



# Jefferson Lab Alignment Group

## Data Transmittal

**TO:** M. Mestayer, B. Miller

**DATE:** 08/16/2018

**FROM:** Kelly Tremblay

**Checked:**

**# :** B1879

### DETAILS:

data: calcs\hallb\12g torus det\keyonS1

The three regions of the 12 GeV Torus drift chambers were set and aligned during the latter half of 2016. This data was reported in alignment transmittal B1759, in December of 2016. M. Mestayer requested that the data be reworked based upon ideal detector centers as shown below. Each detector sector had its data rotated to the sector 1 position and all results are reported below. The table below shows the coordinates for each regions sector 1 position. The values for each region are as follows and are centered at the Hall B12GeV origin:

Region	X [mm]	Z [mm]
1	968.0	2075.9
2	1492.9	3201.4
3	2076.0	4452.1

Creating a line (refLine) from the above points, creates an angle of 25 degrees to the beamline. All the drift chambers are perpendicular to refLine. Based on refLine, a coordinate system was established and the as-surveyed data was transformed to this system.

The as-found locations for each chamber relative to the ideal location are shown below. A positive x is to the left of the refLine; a positive y is above line in the sector plane; a positive z is downstream from the ideal location along the ref line. Units are millimeters; Angles are degrees. Rotations are about each axis using the right hand rule about each axis.

Region 1 Drift Chambers						
Sector	dX [mm]	dY [mm]	dZ [mm]	Rx °	Ry °	Rz °
R1.S1	0.04	-0.20	0.41	-0.00822	0.01012	-0.01693
R1.S2	0.36	-0.05	-0.27	-0.01245	0.00718	-0.03042
R1.S3	0.09	0.12	0.15	-0.00245	0.00174	-0.00733
R1.S4	-0.14	-0.16	-0.02	0.01430	0.00404	0.00135
R1.S5	-0.27	0.18	0.17	-0.00897	0.01024	-0.00586
R1.S6	-0.11	0.24	0.09	-0.00366	0.01050	-0.00019
Region 2 Drift Chambers						
Sector	dX [mm]	dY [mm]	dZ [mm]	Rx °	Ry °	Rz °
R2.S1	-0.41	0.27	0.25	0.00234	0.00348	-0.01639
R2.S2	-0.14	-0.14	-0.10	0.00046	0.00629	0.00105
R2.S3	0.01	0.01	0.20	-0.00279	0.00392	0.00651
R2.S4	-0.09	-0.22	-0.03	-0.01018	-0.00690	0.00360

R2.S5	0.07	0.24	0.12	-0.00554	0.00647	-0.00224
R2.S6	0.14	0.03	0.08	0.00002	-0.00091	-0.00486
<b>Region 3 Drift Chambers</b>						
Sector	dX [mm]	dY [mm]	dZ [mm]	Rx °	Ry °	Rz °
R3.S1	0.13	-0.06	-0.02	0.00240	0.00034	0.00208
R3.S2	0.29	0.02	0.06	0.00181	0.00294	0.00262
R3.S3	0.67	-0.04	-0.04	0.00389	0.00118	0.00692
R3.S4	-0.50	0.01	0.12	-0.00139	0.00069	0.00007
R3.S5	0.24	-0.06	0.06	0.00170	-0.00237	-0.00572
R3.S6	0.32	-0.06	-0.12	-0.00362	-0.00115	0.00089