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From: TUCVAX::PJEWELL "Phil Jewell" 2-DEC-1988 [illegible]
To: GSEIELST, DEMERSON, BTURNER, PVANDENB, AWOOTTEN, PJEWELL
Subj: Thoughts on a new, centimeter-wave dish(s)

2 December 1988

George -- Sorry I couldn't arrange to attend the on-going workshop on a new, centimeter-wave dish. As a user of Green Bank facilities, I am very interested in such a project and would like to provide some input on what capabilities a new dish should have. Here are some thoughts from my perspective.

Without a doubt, a new facility should have a strong capability at L-band. I am interested in work on the OH lines, for example. Some of the most interesting science these days is at higher frequencies, however, namely K-band and Q-band. We have never had a truly world-class capability in either of these bands, at any facility in this country. (The capabilities of the 140' and Haystack in these bands are very good, but we could surely use higher efficiencies and more collecting area.) I would also urge that serious thought be given to a capability in the 3 mm band, all the way to 115 GHz. I think that the weather in GB would allow observations in this band during the winter months. There are a number of ways that a 3 mm capability could be achieved without compromising low frequency performance (e.g., by using the dense-packed, phased-array proposed by Darrel Emerson [to be sent to you] or by making the inner portion of a large dish good to high frequency). Under normal circumstances, a 3 mm capability might be considered extravagant, but the usual constraints may not apply in this case.

Concerning the 30 - 50 GHz band: I support Al Wootten's contention that this is a scientifically valuable, and previously unexploited band. To Al's list of important molecular transitions in this band, I would add the 2(1,2) - 1(1,1) transition of HNCO at 43.8 GHz, which is a good diagnostic of dense regions. I must also disagree with Barry Turner's comments about the 1-0 SiO line at 43 GHz. The information in this line is NOT duplicated in the 2-1 line at 86 GHz. SiO maser studies are now concentrating on understanding the differences from transition to transition in the J ladder and the ground state transition is obviously among the most important. Also, single dish work will not be superceded by VLB work at 43 GHz. The baselines of the VLBA are simply too long for most of the nearby, well-studied maser stars. For example, in previous VLBI studies of SiO masers on the Haystakk,Quabbin baseline, much of the emission was already resolved out. This will be even more the case for 3 mm VLBI.

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