

VLBA ACQUISITION MEMO #280

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To: VLBA Data Acquisition Group

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Subject: Reels for thin tape

So far the only reel which prevents edge damage during shipment is the "self-packing" (flange separation reduced to 25.45 ± 0.05 mm) reel. Tests of the standard reel with plastic bands to prevent movement of the flanges were found to crush scatter-wound-turn due to slipping of large sections of the tape pack inside the standard plastic shipping canister when the reel is dropped from 4 feet.

While the mylar liners on the metal reels form a satisfactory "self-packing" they are not satisfactory for thin tape as they are not sufficiently smooth and uniform so that there is excessive friction applied to the tape edge which often results in a pack with voids or bumps.

A self-packing version of the metal reel--with holeless flanges, hub modified to reduce the flange separation, and flange curvature turned inward, all as in the case of the self-packing glass reel--was tested. This metal reel works as well as the glass version to suppress scatter-wind and is no more susceptible to producing a bumpy pack due to intrinsic irregularities of the inner flange surfaces. Removable irregularities (gum-balls) stuck to inner flange surfaces can cause a bumpy pack in either case even if the tape itself is not damaged. However, when the metal reel is subjected to the 4' drop test (in the standard plastic shipper and with standard reel bands) the flanges are sometimes bent. The most serious disadvantage of metal flanges remains the ease with which they are damaged both in handling and shipment.

Corning no longer makes glass reels, while Ampex is scrambling to fill the niche, initially to meet the continuing demand from some government agencies (NSA, NADC) for standard (W-R-175/6A) non-self-packing glass reels. Subject to first meeting commitments for these, Ampex has indicated a willingness to supply their tape on self-packing glass reels early next year and to provide evaluation samples very soon. Assuming we can qualify these and agree on a commercial specification (NADC is not ready to submit a government specification for the self-packing glass reel) Ampex may also be willing in the long run to supply the reel separately. The price of the non-self-packing reel is to be competitive with Corning's (former) product at ~\$130 a few years ago. If flanges need to be selected to meet a tighter curvature specification, the self-packing version may be slightly higher.

In addition to the glass self-packing reel, the packaging of the VLBI tapes for shipment would be improved by a reel band designed to press the flanges against the faces of the pack and keep them from spreading in a drop test (high shock load). Without such a band even with a perfectly wound tape on a self-packing glass reel, one section of the pack can shift momentarily with respect to another, typically leaving what looks like crushed scatter-wind in the perhaps overly severe drop test.