

Report of Scientific Review Committee

A committee of six NRAO staff members and six visitors met at Charlottesville on October 5, 1983, to assess the scientific impact of the long range computer plan being developed within NRAO. The committee had been furnished in advance with written versions of site plans prepared by planning groups at Green Bank, Tucson, Charlottesville, and Socorro. The bulk of the meeting consisted of oral presentations of these plans by Rick Fisher, Mark Gordon, Bob Burns, Gareth Hunt, and Ron Ekers. Sufficient time was available for detailed questions on many aspects of the proposals, and a number of additional NRAO people contributed information and opinions in response to questions. The Committee then met alone for another two hours, attempting to focus on the adequacy of the proposed course of action to the scientific mission of the Observatory.

Stated very simply, the Committee believes that the plans, as far as they go at present, are sound and well suited to the foreseeable astronomical objectives. In particular:

1. Green Bank and Tucson. The proposals call for badly needed replacements of outmoded and inadequate hardware. The plans are not particularly revolutionary, are (relatively) modest in cost, and should provide adequate solutions for scientific problems to be addressed over the next three to five years. We note that the case for the fourth 68000 in Green Bank and the second VAX in Tucson is not strong. We note further that upgrading of the 140-foot control system might well be added to the list of objectives at Green Bank.

2. Charlottesville. The problems here seem to be an overworked VAX 780, which can not adequately support both the AIPS development and the post-processing; an underused IBM 4341; and the perceived need to produce an exportable, UNIX-based AIPS package. The proposed course of action, including a new VAX (or VAX-like) system, a 68000 UNIX-based system, and the phasing out of the IBM machine, seems sensible to us. We note, however, that attention must be paid to maintaining adequate support for large, traditionally batch-style, general purpose computing.

3. The VLA. In dollar terms, and also in terms of potential scientific impact, the needs of the VLA and the VLBA dominate the problems being addressed. We believe the plan to upgrade the VLA's synchronous computing system with newer and larger Modcomps--capable of running much of the existing code, but at faster speeds and with more available memory--is a sensible course of action. The upgraded system will double the number of available frequency channels, reduce the minimum integration time, and allow improved on-line monitoring of factors involving data quality. These improvements are all highly desirable, and should be implemented in ways compatible with the proposed VLBA system.

The post-processing needs for computing power at the VLA are more far-reaching: the instrument is known to be capable of addressing important scientific problems for which, at present, sufficient number-crunching capability is unavailable. We are convinced of the need for computing capacity at least in the "small super-computer" range, along the lines suggested in VLA Computer Memorandum No. 168. Construction of a VLBA will, of course, add to this need. We urge NRAO to proceed with a detailed plan for achieving this kind of computing capacity in the most expeditious manner possible.

(4) Single Dish Software. An effort should be made to consolidate the post-calibration single dish software at the various sites. The possibility of integrating this with one-dimensional (slice) processing in AIPS should be explored.

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