

# VLBA ACQUISITION MEMO #156

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To: VLBA Data Recording Group  
From: Alan E.E. Rogers  
Subject: Tests of new large diameter idler roller

## Larger diameter idler

A larger diameter idler is required with the new symmetric headblock assembly in order to preserve equal wrap angles on all headstack locations. The change from 1.144" diameter to 1.1768" diameter is small and is not expected to result in any surprises. The new idler also has larger grooves (see Acquisition Memo #144) and smaller lower friction bearings (see Acquisition Memo #138) to ensure that it maintains a good grip on the tape.

## Roller slippage

The new roller was tested at the highest speed, 360 IPS, and the lowest vacuum, 6" H<sub>2</sub>O, for slippage. Even under these conditions some additional friction (approximately 50 gm cm) could be added (by putting a friction pad up against the front rotating surface) before there was any indication of slipping (indicated by tracking shift or audible change).

## Forward - Reverse offset

The forward - reverse offset was 20  $\mu\text{m}$  without any adjustment of the roller mounting pads. This is also the same offset as obtained with the old roller. The asymmetry is most likely in the precision plate itself.

## Speed and vacuum shift

There was no measurable tracking shift with speed (60-330 IPS) or vacuum (6-15") at the level of 5  $\mu\text{m}$ .

## Tape dependent tracking

The main reason for using the idler roller is to reduce the dependence of tracking on the tape. While tape dependent tracking signatures are largely repeatable the signatures do change when the tape is strained. The "prepass" allows strains to relax and passes following the prepass are quite repeatable - but the signature can be altered with environmental cycling of the tape. Also the signatures are machine dependent.

Figure 1 shows an example of the tape dependent forward - reverse offset with fixed post and with the new idler. The signature r.m.s. is reduced by a factor of 4. All tests were made on VLBA REC #3.

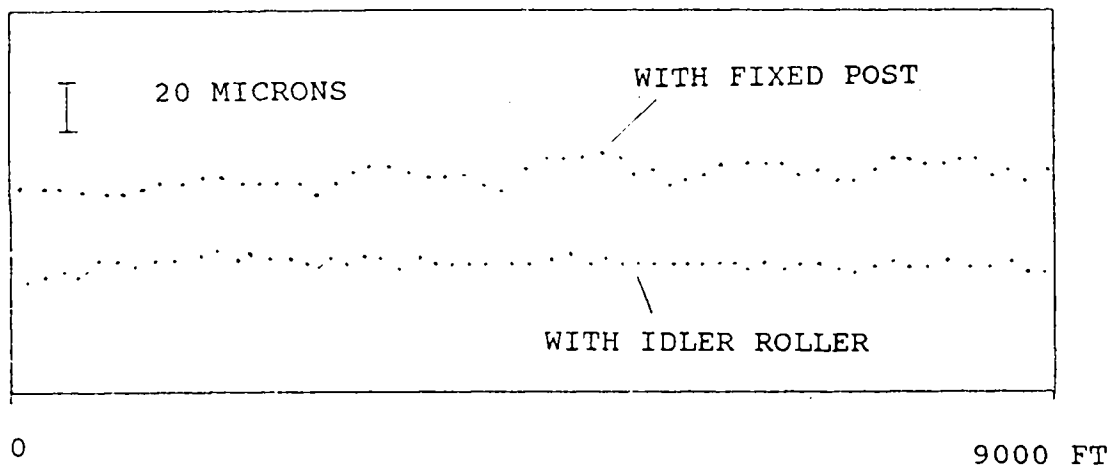


FIGURE REVERSE TRACKING SIGNATURES ON FORWARD RECORDING USING 0.5 MIL SONY D1K TAPE (MS-02766)