MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HAYSTACK OBSERVATORY

WESTFORD, MASSACHUSETTS 01886

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Area Code 617
692-4765

To: VLBA Data Acquisition and Recorder Groups

From: Alan E.E. Rogers

Subject: Minutes of VLBA Data Acquisition Group Telecon held
            19 June 1985 at 1600 EDT.

Attendees: Jon Romney   - NRAO
            Larry D'Addario   - NRAO
            Ken Kellermann   - NRAO
            Ray Escoffier   - NRAO
            Craig Walker   - NRAO
            D. Bagri   - NRAO
            Marty Ewing   - Caltech
            Alan Rogers   - Haystack
            Bill Petrachenko   - Haystack
            Hans Hinteregger   - Haystack
            John Webber   - Haystack

The meeting started with some discussion of the review of the Acquisition Memo
#42.

1] Half-speed playback - positive option

    John and Hans explained that the feasibility without the use of additional
"low-speed" headstacks is not clear and it will be a few more months before we
can carry out experiments. However John Webber agreed to prepare a cost estimate
based upon certain assumptions for the method of implementation.

    Alan Rogers continued with some responses to Larry's comments:

2] I.F. distributor phase change with gain.

    Will try to be a good as 0.6 degree but this may be hard (Weinschel 3200
changes $\sim 7^\circ$/30 dB). Since corrections could be applied in software the stability
and repeatability is probably more important.

3] I.F. distributor noise figure.

    We agree that the I.F. distributor and baseband converter should have a
noise temperature less than 140,000K.

4] Baseband converter gain.

Yes - 30 dB range is needed in addition to 21 dB range for bandwidth compensation.

5] L.O. settling.

While many synthesizers can change frequency fast (~millisec) there is often an additional few seconds of phase drift following a frequency change. We will try to do better than one second but need tests on prototype.

6] Baseband converter phase drift.

10 deg/C can definitely be achieved. We will try to meet a 1%/C or 0.6 deg/C spec.

7] Baseband response.

Yes, response specs should apply to filter plus converter electronics.

8] Formatter sampling epoch.

Will try to make formatter sampling epoch errors under 1 ns. We note that formatter sample errors are not so critical since they effect only the phase across each baseband channel and have little effect on the bandwidth synthesized or "multiband" delay.

9] DQA/Buffer.

We promise to provide more information on the interface to the recorder and monitor and control system.

The group then discussed the fanout/in modes. Jon Romney pointed out that some tape can be saved during spectral line experiments by implementing a fan-in. Haystack people question the significance of this saving but promised to ask Jim Levine to investigate the feasibility of fan-in mode as well as a 32 MHz sampling mode.

Craig Walker emphasized the need for being sure that the VLBA dynamic range is not limited by closure errors. Craig suggested a goal of <0.2 degrees. Alan Rogers promised to write a report on the feasibility of improved bandpass response and stability in the baseband converters.