VLB ARRAY MEMO No. 98

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POST PROCESSING COMPUTER CONFIGURATION

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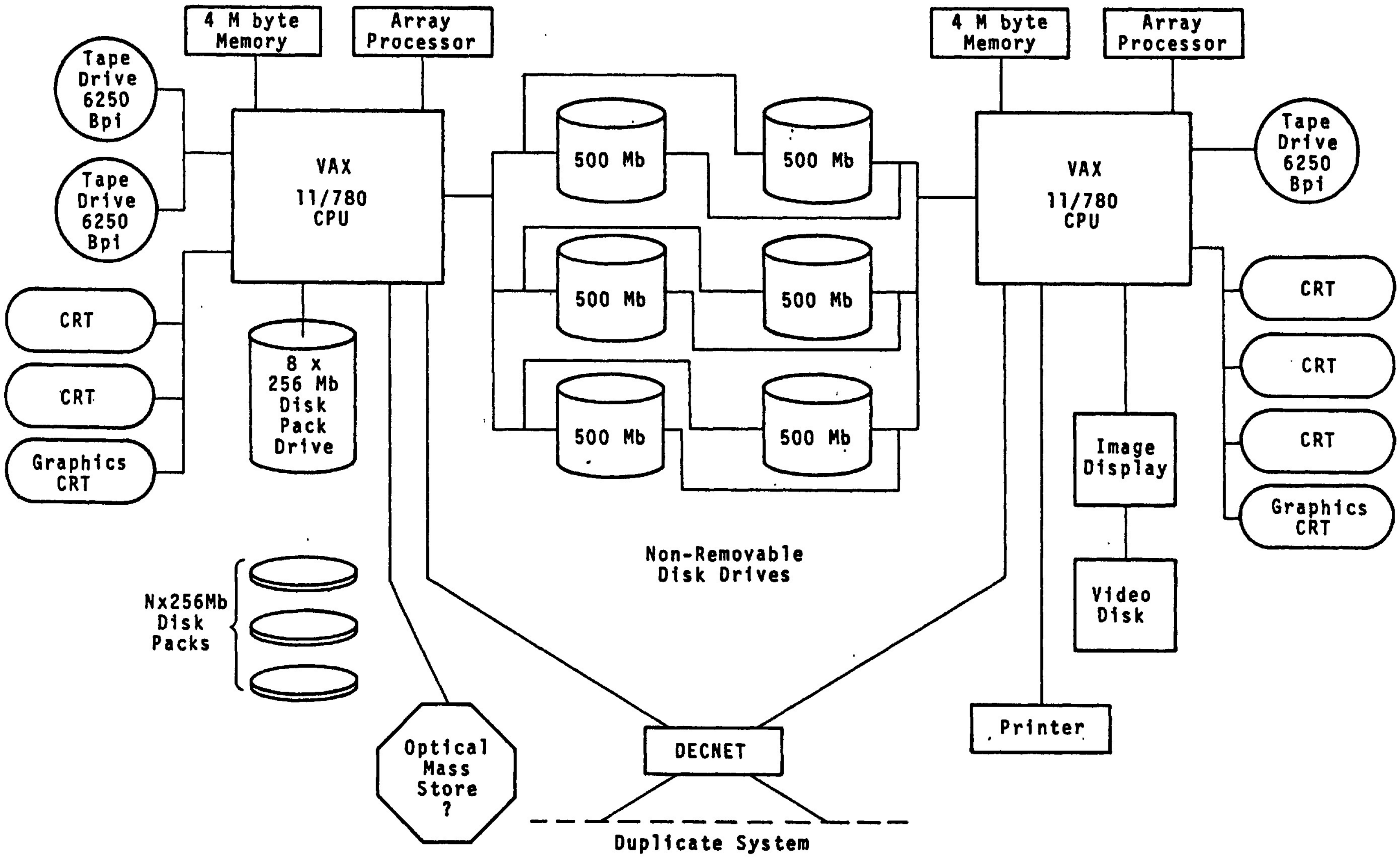
VLBA Memo No. 18a (Cotton and Benson) gives execution times for the various stages of data reduction. Assuming that the array is used for spectroscopy about 20 percent of the time, we estimate that a total computing power equivalent to 4 VAX-11/780's each with an array processor and 2 megabytes of additional memory will be required to handle the post-processing need. A possible post-processing computer configuration is shown in the figure. The two parallel systems are used to double throughput without increasing user interaction, and to increase overall reliability by providing two complete data processing routes. A heavy spectral line user with very large demands on capacity could be given one entire system and would not have to negotiate for resources with the astronomers sharing the other system. The DECNET link is provided to give flexible use of peripherals on either machine and to simplify the software development for both machines. The second VAX in each half of the system is essentially the same as the VAX based post-processing system (AIPS) which has been developed for the VLA. This part of the system would run software identical to the VLA software. Any VLBA specific functions would be developed in the first VAX system, without interaction with the development of other post-processing software. The use of disks which can be switched between the two halves of each system provide the extremely high data rate needed to move from the first to the second VAX without delay or additional overhead. This is also the point at which some astronomers will transfer to their own post processing systems by use of the high density tape recorders. The system provides ten GBytes of directly accessible storage on non-removable disks and an additional ten GBytes on removable disk packs without the need for tape I/O. A further increase in the mass storage may be possible using optical disks. Image display systems on each post-processing VAX are similar to those used in VLA post-processing systems. These are coupled to the image storage units (currently under development at NRAO) with the capability of storing up to 256 512^2 images.

For the VLA the total spectral line capacity will depend on the capacity of the pipeline computer system still under development. It achieves high capacity by use of AP's, pipelined processing in mini-computers, and use of low level software. Since software development costs for this type of system are very high compared with the hardware costs, and since the development time is long compared with the time scale for hardware evolution, this solution is not ideal for the VLBA. Even greater computing capacity may be eventually needed to handle the full spectral line capability of the VLBA. However, commercial development of parallel processing systems (or subsystems) should eventually provide a better route to the higher computing capacity.


4 M byte Memory
Array Processor
Tape Drive 6250 Bpi
Tape Drive 6250 Bpi
VAX 11/780 CPU
CRT
CRT
Graphics CRT
8 x 256 Mb Disk Pack Drive
Nx256Mb Disk Packs
Optical Mass Store ?
500 Mb
500 Mb
500 Mb
500 Mb
500 Mb
500 Mb
Non-Removable Disk Drives
DECNET
Duplicate System
4 M byte Memory
Array Processor
VAX 11/780 CPU
Tape Drive 6250 Bpi
CRT
CRT
CRT
Graphics CRT
Image Display
Video Disk
Printer