

RADIO ASTRONOMY PROJECT

Record of Meetings at National Science Foundation

July 26, 1957

MEETING NO. 1 9:30 A.M.

Present: National Science Foundation:

F. J. Callender
E. A. Eckhardt
J. M. Mitchell
Marguerite Risley
J. B. Roberts
C. B. Ruttenberg

Associated Universities, Inc.

L. R. Burchill
J. J. Carroll
C. F. Dunbar
R. M. Emberson
J. W. Findlay
D. S. Heeschen

1. Financial Plan:

Mitchell acknowledged receipt of Emberson's letter of July 22, 1957 enclosing financial plan for Fiscal Years 1957, 1958, and 1959, covering both capital costs and operating expenses. Mitchell said it was still uncertain when and how much money would be available for the current fiscal year and that the prospects for FY 1959 were distinctly unfavorable. Burchill pointed out that capital costs in the plan for FY 1959 were substantially higher than the figures originally submitted. The increase was necessitated by the reduction in the budget request for the current fiscal year to \$1,130,000 from the figure of \$1,600,000 requested originally by AUI and used as the basis for its earlier submission.

Eckhardt pointed out that there were two bases for establishing the Observatory budget. The first is what the Contractor would like to do, and the second what it will be able to do. He urged that consideration be given to what can be accomplished for a total of \$5,130,000. Emberson and Callender pointed out that priorities had already been established, with the emphasis on acquisition of research equipment. Questions of degree and emphasis must be resolved and it must always be remembered that new developments may necessitate a revision of plans. Eckhardt emphasized the importance of making clear to Congress that the Observatory, to be effective, should be a developing institution, and not simply a going institution.

2. 140-Foot Telescope:

Emberson described the progress toward a contract for fabrication and erection of the 140-foot telescope. Invitations for proposals will be mailed on August 1,

1957. The invitation will include drawings, specifications, and an abstract of essential contract provisions. On September 12 a meeting for the benefit of prospective bidders will be held in New York, at which members of the AUI staff will be available to answer questions. NSF representatives will be welcome at this meeting. The deadline for filing proposals will be September 30. In the invitation, stress has been laid on the need for negotiation and on the degree of control which AUI will have to exert over subcontracting. Joint proposals will be acceptable, provided contract responsibility can be clearly established. It may be necessary to resort to multiple contracts, but AUI hopes to avoid this. There will be no public opening of proposals.

The extent to which NSF will wish to review proposals and the resulting contract was discussed, and Mitchell said the matter would be given further consideration.

3. 85-Foot Telescope:

Emberson described the efforts which have been made to obtain proposals for the fabrication and erection of an 85-foot telescope. AUI is not preparing a design for this instrument, but will expect the contractor to do so on the basis of design and construction done for others. Only four firm proposals were received, and two of these were so high as not to warrant consideration. Blaw-Knox Company and D. S. Kennedy & Company are each prepared to fabricate and erect an 85-foot telescope for about \$300,000. Work could be completed within about a year. Blaw-Knox has two orders, and Kennedy four for similar instruments. Neither company has a complete design. Findlay said the site would be ready for the 85-foot telescope in less than a year and emphasized the desirability of pouring the foundation before cold weather. Bowman will be ready to start work on the roads, etc. in the very near future as soon as AUI has access to the property.

Heeschen stated emphatically that procurement of an 85-foot telescope would insure the existence of an important Observatory within a year. With this instrument it will be possible to carry out programs on the forefront of science. New receivers under development by the U. S. Government for other purposes can be adapted to radio astronomy research. These new receivers in use on the 85-foot telescope will surpass the performance capabilities of older type receivers when used in conjunction with the 140-foot telescope. Thus, within a year Green Bank can be at the forefront of radio astronomy observation, and the 140-foot telescope will permit it to stay there. Furthermore, the existence of this 85-foot instrument will be an important aid in planning the programs for the 140-foot telescope. Heeschen knows of four astronomers at as many universities, who would like to start work at Green Bank in the summer of 1958. Eckhardt considered that delay in contracting for the 85-foot dish should be minimized, and emphasized the importance of an early start. He expressed the opinion that it will be easier to obtain appropriations when Congress can be assured that valuable research is actually going forward.

4. Contract Interpretation:

Dunbar said a question had been raised about the meaning of clause (b) of Article III of the contract, providing for advance approval by NSF of construction and alteration of structures and utilities and the provision of major

equipments. It was the consensus that this language was intended to provide merely for approval of general plans, as distinguished from specific contractual arrangements and detailed designs. During contract negotiations, the parties had intended that control by NSF would be through the medium of the annual financial plans. Dunbar and Ruttenberg agreed to devise a method for recording this interpretation in a satisfactory manner.

5. October Meeting:

Emberson said invitations for the October meeting began to go out on July 19, 1957. Mitchell said he would try to establish some personal contact with the Governor well in advance of the meeting. Callender said NSF would provide a list of recommended persons in the near future.

6. Obligation of Funds to Contract :

Burchill asked when additional funds would be obligated to the contract. The NSF appropriation for the current fiscal year has been passed by Congress and approved by the President. AUI is unwilling to enter into a firm commitment for the procurement of an 85-foot telescope until additional funds have been obligated. Callender said approval by the National Science Board at its September 6 meeting would be necessary, but in his opinion, since the Board had approved the original budget request, approval of the obligation will be a pure formality. Heeschen emphasized the need for speed in order to get active research started as soon as possible.

MEETING NO. 2 10:45 A.M.

Present: National Science Foundation:

F. J. Callender
J. B. Roberts

Associated Universities, Inc.

L. R. Burchill
C. F. Dunbar

7. Financial Plans:

Roberts said he had had no opportunity to study the operating figures AUI has submitted for FY 1959, but would do so and write to Burchill as soon as possible. Burchill said he would submit detailed information supporting AUI's request for a management allowance for the current fiscal year.

Burchill and Dunbar said that they would try to have a contract for the procurement of the 85-foot telescope ready for signature by September 6, 1957, so that it could be executed as soon as additional funds were allocated to the contract. Callender said he would notify AUI at the earliest possible moment, and Roberts said he would try to get first quarter funds from the Bureau of the Budget.

Roberts said he would also tell the Bureau of the Budget that the contract for the 140-foot dish probably would be signed in December of this year.

MEETING NO. 3 2:00 P.M.

Present: National Science Foundation:

F. J. Callender
E. A. Eckhardt
J. M. Mitchell
Marguerite Risley
J. B. Roberts
C. B. Ruttenberg
F. C. Sheppard
A. T. Waterman

Associated Universities, Inc.

L. V. Berkner
L. R. Burchill
J. J. Carroll
C. F. Dunbar
D. S. Heechen
J. W. Findlay

8. Site Acquisition and Master Plan:

Emberson expressed the hope that AUI would have access to the central part of the site by the middle of August. Condemnation proceedings may be necessary in three or four cases. Callender briefly described the tracts in question and expressed the opinion that actual litigation would probably not be necessary in more than about two cases.

Emberson said Bowman is making good progress on the master plan for site development and will make a preliminary presentation at a meeting in Green Bank on July 30, 1957. The plan will cover site development for the next five years, and so will not be very specific. For the October meeting, Bowman hopes to have a model of the site available for display.

9. Telescope Program:

Emberson reviewed the morning discussion on plans for procurement of the 140-foot dish.

Findlay described the work he expected to do at Green Bank in designing receivers and developing a technique for measuring the surfact of the 140-foot telescope. For this purpose, he is proposing to construct a 12-foot model of the telescope.

Berkner described the action taken by the AUI Trustees in authorizing the officers to proceed to contract for an 85-foot telescope, subject to adequate

funds being available.

Heeschen urged that there be as little delay as possible in contracting for this instrument. The reasons he gave are as follows:

(i) It is extremely important to start research at the earliest possible date to overcome the general lethargy among radio astronomers, who have the feeling that the program for the big telescope will be subject to great delay. A continuing program, with support, from visitors, is essential.

(ii) An 85-foot telescope will give the astronomers a real chance to do highly important research. A new field of extra galactic observation at 21 centimeters is just starting.

(iii) If the astronomers can be sure that a telescope will be available within a year, they will start planning to come to Green Bank, and we will have the leading research center for high frequency research in the United States, if not in the world.

Berkner described developments at Yale and at Berkeley and commented on work which is going forward in Russia. There is a very large fixed antenna at the Leningrad Observatory, and plans for the construction of an 80-meter telescope are going forward.

In response to questions, Emberson said the basic Blaw-Know proposal was as follows:

Fabrication of telescope	\$226,330	
Transportation	2,100	
Foundation	18,000	
Erection	<u>34,320</u>	\$280,750

Heeschen said an adequate receiver for several purposes, including 21-centimeter work, could be obtained within eight ten months for \$30,000. A receiver for 3 - or 4 - centimeter work would cost \$56,000. This new receiver, designed by Ewen Knight, has been tested on a 28-foot paraboloid, and in one hour could repeat work that required three weeks of observation with the NRL 50-foot paraboloid, and a less sensitive receiver.

Eckhardt urged that delays be minimized. The consensus was that AUI should proceed in the manner discussed at the morning meeting; i. e., have a contract ready for signature as soon as the necessary funds are obligated to the prime contract, but make no commitment until the design of the foundation can be started in the near future.

10. FY 1959 Budget:

Berkner asked whether any more information was needed for the submission of a budget request for FY 1959. Mitchell said he thought all pertinent facts had been presented. Waterman said the FY 1958 financing would have to be settled, and then the Foundation would work out preliminary figures for FY 1959. Berkner

offered to provide all possible assistance.

11. Plans for October Meeting:

Berkner said several acceptances for the October meeting have already been received from Congressmen. Mitchell said the Foundation would communicate with the Chairman and the minority leaders of the two appropriation committees and also would provide a list of people outside West Virginia to whom invitations should be sent.

12. Public Relations:

Berkner discussed plans for stimulating public interest in the observatory. The design for the 140-foot telescope contains an observation tower, and provision can be made for visitors. It may be desirable to charge admission. Receipts would help to pay for a lecturer at the site during the summer and for maintaining the lecture hall and museum which AUI hopes to build. Berkner suggested that the State of West Virginia might bear some of the cost as part of its program for the development of Pocahontas County as a recreational area. This would be entirely unobjectionable provided NSF and AUI could retain control of these facilities. Callender pointed out that the Forest Service has arrangements of this kind with various states, and it might be desirable to get information about them.

Waterman said the matter of a name for the observatory was still under consideration by a committee of the National Science Board.

13. FCC Hearings:

Ruttenberg said that now the testimony by AUI and NSF has been presented, there would be little or no activity in the FCC hearings. The outcome of the hearings will probably not be known for a considerable period of time, as over 300 people wanted to be heard. Ultimately, FCC will issue a "Notice of Proposed Rule Making", at which time there will be an opportunity for further argument.