DATA ACQUISITION SYSTEM DEVELOPMENT

J. W. McConnell, W. T. Milner, R. L. Varner

The Oak Ridge Physics Acquisition System, ORPHAS, developments during this period include:

- Support for new VME CPU module based on MC68060 processor
- New event-trigger VME module
- Support for multiple FERA readout VME modules and up to two CAMAC interfaces
- A new code for the initialization of CAMAC modules
- Support for additional FASTBUS and FERA readout modules

Our newest VME processors are Force Computers, Model CPU60. These are based on a Motorola MC68060 microprocessor. There are significant hardware differences between these processors and our older Force Computers Model CPU40s. The differences include the ethernet hardware, timers and interrupt vector assignments for on-board devices. Only the very lowest level codes must be different. The acquisition system implies the CPU module-type from the processor name and loads the appropriate code.

The event-trigger module had been built using a VME prototype module that is no longer available. A new design for the trigger module has been done. The PC board layout and fabrication of three modules was done by the RIS Corporation of Knoxville, Tennessee. The older trigger modules have been upgraded so that all modules are now software compatible.

ORPHAS now supports up to four LeCroy 1190 dual-port memory modules used for the FERA readout devices. Limited support for a second Kinetic Systems 2917 CAMAC interface is provided. The second interface may be used only for initialization of CAMAC modules.

Many of the CAMAC modules we use require some initialization of pedestals, upper- and lower-thresholds, discriminator levels, etc. A new code, modu_setup, uses an input file specifying the module types and the parameters for each module. The code converts user specifications to the format required by module, loads, and verifies the initialization parameters. User documentation is available.

In support of the ORNL-MSU-TAMU BaF_2 array, support for several data acquisition modules has been added or is in development. For the FASTBUS, we have added readout for the LeCroy 1881M ADC and the 1877 TDC modules. For FERA bus, we have investigated support of the MSU FERA Faucet module for readout of multiple crates of FERA ADC's. We are currently investigating CAMAC block read support for the LeCroy 3377 TDC.

We currently have ten VME systems and seven workstations available for data acquisition although not all systems are available for general use. A VME system can support only one data acquisition. However, workstations can support multiple VME systems. A list of systems is given below along with the use normally associated with each.

Host-name	**Platform**	**Normal-use**
astro4	Alpha	DRS control and data acquisition
orpas2	DECstation	Portable, general use
orpas3	Alpha	BaF array
orpas4	Alpha	RMS data acquisition
orpas5	Alpha	Beam diagnostics development
orph38	DECstation	Hardware and software development
rms1	DECstation	RMS control system
rms4	Alpha	RMS data acquisition