August 29, 1967

Memo to: D. S. Heeschen
From: D. E. Hogg D.E.H
Subject: The 85-ft. Interferometer.

In view of the new emphasis on the further development of the three element interferometer, I would like to mention a few possibilities which we should consider.

1) The Need for an Interferometer "Project". I feel that the interferometer should continue to be designated as a special project; first because of the anticipated expansion of the system and second, because a visitor will find the interferometer much more difficult to use, and will require more staff assistance and more careful documentation than has been customary with the other instruments. There should be a project engineer, in order to keep the system up; presumably this will be J. Coe. There should be a project manager, if the program of expansion outlined below is undertaken; this man, if he were like Tyler, could also be of great assistance to the visitors. I would like to see a project computer programmer, responsible for the 116. He might be able to work part-time on the other machines, but his primary responsibility for the first few months would be to the interferometer. It would also be nice to have the part-time help of a 360 programmer, especially for periods when visitors are observing. I have no strong feelings on the question of whether there should be an advisory group of staff members as there was with the old project.

2) Instrumental Development over the next 12-18 Months.

a) Finish the present system, including the 42-foot; the

phase-lock system; and the programming, especially the monitoring system.

b) Begin immediately to build a second receiver. We have the capacity for this system, and it is simply a question of choosing the best alternative. A second receiver at 11 cm would greatly increase the polarization capability; however, we can now measure polarization, so I suggest that a second frequency would be more interesting. A receiver at 3 cm would give the best resolution, and the position angles measured would be nearer the intrinsic angles since the Faraday rotation is less; on the other hand, the field of view, set by the 100 m spacing, would be very small. The frequency which I prefer is 6 cm, where the field of view is larger, and the polarization observations might be more easily related to those at 11 cm.

c) Undertake a study, using the VLA beam program, of the synthesized beam. What additional stations are needed? Do we need one or more additional telescopes?

d) What are the future computer requirements? Can the present system handle 4 telescopes and 2 polarizations?

e) If it appears that we need more stations and/or a fourth antenna, then we should look again at the present mobility system. How much would it cost to convert the present system to rails? Should the fourth element be on rails no matter what we do with 85-2 and 85-3? How might we best get more stations -- for example intervals of 100 m out to 2700 m.

3) Possible Developments over the Next 2-3 Years.

a) A Fourth Element

b) More continuum receivers; e.g., a package with two 11 cm receivers, for polarization, and a second package for simultaneous work at 6 cm and 3 cm.

c) A line receiver.