

NATIONAL RADIO ASTRONOMY OBSERVATORY
EDGEMONT ROAD
CHARLOTTESVILLE, VIRGINIA 22901
TELEPHONE 804-296-0211 TWX 510-587-5482

June 10, 1981

Mr. Luther E. Rhoades
Engineering Manager
Electronic Space Systems Corporation
Old Powder Mill Road
Concord, Massachusetts 01742

12 METER MILLIMETER WAVE TELESCOPE
MEMO No. 50

Subject: Request for Proposal # 228 -
Millimeter Wave Telescope Panels

Reference: ESSCO letter dated May 29, 1981

Dear Mr. Rhoades:

Associated Universities, Inc. (AUI), a non-profit corporation operating the National Radio Astronomy Observatory (NRAO) under contract with the National Science Foundation, requests your proposal for the design, fabrication, and manufacture of millimeter wave telescope panels in accordance with NRAO Specification for 12-Meter Telescope Surface Panels dated June 10, 1981.

Because of the need to resurface the antenna in the shortest possible amount of time, we are requesting delivery of the panels approximately four (4) months after your receipt of a subcontract from AUI. In the event that this schedule does not provide enough time for the manufacture and measurement of these panels, we would appreciate your indicating the shortest feasible schedule that ESSCO can meet.

AUI proposes to enter into a firm fixed price subcontract with the successful vendor following generally the requirements of the Federal Procurement Regulations. Other terms and conditions or modifications of the indicated terms may be negotiated to the mutual satisfaction of both parties.

We request that you provide AUI with a breakdown of your price, indicating the labor by category of labor, subcontracts, purchase parts, overhead, and general and administrative expenses. If you have a cognizant government auditor, please provide his name and telephone number in your proposal.

We wish to commence negotiation of a subcontract at the earliest feasible time. We will contact you shortly after your receipt of this request to ascertain when ESSCO will be ready to meet with the AUI negotiating team to discuss the specifications and contractual details in depth.

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It is requested that you forward three (3) copies of your proposal, together with a completed Representations, Certifications, and Acknowledgements form, to the undersigned at the National Radio Astronomy Observatory, Edgemont Road, Charlottesville, Virginia, 22901, at the earliest possible time; we suggest not later than June 29, 1981. Your proposal shall be open for acceptance for a minimum of thirty (30) days from the date of its receipt by AUI.

Sincerely,

J. Marymor, Manager,
Contracts/Legal

JM/lc
Enclosures

cc: J. Findlay
W. Horne
W. Howard
H. Hvatum
T. Riffe
D. Webb

National Radio Astronomy Observatory

SPECIFICATIONS FOR
12-METER TELESCOPE SURFACE PANELS

June 10, 1981

1. The Reflector Surface

(a) Size and Shape.

The reflector edge will have the shape of a 48-sided polygon. The surface will be parabolic in shape, with a diameter of 12.0 meters (39 feet, 4 inches). Its focal length will be 5.04 meters (200 inches) to within ± 5 cm (± 2 inches).

(b) Characteristics

The surface will be made up of 72 individual panels, arranged in two concentric rings. There will be 24 panels in the inner ring and 48 panels in the outer ring. The surface will be solid aluminum at least 0.75 mm (0.03 inch) thick. Gaps between individual surface panels should be no greater than 2.54 mm (0.10 inch). NRAO will design and supply the attachments required to mount the panels onto the back-up structure (BUS) and to adjust the shape of the reflector surface. The weight of the proposed surface will be less than 20 kg/m² (4 lb/sq. foot). The BUS will include a quadrupod structure which will pass through the surface panels at 4 cut-out areas located about 4.3 meters (14 feet) from the reflector center. The inner panels will each have 8 attachment points to the BUS; the outer panels will each have 6 such points. A central hole of about 1.2 meters (4 feet 0 inches) in diameter will be left in the center of the reflector surface.

2. The Surface Accuracy

NRAO wishes to ensure that the telescope surface when finally mounted and adjusted has an RMS departure from the best-fitted parabolic surface of 70 μ m (0.07 mm or 0.0028 inch). This requires that the individual panels be made

and measured to a very high precision. In order to state this precision, NRAO requests that proposals describe briefly the following steps to be taken to measure and numerically quantify the individual panel accuracies:

- (a) The characteristics and accuracy of the measuring machine should be briefly stated.
- (b) The method of mounting of the plate on the machine and constraints applied to the plate should be noted.
- (c) The grid of points to be measured for each panel shape should be described. The number and location of these points should be chosen by the proposer to be, in his judgment, satisfactory to describe the shape of the panel.
- (d) After the measurements have been made, the RMS shall be derived from these measurements by a method chosen by the proposer. This method should be described in the proposal.

The actual value of the RMS which results from these measurements and steps depends to some small extent on the actual formulae agreed on. However, the upper limit of the RMS which can be accepted by NRAO is 50 μm (0.050 mm or 0.002 inches). The NRAO will also require copies of all the measurement data and the data reduction programs.

3. Materials, Identification, and Finish

The proposer shall set forth the materials of which the panels are to be fabricated, together with the physical properties of these materials.

All panels are to have identifying numbers so that inspection records for each panel may be identified.

The panels shall be clean, but no paint is required on either the front or back of the panels.

4. Acceptance and Delivery

NRAO intends to accept the panels at the manufacturer's plant. Such acceptance will be based on the measurement results. NRAO will be responsible for transporting the panels from the plant. The proposal should include the cost of packing the panels in suitable non-returnable crates and loading these into trucks at the manufacturer's plant.