AT 39.2/019

Array Configurations and Length of Scheduling Period

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In the light of the budgetary problems now facing the AT it is timely to look at potential cost savings from less frequent array reconfiguration and from increasing the scheduling period from four to six months.

Cost savings come in at least three currencies: -

(i) Actual dollars saved ($$)

(ii) Staff time saved that can be used on other tasks. ($ Staff)
One staff day = $ Staff 100 - 400

(iii) Additional astronomy done if the array is operational for a larger fraction of the time. ($ Astro). Based on the Narrabri component of the cost of running the Compact Array, one array day ~ $ Astro $10,000. (The cost is much greater if Epping costs are also included).

Although all of these are real dollars it would nevertheless be misleading to simply sum them so I have kept them separate in the following:

Cost of Reconfigurations

Each reconfiguration uses about 15 person days and costs 2 1/2 days of observing time. If reconfiguration takes place out of normal working hours some overtime costs are also incurred.

On average each reconfiguration costs:

$200 + $ Staff 3000 + $ Astro 25000

Cost of each Time Assignment and Scheduling Process

Travel & Accommodation	$2000
Printing	$4700
Postage	$1300
	$8000

TAC Meeting & Preparations	$ Staff 6000
Scheduling Process	$ Staff 2000
Call for Proposals, preparation & distribution	$ Staff 4000
Schedule preparation and distribution	$ Staff 4000
	$ Staff 16000

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A.T.N.F.	Action	cc
R. D. EKERS		X
J. W. BROOKS		
J. B. WHITEOAK		X
P. J. HOWSON		
R. P. NORRIS		
R. Sreenan		X

Clearly important operational cost savings can be made by either lengthening the scheduling period or decreasing the number of reconfigurations or both. For all of these alternatives the configuration sequences have to be different to those currently in use. In devising the new configuration sequences below I have also added the criteria that a particular configuration should not always occur at the same time of year. Solar interference or good phase stability require particular sources to be observed at night or in winter. This is not possible for some sources and some configurations in the present system.

Present Sequence with 4 monthly Scheduling

4 monthly schedule
21 reconfigurations/year
1 year cycle

	6A	6B	6C	6D	1.5A	1.5B	1.5C	1.5D	750A	750B	750C	750D	375
Term 1	x	x	x		x		x		x				x
Term 2	x		x	x		x	x	x		x			x
Term 3	x		x	x		x		x			x	x	x

Alternate Sequence with 4 monthly Scheduling

4 monthly schedule
21 reconfigurations/year
2 year cycle

	6A	6B	6C	6D	1.5A	1.5B	1.5C	1.5D	750A	750B	750C	750D	375
Term 11	x	x	x		x	x			x		x		x
Term 12	x		x	x			x	x		x		x	x
Term 13	x	x	x		x	x	x		x		x		x
Term 21	x		x	x			x	x		x		x	x
Term 22	x	x	x		x	x			x				x
Term 23	x		x	x			x	x		x		x	x

Proposed Sequence with 6 monthly Scheduling

6 monthly schedule
14 reconfigurations/year
2 year cycle

	6A	6B	6C	6D	1.5A	1.5B	1.5C	1.5D	750A	750B	750C	750D	375
Semester 11	x	x	x		x	x			x		x		x
Semester 12	x		x	x			x	x		x		x	x
Semester 21	x		x	x			x	x		x		x	x
Semester 22	x	x	x		x	x			x		x		x

Recommendation

Based on the significant resource savings to the organisation, I recommend the configuration sequence with six monthly scheduling and a two year cycle.

The annual saving of this scheme relative to either of the four monthly scheduling schemes is:

$9400 + $ Staff 37000 + $ Astro 175000