

# Data correlated pre-2010

All LBA data **correlated** before 1 January 2010 have amplitude scaling applied at the correlator based on the nominal SEFD for each telescope. This means that the amplitudes on each baseline from the correlator are roughly in Jy. In order to apply measured Tsys corrections, this factor needs to be “undone” in post-correlation processing. This can be easily done in AIPS task ANTAB by inserting the nominal SEFD applied to each antenna into the denominator of the FT keyword value in the TSYS group in the calibration text file (see the explanation of ANTAB in AIPS).

For all data correlated at Curtin in 2008-2009, the nominal SEFD values used were as listed in the table below (from the old `vex2config.pl`). Note that for the ATCA tied array, it was assumed that 5 antennas were tied, which may not have been the case (see the observers wiki or logs). If less than 5 antennas were used in the tied array, then the nominal scaling factor applied is incorrect. The value applied for each participating telescope is listed in the correlator input file (TSYS keyword) for each experiment, and ideally this should be checked rather than assuming that the values in the table below were used.

Another way to adjust the nominal amplitude scaling (other than in ANTAB as above) is to use AIPS task CLCOR (OPCODE = 'GAIN'). Run once for each antenna as required, specifying CLCORPRM(1) to give the appropriate scaling factor: note that the gain correction factor in CLCOR corresponds to units of square root of antenna SEFD (Jy).

**Hypothetical example:** A 22GHz LBA dataset correlated in 2009 has 'TSYS: 106' for ATCA listed in the correlator input file. This assumes 5 antennas were tied, but according to the observer's log on the wiki, only two ATCA antennas were included in the tied array. Therefore the *a priori* SEFD should have been 265 Jy ( $=530/2$ ).

**If the measured Tsys log is available** (pre-CABB), this will be correct for the number of antennas in the tied array. The measured Tsys can be converted to the ANTAB input format and used to calibrate the amplitudes. The value for FT should be divided by 106 to undo the nominal scaling applied at the correlator.

**If the measured Tsys is not available** (which is the case since the CABB correlator has been used at the ATCA), then either ANTAB input can be generated with nominal Tsys values, or alternatively, the gain could be adjusted to the (correct) nominal value using task CLCOR, setting CLCORPARM = 1.58, 0 ( $=\sqrt{5/2}$ ).

Telescope	Nominal SEFD (Jy) in each frequency range (MHz)								
	<1500	1500-1799	1800-2499	2500-4999	5000-6499	6500-7999	8000-9999	10000-14999	>15000
Parkes	40	42	30	110	110	110	43	370	810
ATCA	68	68	106	70	70	170	86	-	106
Mopra	340	340	530	350	350	850	430	1300	900
Hobart	470	420	650	640	-	1240	560	1200	1800
Ceduna	-	-	400	450	-	550	600	750	2500
Tidbinbilla	-	23	16	-	-	-	25	-	60
Hart	-	200	210	290	260	290	340	480	3000
Tigo	-	-	-	-	-	-	7700	-	-
O'Higgins	-	-	-	-	-	-	6300	-	-

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