



Detector Support Group

Weekly Report, 2016-08-31

Summary of Ongoing Projects

Hall B

Magnet

- Regarding communication:
 - ★ Configuration of:
 - PLC ↔ Hall B network.
 - PLC ↔ cRIOs in solenoid control systems.
 - ★ Modification of routines for:
 - Solenoid PLC ↔ distribution box PLC ↔ Torus PLC.
 - ★ Testing of PLC ↔ MPS
 - Using Torus PLC + Torus MPS (previous testing done with Torus PLC + Solenoid MPS). <https://logbooks.jlab.org/entry/3419284>
- Analysis of spreadsheets and drawings of solenoid control system.

Gas System

- Receiving for the RICH detector components for air cooling and N₂ system.

DC

- Added automatic controls for gas flow during operations.

DC Test Station

- Need TOSP from Mac Mestayer

SVT

- De-cabled and transported detector back to EEL

HTCC

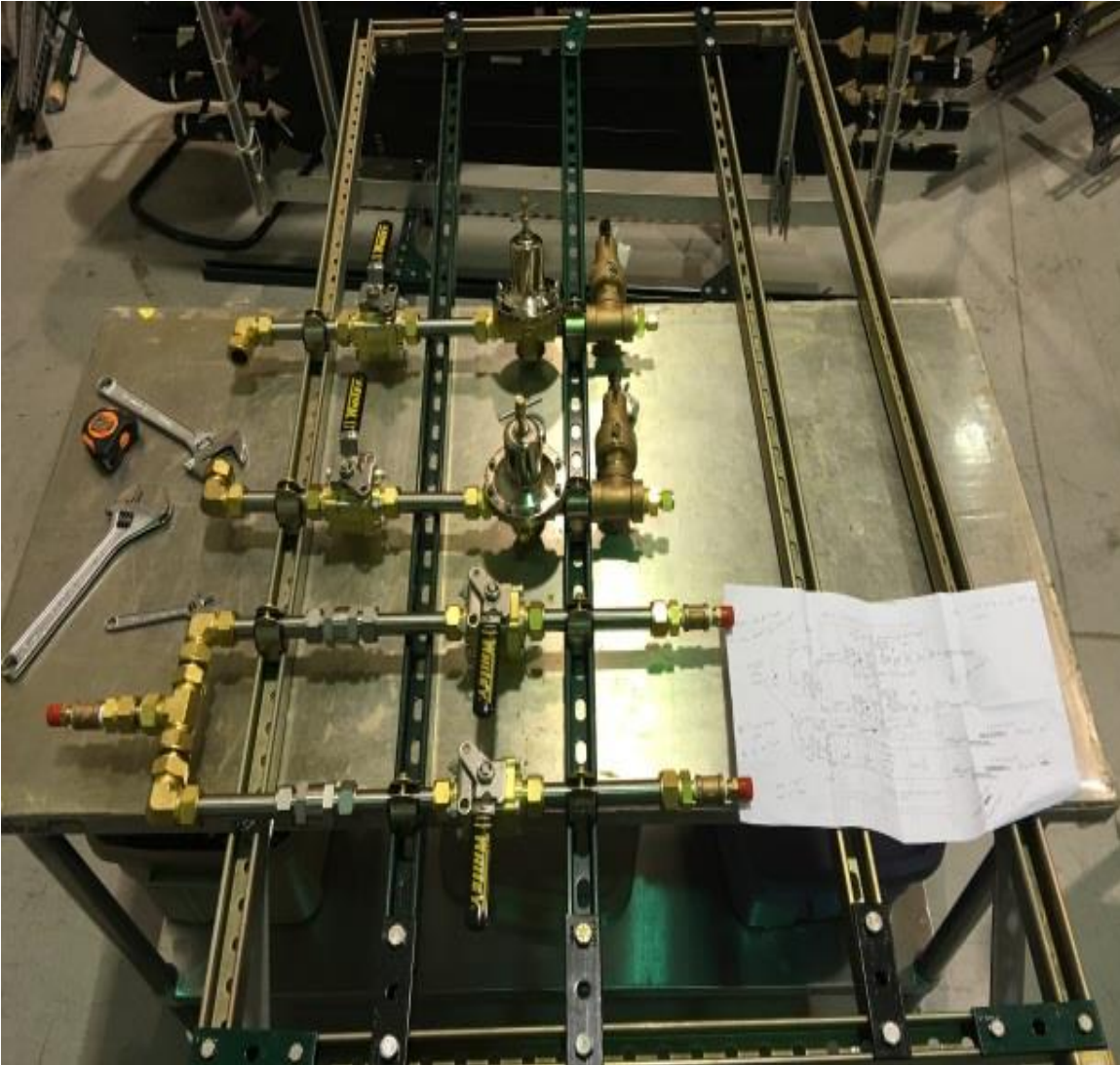
- Code changed to allow flow controller to be closed or open after start up
- Controls tab GUI implemented.

RICH

- Fabricating valve panel.

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Weekly Report, 2016-08-31



Partially assembled valve panel

- Spot test performed on mirrors 1 and 2.
- Python program developed to find radius of curvature of individual mirror sides.
- For a test of the new instrumentation and for standardization reasons between hardware interlock systems, tSVT program loaded on the RICH cRIO processor.

HDIce

- CAENels responded regarding request for modification to CT-Box firmware to allow triggering (using oscilloscope mode).
- **Waiting on OSP to work in lab.**



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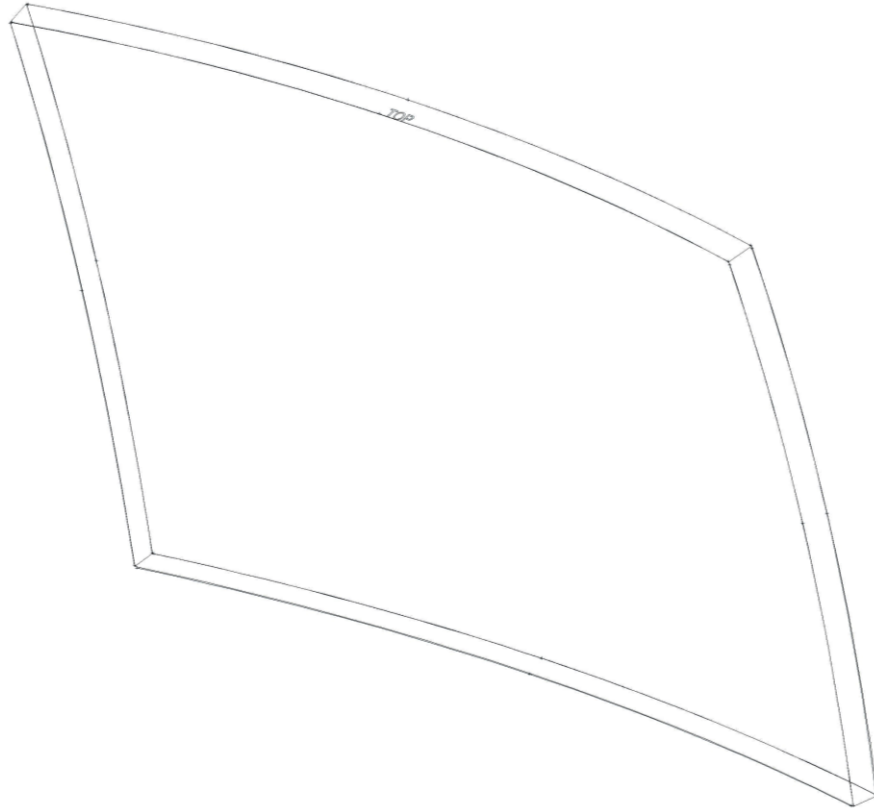
Weekly Report, 2016-08-31

Antonioli, Mary Ann

- Worked on LabVIEW code for full test of HDice RF Attenuation/Switching Unit.

RICH

- Using NX9, drew arcs using CMM points and measured lengths.



Arcs drawn using NX9 of CMM points along edges of mirror 5.

- Observed spot tests of two mirrors.

Arslan, Sahin

- Started assembling RICH cooling circuit valve panel.

SVT

- De-cabled and disassembled SVT in hall, with Mindy.
- Helped with transportation.
- DSG waiting for Mac to submit safety documents for wire test chamber.

Bonneau, Peter

- Added channel to Forward Tagger Hardware Interlock System design to monitor Hodoscope box lid switch; if box is opened, HV will be ramped down.

Magnet Systems

- Identified issues, with Pablo, to be resolved regarding solenoid instrumentation and PLC programming. Problems include:



Detector Support Group

Weekly Report, 2016-08-31

- * PLC- Point I/O is not defined in solenoid drawings or signal spreadsheets.
- * IP addresses for Ethernet interfaces not defined.
- * Signal for SV8622 listed inconsistently in documentation.
- Monitored Torus cool-down progress.
 - * Cool-down halted due to unexpected forces on supports.

RICH

- Loaded onto cRIO processor SVT interlocks program, to test new instrumentation and to standardize hardware interlock systems,.
 - * With one exception, interlock program ran as expected.
 - Real-Time target CPU load value was not available while running local UI. This is a known bug in LabVIEW.

HDice

- Received response from CAENels regarding request for modification to CT-Box firmware to allow triggering (using oscilloscope mode).
 - * CAENels will perform feasibility study of trigger modification in October.
- Worked with Mary Ann to debug front panel display of RF Attenuation / Switching Unit.
- * **Waiting for OSP to install and debug NMR instrumentation in HDice lab.**
- Updated DSG control room laptop computer to Mathematica version 11.

Campero, Pablo

Magnet

- Worked on communication between PLC and Hall B network.
 - * Assigned new IP address for 1756-EN2T1 (local chassis) and 1756-EN2T2 (remote chassis) Ethernet modules to set up communication with PLC, and to read and write.
 - * Set up configurations for each module in local and remote chassis, modifying PLC program.
- Set up PLC and cRIO communications in solenoid control systems.
 - * Configured communication of Ethernet generic modules on PLC program to set up communication with cRIO fast DAQ and LV systems.
 - * Researched IP address for each cRIO system located in TED building.
- Began to modify PLC_Cooms program and routines to set up communication of PLC with distribution box (D_BOX) and Torus PLCs.
- Analyzed with Peter spreadsheets and drawings of solenoid control system.
 - * Noted that a SV_8622_OPEN input signal appears in two drawings.
 - * Informed magnet staff.
- Monitored EPICs screen of Cryo Distribution Systems (LN₂ and LHE) on a daily basis.
 - * There was a second stop in cool down this week.
 - Issues with strain gage values from Torus.
- Updated and labeled DSG photos folders with new photos of solenoid and Torus Control Systems in Hall B Magnet.



Detector Support Group

Weekly Report, 2016-08-31

Eng, Brian

SVT

- Connected TIs via fiber so cosmics could be taken over weekend during noise test.
- After SVT returned to EEL/124, de-cabled R4 on HFCB end in preparation of module replacement.
- For Hall B Gas System, filed support ticket with NI regarding issues with real-time applications deployed on cRIO; some shared variables don't work on apps but are fine when VI is run manually.

Magnets

- Tested PLC to MPS communication using Torus PLC + Torus MPS (previous testing was done with Torus PLC + Solenoid MPS). <https://logbooks.jlab.org/entry/3419284>. Ruben wants to have meeting to discuss results.

Hoebel, Amanda

RICH

- Troubleshooting Python mirror radius program to correct errors.
 - * Two sides were off by ~1000[mm].
- Wrote program in Mathematica to find radius of curvature for multiple points.

Jacobs, George

- Hall B Detector Gas Utilities presentation completed.

RICH

- Receiving components for air cooling and N₂ system.
- Air cooling valve panel assembly in progress.
- N₂ purge valve panel assembly in progress.

Leffel, Mindy

- Worked with Sahin replacing two drift chamber gas cylinders in clean room.
- Cabled and de-cabled SVT with Sahin.
 - * Finished connecting HTSB cables to patch panel.
 - * Removed, organized, and re-bundled patch panel cables.
 - * Cables that had been installed and removed improperly required extensive untangling.

RICH

- Continued work on interlock chassis.
 - * Cut and attached all three DIN rails.
 - * Cut slot for power connector.
 - * Started cutting, terminating, and attaching hook-up wires.



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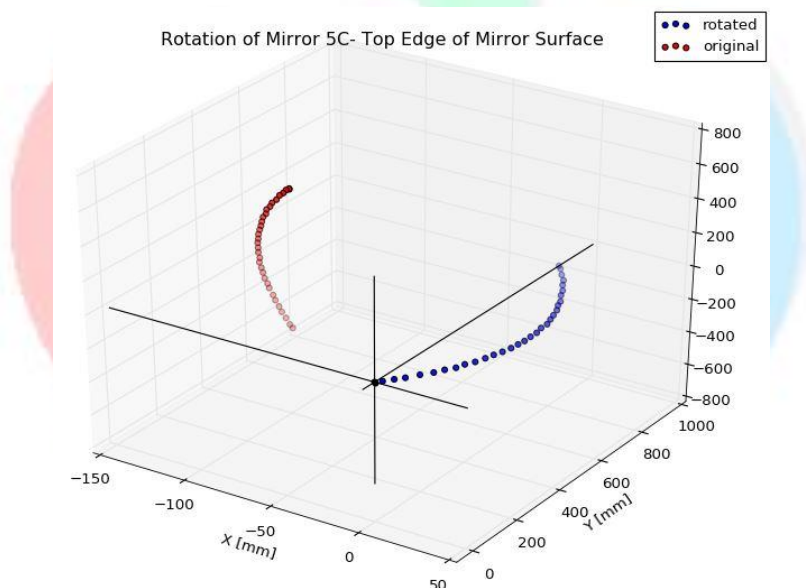
Weekly Report, 2016-08-31

- Terminated and tested one 37-contact D-sub cable for National Instruments cRIO test station.

Lemon, Tyler

RICH

- Performed spot test with Mary Ann on mirrors 1 and 2.
 - ★ Spot test approximates mirror radius of curvature by finding at what distance from the mirror (z) the smallest observed diameter (d_0) of the reflected light is observed.
 - ★ Mirror 1: $d_0 = 1.549$ mm, $z = 2700$ mm
 - ★ Mirror 2: $d_0 = 1.370$ mm, $z = 2700$ mm
- Wrote Python program to find radius of curvature of individual mirror sides.
 - ★ CMM data points projected to plane generated from ideal corner points for side and then rotated and translated to lie in xy -plane.
 - ★ Rotated points used to calculate radius of curvature of side.



Python plot of original CMM points in red and rotated and translated points in blue with x , y , and z -axes in black.

McMullen, Marc

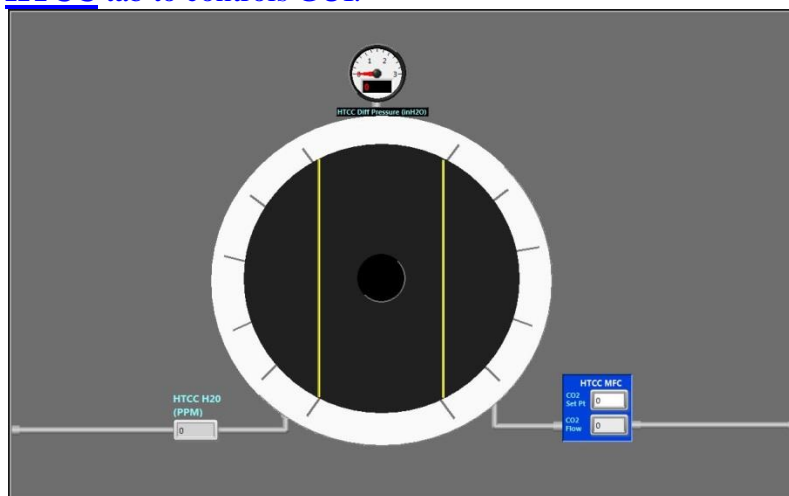
Gas System

- Added automatic controls for DC gas flow during operations. Region flow controller values will provide flow parameters for gas mixing flow controllers. When region flow is changed, mix flow will proportionally increase, keeping a steady pressure in the mixing buffers.
- Changed HTCC code to allow flow controller to be closed or open after start up, preventing HTCC group from having to shut down system during leak checking.

Detector Support Group

Weekly Report, 2016-08-31

- Added **HTCC** tab to controls GUI.



HTCC display in Hall B Gas Controls Software.

- Reviewed **MVT** OSP, and inspected detector for safe operations.
 - * LV supply is class 2 (2 – 7 V, 55 – 100 As).
 - * Protective cover not installed on leads.
 - * Proper signage not present.
 - * LV connections at detector end exposed.
 - * OSP signature will be on hold until safety covers are added to LV supply.

DSG/Safety

- Completed quarterly **safety** walkthrough with Safety Warden Manager.
 - * Addressed findings with CTOF power cable and isolation transformer.
 - * Hall C machine shop machinery OSP updates need posting.
- Met with DSO concerning MVT OSP.
 - * DSO concurs with findings concerning protective covers, proper signage, and isolating exposed leads. DSO has notified Hall B leader.
- Continued work on Hall B gas system software **talk**.