

VLBA ACQUISITION MEMO #270

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TO : VLBA Acquisition Group

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SUBJECT : VLBA Write Driver at 18 Mb/s

I have used a modified VLBA write driver with a 1.5-K Ω Mark IIIA head interface to write Ampex 741 tape at 18 Mb/s. The driver was modified by replacing the 0.1 μ f input coupling capacitors with 1K Ω in parallel with 47 or 100 pf, 100- Ω output resistors with 20 Ω , and the monitor transformers with short circuits. There is some asymmetry evident in the eye patterns on some tracks, but the eye pattern on any given track looked the same with or without reclocking. The error rate, averaged over 10 tracks, as a function of head voltage is shown in Fig. 1, with reclocking; the results without reclocking are similar.

To compare the performance with and without reclocking, a tape was recorded at 18 Mb/s (320 ips) at a Head Voltage of 14 volts; and error rates were measured on 11 tracks for 8 seconds per track at 80 ips in forward and reverse. There were a total of 18 resyncs in the 35,200 frames with reclocking and 33 resyncs without reclocking. In the remaining frames, the average parity error rate was 1.0E-5 with reclocking and 1.1E-5 without, not a significant difference.

Without reclocking, the digital bit synchronizers in the Mark III recorder are probably having trouble with the transition jitter. However, the more robust AT&T bit syncs to be used in the VLBA and Mark IV correlators can probably handle it. This recording will be saved until a recorder with the new bit syncs becomes available. If the new bit sync demonstrates comparable performance with and without reclocking, then the write driver can be simplified by removing the reclocking circuitry.

RECORDED AT 18 Mb/s, 320 IPS

RECLOCKED, PLAYBACK AT 80 IPS

