AiC Report to NOT STC
34^{th} meeting 2001.09.28.

Version for public release

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Contents

1 Down Time

Tables 1 on the following page distills all downtime recorded in end-of-night and end-of-run reports for the period 2001-03-01 to 2001-09-12.

- Technical failures on scheduled observing nights: 15 hr ($\sim 1\%$, assuming an average ~ 8 hr night)
- Technical failures on tech nights: 10 hr
- Technical failures with visitor instruments: 11 hr

System	Severity	Date	Hrs Lost	Observers	Details
Telescope	1	2001-03-10	< 1	Webb & Guillout	No fault, observer seeking information.
Telescope	1	2001-03-11	< 1	Webb & Guillout	Two building crashes.
Telescope	1	2001-03-13	< 1	Webb & Guillout	One building crash.
Telescope	1	2001-03-14	0	Kjernsmo, Saanum & Kathinka	One building crash. Observing data disk filled.
Telescope	1	2001-03-19	< 1	Marquez & Masegosa	Guide star lost twice (star too faint?).
Telescope	1	2001-03-22	< 1	Bettoni & Varela	Building crash
Telescope	1	2001-03-24	< 1	Bettoni & Varela	Building crash
Telescope	1	2001-03-29	0	Christensen & Gorosabel	Stair alarm triggered, cause unknown.
Telescope	1	2001-03-31	< 1	Christensen & Gorosabel	Telescope “jumped”, cause unknown, no error message.
ALFOSC	1	2001-04-03	< 1	Berdyugin & Teerikorpi	Noise bursts in CCD data during slew. (Loose ground?).
Telescope	1	2001-04-03	< 1	Berdyugin & Teerikorpi	Building crash.
Turpol	1	2001-04-04	0	Berdyugin & Teerikorpi	Periscope mirror too loose, moved on its own.
ALFOSC	1	2001-04-06	0	Østensen	Controller/host computer fibre replaced.
Telescope	2	2001-04-12	4	Nasser & Kaas	Mirror support compressor failed. Rotator brakes failed. Fixed by CP.
???	1	2001-04-28	< 1	Vilchez & Iglesias	problem not specified, but misplaced filter noted.
ALFOSC	1	2001-05-05	0	Kaas	CCD controller hung (s/w conflict with Østensen code). Bug noted in slit positioning algorithm.
ALFOSC	1	2001-06-14	0	Wheatley, Mateos & Baskill	ALFOSC s/w crash.
ALFOSC	2	2001-06-23	< 1	Perez, Gallego & Zamorano	Data disk filled.
LuckyCam	1	2001-07-05	2	Baldwin, Mackay, Tubbs & Cox	Problems with own instrument.
LuckyCam	1	2001-07-06	< 1	Baldwin, Mackay, Tubbs & Cox	Problems with own instrument.
LuckyCam	3	2001-07-05	All night	Baldwin, Mackay, Tubbs & Cox	Problems with own instrument.
Telescope	1	2001-07-13	0	Bruntt	Cooling unit 3/4 failure, machine room overheated.
NOTCam	2	2001-08-10	4	Kaas, Clasen	NOTCam commissioning - stuck filterwheel, shutter failure.
Computers	1	2001-08-13	< 1	Gorosabel	TCS/sandra comm failure.
ALFOSC	1	2001-08-24	< 1	Abbott, Lott, & Foulkes	Grism wheel timeouts what at rot-pos 0.
NOTCam	1	2001-09-05	0	Kaas, Abbott & Piirola	Guide probe can vignette field without warning after a teloffset.
NOTCam	1	2001-09-06	0	Kaas & Piirola	’frame’ bugs, focus timed out.
NOTCam	1	2001-09-07	< 1	Abbott, Kaas & Piirola	shutter sync lost, focus timed out.
NOTCam	2	2001-09-08	5	Abbott & Piirola	disk crash destroyed data, archive system couldn’t keep up.

2 Telescope

2.1 Pointing

2.2 Mirror cleaning

The last mirror cleaning (in May) was less than satisfactory. It is clear that a wet wash is required ASAP and realuminisation will be necessary next summer.

2.3 Mirror Damping

A swedish undergraduate student, Anders Magnussen, joined NOT for two months to work on this project under Graham Cox's supervision. Graham reports:

The object of the project was to re-design the active primary mirror damping system for the NOT, in order to remove the significant oscillations measured at 12 and 14.5Hz. The signals from the load cells of the primary mirror are filtered, amplified, inverted and fed back using loudspeaker voice coils, mounted on the edge of the mirror.

An old mirror damping system using analogue filtering exists, but has not been operational on the telescope since the active optics upgrade. The new system uses a digital filter and a prototype was implemented on a Texas Instruments development board, the TMS320VC5402 EVM. The digital filter of type IIR band pass only passes the desired frequencies of interest and attenuates the unwanted noise.

Tests have demonstrated that this new filter works satisfactory though further work is required before the active damping system can be re-installed on the telescope.

2.4 TCS II

Ingvar Svardh reports:

The new TCS will function as a server that performs all kinds of operations with the telescope. The goal for the new TCS (written in c, the old one in Pascal) is that the source code shall be very easy to understand for any professional real time programmer. I estimate a few minutes for most of the solutions, compared to many hours for the old system. Only simple solutions are used, all well explained. The size is expected to be a third of the old one with the same functionality. The switch from the old to the new system is expected to take place during a few hours in day time by moving about 25 connectors to a new mating contact. All functions will have been fully tested before this. A few hours night time adjustments will be needed for final servo and autoguiding adjustments. The I/O is arranged so that only one program controls an I/O section which speeds up and simplifies things. It is my intention that the new TCS should be as reliable as the old one immediately after commissioning.

32% done, finishing date stable at July 2003.

Programs done:

- ◇ Master, initializes all data used in the system.
- ◇ CPU load calculation.
- ◇ Weather. Fully verified with the real weather station.
- ◇ Counterweights.
- ◇ Hydraulics.
- ◇ Building power.
- ◇ Building servo.
- ◇ Rotator power.
- ◇ Rotator servo.
- ◇ Support slow I/O (controls slow hardware).
- ◇ AltAz power.
- ◇ AltAz servo.

The calculation of the position using the coarse Stegmann and fine Inductosyn is done with a much better method, the old one was extremely difficult to understand.

Reference position calculation with a few statements instead of 20 A4 pages as in the old system. It should be noted that the old system was designed for unreliable communication between master and subunits.

Deceleration in advance to avoid overshoots has been made with a very elegant formula:
vRamp = c * abs(PositionError) where c = 2a/vMax
instead of a separate program as before.

◇ GPS time client.

All programs have been tested in realistic simulation.

All server functions defined, amounted to 115. The definition file will be used by the GUI developers.

Small standalone GPS receiver installed for tests, had some faults but looks promising as a general time server placed in the service building.

Good progress has been reported by Carlos for the hardware part so we hope that tests on the telescope systems can be performed soon.

2.5 TMS

Project on hold.

2.6 Building crashes

Occasional unexplained building crashes (without telescope/building misalignment) suggest that all was still not well at the beginning of the reporting period. Eventually, they were found not to be building crashes at all, but arose from anomolous responses from the safety system, causing immediate power downs that appear like building crashes. The problem was traced and repaired. There have been no building crashes since.

3 Instruments

The last 6 months have been dominated by NOTCam commissioning work. Fortunately, during this time, few problems were experienced in other systems, the exception being hacker intrusions which caused some inconvenience but no lasting damage.

3.1 NOTCam

See accompanying report.

3.2 ALFOSC

ALFOSC has continued to serve the community as a reliable observing facility. During the period of 1/3/2001 - 1/9/2001 no technical downtime related to ALFOSC was recorded. In this period ALFOSC was used for 35 runs out of a total of 47 regular observing runs.

3.2.1 ALFOSC filters

Some more filter holders have been manufactured on-site, in order to accommodate large filters in the FASU wheels. IJAF have tested a new set of 90mm diameter Stromgren filters.

3.2.2 ALFOSC zero-point monitoring

More samples have been added to the UBVRI zero-points and colour terms. This information is accessible on our WWW pages.

3.2.3 ALFOSC long-slit spectroscopy

Many updates have been made to the WWW documentation of ALFOSC spectroscopy. Optimal use of the existing grisms for echelle mode will be evaluated soon. The necessity of purchasing 2nd-order blocking filters is being investigated. The internal focus of the instrument has been checked recently.

A program to obtain standard stars for all grisms will be started. The standard star information will be incorporated in the WWW-based ALFOSC S/N estimator. This will allow potential users of ALFOSC in spectroscopic mode to estimate the required observing time when applying for time.

Some details of the control-room computer-system setup will be changed such that quick-look spectroscopic reduction scripts can be run just after the data have been taken.

3.2.4 ALFOSC multi-object spectroscopy (MOS)

MOS target acquisition has been fully mastered, and can be achieved within a few to 10 minutes. High-quality slits are cut in plastic masks on our CNC machine in the service building on site. Initialization of the cutter height of the CNC machine is dificult and time consuming; this height needs to be set very precisely in order to get the correct slit width on the masks. This iterative process can take as long as 4-8 man hours, and we are looking into optimizing this initialization.

Nevertheless, MOS mode is fully operational, and has been advertised to the community as an efficient way to obtain numerous spectra. MOS mode is open for applications as of Oct 2001.

3.2.5 Half-wave plate

A remotely-controllable half-wave plate mount is being manufactured at CUO/IJAF in order to allow spectroscopic calibration without the need to remove the entire assembly and to make observations involving repeated re-orientation more efficient.

3.3 TurPol

No change, continues to operate well.

3.4 HiRAC

Effectively retired, pending the arrival of the mosaic.

3.5 StanCam

Continues to operate well.

3.6 FIES

No change pending further commissioning work.

3.7 Mosaic

Final lab work is under way in Copenhagen. Delivery date unknown at this time.

3.8 FRed

I defer to the director's report.

3.9 CCD Procurement

An order has been placed with Marconi for the purchase of two 2kx4k, 13.5μ CCDs with the new anti-fringing technology. Delivery is expected at the end of this year or the beginning of next. Discussion has begun with CUO/IJAF concerning construction of a new dewar to contain them.

3.10 High speed CCD controller serial link

A Swedish undergraduate student, Bjarne Andersson, joined NOT for two months to work on the project under Graham Cox's supervision. Graham reports:

The purpose of this project was to continue work on the interface card been developed as part of the proposed array controller upgrade at CUO. The principle areas undertaken was the writing of VHDL (V. Hardware Description Language) for the PLD (Programmable Logic Device) on a prototype test board (also referred to as the dummy board) and the understanding of the programming of the PCI interface device (AMCC S5933) on the actual interface board.

Test code was written for the dummy board that made it act like a very simple array controller. Also after significant effort it was possible to program and operate the AMCC chip as a target device, and understand how to program it to act as a bus master, using a purchased driver package. At the end of the project period some work was still required to finish the PLD code and to finalize the AMCC operation and board functionality.

See accompanying report for greater detail.

4 Computers

Jacob Clasen & Markku Verkkomieni report:

The interrim plan for the computer system before the new system administrator arrived was to provide a consistent user home directory environment combined with new deployment of the mail and WWW services, all in a network secured by firewalls. All in that order.

A hacker incident in March forced a revision of this plan. The new philosophy became that without a secure network, the implementation of the oter items would possibly be impaired by future attacks. Therefore, the construction of a firewall protection was given highest priority.

With the arrival of the new system administrator, the interrim plan was enhanced and elaborated. The current plan is roughly divided into the following 5 phases:

Phase 1 Network infrastructure & Security.

Objective: To establish a protected network.

Components: Two firewalls to protect the SLO network and the ORM network.
Two Virtual Private Network (VPN) machines to establish a tunnel between the ORM and the SLO networks so that private services can be provided in a secure manner across the Internet (i.e. the network link from ORM to the SLO).

Phase 2 Home directories and data storage.

Objective: To provide homedirectories and instrument data storage with data loss protection.

Components: On the ORM: one RAID 1+0 storage system that provides home directories and instrument data storage via NFS.
At the SLO: one RAID 5 storage system that provides home directories via NFS.
These two systems will be syncronized in order to contain the same home directory content.

Phase 3 Data recording.

Objective: To provide a CD-ROM storage system for high data volumes.

Components: At the ORM, a CD-ROM jukebox of 240 CD-ROM's controlled by a suitable host computer will be provided for CD-ROM production.

Phase 4 Computing services.

Objective: To provice new and enhance exsisting services.

Components: Migration of the web server to a different computer.
Implementation/enhancement of the following services: mail, DNS, FTP, printing, IMAP, DHCP, NTP, NIS, NFS, logging and WebMail

Phase 5 Transition.

Objective: To finalize implementation of the plan in a way that a normal day-to-day maintanaince state of the system is obtained.

At the time of writing, phase 1 is completed and phase 2 is ready to be implemented. The main components for phase 3 has been identified and purchase have been approved.

5 Infrastructure

The new LN_2 production plant has been installed at the ING facility and is operating normally.

The support building kitchen refurbishment has been completed.

We are considering a proposal to ventilate the dome machine room which becomes too warm during summer months.

A Comments recorded in EON & EOR reports

The following table extracts comments made in End-of-Night and End-of-Run reports over the past 6 months. Only comments about observatory operations are included but no attempt has been made to edit or select on the basis of positive or negative comments.

Table 2. End-of-Night Report Comments, 2000-03-01 to 2001-09-12

Date	Observers	Comment	Response
2001-03-01	Lehto & Katajainen	The bearing of the wind reading is WRONG by 180 degrees on the web page weather monitor.	No, it is correct by NOT definition. Web link added to inform observers.
2001-03-01	Lehto & Katajainen	Shutting down during wind. The regular shut down procedure can be dangerous in windy conditions, so how about changing the order of the shut procedure to - close mirror - close lower and upper hatches - then go to zenith position, park the building and power off. Following the present instructions you may end up trying to turn the telescope towards the wind.	Point taken, no repsonse as yet.
2001-03-03	Lehto & Katajainen	Thanks to Roy, Ingvar and Amanda for helping us during our run.	
2001-03-06	Caon	Many thanks to Thomas and Ingvar for the nice introduction and for their assistance during the very few hours we could do some observations.	
2001-03-06	Cox	Resolved noisy encoder problem. Lots of water on the observing floor due to rain and high winds.	
2001-03-09	Kaas	We should have had a level indicator for the water tank (to service building) to avoid it running empty.	Project under way.
2001-03-13	Webb & Guillout	No major problems. The building stopped a few times during the run, but all the problems were dealt with quickly and efficiently. We found that the NOT was very well set up and run. The support staff were very helpful and we found the telescope very efficient. We would definitely want to observe with the NOT again!	
2001-03-18	Evans & Kjernsmo	We have fulfilled the goal of the observing run by getting a large number of observations. Conditions have been allright, but variable. We have been fortunate to loose very little time, but there have been many close calls. Compared to the first run of this project (where we got only 1 full night plus 3 hours on two other nights in ten nights), this run was very successful, and we are confident these data will be very important for the success of the project.	
2001-03-18	Vilchez	excellent training done by Thomas D. Thank you.	
2001-03-19	Marquez & Masegosa	We want to acknowledge the excellent supporting during the run.	

Table N. End-of-Night Report Comments, 2000-03-01 to 2001-09-12

Date	Observers	Comment	Response
2001-03-29	Wold	Thanks to Roy and Carlos for support! It's been fun to be here again (as always), but especially this time, since now I could visit Amanda as well. We've got two nights of great data, and we'll return next year to get some more :-)	
2001-03-31	Christensen & Gorosabel	We are happy with the results of our run. 90of the GRB fields were obsevered. The seeing of the telescope was good enough to allow the detection of two GRB host galaxies, one of them in several filters. We thank the help received from the support astronomer and by the technical assistance.	
2001-04-01	Casares	It's not much disk space on the home disk for data reduction. A scratch disk for on-line data reduction would be very nice (and also a faster machine than "florence"). Aside from that, everything was perfect, telescope and support asistance.	
2001-04-06	Berdyugin & Teerikorpi	We are quite happy with the plenty of good new data we got with TurPol. We warmly thank Amanda and Carlos for help and attention.	
2001-04-10	Nasser	I have collected a very excellent data which I believe will be very usefull for my research work. That is only and mainly because of the full time help and support from the dupport astronomer starting with Tim in the first night then Amanda in the second and ended with Roy in the last two night. I am very thankfull for all of them for their help, support and patience.	
2001-04-20	Lilje	ALFOSC and the telescope worked very nice though.. Thanks for keeping it in such a way, and sorry you can't do anything with the weather...	
2001-03-31	Christensen & Gorosabel	The telescope turned out very appropiate for our purposes.	
2001-04-17	Esteban	All OK. Support astronomer: excellent!	(SA was AK).
2001-05-06	Ilyin & Andersen	The new coating on the mirrors increase the throughput of SOFIN by at least a factor of two. The new CCD should give us another factor of two. So we are quite satisfied.	
2001-05-12	Delgado, Fernandes &Storchi-Bergmann	The [ALFOSC] spectra are great, due to the excellent seeing!	

Table N. End-of-Night Report Comments, 2000-03-01 to 2001-09-12

Date	Observers	Comment	Response
2001-05-16	Delgado, Fernandes & Storchi-Bergmann	Very nice telescope & suport-staff:) Thanx	
2001-05-16	Vilchez	Thank you very much for the excellent astronomical support.	(SA was AK)
2001-05-17	Hornstrup	Very nice and thorough introduction - thanks to Amanda! I am also impressed by the very automatic way the TCS works. It would be nice, if the final FITS files could be provided with a WCS coordinate set by e.g. running one of the CfA developed WCS-programs. May not be feasible, but worth looking into (when you get the time and manpower ;-)).	WCS programme stalled due to lack of manpower.
2001-05-18	Hornstrup	I used the teloffset 180 360 command in BIAS. The software did what it should, except warning that the guide probe now was in the field. Took a while and a discussion with Ingvar to figure that out.	
2001-05-19	Hornstrup	Thanks for keeping this telescope alive and in such a good shape!	
2001-05-20	Hornstrup	Risking to repeat myself to boredom, I would like to emphasize, that this telescope is remarkably well taken care of, even with the obviously limited staff and financial support. Good work, from the enthusiastic staff! Of course, there are generally things to improve, like the read-out speed of the CCD etc., but that kind of general comments belong elsewhere.	
2001-05-20	Fynbo, Weidinger, & Egholm	The telescope worked perfectly. Few telescopes in the world produce a 1" seeing in a 4000sec integration at 3700AA.	
2001-05-21	Fynbo, Weidinger, & Egholm	As always, the telescope worked perfectly.	
2001-05-22	Fynbo, Weidinger, & Egholm	The telescope works extremely well. It is a pleasure to observe here.	
2001-05-23	Fynbo, Weidinger, & Egholm	Tonight we obtained 0.85" seeing on a 4000sec exposure in a 40AA wide narrow band filter at 3700AA. This clearly demonstrates the strength of the NOT.	
2001-05-24	Fynbo, Weidinger, & Egholm	As always, everything went fine.	
2001-05-24	Fynbo, Weidinger, & Egholm	Everything worked well. Not a single problem during 5 nights. The seeing was very good throughout our run. In a 4000s narrow band exposure we had a seeing down to 0.85" – extremely impressive. Thanks for the excellent and friendly support!	

Table N. End-of-Night Report Comments, 2000-03-01 to 2001-09-12

Date	Observers	Comment	Response
2001-05-25	Dischler & Faria	We don't have any specific comments about the run. We just want to say thanks to Roy (our support) for the first day introduction, and that NOT and ALFOSC is a joy to work with. We are looking forward to any future observation runs.	
2001-05-29	Gorosabel & Lindgren	NOT and Alfosc worked very well during the night :-) A suggestion: A rough guideline for novice observers on how to make e.g. good sky-flats (yes-yes, this should be common knowledge, but guidelines are nice if you are overwhelmed! :)	Agreed in principle, but we have more than enough to document already.
2001-05-31	Gorosabel & Lindgren	Thanks for giving us access to a very nice telescope!! :-)	
2001-06-03	Hackman, Ilyin & Kochukhov	The source visibility programme on the NOT www-page does not seem to work right for objects with negative declination.	Known bug, since fixed
2001-06-12	Wheatley, Mateos & Baskill	No Problems at all (apart from high winds on first night and somewhat variable seeing). Thanks very much for a very smooth and enjoyable observing experience!	
2001-06-17	Dahlen & Ostlin	It would be nice to also have MIDAS installed on the observers computer. & NOT formally supports only IRAF and IDL, there is insufficient manpower for more.	
2001-06-19	Dahlen	Fourth night in a row with clear skies and no telescope/instrument problems. Great...	
2001-06-22	Dahlen & Ostlin	Six photometric nights in a row with seeing below 1 for most of the time. Can't complain about the weather. Furthermore, not a single minute lost due to telescope or instrument problems. The NOT is really working nice. Two wishes for software: Midas and Focas.	
2001-06-22	Perez, Gallego & Zamorano	In some images, we observed all faint objects elongated instead of round. It happened with the R band filter and several Halfa narrow-band filters. Nice introduction by our support astronomers John and Amanda.	Telescope was probably buffeted by wind (or slightly out of focus).

Table N. End-of-Night Report Comments, 2000-03-01 to 2001-09-12

Date	Observers	Comment	Response
2001-06-23	Perez, Gallego & Zamorano	Everything worked fine! We would like to thank the support (Jacob) for his efficiency.	
2001-06-25	Perez	We would like to thank Amanda for her support and for taking care of the minor problems he had during the night.	
2001-06-27	Perez	Both the telescope and the support system worked very nicely. We have had a great observing run not only for the fine weather but also for the perfect performance of the telescope. We would like to thank John, Jacob, Carlos and specially Amanda for their support. Congratulations!	
2001-06-30	Falomo	A good obs run with NOT+ALFOSC working very well. No problems at all during the whole run.	
2001-06-30	Piirola, Abbott, Kaas, Clasen, Cox & Verkkoniemi	NOTCam acquired first light with grace and panache. Many thanks and congratulations to all involved with bringing this instrument to the telescope. It is set for a bright future.	
2001-07-09	Bruntt	I really enjoyed my first night at the NOT. Everything is running s-moothly!	
2001-07-10	Bruntt	Excellent seeing. The best measured value was 0.5 arcseconds in the I band. Wow!	
2001-07-20	Holmberg	Everything went very well with the telescope and instrument. Only problem was sahara dust that made 2/3 of the observation run less valuable due to non photometric conditions.	
2001-07-25	Takalo & Schafeitel	Thanks to John for a very nice and thorough introduction to the tele-scope.	
2001-07-29	Ilyin & Tautvaisiene	All our problems were fixed very quickly. We thank Amanda, Ingvar, Paco and others very much.	
2001-08-13	Gorosabel	It would be great if Sandra could give to the TCS the filter ID and then performs the focus-offsets (foc-del) automatically. Sometimes, specially when you are tired, one forgets to use foc-del when changes the filter. That's all, otherwise the system is perfect!	Not possible at this time due to lack of communication of UIF with TCS.

Table N. End-of-Night Report Comments, 2000-03-01 to 2001-09-12

Date	Observers	Comment	Response
2001-09-05	Hakala, Rodriguez & Casares	It would be nice to have a plot window to monitor graphically ones photopolarimetric data during the observations. I've said it before, but still it would be nice to be able to control the telescope from the service building! Now the service building is really not practical for observer use during the run. Also, I'm not entirely happy about half-nights if that involves instrument setup changes during the run (you have to recalibrate the instrument every night). Also, I must say, it is not very efficient use of astronomer's time to have half nights. Finally, I'm rather tired of these "parasite programmes" that seem to continue indefinetely over several years, asking you to perform their observations! Maybe time to review policy here? Quite a lot of comments here, but I must say all observations went rather smoothly and no problems on that side, which is the main thing.	
2001-09-05	Andrei	Not very happy with weather, but telescope and TurPol work just fine.	
2001-09-06	Kaas & Piirola	(NOTCam) Measured a seeing of 0.3 (!) in K with the HR camera while focusing, 0.4 in J, assuming that the scale of 0.08 arcsec per pixel is right.	
2001-09-14	Hornstrup	Please allow me to once more thank the staff behind the NOT for an always timely support, and for running this telescope so very professionally! Keep up the good work...	