12GeV Trigger meeting notes:

14-Mar-2014: C. Cuevas, W. Gu, B. Raydo, B. Moffit, H. Dong,E. Jastrzembski, A. Somov, Sergey

7-Mar-2014: C. Cuevas, W. Gu, B. Raydo, B. Moffit, H. Dong,E. Jastrzembski

28-Feb-2014: C. Cuevas, W. Gu, B. Raydo, B. Moffit, H. Dong, A. Somov, E. Jastrzembski

14-Feb-2014: C. Cuevas, W. Gu, B. Raydo, B. Moffit, H. Dong, A. Somov

7-Feb-2014: C. Cuevas, W. Gu, B. Raydo, B. Moffit, E. Jastrzembski, H. Dong, A. Somov, J. Wilson

---

1. *Trigger/Clock/Sync – TI/TD*

14-Mar-2014
→Continue testing more TD←→TI links in Hall D.   Tests are progressing well and initial measurements are reasonable and understood.
→Discussion on measuring the fiber length and downloading the delays to the TI. Presently the measurement resolution is 4ns.
→Discussion on LED pulser system and we need a simple block diagram to show the important interconnections from the 1495 boards to the TI-M and TS.

7-Mar-2014
→TD, and TS boards were located and installed in the TS crate in Hall D.
→Fiber patch cables have been installed and tested
→Initial testing is progressing well and so far no surprises!
→Good discussion on how to transmit signals from external pulsers on FCAL (or any other detector area) to the TS crate. Best method is to keep it simple and avoid the L1 transmission path because of serialization issues etc. Ben identified a commercial VME module solution and PR is submitted.

28-Feb-2014
-->TD-TS and Global crates have been installed in U1-14 in Hall D
→SBC are installed in these crates
→Global crate includes SSP, TI, SD, GTP and should be ready for patch cable assignments
→TDs will be located soon!
→Start with connection from TD to BCAL-South TIs
→Bryan is writing code for the TD-TI link measurements.
→TS boards will need to be gathered by Alex. (3) One of these needs to be installed in the TS-TD crate in Hall D
→Install all of the Densi-Shield cables once the TS board is installed.

14-Feb-2014
→Will move two crates from EEL109 to Hall D on Monday 17-Feb-2014
→Still need SBC and other boards, but Sergey or Alex will provide these (TID)
→TD <->TI Link Identification feature is being tested.

7-Feb-2014
> TI Masters working well for FCAL and BCAL south.
> Move trigger crates to the hall as soon as trigger racks have power.
> TD, TS and SD crate will be installed, and the boards will be provided by Alex
> Will need to configure a few more TI to work as TI_Masters.
> TD <-> TI Link Identification feature tested and complete? Work in progress,

2. SUB-SYSTEM PROCESSOR (SSP)

14-Mar-2014
→Week of 17-March we can start connecting FCAL CTP and establish fiber links to the SSP (Global crate)
→CTP←→SSP link ID has been completed but will need test time.

7-Mar-2014
-->Proposed optical to electrical VME boards have been identified and a PR has been submitted. These modules should work well for transmitting logic signals to the TS crate from remote locations using the fiber optic trunks. Will need to purchase MTP←→ST type cable assemblies, but once we know the length, we can receive these cables quickly.
→No other report regarding the SSP. Boards/crate have been ready for commissioning tests.

28-Feb-2014
→Boards are installed in the global crate and ready to run.
→Final firmware iterations will be needed to capture latest changes to the CTP changes
    -i.e. Bit definitions for external CTP front panel inputs
       Other bit fields have changes as well.
→Good discussion of method to pulse the 1495 LED board with the TS. Best method is a solution of NO firmware changes and implement with the existing boards/software.
Reference halldL1 mail regarding the 3 proposed methods.
After the meeting a solution was proposed by Ben and he located a commercial VME vendor that has optical to electrical (and electrical to optical) translators. These boards will work with our fiber optic trunk cable. At some point, we will need to purchase MTP>>ST fiber patch cord, but that is a small detail.

14-Feb-2014
➢ Ben has updated the SSP firmware with the latest features.
➢ Bryan will test the latest firmware with his library soon.
➢ Hall D SSP installed in the Global Trigger crate and will be moved on Monday 17-Feb.

7-Feb-2013
➢ SSP end is ready for testing, but CTP side is work in progress.
➢ CODA library for SSP will be tested and verified by Bryan before release.
➢ Started loan paperwork for additional SSP that will be loaned to Saclay (uMegas)

2. CUSTOMERS

14-Mar-2014
→No report

7-Mar-2014
-->Request sent to the Hall B detector groups to use Mode6 (TDC) when testing their detectors. Hopefully soon we will receive results. I talked to Dan Carmen briefly and he said that at least one sector of the FTOF should be ready soon for a few days of cosmic data.

28-Feb-2014
→CTP BCAL cosmic ray trigger function has been completed.
→FADC250 firmware change for pedestal subtraction (trigger path) is progressing. Hai has distributed a document. This change is a 'global' change to all Hall D FADC250 boards.
→Mode 6 feedback? Chris requested that the Hall B detector groups operate their detectors with the Mode 6(High resolution TDC) feature. Sergey's immediate feedback is that they will

Cuevas   14-March-2014

implement as detectors are connected to the DAQ system. HPS boards/crates can be tested soon also.

14-Feb-2014
- ➢ No feedback from Users regarding the latest release of the FADC250 firmware.
- ➢ Firmware development priorities on track.
- ➢ Details of BCAL cosmic ray trigger functions released and explained by Alex. Firmware changes will affect FADC250 and CTP. New features will allow control of each channel that is summed to the CTP from each board.

7-Feb-2013
- ➢ Mode 6 is RELEASED! Hai and Ed have made it bullet proof!
- ➢ Firmware Priorities:

    CTPV2 testing - Complete (30 of 33 boards passed)
    Mode 6 repair - Complete
    BCAL cosmics
      - Changes to the CTP for 'hit bits'
      - These bits are already defined for the SSP
      - BCAL/FCAL (FADC250 changes to trigger output data)
  Tagger Hit bit application
  TOF application
  Pair Spectrometer
  CTPV2->SSP ID

3. *"B" Switch - Signal Distribution Module (SD)*
14-Mar-2014
-->No issues with SD board have been reported.
➔Spare SD boards for the Physics pool is a quantity of at least 4 boards

7-Mar-2014
➔Need to create a list of additional modules to purchase for a spare 'pool'. We(Physics) have a substantial number of FADC250 boards and will need to have enough peripheral boards on hand to support small test stations and low channel count experiments that are planned for the near future.

28-Feb-2014
- • A few requests for additional SD boards for Hall D. (Spares) I think that before the end of FY14, we will be purchasing additional SD. Good time for the other halls to verify their needs too.

7-Feb-2014
- ➢ Not a high priority but Ed has compiled Nick's project, so testing will progress as time permits.

4. **System Diagrams/Fiber Optics**

7-Mar-2014
➔Armen has been keeping the Hall D fiber drawings up to date and the drawings reflect the existing installation of all the trunk lines and patch panels in Hall D to date. Sergey B. has requested that we begin the planning for the fiber trunk lines in Hall B. We have preliminary drawings that need to be updated, so we should plan a meeting to discuss the details.

28-Feb-2014
➔All trunk lines installed and tested with the Fluke power meter. OK

→Fiber patch cables due TODAY!!
→Begin connection and testing with BCAL South crates

14-Feb-2014
- FCAL fiber has been installed and connected to FO patch panel ports
- Short (1m) cables have been ordered. Procurement slows the process but these will be here soon enough
- Fiber spool for Tagger building (380ft) will be here soon. Not a priority to install yet.
- UPDATE drawings!

7-Feb-2014
- 3 more spools delivered for FCAL run. Tagger spool is on the way. Install week of 10-Feb.
- Order short patch cords. Plenty of 2m cables for crates to patch panel connections.

5. Global Trigger & Trigger Distribution Testing

14-Mar-2014
→Start with the FCAL crates next week. Start with a goal of using "Playback" to deterministically set a global L1 trigger and analyze data alignment from each CTP. Consider rate testing as well.
→Cosmic testing will be next.

7_Mar-2014
→Initial TD←→TI testing looks very good and BCAL south and FCAL north appear to be in working order and there were only a few issues. Not sure what else needs to be added to CODA3 to support the CTP←→SSP testing that we can begin the week of 17-March.

28-Feb-2014
→CODA3 library is progressing but not critical at the moment
→Will need this as soon as the CTP to SSP testing begins.

14-Feb-2014
- No update, but Ben mentions that the new document is released.
- CODA3 Library driver status? (I do not have any notes)

7-Feb-2014
- Version 1.0 has been released for the GTP firmware. Document is updated and includes all the latest register definitions as well as a new section that describes the embedded Linux addition.
- CODA3 Library driver development will begin.

20-JAN-2012 (Keep this date to reference full DAq crate procedure)
3-June-2011
→*Successful testing with the two crates each with a single FADC250-V2, CTP, TI, SD and one SSP!!*
16-July-2010 (Keep this note because it needs to be implemented and tested at some point) See older note dates for the list of items.

Cuevas   14-March-2014

6.   Crate Trigger Processor (CTP)

14-Mar-2014
→Final bids have not been received yet. There were a few vendors that needed extra time and we explained that brokers are acceptable as long as certification forms exist for brokered parts.
→Hai is working on the FCAL and BCAL applications for the CTP firmware.

7-Mar-2014
→Bids received and the total for 4 boards is higher than what was expected. NRE and other charges were inflated somewhat and I think the manufactures added some margin for this job.

28-Feb-2014
-->No bids received yet for the additional CTP
→Hai has completed the cosmic ray firmware changes for Hall D
→Thermal testing in the EEL109 can be started using the FCAT crate.
→MTEQ received 3 dead boards. Memorial services at noon,

14-Feb-2014
- ➢ New PR approved for 4 more CTPV2 boards. See below:
  - Hall A – 1
  - Hall C – 2
  - Hall D – 1
- ➢ 3 boards that never passed acceptance testing will be returned to MTEQ
- ➢ Verify BOM and fabrication files for new order.

7-Feb-2014
- ➢ Contract has been cancelled and new PR issued for replacement of 3 boards
- ➢ Discussion with procurement and 12GeV PM to find funds for an additional 2.
- ➢ See 'Customer' section for activity priorities for CTPV2 firmware.

ACTION ITEMS: **Next meeting -Friday 21-March-2014@10:30AM in TBD**