Jefferson Lab Alignment Group

Data Transmittal

TO: D. Carman, B. Miller		**DATE:** 12/21/2017
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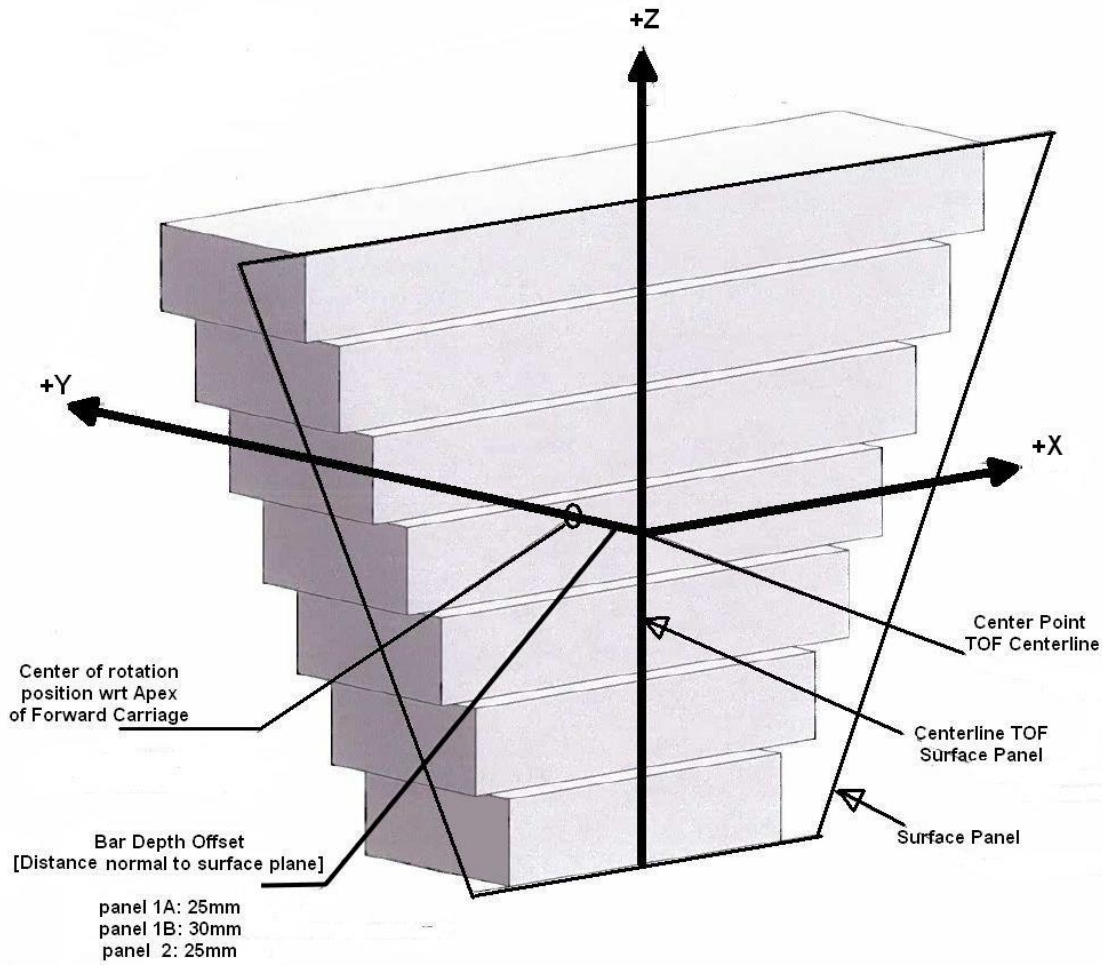
DETAILS: data : step2b\hallb\12GfwdCar\171201a

An as-found survey of the forward carriage was carried out on December 1st, 2017..

The x,y,z coordinates are the calculated locations of each detector relative to each sector's coordinate system. That is, each sector's coordinate system is rotated about the beam line's Z axis so that the centerline of the detector is it's actual Z axis. The 0,0 x/z position is the middle of the z axis. For panel 1A and panel2, the Y coordinate is offset into the detector from the surface of the scintillator's 25.4mm. For panel 1B the Y offset is 30mm. The attached spreadsheet contains additional information and a sketch is attached showing the 'in' and 'out' locations as will be explained below.

The data in the first table below shows each sector's translation and rotation from the ideal location. The ideal location is based on the explanation above. Note that the carriage for December 2017 is approximately two inches (50.4 millimeters) downstream along beamline from design to avoid contact with the torus magnet.

Detector	x[mm]	y[mm]	z[mm]	rX[deg]	rY[deg]	rZ[deg]
Panel 1A						
1A-S1	-4.89	49.02	-23.60	-0.0707	0.0237	-0.0433
1A-S2	-0.41	50.00	-25.48	-0.1624	-0.2213	-0.1189
1A-S3	5.42	52.66	-25.34	-0.1064	0.1071	0.2911
1A-S4	0.94	58.86	-21.59	-0.2399	0.0883	-0.1417
1A-S5	-1.85	53.31	-19.18	-0.1314	0.0136	-0.2369
1A-S6	-2.79	47.00	-21.98	0.0151	0.0163	-0.1180
Panel 1B						
1B-S1	-0.96	51.76	-57.09	-0.0933	0.0686	0.0007
1B-S2	2.82	53.40	-59.98	-0.1147	-0.0384	-0.1164
1B-S3	10.29	54.76	-58.27	-0.1118	0.1144	0.3050
1B-S4	3.52	61.95	-50.08	-0.2783	0.0370	-0.1378
1B-S5	2.29	55.76	-51.24	-0.1922	0.0608	-0.2068
1B-S6	-3.46	49.52	-53.99	-0.0266	0.0262	-0.1074
Panel 2						
P2-S1	-3.69	29.13	-26.87	-0.0071	0.1763	0.0136
P2-S2	-1.13	6.36	-49.08	0.1243	0.0421	-0.1160
P2-S3	-9.71	11.72	-46.81	0.3146	0.5427	-0.0398
P2-S4	-4.74	19.23	-29.23	-1.7819	0.0374	-0.0354
P2-S5	-10.47	19.60	-33.35	-0.8230	0.4067	-0.1428
P2-S6	-2.15	9.66	-34.95	-0.9335	-0.0461	-0.1952



The second table below shows the coordinates for each sector based on the 12GeV target. The asfound and design (ideal values) are shown for each sector. Note that the forward carraige was not as close to the torus magnet as designed. rX, rY and rZ represent the rotation about each of the axis in degrees. (need to check)

Coordinates and rotations at Asfound and Ideal Panel locations - WRT 12GeV Target						
Detector	x[mm]	y[mm]	z[mm]	rX[deg]	rY[deg]	rZ[deg]
Panel 1A						
Asfound 1A-S1	2281.47	-3.81	6574.29	114.9293	0.0248	90.0493
Asfound 1A-S2	1139.51	1975.02	6575.97	114.8371	0.1969	149.8591
Asfound 1A-S3	-1146.35	1972.53	6578.32	114.8934	-0.3135	-150.0166
Asfound 1A-S4	-2287.45	-2.01	6582.36	114.7603	0.0867	-89.8506
Asfound 1A-S5	-1144.32	-1980.46	6576.31	114.8689	0.2045	-29.8781
Asfound 1A-S6	1139.56	-1977.20	6571.78	115.0151	0.0957	30.0741
Ideal 1A-S1	2282.14	1.08	6519.89	115.00000	-0.00441	90.00945
Ideal 1A-S2	1140.14	1976.93	6519.89	115.00000	-0.00441	150.00945
Ideal 1A-S3	-1142.01	1975.85	6519.89	115.00000	-0.00441	-149.99055
Ideal 1A-S4	-2282.14	-1.08	6519.89	115.00000	-0.00441	-89.99055
Ideal 1A-S5	-1140.14	-1976.93	6519.89	115.00000	-0.00441	-29.99055
Ideal 1A-S6	1142.01	-1975.85	6519.89	115.00000	-0.00441	30.00945

Panel 1B						
Asfound 1B-S1	2189.06	-0.96	6441.05	114.9066	-0.0297	90.0619
Asfound 1B-S2	1091.13	1895.51	6443.76	114.8853	0.1217	150.0144
Asfound 1B-S3	-1103.54	1890.80	6444.26	114.8880	-0.3248	-150.0252
Asfound 1B-S4	-2199.71	-3.52	6447.33	114.7218	0.1093	-89.9082
Asfound 1B-S5	-1096.05	-1902.98	6442.20	114.8081	0.1617	-29.8575
Asfound 1B-S6	1092.46	-1899.12	6437.70	114.9735	0.0863	30.0692
Ideal 1B-S1	2218.92	0.00	6370.01	115.00000	0.00000	90.00000
Ideal 1B-S2	1109.46	1921.64	6370.01	115.00000	0.00000	150.00000
Ideal 1B-S3	-1109.46	1921.64	6370.01	115.00000	0.00000	-150.00000
Ideal 1B-S4	-2218.92	0.00	6370.01	115.00000	0.00000	-90.00000
Ideal 1B-S5	-1109.46	-1921.64	6370.01	115.00000	0.00000	-30.00000
Ideal 1B-S6	1109.46	-1921.64	6370.01	115.00000	0.00000	30.00000
Panel 2						
Asfound P2-S1	4080.00	4.37	4999.94	147.7922	-0.1564	90.0824
Asfound P2-S2	2018.45	3509.92	5006.61	147.9238	0.0262	150.1206
Asfound P2-S3	-2025.90	3512.26	5007.55	148.1131	-0.4380	-149.6771
Asfound P2-S4	-4070.37	-3.32	4996.67	146.0176	-0.0128	-89.9501
Asfound P2-S5	-2036.34	-3522.21	5000.35	146.9763	-0.2680	-29.6624
Asfound P2-S6	2034.73	-3512.44	4996.42	146.8661	0.1430	30.1406
Ideal P2-S1	4069.67	8.06	4961.69	147.79950	0.00000	90.00000
Ideal P2-S2	2027.86	3528.47	4961.69	147.79950	0.00000	150.00000
Ideal P2-S3	-2041.82	3520.42	4961.69	147.79950	0.00000	-150.00000
Ideal P2-S4	-4069.68	-8.06	4961.69	147.79950	0.00000	-90.00000
Ideal P2-S5	-2027.86	-3528.47	4961.69	147.79950	0.00000	-30.00000
Ideal P2-S6	2041.82	-3520.42	4961.69	147.79950	0.00000	30.00000