National Radio Astronomy Observatory

To: VLBA Computer Coordination Group

From: Craig Walker

Subject: Correlator Control Computer.

On July 26, 1988 there was a special meeting of the VLBA Computer Coordination Group to discuss the Correlator Control Computer (CCC). Prior to the meeting, Don Wells distributed a document proposing that interconnected workstations, probably under the UNIX operating system, be used for software development and for operations related activities that are not tightly coupled to the real time operation of the correlator. His document will be distributed as a VLBA Memo and should be consulted for an extensive discussion of his proposal.

The Wells proposal is contrary to the earlier decision of this group that both the CCC and the Array Control Computer (ACC) would be VAXes running VMS. That decision was made several years ago in a different market environoment and at a time when the correlator was expected to be designed and built at Caltech using a rather different design than that now planned. Wells argues that the newer technology will significantly enhance the productivity of the correlator programmers, besides providing a more pleasant working environment. The problem is that the previous decision has already been implemented in both hardware (a MicroVAX) and software for the ACC.

There was extensive discussion of the proposal and its impact, both on the monitor and control group and on future operations. Those involved were Romney, Wells, Benson, Broadwell, Fomalont, Horstkotte, Burns, Brown, Napier, Clark, Bignell, Paine, and Walker. Unfortunately, a conflict prevented other VLA computer personel from attending.

There was a strongly expressed desire on the part of those worried about operations (eg. Bignell, Walker) that the operating system be the same in the two systems once we are into operations. It was also considered desirable, for ease of programming and maintenance and for mutual backup, that the hardware and the software maintenance systems be the same, although this was not considered to be as important as the common operating system.

The major options considered were:

1. Force the correlator group to follow the original computer and operating system specification. This has the advantage of preserving a common computer environment for array control and for correlator control. There is likely to be monetary cost because the systems are proprietary and not especially competitive in today's market. There are less easily defined (but maybe more important) costs in loss of programmer efficiency. There is also a hard-to-define cost related to forcing the correlator group to do something it would rather not do.

2. Let the correlator group do as it desires and live with the different systems. This will keep the most people happy during construction and will probably allow the fastest development. The concern is that any effort to isolate the operator interfaces from the operating systems will be expensive and unlikey to be completely effective. Therefore the operators will have to learn two systems. This would complicate the effort to share operators between systems and might tip the scales enough to prevent the use of a single operator for both. This would have a major long term cost impact during operations. It would also hinder the merging of the maintenance and further development of the software for the two systems.

3. Let the correlator group do as it desires and force the monitor and control group switch to the same system at some time. Barry did not seem especially opposed to this, but there is a cost. It would take about a half year to make the switch now

which would delay the ability to operate multiple antennas from early 1989 to late 1989. If the switch is done late in the project, the effort would be larger, but the impact on schedules would not be as important because we would be able to operate with the VMS system while the switch is being made. There would also be a hardware cost in the likely event that a switch is made to the same computers used in the CCC, but that cost is probably smaller than the software costs. The possibility of having the correlator group switch later was dismissed as unreasonable.

None of these options is very attractive. It was decided that option 3 would be chosen with the switch to occur late in the project. At that later date, the impact of a decision not to switch would be more clear and we will know yet more about the directions that the computer market is taking. Also, in the later years of construction, the monetary costs of a switch will be easier to absorb.

A discussion of operating systems on the Motorolas is also needed and will occur at a later date.