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VLA Test Memo 112

DERIVED STATION POSITIONS

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The positions of stations used in recent VLA observing runs have been derived from astronomical observations.

| STATION | (10^{-9} sec) | | | TELESCOPE | TIME |
|---------|-------------------------|-----------|-----------|-----------|------------------|
| | Lx | Ly | Lz | | |
| DW2 | 49.326 | -123.797 | -67.419 | 1 | After 76 Sep 23 |
| DW3 | 96.58 | -248.44 | -136.93 | 3 | After 76 Oct 24 |
| CW5 | 747.20 | -1962.82 | -1093.06 | 1 | Before 76 Sep 23 |
| CW6 | 1021.31 | -2683.67 | -1494.63 | 4 | Before 76 Nov 20 |
| CW7 | 1328.459 | -3496.174 | -1948.542 | 3 | Before 76 Oct 24 |
| CW8 | 1667.24 | -4396.25 | -2452.44 | 4 | After 76 Nov 20 |
| CW9 | 2040.686 | -5381.312 | -3002.026 | 2 | |

Typical errors for each parameter are ~ 0.02 ns or about 20° in phase. Errors are dominated by phase fluctuations in the system. The k-term (non intersection of axis) is thought to be ≤ 0.04 ns.

Station CW9 has been occupied by antenna No. 2 for all observing so far. Thus it has been, by default, adopted as the fixed point of the array coordinate system. A station has not been occupied by more than one antenna, so there is no estimate in the offset of station coordinates or pointing coefficients peculiar to each antenna.

The derived station positions are in good agreement with those measured by C. M. Wade (VLA Test Memo No. 107). There is a slight offset in the zero point of array coordinate systems in the sense

$$Lx \text{ (CMW)} + 0.09 \text{ ns} = Lx \text{ (derived)}$$

$$Ly \text{ (CMW)} + 0.24 \text{ ns} = Ly \text{ (derived)}$$

$$Lz \text{ (CMW)} + 0.09 \text{ ns} = Lz \text{ (derived)}$$

In estimating station coordinates from Memo No. 107 the above offsets should be applied [alternatively one could change all the station positions now used for VLA observing in the opposite direction]. Apart from the offset, the typical error measured by CMW is about 0.06 ns in Lx, 0.12 ns in Ly, 0.07 ns in Lz or about a displacement error of 4 cm.