

# VLBA ACQUISITION MEMO #300

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To: VLBA Data Acquisition Group  
From: Alan E.E. Rogers and Hans F. Hinteregger  
Subject: Measured tolerance on reel table alignment

At very low speeds (< 15 IPS) or during start and stop when tape speed is low, the reel tables must be well aligned to avoid tape edge damage by the I/O rollers. We have measured the maximum allowable reel table displacement before permanent visual damage occurs to the tape edge.

Various tapes were run on a transport (with the configuration given in VLBA Acquisition Memo #290) with deliberate misalignment of a reel table in the axial direction. With a tape mounted, the vacuum was adjusted until running at low speed produced permanent edge crinkle. Photographs 1 and 2 show the same piece of tape before and after damage. Under the microscope the damage is apparent as a gentle weaving of the edge (clearly seen without microscope) and some scuff marks on the backcoat about 600 microns in from the edge.

The results of the tests are plotted in Figure 1 and were found to vary in proportion to the ratio of tape thickness to tension. For 16  $\mu\text{m}$  tape run at 15", the maximum deviation before damage was 60 mils. Making allowance for some safety margin the reels should be aligned to  $\pm 50$  mils. This only accounts for misalignment along the reel axis. Any deviation in the perpendicularity of the reel and/or I/O roller axis with respect to the precision plate could also reduce the margin.

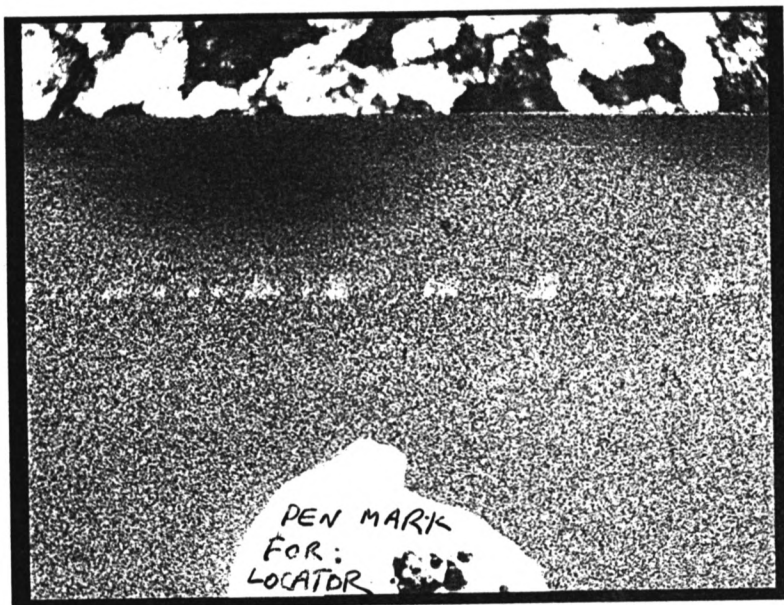
At this time, we think that while tape damage by the I/O rollers on a misaligned transport is a problem, there is no evidence to suggest that it has contributed to the thin tape packing problem. The spoking or bumpiness on thin tapes is still thought to be either edge damage during manufacture or edge damage by frictional heating. The I/O problem, if present, is most likely to damage tape only during starting or stopping the tape, since at moderate and high speeds the I/O rollers develop an air bearing which greatly reduces the forces against the flange produced in a misaligned tape path.



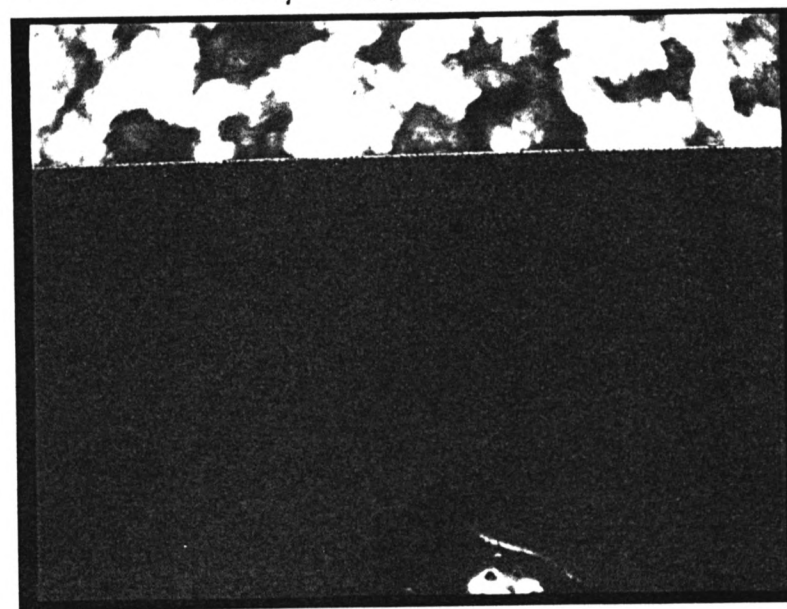
VIEW OF BACKLAP

light and dark regions are  
gentle ripple wave

SONY DIK



SCUFFS



SAME TAPE FOLLOWING EDGE  
DAMAGE BY I/O ROLLER

2500 microns  
BEFORE EDGE DAMAGE

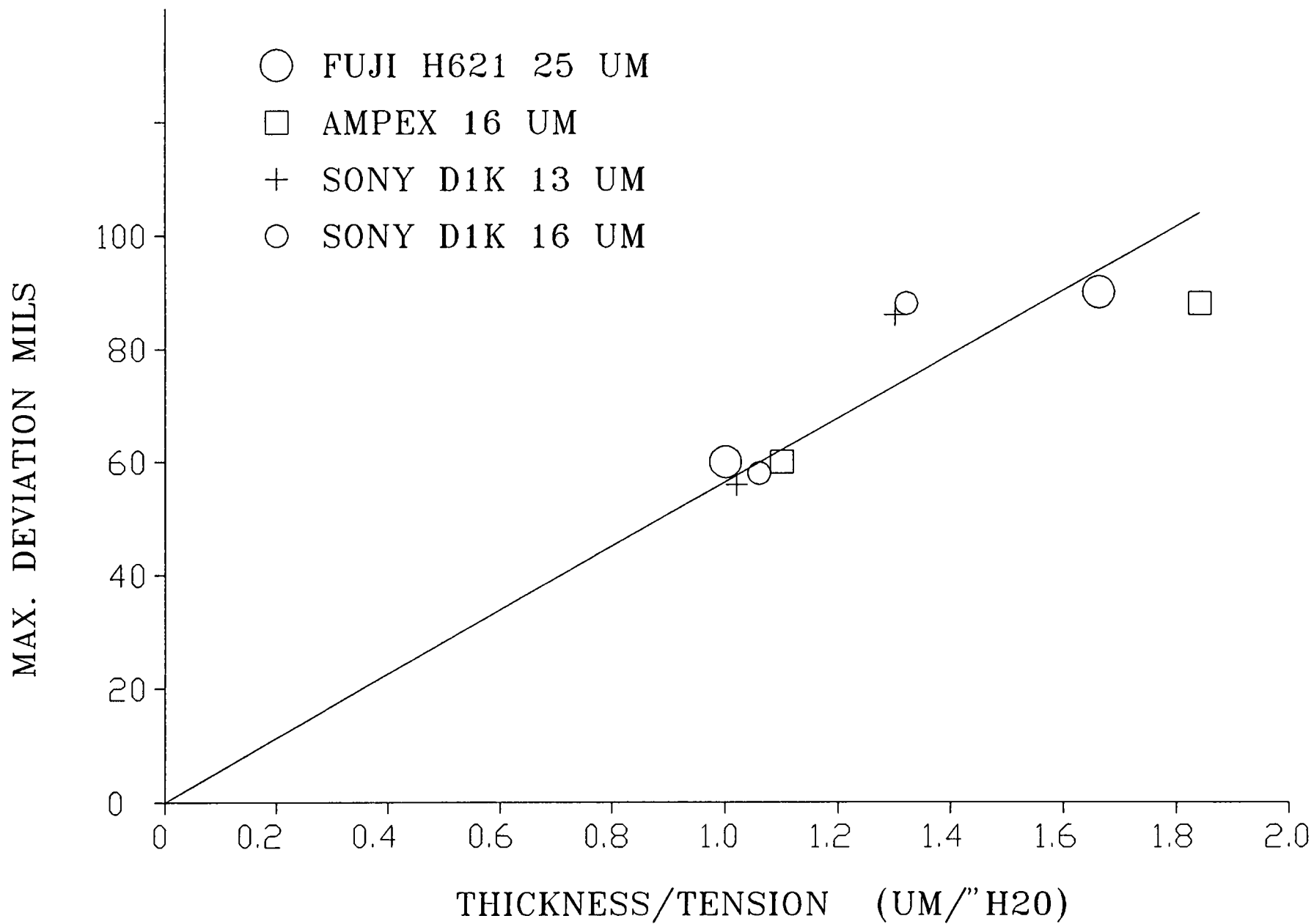


FIGURE 1. MEASURED MAXIMUM ALLOWABLE REEL TABLE TOLERANCE.