

SUMMARY OF “RUN FLOW” IN MICROBOONE

WESLEY KETCHUM
LANL

WHAT I UNDERSTAND OF THE...

BASIC FLOW

RUN CONTROL

- Resource manager takes/reserves resources at request of run control
 - Permanently...?
- Application manager starts apps (sebApp, assemblerMain, monitoring?, etc.)
 - Configurations from a database
 - Processed into a fhicl file?
- We then progress through the state machine...

DAQ SETUP

- Load configurations
- Configure
 - Assembler: not much...
 - Sebs: configure the readout crates
 - ASICs: configure
- “Make connections” (or, software configure)
 - Make connections between seb and assembler
 - Create internal buffers, files to write
- And then begin the run
 - Explicitly allow triggers?

DATA FLOW IN TRIGGERED MODES

- See Georgia's description of triggers
 - Docdb 3137
- Trigger → data flow through the system
 - FEMs to XMIT (via VME backplane)
 - XMIT to PCIe card (via optical fiber)
 - PCIe card to SEB (via DMA)
 - SEB to EVB (via Ethernet)
- After N events, we seamlessly(?) start a new subrun
 - N determined by optimal data size for transfer to tape/ accessing data from tape (~ 200 GB ~ 10,000 events?)
 - Currently EVB just does this on its own, but EVB could report to run control...
 - New subrun → new files on evb (and sebs?)
- Start a new run after set amount of time
 - Based on stability of DAQ and/or necessity of calibrations

NEARLINE HANDLING

- Swizzling on evb(?)
 - Beam data attached
 - Data gets out into LArSoft format
- Nearline monitoring
 - Could run on pre-LArSoft or post-LArSoft files
- Data to enstore from evb
 - Mechanics still to be worked out
 - Raw binaries and swizzled data sent out
- Offline process runs calibration process
 - Keeps accessing of calibration database off DAQ machines

NOW FOR SOMETHING COMPLETELY DIFFERENT...

ASIC CALIBRATION

WHAT'S DIFFERENT AND THE SAME

- Starts with run control again
- Basic configuration of assembler and sebs
 - Though no PMT FEMs used/configured (though, still that SEB gets used)
 - Readout window size is reduced
 - Events / subrun is smaller and definition of subrun a little different here
 - Each subrun will be a set of ASIC calibration and pulser settings
- Trigger: internal trigger
 - CALIB out triggers pulser

BASIC FLOW

- Configure and start run
- Pause after 100 events
 - Pause issued by evb?
- Change ASIC/pulser settings
- Resume
 - Decided by some flow manager in run control
- Repeat for all desired ASIC/pulser settings
- Swizzle and process events via a calibration run analysis routine
 - On evb?
- Put calibration results in database
- Read results back from database and check that they are good
 - Along with some other checks?
- Ship data to enstore at some point along here...

AND NOW FOR SOMETHING ALMOST THE SAME!

LED FLASHER RUN

WHAT'S DIFFERENT AND THE SAME

- All the same basic run control handles
- Include PMT FEMs in configuration, but otherwise very similar
 - Will need to define what subruns mean here, but likely different LED flash configurations
- Trigger: internal trigger
 - Again, with pulser driven by CALIB out
- Similar post-run handling
 - Swizzle, analyze, push to calibrations database, and verify

AND, A WHOLE DIFFERENT ANIMAL:

LASER CALIBRATION

LASER RUN: ONLINE

- Run control starts the show again
- Software and hardware configuration
 - PMTs off
 - TPCs and SEBs configured normally
 - Laser and Laser SEBs included in run
 - Trigger set up for only the laser (IN2)
- Once everything is ready, run control gives the OK for the laser to fire
 - Laser SEB issues command to fire
 - Diode triggers readout on other crates
- All data collected on EVB
 - TPC/PMT SEB: deliver the typical information
 - Laser SEB sends its data to EVB as well
- EVB sends message saying full event recorded
 - Run control checks status of everything, then gives OK for the next trigger
- No subruns necessary here

LASER RUN: NEARLINE

- Swizzling of data, and then ship to enstore
- Analysis likely done offline?
 - I assume so because I wonder if it's simple enough to do in near-real time
- Probably some quick monitoring histograms to check things are OK

QUESTIONS?