MARKIV MEMO #259

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July 28, 1998

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To: Recorder Group

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Subject: Mechanical test and acceptance requirements for thin tape

In addition to meeting signal-to-noise and error-rate performance expectations [1] on par with the already-qualified Sony D1K, 3M5345, and Quantegy 741 products, two mechanical tests are required:

1. tape-edge integrity (endurance)
2. flange-forcing tendency

These two tests must be passed by at least 3 product samples provided to Haystack (or other designated experienced facility, such as NRAO) for VLBI-qualification testing. Conditional lot-acceptance should also be based in part on endurance testing at least one tape from each lot.

Tape-Edge Integrity

The tape-edge integrity endurance test consists of shuttling a sample tape at standard 2.2 Newton tension (10" vacuum) and 270-320 ips high speed for 14 days of cumulative shuttle time, between a VLBI-qualified glass self-packing supply and a non-self-packing glass takeup reel, on a properly maintained, periodically cleaned, Metrum 96 drive VLBI-configured with the so-called thin-tape-upgrade and dry-air kits. The tape-packs, both on the self-packing and on the non-self-packing reel, must remain completely free of bumps. The tape pack must not become bumpy when the tape is periodically wound at a 40-80 ips low speed.

Note: The effective radial compliance of the tape pack is reduced at low speed and high tension; sensitivity to edge-damage (thickness non-uniformity) resulting in a bumpy pack is thereby increased. Bumps are sensed through a freely handheld piece of 0.02 x 0.5 x 6" shim stock, one end of which rests on the rotating tape pack. Its sharp corners are scanned into the corners between pack and both reel flanges.

Flange Forcing Requirement

For shippability reasons, a tape must not significantly 'force' the flanges of the self-packing reel apart so as to defeat its purpose of suppressing 'scatter-wind'. The wound pack must not cause the minimum flange separation (at the labeled 'tightest' azimuth of the self-packing reel) to exceed 1.000". VLBI-qualified tape product should have a non-flange-forcing yield of over 95% at the time of repackaging on a self-packing reel (conditional acceptance) and any flange-forcing tapes found in the process should be rejected and replaced under the terms of purchase.

Reference:

[1] Rogers, A.E.E., Hinteregger, H.F., "Draft-Tape Procurement Specification," VLBA Acquistion Memo 299, M.I.T. Haystack Observatory, 19 May 1992.