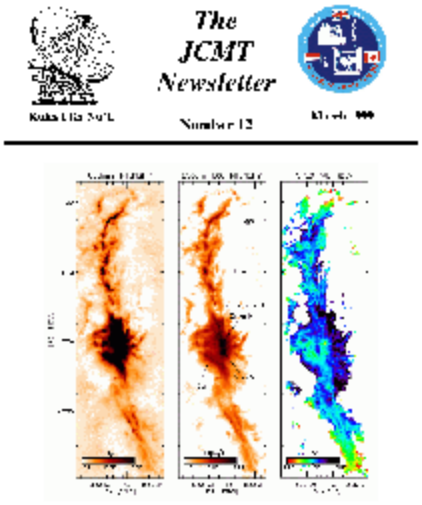
This newsletter was originally published in electronic form by the Joint Astronomy Centre on their web site. This PDF version was created using the web pages still available in August 2014. The most important pages are preserved. The missing pages tend to be administrative in nature and are unlikely to have historical value.



THE JCMT NEWSLETTER

March 1999 Issue Number 12

Downloadable files containing the majority of the contents will shortly be available:

in Postscript format (news12.ps) or in Adobe Acrobat format (news12.pdf).

INSTRUMENTATION UPDATE

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Message from the Director

The main item of interest to the users has been the visit of the International Review Panel to the JAC on February 8-10. The Review Panel worked extremely hard throughout their three days and appreciated the reports, scientific presentations and staff interactions during their visit. The Panel members very much enjoyed their visit to the telescope and at the end of the three days gave an extremely positive feedback about their view of the future potential of the JCMT in the era of the Large Millimeter Array. Since then the Panel has received input from users in the various countries and the final report will be presented to the JCMT Board in May.

In this light it might be useful to remind users again of the current programme of funded developments, as feedback from a number of individuals has indicated that this information is still not widely appreciated, even though the information is on the JCMT web-page and was publicised before the review. Again, let me remind users that it is our policy that JCMT information and top-level updates are all now web-based. I appreciate that our web-pages are not perfect, and with the reduction of staffing last autumn it has been even harder to keep them up to date over the last few months. However, this summer we are going to use outside effort provided by a co-op student to simplify the layout of the pages in order to make this task easier and to make the information more transparent to the user. What follows will be expended and transcribed to the web-page as the ongoing Development Plan.

The JCMT development programme.

The Development Fund provides £350k pa from FY 00/01 through FY 02/03 (4 years) and then a linearly declining budget from FY 03/04 that reaches zero in FY 09/10, the end of the Tripartite agreement between the three governments of the UK, Canada and the Netherlands. This profile is a planning assumption to achieve compliance with the wording of the agreement, but is not meant to imply that further developments are not possible. Indeed, we have confidence in the role of the JCMT in the era of the LMA and look forward to the recommendations of the International Review, and in that light additional funding for new developments would, presumably, come from outside the original tripartite agreement.

The Development Programme continues with the four main themes below:

- Efficiency improvements – mainly by upgrade routes
- A programme of sub-arcsecond astronomy
- Provision of heterodyne focal plane arrays and associated correlator
- Potential new (innovative and fast track) instruments

1. Efficiency improvements

Telescope Control System (TCS) Upgrade

The telescope control system upgrade is a programme to improve the efficiency and capabilities for controlling telescope slewing, tracking and rastering. This project will replace the original VAX-based control system with a microprocessor and Unix-based system using the standard software environments of VxWorks and DRAMA that are in use at other observatories. The new system will have less latency and thus more efficiency, will be more flexible, and will be based on a modern, easy-to-maintain system. It is due for completion in the summer of 1999.

The Observatory Control System (OCS) Upgrade.

The OCS sits above the TCS and co-ordinates the movements of the telescope and secondary mirror with commands to the instruments to integrate, to the data storage system to write the data to disk, and so on. Once an observation has been completed, the data-file is automatically transferred to the Unix systems for analysis, and header information is uploaded to a Sybase observation database. Currently there are two separate systems, one for SCUBA and one for the heterodyne instruments. Again, both of these are VMS specific ADAM systems. The SCUBA OCS allows the parameters of an observation to be defined in advance in an Observation Definition File, and includes a simple queue manager. The heterodyne OCS requires each observation to be set up and executed interactively via a command line interface.

Both of these systems will be replaced by a new Java-based system known as the Todd (Telescope Observation Designer and Driver). This will allow JCMT software engineers and support scientists to set up "recipes" for each type of observation, including the ability to send commands in parallel to multiple sub-systems in an efficient manner. Parameters for the observation will be read from an observation definition file created in advance, and it will be possible to place a number of observations in a queue for automatic execution. The new OCS underwent proof-of-concept observing tests in November 1998; and should be completely installed in the summer of 1999.

SIS Device procurement.

At the centre of all work on new and upgraded heterodyne receivers is the development of new SIS mixers. The JCMT has a long-term contract with the Netherlands Space Research Organisation (SRON) at the University of Groningen for the production of SIS mixer devices. These devices are used for new receivers and for upgrades of existing receivers. SRON manufacture niobium devices covering the entire range of frequencies of interest to the JCMT, 200-900 GHz.

Surface Upgrades

As one of the highest development priorities, the JCMT staff are working to improve the surface accuracy of the antenna in order to have better system sensitivity at the shortest wavelengths as well as cleaner beams. The goal is for an rms surface accuracy of ~22 microns through improved setting of the panels. Furthermore, through the use of active control system, this figure of merit will be achieved throughout the 16-hour observing window. To achieve these goals two sub-projects are underway.

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Active Surface Control System: This is to implement a system where temperature measurements from the dish and backing structure are fed into an FEA model and used to predict corrective panel adjustments which will be made in real time. This project has required the development and validation of detailed thermal and mechanical FEA models of the dish and an upgrade to the panel adjuster control system. It is now almost complete, the final tests will be undertaken in the summer of 1999.

-

Provision of a new Holography Receiver: Because the determination of the surface accuracy is limited by the resolution capability of the current receiver, a new full-phase, dual-frequency (90, 180 GHz) holography system is being developed by MRAO, RAL and the JAC. This new receiver (RxH3) is in the final stages of construction and will be installed and commissioned in late summer. RxH3 should allow dish surface measurements to an accuracy of 5 microns or better.

SCUBA Upgrades

These are in three phases: easy to achieve improvements in current system reliability and performance; more difficult and potential improvements in performance; potential provision of a new instrument with larger field-of-view and higher sensitivity. The first of these upgrades paths is planned for the summer of 1999 and will mainly involve installation of new and improved filters (from QMW) and replacement of the optics by mirrors with diamond turned surfaces (UKATC).

Design studies are underway to investigate the second phase, which includes potential provision of differential amplifiers to allow the 'no-chop' fast jiggling DREAM-like modes to be undertaken as well as the possibility of replacing the horns on the long wavelength array with more efficient designs.

A watching brief is being kept on detector development (for FIRST/Planck) with regard to the ultimate upgrade, or new instrument. Financial provision for these upgrades has been earmarked by the JCMT Board as an area of top-priority.

2. A programme of sub-arcsecond interferometry.

The JCMT will collaborate with the Smithsonian Sub-millimetre Array (SMA) in sub-millimetre aperture synthesis observations on Mauna Kea. The addition of the JCMT to the SMA increases the collecting area of the array by 60% and, in particular, enhances sensitivity on the longer baselines in the array. This will improve sensitivity to objects with small-scale structure such as compact protostellar regions and AGNs and may significantly improve important observing techniques such as self-calibration.

To collaborate with the SMA, we need to convert our receivers to 5GHz centre IFs, provide a polarisation rotator, install signal transmission fibres, and ensure the JCMT is controllable from the SMA. First light (fringes) for the SMA using two antennae on Mauna Kea are expected by the end of September 1999 and the JCMT should be in a position to participate fully in interferometry with the entire array in mid-2001. Earlier tests with the JCMT using our receivers in an overlap region of the Ifs is anticipated well before this time. The fibre optics cables have been purchased and a Memorandum of Understanding is expected to be agreed during 1999. The current mode of collaboration is based on the 'altruistic principle' of collaboration between astronomers on specific projects rather than a national/facility shares basis. Undoubtedly this will develop with observing experience.

Use of the enlarged array will bring two-fold benefits to users from the partner countries: access to sub-arcsecond submillimetre astronomy; experience of using an interferometer before the advent of the LMA.

In support of the existing JCMT-CSO short-baseline interferometry, water vapour radiometers have been developed by MRAO and are installed on both the JCMT and CSO. These instruments monitor changes in phase between the two telescopes induced by the atmosphere and provide a way to correct for this phase offset in real time or in post-time data reduction. The radiometer looks slightly offset from the main beam and we hope to use it to give a continuous record of the water vapour in the observing path and hence allow better extinction corrections. We are currently awaiting the software from MRAO before being able to commission this mode.

3. Heterodyne Focal Plane Array Development

The ACSIS correlator is now well under way and the CDR is planned for June 2000 with delivery planned for late

2001. The prime contractor for ACSIS is HIA Penticton, with major work being undertaken by the UKATC and the JAC.

The Board recently approved the first of the focal plane heterodyne cameras. This is called HARP-B, and is a 345 GHz ("hence B-band") 16 element (4x4) camera. MRAO are the prime contractors with extensive work being also being carried out by the UKATC. The CoDR will be on March 22/23 and delivery is planned for mid-2002.

The camera is designed to suffer no significant performance penalty compared to the best single-beam systems. The receiver will be based on a horn-reflector antenna developed by Withington and others at MRAO; this has very low losses and naturally lends itself to a "stackable" linear layout.

Work is under way to formulate plans for the construction of an 8-element D-band (650 GHz) camera by the Netherlands. The funds for this camera are not yet approved.

4. Innovative new instruments

There are no plans for an announcement of opportunity for instruments under this heading as yet. This will depend on how the D-band array and SCUBA upgrades progress. It is hoped that funds might be identified under this heading during the year 2000.

Although not strictly in this heading, provision of visitor instruments allowing collaborative astronomical programmes to be undertaken is ongoing. SPIFI, the South Pole Imaging Fabry-Perot Interferometer from Cornell, will be on the JCMT this April, and it is hoped this will become a long-term visitor instrument. Discussions are also underway with the MPIfR (Bonn) with regard to provision of an 800 GHz heterodyne receiver for collaborative programmes.

Summary

The JCMT has a tremendously exciting programme of developments, a number of which will come to fruition this summer. The future looks highly positive and productive. On the other hand, all is not sunshine and light. Operations continues to be extremely tightly squeezed by budgetary restrictions and in my opinion is now barely adequate for delivery of the mission to which we are committed and at the quality level we wish to achieve. I am aware of the dissatisfaction of users when we deliver less than 100% performance, and this is something that grates on every facility director.

However, there is only so much that I can do. The JCMT is a strictly resource-limited facility. I appeal to the users in the three countries to demonstrate and vocalise their support for the facility through their national peer review systems to put pressure on the agencies for additional operational funding for the JCMT which will bring benefit to all users.

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Modification Author: Graeme Watt (gdw)

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 The People Page

The following members of staff have left the JAC recently and we would like to extend our thanks and appreciation for all their hard work on behalf of the JAC, and wish them every success in the future.

Alan Aindow

Tamara Brown

Rob Ivison

Phil Jewell

Goeran Sandell

The following new members of staff have joined the JAC recently.

Velvet Gonsalves-Nases - Administration

Eric Kennesey - JCMT Electronic Technician - Instrumentation

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Modification Author: Graeme Watt (gdw)

JCMT Heterodyne Instrumentation Status

The current state of the JCMT heterodyne instruments, their availability on the telescope and their sensitivities and other observational parameters can always be located on the relevant pages within the JCMT World-Wide Web site:

RxA3

RxB3

RxW

DAS non-standard configs

Modification Author: Graeme Watt (gdw)

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 Lethbridge Fourier Transform Spectrometer

Further information is available on the web page at the University of Lethbridge at:

http://home.uleth.ca/phy/naylor/FTS.html

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Modification Author: Graeme Watt (gdw)

South Pole Imaging Fabry-Perot Interferometer (SPIFI)

SPIFI is a direct detection, imaging Fabry-Perot interferometer designed for use in the submillimeter band (200 to 650 microns), especially the 350 and 450 micron windows available to the JCMT. SPIFI's detector is a 5 x 5 element monolithic silicon bolometer array cooled to 60 mK in an adiabatic demagnetization refrigerator. SPIFI uses free standing metal mesh Fabry-Perot interferometers to deliver spectroscopic images at velocity resolutions up to 30 km/s over the entire array. The velocity resolution is continuously adjustable from 300 to 30 km/s in a few minutes time at the telescope. Higher velocity resolutions (better than 15 km/s) are possible for the inner 9 pixels. The Winston cones coupling radiation to SPIFI's bolometers have 6.1" (~ lambda/D at 450 microns) circular entrance apertures and are arranged on a 7.0' square grid, so that SPIFI images a 35" x 35" field of view at the diffraction limit of the JCMT telescope.

At present, SPIFI has 9 pixels operating, we plan to have the additional 16 pixels installed in September 1998. SPIFI has demonstrated background limited sensitivities in the lab that are equivalent to single side band receiver temperatures of ~ 400 K (5 pixels) and < 800 K (4 pixels) at 370 microns. This receiver temperature is not a function of the velocity resolution employed, and is only a soft function of the line wavelength from 300 to 500 microns. We estimate the best attainable receiver temperatures are ~ 100 K (SSB), and are working towards this goal with reasonable hope of success. At present, SPIFI can tune to any frequency in the 350 micron window, and continuously scan 13 spectral resolution elements at any given wavelength. It is also possible to set up in the 450 micron window. In the near future, we expect to be able to easily switch between the two windows while the instrument is cold. Important astrophysical lines in the 350 micron window include the 371 micron [CI] fine structure line, and the rotational transitions of CO (7-6) (372 micron), HCN (10-9 & 9-8) (338 & 376 microns), and HCO+(10-9 & 9-8) (336 & 374 microns).

Tau(225 GHz) (nepers)	Tau(809 GHz) (nepers)	Tsys (K)	TA*(rms) (K)
0.045	0.70	2060	0.013
0.030	0.40	1500	0.010
0.060	1.00	2800	0.018

Estimated 809 GHZ sensitivities of SPIFI per pixel on the JCMT in 1 hour of integration time, scanning 6 spectral resolution elements. For these estimates we have assumed the receptive efficiency of the telescope eta(tel) is 65%.

These sensitivities are calculated based on current lab measurements at a resolving power of 6000 (50 km/s). To scale to other resolving powers, notice that since Tsys is independent of the resolving power, TA* is proportional to R^1/2. For example, at a resolving power of 2,000 (150 km/s) TA* will be sqrt(2000/6000) = 0.58 times smaller (better) than the values in the table.

Note that our sensitivity is not yet optimized. On JCMT it is possible to reach sensitivities 2 or 3 times better than those above, and we are working towards this goal. Current best estimates will be posted on our Web page at the Cornell Astronomy Department Site:

http://astrosun.tn.cornell.edu/research/projects/spifi.html

SPIFI was developed at Cornell University under a NASA grant and is a collaborative venture between individuals at Cornell, Boston University and the SETI institute. It is our hope to achieve first light with SPIFI on the JCMT in early 1999, and our intent to make SPIFI available on loan to the JCMT for the foreseeable future. Our group welcomes scientific collaborations with other JCMT users. Please contact Prof. G. J. Stacey at Cornell University stacey@astrosun.tn.cornell.edu to arrange collaborative efforts.

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Short Baseline Interferometry

The current round of SBI experiments has now been concluded. There are not likely to be any further JCMT-CSO SBI sessions. Further interferometry developments await the arrival and commmissioning of an SMA antenna on Mauna Kea.

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Modification Author: Graeme Watt (gdw)

PATT Application Deadline

Deadlines for receipt of JCMT applications for semester 99B are:

for UK, Canadian, Netherlands and International applications:

31st March 1999

ALL applications have the same deadline.

Please read the next article - Special Notes for 99B Applicants before filling in your application forms for the forth-coming semester.

To ensure prompt processing, please ensure that your applications are sent to the correct establishment. Applications for JCMT time should be submitted to the national TAG of the Principal Investigator (PI) or, if the PI is not from one of the 3 partners, to the national TAG of the first named co- investigator on the application who is from one of the partners. International applications (those with no applicants from one of the partners) should be submitted to the PATT Secretariat at PPARC, Swindon. Members of the JAC staff in Hawaii count as International unless they are the PI on an application, when it should be forwarded to the appropriate national TAG.

Country paying salary of Principal Investigator

Canada	Netherlands	UK or International
Director-General's Office, National Research Council of Canada, 5071 West Saanich Road, Victoria, BC, CANADA V8X 4M6	Dr. J. M. van der Hulst, Kapteyn Astronomical Institute, Postbus 800, NL-9700 AV Groningen, NETHERLANDS	PATT Secretariat, PPARC, Polaris House, Swindon, SN2 1ET, UNITED KINGDOM

Modification Author: Graeme Watt (gdw)

Special Notes for 99B Applicants

The deadline for ALL applications for semester 99B (August 1st 1999 through January 31st 2000) is **31st March 1999**. All applications must arrive at their appropriate collection point by March 31st. These will be processed for the ITAC meeting to be held with the other PATT facilities in early June.

The Latex template application form can be downloaded from the JCMT homepage on the Web. An explanation of how to classify applications into UK, Canadian, Netherlands or International, the correct number of copies required, and the correct addresses of the collecting points can also be found on the Web. Electronic submissions for the Netherlands should be emailed to Groningen. Electronic submissions for Canada should be sent to HIA, Victoria. Electronic submissions for UK and International applications should go to the 'jcmtprop' account at the JAC. Please read here for further details.

INSTRUMENTS AVAILABLE

The current status of RxA3, RxB3, RxW, SCUBA and the SCUBA polarimeter can be found on the Web. These instruments will be available throughout the semester.

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Electronic Submission Update

Canadian and Netherlands Applications

HIA, Victoria and the University of Groningen respectively have the ability to accept electronic submissions. Please refer to local information about formats. Shortly after the PATT deadline all applications are FTP'ed to the JAC and combined with the UK and International applications.

UK and International Applications

1 - if you STILL do not wish to play with the electronic system, you may submit your hard copies through the usual route to PATT Secretariat in Swindon, UK. However, we would like to discourage this form of application. Usually you generate a postscript image anyway so it is much simpler to email that in instead of printing/copying/posting.

2 - the system is setup to attempt to spot duplicate entries or revised submissions. If you submit applications with identical PI, collaborators and title they will be treated as the same applications. The latest submission will over-write previous versions.

3 - to obtain the most recent JCMT application template, send an email to **jcmtprop@jach.hawaii.edu** with the phrase 'request templates' as the Subject. Any subsequent text in the email will be ignored. All neccessary files will be emailed back to you.

4 - complete the Latex template as instructed in the header section. There are only minor modifications to this template from the one that you have already been using. These changes are neccessary because, at some later date, we intend to automatically parse the returned file to generate the tables and files that the TAGs require.

5 - email the completed Latex template back to 'jcmtprop'. You are also required to submit a Postscript version of your application. Please append the postscript to the end of the Latex file since this makes it simpler to associate one with the other.

6 - Each submission will be automatically numbered and acknowledged and several people here will be informed of its arrival. We will process it as soon as possible and will only contact you if we encounter any difficulties with the printing or format.

7 - If you submit a revised version of the same application please follow the guidleines for completing the 'Subject' line. Otherwise this will lead to confused numbering.

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Modification Author: Graeme Watt (gdw)

PATT ITAC Report for Semester 99A

1. Introduction

This document details the allocations for telescope time made by the ITAC for the semester 99A (1st February 1999 - 31st July 1999).

2. Allocations

The individual partner TAGs hold meetings in their respective countries prior to the PATT session to assess applications deemed by the JCMT Board rule to be from their own country. At these meetings informal numbers of shifts are nominated for each application in a priority order. The Chairpersons of each TAG bring their respective lists to the PATT where the ITAC combine the awards, include discussion of the engineering and commissioning requirements, and assess the International applications. The final allocations of shifts are made by the ITAC.

Applications considered

UK status#	77
Canadian status#	48
Netherlands status	23
International status	24
University of Hawaii	9
TOTAL:	181

8 UK starred applications & 2 Canadian carry-overs have been included in this total.

The PATT meeting was held at the Falcon Hotel, Stratford, UK on 9th & 10th December 1998.

It should be noted that if the PI on an application is a JCMT staff member based in Hilo, then the application is assessed by the appropriate national TAG. However, by Board rule, International status is given to any application where the only named collaborator from any partner country is a JCMT staff member. International applications are assessed by the ITAC members at their meeting.

Time Available (in 16-hour nights)

No. of nights in semester 98B	181.0
Engineering & Commissioning	41.0
University of Hawaii (10%)	13.5
Director's discretionary use	4.0
Available for PATT science:	122.5

The above table indicates the order in which nights are removed from the total available for the semester. The table below indicates the allocations using the JCMT Board formula for attributing applications to countries.

Awards (in 16-hour nights)

UK status	54.3
Canadian status	23.6
Netherlands status	17.4

International status	27.2
University of Hawaii	13.5
TOTAL allocation:	136.0

3. Designated Service and/or Fallback time

Allocations for this semester are:

CDN = 4.0 shifts allocated;

NL = up to 24 hours set as Nlflex;

UK = up to 31 shifts in the UKflex fallback program;

INT = up to 24 hours as INTflex.

4. Non-standard Instrumentation

SPIFI (South Pole Imaging Fabry-perot Interferometer) is a new visiting instrument from the Cornell group. Destined for the South Pole towards the end of 1999, it is scheduled for installation in early April with several astronomical runs following during the last two weeks of the month. SPIFI will be located on the right-hand Nasmyth (opposite SCUBA).

The Canadian FTS system is a regular visitor. It is to be scheduled for several shifts in early June mornings. The FTS equipment will also be located on the right-hand Nasmyth once SPIFI has been removed.

Instrument distribution

A-band	12%
B-band	13%
C-band	4%
D-band	1%
FTS	1%
SPIFI	4%
SCUBA polarimeter	8%
SCUBA	57%

Both C- and D-band are combined in RxW. A-band is now observed using RxA3. B-band is observed using RxB3.

5. Applications with Long-Term Status

M/98B/C15 was extended for a further allocation of 8 shifts in 99A to continue the deep survey program on CFRS fields. M/98A/C40 was given an allocation of 1 shift in 99A to make further studies of the asteroid Pallas which were partially lost due to instrument problems in the earlier semester.

M/98B/N02 was extended for a further allocation of up to 3 shifts in 99A to complete their studies of high-z dusty starburst galaxies.

M/99A/U01 was given a further 4 shifts in 99B to continue the dusty disk observations conditional on detections from their 99A allocation. M/99A/U42, mapping of the star formation in the Perseus molecular cloud, was given a further 6 shifts in 99B conditional on maps from their 99A allocation. M/99A/U45, the UK 8mJy SCUBA/ISO survey, was given a further 8 shifts in 99B with 16 shifts spread over 00A/00B conditional on source identifications. M/98B/U30 was given a renewed further 5 shifts in 99B to complete observations of the Galactic Centre region. All of the above extensions are subject to satisfactory progress reports to the relevant TAGs from 99AB observations.

6. Short Baseline Interferometry

There will be no interferometry session during semester 99A.

7. Engineering & Commissioning

A significant period of time has been set aside in May to install a new central bearing on the antenna. This period of heavy engineering is extremely complicated and a further period of contingency has been attached in case of complications. Should the contingency not be required for E&C work, it will be distributed to PATT observing in the appropriate ratio.

Some shifts have been set aside for further commissioning of the heterodyne instruments. RxA3, although having completed its instrument commissioning, is in need of astronomical work such as beam maps/shapes and efficiency measures. It is possible that some new tunerless mixers may be available for installation later in the semester. RxB3 is also scheduled for a mixer upgrade to the tunerless variety in the latter part of the semester. The weather has not been too kind to the commissioning of the high-frequency instrument RxW and further shifts are required for that purpose. The D-band section of RxW is also due for a mixer upgrade in June.

The FTS requires a single setup shift to enable alignment and connections to be made on the Nasmyth platform prior to their observing time. For this semester the FTS run is preceded by a lengthy commissioning and observing run with SPIFI. More details of SPIFI will be available elsewhere.

In addition there is commissioning time for both SCUBA and for its imaging polarimeter. Several of the shifts from the previous semester, critical for complete commissioning of the instruments, have been lost due to poor weather.

A major upgrade is planned for SCUBA in July which necessitates taking the instrument out of service for almost the entire month. Whilst not requiring any E&C time at present, this period will require considerable careful planning to ensure sufficient heterodyne projects are available to keep the observatory operating. It may be appropriate to put out a call for heterodyne only applications sometime later in the semester to fill any gap.

The MPI group were offered 3 engineering shifts plus 2 DDT shifts to install and commission their single mixer 800 GHz system (E-band) but, having learned that they had not obtained PATT observing time in addition, they later declined the offer. They may apply again for semester 99B.

8. Fallback Programmes

A number of applications have been approved by the ITAC to be included in the schedule should the weather not be appropriate for the primary observations on any night. All applicants (allocated and fallback) have been requested to submit a completed template as soon as possible so their observations can be included on the queue system.

Applicants have again been notified that those with starred proposals who have not submitted a completed template by the end of the first month of the semester (28th February) will lose the starred status of the application.

9. The Flex Systems

There remains an outstanding 17.5 shifts of starred applications from semester 98B carried over into this semester. The UK TAG again set aside a total of 31 shifts designated as Ukflex. The intention is that each high-frequency allocation be extended by typically 50% using UKflex time, thus increasing the chance of obtaining suitable weather to complete the high-frequency program. Under weather conditions unsuitable for the high-frequency observing, the current observers or staff scientist would undertake observations from the UKflex list in a serviced mode and in the scientific priority ordering given by the UK TAG. Successful applicants on the UKflex fallback list have been informed that they have to submit complete templates for their observations but that there is no guarantee that any part of their program will be done during the semester.

A flexible system is already in operation by the Netherlands community. This works extremely effectively with all allocated projects being placed in a scientifically prioritised queue and flexed against all other projects in the queue.

The Canadian community began a flexibly queued scheme starting this semester. Although no shifts have explicitly been designated as Cnflex, there is a list of prioritised fallback projects, and an understanding that observers will perform fallback observations should the weather not be appropriate for their own project. There is as yet no mechanism for returning time to the observer at a later point in the semester.

The International queues are often difficult to flex due to their short nature. However considerable flexibility can be achieved by carefully abutting International shifts onto larger blocks from other partners.

From semester 99A onwards the University of Hawaii is operating its own completely flexible system with very little input from or to the JCMT staff. All observational details are kept by the UH applicants and the observations are all conducted by the JCMT Fellow who is present at the telescope for the duration of the requested blocks of time.

10. Electronic Submission

The current scheme continues to be improved. Within 48 hours of the deadline almost all UK, Canadian, Netherlands and International sets of applications were on-line at the JAC with 2 hardcopies produced. Only 2 applications remain in non-electronic form despite prompting. Less than 10 hardcopies were posted to Swindon, and all of these were later obtained in electronic postscript. The JCMT application template (PATT3) has been modified for use by ALL applicants so that all partners have a similar postscript format.

The UH applications do not conform to the electronic system and continue to be collected at the UH and posted to the JAC as hardcopy.

11. Procedures for Semester 99B

The deadline for semester 99B (1st August 1999 through 31st January 2000) applications is 31st March 1999 for ALL applicants. This deadline encompasses applications for all available instrumentation on the JCMT (RxA3, RxB3, RxW, SCUBA, and the SCUBA imaging polarimeter).

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Modification Author: Graeme Watt (gdw)

Weather and Fault Statistics for Semester 98A

The following tables present the weather loss and fault loss for semester 98A. A more detailed description of how these tables are created is also available here.

Month	Avail Hrs	Extend Hrs	Primary Loss	%	Backup Loss	%
February	424.0	58.5	21.0	5.0	15.5	3.7
March	496.0	29.8	12.7	2.6	10.5	2.1
April	480.0	40.3	21.0	4.4	18.5	3.9
May	495.5	22.8	59.3	12.0	19.3	3.9
June	480.0	10.0	67.5	14.1	12.5	2.6
July	496.0	11.3	66.3	13.4	40.3	8.1
Total	**2871.5**	**172.7**	**247.8**	**8.6**	**116.6**	**4.0**

Table 1: *JCMT weather statistics.*

Month	Avail	Total	ANT	INS	COMP	SOFT	CAR	OTH
February	424.0	19.1	2.2	9.4	1.7	4.7	1.1	0.0
March	496.0	18.6	9.8	0.9	4.4	3.3	0.0	0.3
April	480.0	8.3	0.1	3.3	0.5	4.3	0.1	0.0
May	495.5	11.6	3.5	3.8	0.5	0.3	0.0	3.5
June	480.0	53.0	2.5	39.4	3.0	7.1	0.0	1.0
July	496.0	16.1	0.3	5.5	5.3	4.9	0.3	0.0

P(hrs)	**2871.5**	**126.7**	18.4	62.3	15.4	24.6	1.5	4.8
B(hrs)		3.5	0.0	0.7	0.0	1.3	0.0	1.5

Table 2: *JCMT fault statistics. Wherever possible the faults are categorised into ANT = antenna; INS = instrument; COMP = computer hardware; SOFT = software; CAR = carousel; with the remainder going to OTH = other. The figures in the table may not appear to add up correctly due to rounding in the original program. P defines the time lost from Primary projects. The category B(hrs) is the time lost to Backup projects.*

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Modification Author: Graeme Watt (gdw)

Weather and Fault Statistics for Semester 98B

The following tables present the weather loss and fault loss for semester 98B. A more detailed description of how these tables are created is also available here.

Month	Avail Hrs	Extend Hrs	Primary Loss	%	Backup Loss	%
August	496.0	20.6	43.7	8.8	3.7	0.7
September	472.0	9.6	16.5	3.5	16.5	3.5
October	480.0	13.0	165.3	34.4	40.3	8.4
November	481.0	18.3	194.6	40.5	147.1	30.6
December	480.0	19.9	194.9	40.6	97.9	20.4
January	488.0	28.6	209.1	42.8	161.1	33.0
Total	**2897.0**	**110.0**	**824.1**	**28.4**	**466.6**	**16.1**

Table 1: *JCMT weather statistics.*

Month	Avail	Total	ANT	INS	COMP	SOFT	CAR	OTH
August	496.0	21.9	1.0	10.8	5.7	4.2	0.0	0.3
September	472.0	23.5	2.2	13.9	0.6	5.5	1.3	0.0
October	480.0	21.9	4.9	7.9	0.3	0.4	4.6	3.8
November	481.0	10.8	1.5	6.3	0.0	0.9	0.9	1.3
December	480.0	10.4	0.3	5.9	0.8	0.8	0.5	2.0
January	488.0	29.6	8.0	2.9	16.0	2.8	0.0	0.0

P(hrs)	**2897.0**	**118.1**	17.9	47.7	23.4	14.6	7.3	7.4
B(hrs)		10.9	0.5	1.7	1.7	2.9	3.8	0.5

Table 2: *JCMT fault statistics. Wherever possible the faults are categorised into ANT = antenna; INS = instrument; COMP = computer hardware; SOFT = software; CAR = carousel; with the remainder going to OTH = other. The figures in the table may not appear to add up correctly due to rounding in the original program. P defines the time lost from Primary projects. The category B(hrs) is the time lost to Backup projects.*

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Modification Author: Graeme Watt (gdw)

Derivation of Statistical Information

This note provides some explanation on the method of production of the weather and fault statistical summary for the performance of the JCMT. There is very little manual intervention in the generation of these tables, other than to correct obvious errors, mis-labelled categories, or to complete missing entries (where they ca n be found from other sources).

o The data are extracted from the reports completed by the telescope operators at the end of their shift, one report for each shift (evening or morning); the shifts are normally of 8 hours duration. Because the change-over of TOs does not occur on the shift boundaries, the shift information is handed over to the followi ng operator who will file the report at the end of shift.

o A completely separate fault reporting system is used by the TOs and other staff to record time lost to faults (including problems which have zero-time lost). This system is used by the staff to identify, trouble-shoot and solve the faults. Each fault s hould then have an appropriate solve report attached for future reference. This system is not used for generating statistics.

o Input from the TO reports comprises

- - the actual time scheduled (normally 8 hours);
- - any extension of this (normally due to good weather and lack of pressing daywork);
- - loss of time on primary and backup programs due to the weather.;

  (**NB** : in flexible observing mode, the move from a high-frequency primary program to a low-frequency primary program because of a deterioration of the weather conditions does not result in any entry in the 'loss to the primary program' category.
- - loss of time to primary and backup programs due to faults, divided into 6 categories : ANTenna, CARousel, INStruments, COMputer, SOFtware, and OTHer. These categorizations are performed by the TO at the time of filing and persist in the analysis, although suggested changes in categories are suggested by the notes to the analysis.

  (**NB** : faults are defined as being in respect of subsystems that have been commissioned are therefore expected to work flawlessly. If the instrument under commissioning has a fault, this is not recorded in the log.

  (**NB** : previous correlations between faults as reported in these TO reports and via the separate fault reporting system show high levels of completeness. A similar correlation is also found between the TO reports and any completed Observer Reports for the period.
- - automated retrieval of weather conditions for the shift in question. These are not analysed further and are not further correlated with the reported conditions.

o Electronic submission of each report automatically triggers the summary analysis program (AUTO_STATS) for the month and semester to date, and the statistics reported to the JCMT Board and in the Annual Report are essentially these results.

o The analysis performed by AUTO_STATS may be repeated following identification and correction of spurious entries, or significant errors in categorization.

o Occasionally reports are not filed on time, and missing reports can seldom be reconstructed.

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Modification Author: Graeme Watt (gdw)

Protostellar environments in the Orion region

The picture of the cover of this issue of the newsletter in taken from the publication by Johnstone and Bally (Astrophys. J., **510**, 49, 1999).

See article here

Modification Author: gdw
Graeme Watt (gdw)

JAC Internal Science Seminars

All visiting astronomers are encouraged to give scientific presentations to the JAC staff after their observing run. In addition, many of the JAC staff give presentation on their current research topics.

The seminars are organised by Gerald Moriarty-Schieven.

A list of those given to date this year and arranged for the future can be viewed here

Modification Author: gdw
Graeme Watt (gdw)

Points of Contact

Joint Astronomy Centre, 660 North A'ohoku Place, University Park, Hilo, Hawaii 96720, USA

```
Telephone:      +1-808-961 3756
(answerphone)   +1-808-935 4332

Fax:            +1-808-961 6516

e-mail:   jach.hawaii.edu
```

Mauna Kea

```
Hale Pohaku:    +1-808-935 7606

JCMT Carousel:  +1-808-935 0852

Fax in JCMT control room:  +1-808-935 5493
```

Distribution:

Information about new issues of the JCMT Newsletter is circulated to the community via the electronic distribution list held at the JAC, and also via the Canadian listserver. Anybody wishing to be placed on this mailing list should signup on the appropriate Web page.

Newsletter Editor:

Graeme Watt (at the JAC)

```
Telephone:  +1-808-969-6516

Fax:        +1-808-961-6516
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(please note the subtle difference in the two numbers above!!)

E-mail: **gdw@jach.hawaii.edu**

On-line Documentation:

All up-to-date information on the JCMT and instrumentation is maintained through links from the JCMT homepage at URL:

http://www.jach.hawaii.edu/JCMT/home.html

Service Observing:

Applications should be sent by e-mail to the following:

Canada	jcmtserv@hia.nrc.ca
Netherlands	vdhulst@astro.rug.nl
UK (& International)	jcmtprop@jach.hawaii.edu

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NEXT ISSUE DEADLINE

The absolute deadline for submission of science and/or technical articles for the next issue of this Newsletter is **31st July 1999**. All communications regarding this Newsletter should be sent via email to **gdw@jach.hawaii.edu**.

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Modification Author: Graeme Watt (gdw)

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*The JCMT Newsletter is the official publication of the James Clerk Maxwell Telescope. These issues are **ONLY** available on the World Wide Web. **There is no paper magazine that corresponds to these pages, although downloadable files are available in various formats.** This is taken to be a sign of the times, where most, if not all, of the readership has access to an internet terminal. It means that the information presented can be made more up-to-date. Notice that several of the articles now refer directly to other links on the Web both internal to JCMT and on the odd occasion to external sites. It also means that the rapidly dwindling cash supply available for printing booklets can be channeled into other worthy causes.*

Contributions are solicited from recent observers, instrument builders and from the staff at the Joint Astronomy Centre.

Articles for The JCMT Newsletter may be submitted to the Editor at any time. Please take note of deadlines for specific issues. Even an electronic magazine takes a finite amount of time to format appropriately. If you wish to make any comments on the articles, please contact the authors. If you have any comments concerning the Newsletter itself, format and/or content, then please contact the Editor.

*The JCMT Newsletter is **NOT** a refereed journal but remains as the voice of the JCMT User community. It is appropriate that the content clearly reflect the state of the observatory, the availability of the instrumentation, and the quality of scientific output obtained. The former two features can be completed by the JCMT staff whilst the latter is primarily up to the user (and reader). Please contribute to your newsletter.*

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Thank you for taking the time to read this Newsletter.

Graeme Watt,

Editor

Modification Author: Graeme Watt (gdw)