§31. New Computer System in Data Acquisition and Analysis

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CHS data acquisition system consists of four computer systems and two of them are working for data acquisition. DAS is composed of CAMAC, GPIB, RS232C and Parallel wire connections. CHS/DAS does not specialize data analysis computer in the system. Diagnostic data of CHS amounts to 8 Mbyte/shot in this year. We will collect more than 12Mbyte/shot in the next year. Therefore we introduced new data analysis computer system (ACS) which consists of 64 bit standard length processor. It has 64 Mbyte main memory , 4G byte capacity of DAT (Digital Audio-Tape) recorder and 3.2 G byte magnetic disk . Figure 1 shows ACS positions in DAS. ACS is linked to other DAS systems by DECnet/Ethernet which is used for experimental data analysis and data transfer to other computer systems. Main purpose of this computer is to execute fast numerical arithmetic for plasma parameter analysis and graphics processing. DMG, PLOTCH and scientific subroutines will be installed . We are testing numerical arithmetic speeds by using a plasma parameter analysis routine. We have gotten a performance faster by five to ten times than that of 32 bit computer of DAS. Figure 2 shows the comparison between the performances of 32bit computer and 64 bit ACS computer. This test program is to make typical SIN wave by three parameters (hight, wave length, π).

ICRF experiment has begun in this fiscal year and we have developed a new neutron monitoring system by CAMAC and a personal computer. This neutron monitoring system comprises three components: detecter, shape amplifier/discriminator and 2ch CAMAC with 16bit scaler. This system is developed to remove the dead time in the neutron counting. CAMAC scaler of the system can not sample the data, when it is in a READ/WRITE cycle. Therefore we developed double buffered data acquisition method for neutron counting, which results in no dead time. . Figure 3 shows the block diagram of hardware. This system is

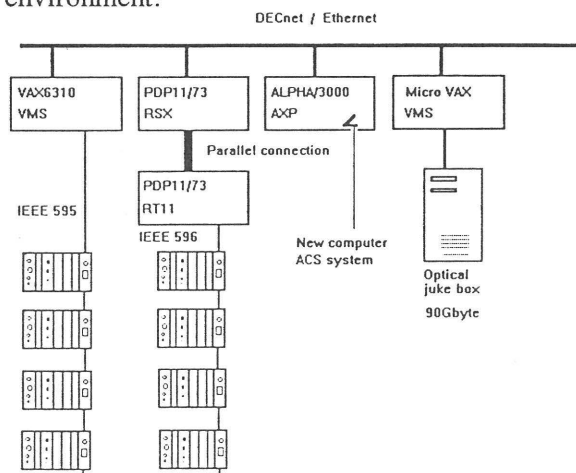successfully working for neutron monitoring of the environment.
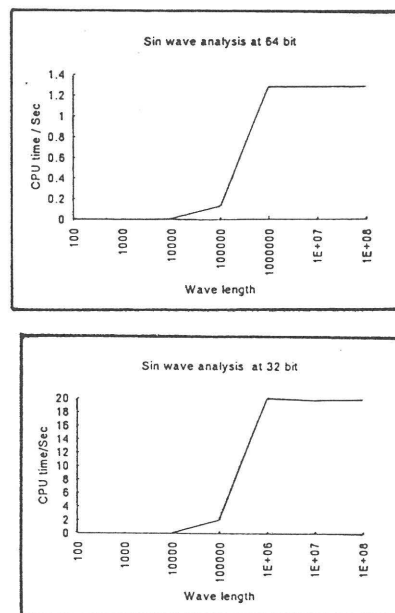

Fig.1. CHS data acquisition system and ACS

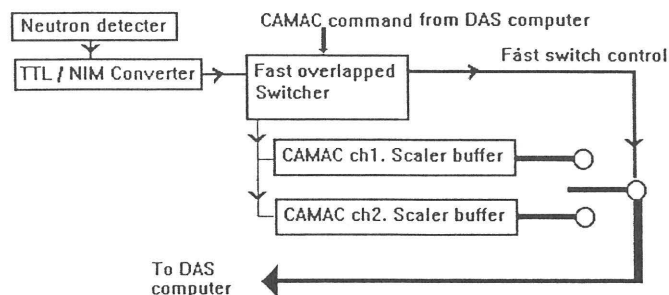Fig.2 Comparison between the elapsed times of 32 bit and 64 bit computer in DAS

Fig.3. Block diagram of double buffered scaler