I. Introductory Comments and Statements.

Richard began the meeting stating the funding situation: there is no formal signed agreement with the NSF on the use of the Lockeed-Martin award. In principal these funds will be available and a formal agreement reached. A Kband FPA budget of 1.2 million dollars is expected with caveats, namely a demonstration of improved science at projects conclusion.

The last point was met with contention. With the original proposal accepted, questions arose concerning the necessity of redrafting, especially with the spectrometer as a separate and unfunded project. Economization was central to the original design and further reduction was not deemed possible.

II. Scientific Case

Jay Lockman along with GB scientists Ron Maddalena, DJ Pisano, and Larry Morgan reiterated the need for demonstrating science gains and revisiting the science use cases. These were not adequately addressed with a sufficient canvassing of the community for potential users due to a hastily prepared proposal.

Discussions of the science need lead to these conclusions and general observations:

The Kband FPA should demonstrate improved observing efficiency compared to the current receiver.

Focus on a specific science case, Ammonia mapping for example, to increase the efficiency of K band observations during good weather.

The design should include an interface to the DCR for pointing and focusing of the telescope. A square law detector and digital link to the DCR is sufficient.

Identifying which spectral lines are important and the minimum frequency spacing between the lines per beam is a critical specification. A quick search leads to many possibilities.

Focus rotation is nonessential

III. Technology Considerations

With these scientific considerations, discussions continued on possible technical implementations, on identifying paths to implement the science, and whether a Kband receiver is justified given the backend limitations.

Discussing the merits of engineering endeavors that utilize emerging technological exposed the limitations within the current budget framework. With this in mind, the

project should demonstrate feasibility as well as assert NRAO's leadership in FPA development.

A low cost fiber optic link for each sampler is an intriguing possibility as long as re-clocking the data is manageable.

Avoiding high speed (>10Gbit/s) optical links and the problems with cost, RFI, size and weight is essential for implementing the receiver

At least 30 DB of sideband rejection with a goal of 40 DB was specified.

Exploring a multiplexing scheme for increasing the number of channels with the existing IF system. This is deemed a solution that limits the maximum number of channels and the exploration of digital transmission systems, but does provide an acceptable, possibly temporary, spectrometer solution.

Finally, investigating a FPGA decimation scheme for reducing the data rates and conjunctively filtering extraneous information is an interesting possibility for cost reduction. ALMA uses this technology so accurate costing is possible (~$200 per individual bandwidth).

III. Conclusions

Jay Lockman agreed to clarify the science case by specifying the minimum bandwidth, spectral line spacing, number of pixels, calibration, and polarization requirements. Once these are specified, examining the breakdown of hardware cost versus FTE cost, technology required, and associated cost savings may allow inclusion of a spectrometer. Otherwise, a scheme to expand the existing system allowing for more than eight beams should be pursued with the limitations on expansion, the impact of not implementing digital transmission, and no new spectrometer development clearly understood.

Once these issues are addressed another meeting is planned to assign tasks, adjust the network diagram and make plans for revised proposal submission. A one week time span was a bit optimistic, more likely scenario is the second or third week of July.