Jefferson Lab Alignment Group

Data Transmittal

TO: D. Carman, B. Miller, C. Wiggins		**DATE:** 07/26/2017
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DETAILS: data : step2b\hallb\12GFwdCar\170111a

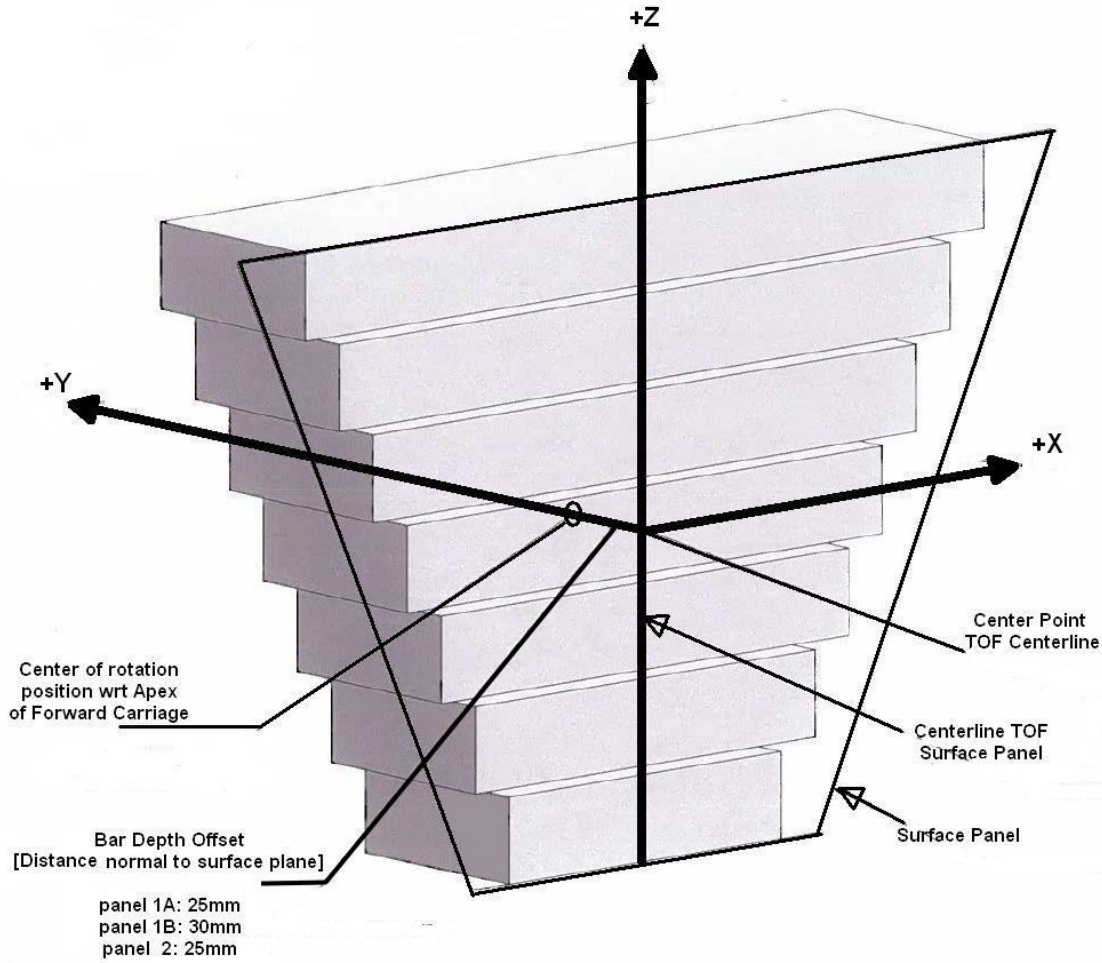
An as-found survey of the forward carriage was carried out on January 17th, 2017. The data taken was to support the KPP experiment. A original transmittal B1781 was produced with the data shown at the originally agreed location. As per the request from Dan Carman, this transmittal re-calculates the data to match desired depth into panels 1A, 1B, and panel 2 (see sketch at end of this document). All linear data millimeters and anglular in degrees.

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 at above location. Note that the carriage was not in the ideal location and stopped short of the torus by approximently two inches (50.4 millimeters) downstream along beamline.

Detector	x[mm]	y[mm]	z[mm]	rX[deg]	rY[deg]	rZ[deg]
Panel 1A						
P1A-S1	-5.00	43.91	-21.46	-0.0663	0.0228	-0.0473
P1A-S2	-0.25	44.83	-23.34	-0.1567	-0.2198	-0.1177
P1A-S3	5.73	47.75	-23.06	-0.1051	0.1103	0.2961
P1A-S4	1.11	54.26	-19.19	-0.2444	0.0907	-0.1383
P1A-S5	-1.94	48.76	-16.79	-0.1371	0.0136	-0.2388
P1A-S6	-3.02	42.20	-19.73	0.0138	0.0146	-0.1237
Panel 1B						
P1B-S1	-1.17	46.64	-54.79	-0.0897	0.0662	-0.0034
P1B-S2	2.78	48.14	-57.76	-0.1088	-0.0384	-0.1156
P1B-S3	10.44	49.66	-56.02	-0.1095	0.1164	0.3101
P1B-S4	3.70	57.15	-47.75	-0.2819	0.0386	-0.1334
P1B-S5	2.29	51.09	-48.83	-0.1981	0.0601	-0.2073
P1B-S6	-3.65	44.68	-51.60	-0.0288	0.0236	-0.1122
Panel 2						
P2-S1	-3.83	25.81	-22.25	-0.0020	0.1749	0.0121
P2-S2	-0.88	3.09	-44.51	0.1286	0.0453	-0.1146
P2-S3	-9.28	8.94	-42.36	0.3138	0.5476	-0.0374

P2-S4	-4.51	16.89	-24.86	-1.7870	0.0394	-0.0348
P2-S5	-10.64	17.22	-28.93	-0.8272	0.4041	-0.1452
P2-S6	-2.50	6.79	-30.42	-0.9326	-0.0504	-0.1986



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.

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						
P1A-S1-asf	2281.25	-3.93	6568.75	114.9338	0.0289	90.0502
P1A-S2-asf	1139.26	1974.90	6570.38	114.8428	0.1951	149.8600
P1A-S3-asf	-1146.60	1972.36	6572.91	114.8947	-0.3194	209.9842
P1A-S4-asf	-2287.68	-2.19	6577.18	114.7558	0.0826	270.1502
P1A-S5-asf	-1144.52	-1980.63	6571.18	114.8631	0.2063	330.1227
P1A-S6-asf	1139.37	-1977.32	6566.47	115.0138	0.1016	30.0750
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						
P1B-S1-asf	2188.97	-1.17	6435.43	114.9103	-0.0249	90.0615
P1B-S2-asf	1091.05	1895.32	6438.05	114.8911	0.1210	150.0140
P1B-S3-asf	-1103.61	1890.62	6438.70	114.8903	-0.3303	209.9744
P1B-S4-asf	-2199.80	-3.70	6441.98	114.7182	0.1046	270.0914
P1B-S5-asf	-1096.14	-1903.16	6436.95	114.8022	0.1625	330.1421
P1B-S6-asf	1092.36	-1899.31	6432.31	114.9712	0.0917	30.0688
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						
P2-S1-asf	4079.65	4.23	4994.27	147.7973	-0.1544	90.0830
P2-S2-asf	2018.07	3509.75	5001.00	147.9281	0.0227	150.1211
P2-S3-asf	-2026.28	3512.06	5002.30	148.1122	-0.4434	210.3235
P2-S4-asf	-4070.72	-3.55	4991.73	146.0125	-0.0148	270.0504
P2-S5-asf	-2036.65	-3522.42	4995.35	146.9720	-0.2646	330.3382
P2-S6-asf	2034.42	-3512.61	4991.05	146.8670	0.1485	30.1412
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