SOME POSSIBLE OPERATING SCENARIOS FOR THE AUSTRALIA TELESCOPE

An important question for the Australia Telescope (AT) is finding the best location for the control centre and data processing centre. This question must be answered early in the design phase of the AT because it will impact the design of data links and building sizes, and because it will significantly affect long-term plans for staffing levels at the various Radiophysics Division sites. Here we consider the advantages and disadvantages of four possible operating scenarios for the AT. We have included those factors which have proven important to the operation of the Westerbork and VLA Synthesis Telescopes. We consider the location of three parts of the AT. The *Real-time Correlator* we define to be the correlator which handles (in real time) the five synthesis telescopes plus Siding Spring and Parkes. The *Control Centre* we define to be the continuously manned control room from which all seven telescopes listed above are controlled and monitored and have their maintenance initiated. The *Processing Facility* we define to be the location of the VLBI tape-input-correlator and the location of the group of people responsible for operating the VLBI correlator and converting raw fringe data from both the real-time and VLBI arrays to fully calibrated UV-data.

The lists of advantages and disadvantages are arranged approximately according to order of importance. We recommend that the two most attractive of these scenarios be selected by a committee of Radiophysics Division personnel and then costed in detail from the points of view of impact on the construction budget, the operating cost and the need to relocate Radiophysics employees between the various sites.

Scenario 1 : Real-time Correlator, Control Centre and Processing Facility - all at Culgoora.

Advantages	Disadvantages
1. All outputs from the array monitoring system and processing facility immediately available to initiate maintenance of the hardware. Very important in early trouble-shooting years.	1. A separate operator must be provided for Parkes.
2. Very good communication between the telescope operators and the engineers and technicians who maintain the hardware.	2. No support in the area of instrument quality control will be available from the Epping scientific staff.
3. Telescope operator is available for emergency hardware repair during after-hours shifts.	3. A large number of good technical people must be induced to relocate to Narrabri.
4. One group of digital experts can work on both the real-time and VLBI correlators.	4. High travel costs if the users wish to visit the processing centre for special experiments.
5. A larger "critical-mass" of personnel will make it easier to attract good people to Culgoora.	5. Computer maintenance difficult to obtain in remote location.
	6. Poor communications between the users and the data processing personnel.
	7. VLBI tape shipping to the processing facility inconvenient.

Scenario 2 : Real-time Correlator and Control Centre at Culgoora, Processing Facility at Epping.

Advantages	Disadvantages
1. The Epping scientific staff can play a useful support role in data quality control.	1. Output from the processing facility not conveniently available as a trouble-shooting aid.
2. Computer maintenance for the processing facility readily available.	2. A separate operator must be provided for Parkes.
3. Good communication between users and the processing facility.	3. No opportunity for face-to-face communication between the instrument maintainers and developers and the data processors who are most familiar with data quality.
4. VLBI tape shipping to the processing facility convenient.	4. Means of transport for correlator data must be provided from Culgoora to Epping.
5. Good communication between the array operators and the engineers and technicians who maintain the hardware.	5. Two groups of digital experts are needed: one for real-time correlator and one for VLBI correlator.
6. Telescope operator is available for emergency hardware repair during after-hours shifts.	6. Additional software and display devices needed to make raw correlator amplitude and phase data available to maintenance people at Culgoora.

Scenario 3 : Real-time Correlator at Culgoora,
Control Centre and Processing Facility at Parkes.

Advantages	Disadvantages
1. Only one set of telescope operators needed.	1. Poor communication between the telescope operators and the engineers and technicians who maintain the Culgoora array and Siding Spring.
2. Less people already on Radiophysics payroll need to be relocated.	2. An additional monitor information display system must be provided at Culgoora for trouble-shooting.
3. VLBI tape shipping to the processor is more convenient than Culgoora but less convenient than Epping.	3. Output from the Processing Facility not available as trouble-shooting aid.
	4. Data paths for control data from Parkes to Culgoora and monitor and correlator data from Culgoora to Parkes are needed.
	5. Additional software and display devices needed to make raw correlator amplitude and phase data available to Culgoora maintenance people.
	6. Two groups of digital experts are needed: one for the real-time correlator and one for the VLBI correlator.
	7. Little opportunity for face-to-face communication between the instrument maintainers and developers and the data processors who are most familiar with data quality.
	8. Telescope operator not available for emergency hardware maintenance.
	9. Scientific staff at Epping can not contribute instrument support.

Scenario 4 : Real-time Correlator at Culgoora,
Control Centre at Parkes,
Processing Facility at Epping.

Advantages	Disadvantages
1. Only one set of telescope operators are needed.	1. The instrument is disjointed. Many communication problems between the different parts.
2. The Epping scientific staff can play a useful support role in data quality control.	2. Poor communication between the telescope operators and the engineers and technicians who maintain the Culgoora array and Siding Spring.
3. Probably needs least relocation of Radiophysics personnel.	3. Output from monitoring system and processing facility not available as trouble-shooting aids.
4. Computer maintenace for the processing facility readily available.	4. Additional software and display devices needed to make raw correlator amplitude and phase data available to Culgoora maintenance people.
5. VLBI tape shipping to the processing facility convenient.	5. No opportunity for face-to-face communication between the instrument maintainers and developers & the data processors who are most familiar with data quality.
	6. Data paths for control data from Parkes to Culgoora, monitor data from Culgoora to Parkes needed as well as a means of transport for correlator data from Culgoora to Epping.
	7. Two groups of digital experts are needed: one for real-time correlator and one for VLBI correlator.
	8. Telescope operator not available for emergency hardware maint.