UXC55

ME
Muon Endcap
On Detector Layout

Prepared by Fred Borcherding

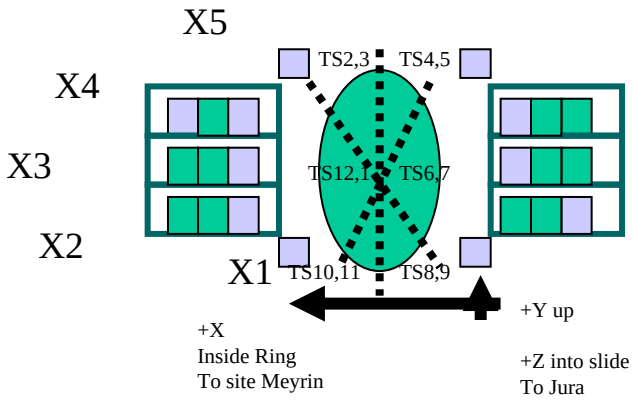
FNAL PPD/CMS

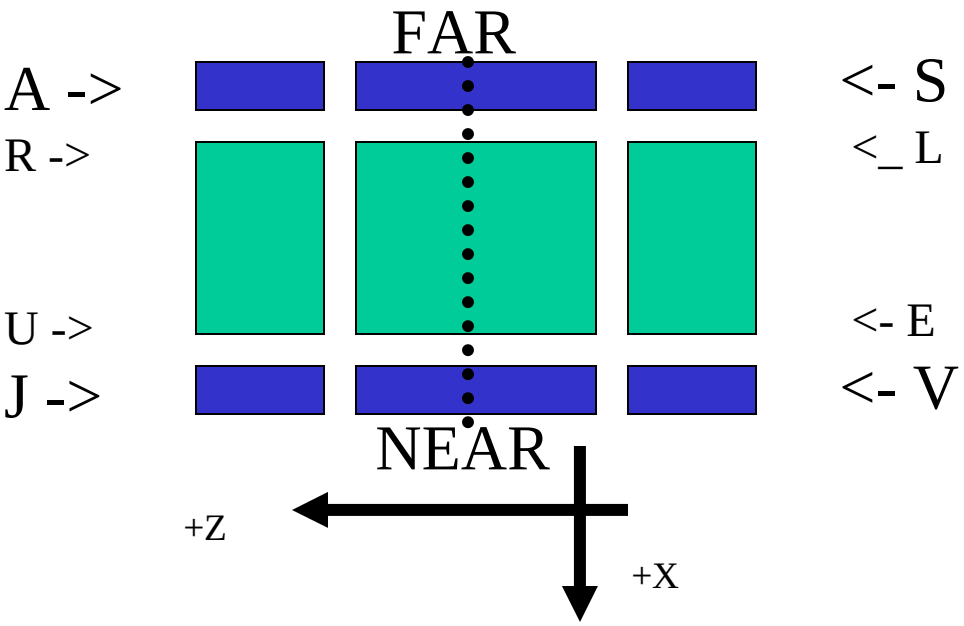
Naming Conventions

- Peripheral Crates, PCs, are Named *VME+1/2*
  - VME(+ or – end) station(1-4)/TS 1- 6 (or12 for ME1)
- CSCs are Named *ME+1/2/m*
  - ME(+ or – end) station(1-4)/ring1, 2 or 3 sequence number m
- Dropping the + or – means the information applies symmetrically to both +Z and –Z ends
  - ME+1 AND ME-1 = ME1
- Key to Rack Names > *X5E31*
  - X1 through X5 are the vertical layers
    - X2, X3 and X4 are the tower layers
    - Y coordinate
  - E, U, J, etc indicate rows in X along Z
    - +Z and –Z have different letter sets
    - X coordinate
  - 3x is on disk YE1, 4x on YE2, 5x on YE3
    - Z coordinate

Rack Naming

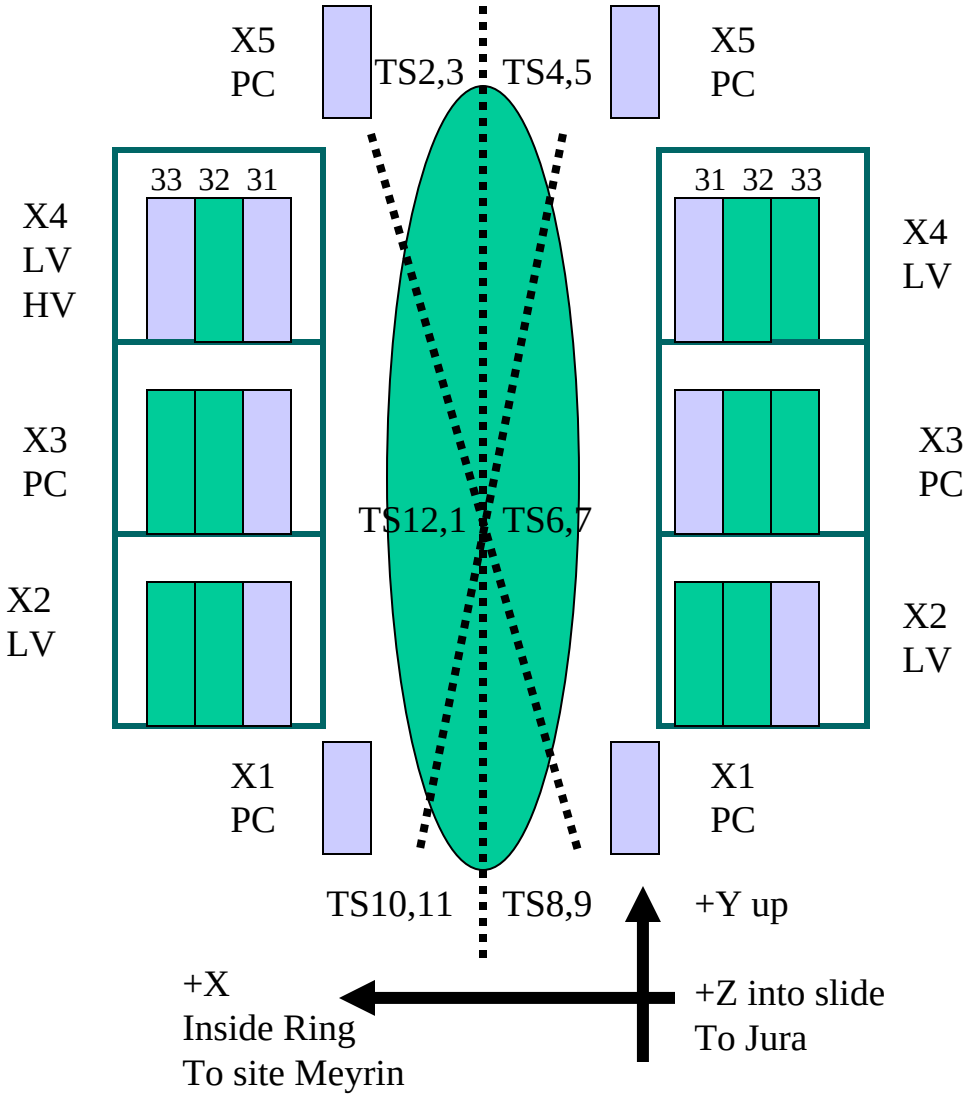
- Convention for RACK Names





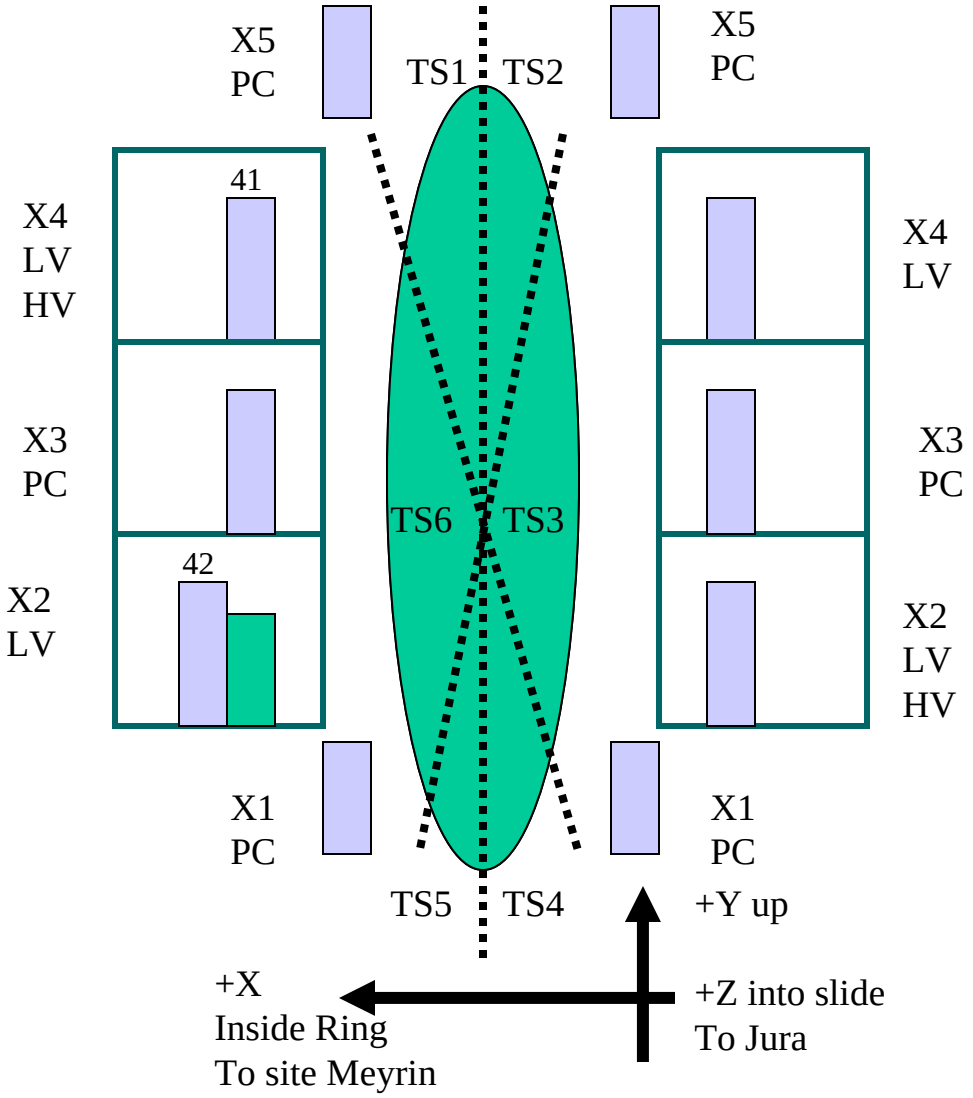
YE+(-)1

- General layout of the YE1 End Cap disks
  - are racks containing CSC hardware



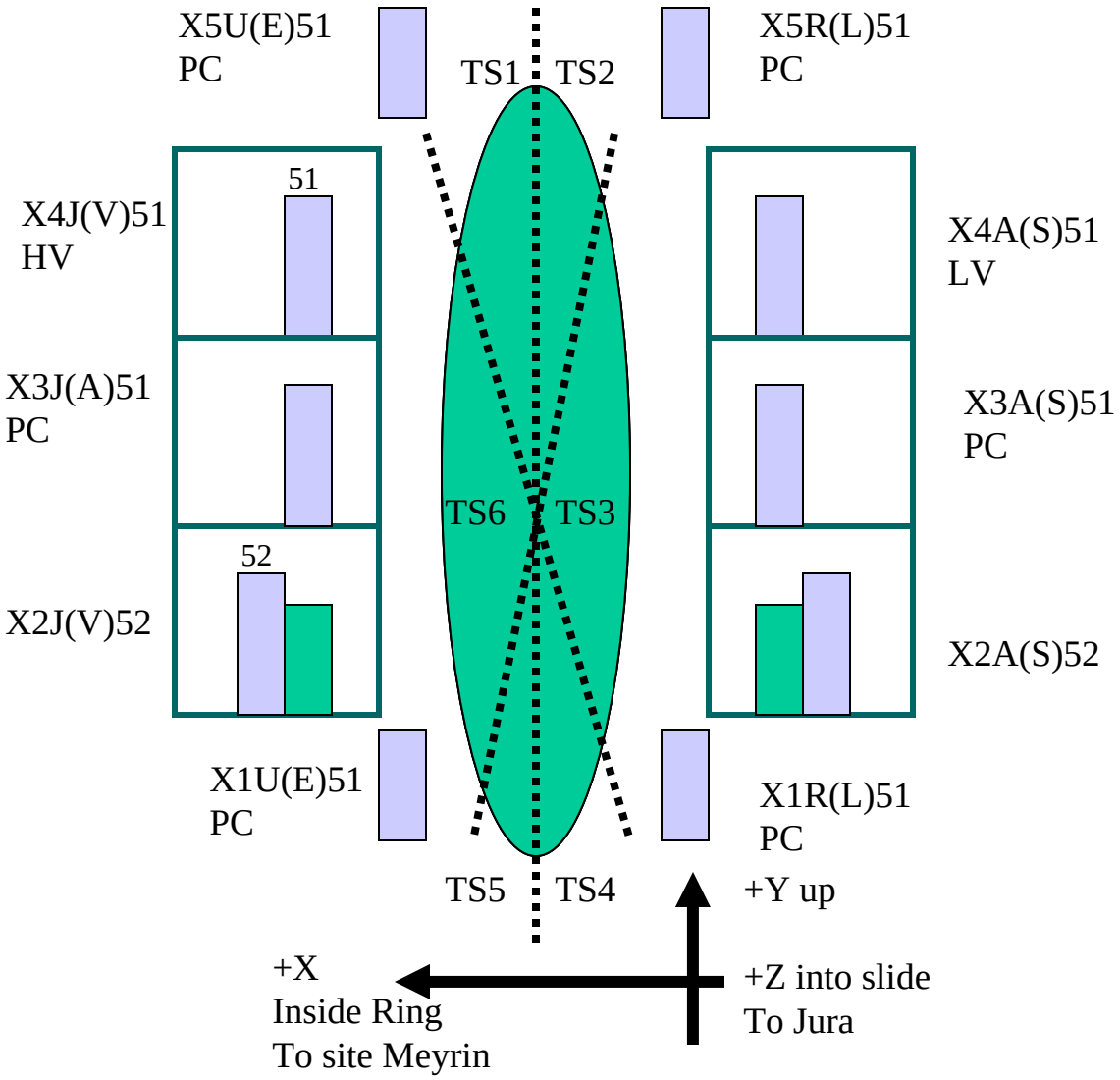
YE+(-)2

- General layout of the YE2 End Cap disks
  - Stations ME2 and ME3



YE+(-)3

- General layout of the YE3 End Cap disks
  - Station ME4



+Z > List of Racks

- **+Z and +X**

- **YE+1**
  - X5U31 – 2xPC
  - X4J31 – ME LV, HE LV, Alignment
  - X4J32
  - X4J33 – ME HV
  - X3J31 – 2xPC
  - X3J32
  - X3J33
  - X2J31 – ME LV, ALIGNMENT
  - X2J32
  - X2J33
  - X1U31 – 2xPC

- **YE+2**
  - X5U41 – 2xPC
  - X4J41 – ME LV, ME HV
  - X3J41 – 2xPC & Alignment
  - X2J42 – ME LV
  - X1U41 – 2xPC

- **YE+3**
  - X5U51 – PC
  - X4J51 – ME HV & RP LBB
  - X3J51 – PC, ME LV, RP LBB
  - X2J52 – RP LBB
  - X1U51 – PC

- **+Z and –X**

- **YE+1**
  - X5R31 - 2xPC
  - X4A31 – ME LV, HE LV, ??
  - X4A32
  - X4A33 - ME Alignment
  - X3A31 – 2xPC, DSS
  - X3A32
  - X3A33
  - X2A31 – ME LV& ALIGNMENT
  - X2A32
  - X2A33
  - X1R31 – 2xPC

- **YE+2**
  - X5R41 – 2xPC
  - X4A41 – ME LV & ME Alignment
  - X3A41 – 2xPC
  - X2A41 – ME LV & ME HV
  - X1R41 – 2xPC

- **YE+3**
  - X5R51 – PC
  - X4A51 – N
  - X3A51 – PC, ME LV, RP LBB
  - X2A52 – RP LBB
  - X1R51 – PC

-Z > List of Racks

- **-Z and +X**
- X5
  - X5E31 – PC
  - X5E41 – PC
  - X5E51 – PC
- X4
  - X4V31 – LV-2JB
  - X4V32
  - X4V33
  - X4V41 – LV-2JB
  - X4V51 – RPC
- X3
  - X3V31 – PC
  - X3V32
  - X3V33
  - X3V41 – PC
  - X3V51 – PC & LV-1JB
- X2
  - X2V31 – LV-4JB & ALIGNMENT
  - X2V32
  - X2V33
  - X2V42 – LV-4JB
  - X2V52 – RPC
- X1
  - X1E31 – PC
  - X1E41 – PC
  - X1E51 – PC

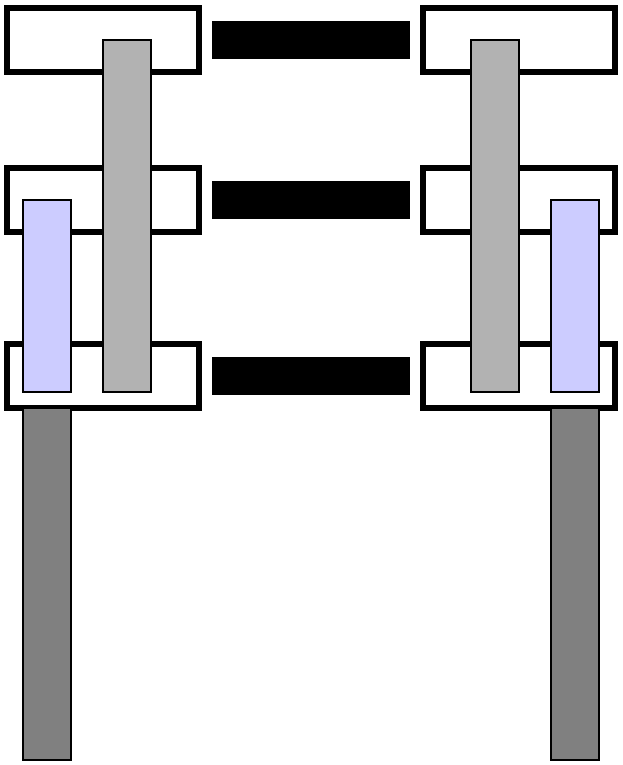
- **-Z and –X**
- X5
  - X5L31 – PC
  - X5L41 – PC
  - X5L51 – PC
- X4
  - X4S31 – LV-4JB
  - X4S32
  - X4S33
  - X4S41 – LV-4JB
  - X4S51 –
- X3
  - X3S31 – PC
  - X3S32
  - X3S33
  - X3S41 – PC
  - X3S51 – PC & LV-1JB
- X2
  - X2S31 – LV-2JB & ALIGNMENT
  - X2S32
  - X2S33
  - X2S41 – LV-2JB
  - X2S52 – RPC
- X1
  - X1L31 – PC
  - X1L41 – PC
  - X1L51 – PC

Key >> X1 through X5 are the layers, X2, X3 and X4 are the tower layers
U, J, etc indicate row in Z

31 is on disk YE+-1, 41 on YE+-2, 51 on YE+-3

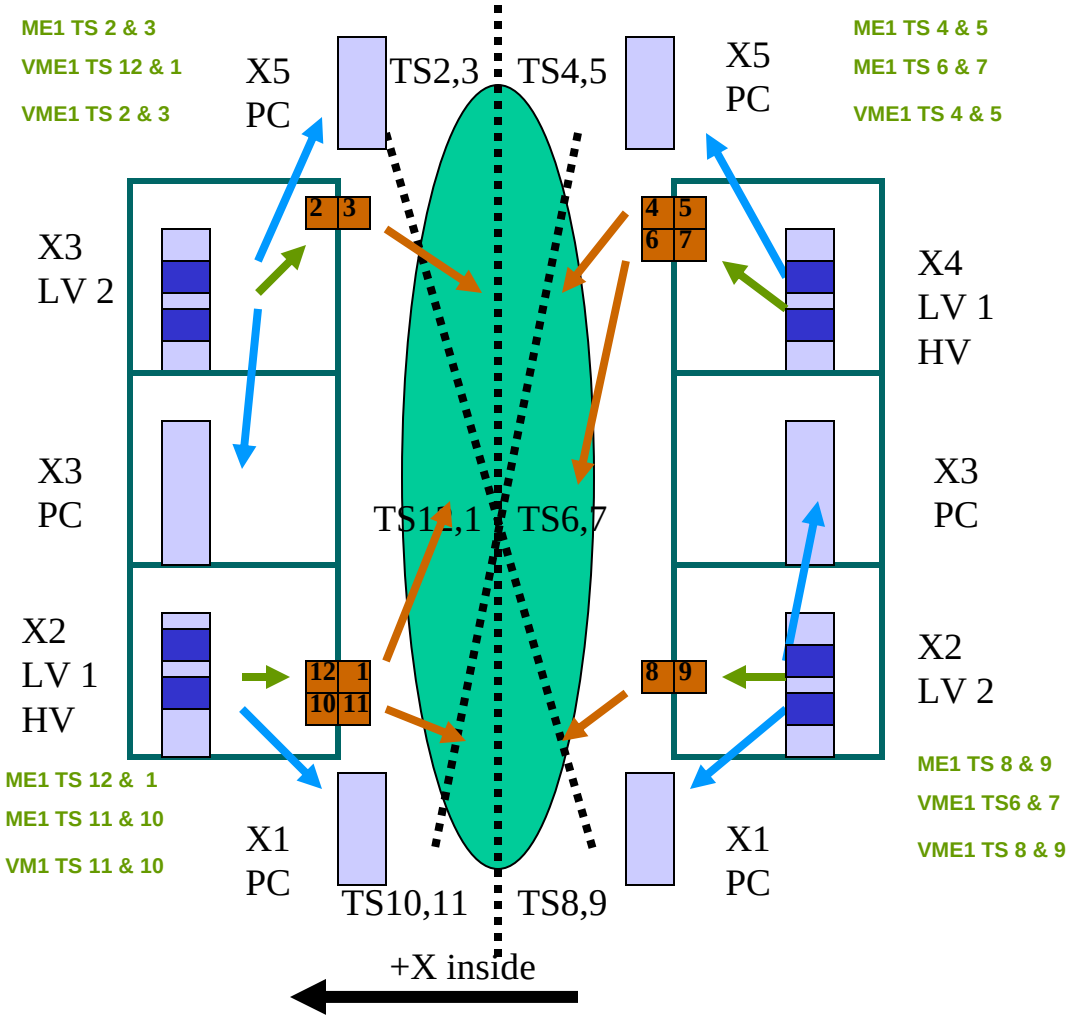
Cable Chains

- From floor to YE1
- From YE1 to YE2
- From YE1 to YE3



YE+(-)1 ME LV

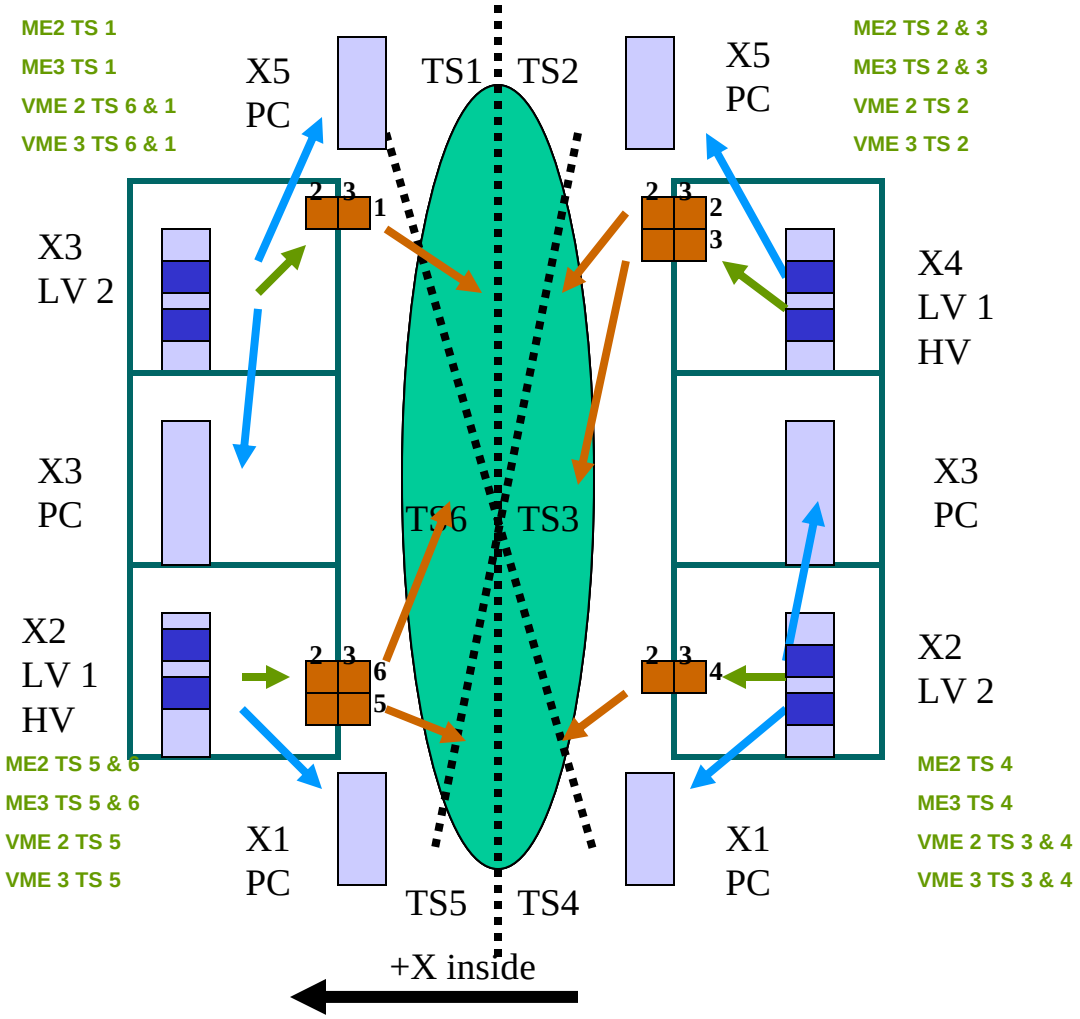
- Maraton in each of 4 corners
  - 2 power boxes per rack
- CSC LV Distribution Boxes shown in BROWN
  - 4 boxes and
  - 2 boxes in opposite corners
- Each rack supplies
  - 4 PCs + 2 TS of CSCs
    - or
  - 2 PCs + 4 TS of CSCs



YE+(-)2 ME LV

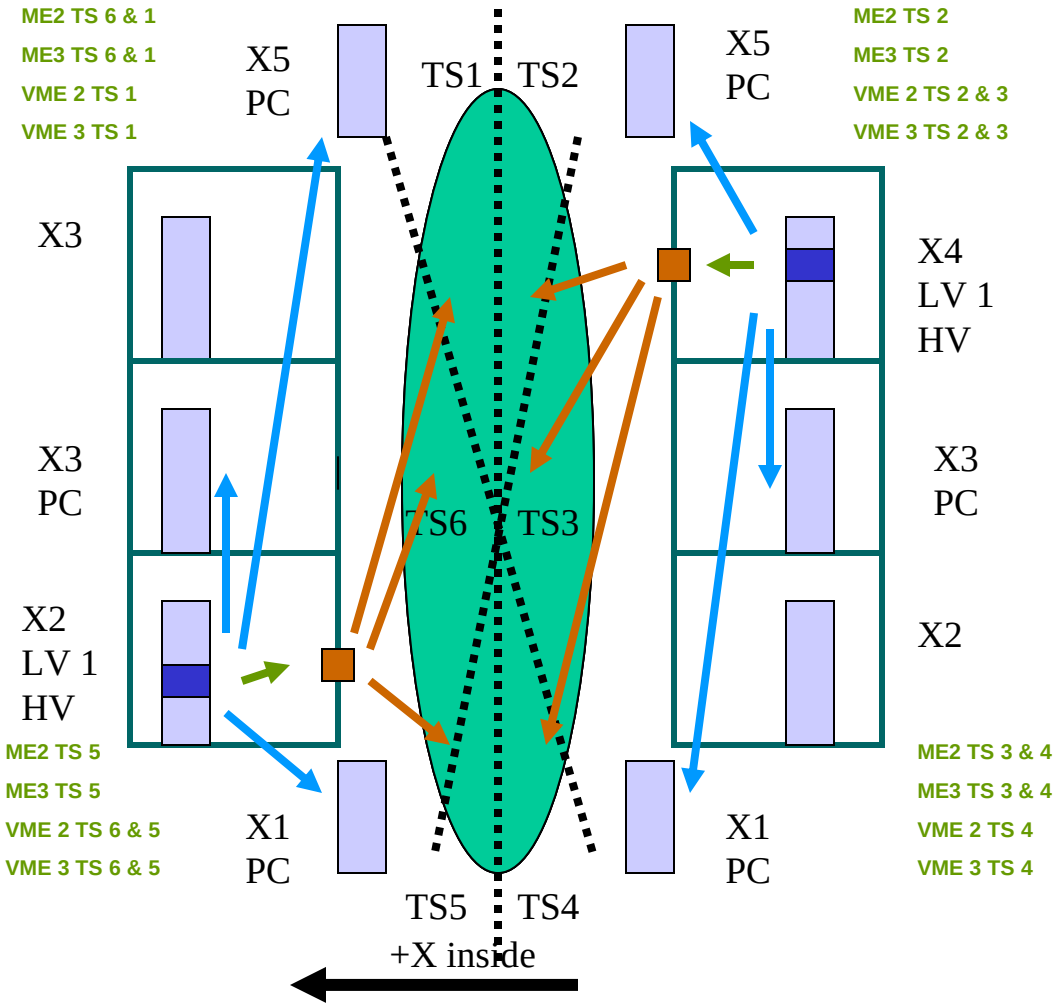
- Maraton in each of 4 corners
  - 2 power boxes per rack
- CSC LV Distribution Boxes shown in BROWN
  - 4 boxes and
  - 2 boxes in opposite corners

- Each rack supplies
  - 4 PCs + 2 TS of CSCs
    - or
  - 2 PCs + 4 TS of CSCs



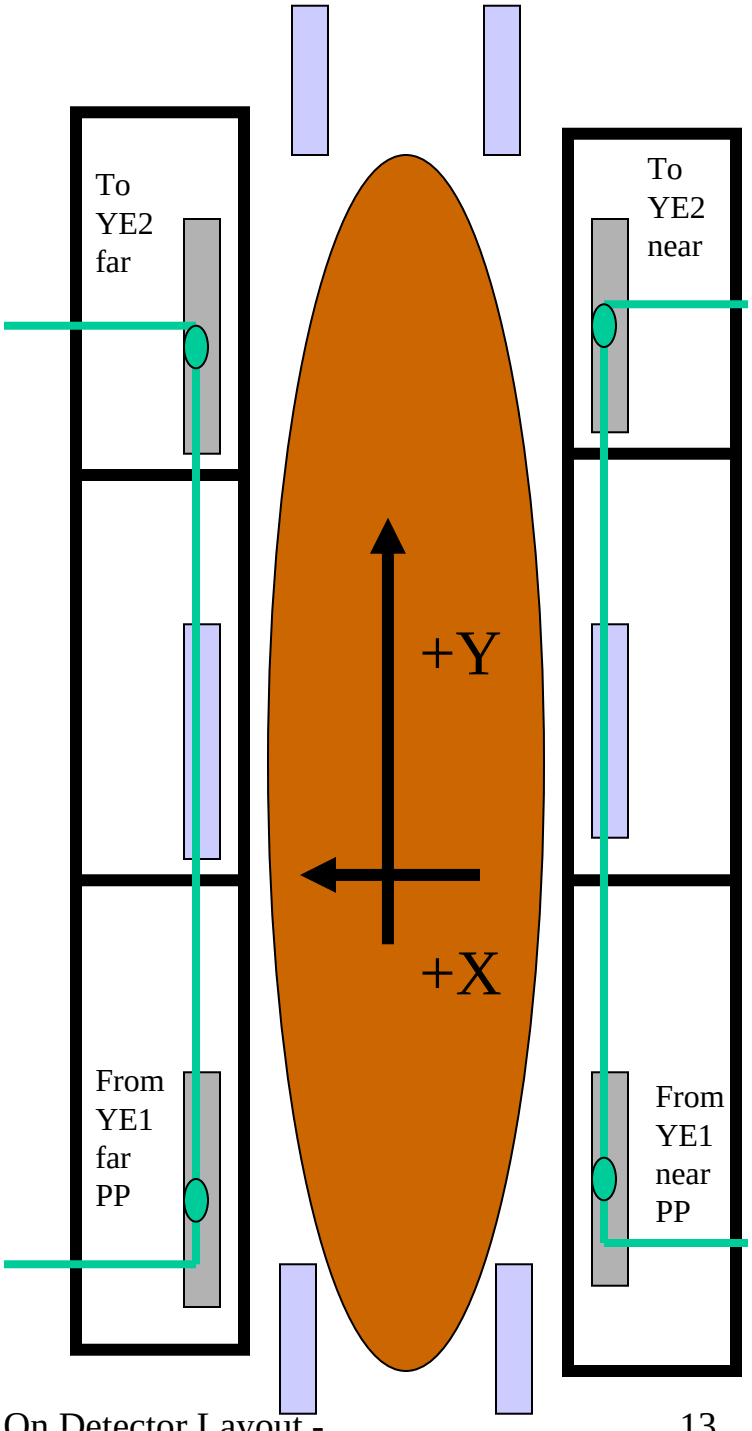
YE+(-)3 ME LV

- Maraton in each 2 opposite corners
  - 1 power boxes per rack
- CSC LV Distribution Boxes shown in BROWN
  - 1 boxes and
- Each rack supplies
  - 2 PCs + 9 CSCs



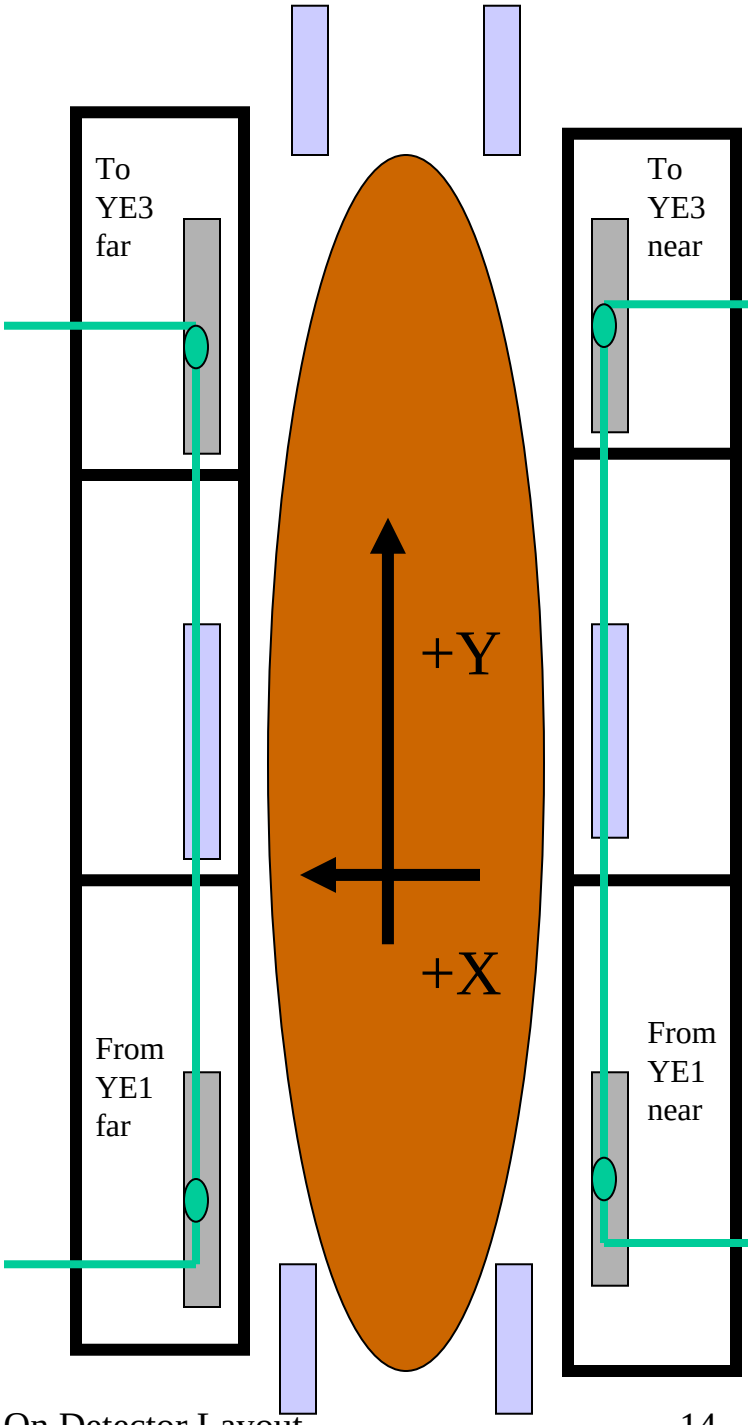
YE1 ME LV CANBus

- DCS CANBus for Maraton
  - From the YE1 PP
  - To the YE2 cable chain



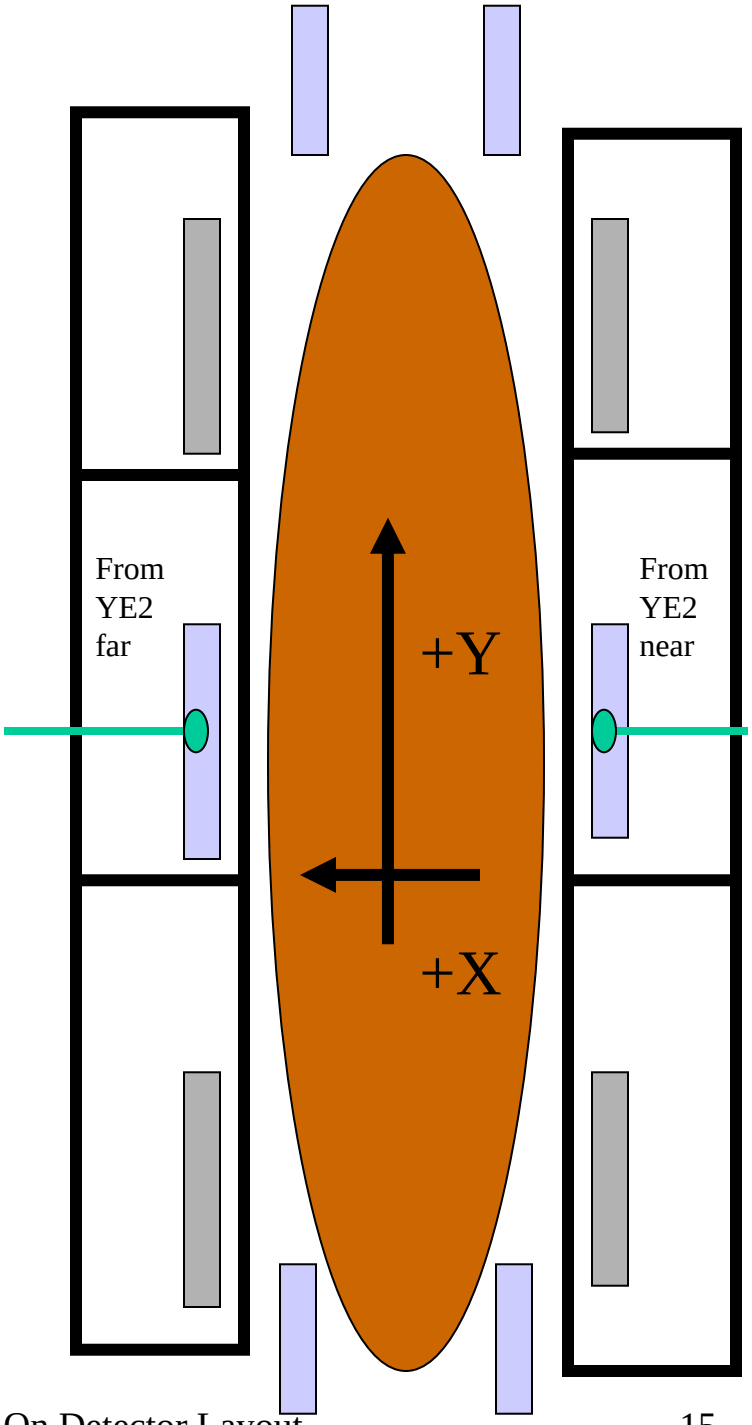
YE2 ME LV CANBus

- DCS CANBus for Maraton
  - From tower to tower via the mini-cable chains



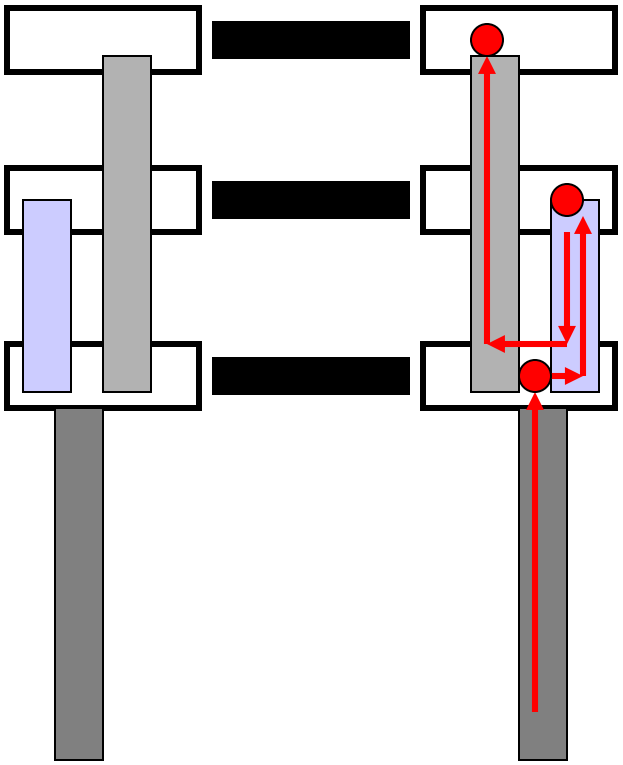
YE3 ME LV CANBus

- DCS



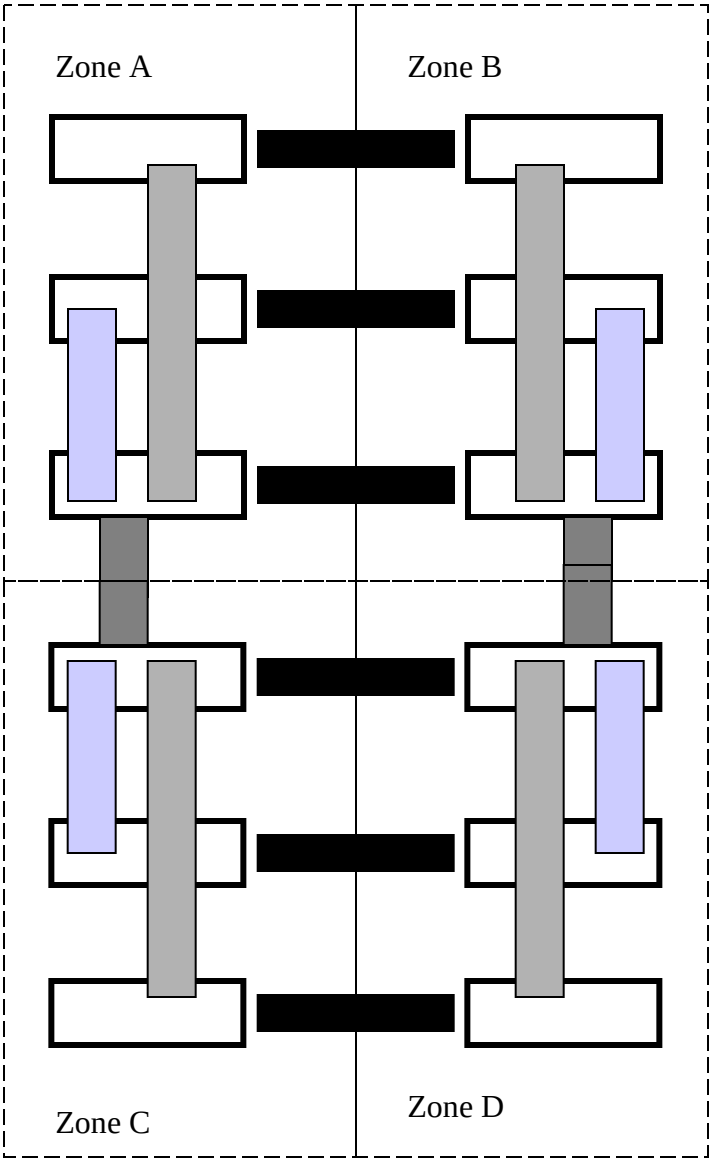
ME LV CANBus

- CANBus for LVPS
  - From floor to YE1
  - From YE1 to YE2
  - From YE2 to YE1
  - From YE1 to YE3



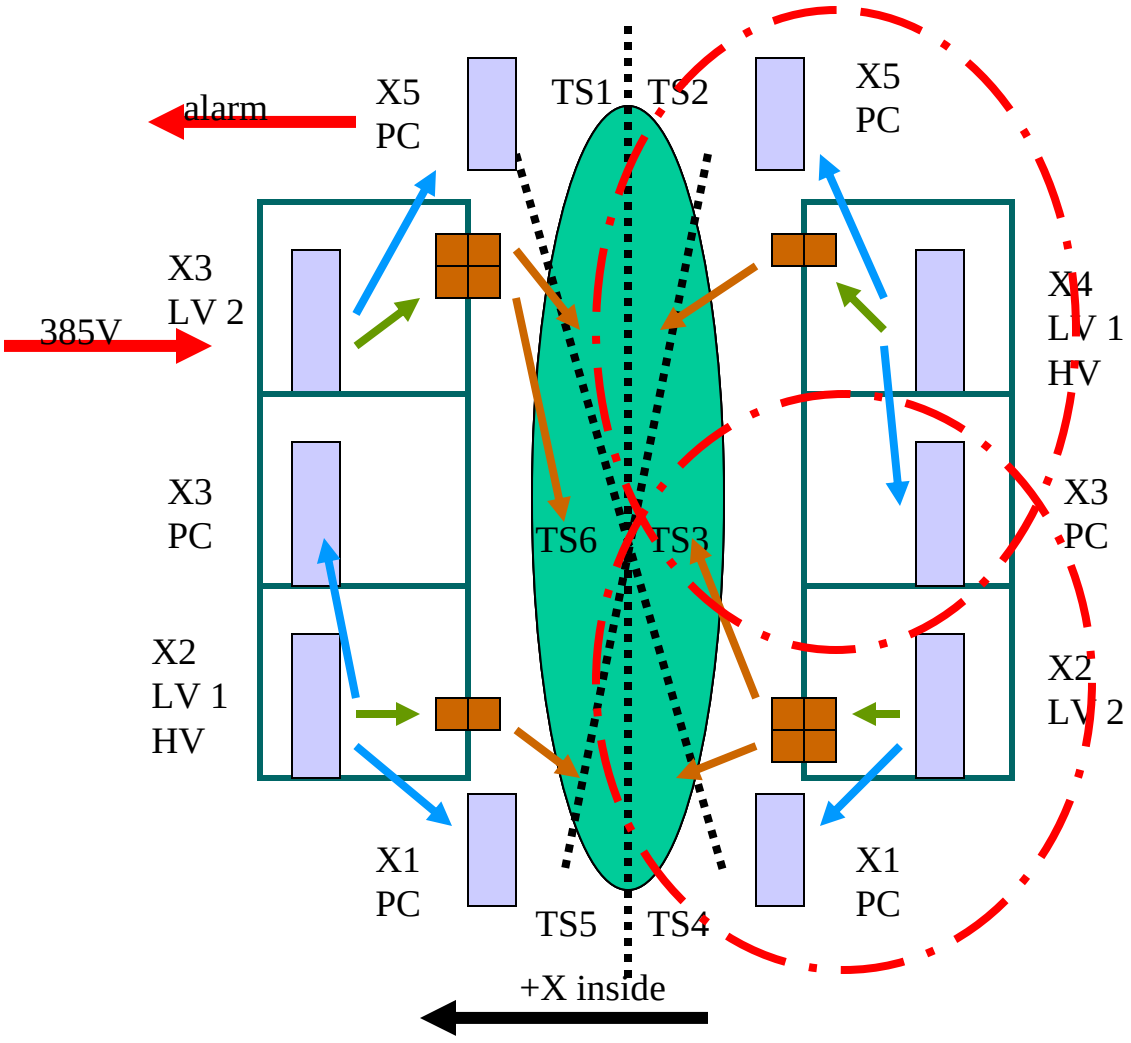
ME LV CANBus

- CANBus for LVPS
  - 4 Zones
  - Each with 9 Maraton Power Boxes
  - 4 CANBus lines into one PCI card on DCS computer in ..



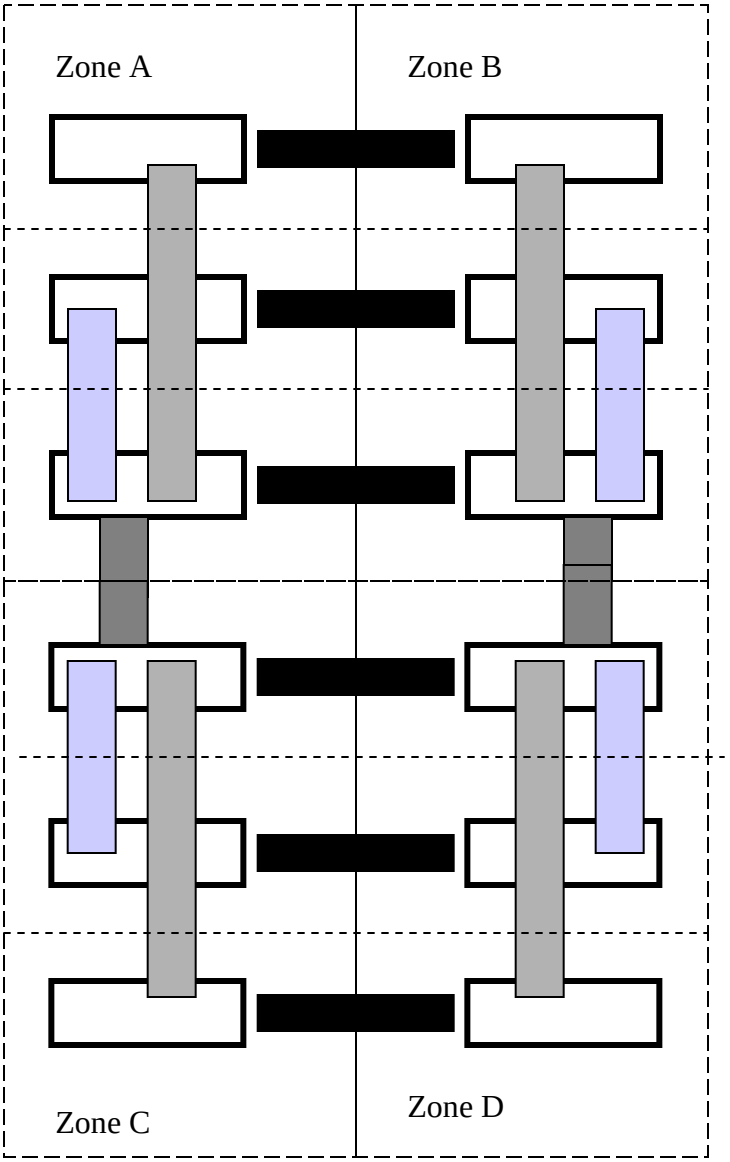
LV YE+(-)1(2) ME LV DSS

- 3 racks on a tower are tied together in DSS
- The X3 rack is part of both zones
- Alarm condition in ANY rack in zone causes
  - 385V to both Maratons from PFC modules to trip off



DSS for LVPS

- 24 Zones
- Two for each tower
- Alarm in any rack in a given half-tower turns off 385V to all 3(1) Maraton Power Boxes in that tower



2 circuits for each tower on each disk

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- Alarm in
  - X5 PC rack THEN
    - PFC for PC LV turned OFF
    - As a result
      - Maraton in X4 rack loses 385V input
      - 8V output to X5 PC also goes OFF
  - X3 PC rack THEN
    - PFC for PC LV turned OFF
    - As a result
      - Maraton in X4 rack loses 385V input
      - 8V output to X5 PC also goes OFF
  - X1 PC rack THEN
    - PFC for PC LV turned OFF
    - As a result
      - Maraton in X2 rack loses 385V input
      - 8V output to X5 PC also goes OFF

Additional Information

- Electronics Installation Home Page
  - http://cms-emu-slicetest.web.cern.ch/cms-emu-slicetest/904/index.htm
- Rack Wizard

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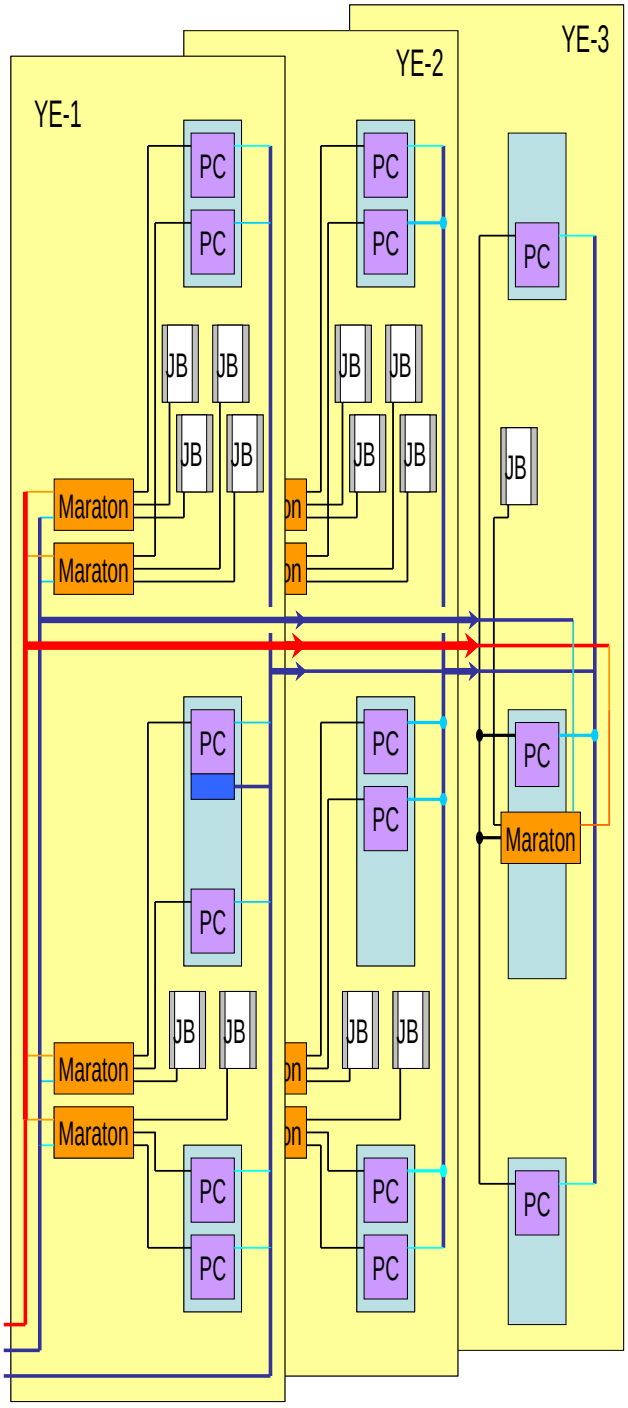
EMU LV Overview (Peripheral Crates and CSC)

Equipment

YE-1/-2/-3, Far Side (-z, -x)

	Side	EMU
Maraton	9	36
Junction Box	13	52
Splitter Box	5	20
Breakout Box	1	4



On-Disk Cable Length

	Side	EMU
Maraton, 380V **(7x6 mm^2)**	~120	~ 480
Maraton,8V **(2x25 & 2x16 mm^2)**	~300 m	~1200 m
Maraton, CAN **(4x0.5 mm^2)**	~150 m	~600m
CAN, PCMB, **Cat5e**	~150 m	~600m

UCS-to-Detector Cables

	Side	EMU
Maraton, 380V **(7x6 mm^2)**	5	20
Maraton, CAN **(4x0.5 mm^2)**	1	4
CAN, PCMB **(19x1.0 mm^2)**	1	4