Midas

- **M** multiple
- **I** instance
- **D** data
- **A** acquisition
- **S** system

Application Independent Components

- Graphical Interface
- Network Interface
- Spectrum Interface

Application Specific Components

- Data processing

Midas - Graphical Interface

Experiment control and monitoring

Diagnostics

Data analysis

- Quick and easy to generate Motif compatible Graphical User Interface
- Designed for use in many varying configurations by a distributed group of implementors
- Common look and feel across all components of the system
- Easy to add new components and safely allows "user" additions and local modifications
- May be extended without sensible limit

Midas - Network Interface

Network Interface via Register Server - network distributed objects

Allows the GUI to control and monitor the state of the data acquisition equipment and real-time software components

- VXI objects
- VME objects
- CAMAC objects
- software objects (variables and procedures)

The GUI can access all objects (or a selected set) of a given catagory by a single built-in procedure call

Network Objects

May be dynamically created

Access can use a wide range of "wild card" features

An object can be

- Hardware register or control within VXI or CAMAC module - addressible to a single bit level
- Portion of VME address space - single location or block
- Variable within control processor software
- Procedure within control processor software
- Any action linked to specific class and object

CAMAC

The following CAMAC ADC modules are currently supported by the Midas package

- LeCroy 4300B ADC
- Silena 4418/V ADC
- Ortec 413 ADC
- Ortec 811 ADC
- Ganelec QDC1612F

Also the following LeCroy CAMAC modules

LC2277 LC2551 LC4208 LC4413 LC4415A LC4434 LC4504 LC4516 LC4518 LC4532 LC2375

Midas - Spectrum Interface

Location independent software interface

- Hardware histograms - real-time "singles" - from data on DT32 bus
- Software histograms - on-line data analysis
- Offline and Stored disc based histograms

Multiple servers (possibly of different type) may appear as one to the GUI

Electronics

Following Eurogam structure

- Primary detectors interfaced via VXI electronics
- Ancillary detectors may have VXI electronics
- Ancillary detectors may use CAMAC adcs with FERA readout interfaced via the FERA =¿ VXI module (Euroball/Diamant/Bordeaux)
- Eurogam/Euroball Hardware Histogrammer
- Single DT32 bus data source into D2VB module (Eurogam) in VME

VXI control

Each VXI crate contains a Slot 0 (Resource Manager) module (Struck) which has inbuilt a standard VME CPU board. This communicates with the Midas control GUI via ethernet and allows setup and monitoring of all VXI modules in the crate. A logic analyser facility is built-in which can monitor some VXI backplane lines.

Each VXI crate contains a Readout Controller module (Struck STR 8080) which contains a DSP. In addition to code to handle normal readout extensive diagnostic and test facilities are built-in. These allow diagnostics to locate faults within the VXI crate and data generation features to aid system testing.

Event Processing

Single data stream (follows Eurogam) - hardware event building via DT32 bus.

- Data received via D2VB module (DT32 bus master; 2Mbyte fast RAM; buffer list processing)
- Software checks data for quality; correct format and valid contents
- Reformat to output data format (Eurogam, Euroball or different?)
- Send to Tape Server via high speed broadcast network (fddi or fast ethernet)
- Produce at each step statistical information for monitoring purposes
- At all stages data buffers accessible to GUI for diagnostics

Tape Server

Manages all output devices

- Exabyte
- Digital Linear Tape (DLT)
- Other SCSI devices ??

Features

- Multiple logical data streams
- A data stream may span several output devices
- Online data stream duplication (same data written to several devices)
- Drive performance monitored and available to GUI

Online Analysis

Event blocks sent via the data network from Event Processor to Tape Server are available in "spy" mode to any number of workstations.

- "Spy" on the online data

  non intrusive

  cannot effect main task of getting data to tape

- "User" programs running in standard workstations

- Multiple concurrent data analyses possible

- Library subroutines allow histograms to be created for viewing using the Midas Spectrum Viewer

Electronics

Following Euroball structure - multiple data sources

- VXI and FERA via VXI with Hardware Histogrammer as before
- Muliple DT32 bus data sources into D2VB modules (Eurogam) in VME
- Ancillary detectors also use CAMAC adcs with FERA readout interfaced directly to D2VB/HSM
- Other data acquisition systems feeding 16/32 bit ECL bus interfaced via D2VB/HSM or similar can be handled

Electronics

multiple data sources

Additional requirements

- Each data source must tag each event fragment with a global event number
- All data sources must be synchronised so that the data blocks from each data source contain fragments of the same events

Event Building

multiple data sources require that software merge the event fragments to generate complete events

- Check raw data streams
- Convert from specific raw formats to standard

  FERA - convert VSN/subaddress to group/item
- Generate singles histograms
- Merge event fragments using the global event number tag

Other processing as for a single data source