

NATIONAL RADIO ASTRONOMY OBSERVATORY

TUCSON, ARIZONA

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TO: W. G. Horne

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SUBJECT: Possible Factors in the Selection of a Back Structure  
Design and Quadrupod Geometry

Those of us who see the 36-ft telescope in use everyday are aware of special needs for a telescope design. Here are a few of these. I hope that you will consider them in your selection of a design.

1. Receiver Access

We've discussed this factor with you at some length, I include it only for completeness. Because our crew is small, and because millimeter-wave astronomy is highly subject to capricious weather conditions, the ease and rapidity with which we can change receivers and their auxiliary equipment (Fabry-Perot filters, polarizers, etc.) is important to us. It would be helpful to have easy access to the receiver-mount area from the back of the reflector, and to the vertex area from the front of the reflector. I would guess that an open back structure and a quadrupod rotated 45° from the present one could help us here.

Is it be possible to provide a catwalk in the quadrupod shadow area?

2. Thermal Time Constant

Often an observer will look at a source with an 1/8 or so of the dish surface in sunlight for about 20 minutes or so. Presently this thermal loading leaves the dish deformed for hours following exposure. This kind of observing is usually done by a desperate observer at the end of his run, with the consequence that the next observer is stuck for hours with a telescope with low gain and erratic pointing.

Very often, an observer will take data with the quadrupod partially in sunlight.

Is a very long (>24 hours) or very short (<1 hour) thermal time constant possible?

3. Uniform Thermal Mass

Seldom, but still sometimes, someone looks at the sun for a short time. Would a back structure of uniform thermal mass help?

4. Access to Plate Adjustment Bolts

We all know that one of the advantages (or is it "disadvantages") of the new surface is the possibility of readjusting the surface during the lifetime of the telescope. Is it worth considering the ease of access to the adjusting bolts as a criterion for selecting a back structure?

These are needs which may supplement your selection criteria of gravity and thermal deflection, cost, fabrication time, etc. They are important to us, and I hope you will consider them. Try as we may, we're probably not going to be able to control weather, failure rates of receivers, and observers as much as we'd like to!