

GRINCH DAQ (VETROC)

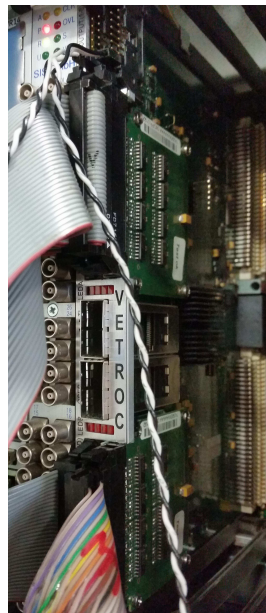
Hall A 12 GeV DAQ Meeting

Evan McClellan

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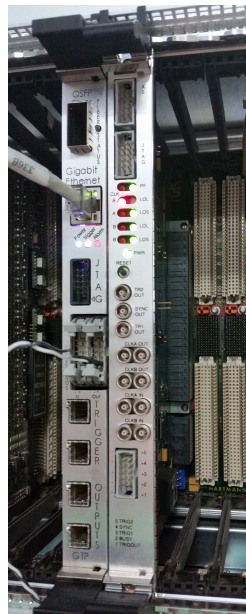
VETROC

- custom VME/VXS FPGA TDC/trigger module
- 128 LVDS inputs (with expansion cards)
- 1ns time resolution on TDC readout
- streams hits to VXS backplane
 - 32ns resolution
- TDC records both edges of hit
- Time-over-threshold 'ADC' possible

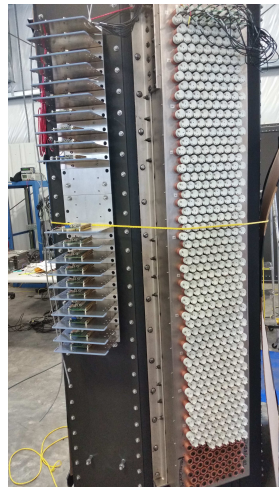


GTP - Global Trigger Processor

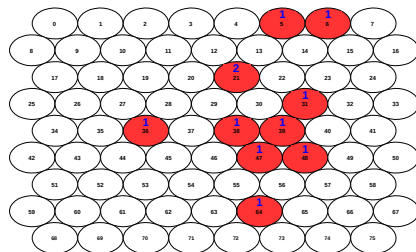
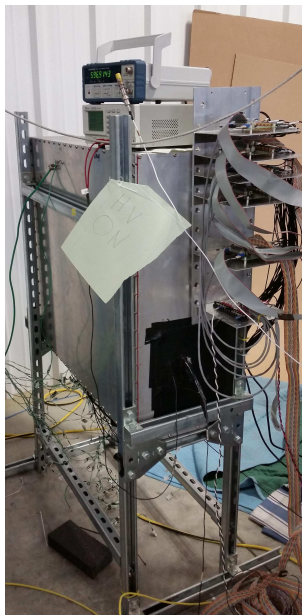
- Reads in data streams from VXS backplane
- Forms trigger decision in FPGA logic
- Internal 250MHz pipeline
- up to 16 input streams
 - using 2 lane serial VXS, 4 Gbps per VETROC
 - 128 channels, 32ns resolution (no compression)
- fixed trigger latency (780ns)
- up to 30 output trigger bits



- 510 PMTs (4 VETROCs)
- Trigger rate up to 5 kHz
- background rate up to 1 MHz per PMT
 - 10% occupancy for 100ns window

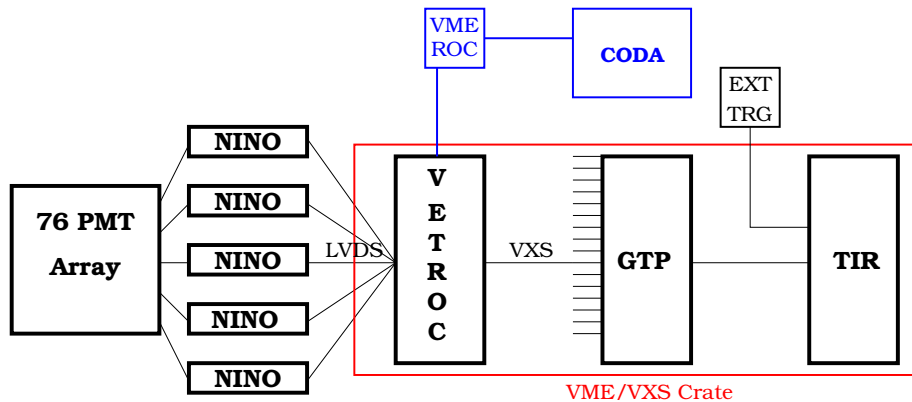


Prototype Test Setup



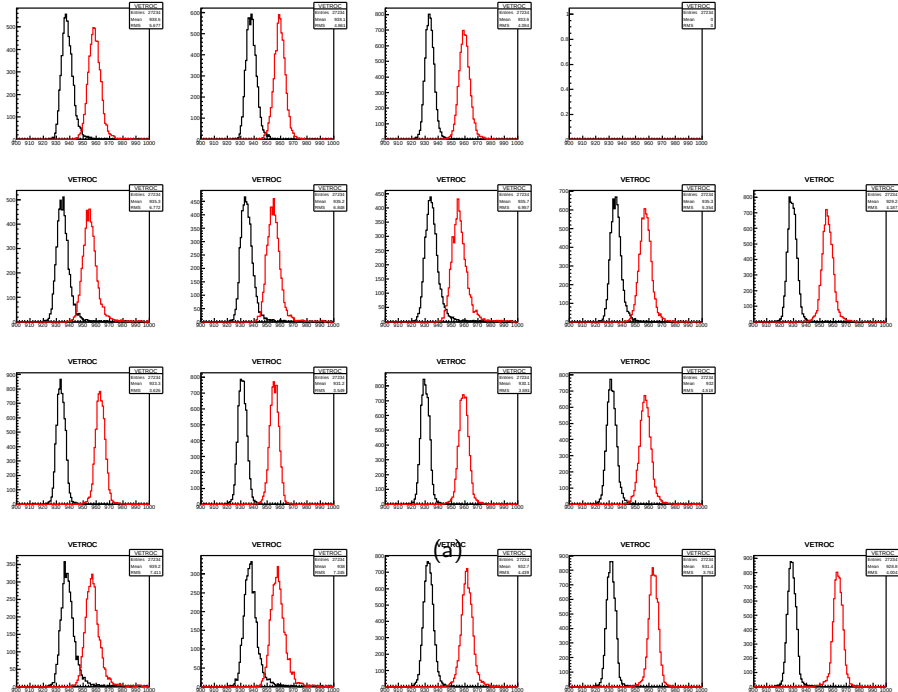
- 1/6 GRINCH array (76 PMTs)
- 5 NINO cards
- 1 VETROC
- 2 LEDs within box
- (installed small chunk of scintillator for cosmics)

Prototype DAQ

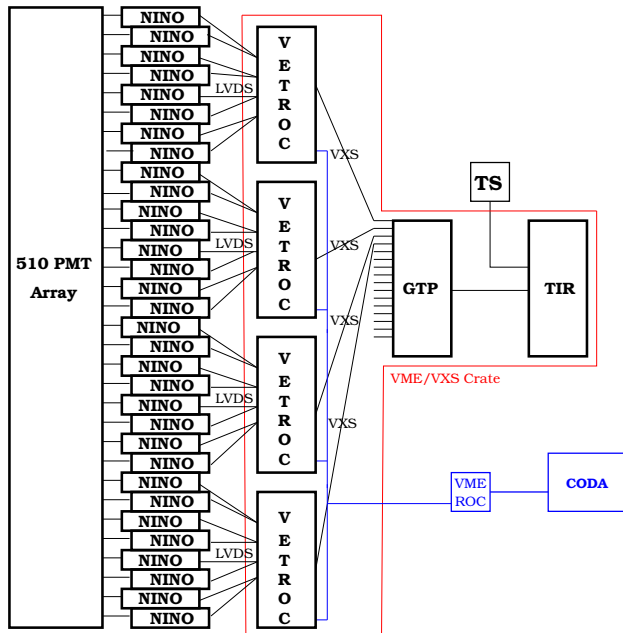


Prototype DAQ Plan

- Measure cosmics with 1 VETROC + ADCs
- measure timing resolution and adjacent-tube correlation
- measure VETROC “time over threshold”, compare with ADC
- test online cluster trigger with cosmics (GTP)
- test multi-VETROC DAQ (test readout, decoding, etc.)



GRINCH DAQ



- prereq: decommission prototype
- instrument full GRINCH with 4 VETROCs + some ADCs
- fill with gas and measure cosmics in ESB?