Overview of Parkes changes (+)

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Welcome

ATUC Members

John Dickey – Chair from Jan 1

Chris Phillips – Secretary

James Allison

Hayley Bignall

Virginia Kilborn

Stephen Ord

Ryan Shannon

Chris Springob

Kathrin Wolfinger – student

Giovanna Zanardo – student

Today's program – Parkes

- Overview (Douglas Bock)
- Power and instrumentation (Erik Lensson)
- Remote operations (Dave McConnell)
- Instrumentation options (Ettore Carretti)
- Discussion

(Support model – will discuss at May/June ATUC meeting)

Summary of ATNF Strategy

- Construct and operate ASKAP to full scientific potential
- ATCA will continue to be operated as a major element of the ATNF; we will explore measures to reduce the cost of operations as much as possible
- We are seeking external funding to operate Mopra; if it is not forthcoming, we will cease to operate Mopra in Oct 2012
- We will be changing the operating model of Parkes to reduce costs

The Parkes model

- Aim to retain the high impact of Parkes
- Seek high-return projects requiring less support
- Limited suite of reliable instrumentation
- Progressive reduction of support
  - Moderate reduction for the first 2-3 years of new operations model
  - Ultimate goal of 40% reduction (5 year timescale)
  - Changes to after-hours support
- Encourage experiment/campaign mode projects
  - But recognising level of onsite support available

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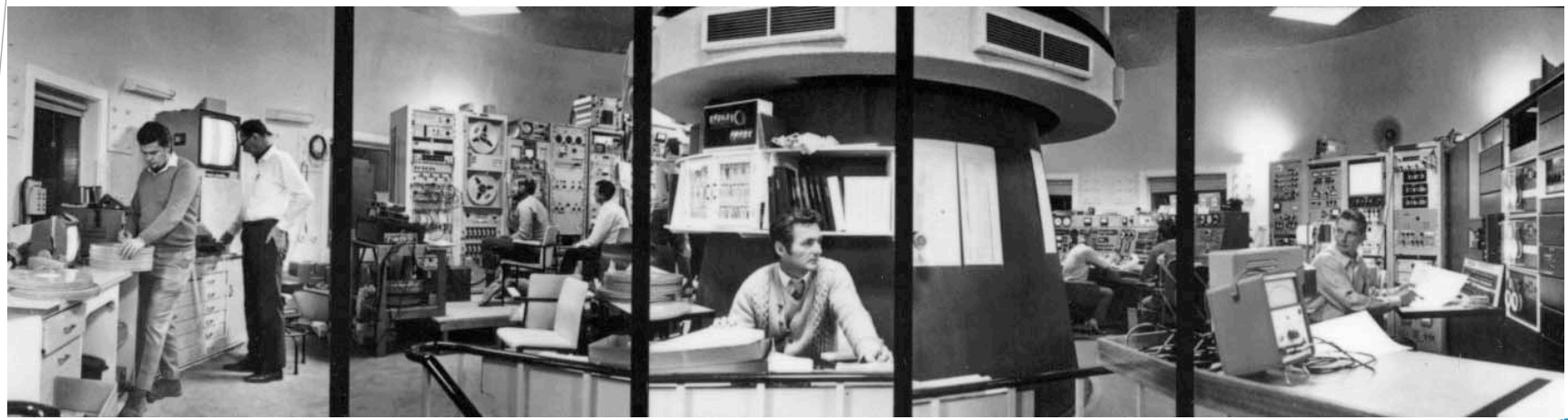
The Parkes model

- Remote operations (Oct 2012)
  - New telescope protection system
  - New observing safety procedures
  - Observers quarters will be closed at some point
  - Operated from Science Operations Centre (Marsfield) or anywhere on the internet
  - Observer support limited
- Improve power reliability



Apollo 14 control room

Constraints

- Parkes budget to be reduced by approximately 40% (in real terms) over 5 years

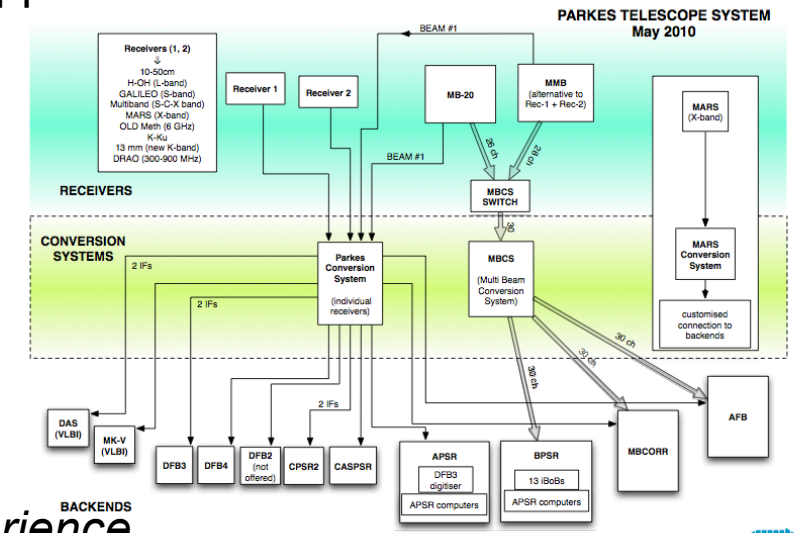
- Science Operations (Telescope operations/science support, software, computing/network, visitor services)
  - More rapid decrease in support (Quarters, re-task to ASKAP)
  - 1.5 FTE in 2012-13
  - Further 2 FTE ~following year

- Engineering Operations (Mechanical, electrical, receivers, cryogenics, etc):
  - Slower decrease in support
  - 1 FTE already
  - Est. further 1.5 FTE through “natural attrition” over next few years

Instrumentation strategy

- Long-term strategy (3+ years; funding **and** resources)
  - No routine receiver changes
  - Broad-band single-pixel receivers
  - Phased array feed at low frequencies

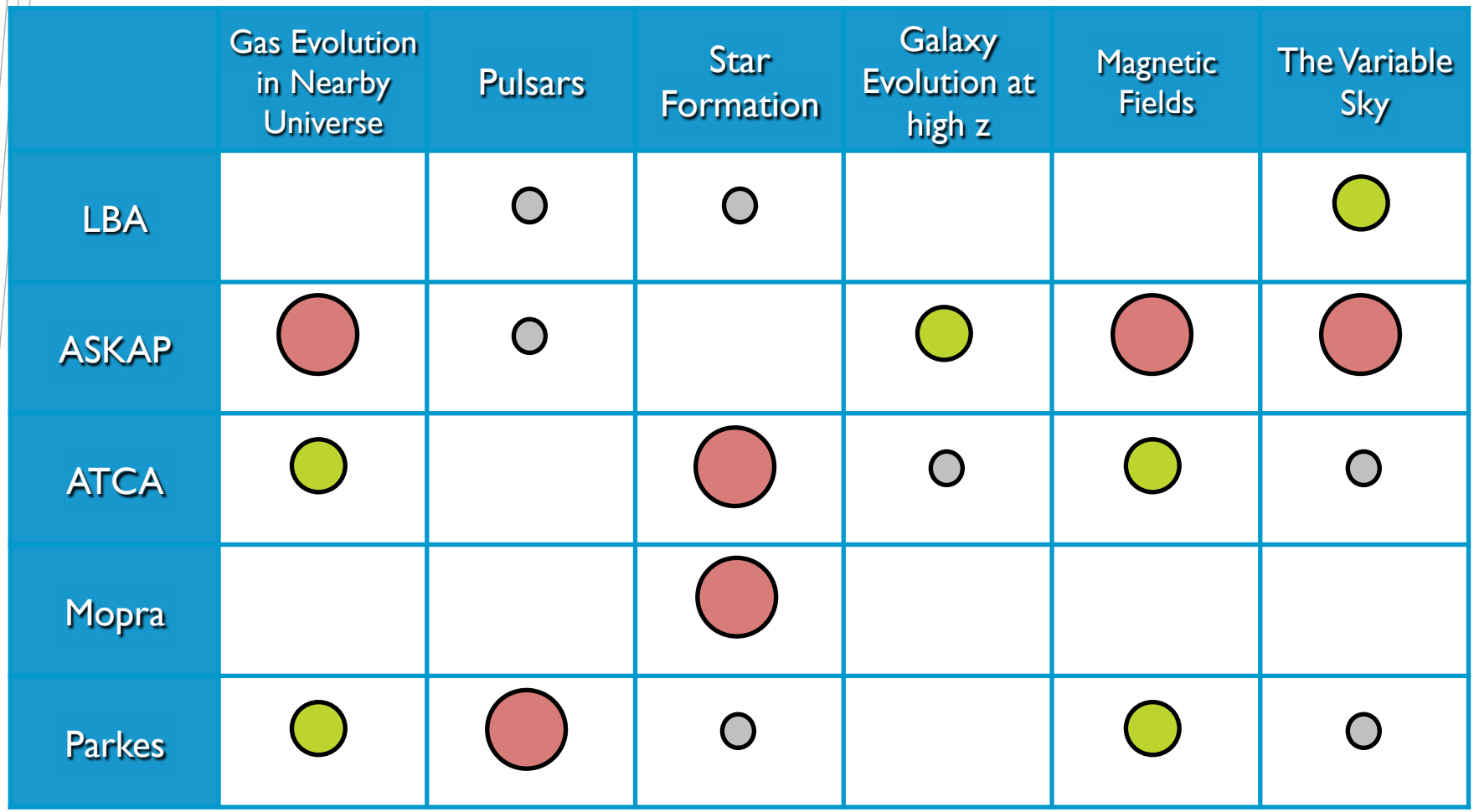
- Interim strategy (from Oct 2012)
  - Make choices to reduce support costs
  - Improve reliability and remote support
  - Implementation
    - Receiver fleet retirements
    - Reduce frequency of reconfigurations
    - Backend consolidation
    - Remote observations
    - Changed after-hours support
  - *Will review based on actual experience*



TELESCOPE USE

Observation Type	Fractional observing time
Pulsar	64.7 %
Polarization & continuum	12.9 %
VLBI	7.3 %
HI	2.9 %
Spectral lines (non HI)	4.6 %
Geodynamic	1.5 %
Others (non-standard, ASKAP tests, etc.)	6.0 %

Science Priority Areas



(ATNF Science Priorities: Science in 2010-2015; Ball et al. 2008)

Parkes Receiver Fleet

Frequency	Receiver	Remotely Operable?	Perform. 1=poor, 5=good	Reliability 1=poor, 5=good	Usage (last 3yr)
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	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 %

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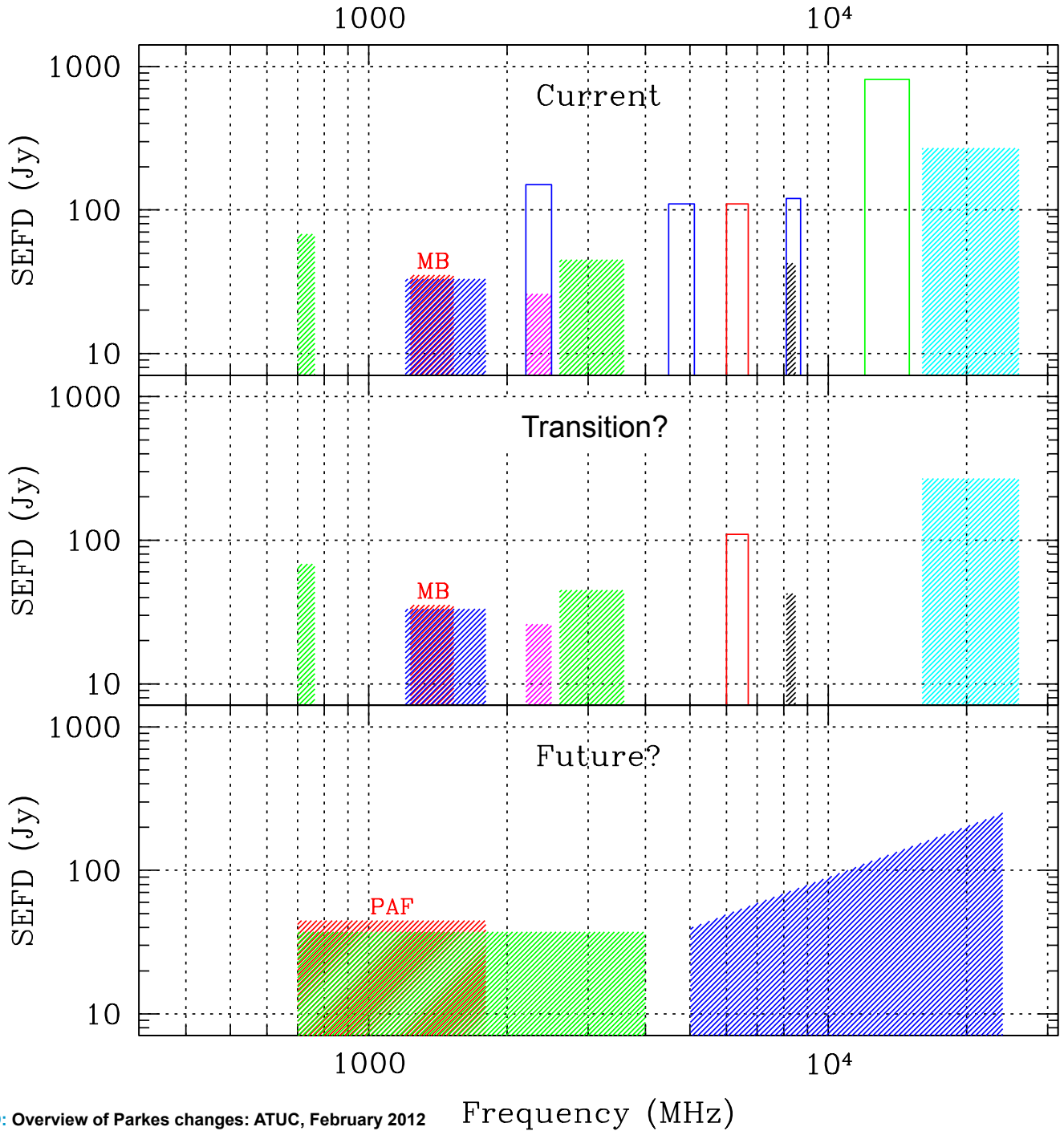
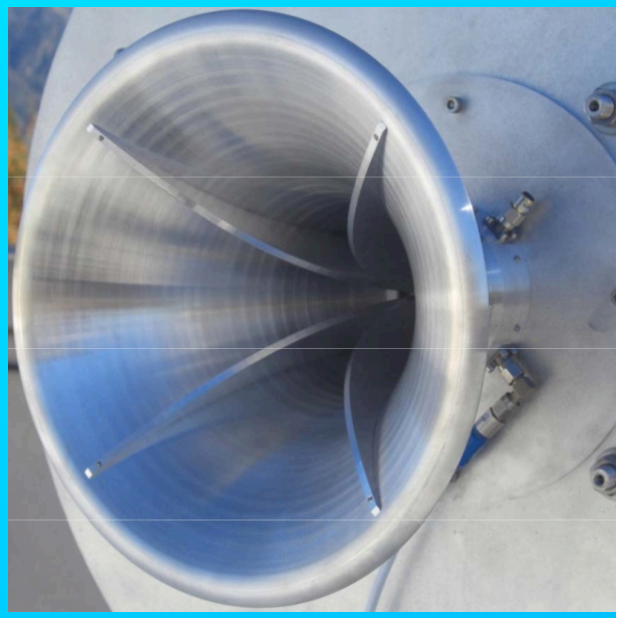

1000
10⁴
1000
100
10
SEFD (Jy)
Current
MB
Transition?
MB
Future?
PAF
1000
10⁴
Frequency (MHz)

Proposed Receiver

Manchester 2011



- Based on **2-12 GHz feed** developed by Sandy Weinreb and students at JPL
- Scaled to **0.7 – 4.0 GHz** bandwidth
- Cryogenically **cooled OMT/feed** and preamplifiers, Tsys < 25 K over most of band
- **Fully digital receiver**; Nyquist sampling of entire RF band at receiver for each poln, >= 8 bits per sample
- FPGA polyphase filter after digitiser, allowing rejection of strong RFI bands
- Data fed to 20-processor **GPU cluster** for quasi-real-time processing, e.g. coherent de-dispersion of pulsar signals

Bonn receiver (Kramer; under construction)

- 0.6 – 3.0 GHz
- Cooled (not feed)
- Aim for Tsys < 40 K
- RFI mitigation: sample limited portion of the bandwidth; filters
- On Telescope May/June

- A version of this receiver could be manufactured for Parkes with little development cost

Mopra update

- Call for Expressions of Interest to operate/fund Mopra closed January 16
- Four models proposed
  - Financial support of National Facility (current) operations
  - Another organisation operates Mopra (and sets time allocation policy)
  - Another organisation takes ownership of Mopra
  - CSIRO operates for a small number of contributors
- Aim to retain LBA access under all options, but will not operate Mopra for LBA alone
- Several EoIs received; now under discussion
- TAC met last week; consideration of large and student projects

Questions for ATUC

1. Is the broad direction of the long-term strategy right?

2. On the high-frequency receiver (long-term strategy):
   a) is it essential to cover the range 5–24 GHz or is a narrower range sufficient?
   b) in case of splitting, what is the pair of frequency ranges with the highest scientific return?
   c) is there strong scientific motivation to extend the low end down to 4.0 GHz? (e.g., to match the 4–12 GHz system at Narrabri)
   d) what are the scientific motivations to extend the high end beyond 24 GHz (e.g., up to 26 GHz)?
   e) in case both are important, which one is most relevant in case technical issues do not allow the entire 4–26 GHz range to be covered?

3. Which interim receiver scheduling strategy is preferred? (today)

4. Which receivers should be mothballed? (today)

More information:

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