Rack Layout and Cable Routing

Murrough Landon – 12 November 1999

- Proposed rack layout
- Cable routing
- Holes in shielding wall
- Status

Current Proposal

- Calo Trigger on upper floor of USA15
- Muon Trigger (and CTP, TTC?) on lower floor
- Calo processor in 14 contiguous racks
- Outlying racks for other services (computers etc)
- Receiver crates at the outside, then preprocessor, trigger processors at the centre
- EM one side, hadronic the other side
- Receiver crates grouped by detector (social reasons)
- Muon RPC and TGC processors either side of a gap in the racks
- CTP and TTC racks near the centre (maybe upstairs if necessary?)

Cable Routing

Cables from Detectors

- Cables from detector all brought to the centre
- Into USA15 via six holes: three 300mm upstairs, two 400mm and one 300mm downstairs.
- Used by Calo trigger cables, Muon trigger cables (inc TileCal), return TTC fibres, magnet cables, maybe others?
- Cables from endcaps include loops to allow endcaps to be retracted
- Restricted space near the detectors imposes a maximum bending radius of 10cm. Present LAr cables have 15cm bending radius!

Cabling inside USA15

- Cables to receivers up from the floor
- Receivers to PPMs: across the front
- PPMs to CPMs/JEMs: under floor (or over the top?)
- Cabling to CPMs to the back; JEMs to the front
- Other cabling (from mergers; to RODs) is less bulky
- NB need to check CPM/JEM to ROD cable length

Cables and Holes

LAr Cables

	Cables	Pairs	Crates	TxB*Cables
Barrel	128	16	32	2*2
EMEC	112	16	8*2.5	(2,3,2) * 2
HEC	96	16	8*0.5	2 * 6
FCAL	24	16	0.5	2 * 6
Total	360			

TileCal Cables

	Cables	Pairs	Comments
Barrel	128	9	One/drawer/end
Ext Barr	128	6?	One/drawer/end
Total	256		

NB The Muon trigger also has 256 TileCal cables.

Holes in Shielding Wall

LAr cable diameter is 12.7mm. Using 15mm for safety, 360 cables occupy 81,000mm². Connector is 20*70=1400mm².

Suppose (worst case) TileCal cables are the same as LAr, 256 cables occupy 57,600mm².

Maximum cable bulk is 138,600mm².

Three 300mm diameter holes offer 70,000mm² each. Naive total is 210,000mm². OK!

Deduct space for last 20 connectors, gives 40,000mm² each. Pessimistic hole space is 120,000mm². TOO SMALL!?

Reserve space for only last 10 connectors. Realistic(?) available hole space is 165,000mm². ADEQUATE.

Status

- Rack layout satisfactory...
- ...if cable runs of 10m are acceptable
- TileCal cables still to be chosen...
- ...after LAr choice confirmed/changed?
- Holes seem (just) adequate