



FastBus

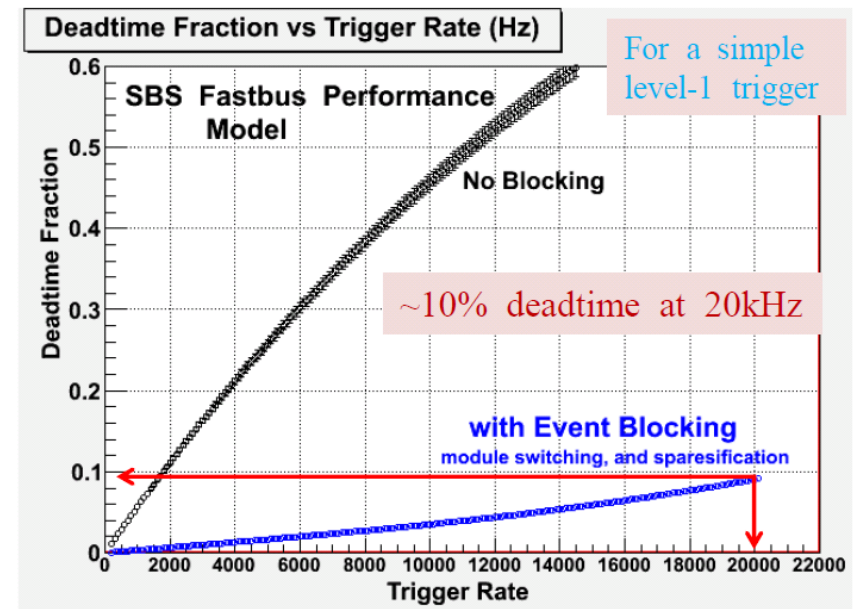
Mark Jones

Experiment Overview

GEp Detectors	Channels	Readout	Type
<u>SBS Proton arm</u>			
Front tracker (6 GEM chambers)	41,472	APV25 MPD	VME
Rear tracker (10 GEM chambers)	61,440	APV25 MPD	VME
HCAL	288	FADC 250	VME
<u>Electron arm</u>			
ECAL	1776	ADCs 1881M	Fastbus
ECAL sums	214	TDCs 1877S	Fastbus
CDET	2688	TDCs 1877S	Fastbus
GEn/GMn Detectors	Channels	Readout	Type
<u>SBS Proton arm</u>			
HCAL	288	FADC 250	VME
CDet	2688	TDCs 1877S	Fastbus
<u>BigBite Electron arm</u>			
PreShower/Shower	243	ADCs 1881M	Fastbus
Scintillator	180	ADCs 1877S	Fastbus
Gas Cerenkov	550	ADCs 1877S	Fastbus
Front Tracker (4 GEM chambers)	27648	APV25 MPD	VME
Rear Tracker (1 GEM chamber)	6144	APV25 MPD	VME

Experiment Overview

- GEn/GMn experiments will trigger on singles rates < 5 kHz. The GRINCH and hodoscope are a modest increase in the number of FASTBUS modules to the standard BigBite DAQ setup.
- GEp experiment will trigger on coincidence. The ECal will have 200 kHz singles rate and HCal will have 2 MHz singles. The coincidence rate will be 5 kHz.
 - Estimate that deadtime = 25%. Need to reduce.
 - Forming the Hcal trigger takes $1 \mu\text{sec}$. Too long to delay the ECal ADC signals. Will have use ECal trigger as a level one gate and fast clear in no level two coincidence.



Reduce FastBus deadtime

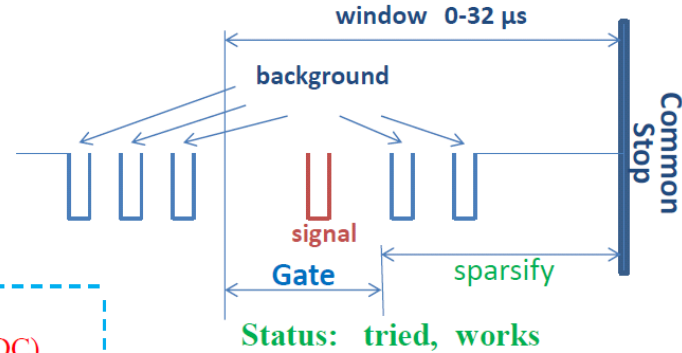
Making Fastbus Faster

Sergey Abrahamyan

Igor Rachek

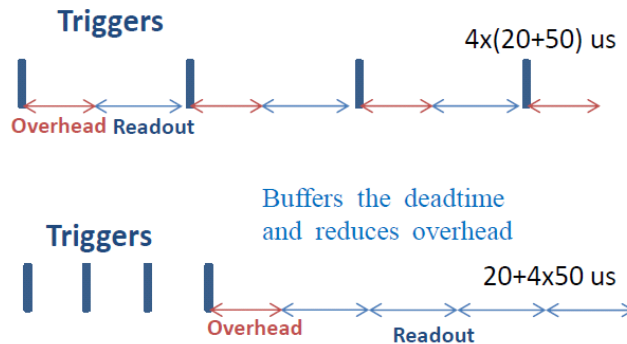
I. Sparsification (built-in feature in TDC and ADC)

Throws out background hits



II. Event Blocking (8 events in TDC and ADC)

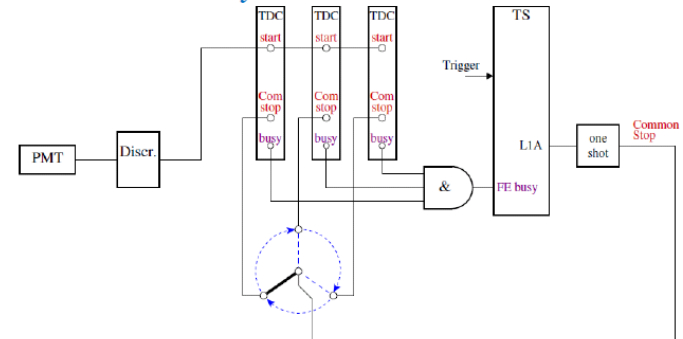
Blocklevel=4 should work with pipelining VME



Status: tried, works

III. Event Switching

3 parallel crates, triplicate equipment, but reduces rate by 3



Status: test about to start
(expected to be straightforward)

FastBus overview

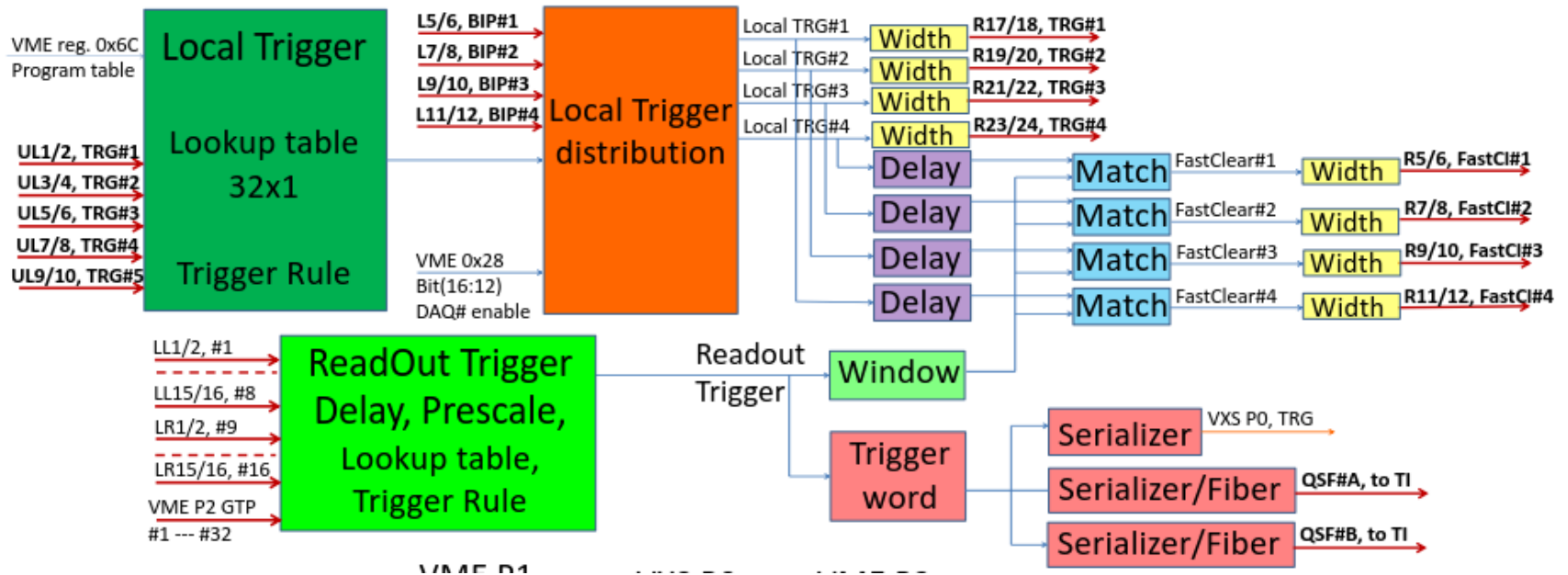
- Have tested the required TDC, ADC, crates. Work done by Sergey and students

	TDC	ADC	Crate	SFI
Have	236	113	30	18
Need	124	94	21	21

- Set up the CDet and ECal DAQ weldments with 9 and 12 FastBus crates (along with the HV). Work done by Albert
- Demonstrated that sparsification and event blocking work to reduce deadtime. Work done by Sergey.
- Need to have event switching within the framework of the VME pipeline electronics.

Updated Trigger Supervisor

- From discussions with Alexandre, William Gu (JLab electronics group) modified the TS firmware to send accept a ECAL singles trigger , check for busy signal on 3 branches, send gate to branch that is not busy and create a fast clear. If coincidence trigger then veto the fast clear. Otherwise readout the free branch.
- Software was written by Bryan Moffitt (Jlab DAQ group)
- Need the new TI modules. (Have for CDet , Need to buy for Ecal)



Test plans

- Setup a cosmic coincidence between two scintillators.

- With one crate , the readout using a TS with one crate with fast clear works at block level =1
- Next step is setting up two crates.
- Tests at block level = 4
- Test with 3 crates which will involve using a Trigger Distribution card and Signal Distribution card.

Current Plan for the Module Flipping Test

