ROD Pre-prototype VME Interface Requirements

UCI / LBL / UW

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(1) Requirement: Load Configuration/Calibration Commands.
Description: VME host can load a set of commands for the ROD to execute autonomously.
This feature should also support a broadcast mode where the configuration / calibration commands can be loaded in all boards simultaneously.
Justification: Since there may be several RODs in a crate, each ROD must have a memory to store a program or sequence of commands. The RODs must then be able to execute these instructions without tying up the host. Otherwise, it would be inefficient for the host to load a command and wait for each one to be executed before issuing the next command. VME bus traffic can be reduced by loading all the RODs in parallel.

(2) Requirement: Operating Mode Control and Status Registers.
Description: Set operating mode: Normal Running, Configuration, or Internal Triggering.
Check the status of the current operating mode (i.e. is it idle, running, processing triggers, etc.)
Execute configuration / calibration commands.
Justification: The host has to control each ROD and know what each one is doing at all times.

(3) Requirement: Look at Error Counters and Error Flags.
Description: Read type and number of errors that have occurred.
Justification: Allows the host to look for noisy or malfunctioning channels.

(4) Requirement: Interrupt VME Host on Errors or Fatal Conditions.
Description: Generate VME interrupts during severe errors.
Justification: The host has to be notified immediately of errors so it can try to correct the problem, generate board resets, resynchronize the ROD, or alert a higher level authority.

(5) Requirement: Read / Write Memory.
Description: Transfer histogramming/calibration data or ROB spy data (Event Trapping Data) to the VME host.
Read / Write to the input memory on the ROD.
These operations should support block transfer or burst mode.
Justification: Data must be moved off the ROD quickly and efficiently so it can support a 1KHz trigger rate at the expected occupancy. Since there may be many RODs in the crate, data transfer must be fast to avoid tying up the host with I/O.

(6) Requirement: Adjust Timing of Atlas Clock and Trigger Distribution.
Description: Read/Write registers or control bits on the TTC chips.
Justification: The timing of clock and trigger signals need to adjustable to synchronize the RODs with the other modules it must communicate with.

(7) Requirement: Turn Off / Reset Malfunctioning Board.
Justification: A malfunctioning board may need to be turned off or reset so it does not generate corrupt data or otherwise prevent other modules from operating properly.