

MDT Faraday Cage

Conceptual Design

Purpose of Faraday Cage and Requirements



Front-End Electronics Overview



Inside the Faraday Cage

Electronics - mechanical details (several views)



On-Chamber Gas Distribution



Faraday Cage Itself

Barrel Faraday Cage



Faraday Cage Penetrations



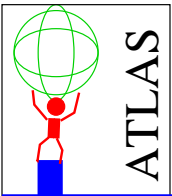
Outside the Faraday Cage

Electrical Services



Summary and Open Issues





MDT Faraday Cage

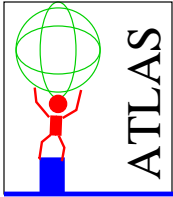
Purpose and Requirements

EMI shielding for front-end electronics

IDEAL: completely sealed enclosure of entire chamber
no openings
all seams, joints covered with 100% conductive material

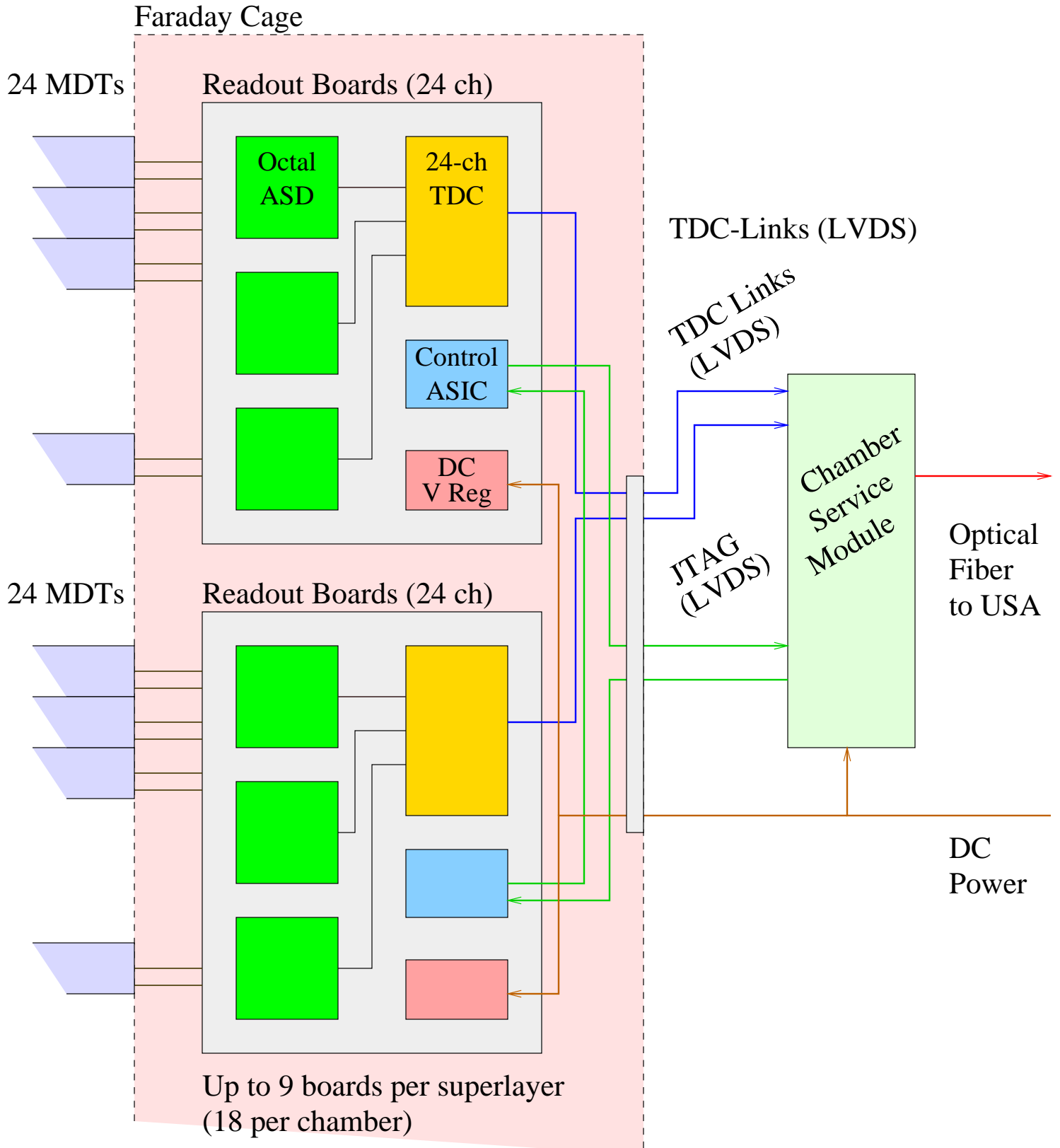
REALITY: complete enclosure is too expensive
gas, electrical, signal, support connections required
perfect sealing of joints is impossible
many openings required

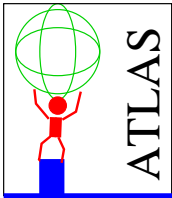
DESIGN: compromise-- two enclosures at opposite ends
close joints as tightly as possible
minimise number of openings



MDT Faraday Cage

Front-End Electronics Overview

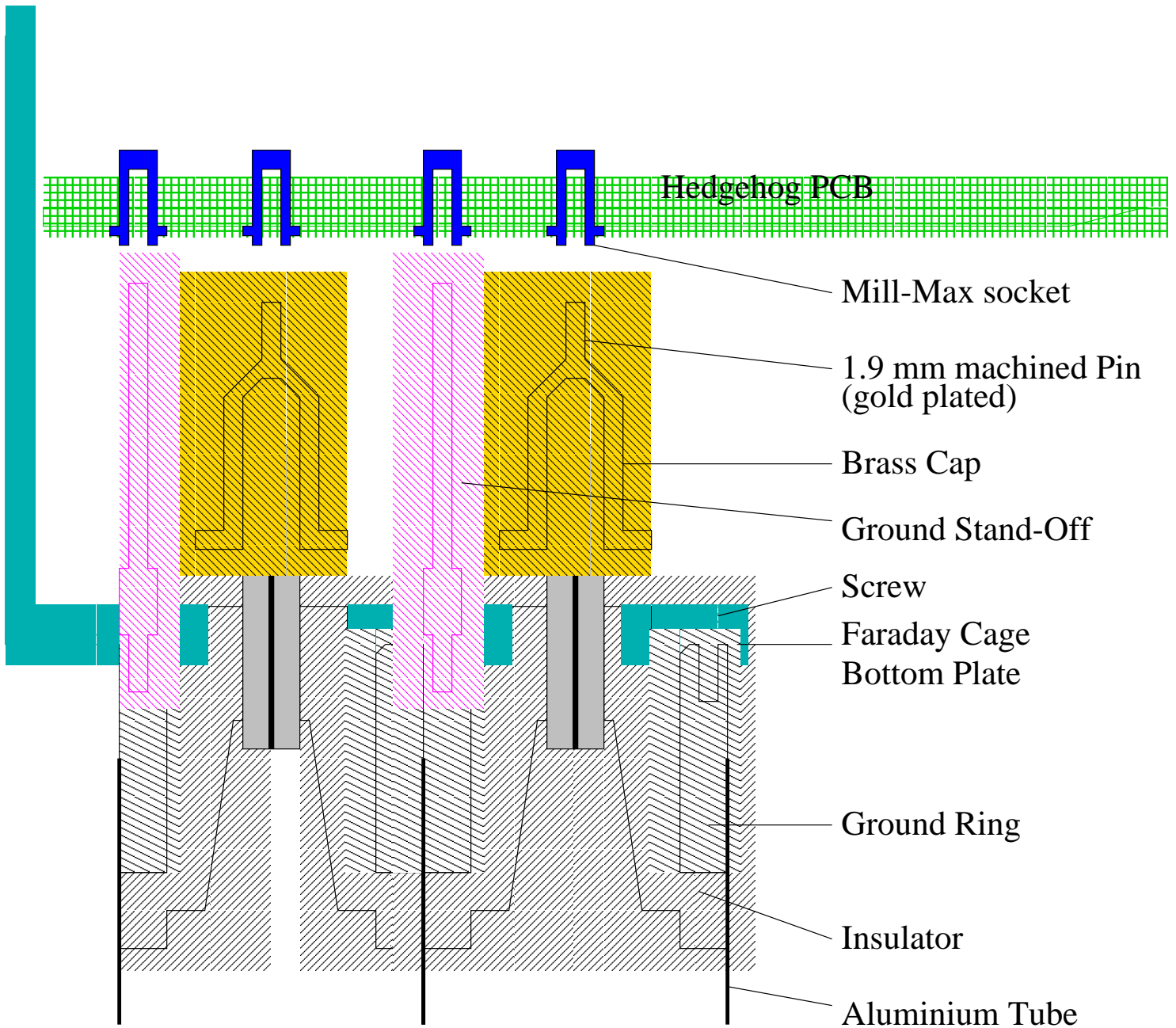




MDT Faraday Cage

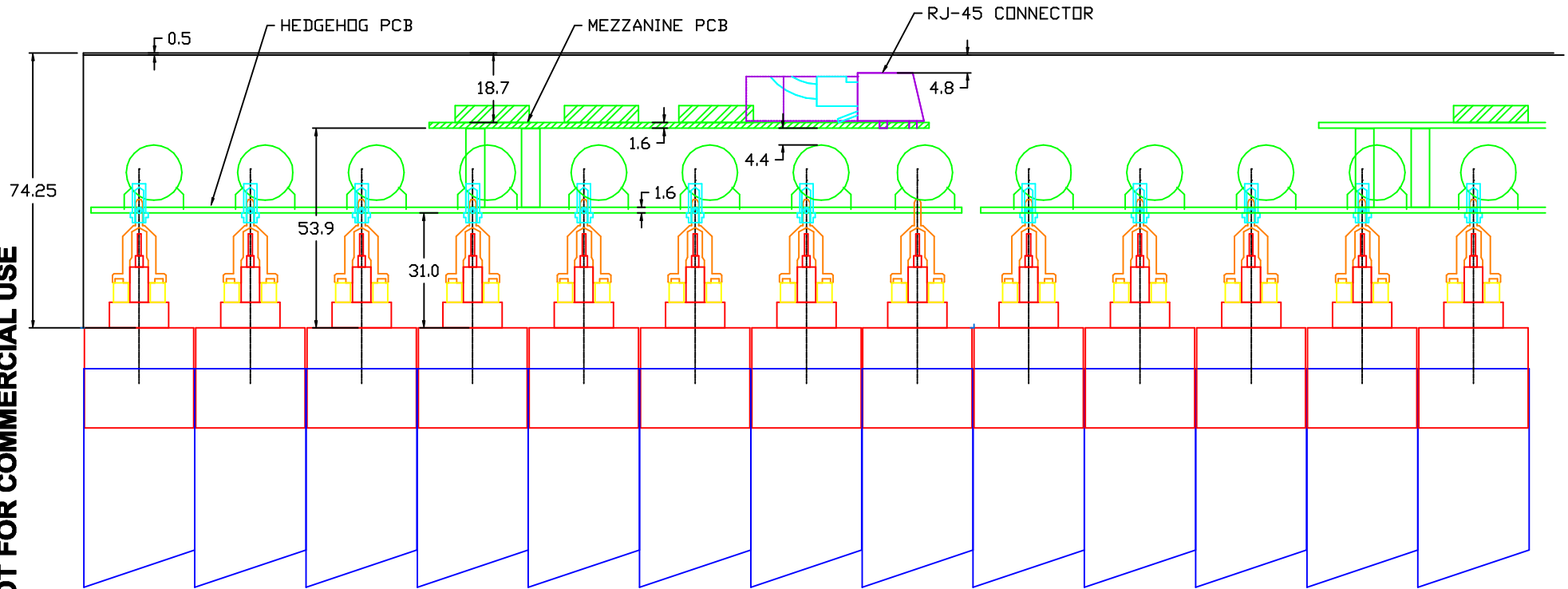
Hedgehog PCB Mounting

NOT TO SCALE



EDUCATION VERSION - NOT FOR COMMERCIAL USE

BM/B0



NOTES: UPDATED to 1998-12-27 Endplug Drawings
TUBES MUST BE SHORTENED 15mm EACH END
TO CONFORM TO M4 ENVELOPE

1999-05-12: ADD DIMS FOR PRR

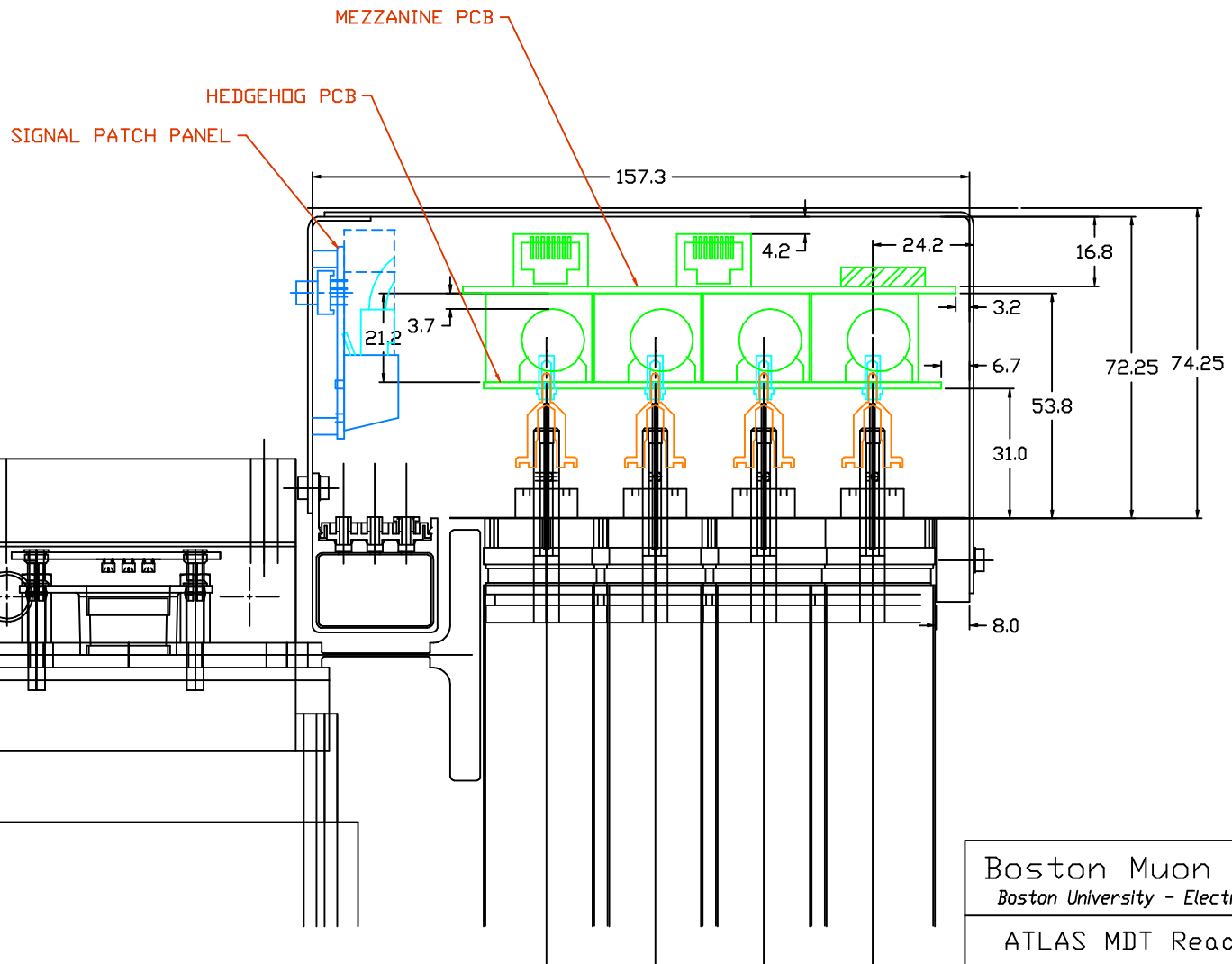
Boston Muon Consortium
Boston University - Electronics Design Facility

ATLAS MDT Readout
BM/B0 Chambers
PCB Stack Reference

SCALE: DO NOT SCALE Revision: XXX

Dwg: E. Hazen Date: 1999-06-04

EDUCATION VERSION - NOT FOR COMMERCIAL USE

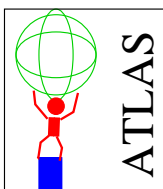


Boston Muon Consortium
Boston University - Electronics Design Facility

ATLAS MDT Readout
BARREL FARADAY CAGE
Reference Drawing

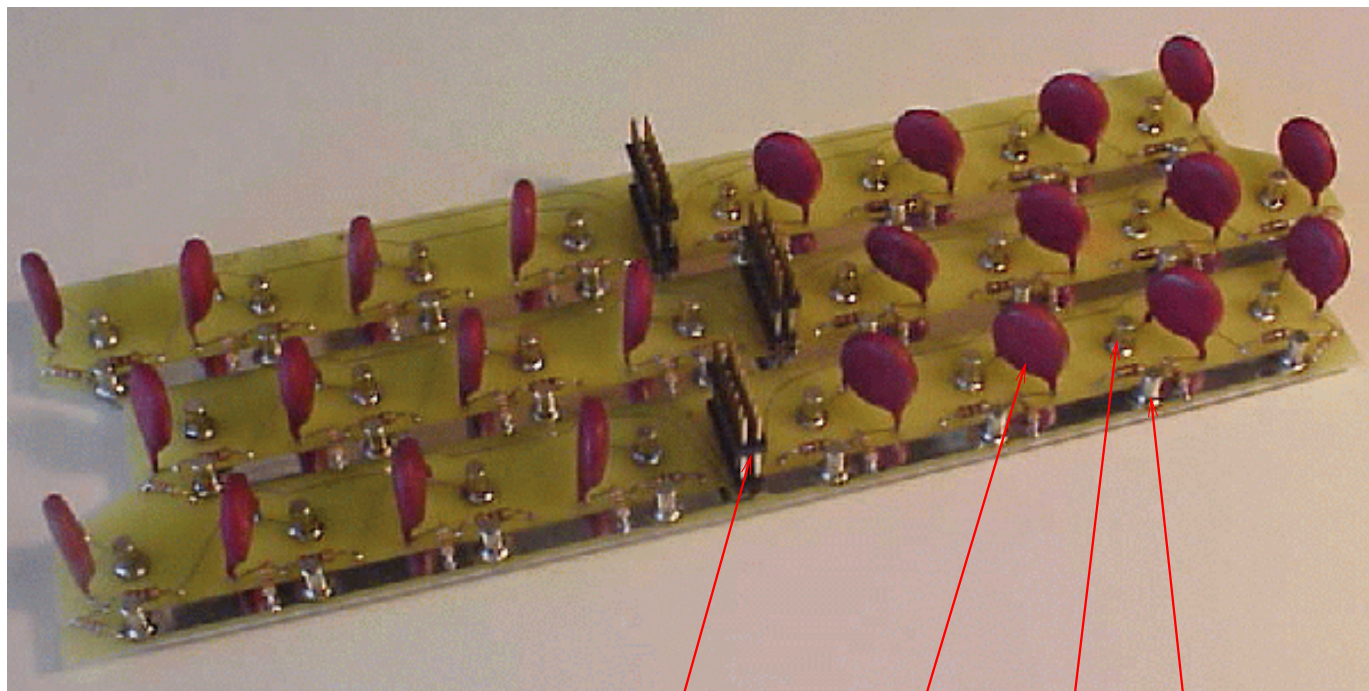
SCALE: *DO NOT SCALE* Revision: *XXX*

Dwg: *E. Hazen* Date: *1999-01-14*



MDT Faraday Cage

Signal Hedgehog PC Board

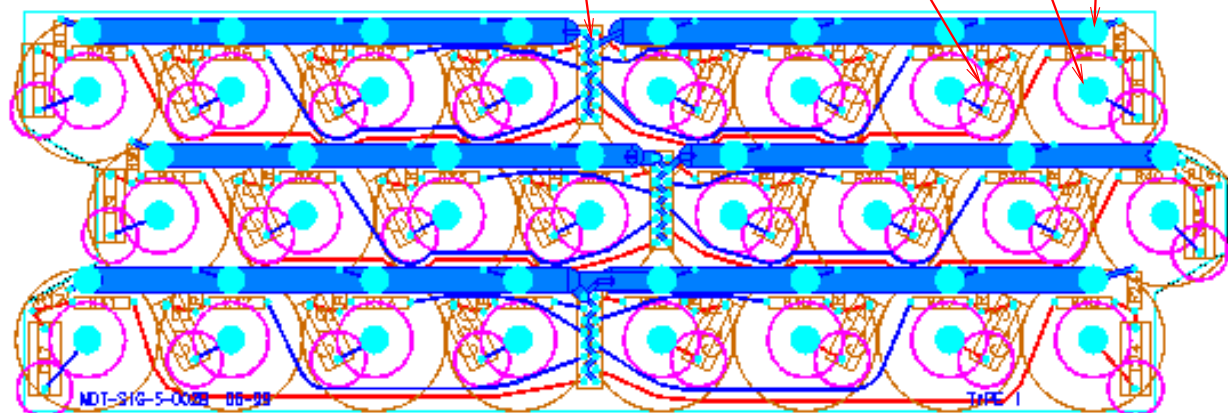


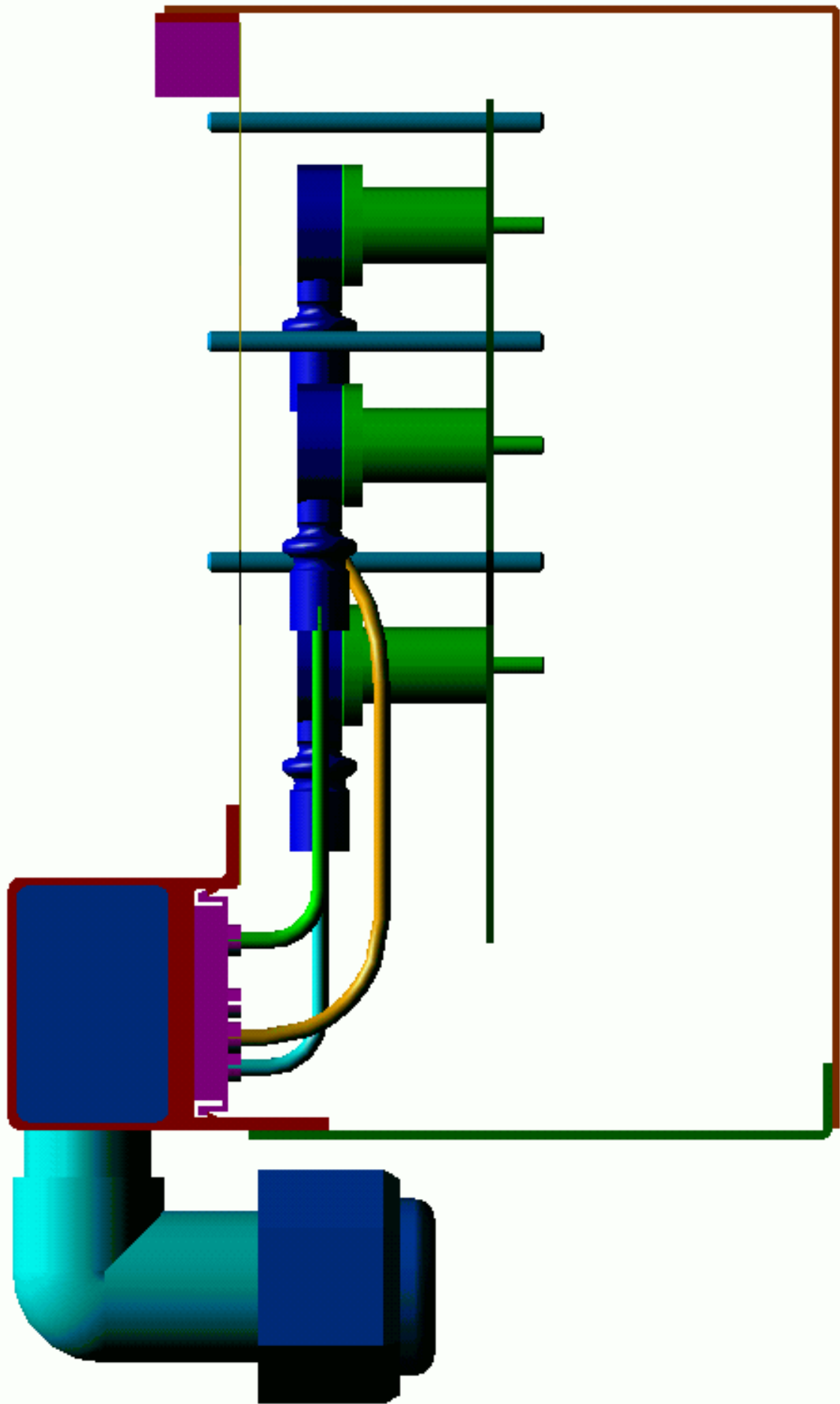
MEZZANINE
CONNECTOR

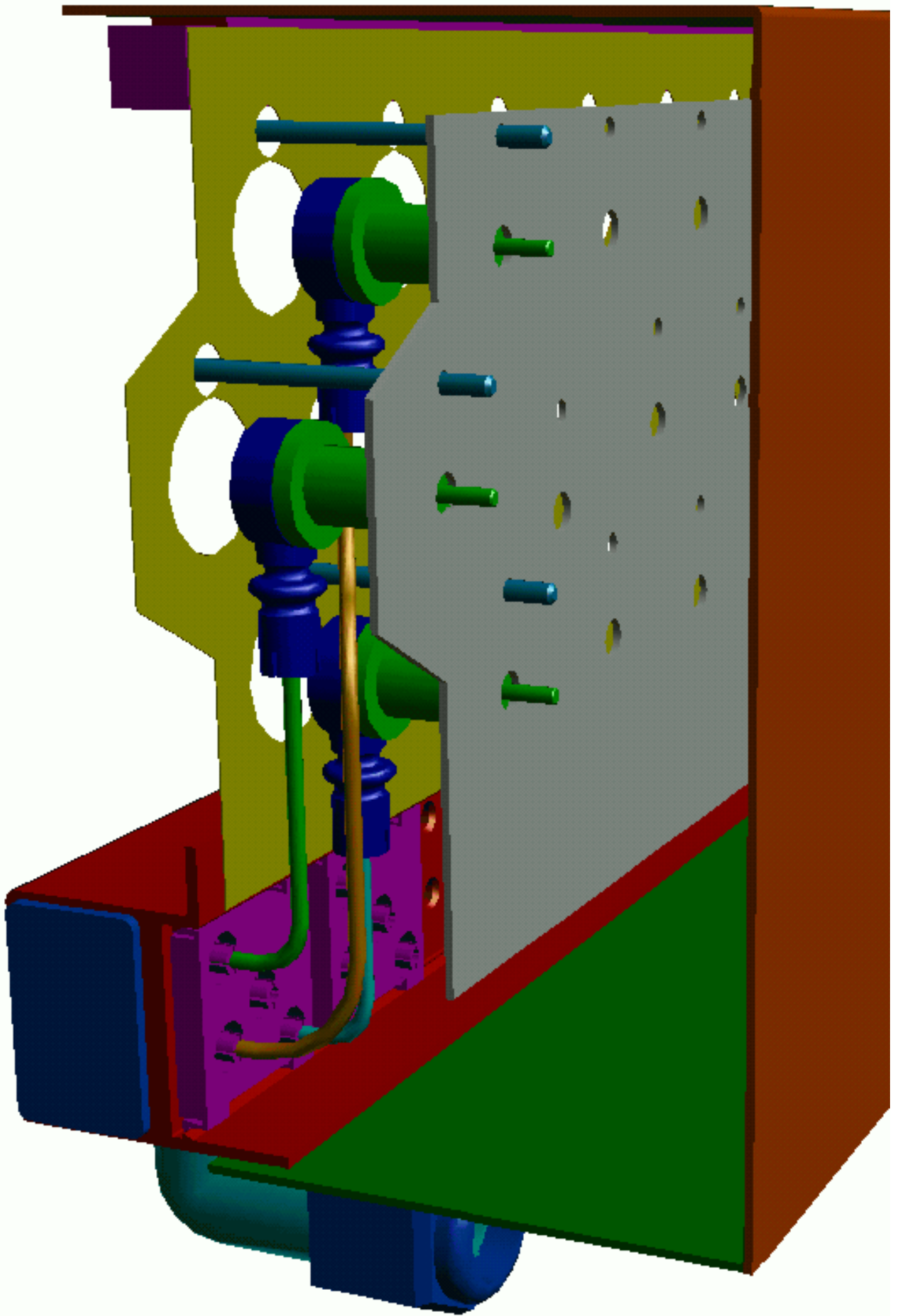
HV
CAP

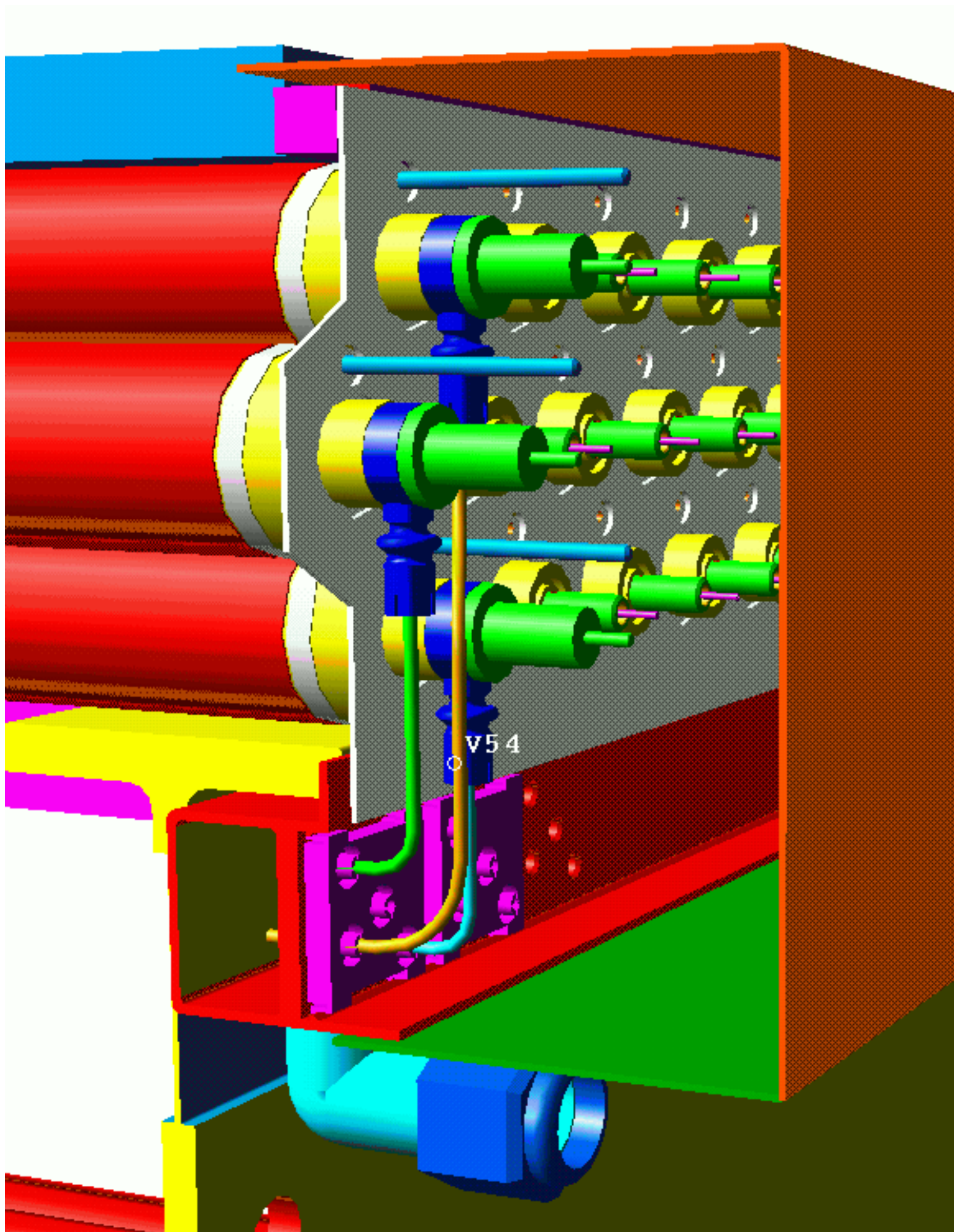
MDT
SIGNAL

MDT
GROUND







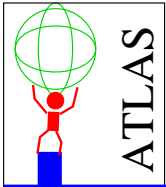




MDT Faraday Cage

Electrical Penetrations

Function	External Cable	Connector	Internal Cable
LVDC	Shielded ~8 AWG	D-type, Shielded shield to F-cage	Unshielded
JTAG (LVDS)	CAT-5 STP	RJ-45, Shielded shield to F-cage	CAT-5 UTP
TDC-Links (LVDS)	Shielded Ribbon	Micro-pitch Header	CAT-5 UTP

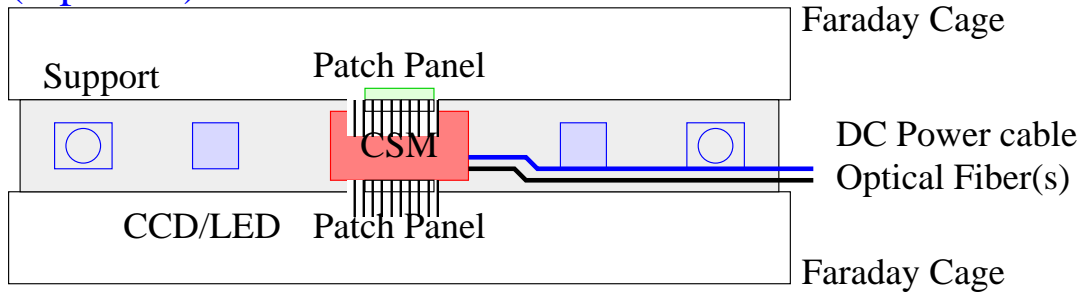


MDT Faraday Cage

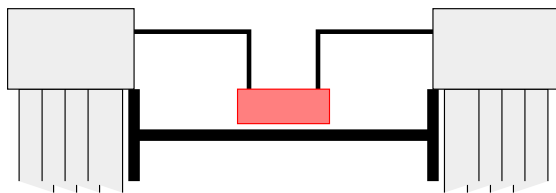
Electrical Services

Patch Panel and CSM are Centrally Located on most chambers:

(top view)

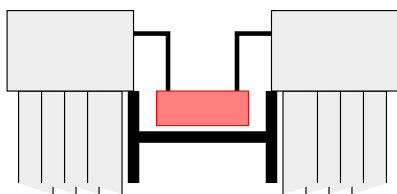


Specific Cases Studied (end views):



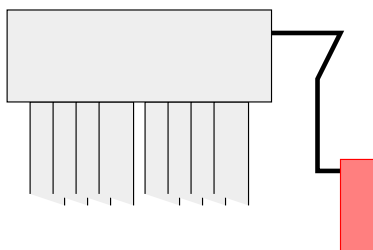
BOL, BML, BOS

317mm spacer

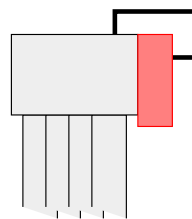


BIL, BMS, BOG, BOH
BMF, BIR

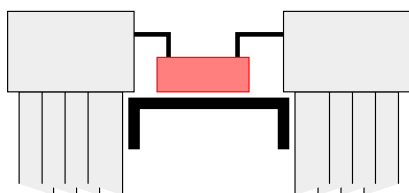
170mm spacer



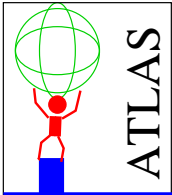
BIS



BEE



Endcap
Chambers (all)



MDT Faraday Cage

Summary

Design Status

Hedgehog PC Boards

Production scheduled to meet requirements for module zero and series production

Faraday Cage Itself

Minor open design issues - tests continue

Wiring inside Faraday Cage

Final design due before 1st module zero

Patch Panel

Chamber Service Module

Installed after chamber production

Wiring outside Faraday Cage

Open Issues

Faraday Cage - how to seal joints?

Ground Connections - tube to Faraday Cage

Alignment of Ground Pins