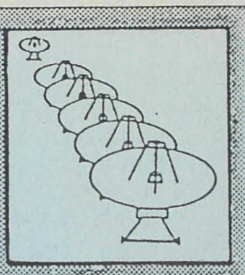
AT NEWSLETTER
The Australia Telescope
CSIRO
Number 9 September 1988



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FOCUS CHANGE FOR AT NEWSLETTER

The AT Newsletter was introduced in 1982 to keep the public au fait with the design and construction of the Australia Telescope. The formal 'Opening' of the Telescope is now behind us, and with the distribution of this edition the Newsletter will have fullfilled its original role. Future issues will be be primarily concerned with AT operations, and will aim to provide topical information for intending users of the facility. Because the Newsletter will change its direction, those people interested in receiving future issues are requested to contact the AT Newsletter Editor, at CSIRO Division of Radiophysics, PO Box 76, Epping, NSW 2121 (phone: (02) 8680300).

FORMER VLA HEAD TO DIRECT AT

In February this years Dr Ron Ekers returned to Australia after a long absence to become the Foundation Director of the Australia Telescope. He brings with him a considerable expertise in image processing and concepts of synthesis telescopes.

Ron left Australia in 1967 on completion of a PhD at the Australian National University and in the following years held positions at California Institute of Technology, Institute of Theoretical Astronomy in Cambridge, Kapteyn Laboratory in Groningen, and the US National Radio Astronomy Observatory. Associated with the last institute from 1980 until his Australian appointment, he was the Director of the Very Large Array (VLA) near Socorro, New Mexico.

Ron has been a member of the AT Advisory Committee since 1983. However, his involvement goes back further - he was amongst a group of scientists who in the early 70's began to push for a new synthesis radio telescope in Australia.

OFFICIAL OPENING OF AT

A large gathering of around 800 people attended the Paul Wild Observatory on 2nd September 1988 for the official Opening of the Australia Telescope by the Prime Minister. The ceremony, performed in blustery conditions near the array of new antennas, began with Prime Minister and Mrs Hawke driving to the dias aboard one of the antennas. CSIRO Chairman Neville Wran opened the proceedings with a general welcome, and Dr Bob Frater, Director of the AT construction, noted that the project provided both a high local content and a potential for significant industrial spinoffs : "Prime Minister, we've delivered!". Following a speech by Barry Jones, Minister for Science, Customs and Small Business, the Prime Minister remarked that the new telscope would keep Australia at the forefront of radio astronomy research, and 'opened' the AT by pressing a button which caused three of the antennas to 'bow'. CSIRO's Chief Executive Keith Boardman closed the ceremony by inviting the Official Party to inspect the antennas. Following a general inspection of the antennas and supporting facilities all attendees lunched in a huge marquee.

The gathering included political and industrial representatives, astronomers and families who had attended the Narrabri Annual General Meeting of the Astronomical Society of Australia during that week, several astronomers from overseas, CSIRO representatives, and media people. Three buses were chartered to transport members of CSIRO's Division of Radiophysics to the site.

AT OPENS DOORS TO PUBLIC

Several major telescope sites in NSW were opened to the public during the long weekend holiday at the beginning of October 1988. These included two AT sites - the Compact Array at Culgoora and the 64-m radio telescope near Parkes. During the three days many visitors flocked to the two sites. At Narrabri up to 300 people each day inspected and rode on the new 22-m antennas, looked at a poster exhibition on the AT, and were shown over the workshops and laboratories by both local and Epping staff members. The Parkes Observatory was visited by a total of around 2000 people, and local and Epping staff showed

Prime Minister Hawke 'opening' the Australia Telescope at Culgoora

these people the telescope and associated things of interest. It was noted that one of the most enthusiastic tour guides was none other than the AT Director. The Visitors Centre was well-patronized, and offered special talks by several radio astronomers.

AT ADVISORY COMMITTEE BOWS OUT

On 5th September 1988, just after the formal opening of the Australia Telescope, the AT Advisory Committee held its 16th and final meeting. This committee had been formed in 1982 under the Chairmanship of Dr Bob Frater (at that time Chief of the Division of Radiophysics) to steer the AT construction. It was composed of scientists from Radiophysics, from other Australian institutions, and from overseas. It will now be replaced by a

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steering committee to guide the operation of the AT as a National Facility. The members of this new group will be appointed by the Minister for Science, Customs, and Small Business, and will report to the CSIRO Board.

RELATIONSHIP BETWEEN AT AND RP

A difficult task is underway to provide an Australia Telescope management structure separate from that of CSIRO's Division of Radiophysics. Whereas RP has had the responsibility for AT design and construction, it will now act as a host for the AT which will operate as a National Facility under the guidance of a government-appointed steering committee. On 1st July 1987 the Parkes radio telescope was officially incorporated into the AT. A second step occurred on 1st July 1988, when the AT took over the RP Astrophysics Group. This caused few problems; some Group members have also retained roles within RP. John Brooks, the AT Project Manager since 1982, is a prime example; he is now the Engineering Manager for both the AT and RP. Regarding site management Dave Cooke and Graham Nelson have been appointed Officers-in-Charge at the Parkes Observatory and Paul Wild Observatory. Discussions are now underway firstly to complete the process and provide the AT with independent CSIRO Divisional status as from 1st January 1989, and secondly to form an appropriate steering committee. A complete separation is neither practicable nor desirable and some of the Epping resources will be shared - the library, general administration, workshop, photolab, publicity group, publications etc. In addition, it is very important to maintain contact between the AT and RP engineering groups.

FIRST FRINGES AT CULGOORA

The first AT correlated signals ('fringes') from a cosmic radio source were detected on 23rd August 1988 using two of the 22-m antennas of the Compact Array. The 6-cm receiving system was used initially; the success was later repeated with the 3 cm system. Not only were fringes detected, but their movement could be stopped with the new phase rotator instrumentation. Similar tests involving three antennas will take place early in 1989.

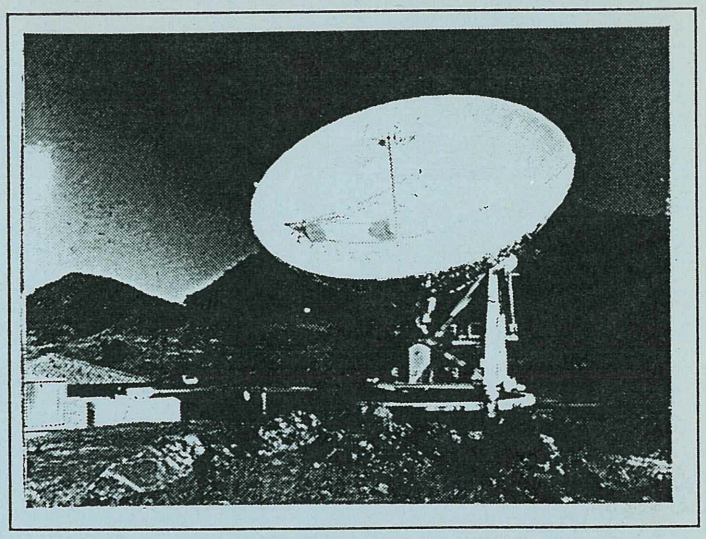
LINKS FOR LBA

The mode of linking the Long Baseline Array sites have yet to be finalised. In the long run the observations at each site will be recorded on magnetic tape systems similar to those to be used on the US Very Long Baseline Array. However, there have been considerable delays in the final design of these units, and it may be necessary to begin LBA operation with the simpler narrowband Mark II recorders that have been well-tested on VLBI networks. For the provision of time and frequency reference signals at the LBA sites, the first tests have just been completed using transmissions via the communications satellite AUSSAT. The results indicate that a phase stability can be attained comparable to that using hydrogen maser clocks.

PTI SUCCESSES

The Parkes-Tidbinbilla Interferometer was set up in 1985 primarily to test techniques intended for the AT; these included antenna control and calibration software. It consists of the Parkes 64-m antenna and either the 70-m or 34-m antenna of NASA's Canberra Deep Space Communication Complex at Tidbinbilla. This provides a 275 km baseline. The Tidbinbilla signals are sent to Parkes over a microwave link and processed with the Parkes signals in the 1024-channel digital correlator.

Aside from the testing, the PTI has been used by several groups (both from Radiophysics and elsewhere) for some important radioastronomical research. At the frequencies of 1.6, 2.3 and 8.4 GHz, continuum studies have been made of the nuclei of normal and infrared galaxies, radio stars, flat-spectrum radio sources, and pulsar proper motions. Spectral-line observations have been obtained of 1.6 GHz hydroxyl masers and 12.2 GHz methanol masers.



The new 22 m wheel-on-track antenna at the Mopra site near Siding Spring mountain.

COMMENCEMENT OF AT OBSERVING

The Australia Telescope construction is about one year behind the original schedule. By May 1989 all five antennas of the Compact Array should be fitted out with 6/3 cm receiving systems. By the end of 1989, all AT antennas should be fitted out with these plus 20/13 cm systems. It is anticipated that the first observing proposals will be requested during the second half of 1989. Wideband VLBA taperecorders will not be available on the LBA until later.

Radioastronomical observations on the Parkes antenna will be severely restricted during 1989. From the beginning of March until the end of August NASA will be using the antenna to support the Voyager-Neptune encounter on 24th August 1989.

UNTIMELY LOSSES

A major setback in computing support for the Australia Telescope occurred on 13th September 1987 when Paul Rayner was tragically killed in a road accident. Known worldwide for his technical ability, as the leader of the Computing Group in Radiophysics his advice had been often sought and followed during the design of software for the AT and in the selection of its computer hardware.

Friends of Max Komesaroff were saddened to hear of his death on 20th May 1988. Retired at the time, Max had spent 35 years with Radiophysics. Although not formally associated with the AT construction project, he was greatly concerned about the capability of the AT to accurately measure polarization, and his insight provided unique contributions to the AT design. For instance, it greatly influenced the decision to adopt linearly-polarized feed systems.

AT PRIZE FOR SCIENCE AND TECHNOLOGY

The first Australia Telescope prize for Science and Technology at Narrabri High School has been awarded to Year 12 student Craig Tindal. The award was on the basis of outstanding performance in Chemistry, Physics and Engineering Science. Craig not only performed well in his other subjects, but also found time to participate in a number of extra-curricular activities.