AT NEWSLETTER
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APPOINTMENTS

Since our last issue a number of internal appointments have been made to the AT Project office:

Project Manager	- John Brooks
Project Scientist	Rick Forster
Project Secretary	John Whiteoak
Public Relations	Andrew Pik
Steno-Secretary	Val Petro
Antenna Manager	Dennis Cooper
Section Head - Receiver System	- Mal Sinclair
Consultant (part time)	Alec Little
Special Projects	Kelvin Wellington

In addition various technical and research staff have been or are in the process of being appointed.

AT SYMPOSIUM

An all-day symposium on the AT took place at Epping on Wednesday 16 March. The symposium was held to present the AT Advisory Committee and staff of the Division with the current design concepts for the telescope. Speakers (and topics) included Bob Frater (introduction), John Brooks (project management), Dick Manchester (scientific objectives), Rick Forster (overview of proposed instrumentation), Dennis Cooper (antenna elements), Mal Sinclair (receivers), Alec Little (signal distribution), Jon Ables (digitization and correlation) and Bob Frater (on- and off-line computing).

The proceedings have been recorded on video and will serve in the orientation program for new staff appointees. The presentation will form the basis of a submission to the Parliamentary Public Works Committee. The bulk of the material will also be reproduced as an AT Memoranda Series document.

STUDY TOUR

Following their tour of European observatories and institutions in December 1982, Dennis Cooper and Nicholas Guoth (Macdonald Wagner and Priddle) will visit institutions in Japan and the USA during April to study current overseas antenna and servo system design practice.

At the same time John Brooks and Mal Sinclair will acquaint themselves with USA experience on cryogenics, receivers and electronics. Their tour will include visits to Berkeley, Caltech, Socorro, Charlottesville, Green Bank, Boston, Tucson and JPL.

CONFIGURATION STUDIES

Considerable progress has been made in studies of possible configurations for the AT. The overall layout is shown in Figure 1. For the compact (6km) array at Culgoora a multiple-day low redundancy observing scheme, based on five antennas and 25 stations on the 3km track and one antenna and two stations on a short (60-m) length of track at the 6km point, has been developed. For a basic 20-m spacing increment and the 6km antenna fixed, this scheme has zero redundancy after five days (i.e. 50 spacings in the 0 - 3km zone and 25 in the 3 - 6km zone) and only 10% redundancy in the 0 - 3km zone after 10 days. To avoid redundancy in the 3 - 6km zone after five days the 6km antenna must be moved to its other station. Other schemes involving non-uniform spacing increments and deliberate redundancy are still under investigation.

Because of high cost and likely operational problems the concept of a movable antenna to extend both the compact and long baseline arrays has been dropped. It is hoped that it will be possible to provide at some later stage, perhaps two low-cost fixed antennas operating to ~10 GHz instead of the movable antenna.

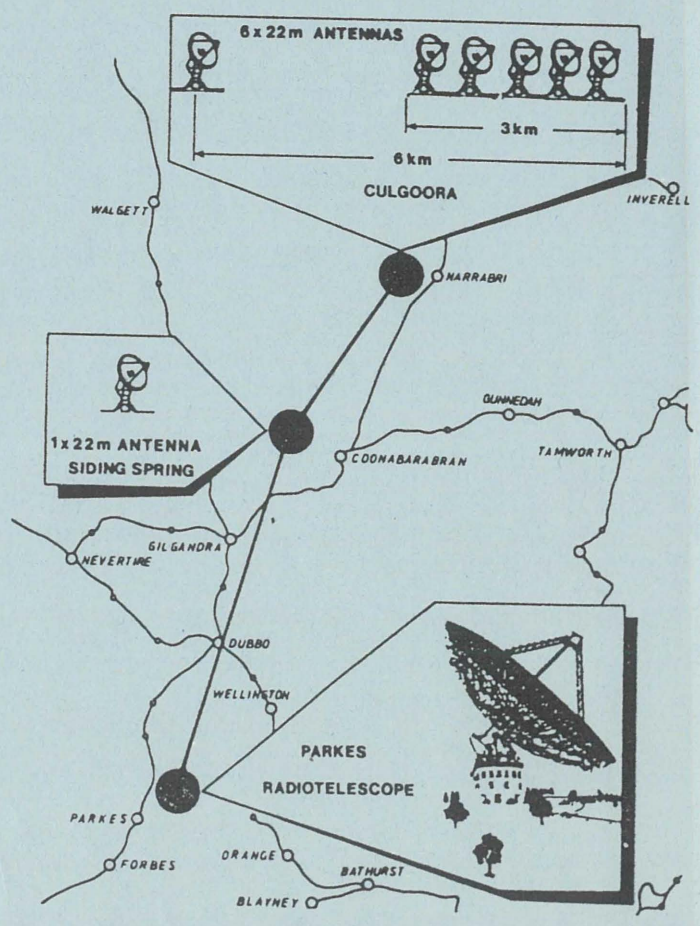

Figure 1 - overall layout

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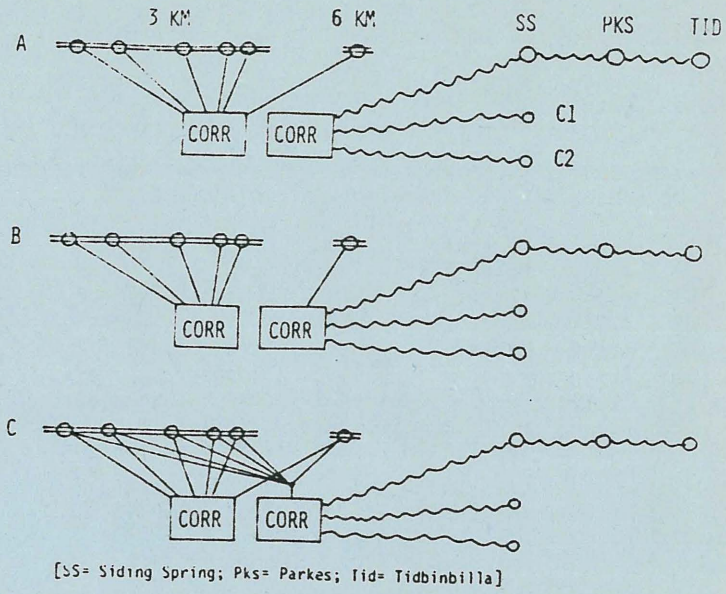
Configuration Studies (cont..)

It is most likely that these antennas will be used to provide additional spacings for the long baseline array (LBA). Simulation studies have shown that most benefit is obtained by placing them in the general area between Culgoora and Siding Spring.

Possible operating modes are shown in figure 2. Antennas of the compact array are linked to the correlation system, most probably by optical fibre. Four IFs per antenna, each of bandwidth at least 128 MHz, will be provided. It is currently proposed to use real-time radio links providing two 10 MHz IFs per antenna together with LO and control data for the LBA. In Mode A all baselines from the compact array are correlated and, separately, baselines of the LBA excluding Culgoora. Although two separate correlators are shown in figure 2, in practice these would be simply sections of a single correlation system. In Mode B one of the elements of the compact array joins the LBA and the remainder of the compact array operates independently. This will be a useful mode when the compact array is operating in its 3 or 1.5km configurations. In Mode C the compact array operates as in Mode A and simultaneously as a tied array as part of the LBA. In this case, of course, both arrays must observe the same field.



[SS= Siding Spring; Pks= Parkes; Tid= Tidbinbilla]

Figure 2 - operating modes

Proposed frequency bands for the AT are shown in the table following:

PROPOSED FREQUENCY BANDS

BAND	FREQUENCY LIMITS (GHz)	MAIN OBJECTIVES
408 MHz	0.405 - 0.425	continuum
L	1.24 - 1.75	HI, OH, continuum
S	2.20 - 2.70	continuum, VLBI
C	4.50 - 6.10	H_2CO, continuum
X	8.30 - 10.8	continuum, VLBI
K	21.0 - 25.5	H_2O, NH_3,continuum

It is hoped that L and S bands will be available simultaneously, similarly C and X-bands and S and X bands. Current designs for the AT antennas have all feeds, except for 408 MHz, at the secondary focus. All feeds will be dual polarization and on-axis; wide-band feeds are envisaged for the L/S and C/X combinations with the S/X combination being provided by a dichroic reflector system. Depending on experience at 10 and 22 GHz, receivers at 45 and 115 GHz may be fitted at later dates.