NATIONAL RADIO ASTRONOMY OBSERVATORY
POST OFFICE BOX 2 GREEN BANK, WEST VIRGINIA 24944
TELEPHONE 304 456 2011 TWX 710 938 1530

December 23, 1981

VLB ARRAY MEMO No. 45

MEMORANDUM

TO: VLBA Design Group

FROM: K. I. Kellermann

SUBJECT: Dec. 18 Meeting

Record System

RPE reported on a design of a multiple VCR System (VLBA Memo No. 44). The cost of the VCR's plus tape changing mechanism is comparable to the Honeywell MKIII tape transport ($\sim$ 30K), while the remainder of the system (i.f., video converters, etc.) is independent of the recording medium. JPL and Haystack are developing the moving head MKIII technique, so NRAO will concentrate on the development of a VCR System. Since the cost of the two techniques appear to be comparable, a choice of the optimum recording medium can be deferred. It is important, however, to demonstrate that the necessary data rate of 16 Mbits can be obtained using pulse width modulation.

It was agreed that for the purpose of costing the Record/Playback system, we will assume 4 independent i.f. channels, each of 14 MHz bandwidth. Each of the 4 i.f.'s will be multiplexed across all 7 tape recorders using a suitable length buffer. In this way, loss of one tape recorder will result only in a decreased SNR.

Correlator

Discussions with other groups show no clear consensus for the optimum approach to the design of the correlator system. Both high-speed recalculating systems and low-speed systems can be made to work for comparable costs. JPL and Haystack are developing large scale low-speed systems, so it is appropriate for NRAO to further investigate the high-speed technique. No decision need be made at this time.

For costing purposes, BGC will develop a conceptual high-speed correlator design (14-station continuum/10 station line). BGC and RE will develop the cost estimate for the correlator.

Post-Processing

There remains a large spread in estimates of post processing needs. Worst case problems require up to 10^{10} bytes of mass storage, but it is not clear if it is realistic or necessary to routinely handle such large data bases. Nevertheless, previous estimates of the computing load are probably low because they did not consider interleaving sources or multiple reanalysis of the same data. It is not unlikely that the VLBA computing needs may be comparable to that of the VLA. One approach would be to seek adequate funding at one time to handle all of the VLA/VLBA requirements, but it is unclear in either case how much of the load can or should be absorbed by regional systems.

Subject to poorly defined, but real, financial constraints, RDE will try to develop a new cost estimate for the Post Processing System.

Control System

SW reported on the costs of the control and communications system. He has reservations about the need for substantial computing capability at the individual telescopes. The total cost of communications between the AOC and the elements is about $13K per month, of which nearly half is due to Alaska and Hawaii.

Next Meeting

1430 EST, Tuesday, January 5, CV, VLA, and GB Conference Rooms. The number to call is 1-800-243-9642.

Agenda:

Front Ends:	Balister
Feed System:	Napier
Local Oscillator:	Moore
Configuration:	Walker
Antenna:	Hvatum
Financial Plan:	Hvatum
Organization, Management and Operations:	Hvatum