1 VLB ARRAY MEMO No.

Nov. 30, 1982

To: VLBA Configuration Group

From: R. C. Walker

Subject: Novembe meetin r g notes.

The Novembe meetin r g of the configuration group was attended by
D. Jones, T. Pearson, R. Mutel, P. Wilkinson, R. Linfield, T. Legg, M. Reid, B. Peery, R. Gaume G,. Swenson, J. Benson, D. Hogg, K. Kellermann, M. Balister, H. Hvatum, F. Schwab, and R. Walker.

Dave Hogg described the results of analysis of Puerto Rico radio sonde data. The water vapor content is clearly large and observations on the water line will be difficult. The system temperature and attenuation effects at other frequencies, including off the line center in K band, are probably tolerable. The major remaining question concerns the stability of the additional path length. The path length is high enough that, if it is variable on short time scales, it could seriously degrade the coherence time of the array at most frequencies. We now need to determine the magnitude and time scales of fluctuations in the path length. Two ways have been suggested to do this, make observations with a water vapor radiometer and attempt actual VLB observations at a high frequency. It turns out that the Two Foot telescope from Green Bank has enough sensitivity to observe the powerful water masers when used with any of the other 1 cm telescopes. The main problem with the VLB option is the need for a hydrogen maser and a good LO system. Something should be done reasonably soon.

I discussed the new array quality measure and the suggested
array presented in earlier memos Th. e suggested array is the only one that has been presented so far so there was little discussion of relative merits of various arrays.

Gaum discusse e d tests that are being done at Iowa of the
sensitivity of the array quality (as measured by Dazi) to small shifts in the position of individual telescopes. Some interesting points have emerged such as the relative insensitivity of the quality to the location of the Midwest antenna and the noticeable improvements that can be obtained by moving the OVRO site further west. A memo on this subject was promised.

The next meeting is on Dec 17 at 01:30 EST. We should generate
a list of about 15 or more sites from which the final configuration will be chosen so that the site group can begin work. We have been planning to choose a final configuration at the Dec. meeting but it is not clear that the pressure is still strong to do so. In any case, committee members should be prepared to discuss final arrays.

Talk of a collaboration with Canada is increasing so we should
be considering joint configurations with between 12 and 14 antennas. The boundary conditions are still vague.