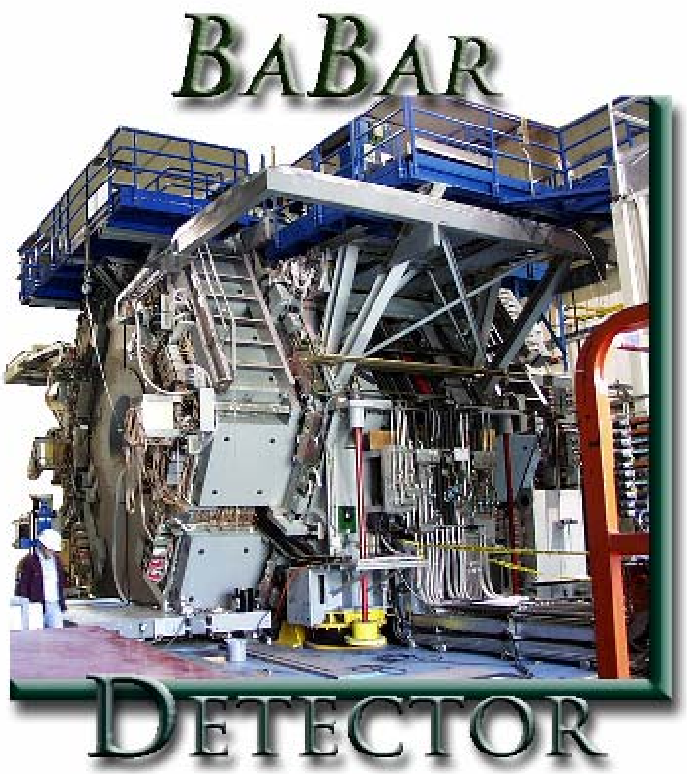
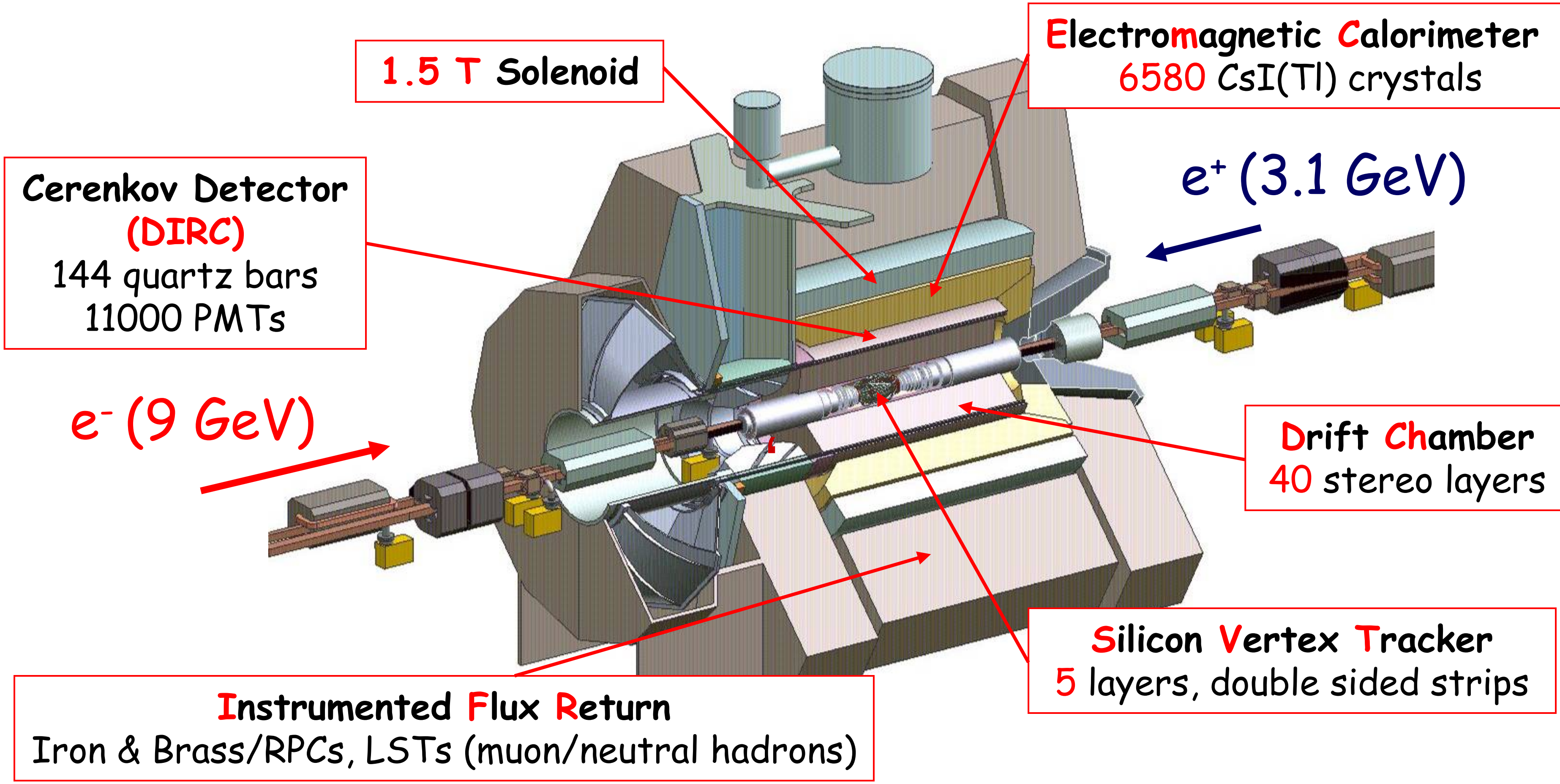
BaBar Overview & MMS Status



- Intro to BaBar Detector and its subsystems
  - Identify the assets
  - Look at reuse potential
- Preserve the assets
  - Minimal maintenance state definition
  - Progress to the MMS
- D&D History
  - Early plans
  - Response to review
    - Inventory

BaBar Detector



'Ideal'

BaBar Detector

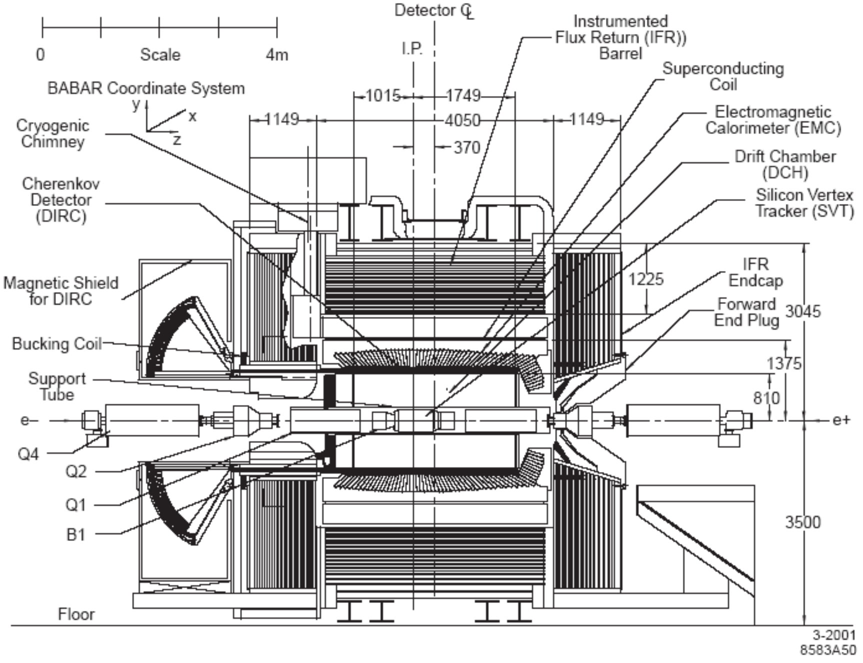


Figure 1. BABAR detector longitudinal section.

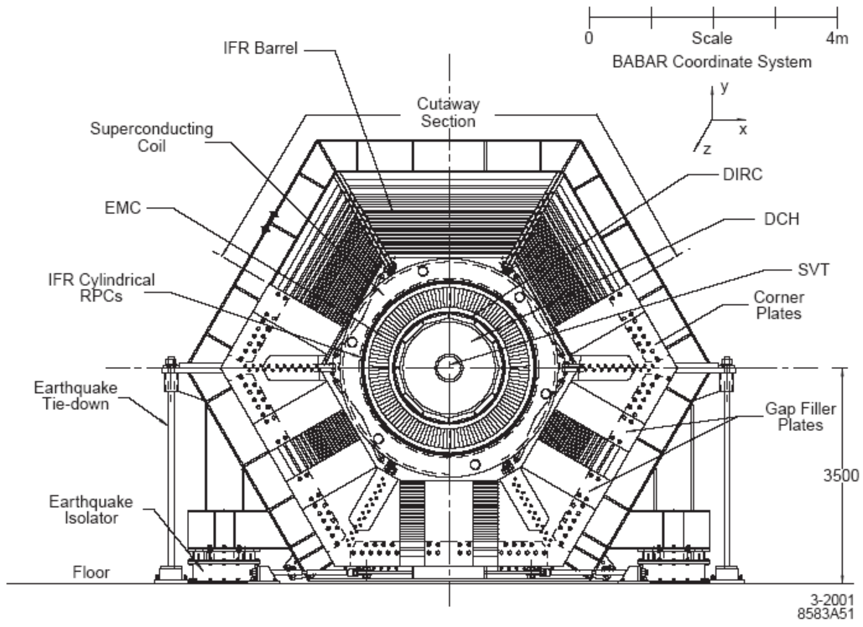
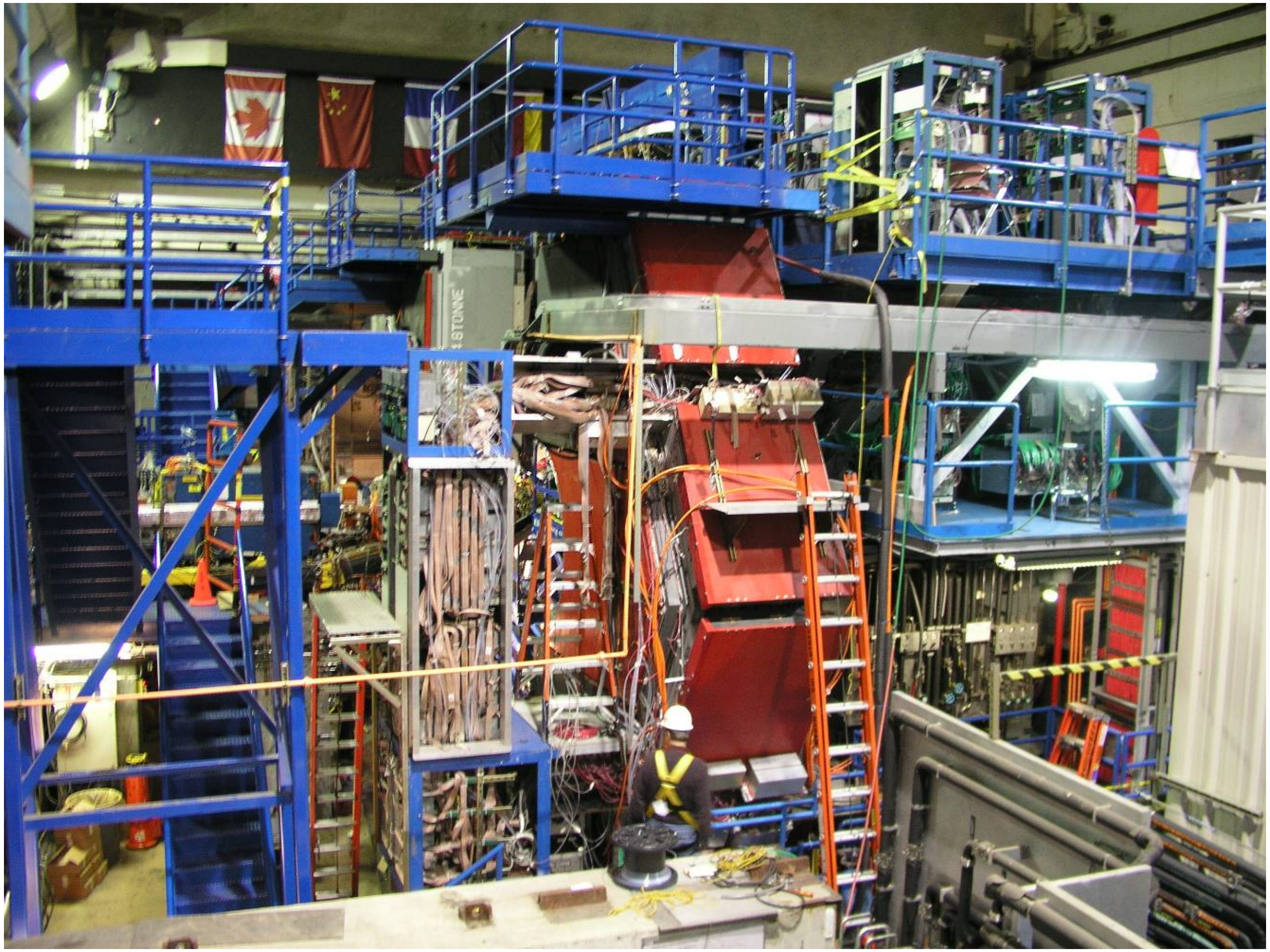


Figure 2. BABAR detector end view.

Details can be found in NIM A479 (2002) 1-116.

BaBar Detector



‘Actual’

Shield wall removed

BaBar Detector Assets

- Subsystems: SVT, DCH, DIRC, EMC, IFR, magnet, Trig and Online
- Identification of assets:
  - Subsystem managers were involved in identifying detector components with long term value.
  - Assets with high value to preserve in the disassembly process, if they have not already been spoken for:
    - Quartz bars from the DIRC.
    - CsI (Tl) crystals from the EMC.
    - Superconducting magnet coil, cryostat and current leads and cryo plant.
- Look at detector disassembly by subsystem from the IP.
  - Complication in the disposition of the disassembled detector components and services that have no clear reuse: Metals Suspension.

Silicon Vertex Tracker

- SVT has 5 double-sided layers providing z and φ readout. There are 6,6,6,16 and 18 modules in each later. ~150K channels in 208 read-out sections.

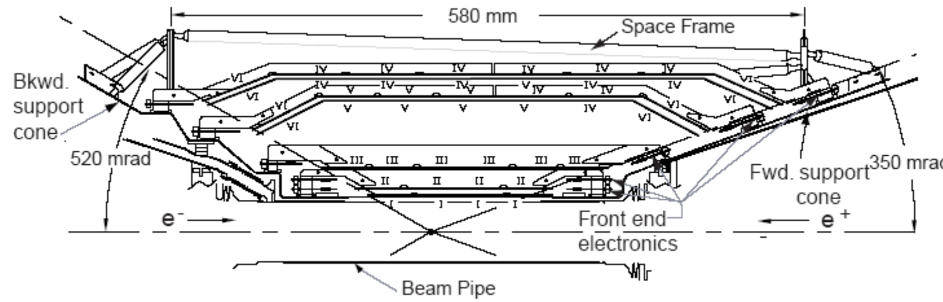


Figure 17. Schematic view of SVT: longitudinal section. The roman numerals label the six different types of sensors.

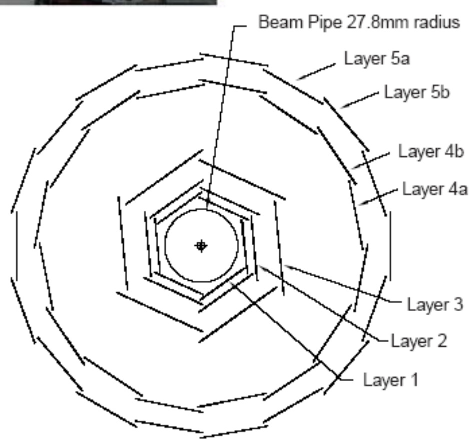
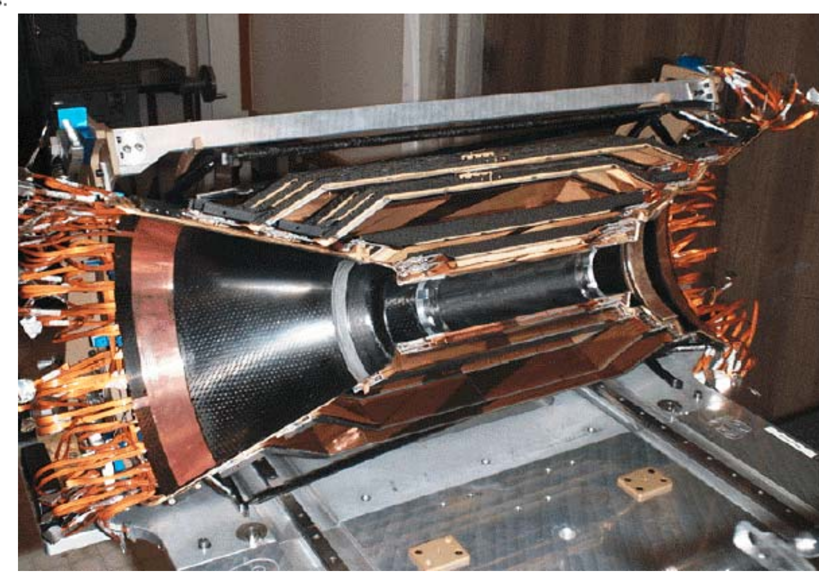


Figure 18. Schematic view of SVT: tranverse section.



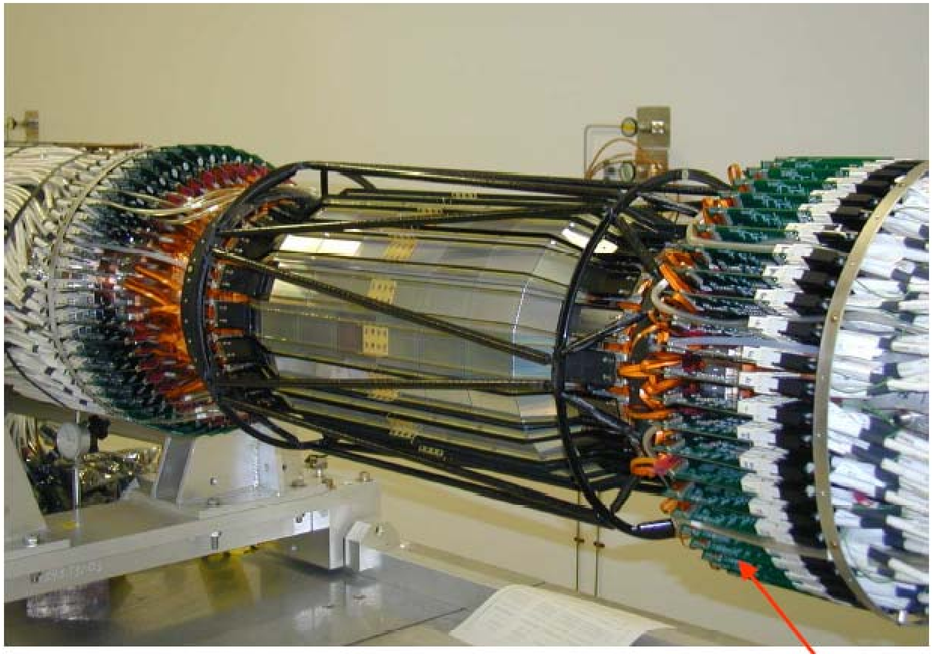
Silicon Vertex Tracker

- SVT located in the support tube that carries the beam line elements closest to IP.
- Read-out: matching cards in the support tube, power supplies and next level of read-out atop the detector and on mezzanine (all in the accelerator housing). Final stage of readout (ROM) in Electronics Hut (EH).
- Services: humidity controlled air; water cooling system (dual system fed from front and rear; includes pumps, chillers, and their backups); cables for power. Parts of each of the services are located in the accelerator housing.

Silicon Vertex Tracker

- Radiation damage sufficient to limit usefulness. Damage especially severe in the accelerator mid-plane.

- Expected disposition: tests initially to understand radiation damage effects on performance (to be folded into the design of a possible Super B factory; display, half in Italy, half in a US museum (site undetermined).



Drift Chamber

- Drift Chamber: charged particle tracker consists of 7104 small drift cells arranged in 40 cylindrical layers which form ten superlayers, 4 axial, and 6 stereo.

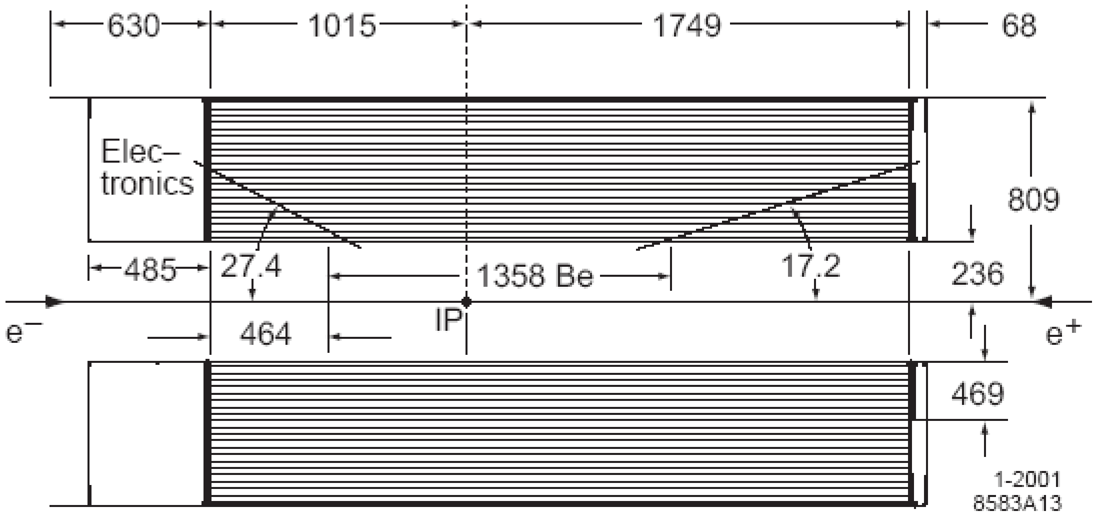


Figure 28. Longitudinal section of the DCH with principal dimensions; the chamber center is offset by 370 mm from the interaction point (IP).

Drift Chamber

- Front end electronics packages are mounted at the aft end of the drift chamber. There is a single low voltage power supply located in the Electronics Hut (EH), along with high voltage supplies for the wires.

Table 9
The DCH superlayer (SL) structure, specifying the number of cells per layer, radius of the innermost sense wire layer, the cell widths, and wire stereo angles, which vary over the four layers in a superlayer as indicated. The radii and widths are specified at the mid-length of the chamber.

SL	# of Cells	Radius (mm)	Width (mm)	Angle (mrad)
1	96	260.4	17.0-19.4	0
2	112	312.4	17.5-19.5	45-50
3	128	363.4	17.8-19.6	-(52-57)
4	144	422.7	18.4-20.0	0
5	176	476.6	16.9-18.2	56-60
6	192	526.1	17.2-18.3	-(63-57)
7	208	585.4	17.7-18.8	0
8	224	636.7	17.8-18.8	65-69
9	240	688.0	18.0-18.9	-(72-76)
10	256	747.2	18.3-19.2	0

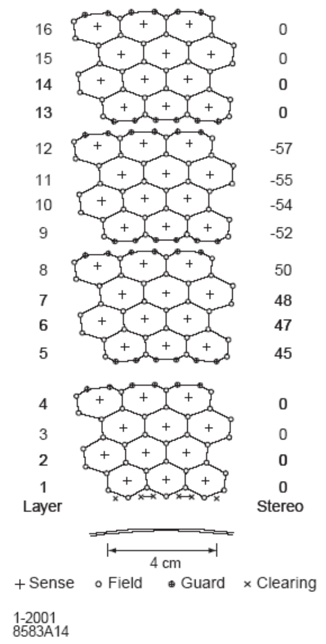


Figure 31. Schematic layout of drift cells for the four innermost superlayers. Lines have been added between field wires to aid in visualization of the cell boundaries. The numbers on the right side give the stereo angles (mrad) of sense wires in each layer. The 1 mm-thick beryllium inner wall is shown inside of the first layer.

Drift Chamber

- The DCH is mounted in the DIRC support tube, cantilevered into the center of the detector.
- The DCH used an 80:20 helium:isobutane mix provided at slight overpressure by a gas mixing system that re-circulates and scrubs gas in the DCH. Nitrogen was flushed between the bulkheads and endplates to limit the spread of He to the DIRC phototubes.

Gas system is an example of 'recovery by collaborators'.

Drift Chamber

- Planned disposition: display in a museum.

DIRC

- Particle identification system: ring imaging Cherenkov detector that provides π/K identification from π threshold to 4.2GeV/c.
- Radiator is synthetic fused silica in the form of long, thin bars with rectangular cross-section. Radiator acts as light pipe too (total internal reflection). The material was chosen for its resistance to radiation, long attenuation length, large index of refraction, excellent optical finishing properties. The 144 bars are collected together in groups of 12 in hermetically sealed bar boxes.
- The bar boxes are cantilevered off the IFR barrel in a central support tube that is necessarily thin, and which is attached to the strong support tube (see figure later transparency).
- The Cherenkov photons emerge from the bars into a water filled expansion region, the Stand-Off Box. The SOB is instrumented with ~11000 phototubes whose faces are exposed to ultra-pure water.
- High voltage distribution and front end readout electronics are attached around the SOB. The final readout electronics and HV supplies are located in the EH.

DIRC

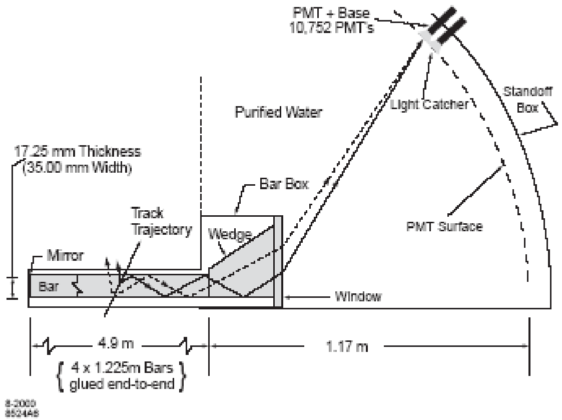


Figure 48. Schematics of the DIRC fused silica radiator bar and imaging region. Not shown is a 6 mrad angle on the bottom surface of the wedge

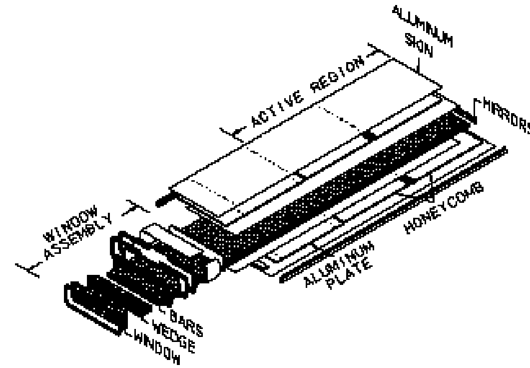


Figure 50. Schematics of the DIRC bar box assembly.

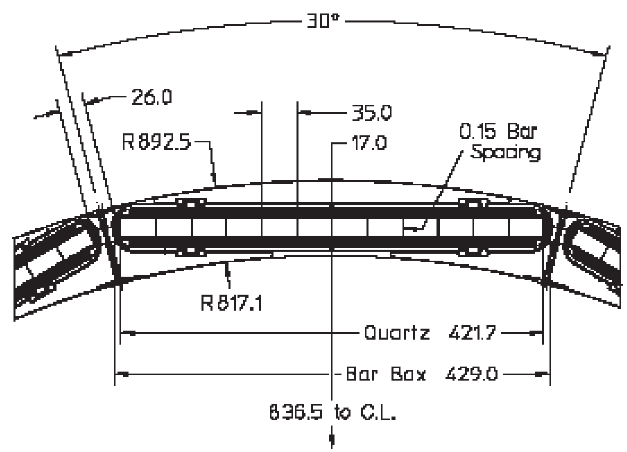
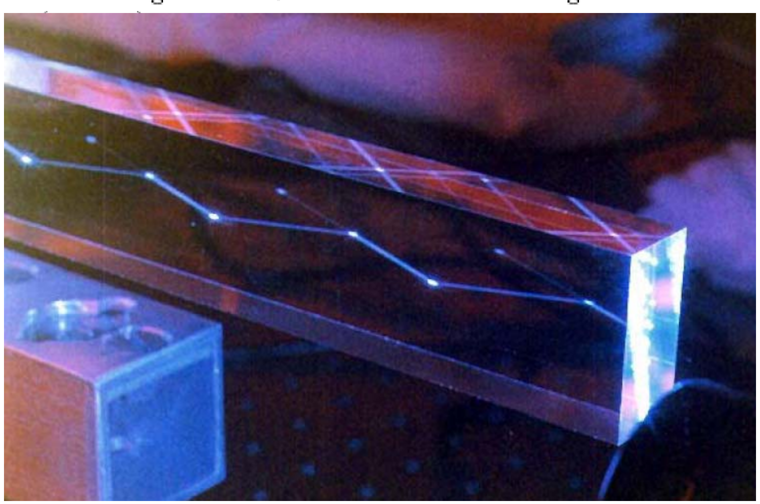


Figure 52. Transverse section of the nominal DIRC bar box imbedded in the CST. All dimensions are given in mm.



DIRC

- The bars are a unique resource. If no reuse will store the bars in their bar boxes.
- Potential reuse: SuperB
  - Quartz bars and support structure
  - Phototubes and SOB do not have an identified reuse there. However, low rate experiments might find the phototubes useful.

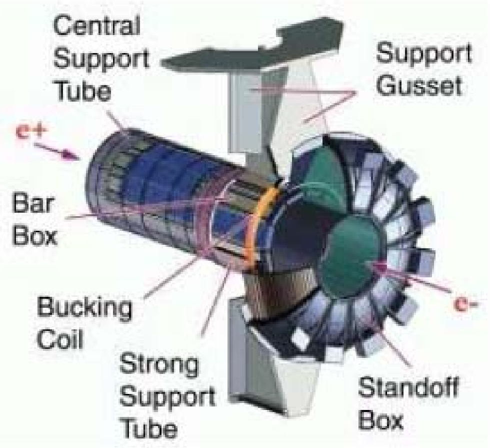


Figure 49. Exploded view of the DIRC mechanical support structure. The steel magnetic shield is not shown.

Electromagnetic Calorimeter

- Measures energy deposited by particles interacting in the device. Principal goal is to measure photon energies; aids in identification of charged particles (hadron-electron separation, muon ID); provides some neutral hadron ID.
- Consists of 6580 ~4kg CsI(Tl) crystals read out with two photodiodes each. CsI(Tl) is mildly hygroscopic. Crystal/diode glue joint is secure over a limited thermal range. Crystals are suspended in carbon-fiber support structures mounted in the calorimeter support structures. ~$30M asset.
- Calorimeter is in two parts: barrel portion (most of crystals) and forward endcap, suspended from the steel flux return.
- Cooling for barrel power-hungry readout electronics is water cooling the support structure. Cooling for barrel preamps located at the back of each crystal is fluorinert. All endcap cooling is fluorinert. Fluorinert cooling maintains constant temperature for the diode-crystal glue joint. Extensive cooling plant. Nitrogen flush system to maintain dry environment.
- Final read-out electronics in EH. Large contingent of ROMs and VME crates, and power supplies.
- Calibration systems include radioactive source system (DT generator) and light pulsing system.

Electromagnetic Calorimeter

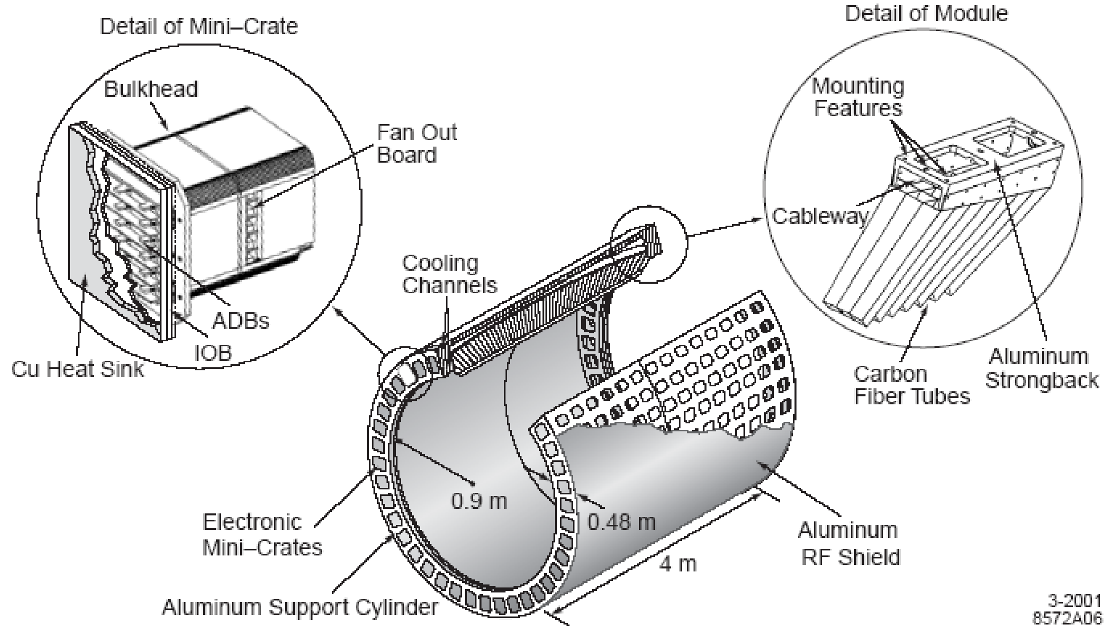


Figure 63. The EMC barrel support structure, with details on the modules and electronics crates (not to scale).

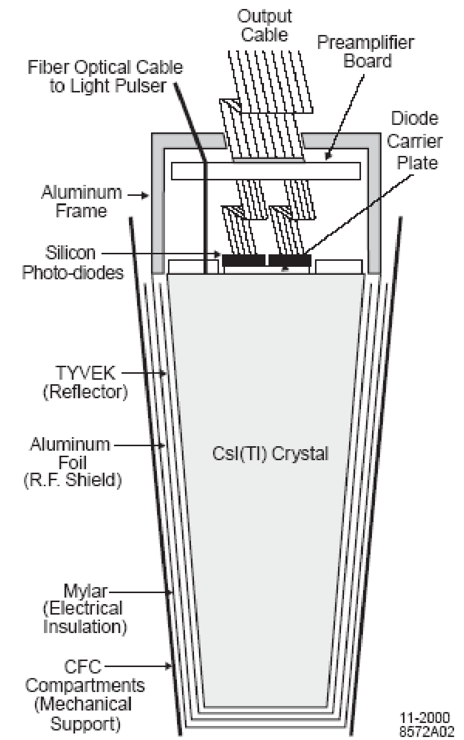
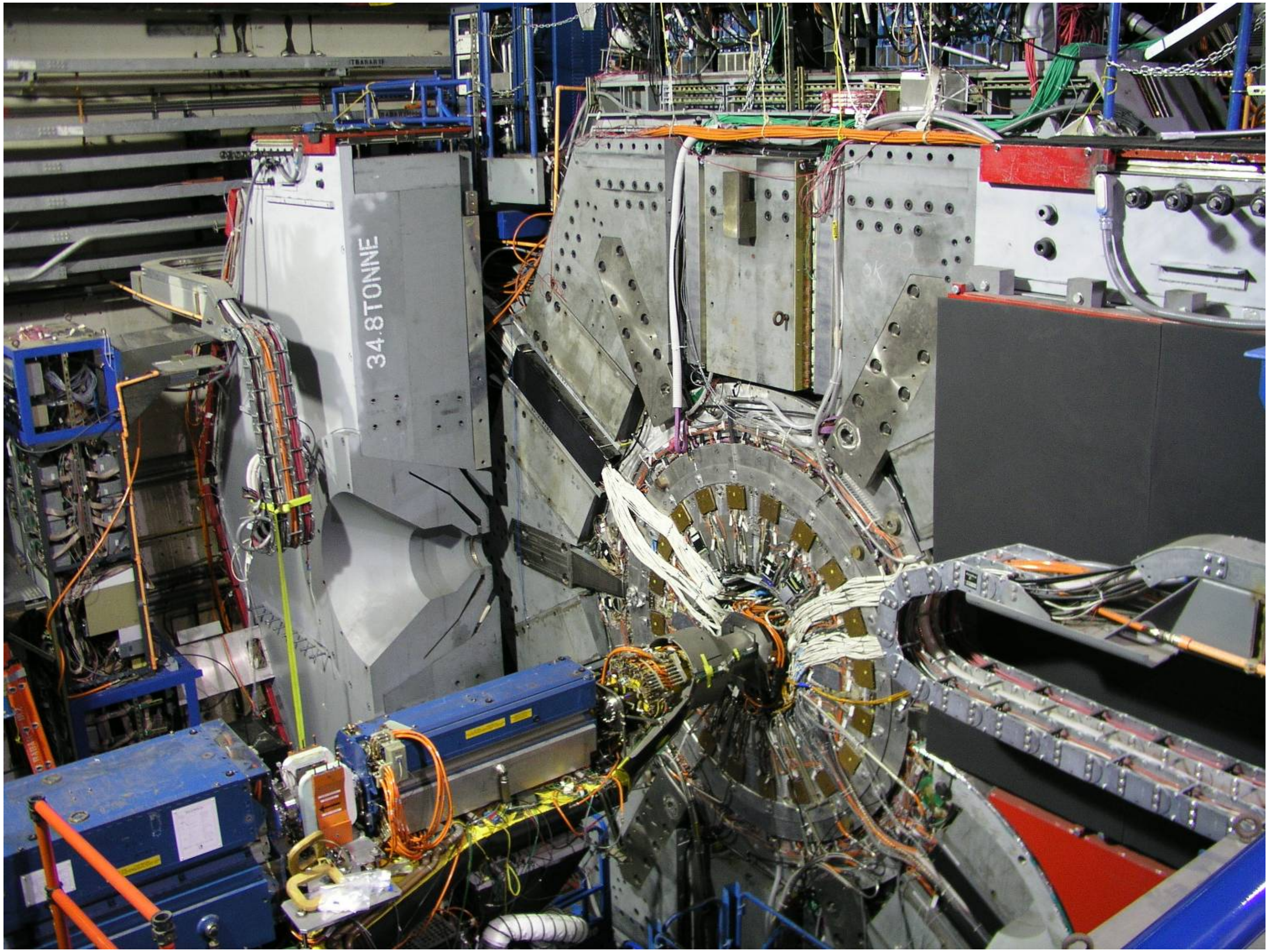


Figure 62. A schematic of the wrapped CsI(Tl) crystal and the front-end readout package mounted on the rear face. Also indicated is the tapered, trapezoidal CFC compartment, which is open at the front. This drawing is not to scale.

Electromagnetic Calorimeter

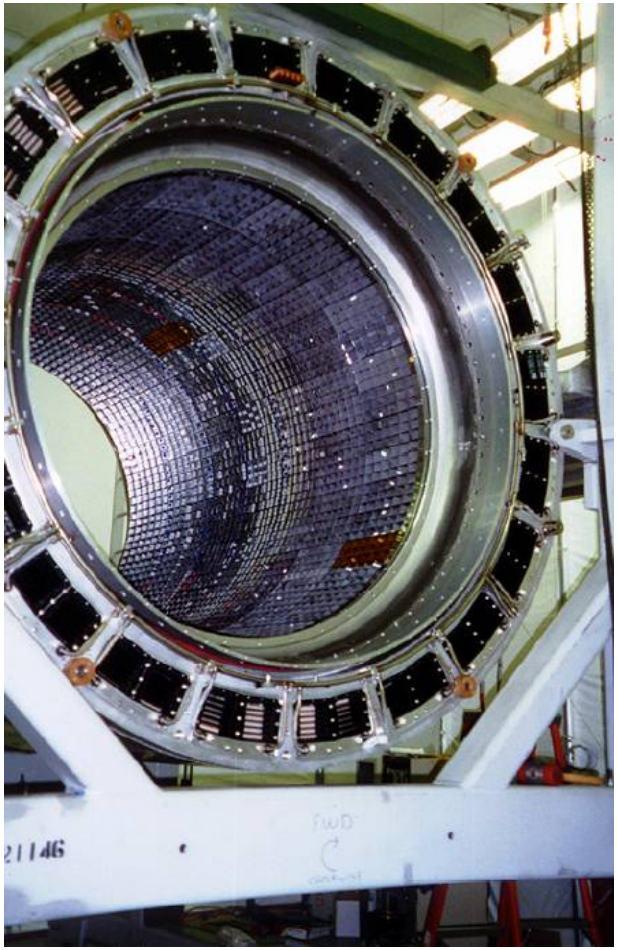


EMC: Glue Joint Fragility

- Crystal-photodiode glue joints (127) were tested before calorimeter construction through 40 8-hour cycles of +/- 4C and 120 12 hour cycles of +/- 5C. No joints failed.
- While the endcap calorimeter was being prepared for installation, assembly area cooling failed on a hot day. A temperature excursion of +10C was measured. Several glue joints failed in several modules, leading to the temperature maintenance requirement for the calorimeter.

Electromagnetic Calorimeter

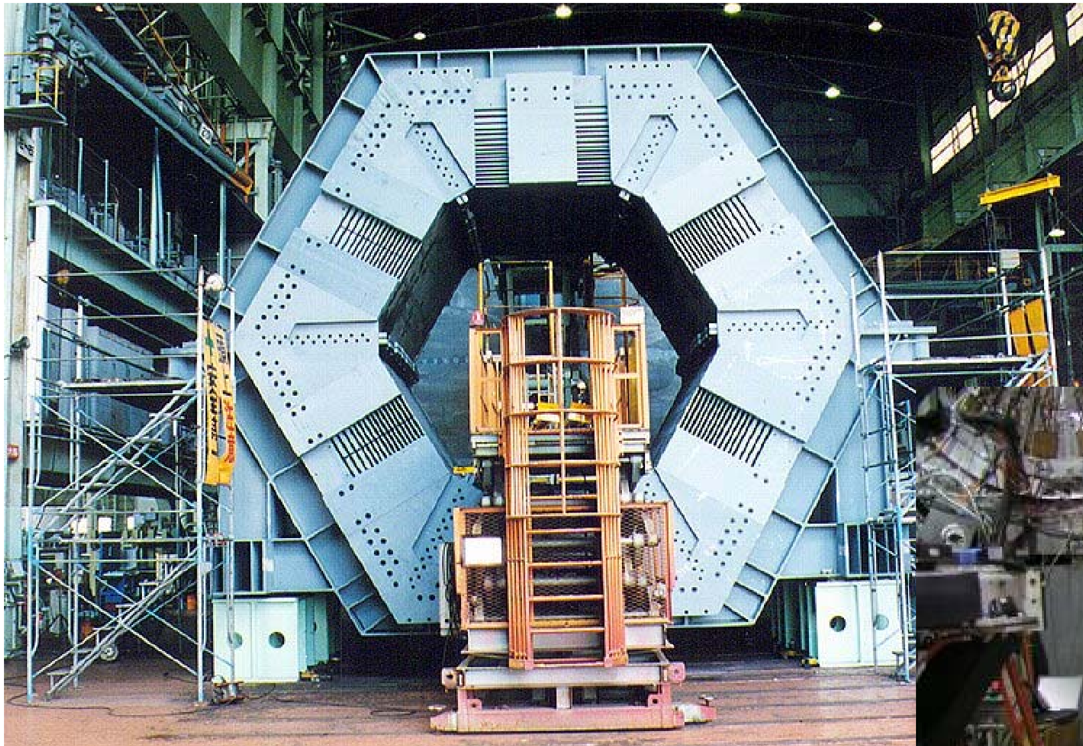
- Potential Barrel reuse: SuperB
  - Some endcap crystals may have a home in SuperB. Others would be stored if radiation damage has not degraded the response too much.
- Will require dry room construction to store crystals that do not have an identified reuse.



Instrumented Flux Return

- Instrumented Flux Return consists of two systems: Limited Streamer Tubes in the barrel, installed in 2004 and 2006, and Resistive Plate Chambers in the forward and backward endcaps.
- LSTs: twelve layers of modules in 6 sextants. Six layers of brass installed in gaps formerly occupied by RPCs (increase interaction lengths). These detectors are expected to have minimal aging at the time of cessation of B-Factory operations. No re-use identified.
- RPCs: Forward endcap: 16 layers of chambers (192 gaps), 4 in double modules, with 5 layers of brass; these chambers are being aged by backgrounds. Backward endcap: 18 layers of modules (216 gaps) from the initial construction of the detector; the majority of these chambers are in bad shape. Discard.
- Gas mixing systems provide mixes for LSTs, RPCs, and avalanche mode RPCs. Has re-use potential, at least for device testing.

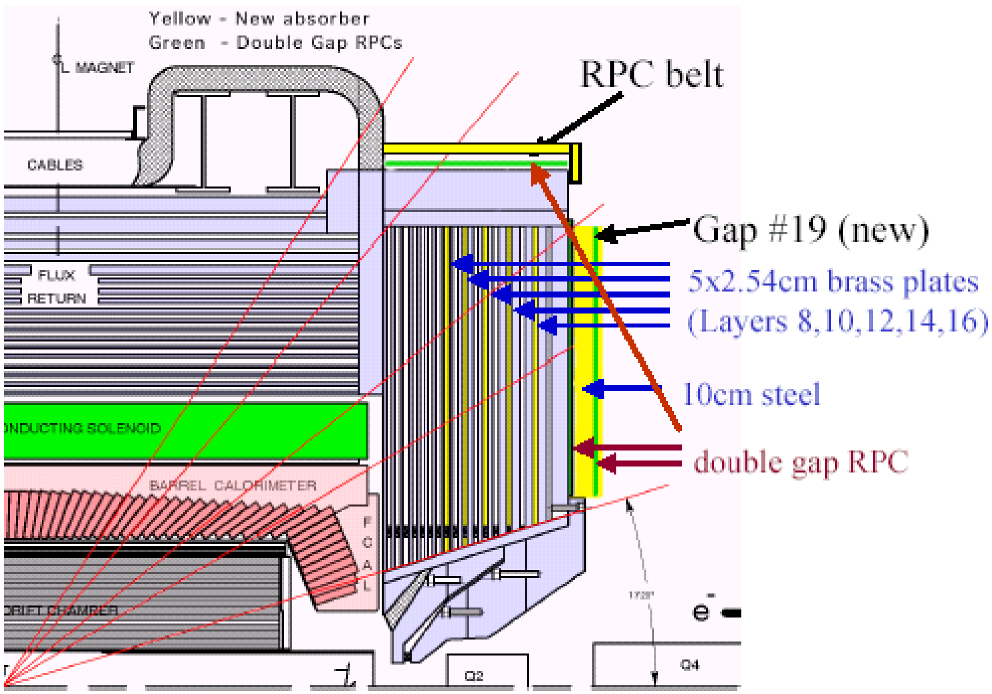
IFR: LSTs



Barrel Flux Return Steel

LST Installation

IFR: RPCs



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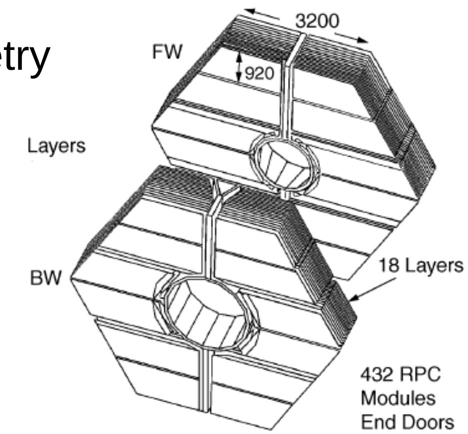
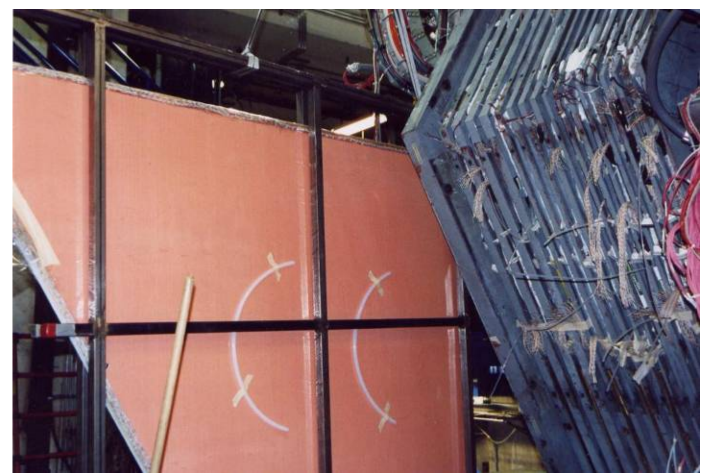
Endcap Geometry





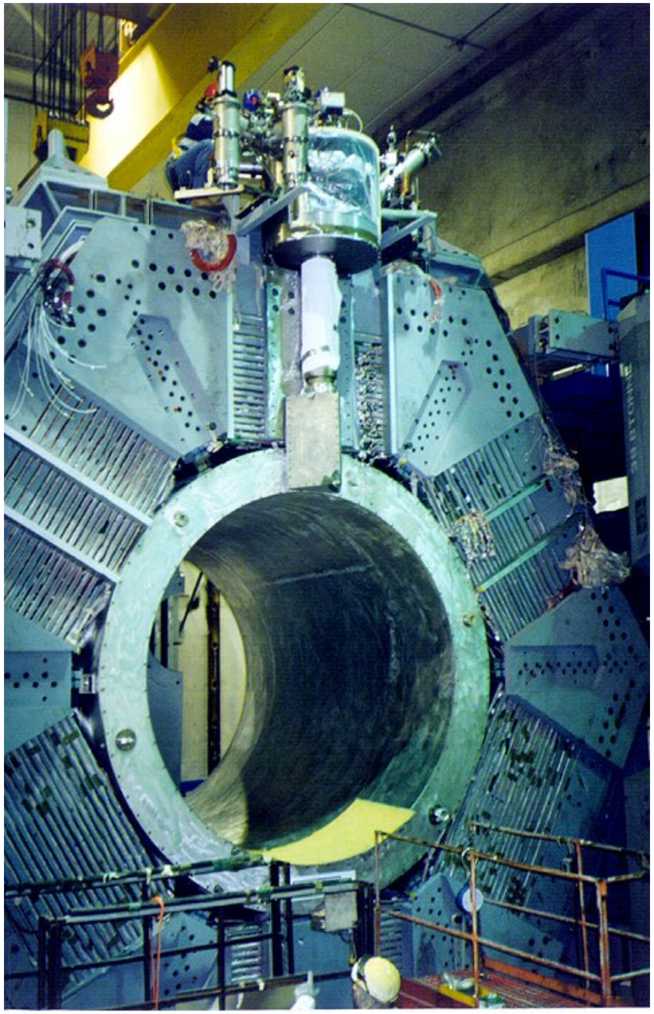
IFR: Gas System

Gas Shack

IFR gas mixing racks

BaBar Superconducting Coil & Steel

- The magnet system is composed of:
  - Superconducting coil in its cryostat, with current leads. This is an asset with long term value.
  - Power supply for the magnet.
  - Cryogen system: pumps, liquifier, dewars and controls. Has long term value, though will be almost two decades old, half its expected service life.
  - Flux return steel (IFR). Has scrap value (pending metals suspension resolution)
  - Potential reuse: coil, cryogenic system, and perhaps steel, in SuperB



TO_300 Valve Box Assembly 12/12/97

Cryo Plant

IR2 portion of the cryo plant.

Electronics Hut

- Electronics hut and contents:
  - Readout electronics: special purpose for BaBar; single board computers are relatively aged, though may have some reuse.
  - Power supplies: some low voltage can be reused ('off the shelf'). HV: supplies are older models, but may be useful to other experiments reaching the end of their lives (and spares) (eg, RHIC experiments); generally useful. Many are property to be recovered by collaborators.
  - Level 3 Trigger compute farm and event builder switches. Have good reuse since recently upgraded. Have been used as a Monte Carlo farm for BaBar in situ till this month.
  - EH was a candidate for disposal.
  - BUT!
    - SCCS has power and cooling limitations
    - Reuse compute farm in situ as MC farm
      - Done!
    - Reuse racks and building in corner of IR2; couple provide equivalent of more than a Sun BlackBox at substantially less cost. This is the most likely fate of the building.

The Minimal Maintenance State

- The goal of the minimal maintenance state (MMS) is to safely preserve assets for reuse. This should be done at the lowest cost in preparation for, and during, detector disassembly
- A stand-alone version of the monitoring system should be developed to track the state of the detector in the MMS. This is in lieu of using the detector's full monitoring system in the data taking phase, which would require substantial computing professional effort.

Silicon Vertex Detector

- During Transition to MMS: electronics to be turned off and locked out; humidification turned off; cooling system drained and dried out.
- Originally intended that during MMS, dry air flow would be maintained. But secular changes due to weather do not interfere with intended disposition
- No monitoring system checks.

Drift Chamber

- Minimal maintenance state:
  - Chamber gas: dry air. Bulkhead flush: dry air.
  - Front end electronics: off.
  - Power supplies: LV off, locked out. HV off, supply locked off.
  - Chiller and cooling water flow off, lines dried.
  - Reduced monitoring system checks gas flow and pressure.

DIRC

- Minimal maintenance state:
  - Electronics off. Low voltage off. High voltage off.
  - Water chiller for electronics off and system drained.
  - Nitrogen flow to bar boxes on to maintain dry atmosphere needed for bar surface.
  - SOB emptied, dried. Purification system off, removed.
  - Reduced monitoring system checks bar box humidity.

EMC

- Minimal maintenance state:
  - Electronics off.
  - Nitrogen flow on to maintain dry environment.
  - Water flow off. System drained. Barrel cooling channels dried out to prevent corrosion of structure.
  - Source system fluorinert (fluid irrradiated by DT generator for 6.1 MeV calibration photons) drained.
  - Fluorinert cooling on, to maintain constant temperature for the glue joint.
  - Reduced monitoring system checks humidity, crystal temperatures, fluorinert chiller operational status (temp out, temp in).

IFR

- Minimal maintenance state:
  - LSTs:
    - Electronics off. Gas changed to nitrogen. HV off. Cooling off.
  - RPCs:
    - Electronics off. Gas off. HV off. Cooling off and drained.
  - No monitoring.

Magnet

- Asset preservation in the MMS:
  - Power supply off.
  - Cryo plant drained and mothballed.
  - Cold mass warmed to room temperature.
  - Vacuum pumps off. Cryostat volume backfilled with nitrogen
  - Stand-alone monitoring system to keep track of temperature and gauges (earthquake).

Minimal Maintenance State Table

2007: expectation

2009: evolution

System	Front-end electronics	Power supplies	Gas	Cooling	Other utilities
SVT	Off	Off	dry air	off, drained	
DCH	Off	Off	dry nitrogen	off	
DRC	Off	Off	dry nitrogen	off, empty	SOB drained, purification system off
EMC	Off	Off	dry nitrogen	fluorinert circulating	water system drained and dried; source system drained
IFR-RPC	Off	Off	dry nitrogen	off, drained	
IFR-LST	Off	Off	dry nitrogen	off, drained	
Trigger	Off	Off	n/a	n/a	
DAQ	Off	Off	n/a	n/a	
Online farm	Off	Off	n/a	n/a	
Safety systems/monitoring/UPS	On	On	n/a	EH cooling on	UPS maintained
Infrastructure	n/a	n/a	n/a	EH cooling on	UPS maintained
Magnet	On	Off	n/a	n/a	vacuum pumps on
IR2 complex	n/a	On	On	On	gas shack limited use

Dry air

Off

On till March: MonteCarlo farm

Pumps off, Backfill N2

Decommission: remove hazards

Detector Transition

- End run April 7, 2008
  - Collaboration decision to maintain the detector in a 'warm ready' state for ~3 months.
    - Purpose:
      - be able to take final calibrations;
      - be able to take data if warranted by results of analysis of Run 7 data

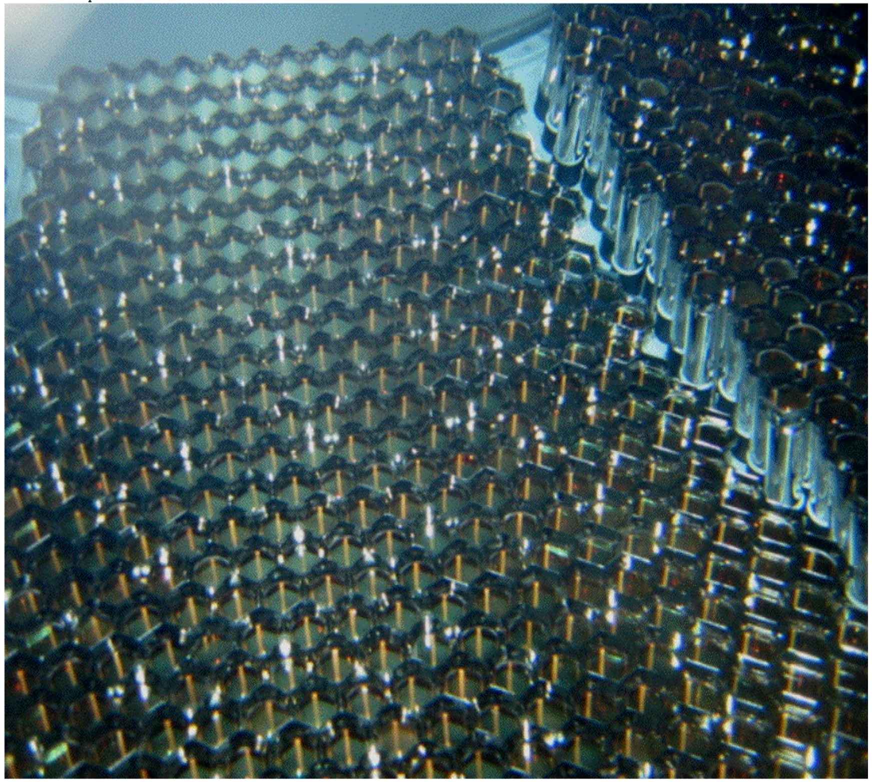
Detector Transition

- Progress to MMS
  - SVT: final calibrations done during first two weeks; cooling systems off and drained. Dry air maintained. Some IR2 magnets were blown out in mid-August. The Be cooling system was drained in the last week of September.
  - DCH: final calibrations done during first week; nitrogen flowing into chamber; front end electronics were turned off in mid July, and water drained from the system & dry air replaced nitrogen in both the main volume and bulkhead spaces.
  - DIRC: final calibrations done in first two weeks; electronics and chiller system off; chiller system drained July 3; SOB was drained on August 20 and SOB and phototube faces dried. Water purification system was kept running until early October. N2 flow to keep bar boxes dry, as well as SOB, continues.

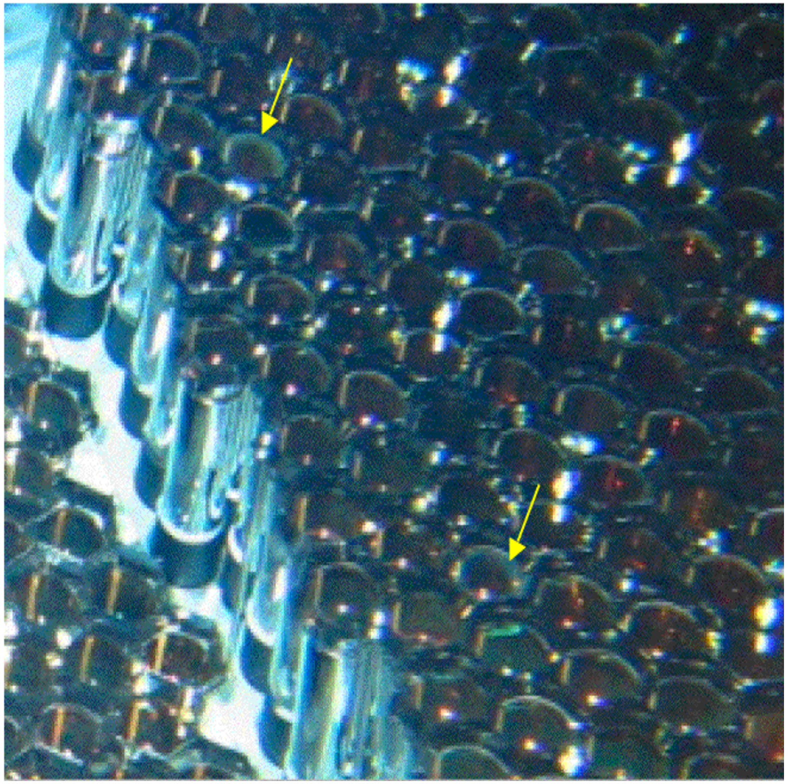
DIRC PMTs

- Peek at the PMTs in SOB while the optical coupling is good. At first glance looks ok.
  - But: some tubes have a whitish ring near the light catcher → something to investigate when the SOB is opened.

Sector 5 and portion of sector 6:



Sector 6"

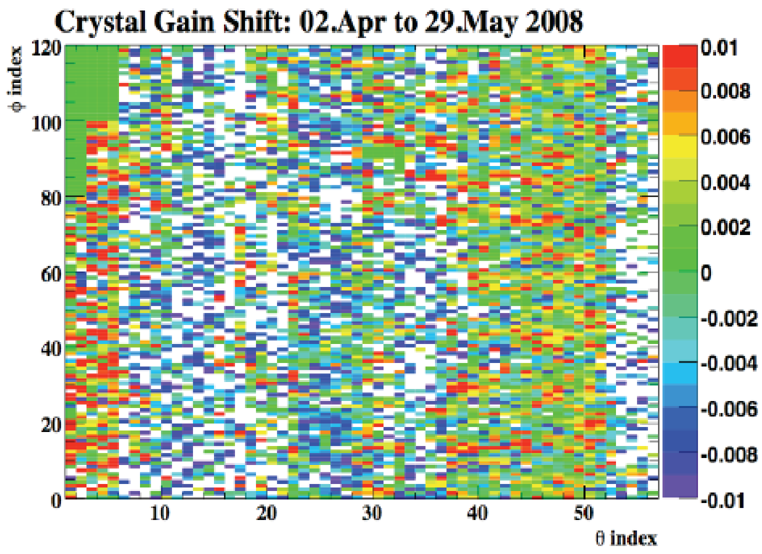


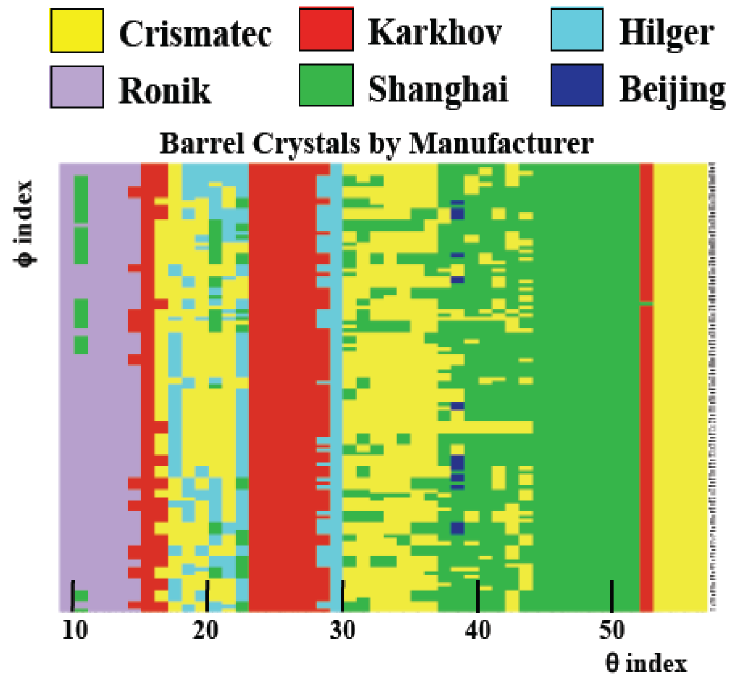
Detector Transition

- Progress to MMS
  - EMC: source calibrations continue until the end of the warm ready state. The last calibration was done mid July. Water was drained from barrel cooling channels to avoid corrosion on Al structure in the last week of July. The patch where the aft water cooling circuit had developed a leak early in the running life of the experiment was OK. Fluorinert flow for barrel and endcap cooling continues till disassembly to keep stress off photodiode-crystal glue joint. N2 flow maintained to keep crystals dry.

Crystal light yield recovery

- EMC source calibrations taken during startups show that certain crystal groups light yield increase from their values at the end of running periods.
  - Mainly crystals manufactured by Crismatec (yellow on right plot)
- After running was complete, goal is to take a series of source calibrations to track and understand the recovery process of the crystals.
  - Calibrations taken approximately every 3 ± 1 weeks.





Detector Transition

- Progress to MMS
  - IFR-RPC: final plateau runs taken in the week following end of data taking; gas off for both avalanche and streamer mode chambers. Chambers open to air.
  - IFR-LST: final plateau runs taken in the week following end of data taking; nitrogen flowing through tubes.
  - Access control: Omnilocks (code for each user, entry recorded) installed on entries into IR2, including PEP South IR2 Adit; Omnilocks also installed on EH and Computing Alcove.
  - Level 3 Trigger farm adapted for Monte Carlo production.
  - Magnet and Cryo-sytems: magnet off; cooling for magnet off; liquifier/compressor system repaired/regenerated before most of cryogenics staff left – now mothballed.

Detector Transition

- Progress to MMS: Monitoring System
  - Defined items to monitor at collaboration meeting early June
  - Progress on monitoring system:

* installed MMS application server
 - Dell 2950 purchased Sep 2007
 - stand-alone RedHat 5
   - non-taylored - update via RedHat subscription
   - minimum dependencies on SLAC core services
 - internal RAID with 500 GB for archive data + 80 GB for applications

* installed control software
 - EPICS version 3.14.7 (BaBar Production version) ported to RedHat5
 - standard EPICS Channel Archiver
 - will provide access to live + archived data through "StripTool","DM" display manager and JAVA archiver viewer
 - no dependencies on BaBar releases or packages

* IOC
 - one installed
 - most recent hardware used by BaBar
   - mvme5500 running Linux
 - driver support for VSAM, SIAM and CANBUS
   - covers all sensors we want to monitor

* servers were shut down at IR2 on August 22

* put the MMS core infrastructure hardware in place

* started to move sensors to the MMS in the last week of August.

Move completed second week of September. Includes fault warning.

Wisniewski, William

From: BaBar Online Detector Control [babarodc@slac.stanford.edu]
Sent: Friday, March 13, 2009 9:28 AM
To: Wisniewski, William
Subject: ALERT from BaBar MMS monitoring

```
MMS: DRC:CAN2:ST29:ALLVAL26= 115.096 is in MAJOR alarm (DRC N2 WARNING)
```

Magnet MMS

- Moving the magnet to its final MMS configuration was a very slow process:
  - June 30: 210K July 21: 228K Aug 27: 251K
  - Sept 23: 263K Oct 21: 271.6 Nov 21: 278.1
  - Dec 3: 280.1K Dec 15: 281.4 Dec 19: 281.6
  - Turn off one of the vacuum pumps
  - Jan 5: 282.9K Jan 20: 283.9 Feb 2: 284.7
  - Back-fill with nitrogen
  - Feb 3: 286.1K Feb 4: 287.1K MMS achieved.

D&D Planning History

- First round of planning for D&D of the BaBar detector was prepared for review August '07.
- Elements of the plan:
  - FY09: BaBar transitions to the MMS in the quarter following the end of data taking.
  - FY10-FY14: keep the detector in the MMS to preserve equipment. Look to possibility of reuse of components (for example: offshore SuperB Factory).
  - About FY15: Dismantle and dispose of the detector if strategic reuse does not materialize, subject to the DOE order dealing with Metals Suspension.
  - Identify components with long term value.
  - Schedule: 45 months to fully disassemble the detector (sequential process)(some steps are crane limited). Requires the use of 2 IR halls.
  - Preliminary cost estimate was $9.4M, no disposal costs.
  - Next steps were seen as: identifying project team, refine the cost estimate, preserving and documenting tooling, develop plan including disposal.

Digression

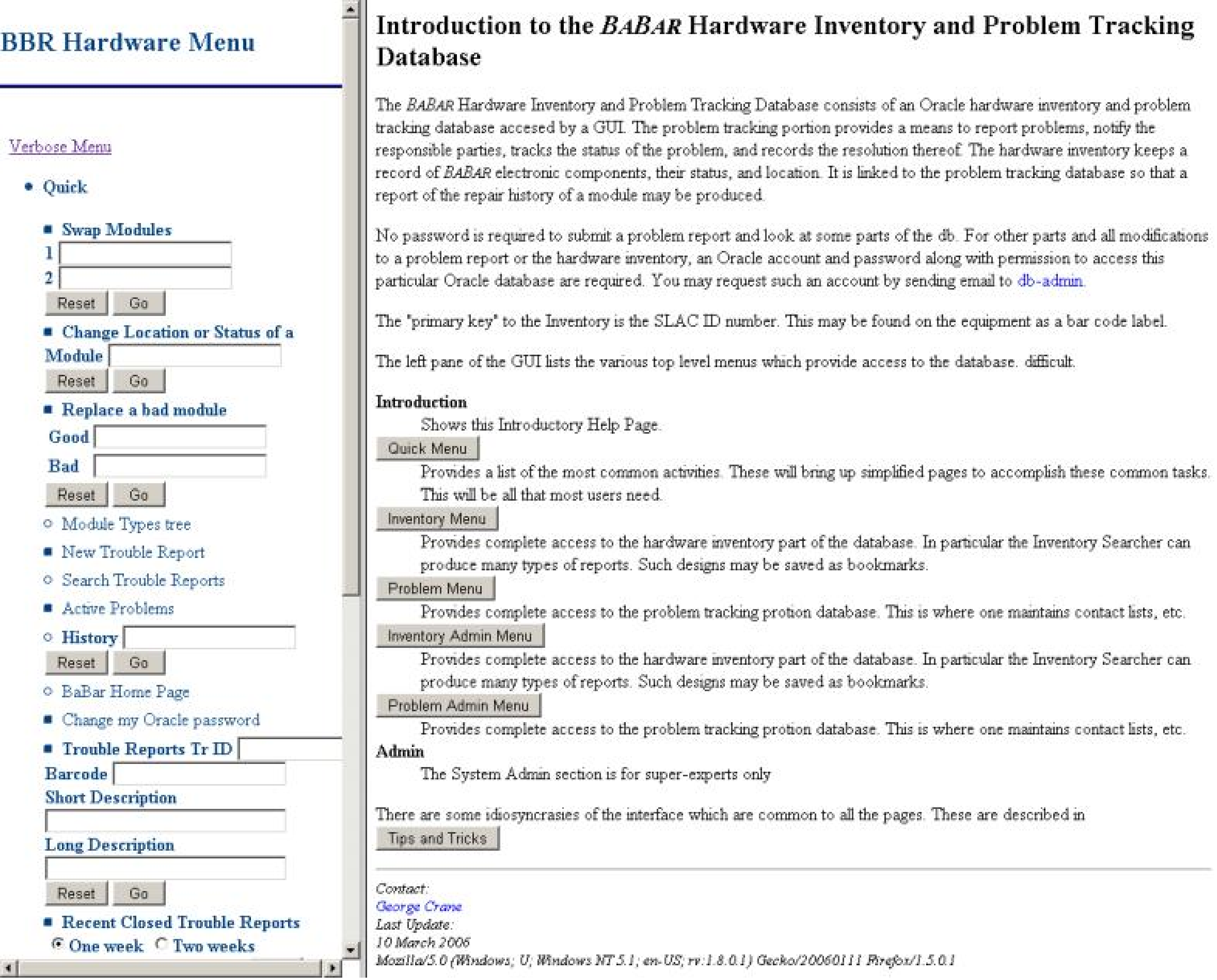
- A word about Metals Suspension:
  - Details will appear in the final talks tomorrow morning. Details of how BaBar D&D will handle all materials will appear in a talk this afternoon.
  - The Metals Suspension restricts the distribution of metals that potentially *may* be activated in bulk because of their stay in the accelerator housing during beam operations. These materials become ‘hold materials’ that require careful handling and record keeping, and may not be free released as scrap metals.

D&D Planning History

- Key recommendations from the review:
  - Database of all equipment, future potential for reuse…
  - Duration of the MMS, cost consequences, eliminate it….
  - Planning for demolition and disposal should begin in FY2008, even if it would begin in 2015.
  - Best if disassembly starts as soon as possible by the physicists and engineers who have detailed knowledge of the detector before they are attracted to other projects.
  - Activities timeline and spending profile to be developed.
  - Bottoms-up cost estimate.
  - Detailed consideration of metals suspension, activated equipment handling, materials disposal.
- Comment from the DOE annual program review (2008):
  - Give high priority to develop a process to deal with the metals suspension.

D&D Planning

- Reactions to the recommendations:
  - Database of all equipment, future potential for reuse…
    - Databases of electronics parts and cables exist. Most straightforward scheme followed after discussions with database experts which suggested a new database would be a long time in arriving. That most straight forward scheme is to use the existing equipment database, since it already has many of the items in it, and has sufficient flexibility to cover mechanical materials.
    - Philosophy:
      - Electronics already captured; update locations as they come off the detector/out of the EH, and are stored, or disposed of.
      - Mechanical items, as they come off the detector will be bar-coded, stenciled where appropriate. Smaller items will be combined into a bar-coded barrel, rather than recorded individually, with their source location included. Cable segments not reused will be stored in grey holding bins which will be bar coded and stenciled, and labeled as hold material. (Details of materials disposition in a later talk).
    - Some details of the database appear in the following slides.



BBR Hardware Menu

Verbose Menu

- Quick
  - Swap Modules
    1
    2
    Reset Go
  - Change Location or Status of a Module
    Reset Go
  - Replace a bad module
    Good
    Bad
    Reset Go
  - Module Types tree
  - New Trouble Report
  - Search Trouble Reports
  - Active Problems
  - History
    Reset Go
  - BaBar Home Page
  - Change my Oracle password
  - Trouble Reports Tr ID
    Barcode
    Short Description
    Long Description
    Reset Go
  - Recent Closed Trouble Reports
    One week Two weeks

Introduction to the *BABAR* Hardware Inventory and Problem Tracking Database

The *BABAR* Hardware Inventory and Problem Tracking Database consists of an Oracle hardware inventory and problem tracking database accesed by a GUI. The problem tracking portion provides a means to report problems, notify the responsible parties, tracks the status of the problem, and records the resolution thereof. The hardware inventory keeps a record of *BABAR* electronic components, their status, and location. It is linked to the problem tracking database so that a report of the repair history of a module may be produced.

No password is required to submit a problem report and look at some parts of the db. For other parts and all modifications to a problem report or the hardware inventory, an Oracle account and password along with permission to access this particular Oracle database are required. You may request such an account by sending email to db-admin.

The "primary key" to the Inventory is the SLAC ID number. This may be found on the equipment as a bar code label.

The left pane of the GUI lists the various top level menus which provide access to the database. difficult.

Introduction

Shows this Introductory Help Page.

Quick Menu

Provides a list of the most common activities. These will bring up simplified pages to accomplish these common tasks. This will be all that most users need.

Inventory Menu

Provides complete access to the hardware inventory part of the database. In particular the Inventory Searcher can produce many types of reports. Such designs may be saved as bookmarks.

Problem Menu

Provides complete access to the problem tracking protion database. This is where one maintains contact lists, etc.

Inventory Admin Menu

Provides complete access to the hardware inventory part of the database. In particular the Inventory Searcher can produce many types of reports. Such designs may be saved as bookmarks.

Problem Admin Menu

Provides complete access to the problem tracking protion database. This is where one maintains contact lists, etc.

Admin

The System Admin section is for super-experts only

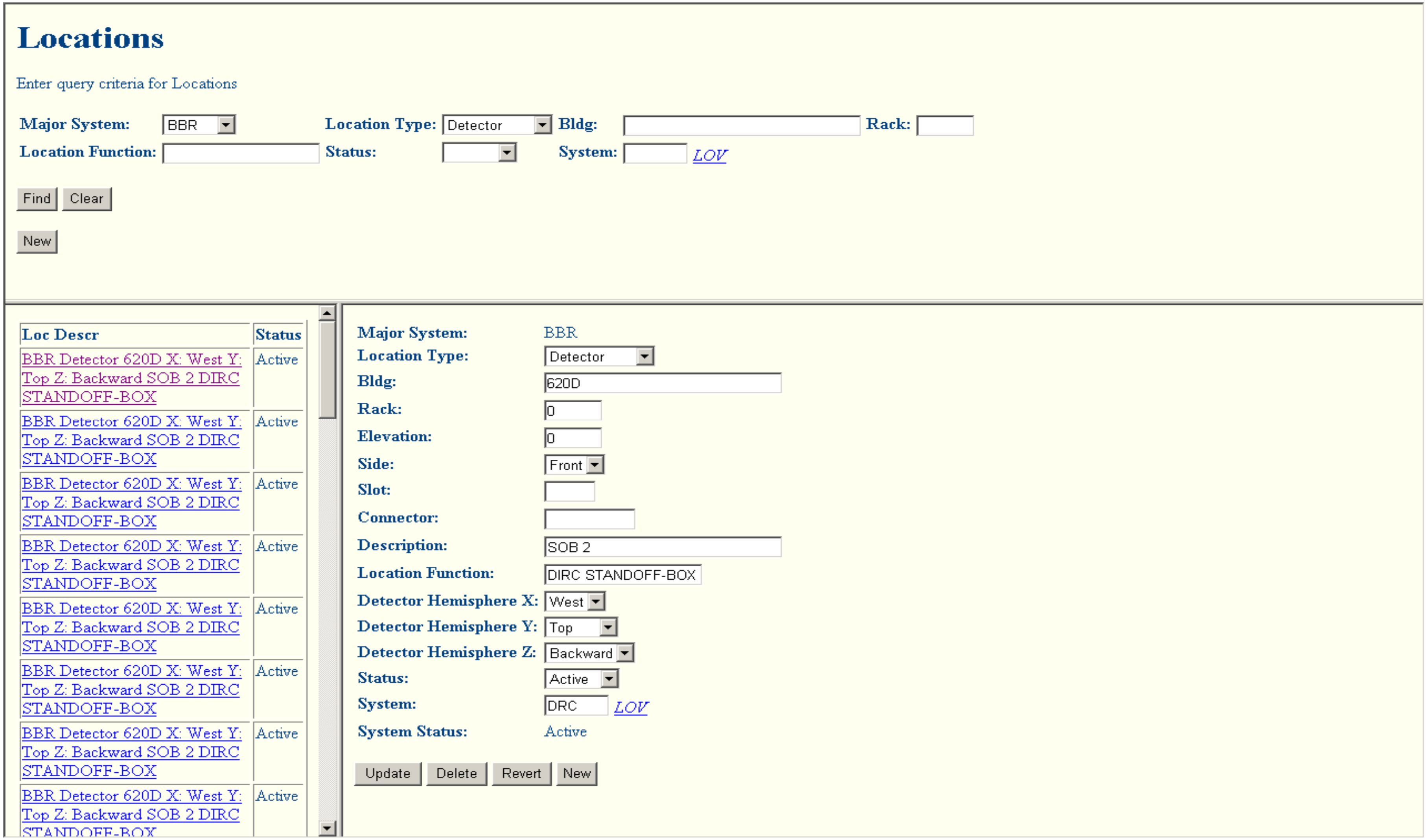
There are some idiosyncrasies of the interface which are common to all the pages. These are described in

Tips and Tricks

Contact:
George Crane
Last Update:
10 March 2006
Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.8.0.1) Gecko/20060111 Firefox/1.5.0.1

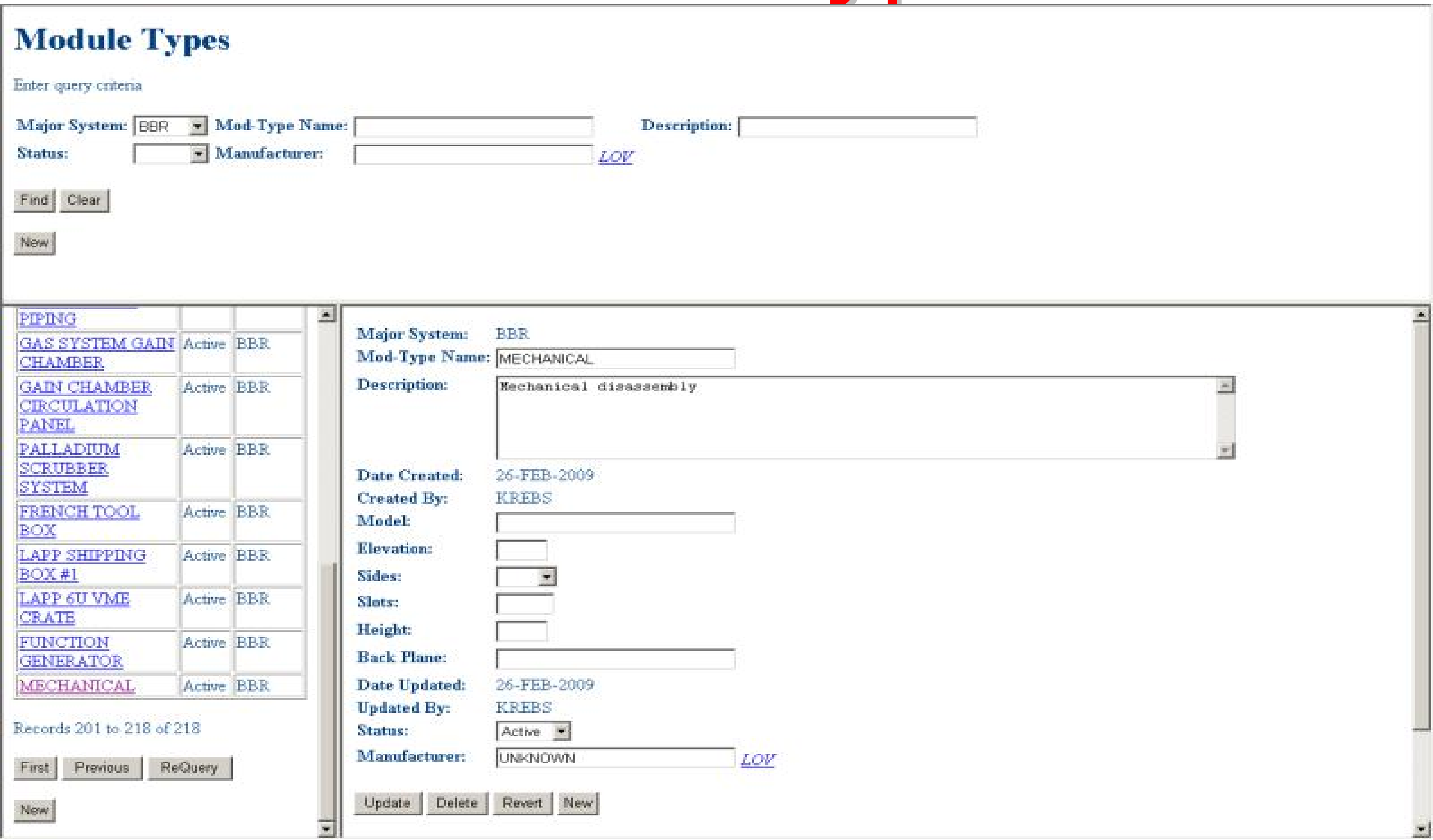
Hardware Database Home page.

Define Locations



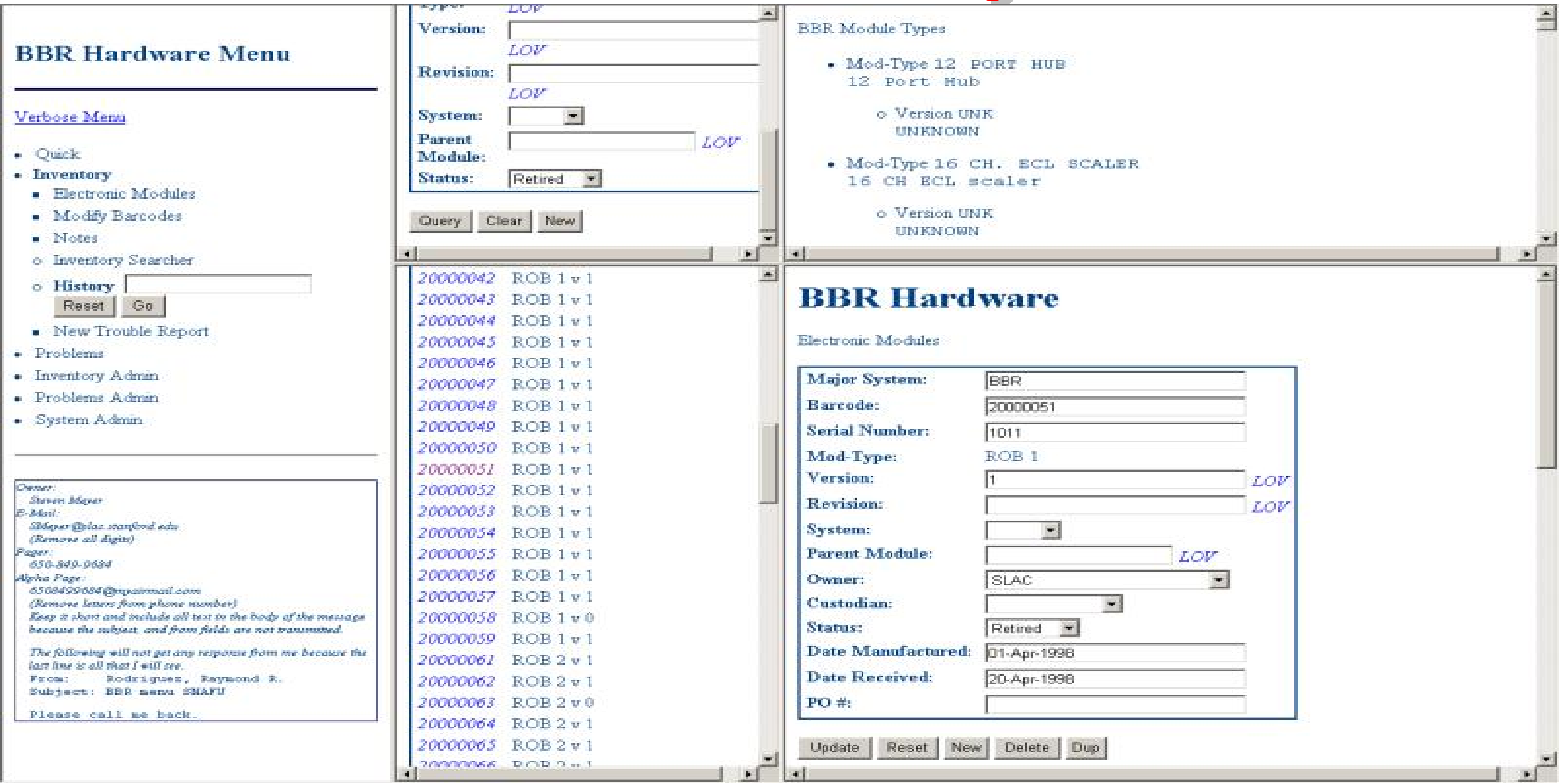
- Predetermine locations or add new ones as you progress
- Searchable by locations and location types

Module Types



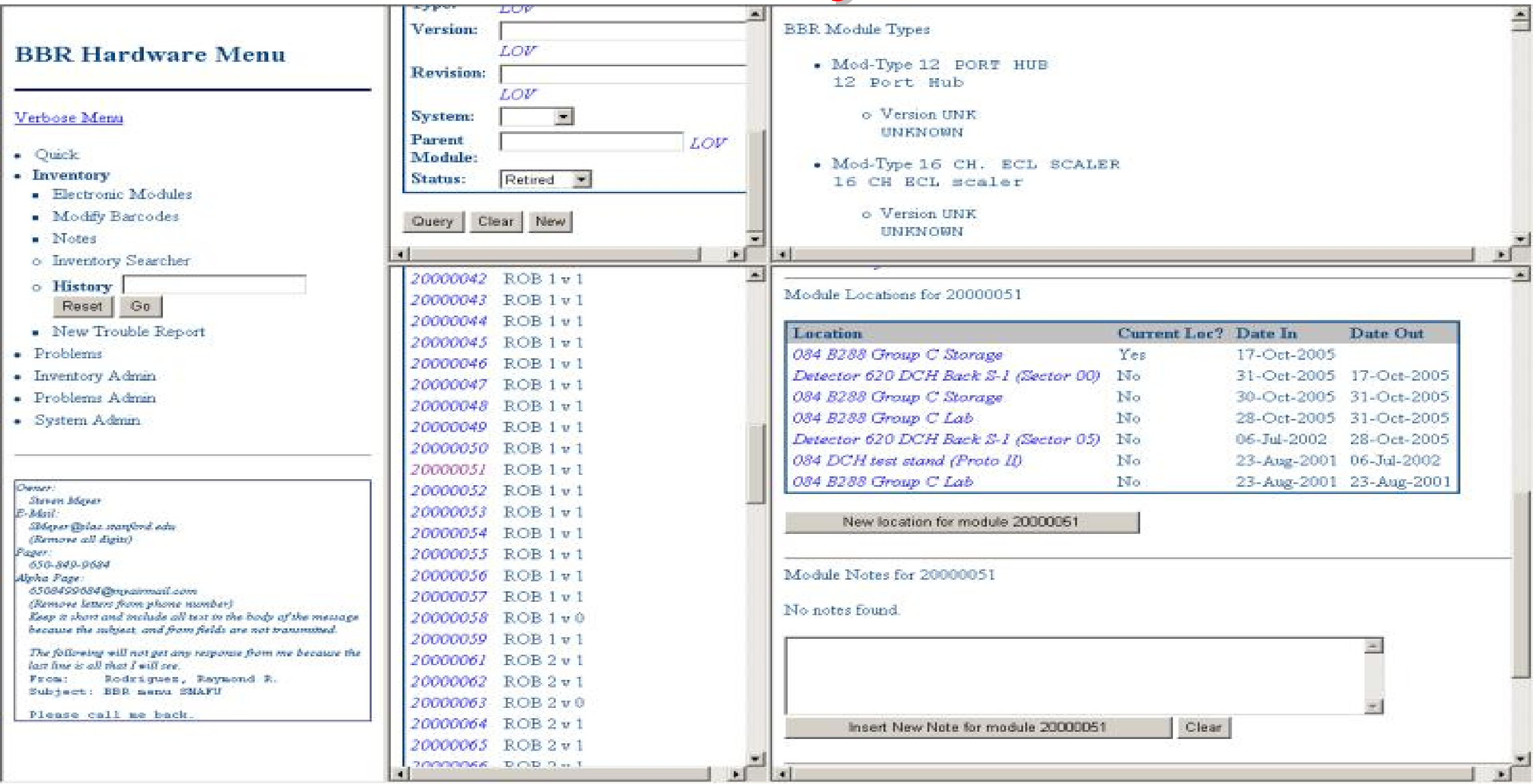
- Again, predefine Module types or add as work is progressing
- Searchable by Module types

Inventory



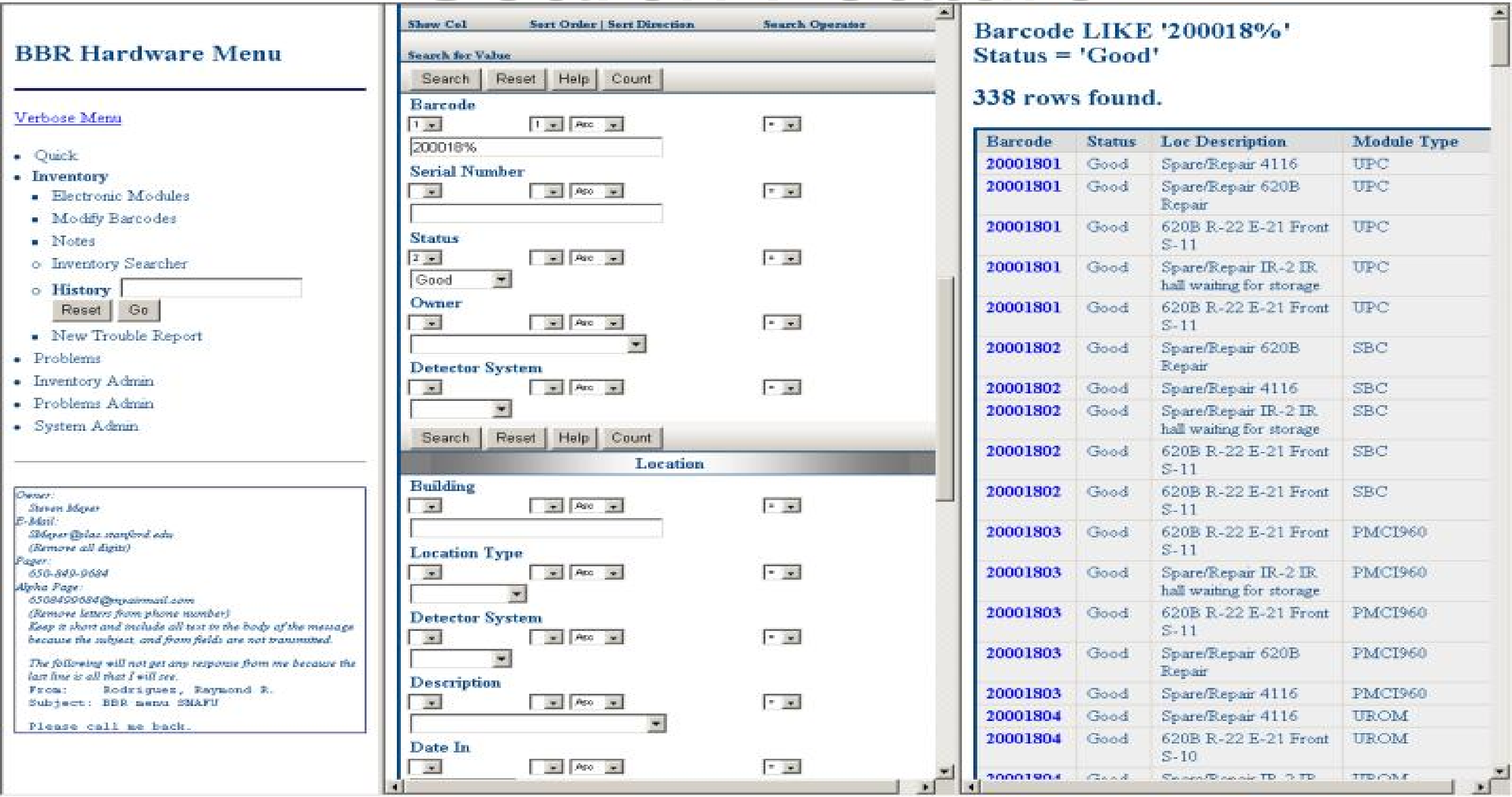
- Can check current location of a particular Module
- Individual Modules are identified by the barcode number
- Can have many of a specific Module but only one instance of a barcode number

Location History and Notes



- Location History is identified and tracked
- “Notes” is simply a text field
  - Hope to use this to identify the location of radiological surveys, photos, special disposition notes.
- ***<u>Some level of institutional discipline will be required</u>***

Search Feature



- Database is "searchable" by any field
- Search can be sorted and prioritized by fields
- Search can be bookmarked so that it can be repeated without rebuilding the search

Mechanical disassembly input form.

BaBar Mechanical Disassembly Materials Database Input Form (v7)

DESCRIPTION:

Bar Code Number: 20006 ☐ Stencil Date: ____

Module Type: ☐ Mechanical Serial Number (Specific Part Name): ____

System:
- ☐ BFR (Barrel Flux Return)
- ☐ DCH (Drift Chamber)
- ☐ DRC (DIRC)
- ☐ EDFR (End Door Flux Return)
- ☐ EMC (Calorimeter)
- ☐ IFRL (LSTs)
- ☐ IFRR (RPCs)
- ☐ MAG (BaBar Magnet System)
- ☐ MEW (Miscellaneous E-Waste)
- ☐ MMC (Miscellaneous Metals & Cables)
- ☐ MSH (Miscellaneous Shielding w/Metal)
- ☐ MVPP (Miscellaneous Valve Panels & Piping)
- ☐ NIR (PEP IR-2 Near Interaction Region)
- ☐ SVT (Vertex Tracker)
- ☐ WSP (Walkways, Stairways & Platforms)
- ☐

Owner: ☐ SLAC ☐ Other: ____

Custodian: ☐ SLAC ☐ Other: ____

Status: ☐ RP Surveyed (see Notes) ☐ Non-Accel Hsg

Notes: ____

Photo location: V:\Babar\DND\matdbphotos

ORIGINAL LOCATION:
- ☐ BBRDetector~620Center,Center,Backward
- ☐ BBRDetector~620Center,Center,Center
- ☐ BBRDetector~620Center,Center,Forward
- ☐ BBRDetector~620Center,Floor,Backward
- ☐ BBRDetector~620Center,Floor,Center
- ☐ BBRDetector~620Center,Floor,Forward
- ☐ BBRDetector~620Center,Lower,Backward
- ☐ BBRDetector~620Center,Lower,Center
- ☐ BBRDetector~620Center,Lower,Forward
- ☐ BBRDetector~620Center,Upper,Backward
- ☐ BBRDetector~620Center,Upper,Center
- ☐ BBRDetector~620Center,Upper,Forward
- ☐ BBRDetector~620East,Center,Backward
- ☐ BBRDetector~620East,Center,Center
- ☐ BBRDetector~620East,Center,Forward
- ☐ BBRDetector~620East,Floor,Backward
- ☐ BBRDetector~620East,Floor,Center
- ☐ BBRDetector~620East,Floor,Forward
- ☐ BBRDetector~620East,Floor,Various
- ☐ BBRDetector~620East,Lower,Backward
- ☐ BBRDetector~620East,Lower,Center
- ☐ BBRDetector~620East,Lower,Forward
- ☐ BBRDetector~620East,Upper,Backward
- ☐ BBRDetector~620East,Upper,Center
- ☐ BBRDetector~620East,Upper,Forward
- ☐ BBRDetector~620East,Various,Various
- ☐ BBRDetector~620Various,Various,Various
- ☐ BBRDetector~620West,Center,Backward
- ☐ BBRDetector~620West,Center,Center
- ☐ BBRDetector~620West,Center,Forward
- ☐ BBRDetector~620West,Floor,Backward
- ☐ BBRDetector~620West,Floor,Center
- ☐ BBRDetector~620West,Floor,Forward
- ☐ BBRDetector~620West,Lower,Backward
- ☐ BBRDetector~620West,Lower,Center
- ☐ BBRDetector~620West,Lower,Forward
- ☐ BBRDetector~620West,Upper,Backward
- ☐ BBRDetector~620West,Upper,Center
- ☐ BBRDetector~620West,Upper,Forward

NEW LOCATION:
- ☐ BBROther~680Inside
- ☐ BBROther~680Outside
- ☐ BBROther~SLCNAInside
- ☐ BBROther~SLCNAOutside
- ☐ BBROther~Guantanamo
- ☐ BBROther~750Pit

FILLED OUT BY:

☐ Jim Krebs ☐ Zorb Vassilian ☐ Other: ____

D&D Planning

- Reactions to the recommendations:
  - Duration of the MMS, cost consequences, eliminate it….
    - MMS is, for the detector, a means of preserving the assets. Some systems will continue in the MMS even as other systems around them are disassembled. However, the plan for D&D for the review has been advanced to an earlier start.
  - Planning for demolition and disposal should begin in FY2008, even if it would begin in 2015.
    - Begun. See Jim Krebs’ talk later today.

D&D Planning

- Reactions to the recommendations:
  - Best if disassembly starts as soon as possible by the physicists and engineers who have detailed knowledge of the detector before they are attracted to other projects.
    - In 2007, before BaBar's final data taking run was curtailed for budgetary reasons, key mechanical engineering personnel have been temporarily transferred to LCLS to meet pressing needs. With the completion of installation in early December, engineering personnel became available. Other personnel have focused on data-taking operations till early April. Nevertheless, planning effort has gone on to define the scope, develop a schedule, develop a budget, including the spread over the years of the disassembly.
    - Progress has been made in refurbishing tooling, documenting tooling and procedures, and load testing fixtures. Tooling has been located, and collected. Cleanup of unneeded equipment has taken place. Containers have been prepared for storage. A D&D Safety Plan, using experience from the IFR interventions in 2002, 2004, 2005, and 2006, has been developed.

D&D Planning

- Reactions to the recommendations:
  - Bottoms-up cost estimate.
    - Engineering effort in FY09 to refine the estimates further.
    - The current cost estimate, $15.1M, incorporates ~27% contingency. Estimate does not include materials disposal costs, in particular, effects of the metals suspension.
    - Jim Krebs will discuss this item later today.
  - Detailed consideration of metals suspension, activated equipment handling, materials disposal.
    - In conjunction with ESH division personnel, have developed materials disposal scheme.
    - Radiation Physics (ESH), with BaBar participation, has developed a plan for seeking an exemption from the metals suspension. It relies on simulation of expected dose, and measurement, including gamma spectroscopy, of materials removed from BaBar, to verify predicted activities. SSO is aware of progress here. The issue will be discussed in several talks tomorrow.

Summary

- BaBar components have been discussed
  - Long term assets have been identified: superconducting magnet, DIRC bars, crystal calorimeter
- BaBar Minimal Maintenance State described
  - Transition to the MMS is complete
- Reviewed BaBar’s response to the recommendations and comments of past reviews
  - Presented information on database for detector components