



# Jefferson Lab Alignment Group

## Data Transmittal

**TO:** Mark Pitt, Steve Wood, Dave Gaskell

**DATE:** 15 Jan 2013

**FROM:** Kelly Tremblay

**Checked:**

**# :** C1489

**DETAILS:**

data: step2b\hallc\qweak\111108b & 120626a

The Hall C region 2 detectors were surveyed June 25<sup>th</sup> and 26<sup>th</sup> 2012. The first table below shows the raw coordinates (in millimeters) for each of the referenced surveyed positions. The positions and target names are based upon a system that Mark Pitt used with the survey crew.

The Z coordinates are along the beamline, downstream from the Qweak target. The +X coordinates are beam left, and the Y coordinates are positive up.

The second table compares common points observed from the beam left and from the beam right. The differences in their coordinates are shown. The differences are the left observed values subtracted from the right observed.

The third table compares the values from this survey minus the observed values from in November 2011. There are 2 groups of coordinate differences with the left observed being the first three dz/dx/dy values (left 2012 minus observed 2011) and the last three coordinates being the right observed values minus the 2011 values.

The last table shows the coordinates of the scattering chamber, the Qweak target and the standard hall C target in the CEBAF coordinate system. (meters)

Targets shot from Beam Left			
Target	z (mm)	x (mm)	y (mm)
R2BLU12	3044.84	273.76	-5.73
R2BLU13	3045.41	272.34	-107.40
R2BLU15	3044.71	748.69	-139.79
R2BLU14	3044.34	752.43	114.55
R2BLD14	3471.33	791.70	116.85
R2BLD15	3471.30	789.05	-137.35
R2BLD12	3472.77	313.76	-5.42
R2BLD11	3473.20	314.82	96.25
R2BRD13	3465.75	-312.59	-101.71
R2BLU23	3045.69	266.35	115.25
R2BLU22	3045.00	195.58	188.07
R2BLU21	3045.22	124.84	260.94
R2BLU24	3043.95	449.62	611.10
R2BLU25	3044.53	626.62	428.65
R2BLD23	3473.39	295.20	144.32

Targets observed from Beam Right			
Target	z (mm)	x (mm)	y (mm)
R2BRU61	3039.60	-703.68	102.40
R2BRU62	3038.67	-703.55	0.84
R2BRU63	3038.91	-703.38	-100.99
R2BRU65	3040.84	-1180.06	-127.38
R2BRU64	3041.52	-1180.60	127.09
R2BRD64	3467.40	-1218.75	125.62
R2BRD65	3466.59	-1218.91	-128.46
R2BRD62	3465.69	-742.20	-1.27
R2BRD61	3466.02	-742.27	100.37
R2BLD62	3472.58	742.81	-10.77
R2BLD63	3473.17	741.31	-112.35
R2BRU11	3039.09	-272.41	103.37
R2BRU12	3038.20	-272.83	1.65
R2BRU13	3038.47	-273.27	-100.06
R2BRU15	3040.40	-750.06	-123.69

R2BLD25	3471.14	653.69	459.14
R2BRD23	3465.96	-150.81	-293.93
R2BRD22	3465.56	-222.33	-221.48
R2BRD21	3465.81	-293.61	-149.14
R2BRD25	3466.33	-472.37	-646.72
R2BRD24	3466.92	-650.87	-465.69
R2BLU34	3044.61	618.48	-446.46
R2BLU35	3044.87	437.36	-624.98
R2BLU31	3045.32	265.54	-124.80
R2BLU32	3044.97	193.20	-196.22
R2BLD34	3471.56	647.86	-472.54
R2BLD35	3471.40	467.63	-651.66
R2BLD33	3473.32	149.59	-295.98
R2BRU34	3040.92	-439.89	618.50
R2BRD31	3465.68	-148.68	290.11
R2BRD35	3465.93	-647.65	464.58
R2BLU44	3044.84	125.72	-752.81
R2BLU41	3045.41	102.01	-275.80
R2BLU42	3045.05	0.18	-275.64
R2BLD44	3471.82	128.10	-791.92
R2BLD41	3473.50	102.22	-315.25
R2BLD42	3473.00	0.55	-315.31
R2BLD43	3473.38	-101.20	-315.42
R2BRD41	3465.79	101.25	310.18
R2BRD42	3465.43	-0.36	309.88
R2BRD43	3465.69	-102.00	309.70
R2BRD44	3466.77	125.41	786.86
R2BRU44	3040.91	127.14	748.13
R2BRU45	3040.16	-127.30	747.04
R2BRU41	3039.47	103.58	271.20
R2BRU42	3038.44	1.88	270.69
R2BRU53	3038.73	122.22	262.23
R2BRU52	3038.56	194.30	190.47
R2BRU51	3039.54	266.37	118.65
R2BRU54	3041.05	621.00	438.46
R2BRU55	3040.28	440.70	618.01
R2BRD54	3466.92	647.14	467.01
R2BRD55	3466.05	467.37	646.60
R2BRD51	3465.89	292.25	147.75
R2BRD52	3465.53	220.43	219.52
R2BRD53	3465.82	148.43	291.43
R2BLD51	3473.55	-148.65	-295.34
R2BLD52	3473.05	-220.90	-223.74
R2BLD53	3473.39	-293.14	-152.22
R2BLD54	3471.73	-466.27	-651.61

R2BRU14	3040.93	-749.18	130.73
R2BRD14	3466.77	-787.58	129.64
R2BRD15	3466.26	-788.87	-124.99
R2BRD11	3465.55	-311.21	101.66
R2BRU24	3041.03	-624.80	-437.14
R2BRU25	3040.53	-446.04	-618.17
R2BRU22	3038.31	-196.02	-192.72
R2BRU21	3039.17	-267.55	-120.35
R2BRD24	3466.85	-651.32	-464.95
R2BRD25	3466.24	-473.03	-646.17
R2BRD23	3465.78	-151.09	-293.67
R2BLU24	3043.94	450.54	610.50
R2BLD21	3473.47	153.55	289.49
R2BLU34	3044.48	618.94	-445.88
R2BLD34	3471.53	648.34	-471.99
R2BLD33	3473.22	149.99	-295.63
R2BLD32	3472.81	221.97	-223.88
R2BLD31	3473.29	294.06	-152.13
R2BRU35	3040.00	-619.39	437.50
R2BRU34	3040.68	-440.31	618.06
R2BRU31	3039.12	-119.70	264.30
R2BRU32	3038.19	-191.29	192.10
R2BRU33	3038.39	-262.98	119.90
R2BRD33	3465.45	-292.28	145.96
R2BRD35	3465.89	-647.90	464.21
R2BRD34	3466.57	-468.59	644.47
R2BLD43	3473.24	-101.23	-315.42
R2BLD42	3472.89	0.53	-315.26
R2BLD41	3473.38	102.10	-315.31
R2BLU45	3044.90	-128.96	-751.78
R2BRU42	3038.35	2.06	270.91
R2BRU43	3038.54	-99.71	270.58
R2BRU45	3040.05	-126.82	747.23
R2BRU44	3040.79	127.55	748.16
R2BRD43	3465.61	-101.90	309.85
R2BRD42	3465.31	-0.17	310.05
R2BRD41	3465.65	101.38	310.32
R2BLU55	3044.67	-620.35	-441.37
R2BLU53	3045.45	-264.58	-122.88
R2BLU52	3044.91	-193.01	-194.71
R2BLU54	3044.55	-440.76	-621.53
R2BLD54	3471.51	-466.85	-650.93
R2BLD55	3471.17	-647.10	-471.71
R2BLD51	3473.37	-148.81	-295.01
R2BRU55	3040.11	441.54	617.65

R2BLU54	3044.75	-440.20	-622.28
R2BLU55	3044.83	-619.98	-442.31
R2RLU15	3044.77	748.83	-139.61
R2RLU14	3044.38	752.52	114.79
R2RLU12	3044.90	273.86	-5.56
R2RLU13	3045.45	272.54	-107.23
R2RLD14	3471.40	791.69	117.07
R2RLD15	3471.34	789.13	-137.09
R2RLD12	3472.80	313.87	-5.21
R2RLD11	3473.21	314.90	96.48
R2RRD13	3465.78	-312.27	-101.78
R2RLUP12	3044.89	273.13	-5.37
R2RLUP13	3045.48	271.67	-107.03
R2RLUP14	3044.39	751.86	114.70
R2RLUP15	3044.78	747.99	-139.70
R2RLDP14	3471.39	791.08	116.94
R2RLDP15	3471.32	788.34	-137.29
R2RLDP11	3473.20	314.25	96.59
R2RLDP12	3472.78	313.14	-5.11
R2BLU61	3044.94	704.67	90.22
R2BLU62	3044.78	702.84	-11.47
R2BLU63	3045.53	701.01	-113.18
R2BLU65	3044.87	1177.16	-147.43
R2BLU64	3044.06	1181.93	106.92
R2BLD64	3471.05	1221.22	109.33
R2BLD65	3471.58	1217.57	-144.74
R2BRD62	3465.87	-742.31	-1.21
R2BRD63	3466.20	-742.30	-102.92
R2BRD64	3467.49	-1219.07	125.69

R2BRD53	3465.63	148.93	291.38
R2BRD54	3466.62	647.83	466.37
R2RRU11	3039.05	-272.43	103.51
R2RRU12	3038.15	-272.75	1.76
R2RRU13	3038.43	-273.15	-99.97
R2RRU15	3040.34	-750.03	-123.61
R2RRU14	3040.87	-749.07	130.77
R2RRD14	3466.67	-787.50	129.68
R2RRD15	3466.20	-788.90	-124.87
R2RRD11	3465.47	-311.13	101.71
R2RRDP11	3465.48	-311.71	101.65
R2RRDP15	3466.28	-789.58	-124.73
R2RRDP14	3466.64	-788.24	129.61
R2RRUP14	3040.88	-749.85	130.77
R2RRUP15	3040.34	-750.75	-123.71
R2RRUP13	3038.43	-273.90	-100.02
R2RRUP12	3038.17	-273.50	1.79
R2RRUP11	3039.06	-273.15	103.57

compare points shot from different sides			
beam left - beam right			
Target	dz (mm)	dx (mm)	dy (mm)
R2BLU24	0.01	-0.91	0.60
R2BRD23	0.18	0.28	-0.26
R2BRD25	0.09	0.66	-0.54
R2BRD24	0.07	0.45	-0.73
R2BLU34	0.13	-0.46	-0.58
R2BLD34	0.02	-0.49	-0.55
R2BLD33	0.10	-0.40	-0.34
R2BRU34	0.24	0.42	0.44
R2BRD35	0.04	0.25	0.37

R2BLD41	0.12	0.13	0.06
R2BLD42	0.11	0.02	-0.05
R2BLD43	0.14	0.03	0.01
R2BRD41	0.14	-0.13	-0.14
R2BRD42	0.12	-0.19	-0.17
R2BRD43	0.08	-0.09	-0.15
R2BRU44	0.12	-0.41	-0.02
R2BRU45	0.11	-0.48	-0.18
R2BRU42	0.09	-0.18	-0.22
R2BRU55	0.17	-0.83	0.36
R2BRD54	0.30	-0.69	0.64
R2BRD53	0.19	-0.50	0.05
R2BLD51	0.18	0.16	-0.33
R2BLD54	0.21	0.58	-0.68
R2BLU54	0.20	0.56	-0.74
R2BLU55	0.16	0.37	-0.94
R2BRD62	0.18	-0.11	0.07
R2BRD64	0.09	-0.32	0.07

Comparing 2012 data to 2011 data (left / right separate)						
Target	Left			Right		
	dz (mm)	dx (mm)	dy(mm)	dz (mm)	dx (mm)	dy(mm)
R2BLD23	-0.07	-0.78	-0.47			
R2BLD25	-0.06	-0.77	-0.88			
R2BLD31				-0.20	-0.17	-0.21
R2BLD32				-0.26	-0.16	-0.23
R2BLD33	-0.15	-0.50	-0.52	-0.24	-0.10	-0.18
R2BLD34	-0.12	-0.98	-0.67	-0.14	-0.49	-0.12
R2BLD41	-0.17	2.65	0.78	-0.29	2.53	0.72
R2BLD42	-0.12	2.72	-0.40	-0.23	2.70	-0.35
R2BLD43	-0.14	2.64	-1.70	-0.28	2.61	-1.71
R2BLD44	-0.17	7.89	0.90			
R2BLD45						
R2BLD51	-0.05	-0.51	-0.72	-0.24	-0.68	-0.39
R2BLD52	0.01	-0.79	-0.94			
R2BLD53	0.03	-0.70	-0.76			
R2BLD54	-0.07	0.29	-1.33	-0.28	-0.29	-0.65
R2BLD55				-0.28	-0.50	-0.80
R2BLD64	-0.02	0.22	-1.62			
R2BLD65	0.43	-0.25	-1.51			
R2BLU11						
R2BLU12	-0.13	-0.79	-0.64			

R2BLU13	-0.16	-0.71	-0.65			
R2BLU14	-0.01	-0.77	-0.56			
R2BLU15	-0.02	-0.74	-0.57			
R2BLU21	-0.14	-0.94	-0.75			
R2BLU22	-0.18	-0.92	-0.81			
R2BLU23	-0.06	-0.99	-0.67			
R2BLU24	-0.33	-0.67	-1.04	-0.34	0.24	-1.64
R2BLU25	-0.13	-0.66	-0.93			
R2BLU31	-0.06	-1.11	-1.02			
R2BLU32	-0.05	-1.16	-0.88			
R2BLU34	-0.10	-1.50	-1.36	-0.23	-1.04	-0.78
R2BLU35	-0.04	-1.61	-1.06			
R2BLU52				-0.34	-0.85	-0.30
R2BLU53				-0.29	-0.68	-0.48
R2BLU54	0.08	0.18	-1.38	-0.13	-0.38	-0.64
R2BLU55	-0.07	-0.12	-1.78	-0.23	-0.49	-0.84
R2BLU61	-0.32	0.66	-0.81			
R2BLU62	-0.35	0.47	-0.78			
R2BLU63	-0.31	0.35	-0.85			
R2BLU64	0.18	0.69	-1.52			
R2BLU65	0.25	0.29	-1.69			
R2BRD11				-0.24	-0.88	-0.41
R2BRD14				-0.20	-0.64	-0.40
R2BRD15				-0.01	-0.61	0.09
R2BRD23	-0.10	-0.92	-0.46	-0.28	-1.20	-0.20
R2BRD24	-0.14	-0.97	-0.10	-0.20	-1.41	0.63
R2BRD25	-0.08	-1.04	-0.24	-0.17	-1.70	0.30
R2BRD33				-0.30	-0.92	-0.65
R2BRD35	-0.13	-0.70	-0.56	-0.17	-0.94	-0.93
R2BRD41	-0.22	-3.75	0.55	-0.36	-3.62	0.69
R2BRD42	-0.23	-3.75	-0.48	-0.35	-3.56	-0.31
R2BRD43	-0.29	-3.66	-1.48	-0.37	-3.57	-1.33
R2BRD44	-0.03	-8.69	1.12			
R2BRD51	-0.15	-0.97	-0.33			
R2BRD54	-0.18	-1.42	0.18	-0.48	-0.73	-0.46
R2BRD61				-0.37	-0.72	-0.43
R2BRD62	-0.17	-0.76	-0.37	-0.35	-0.66	-0.44
R2BRD64	-0.29	-0.86	-0.43	-0.39	-0.54	-0.50
R2BRD65				-0.41	-0.67	-0.48
R2BRU11				-0.17	-0.61	-0.56
R2BRU12				-0.20	-0.75	-0.54
R2BRU13				-0.19	-0.82	-0.46
R2BRU14				-0.20	-0.75	-0.46
R2BRU15				-0.15	-0.68	-0.38
R2BRU21				-0.35	-0.85	-0.10

R2BRU22				-0.31	-0.98	-0.26
R2BRU24				-0.21	-1.41	0.51
R2BRU25				-0.18	-1.72	0.21
R2BRU31				-0.25	-0.92	-0.53
R2BRU32				-0.23	-0.79	-0.53
R2BRU33				-0.24	-0.77	-0.57
R2BRU34	-0.05	-0.87	-0.49	-0.29	-1.29	-0.93
R2BRU35				-0.30	-0.97	-0.98
R2BRU41	-0.15	-3.29	0.46			
R2BRU42	-0.22	-3.25	-0.66	-0.31	-3.07	-0.44
R2BRU43				-0.30	-3.10	-1.46
R2BRU44	-0.27	-8.34	0.82	-0.39	-7.93	0.84
R2BRU45	-0.31	-8.34	-1.97	-0.42	-7.86	-1.79
R2BRU51	-0.09	-0.98	-0.38			
R2BRU52	-0.08	-1.00	-0.47			
R2BRU53	-0.07	-1.17	-0.65			
R2BRU54	-0.17	-1.34	0.08			
R2BRU55	-0.18	-1.59	-0.15	-0.36	-0.75	-0.51
R2BRU61				-0.30	-0.60	-0.50
R2BRU62				-0.33	-0.72	-0.29
R2BRU63				-0.28	-0.64	-0.44
R2BRU64				-0.35	-0.65	-0.43
R2BRU65				-0.35	-0.60	-0.46
R2RLU11						
R2RLU12	-0.15	-0.23	-0.48			
R2RLU13	-0.17	-0.11	-0.46			
R2RLU14	0.00	-0.33	-0.21			
R2RLU15	0.00	-0.15	-0.24			
R2RRD11				-0.37	-0.49	-0.40
R2RRD14				-0.36	-0.28	-0.56
R2RRD15				-0.21	-0.21	-0.45
R2RRU11				-0.30	-0.32	-0.42
R2RRU12				-0.33	-0.33	-0.41
R2RRU13				-0.29	-0.29	-0.38
R2RRU14				-0.27	-0.32	-0.64
R2RRU15				-0.25	-0.26	-0.51

Coordinates for the scattering chamber, Qweak target and standard Hall C target center (meters):

Target	Z(meters)	X(meters)	Y(meters)	dist from pivot
Scat Cham	-393.07332	-128.29149	99.98834	6.0255
Qweak	-393.10324	-128.31446	99.98834	6.0633
Standard	-388.29400	-124.62200	99.98834	