VLBA ACQUISITION MEMO #338

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
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16 September 1992

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To: VLBA Data Acquisition Group

From: Alan E.E. Rogers

Subject: Minutes of VLBA Tape Review Meeting held 14 September 1992

Attendees:

P. Bolis - Haystack	A. Rogers - Haystack
Prof. B. Bhushan - Ohio State	J. Romney - National Radio Astronomy
R. Cappallo - Haystack	R. Ruhl - Metrum
H. Hinteregger - Haystack	J. Salah - Haystack
C. Janes - NRAO	D. Smythe - Haystack
G. Klechefski - National Media Lab.	C. Tarry - Penny & Giles
P. Napier - NRAO	C. Tattersall - Penny & Giles
G. Peck - NRAO	V. Tran - Haystack
Prof. F. Talke - UCSD	K. Wilson - Haystack

A meeting was held at Haystack Observatory to discuss our readiness to procure thin tape for VLBA operations. The meeting appropriately followed the attached agenda with breaks for discussion when questions arose.

Comments from our consultants

1] Head contour at high speeds

Professor Talke commented that head contour worn at high speed is strongly influenced by the surface roughness - and good models are now available at UCSD to make the calculations. Equipment is also available to make accurate measurements of flying height.

2] Flash temperature variation with contact pressure

Professor Bhushan commented that the independence of flash temperature with contact pressure in the Rabinowicz theory is not correct for the tape edge contact and that we should expect higher temperatures with higher pressure. Thus we should try to reduce the edge forces as much as possible without degrading the tracking.

3] Edge contact lubricants

High viscosity lubricants (like Krytox or Fomblin) (~1600 centistoke) might be considered as a means of preventing edge damage to very thin tapes.

4] Compliant edge guide

If we consider further mechanical modifications to the transport we should look at a compliant edge guiding method similar to that used on the IBM 3480.

5] Analysis of deposits and damaged tape by National Media Laboratory

George Klechefski of NML summarized a report from M. K. Hoel and D. L. Molitor of NML. The NML conclusions are that the edge of the damaged tape shows a bead of melted polyester base film (PET). A "melt down" deposit shows smears of magnetic coating. Normal light deposits (on samples of alumina sent after running tape without "melt down" failure) have not yet been analyzed but appear to have a melting point above 300°C. Thus these deposits may be friction products.

Recommendations

1] Conduct further studies to determine why Ampex 741 is more susceptible to edge damage.

2] Conduct more short tape shuttle tests using 3M tape. Study, more carefully, the effect of RH on edge damage and deposits using short tape shuttle tests.

3] Continue accelerated tests indefinitely. Try to reach the equivalent of five years operation (~36 cycles between antennas and processor) as soon as possible.

VLBA TAPE REVIEW MEETING

14 *September* 1992

at

HAYSTACK OBSERVATORY

Westford, Massachusetts

Agenda

08:30 - 09:00	-	*Coffee - Welcome Comments*
09:00 - 10:30	-	*Brief Review of VLBA Recorder Specifications and Performance*
10:30 - 11:00	-	*Mechanical Studies of VLBA Recorder Related to Handling of Thin Tape*
11:00 - 11:15	-	*Break*
11:15 - 11:30	-	*Modification of Transport:* *a) New E-casting* *b) Front Door* *c) New I/O Roller Sleeves* *d) Alignments*
11:30 - 12:15	-	*Discussion and Advice from participants*
12:15 - 01:00	-	*Lunch*
01:00 - 01:30	-	*Results of the Accelerated Tests*
01:30 - 02:00	-	*Environmental Tests*
02:00 - 02:30	-	*Packaging and Handling of Thin Tapes*
02:30 - 03:00	-	*What Tape Should the VLBA Procure?*
03:00 - 03:30	-	*Discussion and Recommendations*

Participants

Peter Bolis, Haystack
Prof. Bharat Bhushan
Roger Cappallo, Haystack
Hans Hinteregger, Haystack
Clinton Janes, NRAO
Peter Napier, NRAO
George Peck, NRAO
George Klechefski, NML
Colin Tarry, Penny & Giles
Alan Rogers, Haystack
Jon Romney, NRAO
Russ Ruhl, Metrum
Dan Smythe, Haystack
Prof. Frank Talke
Colin Tattersall, Penny & Giles
Viet Tran, Haystack
Ken Wilson, Haystack
Joseph Salah, Haystack