

VLBA CORRELATOR DESIGN GROUP

Telephone Meeting

13 July 1982

Present: Hvatum (convener), Clark, LaCasse, Escoffier, Rogers, Ewing

Starting the meeting with an appropriate burst of enthusiasm, Hein announced his intention to bicycle to Green Bank for the NRAO picnic. He then announced that Martin Ewing will henceforth chair these meetings.

This group will meet by telephone on an approximately monthly schedule by telephone, to be supplemented by occasional face to face meetings as appropriate. We have a vertical relationship to an "overseer" group (Simon LeGree, chairman?), but we also will relate horizontally to the groups responsible for recording systems, data acquisition, and post-correlation processing. (I hope we will have membership lists for all these committees soon. - MSE)

Our primary task is to produce a revised correlator plan to incorporate in Volume III of the VLBA proposal by July, 1983. To accomplish this, we will attempt to produce a technical plan that can be unanimously supported, but we may also wish to submit alternates.

Hein encourages us to continue to use the numbered VLBA memo series for our memos. We should do this even though we might worry about overdoing it.

The following projects were suggested for our group to undertake:

1. Look at the channelization question. Are the proposed 25 MHz channels adequate for all scientific problems? In particular, geodesy, and pulsars may need smaller bandwidth chunks. Should we depart from the 4 Mb/s channels of Mk II and Mk III? Alan Rogers volunteered to study this problem.
2. Correlators appear to divide into two complementary types: time domain (conventional shift and multiply) and frequency-domain (FFT and multiply). The Nobeyama spectrometer and interferometer backend appears to be the major current effort of the latter type. We should analyze this more carefully as a candidate for the VLBA, comparing it with the VLSI time-domain approach. In the absence of other volunteers, Ewing will take this on.

3. The JPL VLSI correlator development program has a large potential impact on the VLBA effort, and should be followed closely. Ewing will try to get John Peterson to serve with this group; he is responsible for that work at JPL. We would like to see a preliminary specification for his chip as soon as possible.

There followed a lengthy discussion of data packetization and interfaces between the data acquisition system, the recording system, and the correlator. The debate centered on just how much responsibility should be assumed by the recording/playback system for time synchronization and time tagging of the data.

One school of thought (Escoffier) suggests that the recording system can accept and reproduce precisely time-aligned raw bit streams. (Apparently this means UTC-aligned streams. I assume that interferometer delay corrections, which are much larger than normal tape skews, will be made in the correlator proper. - MSE)

Another view (Rogers and Ewing) is that the recording system might well handle data in the form of packets or frames. Some sort of framing is needed to assure adequate time tagging of the data in any case. We could look at the recording system as a totally invisible pipe (with some specified delay tolerance) that conveys data frames from the IF sampler (data acquisition unit) to the correlator. The frames could be simpler than Mark III frames, since most validity checking (such as parity) could be handled by the recording system.

It would be helpful to have people's suggested block diagrams for various possible correlator arrangements. Perhaps Escoffier, Ewing, and Rogers would prepare these for circulation. Any number can play this game. Send your entries, along with any other VLBA contributions, to Kathy Burgess, NRAO, Ivy Road.

We will try to meet Tuesdays, at 3:30 PM Eastern Time. The next meeting will be August 10.

Distribution: Correlator Design Group
VLBA Memo Series
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