

25 Meter Millimeter Wave Telescope  
Memo #104

NATIONAL RADIO ASTRONOMY OBSERVATORY  
Charlottesville, Virginia

February 15, 1978

M E M O R A N D U M

To: M. A. Gordon  
From: J. W. Findlay  
Subj: 25-Meter Telescope Funding

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1. To me the most important part of your February 9 memo is the page you have called "Ground Rules", and of these #2 is vital. Let me comment more about it, but start by saying that I believe it is, in fact, the correct decision. What does it imply?

(a) We shall need a considerable design effort, partly existing in NRAO and in part available to work under direction from NRAO. For example, the structural design of the telescope above the elevation axis will need to be completed in detail. This is necessary since we have not yet introduced the joint detail into homology. Equally, the final design will depend on the surface plate design chosen--weight, attachment points, and so on. Thus we must carry this part of the design down to fabricator details. This detailing work is straightforward, but will have to be contracted out and supervised by us.

Secondly, our design must be re-analyzed, both for stress and deflection and also for dynamic response. Our analysis of wind-induced pointing errors and the effects of temperature differences should be re-worked. Even in the astrodome these may be important. This kind of task could be done by a group like Simpson, Gumpertz and Heger, in Cambridge. Again, it will need contracting and supervising.

Once we know the structure, we must develop the drive and control system. We have, at present, no available in-house group to do this. It may be that here we shall not have to work down to great detail, but having set the structural response we can contract for a detailed design of the system. However, we must establish the overall control plan and philosophy. This will, of course, integrate the telescope and dome controls. This task must be done in NRAO and will need some good people.

The choice, manufacture, measuring and setting of the surface plates, is another area where we shall need to have competence within NRAO. Are

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we going to define how the plates are made, measured and set? This implies a contract with a good company and good supervision.

So, in summary, we shall be our own prime contractor for a twenty million dollar instrument, and this implies a quite considerable effort by us.

(b) The design time chosen in your plans should start earlier. Up to now, I have not seen a firm plan (which your #2 now gives) on how we should proceed. So I have accepted the "sort of one year for design". It has, to me, assumed that in some way we might get a prime contractor for the whole telescope, and have with him an agreement that would get us the performance we need at a cost we can afford. Thus he would carry out much of the detailed design I have outlined above. We should watch him, but not be required to do much of the work.

If we follow your #2 (and I repeat that I think it good), I believe we should start earlier on some of the work and that we should start identifying who will do the various tasks in NRAO, and get them moving. This will cost some money, but not much. It would mean that, by 1980, we might have some groups within NRAO already at work and with some of the important problems already decided. I do not see why this start should not be made in advance of formal funding. Or, putting it another way, if we follow your #2 then we must start earlier or further delay the telescope.

2. The two funding plans you outline are so much alike that I don't see how they help the NSF much. Adopting the 3-year plan moves only \$175k out of 1980 and \$2.6M from 1981. It adds \$403k to 1982 and \$2.7M to 1983. I can hardly believe that, in effect, moving \$2.6M from 1981 to 1983 really does much for the NSF. But if they like options, these can do no great harm.

3. Circulate this memo or not, as you wish.

JWF/pj