

## v255b Setup:

|                    |   |
|--------------------|---|
| <b>Description</b> | Proper motion and Parallax of Methanol Masers |
| <b>Antennas</b>    | At-Mp-Ho-Cd-Pa-Hh                             |
| <b>Start</b>       | 220 02:00:00                                  |
| <b>Stop</b>        | 220 16:28:20                                  |
| <b>PI</b>          | S. Ellingsen                                  |
| <b>Channel 1</b>   | IFP#1-L0 6640 - 6656 MHz USB RCP              |
| <b>Channel 2</b>   | IFP#1-HI 6656 - 6672 MHz USB RCP              |
| <b>Channel 3</b>   | IFP#2-L0 6640 - 6656 MHz USB LCP              |
| <b>Channel 4</b>   | IFP#2-HI 6656 - 6672 MHz USB LCP              |
| <b>Skyfreq</b>     | 6656.00 MHz                                   |
| <b>Bandwidth</b>   | 16 MHz  |
| <b>DAS Mode</b>    | vsop.pro ( <a href="#">telescope</a> )        |

The beginning and end of the experiment will use the following setup:

|                      |                                  |
|----------------------|----------------------------------|
| <b>Channel 1</b>     | IFP#1-L0 6300 - 6316 MHz USB LCP |
| <b>Channel 2</b>     | IFP#1-HI 6316 - 6332 MHz USB LCP |
| <b>Channel 3</b>     | IFP#2-L0 6640 - 6656 MHz USB LCP |
| <b>Channel 4</b>     | IFP#2-HI 6656 - 6672 MHz USB LCP |
| <b>Bandwidth</b>     | 16 MHz                           |
| <b>Skyfreq IFP#1</b> | 6316.00 MHz                      |
| <b>Skyfreq IFP#2</b> | 6656.00 MHz                      |

Ftp: <ftp://ftp.atnf.csiro.au/pub/people/vlbi/v255/v255b>

## Comments:

## Observing comments for each antenna:

## Background:

The purpose of these observations is to obtain the second epoch for proper motion/parallax observations of the methanol maser source G9.62+0.20 and the first epoch for G8.68-0.37. We are using the same observing mode as for v255a (March 08) and will observe both masers and phase calibrators with  $2 \times 16$  MHz bandpasses, but the correlator output will be high spectral resolution around the masers (G9.62+0.20 should show a strong peak at a sky frequency of around 6668.3 MHz during these observations) and standard continuum for the phase reference source. The idea is to have a mode which expands the number of suitable phase reference sources available for spectral line sources. The frequencies are nearly the same as for March 2008, but shifted by 1 MHz.

## Specifics:

The experiment has 5 distinct sections, **minor setup changes are required between 02:00 and 02:20 then at 05:57:30, 14:36:00 and 15:24:40 UT**

1. 02:00:00 - 02:20:00 : Observing 0537-441 and switching between the two frequency setups to determine the delay differences between the two. See notes below.
2. 02:20:00 - 05:57:30 UT : Use the single polarization (LCP), 4 x 16 MHz bandpass setup. We are refining the position for potential phase reference sources for future maser proper motion/parallax observations and looking at ICRF sources over as wide a range of azimuths and elevations as possible for atmospheric delay calibration for the astrometry.
3. 05:57:30 - 14:36:00 UT : Use the dual polarization 2 x 16 MHz bandpass setup. This portion of the experiment is mainly switching every few minutes between the two maser sources G9.62 & G8.68 and two phase calibrators. There is an ICRF run between 1012 and 1325 UT, this one is done with the maser setup (to reduce the number of changes overall).
4. 14:36:00 - 15:24:40 UT : Single polarization (LCP), 4 x 16 MHz bandpass setup for another ICRF run (except for Hart which continues to record single frequency/dual polarization).
5. 15:24:40 - 16:28:20 UT : Back to dual polarization 2x16 MHz bandpass setup. Any observatories that need extra setup time for the change to 22 GHz for the vc064/v275a experiments can stop whenever necessary in this last hour.

During the ICRF runs we have sometimes had to exclude certain antennas (particularly Parkes & Hart) from observations of some sources in order to get a good spread of azimuths and elevations.

## Observing comments for each antenna:

### Hobart, Ceduna :

The 4 x 16 MHz bandpass setup will require feeding two separate LOs into IFP#1 and #2 on the DAS/frequency translator and splitting the LCP signal so that is feed into both sides. For Hobart the LOs should be set to 468 MHz (IFP#1) and 808 MHz (IFP#2) for the 4 x 16 MHz setup and 808 MHz for the 2 x 16 MHz setup. For Ceduna, if you set the agilent to 11.1 GHz rather than 11.4 GHz, then you can use the same LOs as at Hobart.

### Hart :

Scheduled from 1102 - 1628 UT. Hart should observe with the dual polarization 2 x 16 MHz bandpass setup throughout, even during the final ICRF session when the other antennas change to single frequency 4 x 16 MHz setup.

### Parkes, ATCA, Mopra :

Cable up with the Huygens cable for the entire experiment. Observe with dual DAS setup using 2 DASes for the 4 x 16 MHz setups and 1 for the dual polarization 2 x 16 MHz setup. Record using the following cdisko channel selections at the appropriate time ranges. Stop the recorder in between! At

Parkes you will have to change the frequency manually running for example (in a pavo xterm) >  
 lorun @2008\_METH-split.cmd

| UT                | Channel selection | Parkes Frequency setup |
|-------------------|-------------------|------------------------|
| 02:20-05:57:30    | 3,4,7,8           | 2008Aug_METHc.cmd      |
| 05:57:30-14:36:00 | 1-4               | 2008Aug_METHb.cmd      |
| 14:36:00-15:24:20 | 2,3,7,8           | 2008Aug_METHc.cmd      |
| 15:24:20-16:28:20 | 1-4               | No Parkes              |

ATCA will have to cacal at 6.3/6.7 GHz and 6.7/6.7 GHz before the experiment. Note "catie" should be setup for Rcp/Lcp (Lcp is selected in cdisco)

## DAS calibration

During the first 20 minutes we will need to calibrate the delay between the two ATNF DAS, and the delay between Hobart/Ceduna in dual pol and single pol mode. The following modes will need to be used to calibrate these.

### ATNF DAS offsets:

Everyone records with a dual polarisation/6.7 GHz setup. ATNF records at 512 Mbps, ie Huygens/Channel 1-8 in cdisco with DAS1 and DAS2

### Hobart/Ceduna Single pol calibration

Hobart and Ceduna cable up with LCP into both IFP, but remain at 6.7 GHz. Pks/ATCA/Mop record chans 1-4.

### Split freq fringe test

Hobart and Ceduna retune IFP#1 to 6316 MHz. Parkes/Mopra/ATCA run with DAS#1 centered at 6316 and DAS#2 at 6656 MHz and record Chan 3,4,7,8 in cdisco. Parkes will have to lorun. ATCA and Mopra have the frequency change built into the schedule.

| Time (UT)   | Ho/Cd                | At/Pa/Mp             | ATNF Channels | Parkes lorun           |    |
|-------------|----------------------|----------------------|---------------|------------------------|----|
| 02:00-02:07 | Dual Pol             | Dual Pol             | 1-8           | 2008Aug_METH.cmd       |    |
| 02:07-02:15 | Lcp only 6.7/6.7 GHz | Dual Pol             | 1-4           | 2008Aug_METH.cmd       |    |
| 02:15-02:20 | Lcp only 6.3/6.7 GHz | Lcp only 6.3/6.7 GHz | 1-4           | 2008Aug_METH-split.cmd |    |
| At          | Mp                   | Ho                   | Cd            | Pa                     | Hh |

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## Observing Logs

[Parkes onsource flagging](#)  
[ATCA onsource flagging](#)  
[Mopra onsource flagging](#)  
[Mopra Tsys \(plot\)](#)

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