

# Online Update

Elliott Wolin

JLab

4-Oct-2013

# Outline

- Online Data Challenges
- Networking
- DAQ
- JInventory System
- Farm Manager
- Counting House, Computers, Databases
- System Software
- Computer System Monitoring
- Controls
- ELog
- UPS Power
- Summary

# Maroon Bells





**INDEPENDENCE PASS**

ELEVATION 12,095 FEET

**CONTINENTAL DIVIDE**



# Networking

- Trigger fiber installation separate contract (Chris C)
- Installing final networking
  - Tagger almost done
  - Mark and I optimizing fiber/switch distribution in the hall
  - No sooner than many weeks from now
- Interim networking installed
  - Low bandwidth
  - Run copper cables to interim switch as needed
  - Adequate for near-term needs

**North Wall**

PANEL 212-01-100  
SIA, 8/27/77 - 2 PRINC. 1F  
FED. FIRE DEPT.  
INSTALLED 2/70

TEMPORARY  
INSTALLATION

TEMPORARY  
INSTALLATION



# FCAL Switch





# DAQ (from Dave A)

- DAQ test stand down to 8 crates incl. TS, no GTP/SSP crate
- Summer testing led to important improvements in robustness, error handling and debug-ability
  - Many firmware and driver updates
- Many improvements in auxiliary programs
  - Gui's, editors, diagnostic programs, etc.
- CODA3 version ready for release
  - Supports multiple users
  - Implemented new byte-swapping policy
- 17 Gen 3 Core I7 ROCS just arrived
  - Need to order ~40 more, 10-12 week lead time
  - Ready to order if money available

# DAQ, con't

- To do:
  - More high-speed testing w/two-stage event building
  - More integration with Global Trigger Crate and driver development
  - Continue debugging
  - Eventually move operations out of Counting House into Hall

# JInventory System

- Serguei Pozdniakov (contract) working diligently on this
  - Moving on to other stuff soon
- Database fully implemented, ready for production use
  - ~1000 items entered
  - backed-up regularly by Computer Center
- Item custodians get email if location or condition changes
- Still to do:
  - Complete entering electronics and control items
  - Complete barcode labeling
  - Implement power hierarchy information
  - Add electronics maintenance component
    - For Fernando et al.
  - Add more consistency checking
  - Implement handheld scanner API

**JInventory database in use by CUE user 'wolin' with 'read/write/delete' access**

New item List items People Companies Brands Advanced Search... Delisa's Database Paginate One Page

Item ID:

Housing Parent | Ancestor:

Property Tag:

Short name and description:

Brand-Format-Model:  [Reset >>](#) [Search >>](#)

1 2 3 4 5 6 Next >> [92] Total Items meet Search Criteria = 911

Check	Property Tag (Serial number)	ID	Short name	Description	Housing	Custodian	Insert Date	Action
<input type="checkbox"/>	<b>D1001134 (3J92C)</b>	911	<b>Point I/O Circuit Breaker</b>	Allen-Bradley 1489-A 1-Pole AC Miniature	Hall D (1) N1 (158) N1-6 (296) DIN Rail "AENT7" (906) Point I/O Ethernet/IP Adapter "AENT7" (907)	David Butler	2013-09-24 13:38:00	
<input type="checkbox"/>	<b>D1001133 (8922830)</b>	910	<b>Point I/O Power Supply</b>	Allen-Bradley 1606-XLP Output: 24-28 VDC / 2.1A 50W	Hall D (1) N1 (158) N1-6 (296) DIN Rail "AENT7" (906) Point I/O Ethernet/IP Adapter "AENT7" (907)	David Butler	2013-09-24 13:36:54	
<input type="checkbox"/>	<b>D1001137 (28093670)</b>	909	<b>Point I/O Analog Voltage Input Module</b>	Allen-Bradley 1734-IE2V 2 ch. 15 bits plus sign across -10...10V	Hall D (1) N1 (158) N1-6 (296) DIN Rail "AENT7" (906) Point I/O Ethernet/IP Adapter "AENT7" (907)	David Butler	2013-09-24 13:35:48	
<input type="checkbox"/>	<b>D1001136 (28093630)</b>	908	<b>Point I/O Analog Voltage Input Module</b>	Allen-Bradley 1734-IE2V 2 ch. 15 bits plus sign across -10...10V	Hall D (1) N1 (158) N1-6 (296) DIN Rail "AENT7" (906) Point I/O Ethernet/IP Adapter "AENT7" (907)	David Butler	2013-09-24 13:35:17	
<input type="checkbox"/>	<b>D1001135 (SS1FJ8DQ)</b>	907	<b>Point I/O Ethernet/IP Adapter "AENT7"</b>	Allen-Bradley 1734-AENT	Hall D (1) N1 (158) N1-6 (296) DIN Rail "AENT7" (906)	David Butler	2013-09-24 13:34:16	
<input type="checkbox"/>	<b>D1001141</b>	906	<b>DIN Rail "AENT7"</b>	Support for Barrel Calorimeter Downstream North Point I/O	Hall D (1) N1 (158) N1-6 (296)	David Butler	2013-09-24 13:29:58	
<input type="checkbox"/>	<b>D1001129 (3B32C)</b>	905	<b>Point I/O Circuit Breaker</b>	Allen-Bradley 1489-A 1-Pole AC Miniature	Hall D (1) S1 (309) S1-1 (310) DIN Rail "AENT6" (900) Point I/O Ethernet/IP Adapter "AENT6" (901)	David Butler	2013-09-24 13:26:59	
<input type="checkbox"/>	<b>D1001128 (8922770)</b>	904	<b>Point I/O Power Supply</b>	Allen-Bradley 1606-XLP Output: 24-28 VDC / 2.1A 50W	Hall D (1) S1 (309) S1-1 (310) DIN Rail "AENT6" (900) Point I/O Ethernet/IP Adapter "AENT6" (901)	David Butler	2013-09-24 13:05:37	
<input type="checkbox"/>	<b>D1001132 (28093671)</b>	903	<b>Point I/O Analog Voltage Input Module</b>	Allen-Bradley 1734-IE2V 2 ch. 15 bits plus sign across -10...10V	Hall D (1) S1 (309)	David Butler	2013-09-24 12:23:00	

**JInventory database in use by CUE user 'wolin' with 'read/write/delete' access**

New item List items People Companies Brands Advanced Search... Delisa's Database Paginate One Page

Item ID:

Housing Parent | Ancestor:

Property Tag:

Short name and description:

Brand-Format-Model:  [Reset >>](#) [Search >>](#)

[1] << Back 1 2 3 4 5 6 Next >> [92] Total Items meet Search Criteria = 911

Check	Property Tag (Serial number)	ID	Short name	Description	Housing	Custodian	Update Date	Action
<input type="checkbox"/>	<b>D1000315 (405)</b>	871	<b>A1535SN</b>	CAEN HV Card 24 ch. -3.5 kV 3 mA SHV	Hall D (1) D2 (576) D2-8 (863) SY1527 HV chassis 16 sl. "TOP" (864) * Slot 6	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000314 (489)</b>	870	<b>A1535SN</b>	CAEN HV Card 24 ch. -3.5 kV 3 mA SHV	Hall D (1) D2 (576) D2-8 (863) SY1527 HV chassis 16 sl. "TOP" (864) * Slot 4	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000313 (493)</b>	869	<b>A1535SN</b>	CAEN HV Card 24 ch. -3.5 kV 3 mA SHV	Hall D (1) D2 (576) D2-8 (863) SY1527 HV chassis 16 sl. "TOP" (864) * Slot 2	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000312 (458)</b>	868	<b>A1535SN</b>	CAEN HV Card 24 ch. -3.5 kV 3 mA SHV	Hall D (1) D2 (576) D2-8 (863) SY1527 HV chassis 16 sl. "TOP" (864) * Slot 0	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000311 (1315M1)</b>	867	<b>A1532</b>	CAEN SY1527 Optional Power Supply Unit 750W	Hall D (1) D2 (576) D2-8 (863) SY1527 HV chassis 16 sl. "TOP" (864)	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000310 (1325M1)</b>	866	<b>A1532</b>	CAEN SY1527 Optional Power Supply Unit 750W	Hall D (1) D2 (576) D2-8 (863) SY1527 HV chassis 16 sl. "TOP" (864)	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000309 (126)</b>	865	<b>A1531</b>	CAEN SY1527 Primary Power Supply	Hall D (1) D2 (576) D2-8 (863) SY1527 HV chassis 16 sl. "TOP" (864)	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000308 (500)</b>	864	<b>SY1527 HV chassis 16 sl. "TOP"</b>	CAEN SY1527LC	Hall D (1) D2 (576) D2-8 (863)	Fernando Barbosa		
<input type="checkbox"/>	<b>D2-8</b>	863	<b>D2-8</b>	D2 Rack #8	Hall D (1) D2 (576)	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000165 (237)</b>	862	<b>TI</b>	JLAB Trigger Interface board	Hall D (1) D2 (576)	Fernando Barbosa		

**JInventory database in use by CUE user 'wolin' with 'read/write/delete' access**

New item List items People Companies Brands Advanced Search... Delisa's Database Paginate One Page

Item ID:

Housing Parent | Ancestor:




























































































Property Tag:

Short name and description:

Brand-Format-Model:  [Reset >>](#) [Search >>](#)

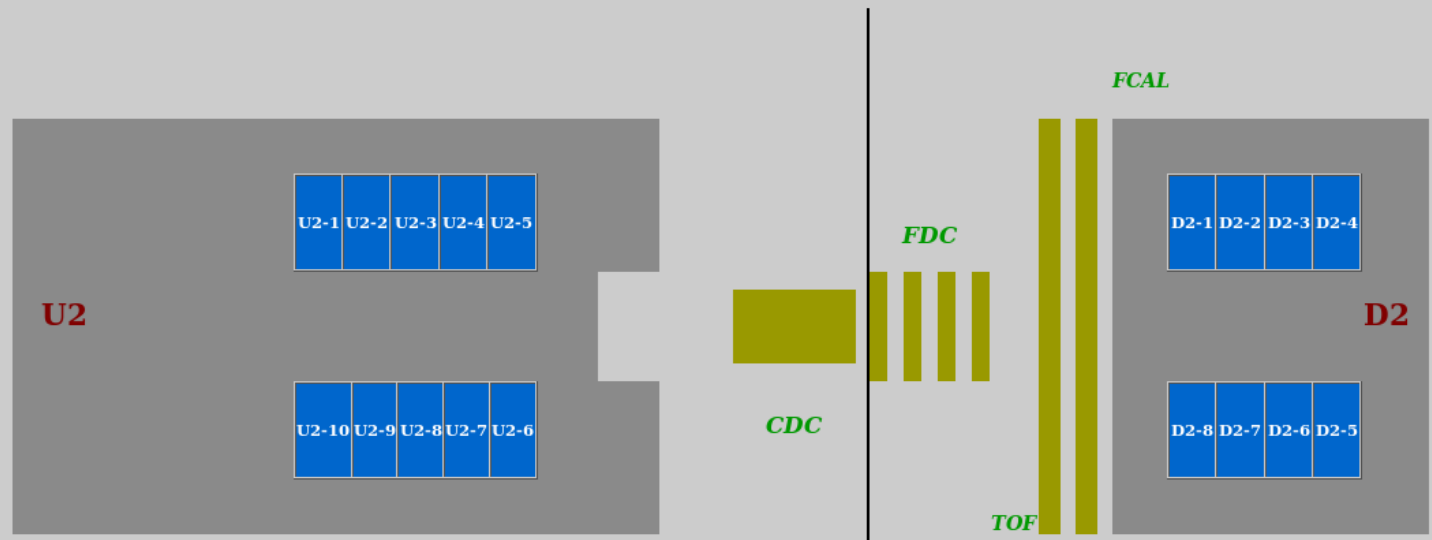
[1] << Back 1 2 3 4 5 6 Next >> [92] Total Items meet Search Criteria = 911

Check	Property Tag (Serial number)	ID	Short name	Description	Housing	Custodian	Update Date	Action
<input type="checkbox"/>	<b>D1000164 (ACDI-001)</b>	<b>861</b>	<b>fADC250</b>	JLAB Flash ADC 12-bit 250 Msp/s 16 ch.	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 19	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000163 (ACDI-058)</b>	<b>860</b>	<b>fADC250</b>	JLAB Flash ADC 12-bit 250 Msp/s 16 ch.	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 18	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000162 (ACDI-072)</b>	<b>859</b>	<b>fADC250</b>	JLAB Flash ADC 12-bit 250 Msp/s 16 ch.	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 17	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000161 (ACDI-062)</b>	<b>858</b>	<b>fADC250</b>	JLAB Flash ADC 12-bit 250 Msp/s 16 ch.	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 16	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000160 (ACDI-095)</b>	<b>857</b>	<b>fADC250</b>	JLAB Flash ADC 12-bit 250 Msp/s 16 ch.	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 15	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000159 (ACDI-070)</b>	<b>856</b>	<b>fADC250</b>	JLAB Flash ADC 12-bit 250 Msp/s 16 ch.	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 14	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000158 (ACDI-073)</b>	<b>855</b>	<b>fADC250</b>	JLAB Flash ADC 12-bit 250 Msp/s 16 ch.	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 13	Fernando Barbosa		
<input type="checkbox"/>	<b>D1000157 (84)</b>	<b>854</b>	<b>SD</b>	JLAB Signal Distribution board	Hall D (1) D2 (576) D2-7 (802) VXS crate 21 sl. "BOT" (843) * Slot 12	Fernando Barbosa		

BrandFormatModel					
ID	Brand	Format	Model	Items of this brand	Action
34	Allen-Bradley	CompactLogix Controller Main Unit	1769-L35E	2	   
37	Allen-Bradley	CompactLogix End Card	1769-ECR	2	   
36	Allen-Bradley	CompactLogix Input Module	1769-IR6	16	   
35	Allen-Bradley	CompactLogix Power Supply	1769-PA4	2	   
41	Allen-Bradley	PLC Circuit Breaker Module	1489-A	2	   
40	Allen-Bradley	PLC Single Phase Power Supply	1606-XLP	2	   
39	Allen-Bradley	Point I/O Input Module	1734-IE2V	4	   
38	Allen-Bradley	Point I/O Main Unit	1734-AENT	2	   
25	CAEN	SY1527 Optional Power Supply	A1532	12	   
24	CAEN	SY1527 Primary Power Supply	A1531	6	   
15	CAEN	SYx527 HV Board	A1535SN	19	   
16	CAEN	SYx527 HV Board	A1550N	4	   
12	CAEN	SYx527 HV Board	A1550P	10	   
11	CAEN	SYx527 HV Mainframe 16 sl.	SY1527LC	6	   
31	CAEN	VME64x Module	VX1290A	6	   
6	Hammond	Rack	19IN x 44U	39	  
20	ISEG	MPOD HV Module	EHS F 201p-F-K	30	   
5	JLab	Area	N/A	0	  
1	JLab	Building	N/A	7	  
33	JLab	DIN Rail	19IN	4	  
3	JLab	Level	N/A	6	  
4	JLab	Room	N/A	0	  
2	JLab	Trailer	N/A	0	  
10	JLab	VME Module	TI	44	  
14	JLab	VME64x Module	DSC2	109	  

[Electronics Search Engine](#)

# Hall-D electronics, Racks layout



*Upper Level*

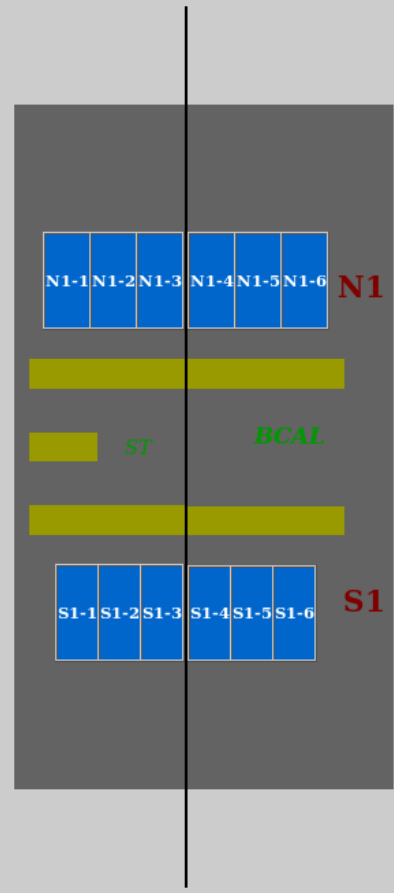
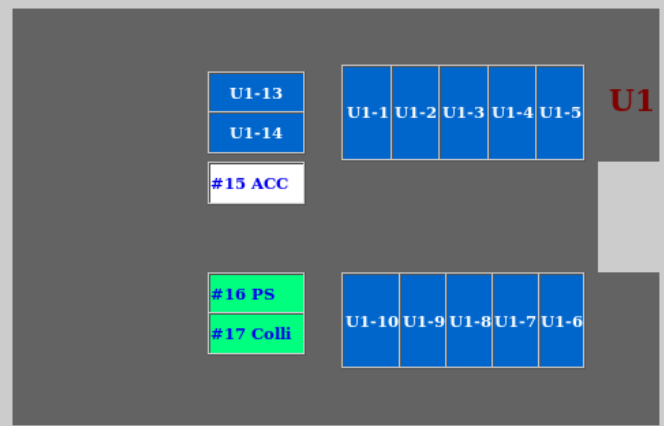
*Lower Level*





*Upper Level*

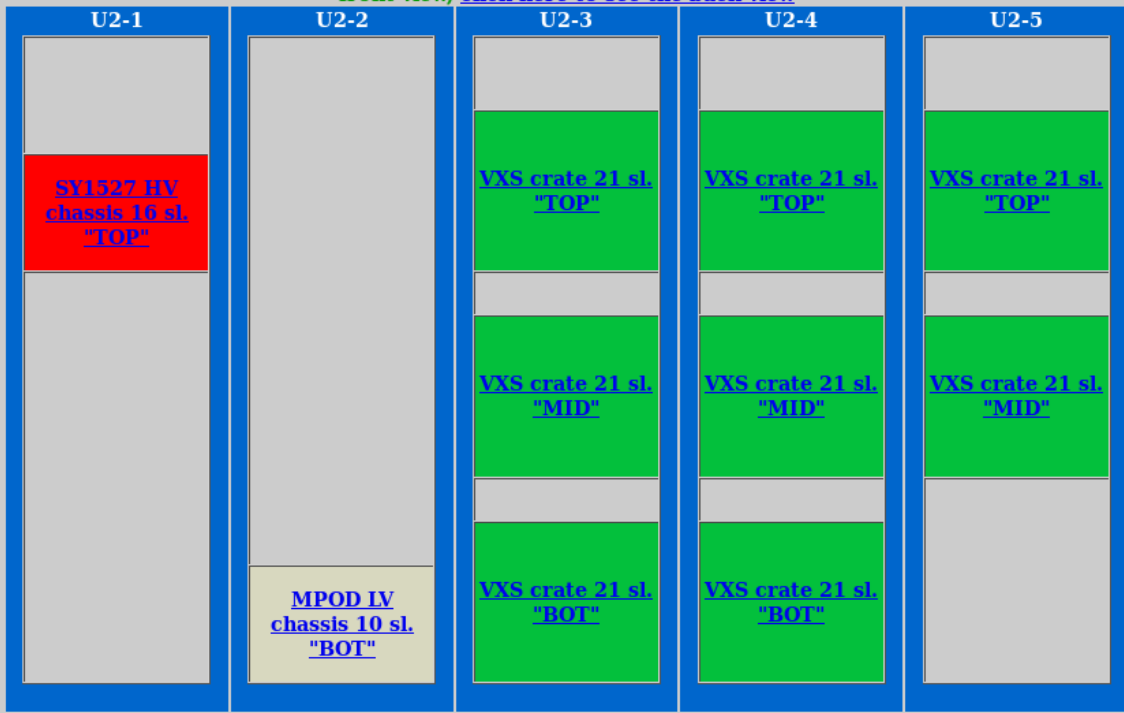
*Lower Level*

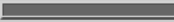




**TAGGER Building**

# Upstream Level 2, Racks U2-1 to U2-5

front view, [click here to see the back view](#)



-  - Crate or Cable Support
-  - Empty place
-  - Ventilator, Fan

## U2, U2-3, VXS crate 21 sl. "TOP"

Slot No	Property Tag	Serial No	Modules	Brief functional description
n/a	<a href="#">DI000643</a>	1688039	<a href="#">WIENER VXS6023x</a>	VXS crate 21 sl. "TOP" WIENER UEV 6023 VXS6023JLx618
n/a	<a href="#">DI000644</a>	1688072	<a href="#">WIENER UEL6020</a>	VXS Fan Tray WIENER UEL6020E
n/a	<a href="#">DI000645</a>	1488096	<a href="#">WIENER UEP6021</a>	VXS Power Supply WIENER UEP6021 Voltage: +5V/230A, +-12V/23A, +3.3V/230A
12	<a href="#">DI000656</a>	77	<a href="#">JLab SD</a>	SD JLAB Signal Distribution board
21	<a href="#">DI000665</a>	267	<a href="#">JLab TI</a>	TI JLAB Trigger Interface board

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## U2, U2-3, VXS crate 21 sl. "MID"

Slot No	Property Tag	Serial No	Modules	Brief functional description
n/a	<a href="#">DI000666</a>	1688051	<a href="#">WIENER VXS6023x</a>	VXS crate 21 sl. "MID" WIENER UEV 6023 VXS6023JLx618
n/a	<a href="#">DI000667</a>	1688057	<a href="#">WIENER UEL6020</a>	VXS Fan Tray WIENER UEL6020E
n/a	<a href="#">DI000668</a>	1488107	<a href="#">WIENER UEP6021</a>	VXS Power Supply WIENER UEP6021 Voltage: +5V/230A, +-12V/23A, +3.3V/230A
12	<a href="#">DI000679</a>	60	<a href="#">JLab SD</a>	SD JLAB Signal Distribution board
21	<a href="#">DI000688</a>	253	<a href="#">JLab TI</a>	TI JLAB Trigger Interface board

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## U2, U2-3, VXS crate 21 sl. "BOT"

# JInventory database in use by CUE user 'wolin' with 'read/write/delete' access

[New item](#) [List items](#) [People](#) [Companies](#) [Brands](#) [Advanced Search...](#) [Delisa's Database](#) [Paginate](#) [One Page](#)

 **Items**

Item ID:

Housing Parent | Ancestor:

Property Tag:

Short name and description:

Brand-Format-Model:  [Reset >>](#) [Search >>](#)

Total Items meet Search Criteria = 1

[New item](#) [Delete selected](#) [Toggle All](#) [Show selected](#) [Edit selected](#)

Check	Property Tag (Serial number)	ID	Short name	Description	Housing	Custodian	Insert Date	Action
<input type="checkbox"/>	<b>D1000643</b> <b>(1688039)</b>	<b>489</b>	<b>VXS crate 21 sl. "TOP"</b>	WIENER UEV 6023 VXS6023JLx618	Hall D (1) U2 (460) U2-3 (488)	Fernando Barbosa	2013-09-18 15:21:40	   

[New item](#) [Delete selected](#) [Toggle All](#) [Show selected](#) [Edit selected](#)

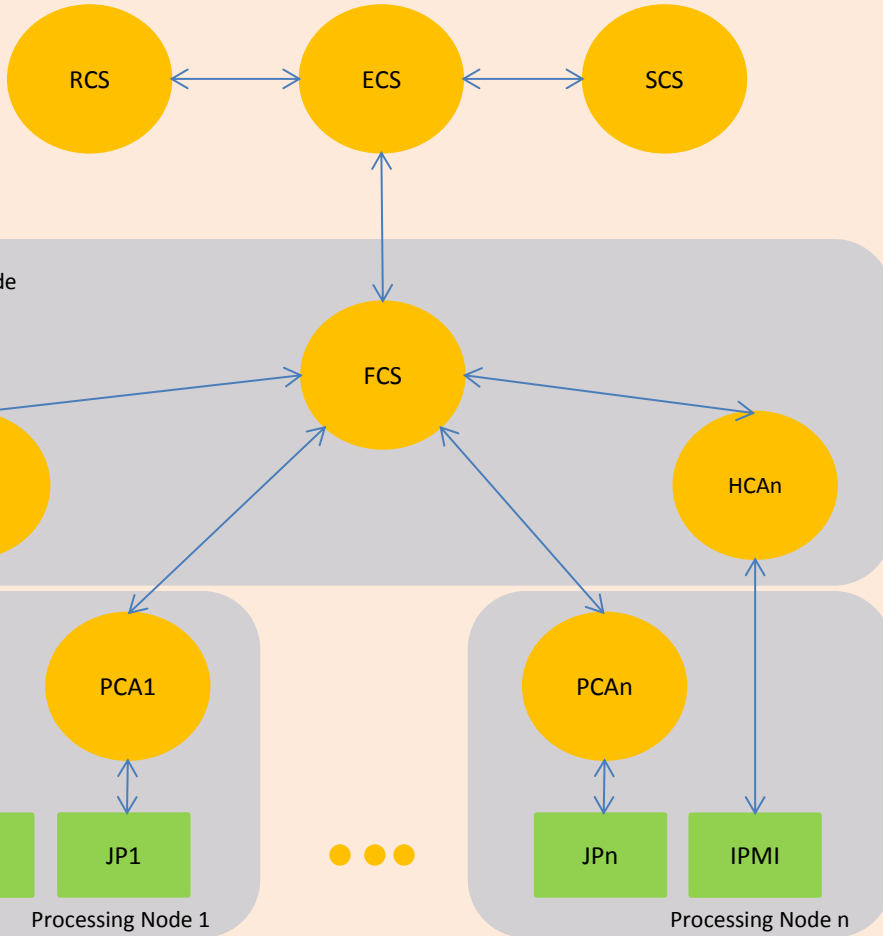

**JInventory database in use by CUE user 'wolin' with 'read/write/delete' access**
[New item](#)
[List items](#)
[People](#)
[Companies](#)
[Brands](#)
[Advanced Search...](#)
[Delisa's Database](#)
[Paginate](#)[One Page](#)

View item	
<input type="button" value="Back"/> <input type="button" value="Print"/>	
General information	
<b>Property Tag</b>	DI000643
<b>ID</b>	489
<b>Short name</b>	VXS crate 21 sl. "TOP"
<b>Entry date</b>	2013-09-18 15:21:40
<b>Description</b>	WIENER UEV 6023 VXS6023JLx618
<b>Brand-Format-Model</b>	WIENER - VXS crate 21 sl. - VXS6023x
<b>Part number</b>	0B02.0133
<b>Serial number</b>	1688039
<b>Housing Parents</b>	Hall D (1)   U2 (460)   U2-3 (488)
<b>GeomLoc</b>	p = 16U from top, h = 11U, w = 11U
Maintenance	
<b>Custodian</b>	Fernando Barbosa
<b>Replacer</b>	Nicholas Sandoval
<b>On-site evaluation</b>	Chris Stanislav
<b>Off-site repair</b>	WIENER, Plein & Baus, GmbH
<b>Status</b>	Normal - Operational
Maintenance History	

# Farm Manager

- CODA component that manages farm processes
  - Farm Manager listed in run control (COOL) configuration file
  - Farm processes are not CODA components
  - Farm processes do not respond to run control commands
  - E.g. a farm process can die but DAQ continues
- Vardan (DAQ group) writing Farm Manager
- Farm process tested in recent data challenge
  - hd\_online (Dave L)
  - Communication layer and state machine (me)

# Hall-D Farm Control System



**RCS** - Run Control System supervisor  
**ECS** - Experiment Control System supervisor  
**SCS** - Slow Control System supervisor  
**FCS** - Farm Control System supervisor  
**HCA<sub>n</sub>** - Hardware Control Agent  
**PCA<sub>n</sub>** - Process Control Agent  
**IPMI** - Hardware control protocol  
**JP<sub>n</sub>** - Jana Process

PCA States	State Machine Actions
connected	start
disconnected	stop
configured	configure
active	go
ended	end
paused	pause
warning	getState
error	getStatus

# Counting House, Computers, Databases

- Counting House done except few punch-list items
- Computers ordered, should arrive any day now
  - Combined order with HPCC
- Paul Letta (system manager) will install everything
  - Maybe by the end of the month
- Working out MySQL database backup strategy
  - Will back up from replicated database
  - May depend on level and type of offline access needed



# Counting Room



# System Software

- Will install locally in /gapps (not in /apps)
  - Should not rely on /apps, /site or /group
- Moved to GCC 4.8.1
  - C++11 “language complete”
  - Missing some libs (esp. regex)

# Computer System Monitoring

- Will use Ganglia for the foreseeable future
  - Used during data challenge
  - Used by Computer Center
- AF ECS controls framework (from DAQ group) includes hardware monitoring component



# Hall D Online Computing Grid Report for Wed, 02 Oct 2013 11:58:11 -0400

Get Fresh Data

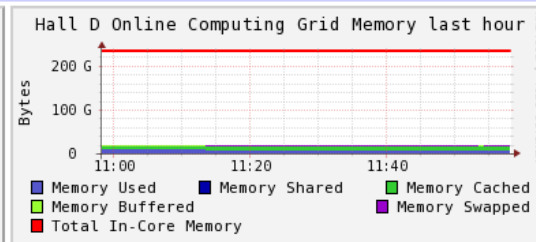
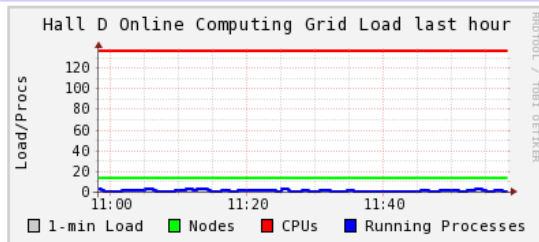
Last  Sorted

Hall D Online Computing Grid > --Choose a Source

## Hall D Online Computing Grid (3 sources) (tree view)

CPU's Total: **136**  
 Hosts up: **13**  
 Hosts down: **0**

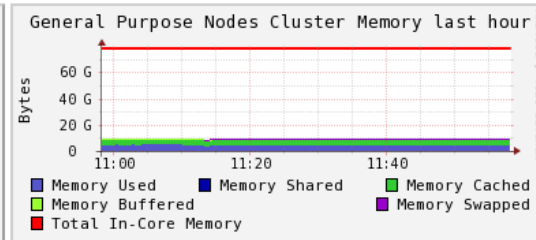
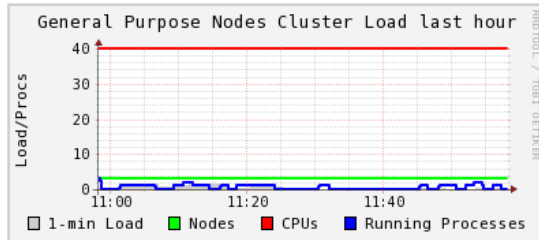
Avg Load (15, 5, 1m):  
 0%, 0%, 0%  
 Localtime:  
 2013-10-02 11:58



## General Purpose Nodes (physical view)

CPU's Total: **40**  
 Hosts up: **3**  
 Hosts down: **0**

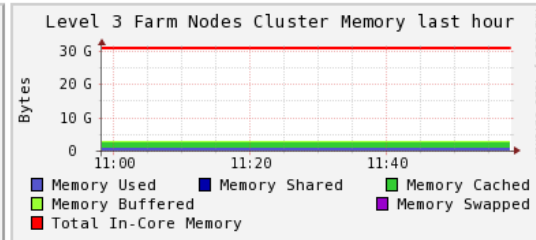
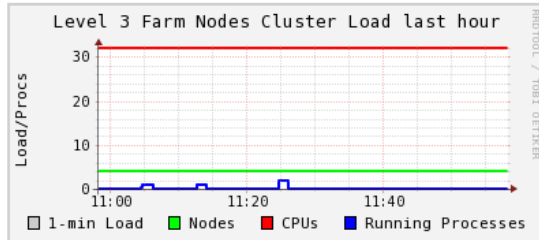
Avg Load (15, 5, 1m):  
 0%, 1%, 1%  
 Localtime:  
 2013-10-02 11:58



## Level 3 Farm Nodes (physical view)

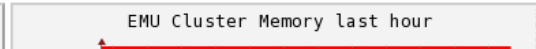
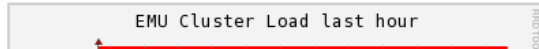
CPU's Total: **32**  
 Hosts up: **4**  
 Hosts down: **0**

Avg Load (15, 5, 1m):  
 0%, 0%, 0%  
 Localtime:  
 2013-10-02 11:58



## EMU (physical view)

CPU's Total: **64**  
 Hosts up: **6**

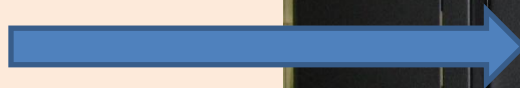


# Controls

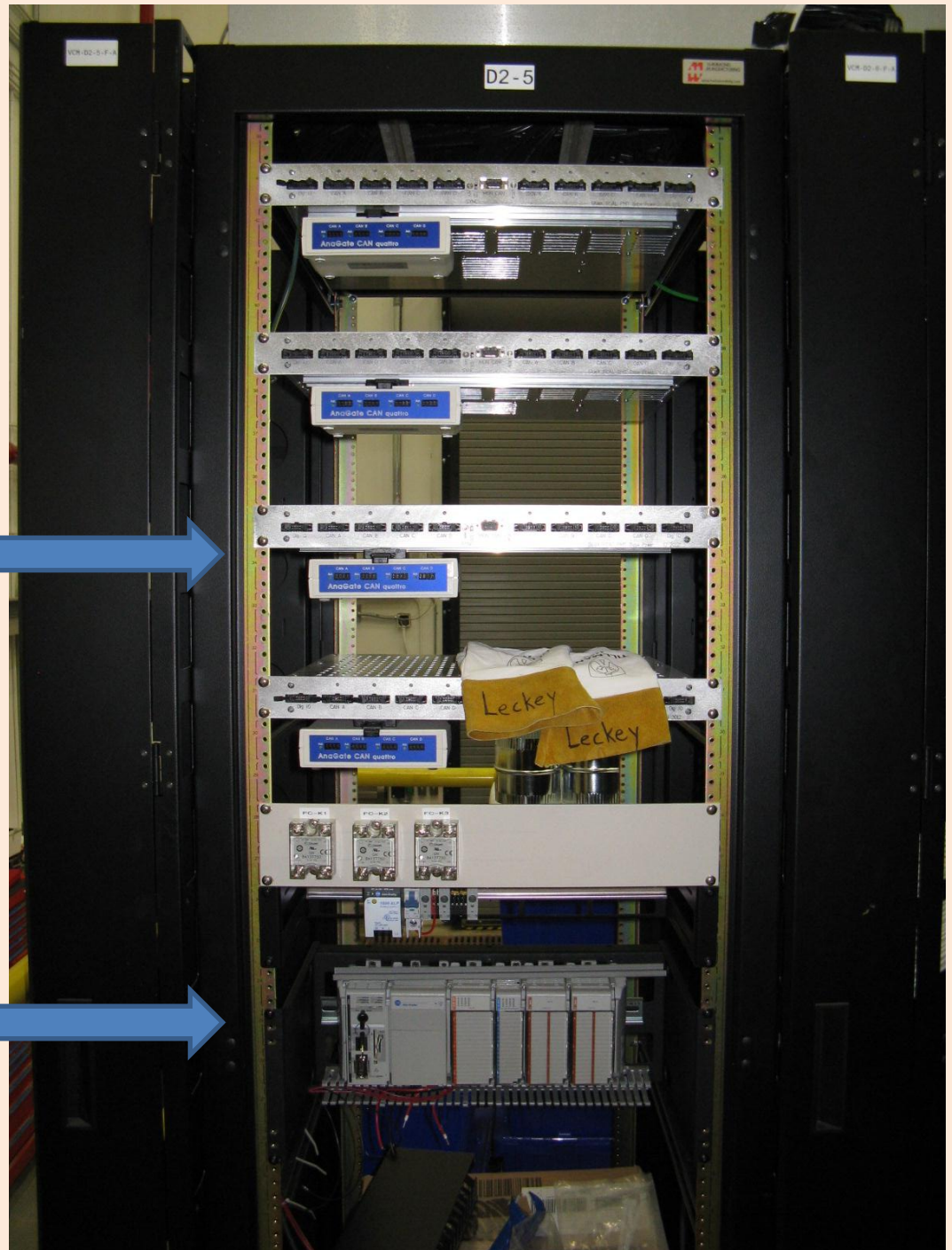
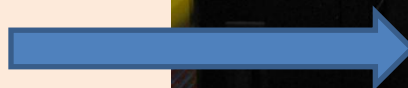
- Dave Butler beginning installation of controls equipment
- Everything we know about is here or on order
- Rack space becoming an issue
  - Detector groups need more space than planned
  - Fernando is the rack-space czar!
- Solenoid control system being upgraded
  - Based on experience during Solenoid test

# FCAL Darkroom Controls

IU Stuff



Allen-Bradley  
CompactLogix  
PLC



# ELog

- Used Accelerator ELog for Solenoid test
- Worked ok, many improvements needed
  - Requirements document developed by four halls
  - Accelerator thinks it's mostly done...
- Underlying database on ACC managed computers
- New ELog from EPICS community?

# JEFFERSON LAB ELECTRONIC LOGBOOK

Username  Password

[Post Follow-up Entry](#)

[<<Prev](#) [Index](#) [Next>>](#)

## This is Hall D solenoid test - signing off....

Lognumber **3251772**. Submitted by **whitey** on Sun, 08/04/2013 - 04:58.

There is 1 comment...

**Woo-hoo...I don't have to come in this morning (Sunday)!**

by wolin on Sun, 08/04/2013 - 05:06

Entry made from home, as I gratefully go back to bed...

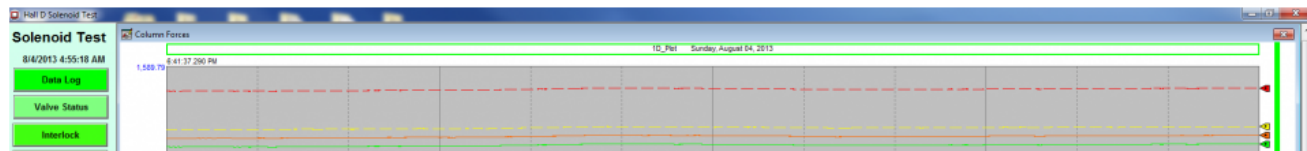
Logbooks: [HDSOLENOID](#)

Called Robert (cryo) and cancelled dewars for the morning.

The state of the Solenoid test equipment is as follows:

- Ramped to zero amps
- Stopped writing PXI files
- Pxi is on
- PLC Data logger on
- Decreased vapor cooled lead flow to 29 slpm
- Power supply off and locked out
- Mapping equipment powered off
- Vacuum pumps engaged and active - valves open.
- Mag field signs off
- Coffe pot - empty

We will discuss warm up cycle with cryo tomorrow.





# UPS Power

- Plan to run filtered power from big UPS to hall
  - Then run branch circuits where needed
- Giles will do the planning
  - After regular power installed in hall

# Summary

- Summer online data challenge very useful
  - Next one late Fall will include almost all DAQ/L3/monitoring components
- Final networking being installed
  - Interim system can accommodate all low-bandwidth needs
- Summer DAQ testing by DAQ group very useful
  - Led to many CODA improvements
- Inventory ready to use
  - Almost all DAQ and controls equipment entered and barcode labeled
- Farm manager being developed
- Counting House and computers almost ready
  - Software installation, backup strategies, compilers, accounts, etc.
- Accelerator ELog needs work
- UPS power coming to the hall eventually