

National Radio Astronomy Observatory

Charlottesville, Virginia

November 15, 1982

To: VLBA Electronics Group

From: M. Balister

Subject: Minutes of VLBA Electronics Group Meeting - Nov. 10, 1982

A meeting of the VLBA Electronics Planning Group was held November 10, 1982. Present were: M. Balister, W. Brundage, R. Escoffier, H. Hvatum, R. Lacasse, K. Kellerman, C. Moore, D. Thompson, S. Weinreb, A. Rogers, J. Carter, and T. Clark.

At this meeting the group discussed the number of desirable channels for the VLBA. It was concluded that the additional cost of going from the originally proposed 4 channels to 32 channels as proposed by Rogers in VLBA memo #140 was about 50 k\$ per antenna. Moore will look into this figure to check that it is reasonable. Some of the scientific reasons for more channels were covered at this meeting. The Scientific Planning Group meeting on December 10 will go into this area in detail and hopefully it will be then clearer as to the best approach to take.

The proposed delay calibrator was discussed and it was concluded that two improvements could be made. The performance of the current harmonic generator needed improving to give more output at the higher operating frequencies, specifically 22 and 43 GHz. Also, a switchable comb separation of 1 or 5 MHz was desirable. The JPL system of servo-ing the cable delay to a constant value was discussed and it was thought that the extra expense and complication made it not worthwhile for the VLBA.

Carter pointed out the need for further engineering on the 43 GHz maser and its pump source. Carter also expressed concern that LO phase noise could be a problem at 43 GHz. Rogers acquainted the group with the problems with the recently run 89 GHz VLB experiment resulting from significant LO phase noise.

Clark reported on some recent work at Johns Hopkins Applied Physics Lab on the NR maser. The short term stability (up to 1,000 secs) has been considerably improved by better temperature stabilization in the area of the hydrogen dissociator. This improvement was made at practically no cost. Later NR masers will be manufactured by Bendix and it is expected that the price will be around 300 k\$ in 1984 dollars. The Sigma Tau (Harry Peters) low cost maser, the development of which is NASA supported, is likely to cost around 200 k\$.

Clark also reported on the S-X cooled receivers being developed at Berkeley. Cooled GASFET amplifiers give flange temperatures of 10-15K at S-band and 50K at X-band; the refrigerator is a CTI model 21.

The next meeting of the Electronics Planning Group will be January 19, 1983, 1330 EST, telephone (203) 797-9065.