INSTALLATION TODO LIST (+ misc. stuff)

---------- T minus 29 days and counting ----------

Last Modified: January 13, 2011

Important issues:

1. There is not a proper connector on the right HRS side for the large Bertha.
    Doug has talked with Ed and he is working on the issue. We might have to use a smaller Bertha if a connector cannot be placed on that side. (Ed) **Done**

2. Need to reroute network cables from left HRS side to right HRS for Test Lab computer. (Tai)

3. Need to remove and re-position wire chamber ribbon cable trays for the front chamber. There is an interference with their current location and the Hadron package re-enforcement frame. (Tai, Or) **Done**
    However we might need to make a slight move of the cable trays for the back chamber. (need to check with Aidan and Whit)

4. Repair loose PMTs on HAND layers 5 and 6. (Moshe, Or, Igor and Eli)
    January 13-17

5. Check for loose PMTs on HAND layers 1-4. (?)


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Jobs list:
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Move small items from Test Lab to Hall (Left HRS side until space is available on right HRS side):
*   Test Lab computer (srcdaq) **Done**
*   Plastic bins and boxes with short ribbon cables (level translators to Fastbus) **Done**
*   yellow/orange "anti-trip" cable bridges
    the yellow/black bridges need to be taken back to the Physics Storage building
*   spare electronics in plastic bins **Done**
*   signal and HV cables not in the cable wire basket **Done**
*   bubbler panel
*   Cable tray(s) for ribbon cables **Done**

Larger items to be moved by Techs (January 7-14):
*   weldment (Jan 19?)
*   hadron stack (Jan. 14?)
    NOTE: The re-enforcement frame may or may not be added before moving into Hall A
*   bertha (Jan. 12) **Done**
*   HAND (Jan. 7) **Done**

- wire chamber threshold and low voltage rack (Jan. 12) **Done**
- level translator rack (Jan. 12) **Done**
- cable wire basket (Jan. 12) **Done**

Items in Hall that need to be repositioned:
- HAND delay cable baskets
- shield wall blocks

Arrange HAND delay cables: (January 8-9)
- rearrange HAND delay cable bundles to make easier access to connect cables to the weldment **Done**
- The cables between the left arm and weldment were measured to be about 50 m +/- 1 m.
- Make cable map for neutron detector

Mark desired weldment location on right arm side: (January 10) **Done**
- Maximum right HRS angle is 45 degs.
- Hall A radius is about 26.5 m.
- HAND will need to be placed at 15 m and 50 degs for calibration.
- We need to leave enough clearance for the HAND calibration and ability to move HAND with the cables attached to the patch panels.
- Currently we have the weldment between 80 and 93 degrees about 15 m from the pivot.

Move cables from left side of hall to right side
- We need to stay clear of the pivot area and leave room for the crane, forklift, etc to drive into the area adjacent to the RHRS
- Make sure all cables are labeled to avoid confusion and work later (Tai)
- Keep the big picture in mind when staging the cables. Ask yourself how you'll be moving from the pre-stage layout to the final layout. **Avoid tangles!!!**
- Ribbon cables need to be laid out neatly and folded back into themselves until we can stretch them to the pivot. Be careful not to crimp or otherwise damage the cables at the fold points.
- The HV and signal cables are on carts and should be easy to contract and expand when needed.

MISC Notes:

BE VERY CAREFUL WHEN HANDLING THE RIBBON CABLE.
- Do NOT slide the ribbon cable on the ground when positioning it. The insulation is thin, soft, and easily abrades against the concrete if there is any weight on it.

The ribbon cables will run on sheets of white poly plastic. Pull the poly sheet to move the cables, don't pull the cables directly.

Watch for loose or damaged connectors. Do NOT tolerate bad connectors, they tend to cost an enormous amount of troubleshooting later on.

- LEMO ends tend to unscrew themselves. Make sure they are tight.
- Ribbon connectors can pop open on one or both sides. The connector should probably be cut off and replaced with a new one. Talk to an expert if you're not sure.
- BNC/SHV connectors are fairly robust as long as on one steps on them.

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Jobs list: continued
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Bertha power supply:
- Need to hook up the 100A Bertha supply and plug in the stack. **Done**
- NOTE: Everything that we use plugs into the Bertha.
  All scopes, network hubs, computers, etc ... No exceptions.
  This will help avoid wasting time on ground loop noise.

Electrical Ground:
- Identify common electrical ground for when the stack moves to the pivot.
  Should the weldment, hadron stack and HAND all be connected to the same ground? (Yes)

Prior to running the cables, stage a test run of a representative set of
1. signal cables,
2. HV cables,
3. ribbon cables, and
4. low voltage cables
from the weldment to the 99 (?) degree location of the BigBite stack. Things to keep in mind:

- The cables all have to go UP into the stack when it's on its platform. Allow 15' of free cable length to account for the cable run from the floor up into the stack
- Remember BB will move from 68 through 99 degrees.
  Watch for any interference problems with that motion.
- The LHRS should be clear out to 70 degrees and the right arm to 45 degrees.
  Watch for any interference problems with that motion (i.e. cables need to be out of the way of the front bogies!)

Cable up HAND (Larry, Or, Igor)
- Complete and verify the cable map for all the electronics and delay cables.
- Update Podd database using HAND library.
- Hook up gas system for the veto bars (Albert).

Run RG8, RG58 and shielded ribbon cables from the LHRS **Done**
        can wait until work on LHRS stack is completed.

Repair connectors on Right arm coax cables between left and right arms.

Cable up the MWDC (Tai):
- Complete and verify the map for the FB crates, level translators, etc. **Done**
- Update Podd database.
- Includes low voltage and threshold connections with CAMAC.

Gas System for MWDC (Jack):
- Connect chambers to gas shed system including bubbler.
- Verify bubblers have enough oil.
- Ar/Ethane 50-50 bottles have been ordered.
  Jack will keep us stocked for the experiment.
- We will need to flush the chambers for 1-2 days before turning HV on.

Cable up the Hadron trigger planes (dE/E):
- HV and signal cables
- Do we need a source calibration of the dE plane or are cosmics good enough?
- Sr-90 was used in the Test Lab for the E plane
- NOTE: Make sure the ADC structure you use to gain-match is close to the energies we will see during the experiment
- Determine discriminator thresholds for the planes; 900 MeV/c protons will be very close to MIP particle energy depositions. Hence we do not want to cut out our real signal. Previously (e,e'd) 100 and 300 mV were used for the dE and E planes, respectively.

Cosmics Tests:
1. Full checkout of BB DAQ using local trigger supervisor.
2. HAND with full electronics check out (ADC and TDC).
3. Check operation of MWDC and reduce noise to acceptable level.
4. dE/E planes verify signals in all ADC and TDC channels.

Tracking checkout using cosmics with fully hooked up MWDCs
- Time offset (T0) calibration.
- confirm wiremap database is correct using event display and coarse track information.
- test tracking code.

Efficiency scan for MWDCs (Tai)
- vs. high voltage
- vs. threshold

Right arm work: (Zhihong, David, Bob)
- Test and replace HV crate. (Jack)
- Reconnect BCM signals to scalers (copy also exists in Left HRS).
- Reconnect BPM and raster signals to ADC (separate copy in LHRS).
- Connect trigger latch pattern to TDC from TS.
- Add scaler in ROC 2(?)
- Connect fast clock (104 kHz) to ROC 1 and ROC 2 scalers.
- Setup ETDM pulser

- Verify scalers and decoding of scalers in right HRS
- Helicity signals in right HRS (TS and ADCs)?
- Add a copy of relevant triggers, L1A, strobe in TDC
- Setup T2 trigger
- Setup retiming
- For S1 and S2m are we using a 1877 or a 1875?

Left arm work: (Zhihong, David, Bob)
- Verify all relevant signals exist scalers, TDCS, trigger latch pattern
- BCM,BPM and raster
- Setup ETDM pulser
- Verify T4 works
- Verify retiming is working
- Verify/add all important signals exists in TDCs and scalers.
- For S1 and S2m are we using a 1877 or a 1875?

FPP: (Jack, Aidan, Kai and Bogdan)
- Jack will perform the installation and gas system hook up
- Need to add 1877's for the FPP in ROC 4
- Complete and verify the detector map
- Update the Podd database
- Cosmic checkout of the FPP

Status of 1458 HV crates:
- We gain two HV crates that were used and tested during DVCS
- One of these is needed for the weldment, the other can be used as a spare.
  - HAND HV channels (288, 24 cards)
  - dE/E plane HV channels (96, 8 cards)
  - MWDC HV channels (8, 1 card)
  - Total of 392 channels or 33 cards, which implies we need three HV crates
- Right arm HV crate is suspected to be problematic and needs to be replaced: Alexandre said we can use the CNU crate from Physics storage.
- Do we need to consider additional HV crate spares? (Yes)

Confirm spares:
- Update module inventory
- power supplies:
  - low voltage for thresholds
  - low voltage to power level translators
  - port-servers
  - network switch?
  - HV crates (see above for 1458 crates)

Update Podd databases with corrected:
- positions for detector elements
- drift time calibration for chambers

Measure/confirm TDC calibration of v1190 (and F1s?)

Stress tests of the full DAQ (i.e. high trigger rate, high deadtime)
- measure ROC event times and cross check with measured DAQ deadtime

EDTM pulser set-up and connected to Hadron stack DAQ:
- Work out correct relative delay timing so we can use the EDTM pulser to simulate HRS + HRS + BB (HRS + HRS + HAND) coincidence.
- Need to verify measurements of all cable and module delays. ^{3}He,e'd) delays should be a good starting point.

Coincidence timing, ADC gate timing, and TDC trigger timing in the circuit:
- MWDC (FB): trigger timing
- HAND (FB): ADC gates and trigger timing
- Hadron VME: ADC gates, TDC triggers, reference channels for 1190 (and F1s?)

Software:
- collect all software we need and make sure it works on adaqlX
  - threshold changing software
  - FB crate reboot software
  - analyzer code
  - event displays
  - scaler displays
  - software for updating MWDC wire-map database (Xin's software)?
  - MWDC database tuning software

Safety Documentation (needed 10 days before experiment starts)
- COO, ESAD, RSAD documentation must be completed by
  - February 1 for N-Delta (E08-010)
  - February 14 for Deuteron Threshold (E08-008)
  - February 20 for SRC (E07-006)
  - March 1 for low pmiss 4He(e,e'p) (E08-009)
  - April 8 for x>2 (E08-014)

Hall A Hardware list:
- Moeller   -- wanted? (only needed by Deuteron Threshold)
- Harp scanners -- should be functional
- OTR   -- must be OUT of the beam for production
- Compton   -- wanted(?) (only needed by Deuteron Threshold)
- Hall A ARC   -- ?
- BPMs/Raster   -- Needed by all experiments
- BCMs   -- Needed by all experiments

Shielding:
- Green blocks between BB DAQ and pivot

- ○ need to confirm with Ed
- Do we need blocks between BB DAQ and beam-line quads, moeller, etc
  This was necessary on the left HRS side

Before the experiment starts

- Test motion of BB sieve plate
- Make sure all necessary surveys are completed (Detectors, sieves, spectrometers, etc)

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Misc stuff:
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- Web site work:
  - ○ shift worker How-To's
  - ○ Runsheets
  - ○ shift checklists
- Analyzer work:
  - ○ online histogram display
  - ○ FPP software (Kai, Aidan)
  - ○ run database scripts
  - ○ detector database updates
  - ○ Update Miha's analytic model for BB optics and optics matrix