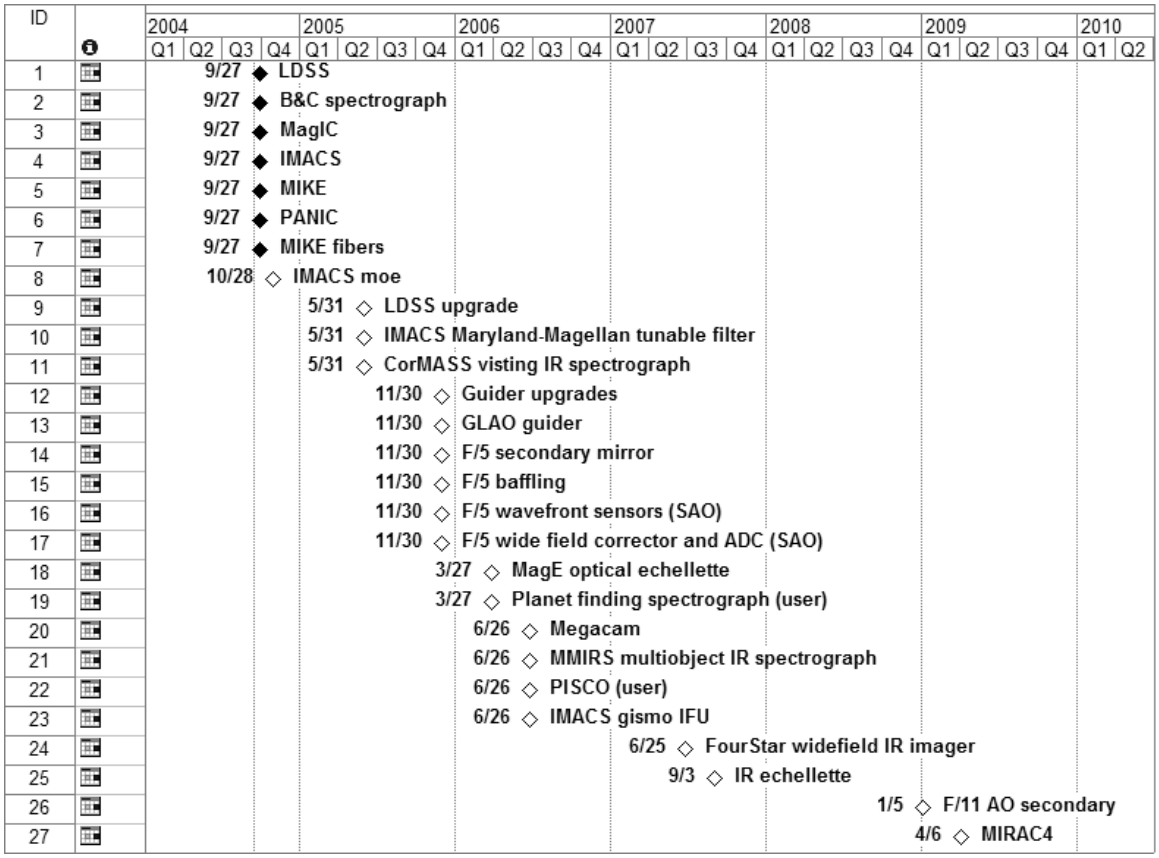
IMACS commissioning will be the focus of engineering work in early 2005. Two long engineering sessions are planned and it is hoped that remaining commissioning tasks can be done.

6. Instrumentation

6.1 A success story

The following chart shows current and anticipated instruments at Magellan. The schedule suggests early arrival dates but these are neither commitments from builders nor anticipations by observatory staff; indeed some instruments are not funded. Filled diamonds show existing instruments. The table following provides a little more detail.

The large number of incoming instruments is a testament to the quality and performance of the Magellan telescopes. These instruments, however, come with extra commitments for installation and operations that will be a challenge to provide.


ID
2004
2005
2006
2007
2008
2009
2010
Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2
1 9/27 LDSS
2 9/27 B&C spectrograph
3 9/27 MagIC
4 9/27 IMACS
5 9/27 MIKE
6 9/27 PANIC
7 9/27 MIKE fibers
8 10/28 IMACS moe
9 5/31 LDSS upgrade
10 5/31 IMACS Maryland-Magellan tunable filter
11 5/31 CorMASS visting IR spectrograph
12 11/30 Guider upgrades
13 11/30 GLAO guider
14 11/30 F/5 secondary mirror
15 11/30 F/5 baffling
16 11/30 F/5 wavefront sensors (SAO)
17 11/30 F/5 wide field corrector and ADC (SAO)
18 3/27 MagE optical echellette
19 3/27 Planet finding spectrograph (user)
20 6/26 Megacam
21 6/26 MMIRS multiobject IR spectrograph
22 6/26 PISCO (user)
23 6/26 IMACS gismo IFU
24 6/25 FourStar widefield IR imager
25 9/3 IR echellette
26 1/5 F/11 AO secondary
27 4/6 MIRAC4

New Magellan instruments, detail

Instrument	*Description*	*Lead*
IMACS/MOE	Multi-object echellette (an IMACS disperser) for high dispersion, multi-object spectroscopy	Andy McWilliam
LDSS	Upgrade to LDSS2 spectrograph	Mike Gladders, Ian Thompson
IMACS/MMTF	Maryland-Magellan tunable filter (Fabry-Perot). Narrow to medium band imaging with IMACS	Sylvain Veilleux (U. Maryland)
CorMASS	R~300 point source spectrometer (visiting instrument)	John Wilson (U. VA), Kevin Luhman (CfA)
Guider upgrades	New features for moving object guiding, finer image resolution, higher accuracy offsets	Carnegie
GLAO guider	Ground layer adaptive optics experiments	Alex Athey, Steve Shectman
F/5 secondary mirror	Clone of MMT F/5 mirror	Magellan
F/5 baffling	Baffles for F/5 focus	Magellan
F/5 wavefront sensors	Shack-Hartmann analyzers for Magellan active optics	CfA (optics), Carnegie (CCDs)
F/5 wide field corrector and ADC	Corrector optics for wide field optical imaging; copy of MMT device for use with Megacam	Andy Szentgyorgyi (CfA)
MagE	Magellan Echellette; R~6000 optical (CCD) echellette spectrograph	Scott Burles (MIT), Ian Thompson, Steve Shectman
PFS	Planet finding spectrograph; Doppler planet searches (user instrument)	Paul Butler, Jeff Crane, Steve Shectman, & Ian Thompson
Megacam	Wide field camera for broad-band photometric surveys	Brian McLeod (CfA)
MMIRS	MMT & Magellan infrared spectrograph; medium resolution multiobject infrared spectroscopy at the Magellan F/5 focus using a Hawaii-2 array	Brian McLeod (CfA)
PISCO	Parallel Imager for Southern Coordinated Observing, a multiband simultaneous imager (user instrument)	Chris Stubbs (Harvard)
IMACS Gismo	Gladders image slicing multi-object front-end; IFU capabilities for many objects	Mike Gladders
FourStar	4K x 4K NIR Hawaii-2 imager for wide field broadband infrared surveys	Eric Persson, David Murphy
IR Echellette	Infrared Echellette; R~6000 near infrared (HgCdTe to 2.5 microns) point source spectrograph	Rob Simcoe (MIT)
F/11 adaptive optics secondary	Thin shell adaptive optics F/11 Gregorian secondary	Laird Close (U. Arizona)
MIRAC4	Upgraded mid-IR imager for Magellan F/11	Bill Hoffman, Phil Hinz (U. Arizona)

6.2 Consequences of success

Of the 20 open diamonds on the chart, 11 are new facility instruments or equivalents (IMACS/moe, LDSS, IMACS/MMTF, Megacam, MMIRS, IMACS/gismo, MagE, FourStar, IR Echellette, F/11 AO, and MIRAC4). There are currently seven Facility class candidates (IMACS, B&C, LDSS2, PANIC, MagIC, MIKE, MIKE Fibers). Without retirements, we would have 17 facility class instruments at the end of 2010 (LDSS upgrade replaces LDSS2 so this is not an additional instrument).

It is neither possible nor wise to support this many instruments without changing the management structure. For example, with six instrument scientists, each takes three instruments, a separate user support division requiring another layer of management would be needed. While such organizations exist and can be successful, this isn't a good path for Magellan.

6.3 Limiting facility instruments

Facing the realities of operations funding and the limits of installed infrastructure (where would we keep 17 instruments?), let us suppose a reasonable number of Facility instruments is six. This is one fewer than our current instrument set and requires increased staffing only to the level that we have determined is required for today's operations, that is, 3.5 FTE over today's staff level.

Choosing six out of 17 possible instruments will be difficult. Some culling might occur after considering the instrument priority poll and some instruments may be delayed or deliberately deferred long enough to expect a retirement slot to open. A few more might replace older near-equivalents (PANIC and FourStar are an example). The SAC would need to decide on the remainder.

6.4 Limiting user instruments

Some Facility instrument candidates might be enabled as User instruments, although their number must be limited. While User instruments do not require deep observer support, they incur significant operations costs in the forms of engineering the telescope interface, mounting and dismounting, storage, and providing utilities and consumables.

Perhaps four User instruments, including those in commissioning, might be on the mountain simultaneously if they are scheduled sparsely (once each per semester) and most are on non-Nasmyth ports.

6.5 Magellan instrument count

Unqualified statements about numbers of instruments permitted are not obviously the best way to handle this situation. Some instruments have low support cost while others might be highly desirable but have high costs. That said, the following can be a guideline or discussion point:

> ***The two Magellan telescopes can support up to six Facility instruments and four User instruments provided reasonable scheduling constraints.***

7. Commissioning and operating at F/5

The Magellan Council instructed the observatory and relevant partners to devise plans for commissioning and operating the F/5 optics and instruments for SAC and Council review. The following comments are not plans because detailed discussions and negotiations have not occurred and the observatory/builder interfaces have not all been clarified. For staffing and costing reference, however, they may be adequate.

We note that although the F/5 system will have a significant impact on observatory operations through telescope reconfigurations and mandatory dark/bright instrument changes, there is nothing unusual about the individual instruments and their support requirements are not different from others.

7.1 F/5 secondary mirror

Installation of the F/5 secondary mirror will begin with a fit-check of the mounting system without the mirror. Procedures for doing the installation will be fine-tuned at that stage. This is expected to take one day and require two people, including one from SBS. The telescope will be returned immediately to operating condition.

Mounting the F/5 mirror in the telescope is the next step. Two people will need a half-day to attach the mirror. Telescope balance will need to be tuned and the mirror control system will need some adjustments. Following that, the telescope will be collimated at the Cassegrain focus, flexure data obtained, etc. With proper testing equipment, a few nights of good seeing will allow us to determine that the optical system works. Two four-night engineering runs are a reasonable requirement for installation and commissioning.

In operations, we expect the mounting or dismounting of the F/5 secondary mirror, including acquiring good performance after the change, to take more than half but less than a full day.

7.2 F/5 baffles

We expect the F/5 baffles to take about a half-day to install or remove and require three people. Part of this depends on how much can remain permanently on the telescope or secondary cage.

7.3 Wide-field corrector and ADC

Since the corrector and ADC are near-clones of existing equipment, we expect relatively few problems with their commissioning, although some night work with test cameras may be desired. Magellan staff will assist in mounting and cabling. We expect two 3-night engineering runs with full support from SAO will get the basic functions.

The MMT experience shows that mounting the wide field corrector takes about 2 hours. At Magellan, we also need to remove and store the tertiary mirror system, which takes a similar amount of time. A half-day with two or three people is needed to install the corrector and ADC.

7.4 F/5 wavefront sensors

We expect that Carnegie will provide the CCD detectors for the F/5 wavefront sensors, making integration into the existing active optics system straightforward. Even so, it will take parts of a couple engineering runs, plus much work off the telescope.

7.5 F/5 switch times

We can expect the commissioning of the F/5 focus to take roughly one year on the calendar, assuming we will want to do other telescope and instrument engineering during that year.

The switch to F/5 during operations will require two telescope nights if only one work-crew shift is available. Some work will cross the first night while the second night will be used for setup.

7.6 Megacam

This instrument exists and there will be operational experience with it so commissioning is expected to go smoothly. One 3-night engineering run. Installation at the MMT takes 3 hours.

7.7 MMIRS

This instrument is currently in production and will be operated at the MMT before being deployed at Magellan. There are outstanding questions about things like mask cutting and data acquisition, but one can expect at least one, and maybe two, 4-night engineering runs will be needed before it's ready for science.

7.8 F/5 staffing summary

For installation and commissioning, SAO is expected to provide adequate technical and scientific support. Observatory staff will be tapped for interface work, including software and mounting equipment on the telescope.

For operations, we can expect to devote one instrument scientist and one electronics technician to support the F/5 equipment. If we want some freedom in instrument change schedules, an additional mechanical technician is desirable.

There is likely only little savings due to the smaller instrument duty cycle because of the added work of telescope and instrument changeovers and because it is likely that we cannot apply the same instrument scientist who cares for the F/11 instruments. Asking someone to support more than three instruments during a single year is not realistic. The F/5 instrument scientist will likely care for most F/5 systems, not just MMIRS and Megacam but if the on-telescope time is small, this person will need some other non-instrument tasks.

8. Commissioning and operating F/11 AO

The Magellan Council instructed the observatory and U. Arizona to devise a plan for installation, commissioning, and operating the F/11 AO system. The following comments are based on information from Laird Close.

MMT experience suggests that deploying and commissioning the F/11 AO secondary will require about one year on the calendar and three engineering runs. In operation, an AO expert (instrument scientist) will be needed to run the AO user GUI and telescope operators will need special training.

We presume that the AO secondary will function properly in a static mode without needing an AO scientist. In that case, seconday changes will not be needed and we can avoid the need for full-time AO support and the operations impact, after commissioning, will be the one additional instrument scientist.

9. Operations and staffing requirements

> *Technical Support: Good as always. I did notice more than ever that the staff is overworked. There were major problems at the Clay and if I had required more attention (e.g. a new observer), there would have been no way the staff could handle both telescopes simultaneously.*
>
> -From a recent run report entry.

9.1 A moderate-service observatory

Enough on-site support is provided that experienced and prepared visiting astronomers can expect satisfactory results even if they did not build the instruments or fully understand the telescope operation. The level of service is similar to that at many national facilities such as CTIO. In particular:

- Each telescope has an operator responsible for telescope and observer safety.
- Facility instruments are prepared and tested in the afternoon by instrument specialists.
- Staff astronomers assist experienced observers.
- Mechanical and electronics staff are on-call to fix problems.

On-site staff also support instrument builders through testing, characterizations, documentation maintenance, and troubleshooting.

This level of service enhances value by reducing instrument and telescope failures and improving observer efficiency. We believe it is the correct level for the Magellan user community. ***Our goal is to keep this level of observer support while also properly maintaining the instrumentation and observatory infrastructure.***

9.2 Operating cost is low

Our current operations budget is a little more than $3M/yr. The telescopes cost about $65M to build and the instrumentation is valued at about $10M so our operations costs are 4% of capital. While comparisons with other observatories are difficult because different levels of support are provided and demanded, we generally see that low to moderate service observatories operate on about twice that amount relative to capital cost.

9.3 Too few people

The SAC has already heard reports and discussed the difficulties in supporting Magellan operations with the current staffing level. A detailed analysis of operations and staffing is presented in a Technical Manager's Report *Magellan Staffing Requirements* (04PM0006), August 19, 2004. The conclusion presented there is that the observatory is understaffed in Chile by 3.5 FTE: two instrument specialists, one instrument scientist, and one-half computer systems administrator. This situation creates the following serious problems:

- Existing non-critical telescope problems are not being fixed.
- Preventive maintenance is not being performed.
- Staff dissatisfaction with the excess work is high.
- Staff absences due to vacations or illness have high impact.
- Staff burnout and resignations are a worry.

The current staff members are overworked, non-Magellan scientists are providing significant observer support (about 1 FTE), technical support is being purchased from the small telescope group (0.5 FTE), and non-critical repair and maintenance tasks are being deferred. Without more people, user support and telescope maintenance will certainly fall below acceptable levels.

In the long term we are working to correct this shortfall through proposed increases in staffing. An already approved new assistant telescope engineer will help with the maintenance load but the earliest that even partial relief can come is late in the second semester of 2005, and only if this year's budget increases are approved.

In the short term, this situation is unsupportable. Not only is the staff workload too high, we are seeing the effects of deferred maintenance. To rectify this, we intend to change the emphasis of work at the observatory.

9.4 Staffing terminology

For clarity, we will use the terms *current staffing* and *required staffing* to compare the current understaffed situation with the level required to operate today. Increasing the instrument complement above our current set implies adding new staff at the rate of one instrument scientist for every additional three instruments, and one electronics technician for every additional five instruments.

9.5 Staffing status

The following table compares the current and required staffing levels for today's Magellan operations. We need an additional 4 FTE to reach the required staffing level and have requested an increase in the next budget of 3.5 FTE composed of one instrument scientist, two instrument specialists, and one-half of a computer administrator and web programmer.

Current and required staffing levels

Title	***Description***	***Current (FTE)***	***Required (FTE)***	***Under (FTE)***
Site manager	On-site administration and technical management	0.25	0.25	0.00
Telescope engineer	Maintenance, repair, and telescope upgrades	1.60	1.60	0.00
Instrument scientist	Maintains facility instrument performance, documentation, & calibration; reports anomalies, assists and advises observers. Assists instrument builders in commissioning and maintenance	1.00	2.50	1.50
Instrument specialist	Performs instrument setup, filter changes, grating settings. Assists in telescope maintenance work, collimation, testing	2.00	4.00	2.00
Telescope operator	Nighttime operations	6.00	6.00	0.00
Electronics technician	Maintenance, repair, and new construction of electronics and controls hardware	3.00	3.00	0.00
Programmer	Software maintenance and new software for incoming systems and instruments	2.90	3.00	0.10
Mechanical technician	Maintenance, repair, and new construction of mechanical systems	2.00	2.00	0.00
Mechanical assistant/janitorial	General hardware assistance (aluminizing work, for example) and telescope cleaning	2.00	2.00	0.00

Title	*Description*	*Current (FTE)*	*Required (FTE)*	*Under (FTE)*
Network and computer administrator and web programmer	Maintains and repairs the mountain network, observer and science staff computers	0.10	0.50	0.4
Totals		**20.85**	**24.85**	**4**

9.6 Short-term adjustments

The current understaffing suggests that an immediate change of emphasis in observer support is needed. The mountain staff has assembled a list of high-cost tasks, individual jobs that each draw a large effort from the instrument scientist and specialists. We have identified some procedural changes that reduce these tasks without strongly affecting observing effectiveness. We also find that increasing the minimum length of an observing run generally helps in the same way.

9.7 High-cost tasks

The mountain staff has provided these suggestions for short-term workload reduction:

1. Limit the instrument complement to IMACS, PANIC, LDSS2, MIKE, and MagIC.
2. No more than 6 IMACS configuration changes (dewar movements) per semester.
3. Documentation and software are the responsibility of the instrument PI.
4. Instrument PIs are the first responders to astronomer questions.
5. No new facility instrument installations without decommissioning an equivalent.
6. No iodine cell use until automatic mechanism is installed.
7. No more than 3 user instruments in a year.
8. Support astronomer available for startups no more than 6 nights per month.
9. Reduce somewhat the instrument specialists support role (e.g., no data backups or taking calibration data).

Limiting the instrument complement as shown removes the B&C spectrograph and MIKE Fibers from the facility instrument category and hence reduces the number of instrument changes (these instruments might still appear as User instruments in item 7). Limiting IMACS configuration changes, which are considered instrument changes, helps in the same way. We note that no Magellan instrument has been accepted formally as a facility instrument, so site staff are not yet officially responsible for documentation and software. Instrument PIs should be the first to field questions. Having five major instruments and only one instrument scientist is already difficult, so retiring one before adding another makes sense until more instrument scientists are trained and available. The iodine cell is, effectively, an instrument change since it requires removing the MIKE spectrograph from the telescope. The automatic iodine cell system is almost ready to ship to LCO for testing, however. The limit of three user instruments per year is for workload reduction. The local scientific staff can provide a maximum of 12 nights of mountain presence per month (nine from the single instrument scientist and three from the associate director). Six of these nights are for engineering support, so six are left for observer support. Reducing the instrument specialist's load in this way would allow them to spend more time on instrument and telescope maintenance.

9.8 Longer observing runs

Looking at the telescope schedule for Jul-Dec 2004, we find the following number of observer changes in each month:

Item	Jul	Aug*	Sep	Oct	Nov	Dec	Avg
Observer changes	24	19	19	26	26	28	**24**
Instrument changes	11	5	13	9	13	12	**10**

* Clay aluminizing this month

On average, there are 24 observer changes per month. Two telescopes provide roughly 60 observing nights in this time so the average observing run is 2.5 nights long, about what one would guess from specific experience.

The number of instrument changes, 10 per month, is slightly less than half the number of observer changes (IMACS configuration changes were considered instrument changes). This is lower than the number of observer changes because following observers often use the same instrument. It's also a lower limit on the workload, since new observers with the same instrument often require different filters, gratings, or other setups. Within a given observing run there may also be requests to change instrument internals and even instruments.[1] On average, there have been five major[2] instrument changes per month, roughly half of all instrument changes.

Reducing the number of instrument setups and changes might be done by increasing the average observing run length. If the average run was four nights long instead of 2.5, then we expect 15 observer changes per month instead of 24 and some reduction in instrument changes. The downside is that reduced granularity likely permits fewer observing programs to be scheduled.

9.9 Short-term changes

The practical implementation of the above need not have a high impact on the observer's telescope experience. Our immediate goal is to reduce the workload on instrument scientists and instrument specialists by reducing instrument changes and observer startups. We are considering the following operations changes to apply until we reach the required staffing level for the existing instrument set:

1. Instrument PI's will be the source of information about the characteristics and observing techniques for instruments.
2. Documentation and software for instruments will be provided by the PI and on-line hosting will be at the PI's institution.
3. No more than two major instrument changes (including IMACS dewar changes and perhaps certain grating changes) will be done per lunation. Total, both telescopes.
4. The following instruments are available: IMACS, PANIC, LDSS2, MIKE, and MagIC.
5. Up to two user (visitor) instrument runs per semester. At least one must come from this list: B&C, MIKE Fibers, MIKE iodine cell (before automatic system is installed).

1A recent instrument setup request: “We would like to do imaging on one night, and nod and shuffle as well as non-nod and shuffle multislit spectroscopy on the other nights.” This might be a reasonable request but one that requires considerable effort to implement.

2A major instrument change is one that requires moving heavy hardware, such as the IMACS dewar, rather than only turning the tertiary mirror.

6. All observing runs require that a thoroughly experienced observer be on-site during the run to minimize required science staff support.
7. The minimum observing run length is four nights.
8. Observers are responsible for data recording, focusing, backups, and obtaining calibration data.
9. No new instrument installations will be done unless approved by and coordinated with site staff.

We expect that the ability simply to schedule an observing run will sometimes override science priorities and a larger pool of eligible proposals will be needed to give the scheduler more options. Since second-ranked Magellan science proposals are likely still excellent, there is little fear that Magellan output will be compromised with a broader initial proposal selection.

Following this plan, we reduce the number of major instrument changes by 3 per month and the number of user setups by about 9 per month. A major instrument change takes two people half a day while a user setup takes one person about ½ day. This is equivalent to adding about 0.35 FTE to the mountain staff. Combined with somewhat reduced instrument scientist support due to reduced mountain time, we might recover 0.5 FTE total.

10.Facility instrument policy compliance

The Magellan Council has requested of the Magellan SAC compliance review of the Facilities Instrument Policies. It also requested an examination of the utility of the procedures from the perspective of the Observatory and that of the instrument builders.

The *Magellan Facility Instruments Policy Document* (01PM004, Rev E) list the steps required to build and install a Magellan Facility Instrument. The table below summarizes the steps in time order and also includes my knowledge of the corresponding state for the seven existing Facility Instrument candidates. We believe that satisfying the Facility Instrument Policy, perhaps with small modifications, is essential to effective instrument deployment.

At the top of the table I have assumed that all instruments have made successful proposals to the Magellan SAC and that the next three items are moot because the instruments are at the telescopes. LDSS and B&C do not have monitoring and construction reports because they were built before Magellan.

Facility Instrument Policy

Item	***IMACS***	***MIKE***	***MIKE Fibers***	***PANIC***	***LDSS***	***B&C***	***MagIC***
Proposal to SAC	✓	✓	✓	✓	✓	✓	✓
Joint supplemental report	NA	NA	NA	NA	NA	NA	NA
SAC approval of proposal and joint report	NA	NA	NA	NA	NA	NA	NA
Council approval to build instrument	NA	NA	NA	NA	NA	NA	NA
Liaison appointed by Director	M. Rauch						
Monitoring & construction reports	✓				NA	NA	
Final support agreement approved by Magellan staff							
Pre-ship review by Director	✓						

Item	*IMACS*	*MIKE*	*MIKE Fibers*	*PANIC*	*LDSS*	*B&C*	*MagIC*
Commissioning plan							
Engineering time award	✓	✓	✓	✓	✓	✓	✓
Commissioning report to SAC from instrument team							
SAC performance review							
Documents delivered							
Spares delivered	✓					NA	
Observatory staff training		✓				✓	
Support agreement in place							
Staff recommendation to SAC							
SAC recommendation to Council							
Council acceptance							

Some of the empty boxes are lack of information on my part but others, particularly the bottom five lines, are unsatisfied steps. After a year or two of normal operations, no instrument has achieved official Facility status.

The reasons are stasis and inertia. There is tension between the observatory, which operates incomplete equipment without training, and the instrument builder, whose engineering team may have disbanded. There is neither incentive nor enforcement available to move instruments closer to Facility status.

This is a problem that most, perhaps all, multi-institution observatories face and have not solved. While the intent of a Facilities instrument policy is good, the realities of university-based research make it difficult for a small lab to fulfill the demanding requirements without compromising on important local obligations and opportunities.

11.User instrument policy – draft

A policy for User instruments has been requested. The following sections comprise a draft for SAC discussion.

11.1 Definition

A Magellan User instrument is an instrument or instrument upgrade that is not a Facilities instrument (see document 01PM004, *Magellan Facility Instruments Policy, Rev E*). These include visiting instruments, instruments with a small user base, decommissioned Facility instruments, or instruments with unusual support requirements. A User instrument is also known as a PI (Principal Investigator) instrument.

11.2 Principal investigator

User instruments are operated and managed by a Principal Investigator (PI) who is responsible for the instrument's scientific program.

11.3 Intent and permission

The PI should make initial contact with the Magellan technical manager to discuss the feasibility and requirements for installing the instrument. After consultation with the observatory staff, the Magellan technical manager will accept or reject the User instrument proposal.

If accepted, a letter from a responsible person at the PI's institution, but not the PI, will be sent to the Magellan technical manager stating that the instrument will be available for use at Magellan and that its scheduling will be given serious consideration by that institution's telescope allocation committee. This letter must be received before significant work by observatory staff can be done.

11.4 Installation and commissioning

Because the observatory workload for installing and commissioning an instrument does not depend on its category (Facility or User), similar documentation and planning requirements are needed. The following documents must be provided and approved before a User instrument arrives at Magellan:

1. Joint Supplemental Report to the SAC
2. Commissioning plan
3. Support agreement

These are to be written in the spirit of the corresponding documents for a Facility instrument. The commissioning plan will include the specific items required for the instrument to be eligible for ordinary scheduling on the telescope. SAC approval is not required to install a User instrument, although notification, via the Joint Supplemental Report, is.

11.5 Engineering time

On-telescope nighttime engineering time will be supplied by the sponsoring institution or institutions. Scheduled telescope engineering time will not generally be available.

11.6 Costs

The PI is responsible for all ancillary costs of installing and commissioning the instrument. These include shipping, computer hardware and software, and interface items. The observatory will supply interface assistance. Cost details, if necessary, are clarified in the Joint Supplemental Report.

11.7 Availability

User instruments are not available to anyone except the Principal Investigator. Collaborations may be considered by the Principal Investigator but are not required to be available. The PI will be on-site during every observing run with a User instrument.

11.8 Scheduling and use

A User instrument will not be scheduled for science use until the observatory staff and PI agree that it is ready.