

**VLBA ACQUISITION MEMO #225**  
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To: VLBA Data Acquisition Group

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Subject: Preliminary report on first VLBA tapes

Nominal 16 $\mu$ m thickness tapes have now been received from Ampex, Maxell and Sony. The table below summarizes the abrasivity and magnetic performance at 1 $\mu$ m wavelength.

	Abrasivity $\mu$ m/hr	1 $\mu$ m signal dB	Comments
Sony	0.01	0	reference
Maxell	0.002	+1	
Ampex	0.006	+1	see note 2

Notes 1] Abrasivity at 10" vacuum, 160 IPS, 55% RH, 75°F  
2] Some Ampex tapes are initially very dirty and need cleaning

The 18,000' long Sony tapes wind and pack well on all the reels tried including the metal reel with mylar liners. Both the Maxell and Ampex tapes have a serious winding and packing problem which makes their use questionable. These tapes often pack loosely (at speeds above 10 IPS) and often show "cinching" and "windowing". Sometimes voids appear in the loose pack and the pack will shift and rotate while on the transport by such a large amount that the vacuum buffer cannot accommodate the shift and vacuum is lost and/or the tape is stretched. While the packing problems are somewhat unpredictable, the pack is loose (except at very low tape speeds) and shows other defects which appear more frequently with:

- 1] Increased vacuum
- 2] Increased radius on reel
- 3] Use of mylar lined self packing reels
- 4] Continued shuttling of the tape
- 5] Higher tape speed

At this point we speculate that the loose packing is the result of air entrapment. A rough estimate of the thickness of the air layer between windings can be made by the change in pack diameter. For Ampex and Maxell tapes on the self packing glass reel the increase in radius is about 0.1" at 7" radius or about 0.3 $\mu$ m air layer. The air layer apparently vanishes at speeds below 10 IPS. Apparently the Sony tape has backcoat with sufficient roughness to absorb or somehow disperse the ultra-thin film of air which would otherwise remain. A successful test has been made of the dual vacuum level operation (6" for thin and 16" for thick tape - see VLBA Memo #208) of a processor transport using a Sony tape. We continue to try and understand the winding problems of the Maxell and Ampex tapes.