

VLBA ACQUISITION MEMO #196

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To: VLBA Data Recording Group

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Subject: Demonstration of Gigabit per second recording with
the VLBA Recorder

For a special test demonstration, we outfitted REC #3 with 4 headstacks and 4 sets of write electronics. We positioned the headstacks at -55, 0, 55, and 110 microns and recorded using all 144 heads (we included system tracks) at a 9 Mb/s formatted data rate on each track for a total of 1.296 Gb/s. We then played back the Gigabit recording using headstack #2 (we labelled the headstacks 1, 2, 3, and 4 in increasing distance along the tape from the supply reel) and verified that we had satisfactorily recorded each group of 36 tracks. We also auto-correlated the data in 4 separate mode A passes on the MKIIIA correlator. For compatibility with the MKIIIA, we used MKIII format at 33,000 bpi. With this demonstration we hope to make people more aware of the data rate expansion path which is part of the VLBA recorder design. While the VLBA will begin operating with only one headstack allowing a maximum rate of 512 Mb/s when using the two transports simultaneously, we have made provision (given future NSF funding for more headstacks, formatters and write electronics) to be able to record at 2 Gb/s at each site. With a new formatter capable of generating an 18 Mb/s data stream per head we could increase this rate to 4 Gb/s. If the funding ever becomes available, we hope to improve the VLBA sensitivity for coherent limited experiments (like 3 and 7 mm VLBI continuum) and certain other special experiments, by a factor of almost 3 in going from our present peak recording rate of 0.5 Gb/s to 4 Gb/s.