Detector Support Group

Weekly Report, 2016-08-24

Ongoing Projects

Hall B

Magnet

- Pablo Campero is working on PLC ↔cRIO communication.
  - ✶ Test to be performed by 8/31/2016.
- Brian Eng has been requested to perform PLC ↔ Torus power supply test.
  - ✶ Krister Bruhwel needs to complete wiring.

Gas System

- Gas storage tanks pressure washed?
- Volker Burkert informed that DC pumps (5 in all) are to be procured in October, 2016
- ASME relief valve approval needed
  - ✶ E-mail sent to Saptarshi Mandal.
- SVT mass flow controller installed and tested with software.

DC Test Station

- Need TOSP from Mac Mestayer

SVT

- Cabled and powered up.

Mindy Leffel and Sahin Arslan cabeling up the SVT

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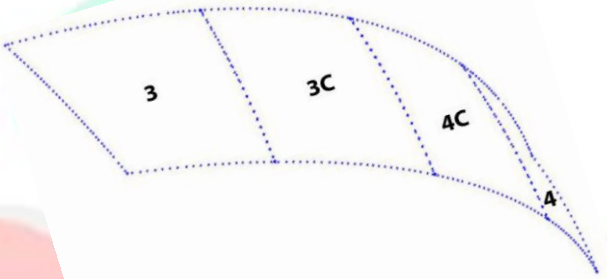
- Space and location issue in EEL regarding move of SVT back there.
- Initial gain scans look good.
  - ✶ Nothing broken in the move.

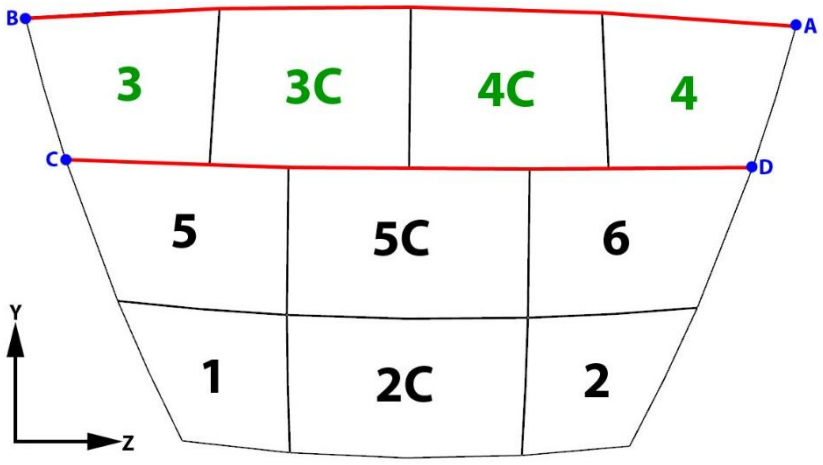
RICH

- Mirrors 1 and 2 received.
- Top row linear measurements done by Mary Ann in 3d-AutoCAD.
- CMM data points for the top row of mirrors shown below.



	Ideal		CMM		CMM - Ideal	
	Top (AB)	Bottom (CD)	Top (AB)	Bottom (CD)	Top (AB)	Bottom (CD)
distance [mm]	2687.066	2396.173	2686.620	2396.480	-0.447	0.306
Δx [mm]	0.0003	-0.0003	-0.2200	0.3200		
Δy [mm]	-0.0004	0.0003	-0.0900	-1.0400		
Δz [mm]	-2687.067	2396.173	-2686.620	-2396.480		

Small Δx show that the corners of the top row (shown in blue on diagram) are coplanar.



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- Tyler developed Python script to calculate distance between **RICH** Mirror CMM measurements and ideal model.
  - ✶ Determined at 95% confidence level deviation of sides from ideal model.
  - ✶ Results in table below with z-scores meeting 95% confidence level highlighted.

Mirror 3 Distance from CMM Points to Ideal Plane

	Mirror				Back			
	Top	Bottom	Left	Right	Top	Bottom	Left	Right
Average	0.5064	-0.24655	-0.29023	0.407669	0.395711	-0.17778	1.315425	0.140439
Std Dev	0.214	0.135415	0.340361	0.154662	0.19187	0.167447	0.147675	0.15844
z-score	2.3663	-1.82073	-0.85271	2.63587	2.062386	-1.06173	8.907579	0.886385

Mirror 4 Distance from CMM Points to Ideal Plane

	Mirror				Back			
	Top	Bottom	Left	Right	Top	Bottom	Left	Right
Average	0.4826	0.208645	-0.36306	-0.29955	0.2723	0.175407	-0.20676	0.837024
Std Dev	0.1221	0.204034	0.115459	0.193764	0.194382	0.102938	0.143746	0.21376
z-score	3.9508	1.022595	-3.14447	-1.54598	1.400854	1.704009	-1.4384	3.915724

- Gas system hardware arriving.
  - ✶ Compressor and tank pallet scheduled to arrive on 9/14/16.

Forward Tagger

- Marco Battaglieri informs all interlock components will be procured in Italy.

HDIce

- CAENels contacted regarding triggering CT box in oscilloscope mode.
- Review on 09/08/2016 @ 11:00 hrs in Dsg contrl room.
- Waiting on OSP to work in lab.

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Antonioli, Mary Ann

- Continued debugging **HDice** subVI to send information to LCD screen on RF Attenuation/Switching Unit.
- Made various AutoCAD drawings of **RICH** mirrors to aid in analysis.

Arslan, Sahin

- Preparing, fitting, and cutting tubing for **RICH** air tank.

SVT

- Worked with Mindy hooking up HTSBs to patch panel.
- Installed purge line, regulator, and MFC.

DC

- Making preparations to work on DC test chamber and waiting on Mac Mestayer to complete TOSP.
- Located four HP LV power supplies and delivered to Fast Electronics.

Bonneau, Peter

Magnet Systems

- Identified, with Pablo, issues regarding Solenoid instrumentation and PLC programming.
    - ✶ Modules installed and cabled in PLC chassis but not defined in PLC program.
    - ✶ Hall sensor current source not implemented in Local PLC – 0 I/O definitions.
    - ✶ Incorrect signal assignments in slot 7 of Remote PLC – 1.
    - ✶ Valve SV8622-Open is not defined in slot 0 of Remote PLC – 1
- Downloaded LV and Fast Daq cRIO/LabVIEW code to DSG local computer.
- Monitored Torus cool-down in progress.

Forward Tagger

- Updated Hardware Interlock System design documentation.
    - ✶ Calorimeter gas flow will be monitored via direct voltage or current interface rather than Ethernet connection.
- Email from Marco Battaglieri states: “We now have all the necessary information to proceed (in September) with the modules purchase (in Italy).”
- Details of design report will be discussed in next FT meeting.

RICH

- Loaded the real-time operating system, LabVIEW base, and drivers were on cRIO controller chassis.
- Requested and received Hall B IP address
    - ✶ Programmed and tested it on controller.

HDice

- Requested from CAENels a modification to CT-BOX firmware to allow triggering (using oscilloscope mode) with lock-in amplifier during NMR scan.
- No information from HDice on OSP DSG
    - ✶ Work in HDice lab can only begin after receiving OSP

- Completed configuration of second HDice computer in preparation for installation of instrumentation rack in HDice lab.

SVT

- Updated software on Hardware Interlock System's cRIO controller due to change of IP address in Hall B for SVT noise test.

- Uploaded HDice, RICH, and Forward Tagger talks to **DSG** website.
  - ✶ Changed web page html files to reflect updates.

Campero, Pablo

Magnet

- Worked on PID program for Solenoid Control Systems.
  - ✶ Researched P&ID diagrams and information related to solenoid.
  - ✶ Made list with instrumentation controlled by PLC Solenoid.
  - ✶ Understood sequence and logic in Torus PLC system to base new PLC Solenoid code.
  - ✶ Set up main functions for each electro valve, pneumatic valve, and heater in cryo process in Solenoid.
  - ✶ Began to write PLC code on PID_Setup routine to EV.
- Worked on setting up PLC and cRIO test communication.
  - ✶ Made diagram between PLC, cRIO Fast-Daq, cRIO LV, and Epics.
  - ✶ Took tag names from master list instrumentation solenoid to set up size and number of variables sent by LV_Crio to PLC Solenoid.
  - ✶ Generated Status_Error and Error_Fill routines to check errors during communication test.
  - ✶ Wrote PLC code in RSLOGIX-5K V.27 to read variables (temperature, magnetic field, load cell, strain gauges) sent by LV_cRIO system.
- Monitored EPICs screen for Cryo Distribution Systems (LN_2 and LHE) on a daily basis.
- Analyzed spreadsheets, drawings, and PLC program configuration of the Solenoid control system with Peter.
  - ✶ Found discrepancies and errors in local and remote PLC solenoid chassis.

- Updated and labeled photos folders with new photos of Cryo systems in Hall B Magnet.

Eng, Brian

- Reviewed **Torus** Power-up Procedure from Ruben.

SVT

- Cabled SVT to crates.
- Modified elog gain scan scripts for current placement of VSCMs in VXS crates.
- Troubleshooting issues on first power up. R4S14 LV cable needed to be reseated, R2S3 LV top analog needed to be resoldered, R4S4 SC cable didn't have ground wire installed.
- Ran register test and in process of doing elog gain scans on all modules.

- Power was cycled on **Magnet** PXI, which was constantly rebooting itself. Manually ran VI and is running normally. Will need to debug rebooting further during next downtime.

Hoebel, Amanda

RICH

- Wrote program in Python to find radius of mirror sides for mirrors 2c, 3, 3c, 4, and 4c.
  - ✶ Most sides close to correct radius of 2700 [mm] with error ± 50[mm].
  - ✶ Two sides off by ~1000[mm].
- Wrote program in Python to calculate arc length of mirror sides for mirrors 2c, 3, 3c, 4, 4c, and 5c.
  - ✶ Created spreadsheet in Excel with arc length measurements for Mary Ann.

Jacobs, George

- Placed PR for Hall B LN_2 contract funding.
- Completed Hall B Detector Gas Utilities PP draft.
- Pre job planning and safety walk through for NEW location of **SVT** N_2 purge MFC.

RICH

- Receiving components for air cooling and N_2 system.
- PR is in for steel pallet to mount air tank on, but missing signatures from SME group.
- Placed PR for gas system components.
- Assembly in progress for
  - ✶ Air cooling valve panel.
  - ✶ N_2 purge valve panel.

Leffel, Mindy

- Wired D-sub connectors and slow controls cables to **SVT** patch panel.
- Working with Sahin, wired the HTSBs to the patch panel.
- Attached backshells to four 25-contact and two-37 contact D-sub cables for National Instruments cRIO test station.

Lemon, Tyler

- Analyzed results from Python script that calculates distance between **RICH** Mirror CMM measurements and ideal model.
  - ✶ Determined at a 95% confidence level which sides deviate from ideal model.
  - ✶ Results in table below with z-scores meeting 95% confidence level highlighted.

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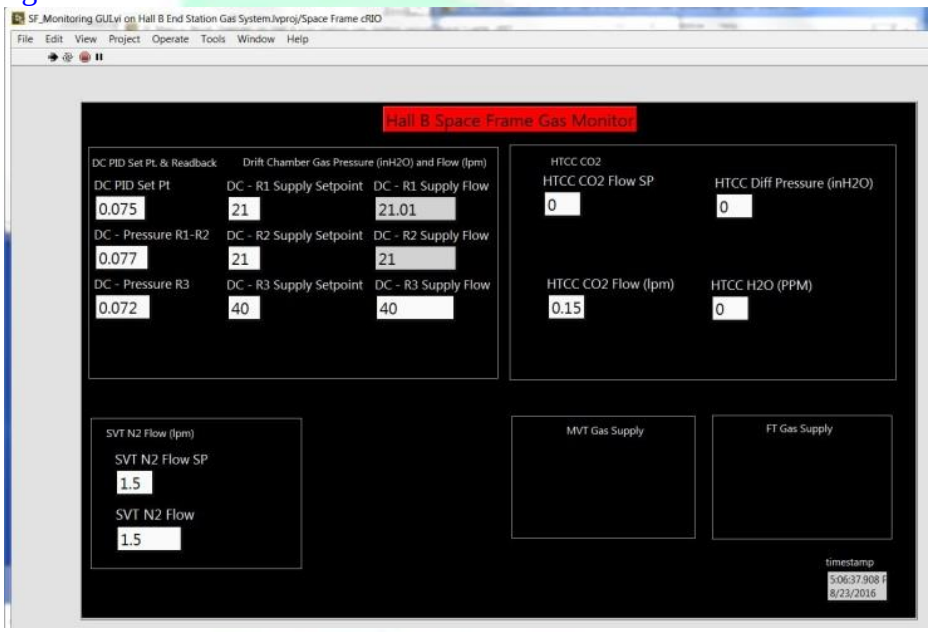
z-score	3.9508	1.022595	-3.14447	-1.54598	1.400854	1.704009	-1.4384	3.915724

McMullen, Marc

- Added monitoring GUI for space frame **DC** cRIO, which will allow user to observe important gas values in hall.



HTCC

- Worked with Sahin Arslan on installing mass flow controller.
- Added mass flow controller display to controls GUI.

SVT

- Worked with Brian Eng, Sahin Arslan, and Mindy Leffel on wiring HTSBs to patch panel.
- Worked with Brian Eng on debugging cabling issues.
  - ✶ R2S3 LV cable Top Analog was resoldered.
- Completed N_2 purge test of gas controls on the detector in the hall.