VLB ARRAY MEMO No. 145

To: VLBA DESIGN GROUP 11 NOV., 1982
From: Martin Ewing
Subj: MINUTES OF CORRELATOR GROUP MEETING OF 9 NOV., 1982

Present: Hvatum, LaCasse, Escoffier, Rogers, Fort, Kellerman, Ewing, Moore

MEMO 138 (C. Moore - IF frequency switching)

The LO system can accomodate coherent frequency switching every few hundred milliseconds and a settling time of a few milliseconds, according to Craig's estimates. Accepting this conclusion, the group discussed the reasons why this technique may not be as desirable as simultaneous recording of smaller passbands.

Rogers suggested that one problem with frequency switching is the difficulty of handling frequency-dispersed pulsars. Shaffer is said to be preparing a memo on the general subject of bandwidth synthesis.

The extra bins needed in the correlator to hold the separate frequency channels are no worse than those required for the parallel channel approach, Ray reminded us. Actually, we should remember that there will be a huge number of correlators lying around in continuum work that are needed only for spectroscopy. Thus either parallel or switched techniques should have no problems. (It may be, though, that a recirculation system offers the only hope of flexibly re-allocating accumulators as needed.)

MEMO 137 (R. Escoffier - Data recording/playback interface)

Ray presented his thoughts on the data recording interface. He would have the playback system handle nearly all the delay functions needed to align the playback streams. Comments from Ewing and Rogers still empnasize the desirability of separating "astronomy" functions as much as possible from "recording" functions. Memos are forthcoming from both people.

Another concern is how to handle spectral line work efficiently. Do you slow down the nominal 25 Mb/s clock? Or would it be better to define narrower channels that would match the maximum spectral line bandwidth better? (AEER reminds us that most spectral line experiments can live with 2 MHz bandwidth channels, sometimes with 4 of these in parallel. The maximum bandwidth needed to date is about 6 MHz.)

There was some support for electronic delay capable of handling the full terrestrial delay range. Ray suggests using offset tape alignment since tapes can be slewed faster than telescopes. Alan replied that very fast slewing telescopes (30 sec source acquisition anywhere in the sky, 2 sec settling time) would be "extremely potent" for astrometric and geodetic observations. (Kellerman and Hvatum will consider this statement in light of budgets and antenna designs.) Alan continued that it would be unfortunate to restrict the correlator by eliminating

full-scale delay capability. Ewing added the examples of real-time satellite links or VLBI with orbiting telescopes as cases in which wide range or fast delay tracking would be necessary.

NEW CANADIAN VLBI SYSTEM

Dave Fort discussed the new geodetic VLBI system being developed now. It will use Yen's 12 Mb/s VHS recorders, possibly in a burst recording mode. The recording system, with microprocessor control of burst ephemeris at each telescope, is thought to be ready in March, '83. A 3-station correlator, however, is just now being designed. The first baseline is not expected before about April, '84.

BUDGET

Ken exhorts us to think further about the work we would want to carry out under a FY '84 development budget. What are the priorities for correlator development? VLSI development?

The next correlator meeting is scheduled for Dec. 7, at 15:30 EST.

- Martin Ewing