

VLB ARRAY MEMO No. 197

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM
2. March 1983

TO: VLBA Correlator Design Group

FROM: B. Rayhrer

Subject: VLB Array Memo No. 176

These comments and suggestions refer to CIT's VLBA Correlator Specification Draft 6, Febr. 1983 (VLB ARRAY MEMO No. 176) and concern the design of the station electronics and the lobe rotator.

1. The station-electronics can be divided into two submodules: recorder-electronics containing descew-buffer, time-decoder, housekeeping and station-electronics containing delay-line, phasecal-tone-extractor. This allows the recorder-electronics to be located near or inside the tape-recorder and allows the electronics to be specifically designed for a given recorder. The station electronics however will be recorder independent and can be located near or inside the correlator system. Interface cabling between recorder and correlator will then be simpler since it only has to transfer data and no phase-cal. Phase-cal interface will be within the correlator. Furthermore delayline-update and simultaneous fringe-rotator phase-shift can be synchronised easier.
2. The fringe-rotator can be conveniently broken into two parts: the actual rotator and the fringerate synthesizer. The bulk of the circuitry will be in the synthesizer. For a large processor (>3 station) it is therefore economical to have the synthesizer in the station electronics and the rotator in the correlator. The fringe-phase of a baseline is then the phase difference of the two stations processed. The fringe-phase is send from the synthesizer to the rotator bit-parallel (e.g. 8 bits). The rotator subtracts phase 2 from phase 1 and uses the most significant bits of the difference (after rounding) for rotation. Maximum fringerate is equal to the bitrate. Instantaneous phase error is ± 1.5 degrees max. Phase-model-updates need to be calculated for each station and not each baseline.

