MINUTES OF VLBA COMPUTER MEETING - 4/26/83

Fringe Processing (See Memos #204 and #217.)

John Benson continued a discussion of the fringe processing work he and Bill Cotton have been pursuing. We feel we have an adequate understanding of the necessary steps to take place in the fringe processor. (Note that fringe fitting is done only on calibration data.)

It is clear that the necessary model calculation is easily doable by attaching some general purpose computing capability to the correlator. Applying the corrections to the data, however, is a computer activity requiring special purpose hardware.

The areas of processing involving this special purpose hardware is probably best done by the correlator builder. The processing beyond this point is probably best done by the computer group. The question of which group will supply the software for the fringe processor was left open. John Benson and Marty Ewing and perhaps others are going to get together and work out a possible division of labor. This will be put out in the memo series.

Control Computer in Each Antenna Question (See Memos #210 and #215.)

The original proposal called for each antenna to be controlled by a small computer located at the antenna. This computer would be updated by the central array control computer. In this approach, the software in the antenna computers would be modified as necessary by down loading software from the central computer or by a real or virtual terminal line routed through the central computer. The link would not be required for the operation of the telescope. Larry D'Addario has suggested an approach where the control emphasis is shifted from the antenna computer to the central control computer, making it more like the VLA. The role of the antenna computer would be simplified, so that its only task is to manage a buffer of commands, where the buffer is large enough to allow coasting through nearly all dropouts of communications. That computer would look more like a microprocessor; software changes would not normally occur after the construction of the array. Tasks requiring significant "intelligence" would be performed centrally.

The relative advantages of each approach were discussed at length. The primary difference between the two schemes is one of control philosophy rather than budget. The control system must be flexible but should that flexibility be located in the antenna or at the array control center? It is not clear that there is a cost advantage to either approach. If the antenna computer is made simple, the array control computer must be made more complex and probably a redundant one should be added.

The question of whether there are any tasks which actually require significant intelligence at the antenna was considered. Only the antenna pointing task was in this category, and then only if the pointing correction algorithm must depend on locally-measured variables which change rapidly.

If I might summarize the feelings of the computer group:

1) The group has not been convinced that the original approach is not the best one. That is, each antenna should be controlled by

its own computer whose operation is not dependent on the communication link. This would require an operating system which supports multitasking; a basic but not fancy network interface; and probably a disk, although operation should not depend on the disk.

2) One should keep the antenna computer system simple and not get carried away. (Actually this was one of Larry's main points.) Also, if it can be done without increasing the present budget, a redundant antenna control computer should be included.

To aid in future discussions of the communications question, I have agreed to collect some information on telephone line based communication dropouts.

wrb/ndw