

GENEVE, SUISSE:

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LHC-b - UX85
Inner Tracker
Geometrical control of the IT1C "E" structure
IP side / Cryo side
October 18th, 2006



The EDMS document, **id: 790118** containing this report can be found at the address:

<https://edms.cern.ch/document/790118>

1 IT1C – Introduction:

The aim of the measurement was to measure the E frame reference marks of the Inner Tracker IT0C (frame on IP side Side / Cryo) in order to get the geometry of the frame.

For this survey the “E” structure was hanging on the first rail (IP side) of the bridge.

2 E frame point positions and names:

2.1 Point names:

- On IP side

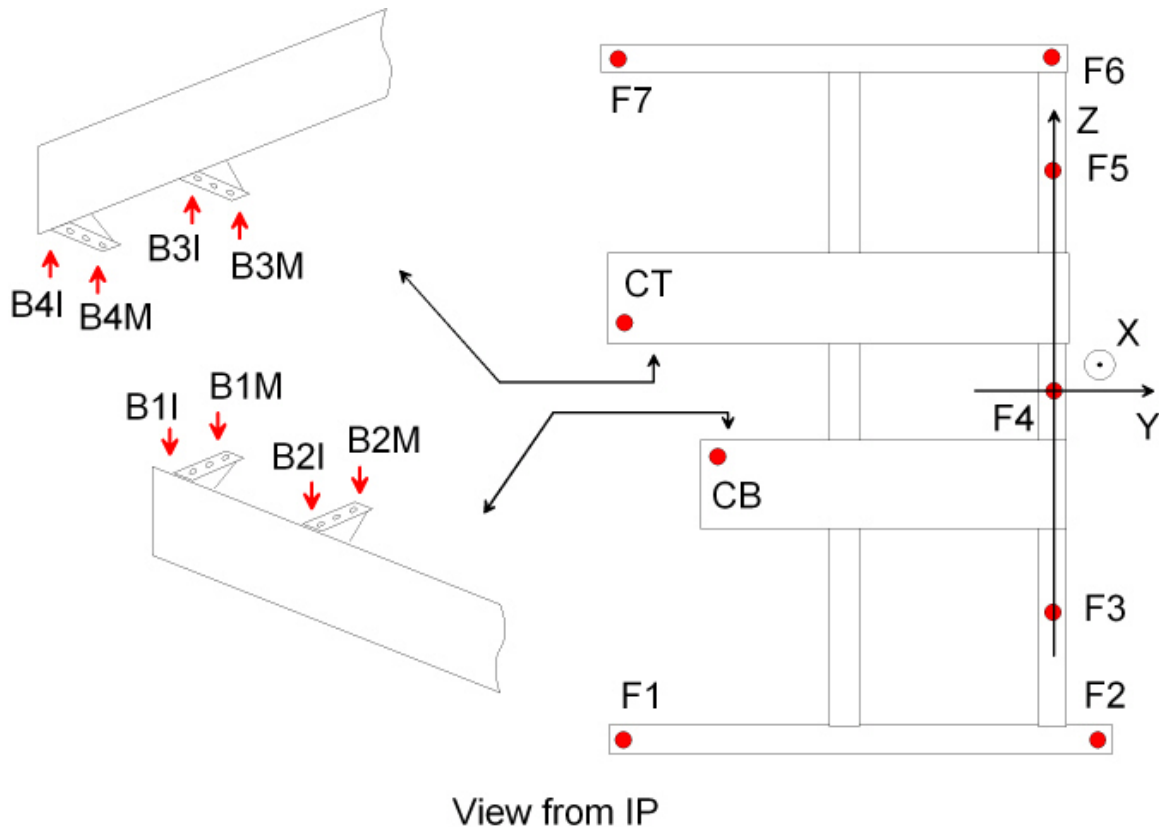


Figure 1 : Point names on the Inner Tracker – View from IP

Point names are:

- F_x for frame
- B_xM or B_xI for bracket, M for Muon side and I for IP side.
- CB or CT for carbon, CT on Top and CB on Bottom

- *Extra points on Muons side*

As F2 and F6 were not visible, extra points were measured to define the best fit plane of the “E” structure.

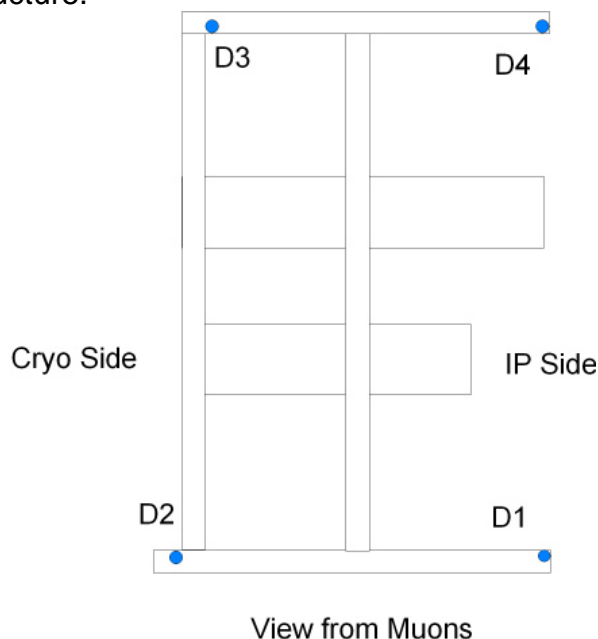


Figure 2 : *Point positions on Muons side*

2.2 Measured points

The coordinates are given at the centre of the Survey target.

2.2.1 Fx, CT or CB points

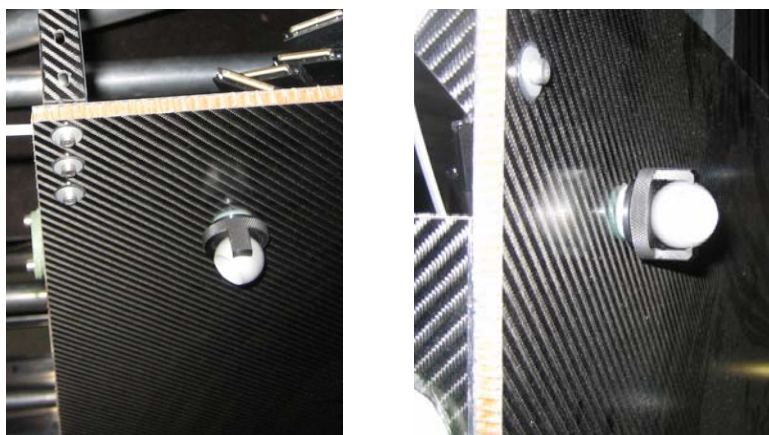
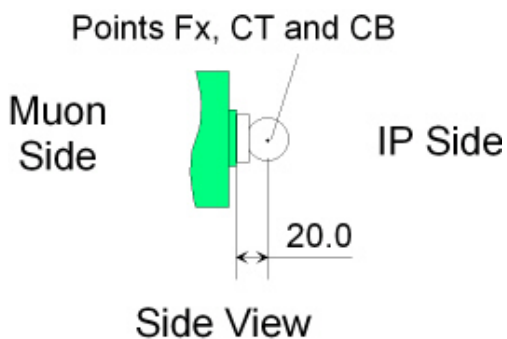
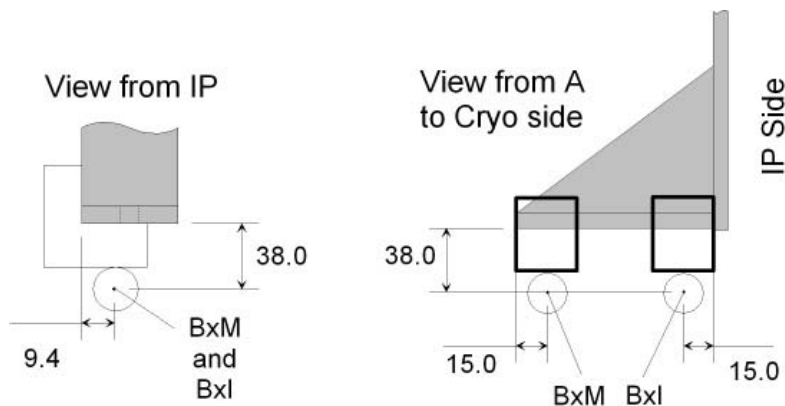


Figure 3 : *Position of the target*

The centre of the survey target is at 20mm to the top surface contact.

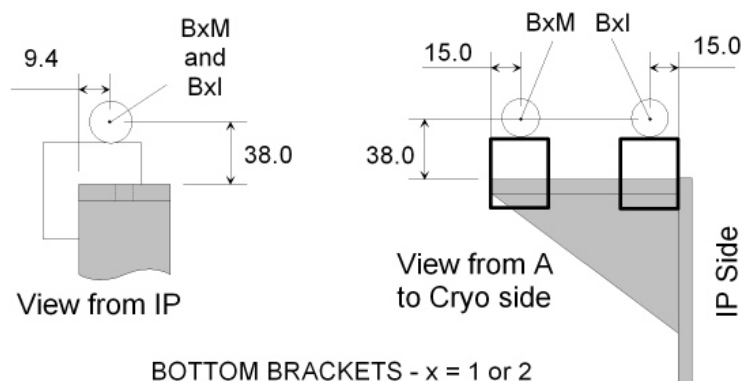
2.2.2 Points on the brackets

Distances are given in mm.



TOP BRACKETS - $x = 3$ or 4

Figure 4 : Bracket on the Top



BOTTOM BRACKETS - $x = 1$ or 2

Figure 5 : Bracket on the bottom

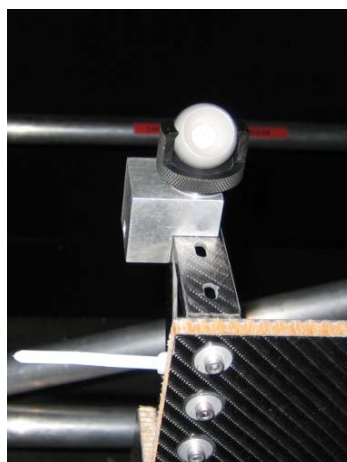
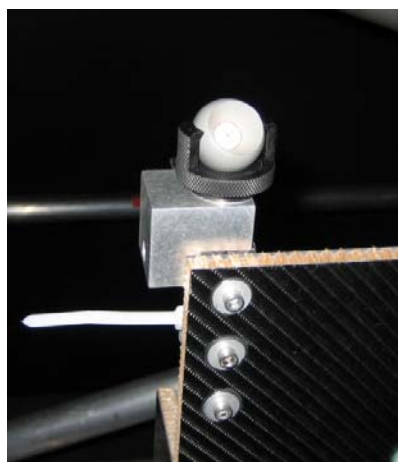
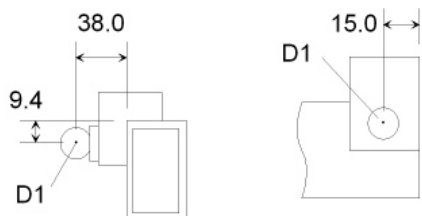


Figure 6 : BxI point (on the left) and BxM point (on the right)

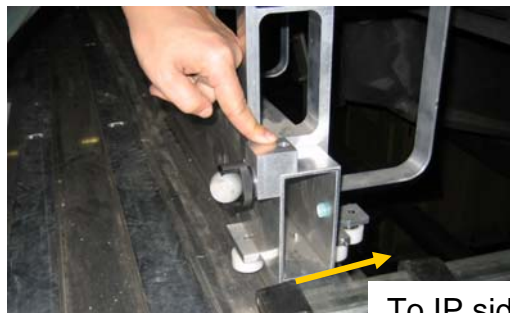
2.2.3 Points Dx, on Muons side

Distances are given in mm.

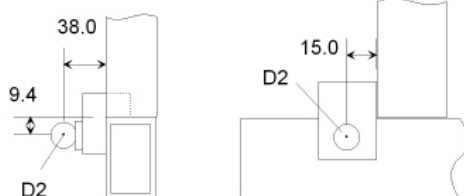
- D1 point



View from A to C side View from Muons



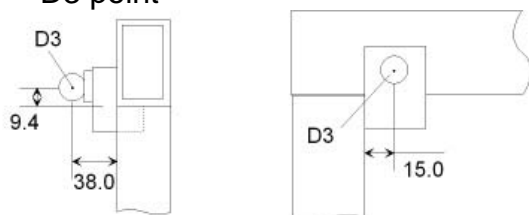
- D2 point



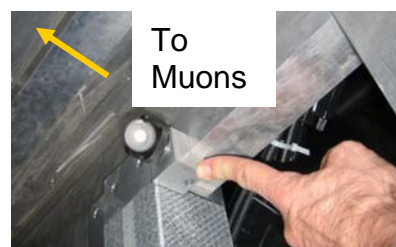
View from A to C side View from Muons



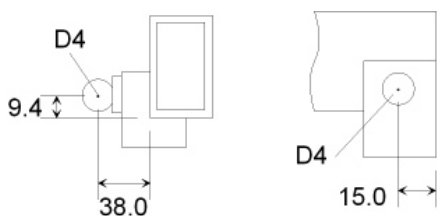
- D3 point



View from A to C side View from Muons



- D4 point



View from A to C side View from Muons



3 Inner Tracker IT1C Local Co-ordinate System

- Plane YZ: **best fit plane** of points D1 to D4.
- Z-Axis: line F'3-F'5, with F'3 and F'5 the projection of the points F3 and F5 on the plane.
- Y-Axis: perpendicular to Z-Axis, positive to Cryo Side.
- X-Axis: perpendicular to the YZ plane, positive to IP direction.
- Origin: Projection of the point F4 to the plane YZ.

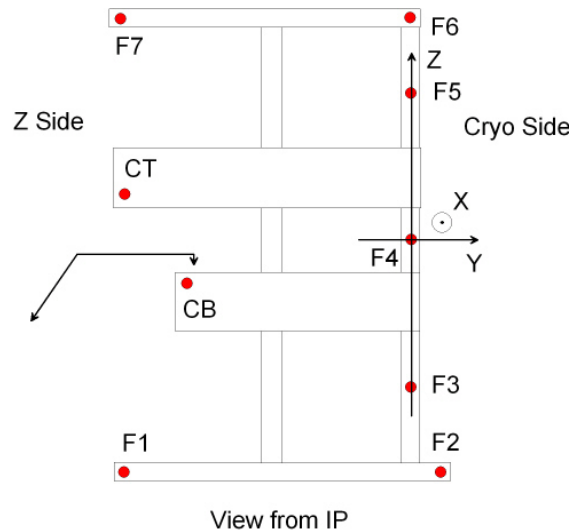


Figure 7 : Inner Tracker Local Co-ordinate System

4 Coordinates of the points in the IT1C Local System

The coordinates of the points are given at the centre of the Survey target with an offset defined in chapter 2.2.

The precision of the coordinates is 0.5mm at 1 sigma level.

Points F2 and F6 were not visible.

Point names are given with the prefix IT1C_ which is the name of the Inner Tracker "E" frame measured.

	X (m)	Y (m)	Z (m)
IT1C_B1I	0.1676	1.7615	0.2615
IT1C_B1M	0.1203	1.7611	0.2619
IT1C_B2I	0.1732	1.1090	0.2620
IT1C_B2M	0.1226	1.1088	0.2622
IT1C_B3I	0.0989	1.4670	-0.2632
IT1C_B3M	0.0516	1.4668	-0.2629
IT1C_B4I	0.0985	2.1473	-0.2638
IT1C_B4M	0.0465	2.1468	-0.2634
IT1C_F1	0.1113	1.7914	3.0607
IT1C_F3	0.1261	0.0000	1.2501
IT1C_F4	0.1265	0.0000	0.0000
IT1C_F5	0.1261	0.0000	-1.2499
IT1C_F7	0.1106	1.7420	-2.9720
IT1C_CB	0.2163	1.6761	0.4006
IT1C_CT	0.1445	2.0764	-0.3974
IT1C_D1	0.0005	1.7966	3.0216
IT1C_D2	-0.0005	-0.0531	3.0192
IT1C_D3	0.0006	0.0533	-2.9225
IT1C_D4	-0.0006	1.7465	-2.9210