VLBA ACQUISITION MEMO #323

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886

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Telephone: 508-692-4764
Fax: 617-981-0590

To: VLBA Data Acquisition Group

From: Alan E.E. Rogers

Subject: Accelerated thin tape tests: Status Report

The attached table summarizes the results of the accelerated tests.

Melted edges

There is evidence (at least one example) for the melted edge syndrome on all three types of tape indicating that there are still some conditions under which the upgraded transports are not yet able to prevent this kind of damage.

Wind test damage (?)

The wind test itself has produced temporary failure of several tapes and two tapes which were inadvertently left for some time in a very bumpy state following the wind test show no signs of a melted edge, but show a stretched edge with the impression of the spokes (curled-up ("scalloped") edges) permanently impressed. The impressions left by the bumpy pack are not surprising owing to the viscoelastic nature of the PET film which will creep when stressed.

Wind test repeatability

The 15" wind test can be easily failed by an undamaged tape when there is excessive friction on the tape reel flanges. For a period we used self-packing take-up reels on the wind test transports but we have now reverted to the standard non-self-packing reel.

High humidity

Unfortunately, the wind test transports at Haystack are not in a well controlled environment and the relative humidity can exceed 50%. At high humidity the wind test is more likely to fail - presumably owing to the increased friction between the tape edge and the reel flange. Also, the one 3M tape which suffered a "melt-down" was damaged during a high speed shuttle at Haystack under humidity of about 50-55%. Following this shuttle there were substantial sticky deposits on the front door as well as on the alumina on all drives. We had been using an aluminum front door. With this experience, there is now some doubt that aluminum is as good as copper and further tests will be needed to settle this issue.

Tape rehabilitation

There is some hope that tapes that have become bumpy but are not severely melted can be restored. The Sony tape appears especially promising in this regard as much of the edge thickening on this tape appears to be the result of debris from the delicate backcoat which can be removed with cleaning. Also tapes that have become deformed might be forced to relax back into good condition if they can be wound into good pack (with pack arm if necessary) and then left for a few days to relax.

ACCELERATED TAPE SUMMARY for week of 6 July 1992

Notes on Damaged tapes:
VLBA0037 - damaged at Brewster during tests
- it was run with negative tape angle
USNO1018 - has been left bumpy - could not relax
VLBA0058 - has pack rotation marks - shipping problem?
VLBA0059 - has melt burr on front
VLBA0061 - has been left bumpy - could not relax
VLBA0066 - has melt burr on rear
VLBA0072 - has melt burr on front - shuttled at high RH

Tapes marked with * continue to fail wind test
Some tapes which failed the wind test have now
passed and have been put back into the accelerated testing
The damaged tapes have now been withdrawn from the accelerated testing

TAPE	TYPE	Num of Cycles	Date of last test
USNO1003	SONYD1-K	8.00	07/02/92
USNO1010	SONYD1-K	6.00	05/05/92
USNO1013	SONYD1-K	11.00	06/29/92
USNO1018*	SONYD1-K	5.50	05/28/92
USNO1027	SONYD1-K	10.00	06/30/92
USNO1037	SONYD1-K	2.50	04/07/92
USNO1044	SONYD1-K	10.00	06/30/92
USNO1046	SONYD1-K	2.50	04/03/92
VLBA0013	SONYD1-K	3.00	06/19/92
VLBA0037*	SONYD1-K	1.00	03/26/92
VLBA0057	AMPEX741	2.00	07/02/92
VLBA0058*	AMPEX741	2.50	05/20/92
VLBA0059*	AMPEX741	2.50	06/26/92
VLBA0060*	AMPEX741	2.00	06/18/92
VLBA0061*	AMPEX741	2.50	06/01/92
VLBA0062	AMPEX741	2.50	06/16/92
VLBA0063	AMPEX741	3.00	06/29/92
VLBA0066*	AMPEX741	2.00	06/04/92
VLBA0067	3MQIC16T	4.50	07/03/92
VLBA0068	3MQIC16T	3.50	07/01/92
VLBA0069	3MQIC16T	4.00	06/26/92
VLBA0070	3MQIC16T	3.50	06/22/92
VLBA0071	3MQIC16T	3.50	06/26/92
VLBA0072*	3MQIC16T	4.50	06/26/92
VLBA0076	3MQIC16T	4.00	06/26/92
VLBA0077	3MQIC16T	2.50	06/26/92