

## Computing / Data Acquisition

During 1996, the Data Acquisition group continued to maintain the standard VMS VDACS/ $\mu$ SR data acquisition systems, the CHAOS CODA data acquisition system, the special RMC data acquisition system and two development systems while bringing online some more modern systems.

### Proton hall systems

New front end hardware was purchased for TISOL. The standard STARBURST/CAMAC QBus interface is replaced by a MVME162-513 CPU running VxWorks (a UNIX-like OS) accessible via Ethernet. This CPU resides in VME and can access any VME DAQ modules or CAMAC via a VME/CAMAC Parallel Branch Coupler. A DECstation 5000-240 was used as the host computer running the CODA software for online acquisition and logging coupled to NOVA for online monitoring. This Decstation was shared with the parity group who uses it for semi-online data reducing during beam running. At year end a PC Pentium Pro was purchased for TISOL to be used as a dedicated host with the intention to run the MIDAS software.

### $\mu$ SR systems

M20 and M15 front ends have been equipped with the MVME162 CPU with SCSI CAMAC controller and all beamlines are running regularly with the CAMPS system for slow controls developed last year. Faster VMS hosts can be used with this new system and will be installed next year. Support for a new 8 channel, 48ps resolution VME TDC is forthcoming.

### New Fastbus system

We acquired an SFI board from Dr. Struck Co. This is a Fastbus sequencer that fits in a Fastbus crate and contains a three slot VME backplane in which we can install our standard VME processor board (MVME162). The MVME162 runs VxWorks, and has an Ethernet interface so it can be accessed from any computer on the Ethernet. The SFI/VME162 combination forms an interface between FASTBUS and a host computer.

Software support for the SFI/MVM162 has been developed. We have a library of Fastbus routines accessible via RPC calls from any hosts as well as a small data acquisition program to setup and read test data from Fastbus TDC1877 modules. The next step is to incorporate these programs into Midas and prepare for use by experiment 614 at Triumph.

### New software package - MIDAS

The development of the new Data acquisition software MIDAS has been carried out through the year by Pierre Amaudruz with the help of Dr. Stefan Ritt,

the originator of this software package. Dr. Ritt visited for three weeks in the fall during which he addressed in particular the framework of the system from the experimenter point of view as well as some issues related to specific Operating Systems. MIDAS is currently in use by the CHAOS group. Tests are in progress to evaluate the level of improvement of MIDAS over its predecessor CODA. The Event Analyzer packages SUSIYBOS and NOVA have been coupled to MIDAS system.

The Data acquisition System for TISOL will migrate towards MIDAS in a short future. Side projects such as Xwindow GUI for Midas, Fast CAMAC/VME functions, VME and Fastbus Hardware module library extension are underway. Future projects beside extensive tests on the stability of MIDAS are tests on other Operating system platform such as VMS, MS-DOS; interface to HBOOK and PAW for analysis; small stand-alone Data acquisition system with direct CAMAC or VME interface from PC.

### NOVA software

The NOVA analysis system, version 2.0 now runs reliably on all of the major computer platforms supported at TRIUMF (VMS, Ultrix and DEC-Alpha). NOVA is installed on all machines at TRIUMF, and at various TRIUMF-associated Universities (University of Alberta, Manitoba and UNBC). In addition, NOVA has recently been ported to Linux (both Slackware and Red Hat versions), and installed on the new Pentium PC for TISOL. Additionally, NOVA has been ported to SGI IRIX (installed at College of Willam and Mary), HPUNIX (at University of Toronto) and Sun, to ease the burden of analysis at off-site institutes.

The CODA and MIDAS packages allow the tasks of Data Acquisition to be separated from online analysis / monitoring. A large part of the NOVA upgrade has been the inclusion of MIDAS. This has now been used successfully for the Parity experiment, and is being implemented for TISOL experiments using a Linux-based Pentium PC.

As NOVA is being used increasingly in a multi-platform environment, it has become clear that one of the serious short-comings of the system is the inability to transfer Binary data files among different operating systems. The development of a platform-independent Dump file format is under way, and will form the basis for the next major revision of the system. Conversion routines for older-format dump files are being developed to maintain backward compatibility.

A second area of upgrade required for NOVA is the development of an X-windows based replacement for the Atari ST640 program. A preliminary version of such a package has been developed and will be implemented in the next release of NOVA.

### **Recording media**

In the coming year, the group plans to test usage of DLT and DAT-3 media as replacement for aging Ex-

abyte 8 mm tape drives. The newer media would offer faster logging speeds, larger storage capabilities and better reliability.