

**VLBA ACQUISITION MEMO #139**  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HAYSTACK OBSERVATORY

WESTFORD, MASSACHUSETTS 01886

13 April 1989

Area Code 508  
692-4764

To: VLBA Data Recording Group

From: Alan E.E. Rogers

Subject: Minutes of VLBA Data Recording Telecon  
Held 12 April 1989 at 1300 EDT

Attendees: Ken Stetten - Socorro  
Durga Baghri - Socorro  
Jim Ruff - Socorro  
Craig Walker - Socorro  
Dick Thompson - Charlottesville  
Jon Romney - Charlottesville  
Alan Rogers - Haystack  
Hans Hinteregger - Haystack  
George Peck - Haystack

Setting formatter clock

Apparently the problems of reliably setting the formatter clock are still not fixed. The formatter in the VLBA system on loan to OVRO is coming a second or more late about 50% of the time following the reset by NEWD. Further, NEWD is not reporting the error.

Recorder characterization

There was considerable discussion of the recorder tracking performance and the proposed fixes. In summary:

A] History

Honeywell demonstrated good tracking repeatability in 1975. Hans quantified this in 1980 and demonstrated repeatability (of the short term signatures) at the one-quarter micron level. Although tests were made with and without an idler roller, apparently drifts on the scale of a hundred feet and longer were not measured. In 1984/5, John and Hans found that they could only achieve good tracking without the idler and they substituted a fixed post. About the same time, some tracking drifts were noticed and the need for a prepass became evident. More recently it has become known that occasional tracking shifts can reach as high as 80  $\mu\text{m}$  and on some tapes the reverse passes crossover forward passes.

B] Study results

A study of the machine has shown high sensitivity to capstan taper, alignments and the presence of grooves worn in the critical edge guiding regions. It has also been shown that there are significant tape signatures that have large drifts with footage and a substantial forward-reverse offset. Models have been developed for the machine and tape and both the models and tests show that machine sensitivities and tape signatures are reduced by a factor of at least 3 when an idler is used.

C] Tentative recommendations

Alan Rogers now tentatively recommends that we return to using the idler, provided we can be sure that Honeywell's new idlers will not slip like some of the older idlers. [The problem that probably resulted in Hans and John giving up on the idler is now thought to be related to excessive bearing friction - possibly due to evaporation of the lubricating oil over the years.] Tests are currently in progress to better define the tracking limits using a correctly functioning idler. So far, results are encouraging and the prepass shift may now be small enough to consider dropping the prepass requirement. More tests and studies are still needed to be sure the idler will work reliably.