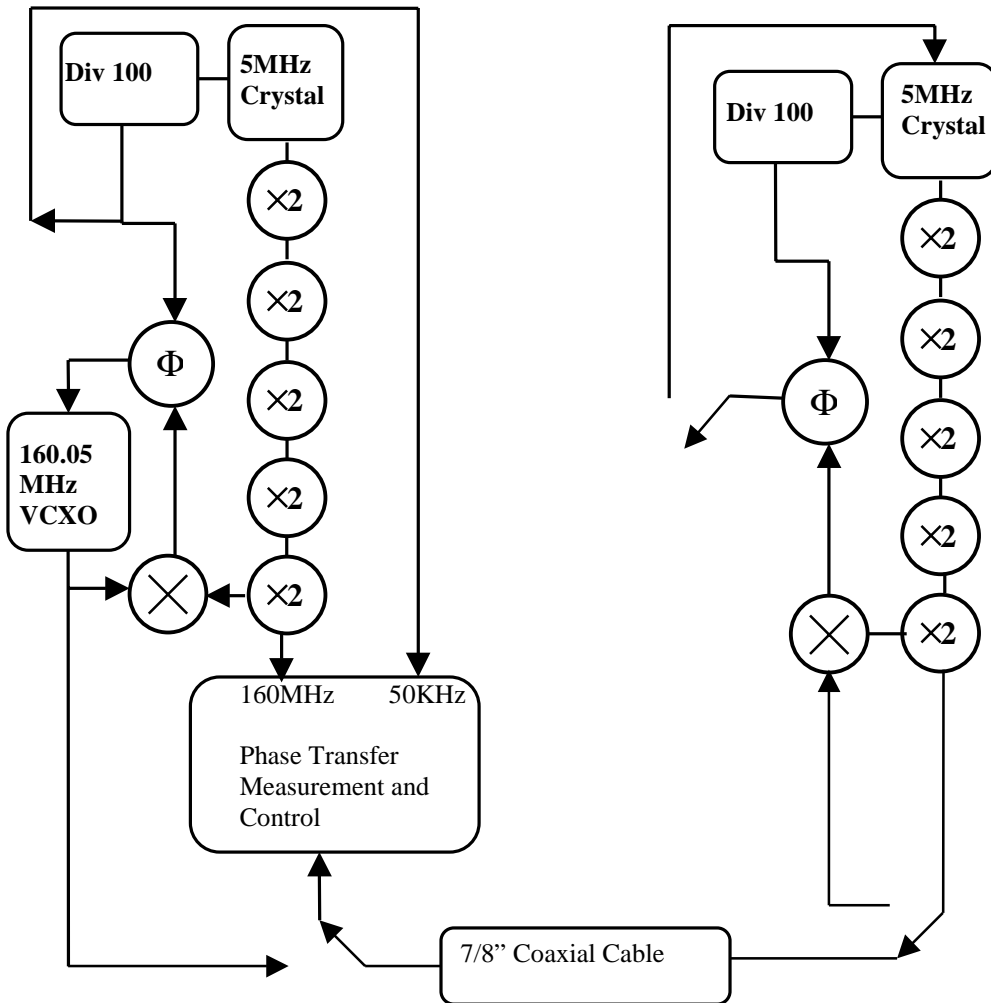


Current 160.05MHz Local Oscillator Reference Distribution Scheme

Central Site

Compact Array Antenna 1 to 5



A 160.05MHz signal is derived from a stable reference Crystal at the central site using an offset phase locked loop. A 50kHz signal is derived from the 5MHz central site crystal by a divide by 100 circuit. The 50kHz signal is used as a phase reference by the Phase Transfer System.

In the block diagram, 160.00MHz generated from the remote antenna crystal and reference multiplier chain, is connected to the Phase Transfer system via switches and the 7/8" coaxial cable. Mixing the 160.00MHz and the 160.05MHz signals in the Phase Transfer system produces a 50kHz tone. The phase difference between the reference 50kHz and each of the 50kHz tones produced by each remote antennae is measured every integration.

When the switches in the block diagram are reversed, 160.05MHz from the central site 'phase locks' each antenna's offset phase lock loop. When the 160.00MHz from any antenna is being measured by the Phase Transfer system the offset phase lock loops 'unlock', and the reference crystal at each antenna is 'held' by a sample and hold circuit.

The Phase transfer system is used to measure diurnal changes in the 'electrical length' of the 7/8" coaxial cable and the antenna reference offset phase lock loop. The measured phase changes are corrected by the addition of phase offsets produced by the Local Oscillator and Sampler Phase Rotation modules.

The reference phase lock loop in each antenna is used to produce the local oscillator frequencies required for frequency conversion from the Radio Frequency bands to the sampler input band. The Local Oscillator system currently produces the following frequencies.

X Band L.O:	6710 to 8330MHz in 320 +/- 10MHz steps
C Band LO:	1815 to 2215MHz in 20 +/-5MHz steps
UHF LO:	511 to 840MHz in 160MHz +/- (F-10)MHz where F is in the range of 41 to 50MHz and the 10MHz is phase rotated.
Sampler clocks:	128MHz/256MHz/512MHz with phase rotation.

Antenna CA06 has uses a 160.05MHz local oscillator reference supplied by single mode fibre optic cable. The distance between CA06 and the central site meant that transmission by coaxial cable is impractical.

The decision to use coaxial cable for the 3km array was influenced by the lack of single mode fibre optic connectors and superior transmission characteristics of coaxial cable at the reference frequency.