National Radio Astronomy Observatory
Tucson, Arizona

November 9, 1989

MEMORANDUM

To: Mike Balister, Tony Kerr, and John Payne

From: Darrel Emerson

Subject: 12m Telescope Receiver Requirements

The purpose of this memo is to reinforce my note of last August, on the subject of new mixers and receivers needed for the 12m during the next 12 months.

NRAO has fallen at least a couple of years behind most other mm-wave observatories as regards SIS receivers for the 150, 230 and 345 GHz bands. Most (all?) of the telescopes capable of operation at 345 GHz now have SIS receivers, and almost all of those which operate regularly at 230 GHz have had operational 230 GHz SIS systems for some time (one or two years). Some specific observatories which fit the above are the Caltech dish and the IRAM 30m. Some of the claims I hear about these instruments are probably exaggerated, but the fact remains that NRAO is the only major mm-wave facility without SIS capability in these wavebands. It is becoming more and more frequent that 12m observers ask the embarassing question about why NRAO is so far behind, and I find it difficult to give a satisfactory answer.

Specifically, before the end of 1990, we need quality junctions and mixers, built into complete receivers, for the bands:

68 - 116 GHz
130 - 170 GHz
195 - 310 GHz
330 - 365 GHz

This is already much less demanding than the plans outlined in the memo of June 3 1988, from Kerr, Lamb and Payne. According to those plans, most of the above systems should have been available on the telescope **now, in time for the 1989 high-frequency season.** Quoting projected dates from that memo, Phase I of the 200-360 GHz system was to have been completed by February 1989; Phase II by Mid 1989; and the 230 GHz 8-beam SIS system by the end of 1989.

*As it stands today, near the end of 1989, **none** of these systems has yet been completed.*

With the current political situation concerning the 12m, not to mention NRAO's credibility for a future MMA project, it's even more important that we do not remain as far behind as we are today. The 230 GHz system seems in hand (if delayed), but it is imperative that we do have a 230 GHz SIS receiver on the telescope **this** observing season, and that receivers for all the other bands up to 365 GHz become available during 1990. We can't afford to miss another high-frequency observing season.

c: James Lamb, Phil Jewell, Paul Vanden Bout, and Bob Brown.

Darrel Emerson