

Interoffice

NATIONAL RADIO ASTRONOMY OBSERVATORY

TUCSON, ARIZONA

August 5, 1976

*25 Meter Millimeter Wave Telescope
Memo # 47*

To: Working Group

From: M. A. Gordon

Subject: My Impression of the July 30 Meetings of Advisory Committee
and Working Group

Advisory Committee:

1. Prospects for funding the 25-M telescope are uncertain because of NSF budget difficulties, perhaps preoccupation with their own difficulties in reorganization, and a lack of great enthusiasm within NSF for this project above all others. Dave Hogg's comments indicated that the NSF reviewers, on average, rated this project as good but not excellent.

While we cannot deal directly with problems of NSF, it does seem advisable to point out to our peers the merits of maintaining our world leadership in an important new area of astronomy. We should not sit smugly and expect everyone to share our insight.

2. Problems associated with measurement of the surface are well in hand. The combination of the present trolley and a definition of the rim using laser radar will permit measurement of a continuous surface to $40\mu\text{m}$. However, considerable improvement is desirable and may be possible by using an area-averaging depth gauge. The gap problem may not be solved yet.
3. Machined panels currently available can meet our requirement of $40\mu\text{m}$ RMS. The fabricated type from Essco, appears to be about twice as rough as the manufacturer claims, suggesting a fundamental difference of measurement schemes between Essco and the NRAO. A resolution of this discrepancy is important because of the cost-saving potential of using fabricated rather than machined ones.

There is some concern over the statistical variation of RMS from one panel to another. The first of BTL's panels measured at an encouraging value of $\sim 30\mu\text{m}$; the later ones at $50\mu\text{m}$.

4. Woon Yin Wong has successfully constructed a computer-controlled scheme of panel adjustment, to an angular resolution of $1.0^{\circ}2$ which, at current pitch, meets our goal of $15\mu\text{m}$ setting precision.
5. Lee King has designed an astrodome which should cost \$1M (1976) above a radome. This dome must track with the telescope even when closed, because the transparent sections are the dome doors. While advantageous to spectroscopists preferring minimal reflecting surfaces between telescope and radio source, this design does not penalize continuum people because the loss through the door sections is comparable to loss through a radome. (Continuum people prefer stable performance to maximum transparency.)
6. There is concern over the \$500K price increase associated with the telescope's ability to point at -5° elevation.
7. Bobby Ulich's most recent measurements have failed to locate existing radome fabrics capable of meeting our transparency goal of 90% at 300 GHz exclusive of geometrical blockage. Sandy Weinreb suggested someone should look at the tradeoff between a busier structure and thin fabrics versus a more open structure and thicker fabrics.
8. There is great concern over the wisdom of changing parameters such as focal ratio which would require a restart of the structural design.
9. Dave Heeschen cautioned against design changes which might make the project look like a new telescope to outsiders, such as a major size change, etc. While this route might come about, it would damage the credibility of the NRAO.
10. The site issue is still an open one. While Mauna Kea has not been discredited as a desirable site, there are alternatives.

Working Group:

1. I ask that each member of the Working Group prepare a list and schedule of activities within his specialty through 1977. Also, please advise me of travel and other expenses which you expect over that period. If the NSF were to offer, unexpectedly, supplementary design funds, we should be organized to spend these funds immediately (and effectively). Thus the activity schedule is vital preparation, among other things.

2. I understand that two series of numbered communications will be maintained: Memoranda, for the Working Group; Reports, for Working Group and Advisory Committee. Master sets will be provided for all members of the Working Group and to Wong and King's office. Buck Peery has graciously volunteered to number and distribute such material; hence memoranda, etc. should be sent to him first.
3. Meeting schedules are set forth in another memorandum.
4. I view site selection and the focal ratio question as two items having high priority. Cam Wade hopes to have ducks in order by the end of December. I hope Bobby Ulich will be able to defend f/0.43 or an alternate number earlier than this, in view of its impact on Buck's group. My intuition is that there must be strong reasons to change it from f/0.43. Sebastian claims insight into the focal ratio problem.
5. Buck needs information on facilities space, etc. soon. My job is to get this.