



XFT

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- Contribution to the Cosmic Ray Run:
 - Any contribution to the cosmic ray run depends on the schedule of the COT.
 - Limited track finding efficiency due to large “impact parameter” and out of time tracks...however, we can find tracks!
 - If a cosmic ray run with the COT does occur, we have the necessary FPGA designs to run the XFT.
 - Contribution to the Commissioning Run:
 - Provide tracks for use in the Level 1 decision.
 - This is opportunity to find “major” problems and fix them.
 - Design relies on FPGAs so we have some flexibility.



Goals for Commissioning Run

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May 15
Page 2

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- Pass data from COT through XTC to Finder to Linker to XTRP.
 - Determine t_0 for XTC cards.
 - Find Track Segments
 - Link Track Segments into tracks.
 - Time-in XFT with rest of the trigger system
 - Compare the performance of the XFT with simulation expectations. (Using XFFD and XFLD Banks)
 - Bit-wise Comparison -- tests functionality of the XFT and accuracy of the simulation.
 - Performance measurements
 - Hit efficiency for COT
 - Mask finding efficiency
 - Track efficiency
 - Pt Resolution and Phi Resolution



Current Status

- XTC: (168 Cards +spares)
 - XX Installed in COT crates.
 - Balance waiting for installation on TDCs.
- Ansley Cables, COT/TDC Transition cards, Finder Transition cards, XFT-XTRP Cables installed and tested.
- Finder Boards: (48 + spares)
 - All cards checked out and installed.
- Linker Boards: (24 + spares)
 - All cards checked out and installed.
- Linker Output Modules: (24 required)
 - 7 Preproduction cards in hand and tested
 - 2 Production boards tested at OSU and are now at B0.
 - Balance of Production order out for fabrication May 26th (at B0 by 8/1)



Readiness for Commissioning Run

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Page 4

- *All comp. of the XFT will be ready for the commissioning run.*
 - # XTC cards installed will depend on the availability of TDC cards.
 - Finder backplanes are being refabricated to correct a flaw in the hole diameter for the press fit J3 connectors.
 - Expect new backplanes installed by early July.
 - Linker Output Modules (24 required)
 - Expect full order back from PC board fabrication June 15
 - Populate and test 1-2 boards a day.
 - Install at B0 in batches...completed 8/1
 - Could use 7 preproduction cards if necessary.
- The TDCs will be installed more or less in ϕ wedges.
 - We will run whatever fraction of the XFT that has been instrumented XTC/TDC.
 - Require all four axial layers of COT.



Dependencies

- For the purpose of testing the XFT the obvious dependencies:
 - Functionality of the COT
 - Availability of TDCs
- The XFT has a L1 pipeline and L2 buffers that can be readout to check the performance of the XFT.
 - We can check that the XFT is working.
 - Requires that Trigger Supervisor (TS) and DAQ system is working.
 - Substantial testing with TS has already occurred.
 - If the XFFD and XFLD banks cannot be readout we could still do some testing with out production checkout board (LinkerTester).
- Passing tracks to the remainder of the trigger system depends on the availability of XTRP components.



Tools

- Bitwise Simulation of XFT (XFTSim)
 - Version is available in offline.
 - Used for integration/commissioning (no-beam).
 - Is good enough now...should be better by late summer.
- Readout of XFFD and XFLD
 - some DAQ software work is required
 - This has started and will continue in June/July
- Event Display (Need to talk to Experts)
 - Would like to get XFT Information displayed
 - XTC hits
 - Finder Segments/Pixels
 - Linker Tracks
 - Unpack XFFD and XFLD banks.



Tools

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- If we get to the goal of measuring efficiencies and resolutions, we need offline tracking.



Tasks between Now and August 1

● May

- Sending Simulated data between Finder and Linker
 - Test run using TS
 - Done with one linker and several finders
 - Full crate of Finders to full crate of Linkers by May 31
- Sending Patterns from XTC to Finder Board
 - Done with 1 COT crate.
 - Multirate testing by May 26 (Test with TS)
 - Send simulated events to Finder and reconstruct segments by May 31.
- Test Production Linker Output Module (LOM) with XTRP prototype.
 - Finished May 22nd
- Release order for remainder of LOMs (May 26th)
- Order new Finder Backplanes (This week)
- XFTSim made part of official MDC2 release.



Tasks

● June:

➤ XTC to Finder to Linker Tests

- Pass simulated track data loaded at XTC through to the Linker
- Start with 4 Finders and 1 Linker
- Work up to maximum number of Linkers given availability of XTC cards
- by June 15th

➤ Start loading and testing of LOM (June 15th)

➤ Linker to XTRP Production data board Tests

- Sending Track data/Patterns
- Completed for prototype XTRP data board.

➤ Readout of XFFD and XFLD banks by Run Control

- Completed?

➤ XTC to Finder to Linker to XTRP

- Passing track data (Late June)



Tasks

- July
 - Install New Finder backplanes (Could be in June)
 - Installation of LOMs as they become available. Completed by 8/1
 - XTC to Finder to Linker to XTRP to Muon/L1 Cal.
 - Pass simulated track data
 - Finalize integration with RunControl
 - Initial Calibration of XTC t0 with COT Calibration card.
- Basic Approach: Get each connection between subsystem working, then string the subsystems together.
- More and more of the system will be implemented in these tests as TDCs become available.