Jefferson Lab Alignment Group
Data Transmittal

TO: T. Whitlach		**DATE:** 03/21/2019
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DETAILS:

The beam right bar box mirrors were located on February 4th, 2019. The results are shown below.

The ideal coordinates for the Hall D target and the Hall D 'zero' point shown in meters relative to the CEBAF coordinate system. The found location for the beam right mirror box is show (Cebaf system – meters). Additionally, the found yaw, pitch and roll are shown at this point. The angles were based on the fiducialized data. Positive yaw is the counter clockwise rotation about the Y axis; negative pitch is the clockwise rotation about the X axis (physics standard); positive roll is the clockwise rotation about the Z axis.

The second table shows the planes of the mirrors based on the location of the fiducialized data, then transformed into the found survey data. A centroid point and normal point are given for each plane. The resulting plane formula data (ABCD) is shown along with the calculated rotational values. Units are millimeters and degrees from the Hall D target.

	Cebaf Coordinate Location [meters]			**Angular Position [degrees]**		
Ideal Location	**X [m]**	**Y [m]**	**Z [m]**	**Yaw°**	**Pitch°**	**Roll°**
Target	80.60000	104.70000	398.78983	0.00000	0.00000	0.00000
Hall D 'Zero'	80.60000	104.70000	398.13389	0.00000	0.00000	0.00000
Found Location						
BR – BOX center	77.58716	104.39449	403.94400	-0.03319	-0.22928	0.038206

Plane Data:

windowpane	X[mm]	Y[mm]	Z[mm]				
Centroid	-3215.96	-569.068	5417.785				
Normal	-3600.89	-567.458	5068.233		Rx from Y	Ry from Z	Rz from X
ABCD	-0.74031	0.00310	-0.67226	1263.13400	-89.7362	-132.242	179.7605

bl_mirror_blm	X[mm]	Y[mm]	Z[mm]				
Centroid	-3106.04	-538.934	5518.119				
Normal	-3623.57	-539.421	5517.07		Rx from Y	Ry from Z	Rz from X
ABCD	-1.00000	-0.00094	-0.00203	-3095.35200	-114.866	-90.1162	-179.946

BL MFRM_EXIT	X[mm]	Y[mm]	Z[mm]				
Centroid	-3044.7	-593.167	5803.11				
Normal	-2561.2	-592.827	5803.922		Rx from Y	Ry from Z	Rz from X
ABCD	1.00000	0.00070	0.00168	3035.36000	67.3174	89.9037	0.0402

DS_mirror	X[mm]	Y[mm]	Z[mm]				
Centroid	-3137.88	-555.798	5854.339				
Normal	-3136.39	-553.815	5375.473		Rx from Y	Ry from Z	Rz from X
ABCD	0.00311	0.00414	-0.99999	5866.32700	-89.7628	179.8217	53.0705

Reflector	X[mm]	Y[mm]	Z[mm]				
Centroid	-1488.69	-513.061	5570.025				
Normal	-2161.93	-513.812	5570.025		Rx from Y	Ry from Z	Rz from X
ABCD	-1.00000	-0.00112	0.00000	-1489.26000	179.9957	-90	-179.936

bottom_mirror	X[mm]	Y[mm]	Z[mm]				
Centroid	-3189.46	-1054.84	5649.922				
Normal	-3189.61	-809.2	5650.915		Rx from Y	Ry from Z	Rz from X
ABCD	-0.00065	0.99999	0.00404	1029.92900	0.2317	-9.068	90.037

top_mirror	X[mm]	Y[mm]	Z[mm]				
Centroid	-3185.45	-66.818	5639.273				
Normal	-3185.36	-290.483	5638.314		Rx from Y	Ry from Z	Rz from X
ABCD	0.00040	-0.99999	-0.00429	-41.37200	-179.754	174.7128	-89.9773

br_us_mirror	X[mm]	Y[mm]	Z[mm]				
Centroid	-3322.35	-570.745	5620.81				
Normal	-2849.05	-570.199	5546.323		Rx from Y	Ry from Z	Rz from X
ABCD	0.98784	0.00114	-0.15546	4156.42600	-89.5798	98.9436	0.0661

br_mid_mirror	X[mm]	Y[mm]	Z[mm]				
Centroid	-3302.06	-556.438	5714.799				
Normal	-2843.35	-555.6	5584.175		Rx from Y	Ry from Z	Rz from X
ABCD	0.96176	0.00176	-0.27388	4741.93200	-89.6325	105.8952	0.1047

br_ds_mirror	X[mm]	Y[mm]	Z[mm]				
Centroid	-3269.81	-548.329	5806.572				
Normal	-2836.67	-547.243	5624.3		Rx from Y	Ry from Z	Rz from X
ABCD	0.92171	0.00231	-0.38787	5267.27000	-89.6587	112.8219	0.1436

Picture next page.