Parkes Future Receiver Discussions

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Parkes Receivers Interim (2012 - 2014?)

Need to address anticipated receiver usage

- Group of Astros met in May to brainstorm future projects
- Assume current instrumentation

Frequency	Receiver	Remotely Operable?	Perform. 1=poor, 5=good	Reliability 1=poor, 5=good	Usage (last 3 yr)
1.2–1.6 GHz	MB-20	Y	5	5	54.4 %
700–764 MHz 2.6–3.6 GHz	10/50 cm	Y	5	5	16.4 %
1.2–1.8 GHz	H-OH	Almost[2,3]	5	5	5.5 % (now ~1%)
2.2–2.5 GHz	GALILEO	Almost[2,3]	5	5	4.6 % (now ~1%)
6.0–6.7 GHz	Methanol 6	Almost[2,3]	3	3	2.4 %
8.1–8.5 GHz	MARS	Almost[3]	5	5	2.4 %
2.3+8.5GHz (S/X) 5 GHz (C)	Multi band (S/X,C)	Almost[2,3]	2	2	1.4 %
12–15 GHz	Ku	Almost[2,3]	2/3	3-	0.4 %
16–26 GHz	13 mm	Y	5	4	4.3 %

Fig 1, from Carretti & Bock report Feb 2012

Known Current/Future Projects

Considered:

- On-going large projects
- Known future large projects
- Major possible projects
- Smaller possible projects
- VLBI requiring Parkes

PROJECT	RECEIVER(S)	TIME ESTIMATES
Major	*Known*	*Projects*
Pulsar Timing	10/50 & H-OH	1000's
SPLASH OH Galactic Plane	H-OH	2000
HIRTUN (finishing)	Multibeam	500
Major	*Planned*	*Projects*
Deep HI mapping	Multibeam/ HIPSR	1000's

Future Project Brainstorming

PROJECT	RECEIVER(S)	TIME ESTIMATES
Major Possible Projects		
HII Recomb Discovery	Mars (8 GHz)	1000
Methanol Absorption	Ku (12 GHz)	1000
Ammonia Galactic Plane (?)	22 GHz	1000's
GMIMS Hi-band (?)	DRAO	500
Smaller Possible		
LUNASKA	Multibeam	100's
CH Mapping Galactic Centre	10/50	100's
Galaxy Clusters continuum	H-OH, 10cm (Galileo)	
Anomalous Dust emission	8 - 20 GHz	100's
Transient 2 dish follow-up	?	?
Pulsars at GC (if found) timing?	20 GHz	100's
VLBI projects		
Maser Parallax	6.6 GHz	100's-1000's
Maser Parallax II if ATCA upgrade	Ku (12.2 GHz)	100's-1000's
Pulsar parallax	H-OH/Galileo	100's
TANAMI Fermi sources	8/22 GHz	1000

Project summary

- Dominant receivers:
  - 10/50, Multibeam, H-OH
- 13mm, Ku and maybe Mars may be required to be identified at TAC process
  - The possible major projects are speculative
- VLBI requirements overlap with H-OH, 13mm and Mars
  - Note 6.6. GHz VLBI requirement could be replaced with 12.2GHz if ATCA upgrade pushed to 12.2 GHz
- Future discussions to focus on science cases for ~20cm PAF and wideband 0.7 - 4 GHz and 4 - 24 GHz receivers
  - Possible large projects in both bands

A NMMc-G suggestion

- Offer Multibeam 10/50 and H-OH every term
- Rotate 13mm, Ku, Mars and Galileo on pre-announced term schedule, such as:

TERM	13MM	GALILEO	KU	MARS
13APR	X			X
13OCT		X	X	
14APR			X	X
14OCT	X	X		

Advice on priorities - Parkes

Other options?

Is it agreed that the high frequency multibeam is the lower priority of the three considerations?

We are likely to investigate both, but if there was a preference for investigating wideband or PAF which would it be?

We feel our wideband approach is less risky than the ‘all eggs in one basket’ consideration of the lower frequency receiver only. Comments.

Advice on priorities - ATCA

For later, but start thinking now – the case for going to 12.2 GHz on the Compact Array