

VLBA ACQUISITION MEMO # 320
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 HAYSTACK OBSERVATORY
 WESTFORD, MASSACHUSETTS 01886

30 June 1992

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

To: VLBA Data Acquisition Group
 From: Alan E.E. Rogers
 Subject: Wear tests on short tapes

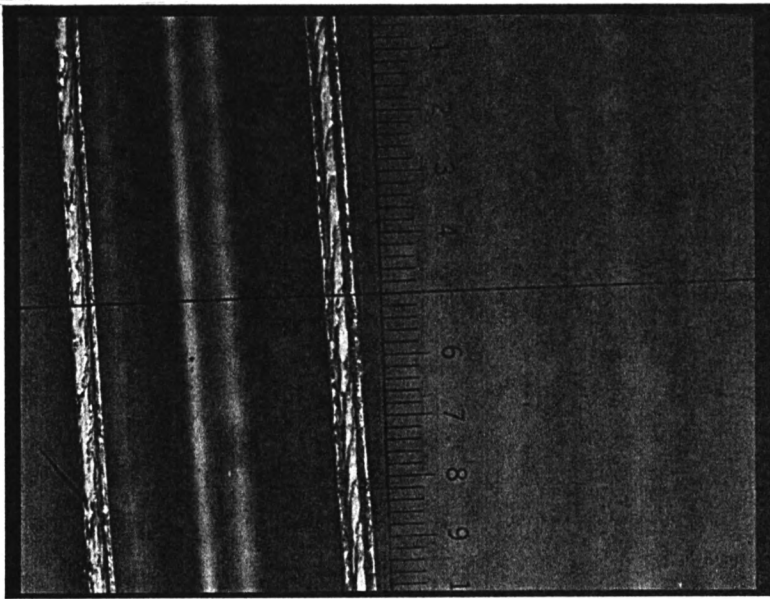
In order to accelerate the wear on thin tapes we have shuttled short lengths of tape under various conditions. By adjusting the length of the tape so that it is slightly longer than that needed to accommodate the low tape region it was possible to reduce the duration of a pass to under 30 seconds. With these very short passes several thousand passes could be accumulated in a day. Table 1 summarizes the tests. In all cases it was possible to observe some edge wear or smoothing (see Figure) of the edge relative to portions of the tape not shuttled (i.e. those within the low tape regions). In most cases the amount of wear evident was about equal on the front and rear (nearest the precision plate) edges. In only one case (REM #4) there was heavy apparent wear and the formation of a bead (see Figure) on the backcoat side characteristic of the melted edges seen on damaged tapes (before mechanical upgrade). In this case the melted edge was on the back and was mostly likely the result of the heavy coating of sticky deposit seen on the alumina plate after shuttling this tape remnant. With exception of REM #4 none of the edge wear on the test samples appears bad enough to produce a bumpy pack. However this cannot be easily tested as long tapes are needed to produce the bumpy pack syndrome. Several special conditions were tested to try and provoke edge damage. A high humidity (100% RH) did generate some dirt - but not enough to provoke a melt down. However this test was only run for a relatively short time and needs to be repeated. For these tests, the bottom line appears to be NO STICKY DEPOSIT = NO PROBLEM.

Conditions			AMPEX	3M	SONY
Speed	Tension	Config.	REM#, Duration,# passes		
330	10	S		2, 24 hrs, 3000p	14, 24 hrs, 3000p
330	10	CuF	4, 3 hrs, 300p		
330	5	CuF	6, 4 hrs, 500p		
330	15	S	8, 1 hr, 300p		
270	10	HH	13, 15m, 90p		
270	7	HO	12, 1 hr, 120p		
270	10	S	9, 12 hrs, 1400p		
90	10	S	5, 48 hrs, 2000p		
67	10	S	7, 48 hrs, 1800p		3, 63 hrs, 2000p
330	10	R	10, 1 hr, 300p		

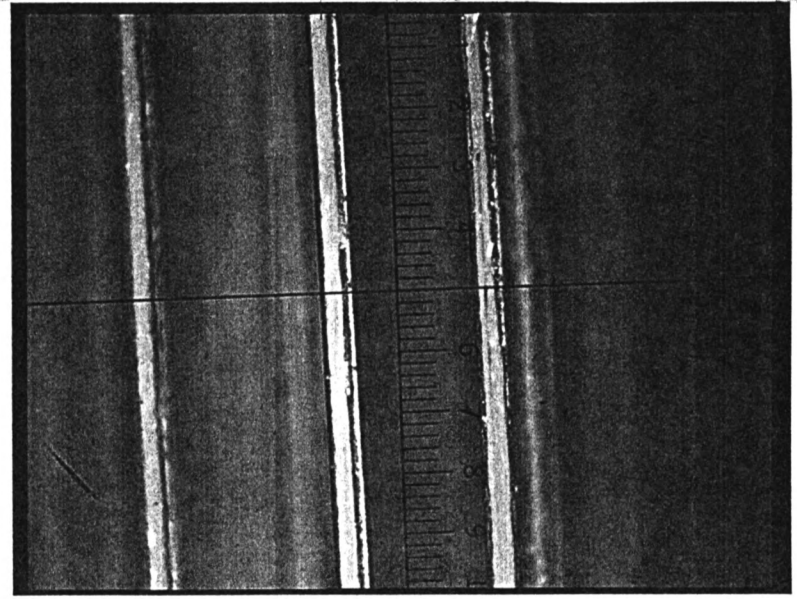
Notes: S = aluminum front door,
 CuF = Copper front door,
 HH = high humidity,
 HO = honking (front door shimmed open by 10 mils),
 R = tape reversed (oxide out)

REM # 14

typical edge wear



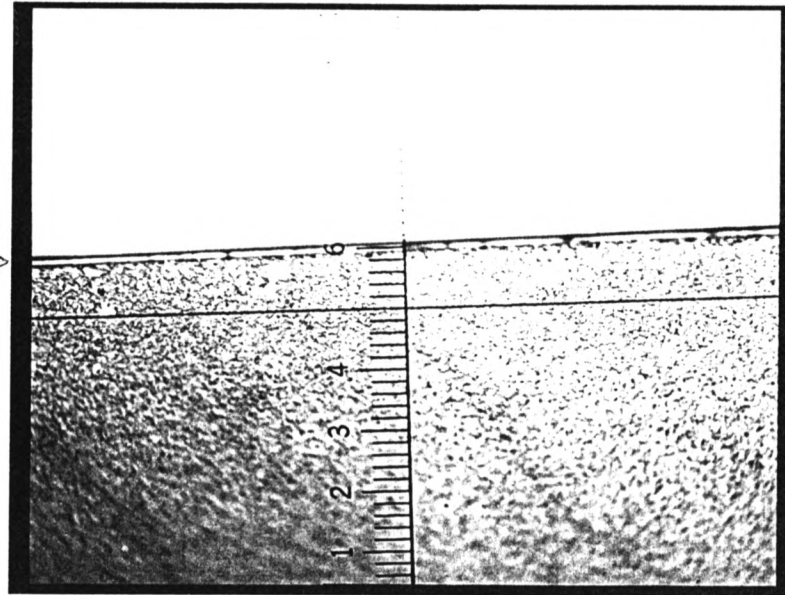
FRONT UNWORN



FRONT WORN 3006

REM # 4 BACK DAT

melted edge



EDGE RUN AGAINST ALUMINA

Figure 1.