mechanical tolerances, . . . The performances of this mode are the most difficult to achieve.

## 4. Perspectives

VISIR is an ambitious instrument which will require a total work of 100 man years with some hard time.

Rendez-vous in five years to report on the first telescope tests of VISIR, . . . hopefully.

**Acknowledgements:** We wish to thank the various colleagues who have contributed to the phase A study, either technically or scientifically and which are too numerous to be quoted here. We also would like to thank the ESO staff and especially A. Moorwood, B. Delabre, H. Käufl, J.-L. Lizon à l'Allemand for their valuable comments all along the study.

### *References*

[1] Käufl H. and Delabre B.: 1994, "Improved Design and Prototyping for a 10/20 μm Camera/Spectrograph for ESO's VLT" in *Instrumentation in Astronomy VIII*, SPIE volume **2198**, p. 1036–1047, Crawford D.R. and Craine E.R. Eds.

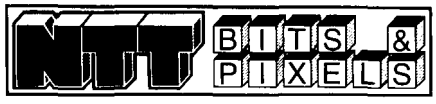
[2] Lagage P.O. et al.: 1993, "TIMMI: a 10 μm camera for the ESO 3.6-m telescope" in *Infrared Detectors and Instrumentation*, SPIE volume 1946, p. 655–666, Cormer B. Ed. Moorwood A.: 1993, "IR Instrumentation for the ESO VLT" in *Infrared Detectors and Instrumentation*, SPIE volume 1946, p. 461–471, Cormer B. Ed.

[3] Käufl H.-U., Jouan R., Lagage P.O., Masse P., Mestreau P., Tarrius A.: "TIMMI at the 3.6-m Telescope". *The Messenger* **70**, 67.

[4] Käufl H.-U.: "Phase-A Study Launched for the 10/20-μm Camera/Spectrometer for ESO's VLT". *The Messenger* **72**, 44.

[5] Käufl H.-U.: "Ground-Based Astronomy in the 10 and 20 μm Atmospheric Windows at ESO – Scientific Potential at Present and in the Future". *The Messenger* **73**, 8.

P.O. Lagage
e-mail address: lagage@sapvxg.saclay.cea.fr




*With this periodically compiled collection of short notes, the NTT Team intends to keep the community informed about changes in performance, configuration, and operation of the NTT and its subsystems.*

### First NTT Team Member To Leave

The first departure of members from their group often marks the transition to a new phase. This is also true for the NTT Team which started to come into existence about one year and a half ago. Since then, a fair number of improvements could be reported, and the operation of the NTT has stabilised considerably. Thanks to his astronomical expertise, Edmond Giraud has had his share in this progress. When Edmond heard about the NTT Upgrade Plan (*The Messenger* 75, 1), he spontaneously offered to spend a year on leave of absence with the NTT Team at La Silla. (Our colleague Miguel Albrecht has suggested the handy acronym "NTT UP" for the NTT Upgrade Plan, which henceforth we shall gladly use). That year has meanwhile become 14 months long, but now it is time for him to return to his home institute, the Observatoire de Marseille.

This is a good example of how ESO's role as a service organisation can be strengthened by the active support of the astronomical community. We thank Edmond for his willingness to help during a critical initial phase and wish him all the best.

### Instrument Operators to Join the Team

On May 16 and June 1, Gabriel Martin and Roberto Aviles, respectively, will take up their duties as instrument operators. This is the first big step towards the operational part of Phase II and beyond of NTT UP which foresees that the NTT will be re-commissioned in service mode, much the same as is planned for the commissioning and operation of the VLT. Since this is a very important and complex type of work, for which there is only limited experience available, Gabriel and Roberto are joining us early in order to insure the proper commissioning of this operating mode.

An important aspect of this early start is that the training of the instrument operators will not be limited to ESO staff. Between now and the 'Big Bang' on April 1, 1996, Gabriel and Roberto will increasingly assist Visiting Astronomers in the operation of EMMI and SUSI. We hereby hope to achieve two goals: (a) The know-how transfer will also take place directly from the community to the instrument operators; (b) Visiting Astronomers can convince themselves that also in service mode their programmes will be in 'good hands'. (The scientific responsibility and supervision will always rest with an astronomer.)

We wish Roberto and Gabriel a successful start with their demanding work.

### Postdoctoral Fellowship Available at La Silla

Given the proto-typical character of the NTT hard- and software and the operations model for the VLT, a few years of work with the NTT Team at La Silla should be the optimal practical and conceptual preparation for young astronomers with strong interest in observational work for the VLT era. Currently, we have an opening for a recent PhD recipient. If you are interested in a challenging job which offers an unusual diversity of experiences and research opportunities at a major observatory, consult the vacancy notice in the *Announcements* section of this issue of *The Messenger*.

### Field Test of Work Component No. 5

During February 18–21, the latest test of another component of the VLT-like control software as defined in NTT UP was successfully completed. It consisted of two parts, (i) the control of the hydraulic system and (ii) the selection of video signals such as from guide probe or slit viewing cameras and their distribution to the requested local or remote destination. Apart from these specific applications, the scope of the tests also included checking the VLT LCU Common (LCC) and Central Control Software (CCS). Once again, no real problems were encountered during the installation so that most of the night time could be used for further optomechanical tests and other work with the telescope. As for all other tests of the new control system, the old control software was fully restored after completion of the tests.

## R4 Grating for EMMI Now Offered

For a scaled-down prototype of the R4 grating to be used in UVES (H. Dekker and S. D'Odorico, *The Messenger* 70, p.13), the commissioning could now be completed. A year earlier, this had been made impossible by a problem with the calibration of the slit width which was noticed only after the completion of the observations so that the actual resolving power could not be assessed. This time, the nominal slit-resolving power product of 70,000 arcsec (corresponding to 2-pixel sampling with the F 5.3 camera of the red arm of EMMI, cf. Dekker et al., *The Messenger* 76, p.16) could be confirmed over the full spectral format. The combination of high spectral resolution and a wavelength coverage of 250 nm in the red and 450 nm in the 'blue' make this mode of EMMI a rather unique research tool. As of Period 56 (starting October 1, 1995), it will be offered to the community. However, in order to limit the additional operational overhead, it will be scheduled only if nights can be combined into one or more blocks of sufficient length.

## Closed-Loop Operation of Active Optics System

Considerable progress has been made towards making the New Technology Telescope the optically fully active telescope as it was originally conceived. On an experimental basis, the parallel mode of the image analysis has, with much help from Lothar Noethe and additional advice from Krister Wirenstrand, been put into operation. This means that 80% of the light from the guide star is diverted to the image analyser which can thus be operated parallel to the scientific exposures. The results can be accepted by the observer during or after the exposure, with the former option currently not being advisable for direct imaging.

So far, image analyses was possible only at the centre of the field, thus excluding the simultaneous usage of the scientific instrument. As a result, even during nights of excellent seeing, most observers did not use the active optics system as often as would have been optimal. Therefore, the recent step improves both the operating efficiency and the practical optical performance of the NTT. Since the image analysis is more demanding on the brightness of the guide star than the autoguider alone, tools have also been developed to automatically select the brightest suitable guide star from a computer-resident catalogue. Miguel Albrecht will soon install this catalogue on a server at La Silla so that the problems which are now occasionally experienced with accessing this catalogue in Garching will no longer occur.

## VME CCD Controllers

Visiting Astronomers Palle Möller and Steve Warren reported a strange problem which they noticed in data obtained with SUSI and CCD #25. In exposures with low light levels, the noise exceeded the value expected for Poisson statistics by up to 40%. In images with very uniform signal level, a weak chessboard-like pattern could be seen. In a remarkably quick and concerted action of the La Silla and Garching branches of the newly-formed CCD group, the problem could be traced back to cross talk involving the bus and analogue-to-digital converter of the VME controller. When the output of the A/D converter changed strongly, i.e. near powers of 2 where many bits flip, this effect was particularly noticeable. This explanation predicted that the same problem would occur also for CCD #31 in the blue arm of EMMI, since it is operated with the same type of controller. In fact, careful analysis confirmed this expectation, although to a lesser extent than in SUSI. By changing the timing of the readout and A/D conversion process the symptoms could be fully suppressed.

## Image Quality Monitoring Programme and Enclosure Operations Model

We gratefully acknowledge the efforts by Wolfgang Eckert and Juan Carlos Piñeda to manufacture and install the mount for an additional CCD camera. Attached to guide probe 2 of side B (EMMI), it will be used to monitor the FWHM of the images delivered by the telescope. This approach was chosen because the image size does not come out of the image analysis nor can it be readily extracted from all scientific data, e.g., spectra. We thank Lothar Noethe and Francis Franza for their help with the procurement of the CCD camera and the optics, respectively.

In Garching, Volker Bäumer started to work on his PhD thesis which aims at establishing the link between model calculations for the wind flow in the NTT enclosure, measurements of wind speed and direction, temperatures, and the seeing. The mechanics workshop at La Silla has provided a platform for a mobile anemometer. Visiting astronomers will see it in operation mainly between the opening of the dome in the afternoon and the beginning of the observations. Logging of the data from the other wind and temperature sensors started already some time ago.

## Rotator Bearings

The ball bearings of the instrument rotators in the two Nasmyth stations are operated under conditions which are very different from normal applications of such devices: the rotator bearings move continuously, but hardly ever turn through angles of 360° or more, run at very low speed and regularly change direction of motion. During the zero passages of the speed, the effects of the transition between static and dynamic friction are aggravated when, owing to the special operating conditions, the balls have settled at the bottom of the bearing. There are indications that rotating the bearing through 360° which rotates any cluster of balls from the bottom of the bearing to its top, can keep the incidences of increased friction at a low level. It should also be noted that these events have almost never affected the observations.

However, on side A (IRSPEC, SUSI), additional problems have been noticed for quite some time which are not covered by the simple model described above. In particular during beam switching for IRSPEC observations, the bearing got completely stuck a couple of times. After the electronics problems with the rotator control had been eliminated (*The Messenger* 79, p.10), this problem accounted for roughly 0.7 of the 1.8% of observing time lost because of technical failures in the first quarter of 1995.

To investigate this behaviour more thoroughly, it was decided to open the bearing (including the re-installation, this takes 3 days). Some small cracks were noticed in the bearing races. The evaluation of this finding has just started. Once the bearing was open, this opportunity was also used to replace the balls and install a different type of spacers which separate the balls. In the first week of intensive usage of SUSI after this intervention, not one overcurrent was recorded.

We thank Gerardo Ihle and the Mechanics Group for the effective support provided on relatively short notice. The above intervention was only possible because the same group had upgraded the crane to the capacity needed for the safe handling of the adapter.

The setting up of a test stand of a spare NTT bearing and motor in Garching was nearly completed. It will be used in the frame work of a research project at the Technical University in Munich to better understand the nature of the problem and to try out possible solutions. This was done by F. Franza, M. Ziebell, and B. Gustafsson. We are grateful to them for their continued support in analysing the bearing problems (and many other aspects of the NTT).

Because the altitude axis of the NTT is used in a similar fashion as the rotators,

the behaviour of the altitude motors is now also being monitored.

### Automatic Display of Incoming Images for Remote Observers

A few fellows and students in Garching now provide additional support to the operation of the NTT. As a first result, we can report the installation of software by Markus Kissler which, in analogy to the practice at La Silla, also in the remote control system automatically displays newly arriving images for inspection and further analysis with MIDAS. The convenience of this new feature has been appreciated not only by the NTT Team but, more importantly, also by various remote observers.

### Electronic Operations Report System

The NTT Team has for quite some time been using a commercial system (*Razor*) for the tracking of technical and operational problems. Initially, the intention had been to use the same system also for the nightly operations reports by the observers. However, because of the way the system had been set up and a variety of technical problems with *Razor*, this was never implemented. Meanwhile, the technical problems could be solved, and we thank Joseph Schwarz for his constant support. A second database and form for night reports have also been prepared, and the system is now in routine operation. It serves us as an efficient and convenient source of references by means of which for instance a problem can be traced back in time and all relevant staff (plus visitors) at La Silla and in Garching can share the database.

### Technical Feasibility Checks of NTT Proposals

For the first time, the NTT Team has attempted to perform technical feasibility checks of all observing proposals received for the NTT during Period 56. This was a laborious exercise. Only in a small percentage of the projects were potential problems noted; they were brought to the attention of the Observing Programmes Committee for evaluation. For us, the more important aspects were (i) to obtain an early overview of the operational requirements on us during the next period and (ii) the opportunity to assess under realistic conditions what kind of information will in future be required for observations to be carried out in service mode.

The NTT Team
e-mail address: ntt@eso.org

# VLT Insurance Contract Signed

*At a ceremony in Paris on April 11, ESO signed an all-risk insurance policy for the VLT project with AGF, one of the leading French insurance companies. The policy was also signed by Messrs Fauchère & Jutheau, the insurance broker who has worked with ESO on this contract.*

*The signing ceremony, which took place at the AGF Headquarters, was preceded by a well attended press conference, featuring an interesting composition of jounalists specialising in scientific and in financial matters.*