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To: VLBA Data Acquisition Group
From: Alan E. E. Rogers
Subject: Requirements to Make VLBA DAR and REC Fully Compatible
With Geodetic S/X Mode

The VLBA Data Acquisition Rack (DAR) and Recorder (REC can be made functionally equivalent to a MKIIIA (high density) recorder and MKIII Data Acquisition Terminal (DAT) provided:

1) I.F. Conversion

The DAR has an I.F. range of 500-1000 MHz and thus stations with receivers compatible with the MKIII DAT (I.F. range 100-500 MHz) will need an IF upconverter.

2) Delay Calibration Electronics

The DAR contains no delay calibration electronics and thus stations will need a MKIII delay calibrator ground unit with power supplies.

3) Number of Converters

The standard DAR has only 4 converters (expandable to 8) and hence either a special DAR with 14 converters or 2 DARs with 7 converters is needed. When more than 4 converters are used in a DAR, a second sampler module is also needed to support the added converters. A special 14 converter DAR has been proposed (see VLBA Acquisition Memo #89) which requires an extra bin, 5MHz distributor and sampler to support MKIII mode C. It could also support Mode A if the special sampler modules are designed to handle 16 channels of 1 bit/sample channels each.

4) Computer Interface

The DAR and REC are controlled via the Monitor Control Bus (MCB) which is a special serial communication protocol which runs at 56K baud. To be compatible the DAR and REC need special computer software and interface card or a VLBA station computer system with special software. At present no software exists for the standard HP computer or the VLBA station computer which is fully compatible with MKIII field system operations.

5) Station Timer

The DAR requires 5 MHz and 1-second tick. The 1-second tick (which comes from the "station timer" in the VLBA C rack) has to be present at all times and whose positive going edge should be coincident (± 20 ns) within the positive going transition of the 5 MHz. A VLBA station timer module or equivalent is required.