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To: VLBA Data Acquisition Group  
From: Alan E.E. Rogers  
Subject: MKIIIA/VLBA Compatibility - an Update

1] Compatibility with Existing Processors

The VLBA DAR is compatible with MKIIIA to the extent that VLBA can emulate a MKIIIA with 8 converters (for DARs with 8 converters) and therefore has a maximum of 64 MHz common bandwidth (16 4-MHz channels). Thus VLBA sites with 8 converters are fully compatible with MKIII Mode B.

2] Compatibility with VLBA Processor

At a meeting held on 17 November 1988 it was decided that the VLBA processor will be able to read MKIIIA tapes. However, the VLBA processor will support only 8 channels without multiple pass processing and thus the widest bandwidth in common with MKIIIA is only 32 MHz. With multiple pass processing the bandwidth is limited by the number of VLBA baseband converters to 64 MHz. It has been pointed out that advantage can be taken of the 2-bit sampling and that VLBA-VLBA baselines can be processed with 2 bits/sample and VLBA-MKIII baselines can be processed with 2 x 1 bits/sample.

3] MKIIIA Upgrades

The simplest upgrade to make MKIIIA more compatible with the VLBA would be to make the sampler capable of 2-bit sampling. The next level would be to add 8 MHz filters (this can actually be accommodated at present by connecting an 8 MHz filter to the external filter connections on the rear of the MKIII video converters) and a "presampler" to sample at 16 MHz. A new module could perhaps be added to the MKIII to sample 7 channels\* at a 16 MHz rate with 2 bits/sample and provide 28 outputs to the MKIII formatter. This would make use of all the available MKIIIA recorder bandwidth in a manner fully compatible with the VLBA and provide a sensitivity approximately equivalent to 100 MHz bandwidth with 1 bit sampling.

\*Or for a better match, 8 channels, 6 with 2-bits/sample and 2 with 1-bit/sample.