

National Radio Astronomy Observatory
Tucson, Arizona

March 18, 1987

MEMORANDUM

TO: P. Vanden Bout

FROM: John Payne *JP*

SUBJECT: Comments on "Millimeterwave Receivers, Ours and
Theirs"

I would like to comment briefly on the above memorandum. Al Wootten did a fine job on tabulating the performance of existing receivers; I agree with all the numbers and they illustrate vividly that the NRAO stable of millimeterwave receivers is becoming mediocre.

You state that it is the goal of the NRAO to produce SIS receivers for all our frequency bands. I think that this is an admirable goal but unfortunately we have no plan to do so. Or, at least, not one that I know about. As you say in the NRAO Newsletter: -- "It will be essentially impossible to begin any new instrumentation projects and very difficult to maintain existing projects at their current level."

The only bright spot in our receiver situation here is the 90-115 GHz SIS receiver and it is worthwhile to consider how much effort has gone into this receiver. Two years ago the cryostat arrived from Charlottesville and at the same time we hired James Lamb to work on it. The cryostat was advertised as a completely working system, and James Lamb is highly qualified with cryogenic and millimeter wave experience, and is an absolutely first rate engineer. James has had no other telescope responsibilities during this two years and has pretty much worked solely on this receiver. The result is a very well engineered receiver that is undoubtedly the best in the world at this wavelength. This is what it takes.

I believe that a lot of misunderstanding exists in the community and within the NRAO scientific staff on the subject of "Ours and Theirs." When NRAO builds a millimeterwave receiver for our telescope we choose to build the receiver to satisfy pretty

stringent requirements. The receiver must not require constant servicing, it must be remotely tuneable, there should be no "holes" in the frequency coverage, it must have adequate monitoring and it must be simple enough to be operated by telescope operations and visiting astronomers. To build the receivers any other way, given our 24 hour a day remote operation, would be ill-advised. It's all too easy to compare our efforts unfavorably with university designed and built receivers that have, quite correctly, not been designed with such considerations in mind. This all sounds defensive and as if excuses are being made but I really can't help that.

The only other engineer working here in Tucson on front ends is myself. I am personally responsible for the maintenance of every Schottky mixer receiver, running the electronics division and a multitude of other tasks. Antonio Perfetto helps sometimes but he has been almost fully occupied with the Gunn program. I seem to find myself in a no win position. I either work very long hours at the thankless task of supporting the telescope or I work normal hours and fail.

A problem seems to be that although the management pays lip service to manpower and money shortages, there doesn't seem to be a realistic adjustment to expectations, both in terms of supporting the telescope and in building new instrumentation. Look at the 12 m schedule for February and March and see if you think it is reasonable. To talk of us building a completely new set of SIS receivers in such a climate seems to me to be unrealistic.

So -- what's the answer? Do we keep pretending that we can do all these things with the people we have? I'd like to meet with you, Tony and Darrel to discuss what we can do.

c: D. Emerson
A. R. Kerr
P. Jewell ✓