DEUTERIUM ARRAY MEMO #030

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886

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Telephone: 978-692-4764
Fax: 781-981-0590

To: Deuterium Array Group

From: Alan E.E. Rogers

Subject: Receiver control file keywords

The host software which runs on the motherboards in the receiver uses a control file d1.cat. This file is similar to the SRT control file and uses keywords to identify lines with specific information. A line becomes a comment if the first character is * or #. The keywords are:

STATION lat lon name
AZIMUTH (deg) - azimuth of ground plane
ELEVATION (deg) - elevation of ground plane
SOU rah ram ras dec deg decmin decsec name (epoch)
RECORD unit sec more key works

Unit – ID unit for file_name
i.e. 1 generates files with names like 2003_010_1030.d01

sec – number of seconds between output

more key words: NEWDAY – start a new file each day
SPEC – record spectra for each port
BEAMSPEC – record spectra from each beam
COR – record correlations between ports
PWR – record total power for each port
PULSAR – record pulse profile
BMAP – record a beam map

PERPULS – pulsar period
NODISPLAY – if present all gtk code is bypassed
BEAMSPAC – beam spacing if no specific beam positions given by BLOC
BLOC – az0, *el*0, az1, *el*1, az2, etc…..relative beam locations
DEVICES – n0, n1, n2…
List of USB devices (board ID number) if present can be used to limit the participation to specific boards.
TRACK name – name of source to be tracked if not present the beams are fixed in az and *el*.
SCAN – if present the beams are scanned to make a map
NFREQ num – number of output frequencies (normally 1024) can be used to limit output by performing boxcar frequency averaging.

CHANVIEW num – used to specific channel whose spectrum is singled out for special display

XLOC x_0, y_0, x_1, y_1, x_2, y_2 ….
- locations of array elements in the backplane in coordinate frame viewed from the back of the ground plane with origin in lower left hand corner. Units in the 0.8λ spacing between elements.

LOFREQ (MHz)

DACVOLTAGE – DAC_units (0-4000)

AVERAGE – if present the spectrum of channel selected by CHANVIEW is a continuous average.

CALPHASE (deg) – calibration phases for the elements.

CORCH ch0, ch1 – channel numbers to be correlated

CORRCYCLE mode – if present cycle through combinations
Mode 1 all combinations
Mode 2 only baselines

PEAK – if present software attempts to find calibration phases by dithering their values to peak up the beam on the Sun or test signal.

FSTARTSTOP fstart fstop – start and stop frequencies for frequency range used in the beamformer and total power averages. Limits are in FTT box number 0 thru 1023.

Notes:

1] Not all record items can be used simultaneously for example output valid correlations requires CORCH or CORRCYCLE and while correlations are run valid beams are not computed.

2] Currently the number of beams is hardwired in the code to 4 and can only be changed by recompiling.