

NORTHEAST RADIO OBSERVATORY CORPORATION
HAYSTACK OBSERVATORY

Minutes of VLBI recorder group meeting held Monday 7 November 1983, 9:30 am at NRAO, Charlottesville, VA.

Attendees:

Alan Whitney	Rich Lacasse	Benno Rayhrer
Alan Rogers	John Webber	Hein Hvatum
Mike Ballister	Jim Levine	Sandy Weinreb
Ken Kellermann	Hans Hinteregger	Alan Yen
Craig Walker	Marty Ewing	Tony Readhead

Longitudinal system - Haystack Effort

Hans reported that the first headstack made at Haystack from unpatterned gapped bars yield good analog performance with approx. 53 dB SNR in 30 KHz BW at 2.25 MHz at 135 IPS. This SNR is somewhat better than that expected extrapolation from wide track heads. Because most of the gapped bars were defective (owing to missing glass support fillet) manufacture of more headstacks awaits the replacement gapped bars from Matsushita. As soon as more headstacks are built enviromental and recorder interchange tests can be made. Playback at 270 IPS has been tested and shows no tracking or flying problems. Alan Yen mentioned that tapes may stretch by a part in 10^{*4} which is quite small and should not produce tracking problems. Haystack built headstacks are estimated to cost \$2,000 in production quantities.

Longitudinal system - JPL effort

Benno reported that good performance has been achieved with heads assembled from individual VCR chips with typical SNR of 60 dB in 3 KHz at 33,000 transitions/inch at 120 IPS. However a complete 28 or 32 track head assembly has yet to be manufactured. The JPL narrow track head tips alternate in azimuth ($\pm 7^\circ$) and an assembly or stack is estimated to cost \$6,000.

Cassette system

Ray Escoffier reported that he is having difficulty getting a VCR to record 3 MK III 4 Mbits/sec channels (14 Mbits/sec with overhead on tape) using the adaptive equalization scheme developed by Alan Yen. Part of the problem is the oscillation and interference thought to be the result of a new circuit layout. Another difficulty is the modification of the VCR needed to accept an external reference upon playback. Ray has worked out a modification which involves the "piggybacking" of a duplicate LSI chip to allow the injection of a reference.

Choice between systems

It was unanimously agreed that at present we cannot be sure that either system will meet the VLBA requirements and further that neither system appears to be technically superior. All would like to see both systems developed further until it either becomes clear which system is superior or we reach a deadline for the decision. The original deadline set by the group was 31 Dec 83. The VLBA project will setup a new deadline based upon project schedule requirements.

The agenda was as follows:

Agenda for Recorder group meeting - 7 November 1983

A] Technical Review

Longitudinal Systems

- 1) MK IIIA - Integrated head assembly Hinteregger, Webber
 - a) Analog performance of narrow track heads
 - b) Recorder performance and tracking
 - c) Digital performance
- 2) MK III - Assembled VHS heads Rayhrer

Cassette systems

- 1) NRAO - VHS Escoffier
 - a) Analog performance
 - b) Recorder performance, tracking, environmental sensitivity
 - c) Digital performance
 - d) Recorder modifications required
 - 2) Canadian - VHS, Betamax Yen
- B] General discussion of the relative merits of cassette vs longitudinal
- a) Meeting VLBA requirements
 - b) Reliability and maintenance
 - c) Processor requirements and interface
- C] Performance tests and other data needed to decide which system should be developed for the VLBA
- a) Environmental
 - b) Reliability
- D] Development schedule and deadlines