

**To:** ATUC  
**From:** Philip Edwards  
**Date:** 2 June 2006  
**Subject:** ATCA/Mopra operations report

### Narrabri Staff

Since the last ATUC meeting Bob Sault, Ravi Subrahmanyam, Lakshmi Saripalli, John Giovannis and Maxim Voronkov have been farewelled from the Observatory, and John Wilson, Brett Lennon, and Dion Lewis have been welcomed to Narrabri. I would personally like to thank all staff for giving my family and me a very warm welcome and helping us settle in quickly. The efforts all staff, and of Brett Hiscock (Acting OIC), Mark Wieringa (Scheduling) and Robin Wark (On-site support) in particular, in recent months have been commendable.

### ATCA Systems

The last ATUC report mentioned two problems that had been experienced with the 12mm receivers: moisture condensing on the dewar window, and an ice build-up in the dewar. A dry air system has been trialled successfully on one antenna to circumvent the first problem and it is now being extended to all antennas. The build-up of ice in the dewar requires a modification which is planned to take place when the receivers are taken off the antennas for the 7mm installation. In the interim, receivers displaying this problem have been warmed as a temporary solution.

The mm observing season started on April 20th. The weather has, thus far, been good, but several niggling instrumental problems have arisen. CA05 has a notably higher  $T_{\text{sys}}$  and lower gain than the other four antennas. Testing to isolate the problem is underway: if needs be, there is a two week period toward the end of June with no mm observing scheduled during which the receiver can be removed and worked on.

CA01 and, to a lesser extent, CA02, have had occasional recurrences of the azimuth oscillation problem seen last year. The drive systems are complex feedback systems and the regular checking and adjustment has not been able to eliminate this problem. A more detailed monitoring of the interplay between the feedback loops involved in the drive systems is underway.

Difficulties were encountered obtaining a good baseline solution for the recent H214 array. Tony Wong worked on this during his recent stint as DA and found that a recurrence of the "wrap dependent phase" issue for CA04 and CA05 was the main cause, and that obtaining baseline solutions at 24 GHz minimizes the problems encountered at lower frequencies.

Synchronisers have now been installed on the Generators of CA01–05 with the installation of CA06 and Mopra to occur in July. These units will allow the generators to synchronise with mains power and will allow a seamless transfer of power to and from the generator. This will negate the need to interrupt observing when switching between power sources and will provide improved monitoring of the antenna power systems.

### CloudSat

The CloudSat satellite was launched on 28 April 2006 and is in a near-polar orbit at 705 km altitude with a 99-minute period. It carries a pulsed, 1.8 kW, narrow-band, 94.05 GHz radar feeding a nadir-pointing (downward-looking), high-gain, off-axis parabolic antenna. Switch on of the CloudSat radar is planned for June 2nd. Calculations indicate that there should be little impact on observations

unless the satellite passes directly overhead while the mm receivers are on axis and the telescope at zenith. The Antenna Control Computers (ACCs) have been modified and will now not let the telescopes be parked with the mm systems on axis. This may be extended so that the telescopes cannot be stowed with the mm systems on axis either. Dave Brodrick has set up a script that will warn us of upcoming passes within (currently) 5 degrees of zenith so that we can ensure mm observers are not tracking near zenith at these times.

### On-line systems

The transitions from VMS-based to Linux-based systems at the ATCA and Mopra are almost complete. A disk crash on ellen, the main linux computer, resulted in a reversion to the VMS system for several days in May. A back-up for ellen is being purchased.

### 7mm upgrade

It is planned to install the prototype 7mm system on antenna 6 in July, and this should be able to be carried out with little impact on observers. The full installation will be carried out over the first four months of next year and, as noted in the recent announcement of opportunity, some impact on observing is unavoidable: 12mm observing will not be possible in the first four months of next year, and there will be several periods of a week or so in which only 4 antennas will be available.

### Configurations

The configuration cycle described in the previous ATUC report and in last October's ATNF news is being followed for the next semester. This cycle does not include an H75 configuration in the October semester, however Jürgen Ott noted that as the April semester ends with an H75 array, it will be possible to accommodate proposals requesting this array. H75 is an important configuration for mm observers requiring short baseline data for calibration purposes.

### Mopra issues

A lightning strike at Mopra in January damaged a broad range of systems. Repairs were completed in time for the first observations at the end of April. The VLBI run in mid-May coincided with first light for the new 12mm system at Mopra. Measurements of  $T_{\text{sys}}$  across the band indicate the system is working well. A linear to circular polarisation conversion unit was also installed for the VLBI observations.

It had been anticipated that, starting with this observing season, observations with the Mopra telescope would be able to be conducted remotely from Narrabri. However, the agreement providing access to the optical fibres linking the ATNF sites have not yet been signed, and so we are not yet able to offer this. As it is unclear what timescale this will be resolved on, observers have been advised to continue planning to travel to Mopra for observing.

For a combination of several reasons, the Mopra Induction Weekend for this year was cancelled, however observers have been assured that Dion Lewis, the new Mopra Operations Scientist, will be available to provide all the necessary observer support. Observers have been encouraged to arrive a day or two before their observations to become familiar with the new hardware and software systems, and to coordinate travel plans with Dion as far in advance as possible so that he is able to provide the best possible support.

The MOPS installation is described in Warwick Wilson's report, and Warwick and his team are

to be congratulated for providing this fantastic new capability.

### Infrastructure

The design of the major refurbishment/extension of the Narrabri Control Building is nearing completion with the tender documents due for completion later this month. The planned building incorporates improved RFI shielding and a number of environmentally friendly design aspects and will provide a safer, more comfortable, and more efficient facility for staff and observers.

### Outreach

The installation of new panels and displays at the Narrabri Visitors Centre has been completed and an opening ceremony for the redeveloped Centre will take place during the Narrabri Observatory Open Day on July 29th. Efforts are underway to bring a number of the displays inside the centre up-to-date before then too. There have been four visits to the Observatory in recent months from film crews, and segments with Ernie Dingo and Mike Whitney went to air in late April.