



L2 Improvements and Work

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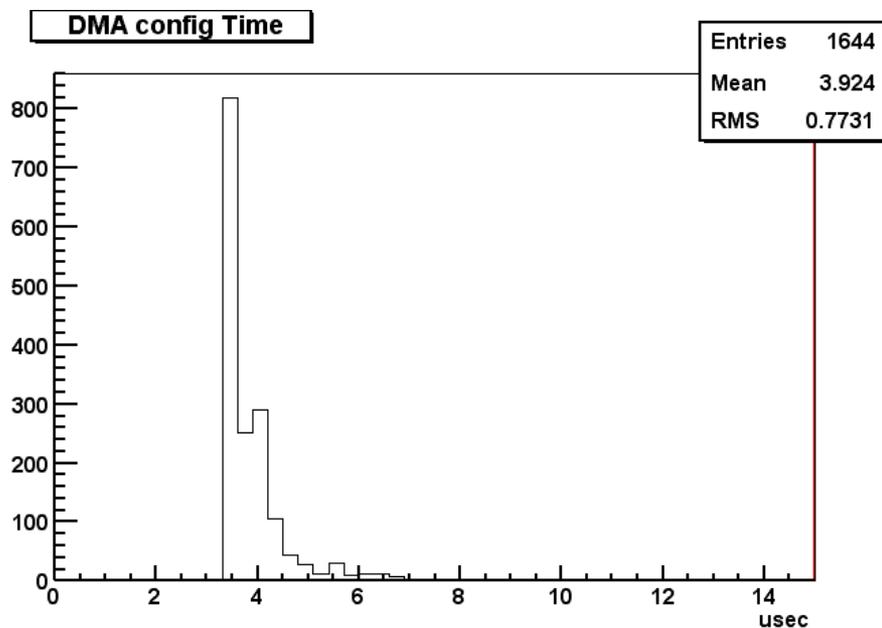
May 9, 2003

Trigger Hardware Meeting



DMA Config

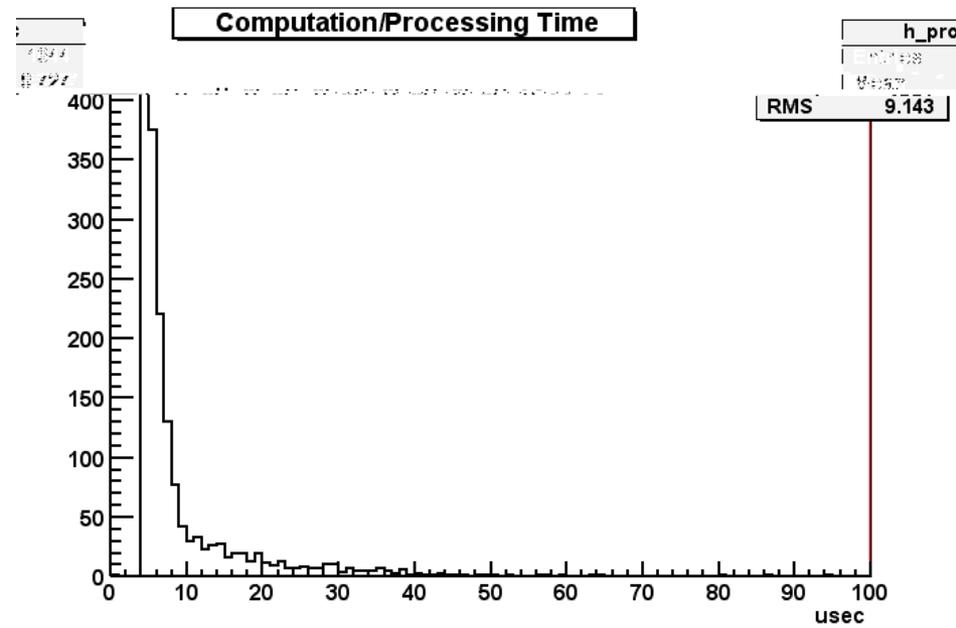
- Remove reading of DMA buffer
 - Use EOE bit sent in data
 - Savings of 2-3us
- Removes some error checking
 - TrigMon #Mbus words plot
- Problem: Clist doesn't always send EOE bit
 - Requires firmware fix and testing
 - Most L2 Decision timeouts are Clist errors
 - Option B: Only read Clist buffer. Saves 5/6 of time
- Software: Need to change how data is unpacked
- Put all DMA config in firmware
 - Extensive changes. Save 0.5-1us
 - True pipelining. Not worth effort.





Software Improvements

- Can reduce mean and/or tails
- Drop L1 Trigger scalers – save 1.5us
- Change trigger pre-reqs
 - Check L1 bits for groups of triggers
 - E.g. track triggers checked with mask
 - Save 0.5-1us (?)
 - Put dependencies between triggers
 - E.g. if lowest Et photon trigger failed, don't check higher Et triggers
 - Requires changes to TDB code
- Algorithm improvements
 - Easy to test and implement
 - No changes to infrastructure
 - “Work smarter, not harder”





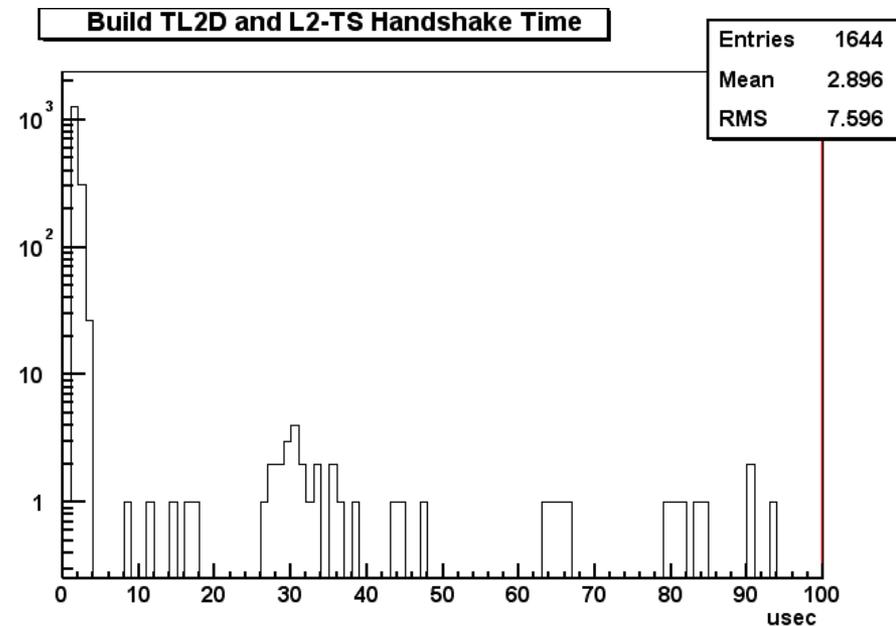
Multiple Alphas

- Expand operation to 2-3 alphas
- Need to study effect on timing
 - Reduces mean somewhat (.e.g L1 trigger scalers)
 - Probably helps tail the most
 - On L2A, need to read Trigger decision data from other Alphas
- Need extensive tests of data integrity
 - Previous tests didn't show a problem
- Major changes to TDB code
- Most extensive change to operation of L2



Misc. Other Improvements

- **L2-TS handshake**
 - Requires 3 PCI transactions
 - Could put final acknowledge in firmware
 - Savings of about 300ns
- **Build TL2D after L2-TS handshake**
 - Starts DAQ readout 30us sooner
 - Doesn't change time in Alpha
 - Change bookkeeping of deadtime
 - Slight reduction in true readout deadtime
 - “Trivial” code change





Other L2 Issues

- **L2 Muon board**
 - Highest priority for L2 work
 - Limits other L2 trigger work which can be done by Tom or Stephen
- **Spare boards**
 - Would like to test/fix all spares during shutdown this summer
 - 1 of Clist, Isolist, Alpha spares need some work
- **New Clist Firmware**
 - Could help with occasional L2 Decision timeouts