November 12, 1957

MEMO TO: Dr. L. V. Berkner

FROM: D. S. Heeschen

SUBJECT: Visitor Programs for the NRAO

1. The attached minutes of the afternoon session of the Oct. 16 Advisory Committee meeting give a summary of the general plans various people have with regard to the NRAO.

2. Three people, Field, Lilley, and Menon, have specific plans for observing with the 85-ft. telescope. Lilley hopes to get his own receiver. We will in any event provide him with frequency measuring equipment, calibration equipment, power supplies etc.--all this equipment is now either on order or being planned for. Field will use the red shift hydrogen line receiver we are getting from AIL. Menon's plans are not settled so he doesn't know whether he will have equipment of his own. It would be well if we could obtain equipment to meet his needs. Menon and Lilley both require a fairly standard type hydrogen line receiver, which we will want to have at NRAO also. The AIL receiver can be modified to meet most of their needs. I plan to both modify the AIL receiver, and work towards obtaining another 21-cm receiver for galactic hydrogen work. I will keep in close touch with Field, Lilley, and Menon, regarding their equipment needs, and their plans for coming to Green Bank.

3. Cohen, Fleischer, Meyer and Weaver may also wish to use the 85-ft. I will contact them to follow up their remarks at the Oct. 16 meeting. I think we should encourage all of these people, but particularly Weaver and Fleischer, to come to Green Bank. Cohen's receiver needs are apparently peculiar to him alone, and will have to be looked at in more detail if his plans become more specific. Meyer would probably bring his own receiver, or use the one we plan to get. Weaver and Fleischer would both require a galactic 21-cm receiver. Weaver may have a student to send to Green Bank also.

4. With regard to equipment planning for the 140-ft. telescope, the general program now being followed, as outlined in the Research Policy statement, does not seem to need changing as a result of the Oct. 16 meeting. The Advisory Committee stressed the need for:

(a) Studies of antenna feeds.
(b) Temperature controlled housing for equipment, at the focus of a telescope and/or in the control room.
(c) Frequency standards and calibration equipment at NRAO.

The first of these requires more attention than has so far been given it. We plan to take this up with Jasik, in a limited sense, but a fairly general study, possibly but not necessarily financed by NRAO, seems called for.

Minutes of the Afternoon Session
of the
Advisory Committee Meeting
October 16, 1957

1. At the afternoon session Mumsel asked those present for,(a) suggestions of possible programs at the NRAO, in broad terms, to help in equipment planning, and (b) what should we ask NSF to sponsor as research projects?

2. Each person present then made comments, which are summarized below:

HADDOCK plans to use the 140' for 3 cm studies of the sun and for cm wave studies of H II regions and planetary nebulae. He discussed the possibility of using a 4 horn technique for high resolution. He plans to bring his own equipment.

GOLDSTEIN is interested in the cm wave emission from Pluges. He will perhaps be interested in using the 140' at 3 cm.

MERKEL—The Fort Davis Solar Radio program may later be extended in frequency, possibly to 3 cm.

GORD—His interests are in 21 cm line extra-galactic studies, similar to Kraushaar's current work. He will be interested in working on the 140' and will probably bring his own equipment. He may desire assistance with the antenna feed. He did not think it likely that he would want to use the 85' telescope.

KERR is interested in a variety of aspects of galactic hydrogen work. He will want to use the 85' telescope and NRAO receiving equipment. His equipment requirements include provision for frequency scanning with a narrow band-width.

KRAUSHAAR is interested in 21 cm line absorption problems and extra-galactic red shift measurements. He is also interested in using the 140' telescope for pulse radar work. He will provide his own equipment. He indicated that he has a large number of receivers available and that it might be possible for persons to use his equipment, on loan from NRL, on the 140'. He is not interested in the 85' telescope.

MATHER—His interests are in cm wave studies of planets, H II regions, planetary nebulae, etc., and in particular in the spectra of planets and in the polarization of sources. He will work on the 140' and may be interested in the 85' as well.

WELLS brought up the point of using the 140' as a means for obtaining precise positions of sources. In this same connection Haddock suggested using the 140' with a smaller dish as an interferometer.

OORT is interested in polarization of the sun and sources at various wave lengths. He might be interested in working on the 85' and certainly on the 140'. He would probably need NF front ends for his present receiver, and special antenna feeds.

GORDON is interested in ionospheric studies and may wish to make simultaneous observations at Green Bank and Ithica. The question of whether or not the Green Bank facilities would be available for geophysical and other fringe area work was left open for the director to decide.

STRUVE--The Berkeley Radio project is going ahead with Weaver and Silver. Weaver is interested in 21 cm line work, particularly as regards galactic rotation. He and/or some of his younger people may be interested in using the 85' and 140' telescope. Silver is interested in upper atmospheric problems. Struve stressed the need for the ability to compare brightnesses at different frequencies and over long intervals of time. He also stressed the possible importance of T. Tauri stars as radio sources.

HEVITTIE--The Illinois program, now in the planning stage, is aiming at obtaining positions and flux densities of sources in the 30 cm to 60 cm wave length range. They are planning a 400' x 600' cylindrical paraboloid.

TOWNES may be interested in testing Maser amplifiers on the NRAO antenna's. He emphasized the need for cooling these amplifiers to liquid nitrogen temperature, and preferably to liquid helium temperature. He emphasized the probable need for cryogenic equipment at Green Bank. He is also interested in work at millimeter wave lengths.

EDINBURGH--Indiana will probably obtain a radio astronomer for their staff and build up a radio astronomy program based on the Green Bank facilities.

DEUTSCH is not particularly interested in observing at Green Bank himself. He mentioned the importance of color indices of sources and of the background emission as a function of longitude; and the study of fine structure in the hydrogen line in both angle and frequency.

HATANAKA is interested in 3 cm wave polarimetry of the sun with the 140-ft. telescope.

FEHSENFELD is interested in observing at Green Bank, both with the 85-ft. and the 140-ft. telescope. He is probably most interested in 21 cm line work; in particular in the structure of the interstellar medium.

FIELD plans to do 21 cm work with the red-shift receiver and the 85-ft. His interest is in intergalactic and extragalactic hydrogen studies. With the 140-ft. he is interested in 21 cm studies requiring very high frequency resolution, and in absorption in H II regions.

LILLEY plans to observe with the 85-ft. telescope, probably using a receiver he will develop at Yale. He is interested in H I absorption studies of radio stars.

UNIVERSITY OF VIRGINIA--The University of Virginia wants to develop a program in radio astronomy based on observations with the NRAO equipment. They are now looking for a radio astronomer for their staff.

LAWRENCE wants to do low frequency, high resolution interferometry on the sun. There may be too much interference at Boulder. If so, he might be interested in setting up his own 30 megacycle equipment at Green Bank.

SEIFERT--Vanderbilt has no radio astronomy plans for the foreseeable future.

YEH--At Toronto they are doing absolute calibration and developing thermal noise sources. They have no plans for work at Green Bank.

MEINEL has no specific plans regarding the NRAO. He did, however, suggest the desirability of exchanging resident personnel between the National Optical Observatory and the NRAO.

CHAMBERS--The University of Pa. will start a radio astronomy project shortly. They plan to use the NRAO equipment extensively. Since they do not as yet have a radio astronomer, they have no specific plans at the moment.

SEEGER suggested the need for coordination of work on radio observations of occultations of the Crab nebula. There will be several occultations in the next few years. He feels it is desirable that all large antenna's should observe these occultations, that as great a frequency range as possible is covered, and that polarization studies be made.

3. Two general equipment problems were emphasized by the Advisory Committee. These were the need for investigation of the problems of antenna feeds and the need for a temperature and humidity controlled box at the focus of a radio telescope. It was generally agreed that the NRAO should look into both of these problems.