

# VLBA ACQUISITION MEMO #330

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To: VLBA Data Acquisition Group  
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Subject: Capstan and Idler Alignment Tests

The following checks are needed to ensure that the capstan and idler axes are aligned:

- 1) Measure location of pre-recorded track in forwards and reverse.
- 2) Remove the idler roller and replace with a fixed post assembly.
- 3) Again measure the locations of the same recorded track in forwards and reverse.

If the axes of the capstan are aligned there will be little change in apparent location of the recorded track. The differences with the idler and the fixed post should be less than 75 microns. In the case of larger differences checks need to be made to determine the cause. If the tape angle is abnormal with the idler removed then there is a problem with the capstan alignment. Some of the problems we have seen in the past are:

- a) **Loose or damaged idler mounting.** Remove idler and hold a flat against the rolling surface. Rotate, and check that the mounting posts are all of equal height.
- b) **Idler mounting screw is too long.** If an idler screw bottoms out, it will fail to pull mounting post up to the reference surface.
- c) **Capstan mounts are not in a plane parallel to the precision plate front surface.** Use shims to correct.
- d) **Idler mounting triangle or headblock is not in good contact with the front of the precision plate.** Check the headblock assembly and the idler mounting triangles for dirt, burrs, screws bottoming out, or anything (like excess epoxy around locating pins) that might prevent good contact. (Do not overtighten idler screw into headblock (6 inch lbs max.) as the headblock assembly is easily indented.)
- e) **Front door doesn't latch down fully.** Check for alignment of door and latch - readjust if necessary.

Another method to make a quick test of axis alignment is to check that the tracking in forward and reverse is unaffected by shimming the front door open by 10 mils. If the tracking is effected by opening the front door by less than 6 mils, or if it takes more than 15 mils to lose tracking, there is an axis misalignment influencing the edge guiding force.

An axis difference between the capstan the idler of 4 minutes of arc is found empirically to produce a door margin (see VLBA Acquisition Memo #326) change of 8 mils.