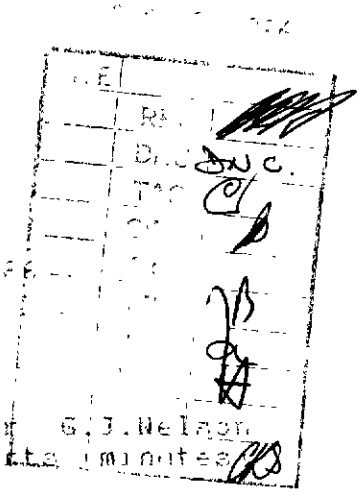
AT/17-3.1/010a



MINUTES OF LBA DISCUSSION 1st AUGUST 1986

Present; L.F.D'Addario M.S.Ewing J.E.Forster G.J.Nelson
P.P.Norris J.D.O'Sullivan J.A.Roberts (minutes)
W.E.Wilson A.C.Young

Local Oscillators

Alan Young reported that the test of the UW2 cavity oscillators in the non-active mode had been carried out satisfactorily and the frequency stability improved but not sufficiently to attract further funding from Steedman.

Transmission of the LO via Aussat is now the preferred option. There was some brief discussion of ionospheric and other problems. ACY indicated that a one-year visitor was expected to arrive in a few months time and might be given the project. If work started seriously in early 1987 with two people working on the project some results could be expected by the end of 1987.

GJN reported that the Ionospheric Predicton Service has a proposal for phase-related 'beacons' at 0.136, 0.4, 1.2 & 29 Ghz to be carried on the next Aussat to provide monitoring of ionospheric electron content. There was some discussion as to the possibility of having our own transponders on Aussat. Transponders with the same frequency for the up and down links would solve the ionospheric problem. Transponders of higher power would improve the short term phase jitter which is determined by signal/noise. GJN to convene a meeting with IPS representatives to include PPN ?LFE? ACY & JEF ?

There was discussion as to whether the 29 Ghz beacon could be used to monitor precipitable water vapour. LRD'A reported that water vapour radiometers were able to measure the precipitable water vapour to an accuracy of 1 mm, which corresponds to a few mm in path length.

Problems Faced by the LBA

Marty Ewing listed five items that appeared to him to be problems facing the LBA.

1. Costs versus guaranteed funds.
   [It sometimes seemed that the LBA was treated as only a possible add-on to the CA. In particular a lot of manpower is needed for software.]

2. The local oscillator problem.

3. Not enough telescopes and not in the right places for good u-v coverage.

4. The difficulties of achieving compatibility for global experiments.

5. The correlator.

Data Validity Problem for the LBA Correlator

US VLBA tape recorder specs allow for 1% 'data invalidity'. Because the AT correlator cannot be blanked on a multiplier by multiplier basis it seems that blanking out flagged bad data could lead to a large loss of data. See discussion at the LBA Workshop.

Discussion at this meeting as to whether need to blank or replace bad data. If no action taken, and if errors are uncorrelated between stations errors cause only a loss of correlation. If the error rate is recorded the loss can be allowed for. If the 180 degree phase switch were demodulated after playback this would help provided there were many faults per integration period (?)

There was discussion of replacing bad data by 0 1 or 1-2 possibly on a random basis. There was no decision as to what will be done.

Lobe Rotation at the Correlator

The XCELL is not ideal for this purpose. MSE explored doing a small (32 channel) FFT before a (double) full complex correlator (presented at March LBA Workshop). Somewhat complex. Using Vax simulations JDO'S has further investigated his suggested Hilbert transform approach. RPN undertook to do further testing on the Cyber 205.

Delay Tracking at the Correlator

When phase tracking is moved from the antennas to the correlator delay tracking will likewise be moved. This will require an extra add-on at the correlator inputs to provide the delays (as in the US VLBA). In the US VLBA delays are considered part of the correlator not the Data Playback System.

Delay Tracking at Antennas

To implement delay tracking at the antennas for the LBA in a manner similar to that used in the CA there must be a FIFO between the MT sampler and the tape recorder. The sampler will run at a variable rate while the tape recorder removes samples from the FIFO at a fixed rate.

Bulk delays will be corrected at the correlator input as in the CA. The bulk delay provided must be greater than that needed for the CA.

ACTION ITEMS

GJN: To convene meeting with IPS re beacons

RPN: To collaborate with JDO'S in further tests using Cyber 205

JAR 11 September 1986