

ASSOCIATED UNIVERSITIES, INC.

UPTON, L. I., N. Y.
TEL. YAPHANK 4-6262

October 4, 1957

Mr. James M. Mitchell
Associate Director
National Science Foundation
1520 H Street, N. W.
Washington 25, D. C.

Dear Jim:

I enclose 11 copies of minutes of the meeting of NSF-AUI representatives held September 27, 1957 at Green Bank, West Virginia. If these are satisfactory, will you please sign and return to me one of the two signed copies? If you have any changes or additions to make, please let me know. We can then decide whether to prepare a supplement or to get out a new version to replace this one.

The addendum is self-explanatory. Strictly speaking, it is not part of the record; on the other hand, its pertinence seems to make it a desirable attachment.

If you prefer some method of evidencing our mutual agreement on the accuracy of the minutes, other than the one I have used, I should be glad to adopt it.

Our understanding is that the next formal meeting will be in Washington, on Friday, November 22. Of course, we will have a chance to chat informally at Green Bank on the 17th.

Sincerely yours,

Charles F. Dunbar
Secretary

CFD:VN

ENCL.

cc: IRBurchill
RMEmberson

✓
L.R. Burchill

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RADIO ASTRONOMY PROJECT

Record of Meeting at Green Bank

September 27, 1957

Present: National Science Foundation:

J. M. Mitchell
E. A. Eckhardt
F. C. Sheppard
C. B. Ruttenberg
F. J. Callender
Geoffrey Keller
Lee Anna Embrey

Associated Universities, Inc.:

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

1. Budget and Financial Plan:

The recent exchange of letters (August 12 and September 16) between Berkner and Waterman was considered. Berkner and Eckhardt discussed the need for a government policy for the support of basic research, different from the practice followed by the Armed Services of approaching research problems project-by-project.

It was agreed that as matters now stand, \$5,130,000 will have to cover operating expenses of the Observatory through June 30, 1958 and all capital construction required to produce an "operating observatory." It was also agreed that NSF will include in its budgetary request for fiscal year 1959, the sum of \$850,000 to provide operating funds of \$400,000 for fiscal year 1959 and \$450,000 for fiscal year 1960. AUI will provide NSF with a full statement of what capital expenditures it considers are desirable (after the "operating observatory" to be built with the \$5,130,000 is in operation) in fiscal years 1959, 1960, and thereafter.

2. 85-Foot Telescope:

Emberson reported that AUI had decided to accept the proposal made by Blaw-Knox for fabrication and erection of an 85-foot telescope. Carroll described some of the details of the contract. AUI will construct the foundation in accordance with plans to be furnished by Blaw-Knox. AUI will also provide lead for the counterweight. The price to be paid Blaw-Knox will be about \$255,000, and the total cost of the instrument erected should be under \$300,000. Carroll and Dunbar gave a brief description of the contract negotiations. AUI at first sought to require that the design of the telescope be the property of the Government. Blaw-Knox objected strongly, since the Government and AUI could then use a design developed by Blaw-Knox to secure competitive bids from someone else. AUI accepted the Blaw-Knox

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position. Dunbar said, so far as he knew, there were only one or two minor points remaining unsettled, and he hoped that a contract would be signed by about October 2. The contract calls for completion of the work about July 15, 1958. The design will be substantially identical with that of the University of Michigan telescope, with proportionate saving in cost.

Westman said he was ready to start work on the foundation as soon as he received plans from Blaw-Knox. Work will be done by AUI direct, and not by contract, in order to save time.

NSF approved the proposed purchase.

3. Receiver for 85-Foot Telescope:

A purchase order has been issued to Airborne Instruments Laboratory for the purchase of a receiver for the 85-foot telescope, at a price of about \$29,000. This order was placed after competitive bidding. This receiver is to be for 21 centimeter work. Two points remain to be settled. The Vendor, somewhat belatedly, has asked for progress payments, which AUI is willing to give, and also has objected to the standard language indemnifying AUI against any claim for patent infringement. Dunbar considers that AUI should not make this concession, since the original proposal came from Airborne.

NSF approved the proposed purchase.

4. Contract Interpretation:

Reference was made to the correspondence between Mitchell and Dunbar on 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. At the time of the contract negotiations, it was contemplated that the financial plan would provide the medium for NSF approval as required by the contract. However, owing to circumstances beyond the control of the parties, no financial plan has yet been approved. Moreover, it is apparent that the plan will change with some frequency.

It was agreed that for the protection of both AUI and NSF, there should be some standard form of communication indicating NSF approval as required by the contract. It was the consensus that the minutes of the monthly meetings between NSF and AUI representatives could well serve to set forth the understanding of the parties with respect to what had been approved, and that the minutes should be so phrased. Agreement can be evidenced either by actual signature of the minutes by the parties, or by an exchange of letters.

As to the past, it was agreed that AUI would take the necessary steps to bring approvals of past actions up to date.

There was some discussion on the meaning of the word "major" in paragraph (b) of Article III, and the possibility of using a dollar limit as a definition was considered. No agreement was reached on this point.

5. Receiver Development:

Berkner pointed out the need for a development program for a maser receiver for radio astronomy and other electronic components of radio telescopes. The expenditures for this purpose, although not operating funds in the strict sense of the word, would not be capitalized. Eckhardt thought the proper person to carry out a program of this kind should be selected and urged to make a proposal to the NSF. Berkner said AUI would assemble a list and discuss it with the NSF. He estimated the cost of the development program to be about \$200,000. Eckhardt did not consider that funds could be obtained during the current fiscal year, and so there should be plenty of time to make a careful selection.

6. 140-Foot Telescope:

Emberson described the meeting in New York on September 12 to which were invited all companies interested in making proposals, either as prime contractors or subcontractors, for the fabrication and erection, in whole or in part, of the 140-foot telescope. About 100 people, representing 81 companies, were present.

At the meeting, it was decided to postpone to October 21, 1957, the closing date for submission of proposals. This extension of time should produce more lively competition, with proportionate benefit to AUI and NSF.

In the discussion at the meeting, it was emphasized that the prime contractor must be able to demonstrate skill in fabrication of steel and/or aluminum and in the construction of machinery. It was made clear that the design submitted to prospective bidders was the result of long study and that AUI had no intention of embarking on an elaborate redesign program based on suggestions from bidders. Emberson expressed the opinion that the various company representatives left the meeting satisfied that a telescope could be built according to the design and that AUI had a solution for the various problems presented. The likelihood of achieving any substantial saving by changes of design other than those of a drastic nature is not considered great.

The problem of rejecting a low bid or bids from an unsatisfactory contractor was discussed. It was the consensus that AUI should maintain its position that the prime contractor must demonstrate its ability to do the work and be prepared to agree to approval of its subcontractors by AUI.

7. Site Development:

Findlay reported that a contract for construction of a road and parking areas had been let. The low bid was between \$85,000 and \$86,000, as against an estimate by Bowman of \$125,000. However, the contract, as is customary in contracts for road construction, is on a unit price basis, based on yards of material. Findlay said the contract calls for nine inches of crushed rock and a binder. The top finish will be postponed until the completion of the 140-foot telescope. However, the road in its unfinished state will be entirely usable.

NSF representatives approved the undertaking of this portion of the work.

Findlay also reported that an eight inch well has been sunk and appears to be producing a satisfactory stream. Adequate water was found at 96 feet and the well was drilled to a depth of 100 feet.

Invitations for bids for the control building for the 85-foot telescope have gone out. Bowman's estimate is \$35,000, which Findlay, Westman, et al. consider high for 1,000 square feet of floor space. The contract called for completion of the building by May 1, 1958.

NSF approved the construction of the control building in accordance with the plan described.

Heeschen and Findlay described plans for power supply, which are being prepared by Bowman. The work should be completed in the spring of 1958. The Monongahela Power Company will install the necessary substation. All cable on the site will be in underground conduits.

In response to a question, Findlay said that each building will have its own water supply and sanitary system.

8. Site Acquisition:

Emberson said it would be necessary in the near future to modify the M. Beard house which is near the site of the 85-foot telescope.

Callender said that present plans call for the acquisition of 31 tracts of land, 18 of which have actually been acquired by the Corps of Engineers. In four cases, it was necessary to proceed by condemnation. Of the remaining 13 tracts, probably eight will have to be acquired by condemnation, but it seems unlikely that there will be an actual trial in more than two cases. The Corps of Engineers hopes to negotiate settlements in the others. In the remaining five cases, the Corps of Engineers is still negotiating with the owners.

Callender emphasized the importance of coming to a firm decision on when the former owners must vacate. It was agreed that except in the few cases where a longer period of occupancy is to be permitted (e.g., Arbogast and Brown), the property purchased should be vacated by July 1, 1958. The former owners should be advised not to plant crops to be harvested after that date.

As to cost, Callender said that the prices paid for the land perhaps will be as much as \$17,000 over the estimate. On the other hand, acquisition costs may be as much as \$50,000 under the estimate. In any event, the Corps of Engineers clearly understands that not more than \$650,000 is to be expended.

9. Next Meeting:

It was agreed that there need be no meeting of NSF-AUI representatives in October, and that the November meeting should be held in Washington, on November 22, 1957.

Accepted on behalf of
National Science Foundation

Prepared and submitted on behalf of
Associated Universities, Inc.

W. James M. Mitchell

Charles F. Dunbar
Charles F. Dunbar, Secretary

Date Oct. 31, 1957

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A D D E N D U M

At an AUI staff meeting, held September 28, two decisions with respect to the site were reached which are pertinent to the discussion on September 27.

It was the consensus that protection against radio noise is essential to the success of the observatory and that, in the absence of compelling reasons to the contrary, all reasonable protective measures should be taken.

Therefore, it was decided as follows:

1. Appropriate steps should be taken to have Civil Aeronautics Administration establish a restricted zone from which aircraft will be excluded. Emberson and/or Findlay will take up this matter with Porter in Washington.
2. The program for acquiring restrictive covenants from neighboring property owners should not be curtailed within the cost ceiling of \$650,000 for site acquisition.