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Memorandum

To: Computer Planning Group  
From: R. Burns  
Subj: Charlottesville Hardware Plan

Charlottesville Plan

1. The most obvious part of the Charlottesville plan is to replace the Modcomp with a VAX or VAX class machine (32 bit). The Charlottesville VAX is the most heavily used VAX in the observatory, reaching extended periods of loading at near 100% utilization. It supports 32 terminals. It is used as the primary Charlottesville-AIPS machine, for AIPS development, for VLBI processing, for VLBI development, and for miscellaneous things. The Modcomp, which acts as the second AIPS machine, is used only for single dish work and AIPS. Several points make it a less attractive AIPS machine. It therefore is only used as a second choice and it seems to be growing less attractive with time. Additionally, major pieces, the disks for example, need replacing. It should be replaced with a large VAX or VAX class machine when possible.

This will cost about \$350K and would include the purchase of a VAX 11/780 CPU, two high density tape drives, and 1.9 Gbytes of non-removable disk. An image processor (I\*\*2S) interface and an array processor interface must also be purchased.

If budget limitations prohibit the replacement of the Modcomp beyond the end of 1984, then the Modcomp memory should be expanded, the disk replaced and a good tape drive added. This would cost about 150K but it is not a good alternative.

2. One of the goals for the AIPS project is to "support AIPS under the Unix operating system as well as it is supported under the VMS operating system". This is both because we want to support user sites which run Unix on various computers and because we want to maximize our flexibility in choosing future computer hardware. It is not sufficient to test AIPS under Unix on a VAX because this does not detect hardware dependencies in the code. To accomplish this goal we must obtain a state-of-the-art machine which NRAO and other sites can duplicate and which runs under the Unix operating system. One of the popular 68000-based systems is a good choice because a number of universities have purchased or requested these systems. We expect that support of

AIPS on 68000-based systems under Unix will be as important in the next five years as the support of VAXes has been in the last three.

The AIPS group should purchase and develop a 68000-based system operating under Unix as soon as possible. This system should include a newer, lower cost AP, probably the Analogic AP-500.

The projected budget for such a system is \$150K.

3. The IBM situation is far from clear. Work on the IBM over the last four years has fallen off sharply. Also, it has moved from a nearly all batch machine to a some batch and some interactive use machine. As such, like the DEC10, it is overloaded in the afternoon and underused or not used at night. The IBM is not competitive with the VAX in attracting users and we encourage this even more since we have program development on the VAX and not the IBM, and since we have not purchased hardware to make the IBM more friendly. We could put some money into the IBM and make it more attractive, but I question that this is the way to go. The best solution may be to phase out the IBM, if it can be replaced with alternative more attractive hardware. The IBM system has an IBM replacement value of \$550K and probably a market value of better than half that. Excluding the disk subsystem, it is on a lease/buy under which we pay \$7K/month up through October 1985. The disk subsystem is rented at a recently altered cost of \$1K/month. If the NRAO discontinues use of the IBM it would pass to the government for alternative use. It would represent a loss to the NRAO. On the other hand, the total funds expended on the IBM during its use would equate to an abnormally low rent, so the loss would be a loss only in terms of what further savings could be achieved.

Could the IBM be removed without replacement? On the short term, the combined effect of the Modcomp replacement, the addition of the 68000-based system, and additions in Green Bank, would probably mean the IBM need not be replaced. On a longer time scale, it is not clear that this would continue to be the case. As such, a replacement system needs to be considered and should be budgeted.

An additional complication is a possibility that the IBM may be attractive as a front end machine for the VLA next generation system. More study needs to be done here. Although the IBM looks attractive for this now, it may look less attractive in 1986.

The recommendation is to not eliminate or replace the IBM at this time but to first observe the impact of the other measures. A replacement capability should be budgeted as a possibility, but no decision should be made until this impact can be weighed.

wrb/ndw