§30. CHS Data Acquisition and Analysis System

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I. Hardware extension

(1) In this fiscal year three AD/Cs, one scaler and five memories of CAMAC were newly installed in the CHS data acquisition system (DAS). Data from CHS experiments are over 26Mbyte/shot (2.6Gbyte/day). Figure 1 shows a block diagram of DAS and data analysis system.

(2)VAX/6310 having 96Mbytre physical memories, the main data acquisition computer system of DAS, was upgraded to have total 128Mbyte by adding 32Mbyte physical memories in this fiscal year.

(3) CHS has experimental data storage system consisting of optical cartridges juke box machine. DAS has two juke boxes. One is of the write-once type [OP1] and the other is of the read/write type [OP2]. We removed OP1 system from DAS because VMS operating system could not directly read/write the experimental data via local area network [LAN] . We have used OP2 system which is read by VMS and UNIX operating system via LAN. DAS has twelve magnetic disk systems which have totally 12Gbytes for operating system, programming code and analyzed data. Using rate of this magnetic disk systems is eighty percent totally. We installed the new magnetic disk that has 2.4Gbyte capacity. It could improve the data accessing time for acquisition and analysis.

II.Software extension.

[1] The data base management system (DMG) can read the experimental raw data and it makes data array on the data base system. DMG has a good availability, facility, response time and reliability. It has been developed at ORNL since 1985. We could read/write the data base from DMG on VAX6310 since early phase of CHS experiment. Because the network system grew larger, we need to read the DMG by other computer system via LAN. But we could not read this data base via LAN, because the VAX6310 computer system has basic bit length of 32 bit, and other computer systems have basic bit of 64 bit. We have developed the new method for the access to DMG. This method can be used under the VMS, DECnet system and a virtual shared disk in the VAX6310 computer system.

This method(program) is very simplified. When 64 bit computer system under the VMS will read the DMG on the 32 bit computer systems under the VMS via LAN, this program arranges the 32bit length by truncation of the 64 bit basic length. If less space is available than needed to accommodate nominal value, the nominal value is truncated and part of the constant is lost. Truncation of the nominal value is on the right for the character constant and on the left for binary constants. This program took effect to obtain a good performance of VAX6310 computer system because the DMG users moved to other 64 bit computer systems and they were able to read the DMG via LAN.
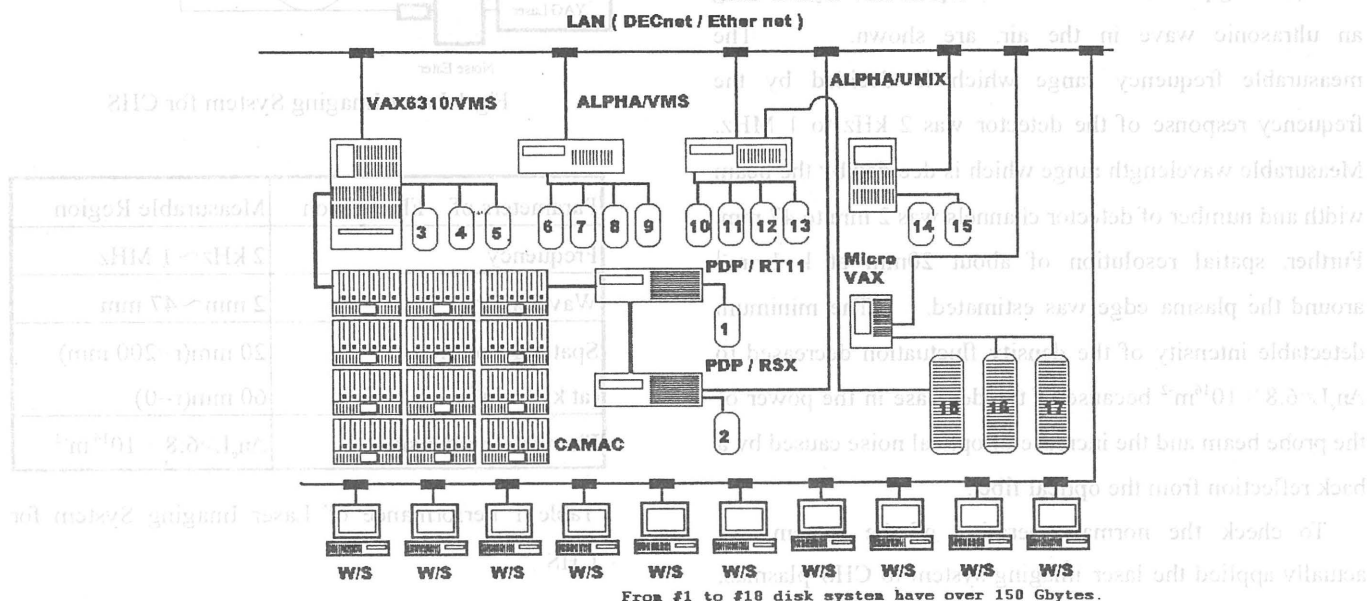

Fig.1. CHS data acquisition and analysis system