

VLBA ACQUISITION MEMO #240

NATIONAL RADIO ASTRONOMY OBSERVATORY

Edgemont Road

Charlottesville, VA 22903

Jan. 24, 1991

To: P. J. Napier and meeting attendees.

From: Dick Thompson

Subject: Meeting on problems of analog crosspoint switch on A/D board of formatter.

Attending the meeting were D. Bagri, G. Peck, and C. Walker in Socorro, J. Levine, A. Rogers, J. Hargreaves and R. Capallo at Haystack, and J. Romney, R. Treacy, and Dick Thompson in Charlottesville. The principal conclusions were as follows.

(1) The limitations of the present crosspoint switch are described in VLBA Acq. Memo No. 235. It was not envisaged that more than one set of tracks would be used on any single output when the switch was designed. It is believed that the switch can reliably handle outputs to either one or two track sets. However, the performance of each board when driving two sets of tracks should be checked as part of the tests performed as units are constructed.

(2) In CDP observations at Pie Town, outputs have been written simultaneously on three track sets for observations involving frequency switching. This mode of recording was chosen to overcome a limitation in the present Mark III correlator at Haystack. Some problems were found. It is believed that writing the data on two sets of tracks would also provide data usable with the Mark III correlator, and would be within the capability of the present switch.

(3) The present crosspoint switch, with capability of providing output to two track sets, is adequate for all scientific purposes that are now foreseen. However there is some concern on how well it may perform when two such A/D boards are used together in the expanded formatter (to provide outputs to two tape recorders). A test of this performance would involve about three or more man-weeks of work to produce the new firmware and software required. This test could probably be performed most conveniently at Haystack since there is a development system for firmware there.

(4) If we stay with the present A/D board, 26 such boards will be required for the 13 VLBA DAR's, plus six more for spares. For 15 of these, construction is complete or parts are in hand.

(5) The alternative procedure would be to set up each formatter initially with one A/D board of the present type, so that it could do everything except run two tape recorders simultaneously, and then replace the A/D board with a new board which would have two digital crosspoint switches. The advantages of

this would be (a) the possible loading problem of running two of the present boards in the same formatter would be avoided, and (b) there would be one spare formatter slot that would probably be adequate for the phase calibration extractors.

(6) Before a decision is made on which way to proceed, answers to two questions are needed: (a) is there a problem with running two of the present boards in one formatter? and (b) what is the cost of a redesigned board with two digital switches? (Jim Levine believes that such a board should probably be multi-wire board rather than a wirewrap one.)