



Jefferson Lab Alignment Group

Data Transmittal

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DATE: 11/02/2016

FROM: Kelly Tremblay

Checked: (cwg)

: A1747

DETAILS:

data : step2b\halla\dvcs\161102a

Below are the results from the survey of the DVCS calorimeters on November 2nd, 2016. The coordinates are based as follows. The origin is the hall A target. The positive z axis is along the incoming beam pointing downstream towards the dump; positive x is to the beam left; positive y is vertical. Units are millimeters. Angular units are degrees with positive yaw counter clockwise about the y axis; positive pitch is clockwise about the x axis; positive roll is clockwise about the z axis. The S value is the distance in the horizontal plane from the target.

The two surveyed positions are as follows:

Position	S[mm]	x[mm]	y[mm]	z[mm]	yaw ^o	pitch ^o	roll ^o
1	1886.77	-374.11	-2.61	1849.31	-11.5686	-0.0917	-0.0189
2	1475.17	-396.92	-3.13	1420.77	-15.8102	-0.0796	-0.0739

The reference point for the calorimeter is the upstream face of the PbF2 crystals at a location as shown on drawing A00000-01-14-0900 sheet 2. The crystals were re-stacked and re-fiducialized on October 28th, 2016. The re-fiducialized and two locations coordinates of the crystals relative to the above coordinate system are shown below.

Position 1				Position 2				Re Fiducialized Crystals			
Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]
ci_000	-600.87	-232.04	1,802.75	ci_000	-619.82	-232.32	1357.56	ci_000	-231.40	-229.45	0.23
ci_001	-599.99	-200.99	1,802.98	ci_001	-618.94	-201.27	1357.86	ci_001	-230.50	-198.40	0.23
ci_002	-602.12	-170.39	1,802.61	ci_002	-621.01	-170.67	1357.33	ci_002	-232.67	-167.80	0.25
ci_003	-600.04	-139.97	1,803.08	ci_003	-618.93	-140.25	1357.96	ci_003	-230.55	-137.39	0.25
ci_004	-600.59	-109.80	1,803.02	ci_004	-619.45	-110.08	1357.87	ci_004	-231.12	-107.22	0.25
ci_005	-598.82	-78.89	1,803.43	ci_005	-617.69	-79.18	1358.41	ci_005	-229.31	-76.31	0.25
ci_006	-600.56	-48.01	1,803.15	ci_006	-619.37	-48.29	1357.99	ci_006	-231.08	-45.42	0.26
ci_007	-599.73	-17.16	1,803.36	ci_007	-618.53	-17.45	1358.27	ci_007	-230.24	-14.58	0.27
ci_008	-599.69	13.35	1,803.43	ci_008	-618.47	13.06	1358.34	ci_008	-230.20	15.94	0.27
ci_009	-600.30	44.09	1,803.37	ci_009	-619.04	43.81	1358.23	ci_009	-230.81	46.68	0.28
ci_010	-599.39	74.61	1,803.60	ci_010	-618.12	74.33	1358.53	ci_010	-229.89	77.20	0.28
ci_011	-601.04	106.76	1,803.33	ci_011	-619.70	106.48	1358.15	ci_011	-231.56	109.34	0.29
ci_012	-599.80	137.11	1,803.64	ci_012	-618.47	136.83	1358.54	ci_012	-230.30	139.70	0.29
ci_013	-601.82	167.85	1,803.29	ci_013	-620.42	167.57	1358.05	ci_013	-232.36	170.44	0.31
ci_014	-599.69	198.61	1,803.77	ci_014	-618.30	198.33	1358.69	ci_014	-230.18	201.20	0.30
ci_015	-600.43	229.25	1,803.68	ci_015	-619.00	228.97	1358.54	ci_015	-230.93	231.84	0.31
ci_016	-570.96	-232.55	1,808.71	ci_016	-590.44	-232.87	1365.73	ci_016	-200.91	-229.96	0.09
ci_017	-569.96	-201.81	1,808.98	ci_017	-589.43	-202.12	1366.06	ci_017	-199.88	-199.21	0.09

Position 1				Position 2				Re Fiducialized Crystals			
Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]
ci_018	-571.96	-170.82	1,808.63	ci_018	-591.38	-171.13	1365.57	ci_018	-201.93	-168.23	0.10
ci_019	-570.39	-140.53	1,809.00	ci_019	-589.81	-140.84	1366.06	ci_019	-200.32	-137.93	0.10
ci_020	-570.50	-109.57	1,809.04	ci_020	-589.89	-109.88	1366.09	ci_020	-200.43	-106.97	0.11
ci_021	-568.92	-78.43	1,809.40	ci_021	-588.30	-78.75	1366.57	ci_021	-198.82	-75.84	0.10
ci_022	-570.51	-47.69	1,809.15	ci_022	-589.84	-48.00	1366.19	ci_022	-200.44	-45.10	0.12
ci_023	-569.69	-16.64	1,809.37	ci_023	-589.01	-16.96	1366.47	ci_023	-199.60	-14.05	0.12
ci_024	-569.64	14.10	1,809.43	ci_024	-588.94	13.79	1366.55	ci_024	-199.55	16.70	0.12
ci_025	-570.07	44.55	1,809.40	ci_025	-589.34	44.24	1366.49	ci_025	-199.99	47.15	0.13
ci_026	-569.44	75.07	1,809.59	ci_026	-588.69	74.76	1366.72	ci_026	-199.34	77.67	0.13
ci_027	-570.85	106.30	1,809.36	ci_027	-590.05	105.99	1366.39	ci_027	-200.78	108.90	0.15
ci_028	-569.85	136.21	1,809.62	ci_028	-589.05	135.90	1366.72	ci_028	-199.76	138.81	0.15
ci_029	-571.36	167.36	1,809.37	ci_029	-590.49	167.05	1366.36	ci_029	-201.29	169.96	0.16
ci_030	-569.42	198.31	1,809.81	ci_030	-588.57	198.00	1366.95	ci_030	-199.32	200.91	0.16
ci_031	-569.81	228.66	1,809.79	ci_031	-588.92	228.35	1366.90	ci_031	-199.71	231.26	0.16
ci_032	-540.64	-232.53	1,814.78	ci_032	-560.65	-232.87	1374.01	ci_032	-169.98	-229.92	-0.06
ci_033	-539.89	-201.96	1,814.98	ci_033	-559.88	-202.30	1374.27	ci_033	-169.21	-199.35	-0.06
ci_034	-541.47	-171.02	1,814.72	ci_034	-561.42	-171.35	1373.90	ci_034	-170.83	-168.41	-0.05
ci_035	-539.93	-140.19	1,815.08	ci_035	-559.88	-140.53	1374.37	ci_035	-169.26	-137.58	-0.05
ci_036	-540.16	-109.34	1,815.09	ci_036	-560.08	-109.68	1374.38	ci_036	-169.50	-106.73	-0.04
ci_037	-538.98	-79.18	1,815.39	ci_037	-558.90	-79.52	1374.75	ci_037	-168.29	-76.57	-0.04
ci_038	-540.23	-48.37	1,815.19	ci_038	-560.09	-48.71	1374.47	ci_038	-169.55	-45.76	-0.03
ci_039	-539.64	-17.36	1,815.36	ci_039	-559.49	-17.71	1374.68	ci_039	-168.96	-14.76	-0.03
ci_040	-539.41	13.49	1,815.47	ci_040	-559.23	13.15	1374.81	ci_040	-168.72	16.10	-0.02
ci_041	-539.98	43.85	1,815.41	ci_041	-559.78	43.51	1374.71	ci_041	-169.31	46.46	-0.01
ci_042	-539.45	74.71	1,815.58	ci_042	-559.23	74.37	1374.91	ci_042	-168.76	77.32	-0.01
ci_043	-540.95	105.78	1,815.33	ci_043	-560.67	105.44	1374.56	ci_043	-170.29	108.38	0.00
ci_044	-539.78	136.25	1,815.62	ci_044	-559.51	135.91	1374.93	ci_044	-169.10	138.86	0.00
ci_045	-540.86	166.99	1,815.47	ci_045	-560.53	166.65	1374.70	ci_045	-170.20	169.60	0.01
ci_046	-539.24	198.27	1,815.84	ci_046	-558.92	197.93	1375.20	ci_046	-168.55	200.88	0.01
ci_047	-539.84	228.64	1,815.78	ci_047	-559.48	228.30	1375.09	ci_047	-169.15	231.25	0.02
ci_048	-510.37	-232.15	1,820.82	ci_048	-530.91	-232.52	1382.28	ci_048	-139.12	-229.53	-0.21
ci_049	-509.34	-201.96	1,821.08	ci_049	-529.88	-202.33	1382.63	ci_049	-138.07	-199.34	-0.21
ci_050	-511.52	-170.80	1,820.71	ci_050	-532.00	-171.16	1382.08	ci_050	-140.29	-168.18	-0.19
ci_051	-509.92	-140.40	1,821.08	ci_051	-530.39	-140.77	1382.58	ci_051	-138.66	-137.79	-0.19
ci_052	-510.38	-109.73	1,821.04	ci_052	-530.81	-110.10	1382.51	ci_052	-139.12	-107.12	-0.19
ci_053	-508.69	-79.09	1,821.43	ci_053	-529.14	-79.46	1383.03	ci_053	-137.40	-76.47	-0.19
ci_054	-510.27	-48.22	1,821.17	ci_054	-530.66	-48.58	1382.66	ci_054	-139.01	-45.60	-0.18
ci_055	-509.44	-17.63	1,821.40	ci_055	-529.81	-18.00	1382.94	ci_055	-138.16	-15.01	-0.17
ci_056	-509.36	12.69	1,821.47	ci_056	-529.72	12.32	1383.01	ci_056	-138.08	15.31	-0.17
ci_057	-510.03	43.45	1,821.39	ci_057	-530.34	43.08	1382.89	ci_057	-138.76	46.07	-0.16
ci_058	-509.67	73.74	1,821.52	ci_058	-529.98	73.37	1383.04	ci_058	-138.40	76.36	-0.16

Position 1				Position 2				Re Fiducialized Crystals			
Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]
ci_059	-511.10	105.25	1,821.29	ci_059	-531.35	104.88	1382.72	ci_059	-139.85	107.87	-0.14
ci_060	-510.08	135.58	1,821.55	ci_060	-530.31	135.21	1383.05	ci_060	-138.80	138.19	-0.14
ci_061	-510.90	166.36	1,821.44	ci_061	-531.11	165.99	1382.88	ci_061	-139.65	168.98	-0.13
ci_062	-509.26	196.89	1,821.83	ci_062	-529.46	196.52	1383.39	ci_062	-137.97	199.51	-0.14
ci_063	-509.87	228.07	1,821.76	ci_063	-530.04	227.70	1383.28	ci_063	-138.59	230.69	-0.13
ci_064	-480.19	-232.34	1,826.84	ci_064	-501.26	-232.74	1390.53	ci_064	-108.35	-229.71	-0.35
ci_065	-479.26	-201.41	1,827.09	ci_065	-500.32	-201.81	1390.84	ci_065	-107.39	-198.79	-0.35
ci_066	-481.18	-170.70	1,826.77	ci_066	-502.18	-171.09	1390.37	ci_066	-109.35	-168.07	-0.34
ci_067	-478.98	-140.50	1,827.25	ci_067	-500.00	-140.90	1391.03	ci_067	-107.11	-137.88	-0.34
ci_068	-480.00	-109.20	1,827.11	ci_068	-500.97	-109.60	1390.80	ci_068	-108.14	-106.57	-0.33
ci_069	-478.75	-79.26	1,827.42	ci_069	-499.72	-79.66	1391.21	ci_069	-106.87	-76.63	-0.33
ci_070	-480.14	-48.79	1,827.19	ci_070	-501.06	-49.18	1390.88	ci_070	-108.29	-46.16	-0.32
ci_071	-479.67	-18.00	1,827.34	ci_071	-500.57	-18.40	1391.07	ci_071	-107.81	-15.38	-0.32
ci_072	-479.25	12.73	1,827.48	ci_072	-500.13	12.33	1391.24	ci_072	-107.37	15.36	-0.32
ci_073	-479.89	43.46	1,827.42	ci_073	-500.73	43.07	1391.13	ci_073	-108.02	46.09	-0.31
ci_074	-479.60	74.23	1,827.53	ci_074	-500.43	73.83	1391.25	ci_074	-107.74	76.86	-0.30
ci_075	-481.02	104.91	1,827.30	ci_075	-501.79	104.51	1390.92	ci_075	-109.18	107.53	-0.29
ci_076	-479.62	135.41	1,827.64	ci_076	-500.39	135.01	1391.37	ci_076	-107.74	138.03	-0.29
ci_077	-480.62	166.40	1,827.49	ci_077	-501.35	166.00	1391.15	ci_077	-108.77	169.03	-0.28
ci_078	-479.44	196.98	1,827.78	ci_078	-500.17	196.58	1391.53	ci_078	-107.56	199.60	-0.28
ci_079	-479.85	227.68	1,827.76	ci_079	-500.55	227.28	1391.48	ci_079	-107.98	230.30	-0.27
ci_080	-450.42	-232.03	1,832.79	ci_080	-472.01	-232.46	1398.66	ci_080	-77.98	-229.40	-0.50
ci_081	-449.53	-201.86	1,833.02	ci_081	-471.12	-202.29	1398.96	ci_081	-77.08	-199.23	-0.50
ci_082	-450.88	-171.40	1,832.81	ci_082	-472.42	-171.83	1398.65	ci_082	-78.45	-168.76	-0.49
ci_083	-449.47	-140.87	1,833.15	ci_083	-471.01	-141.30	1399.09	ci_083	-77.02	-138.23	-0.49
ci_084	-450.00	-110.18	1,833.10	ci_084	-471.51	-110.60	1399.00	ci_084	-77.56	-107.54	-0.48
ci_085	-449.16	-80.06	1,833.32	ci_085	-470.65	-80.48	1399.28	ci_085	-76.70	-77.42	-0.48
ci_086	-449.95	-48.58	1,833.22	ci_086	-471.39	-49.01	1399.13	ci_086	-77.49	-45.94	-0.47
ci_087	-449.25	-17.84	1,833.42	ci_087	-470.69	-18.27	1399.38	ci_087	-76.79	-15.20	-0.47
ci_088	-449.22	12.59	1,833.48	ci_088	-470.63	12.16	1399.44	ci_088	-76.75	15.23	-0.46
ci_089	-450.02	43.10	1,833.37	ci_089	-471.39	42.67	1399.28	ci_089	-77.56	45.74	-0.45
ci_090	-449.43	73.38	1,833.55	ci_090	-470.79	72.95	1399.50	ci_090	-76.96	76.02	-0.45
ci_091	-450.96	104.80	1,833.30	ci_091	-472.26	104.38	1399.14	ci_091	-78.53	107.44	-0.44
ci_092	-449.43	135.21	1,833.67	ci_092	-470.74	134.78	1399.61	ci_092	-76.96	137.85	-0.44
ci_093	-450.67	165.88	1,833.47	ci_093	-471.92	165.46	1399.33	ci_093	-78.23	168.52	-0.43
ci_094	-449.23	196.19	1,833.81	ci_094	-470.48	195.77	1399.78	ci_094	-76.76	198.83	-0.43
ci_095	-449.89	226.69	1,833.74	ci_095	-471.11	226.26	1399.66	ci_095	-77.43	229.33	-0.42
ci_096	-420.33	-232.37	1,838.79	ci_096	-442.46	-232.83	1406.88	ci_096	-47.31	-229.72	-0.65
ci_097	-419.45	-202.08	1,839.03	ci_097	-441.56	-202.54	1407.18	ci_097	-46.40	-199.43	-0.64
ci_098	-420.90	-170.80	1,838.80	ci_098	-442.95	-171.25	1406.84	ci_098	-47.88	-168.15	-0.63
ci_099	-419.18	-140.17	1,839.20	ci_099	-441.25	-140.62	1407.37	ci_099	-46.13	-137.52	-0.63

Position 1				Position 2				Re Fiducialized Crystals			
Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]
ci_100	-419.90	-109.85	1,839.11	ci_100	-441.93	-110.31	1407.23	ci_100	-46.86	-107.21	-0.63
ci_101	-418.99	-78.86	1,839.35	ci_101	-441.00	-79.32	1407.53	ci_101	-45.93	-76.22	-0.62
ci_102	-419.98	-48.18	1,839.21	ci_102	-441.95	-48.63	1407.32	ci_102	-46.93	-45.53	-0.61
ci_103	-419.18	-17.78	1,839.42	ci_103	-441.15	-18.24	1407.59	ci_103	-46.13	-15.14	-0.61
ci_104	-419.32	12.88	1,839.46	ci_104	-441.26	12.43	1407.61	ci_104	-46.26	15.53	-0.61
ci_105	-419.90	43.16	1,839.39	ci_105	-441.79	42.70	1407.52	ci_105	-46.85	45.81	-0.60
ci_106	-419.59	74.04	1,839.51	ci_106	-441.46	73.58	1407.65	ci_106	-46.53	76.68	-0.59
ci_107	-420.84	105.03	1,839.31	ci_107	-442.67	104.58	1407.37	ci_107	-47.81	107.68	-0.58
ci_108	-419.87	135.31	1,839.57	ci_108	-441.68	134.85	1407.69	ci_108	-46.81	137.95	-0.58
ci_109	-420.23	165.80	1,839.55	ci_109	-442.02	165.35	1407.65	ci_109	-47.19	168.45	-0.57
ci_110	-419.26	196.57	1,839.80	ci_110	-441.04	196.11	1407.97	ci_110	-46.20	199.22	-0.57
ci_111	-419.86	227.43	1,839.74	ci_111	-441.60	226.98	1407.86	ci_111	-46.81	230.08	-0.57
ci_112	-389.97	-232.53	1,844.86	ci_112	-412.63	-233.02	1415.17	ci_112	-16.34	-229.88	-0.79
ci_113	-389.64	-201.94	1,844.99	ci_113	-412.27	-202.42	1415.32	ci_113	-16.01	-199.28	-0.79
ci_114	-390.61	-170.55	1,844.85	ci_114	-413.20	-171.04	1415.11	ci_114	-17.00	-167.90	-0.78
ci_115	-389.43	-140.24	1,845.14	ci_115	-412.02	-140.73	1415.49	ci_115	-15.79	-137.59	-0.78
ci_116	-389.96	-109.83	1,845.10	ci_116	-412.51	-110.32	1415.40	ci_116	-16.33	-107.18	-0.77
ci_117	-389.05	-78.99	1,845.33	ci_117	-411.60	-79.48	1415.71	ci_117	-15.40	-76.34	-0.77
ci_118	-389.79	-48.40	1,845.24	ci_118	-412.30	-48.88	1415.56	ci_118	-16.15	-45.74	-0.76
ci_119	-389.24	-17.62	1,845.40	ci_119	-411.73	-18.11	1415.77	ci_119	-15.59	-14.96	-0.76
ci_120	-389.29	12.69	1,845.45	ci_120	-411.76	12.20	1415.81	ci_120	-15.64	15.35	-0.75
ci_121	-389.80	43.33	1,845.40	ci_121	-412.22	42.84	1415.73	ci_121	-16.16	45.99	-0.74
ci_122	-389.54	74.23	1,845.51	ci_122	-411.95	73.75	1415.86	ci_122	-15.90	76.89	-0.74
ci_123	-390.55	104.41	1,845.37	ci_123	-412.91	103.93	1415.64	ci_123	-16.92	107.07	-0.73
ci_124	-389.84	135.25	1,845.57	ci_124	-412.19	134.76	1415.89	ci_124	-16.19	137.91	-0.73
ci_125	-390.30	166.02	1,845.53	ci_125	-412.61	165.53	1415.82	ci_125	-16.66	168.68	-0.72
ci_126	-389.43	196.78	1,845.76	ci_126	-411.74	196.29	1416.12	ci_126	-15.78	199.44	-0.72
ci_127	-390.10	226.87	1,845.68	ci_127	-412.36	226.38	1415.99	ci_127	-16.46	229.53	-0.71
ci_128	-359.92	-232.40	1,850.87	ci_128	-383.10	-232.91	1423.38	ci_128	14.31	-229.73	-0.94
ci_129	-359.35	-201.92	1,851.03	ci_129	-382.52	-202.43	1423.59	ci_129	14.88	-199.25	-0.94
ci_130	-360.27	-170.87	1,850.91	ci_130	-383.38	-171.38	1423.40	ci_130	13.95	-168.20	-0.93
ci_131	-359.11	-140.73	1,851.20	ci_131	-382.23	-141.25	1423.77	ci_131	15.13	-138.07	-0.93
ci_132	-359.91	-109.74	1,851.09	ci_132	-383.00	-110.26	1423.61	ci_132	14.31	-107.08	-0.92
ci_133	-358.97	-79.01	1,851.34	ci_133	-382.03	-79.53	1423.93	ci_133	15.28	-76.35	-0.92
ci_134	-359.78	-48.77	1,851.23	ci_134	-382.80	-49.29	1423.76	ci_134	14.46	-46.11	-0.91
ci_135	-359.38	-17.62	1,851.36	ci_135	-382.39	-18.13	1423.92	ci_135	14.86	-14.95	-0.90
ci_136	-359.52	12.75	1,851.39	ci_136	-382.50	12.23	1423.95	ci_136	14.72	15.41	-0.90
ci_137	-359.55	43.20	1,851.45	ci_137	-382.51	42.68	1423.99	ci_137	14.68	45.86	-0.89
ci_138	-359.75	73.68	1,851.46	ci_138	-382.68	73.16	1423.99	ci_138	14.48	76.35	-0.89
ci_139	-360.67	104.77	1,851.33	ci_139	-383.55	104.26	1423.81	ci_139	13.55	107.44	-0.87
ci_140	-359.71	135.00	1,851.58	ci_140	-382.59	134.49	1424.13	ci_140	14.53	137.67	-0.87

Position 1				Position 2				Re Fiducialized Crystals			
Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]
ci_141	-360.26	166.03	1,851.52	ci_141	-383.10	165.51	1424.03	ci_141	13.97	168.69	-0.87
ci_142	-359.29	196.43	1,851.77	ci_142	-382.13	195.91	1424.35	ci_142	14.96	199.10	-0.87
ci_143	-359.86	227.14	1,851.72	ci_143	-382.65	226.63	1424.25	ci_143	14.38	229.81	-0.86
ci_144	-329.66	-232.40	1,856.91	ci_144	-353.37	-232.94	1431.65	ci_144	45.16	-229.72	-1.09
ci_145	-329.51	-201.63	1,856.99	ci_145	-353.19	-202.17	1431.75	ci_145	45.32	-198.95	-1.08
ci_146	-330.14	-170.77	1,856.92	ci_146	-353.79	-171.32	1431.63	ci_146	44.67	-168.10	-1.07
ci_147	-329.38	-140.54	1,857.13	ci_147	-353.02	-141.09	1431.90	ci_147	45.45	-137.87	-1.07
ci_148	-329.53	-110.15	1,857.16	ci_148	-353.14	-110.69	1431.91	ci_148	45.30	-107.47	-1.06
ci_149	-329.06	-79.53	1,857.31	ci_149	-352.66	-80.08	1432.10	ci_149	45.77	-76.86	-1.06
ci_150	-329.74	-48.65	1,857.23	ci_150	-353.30	-49.20	1431.97	ci_150	45.08	-45.98	-1.05
ci_151	-329.35	-17.34	1,857.36	ci_151	-352.89	-17.88	1432.13	ci_151	45.48	-14.66	-1.05
ci_152	-329.24	12.98	1,857.44	ci_152	-352.74	12.44	1432.22	ci_152	45.60	15.66	-1.04
ci_153	-329.39	43.98	1,857.47	ci_153	-352.87	43.44	1432.23	ci_153	45.44	46.66	-1.04
ci_154	-329.88	74.97	1,857.42	ci_154	-353.33	74.43	1432.16	ci_154	44.94	77.65	-1.03
ci_155	-330.14	105.50	1,857.43	ci_155	-353.56	104.95	1432.14	ci_155	44.68	108.17	-1.02
ci_156	-329.59	136.09	1,857.60	ci_156	-353.00	135.55	1432.35	ci_156	45.24	138.77	-1.02
ci_157	-330.09	166.95	1,857.56	ci_157	-353.46	166.40	1432.27	ci_157	44.73	169.62	-1.01
ci_158	-329.27	197.67	1,857.77	ci_158	-352.64	197.12	1432.56	ci_158	45.56	200.35	-1.01
ci_159	-329.91	227.87	1,857.70	ci_159	-353.22	227.32	1432.44	ci_159	44.93	230.55	-1.00
ci_160	-299.69	-232.52	1,862.89	ci_160	-323.93	-233.09	1439.84	ci_160	75.72	-229.83	-1.23
ci_161	-299.76	-201.88	1,862.93	ci_161	-323.98	-202.45	1439.87	ci_161	75.64	-199.19	-1.23
ci_162	-299.99	-171.05	1,862.95	ci_162	-324.17	-171.62	1439.87	ci_162	75.41	-168.36	-1.22
ci_163	-299.35	-140.72	1,863.13	ci_163	-323.52	-141.29	1440.10	ci_163	76.07	-138.03	-1.22
ci_164	-299.05	-109.44	1,863.24	ci_164	-323.20	-110.01	1440.24	ci_164	76.38	-106.75	-1.21
ci_165	-299.13	-79.14	1,863.28	ci_165	-323.25	-79.71	1440.27	ci_165	76.29	-76.45	-1.21
ci_166	-299.69	-48.74	1,863.23	ci_166	-323.77	-49.32	1440.18	ci_166	75.73	-46.06	-1.20
ci_167	-299.56	-18.09	1,863.31	ci_167	-323.63	-18.67	1440.27	ci_167	75.85	-15.41	-1.19
ci_168	-299.12	12.92	1,863.46	ci_168	-323.17	12.35	1440.44	ci_168	76.31	15.61	-1.19
ci_169	-299.36	44.13	1,863.47	ci_169	-323.37	43.55	1440.44	ci_169	76.07	46.82	-1.18
ci_170	-299.90	74.44	1,863.42	ci_170	-323.88	73.87	1440.35	ci_170	75.51	77.13	-1.18
ci_171	-299.83	105.03	1,863.49	ci_171	-323.78	104.46	1440.43	ci_171	75.59	107.72	-1.17
ci_172	-299.51	136.12	1,863.61	ci_172	-323.45	135.54	1440.57	ci_172	75.91	138.81	-1.17
ci_173	-299.63	166.51	1,863.64	ci_173	-323.53	165.93	1440.59	ci_173	75.79	169.20	-1.16
ci_174	-299.40	197.49	1,863.74	ci_174	-323.28	196.92	1440.72	ci_174	76.03	200.18	-1.16
ci_175	-299.96	228.14	1,863.69	ci_175	-323.80	227.57	1440.62	ci_175	75.46	230.83	-1.15
ci_176	-269.78	-232.29	1,868.86	ci_176	-294.54	-232.89	1448.00	ci_176	106.22	-229.59	-1.38
ci_177	-269.64	-201.82	1,868.95	ci_177	-294.38	-202.43	1448.10	ci_177	106.37	-199.13	-1.37
ci_178	-270.01	-170.61	1,868.93	ci_178	-294.72	-171.22	1448.06	ci_178	105.99	-167.92	-1.36
ci_179	-269.19	-140.43	1,869.16	ci_179	-293.88	-141.03	1448.34	ci_179	106.83	-137.73	-1.36
ci_180	-268.81	-109.26	1,869.28	ci_180	-293.49	-109.86	1448.50	ci_180	107.21	-106.56	-1.36
ci_181	-269.29	-78.99	1,869.25	ci_181	-293.93	-79.60	1448.42	ci_181	106.73	-76.30	-1.35

Position 1				Position 2				Re Fiducialized Crystals			
Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]	Circle	x[mm]	y[mm]	z[mm]
ci_182	-269.31	-48.59	1,869.30	ci_182	-293.93	-49.20	1448.47	ci_182	106.71	-45.90	-1.35
ci_183	-269.58	-17.30	1,869.30	ci_183	-294.17	-17.90	1448.46	ci_183	106.43	-14.60	-1.34
ci_184	-269.13	13.47	1,869.45	ci_184	-293.68	12.86	1448.64	ci_184	106.90	16.16	-1.34
ci_185	-269.58	43.96	1,869.41	ci_185	-294.12	43.36	1448.57	ci_185	106.43	46.66	-1.33
ci_186	-269.86	74.37	1,869.41	ci_186	-294.36	73.76	1448.56	ci_186	106.15	77.06	-1.32
ci_187	-269.76	105.86	1,869.49	ci_187	-294.24	105.26	1448.64	ci_187	106.25	108.56	-1.32
ci_188	-269.52	136.14	1,869.59	ci_188	-293.98	135.54	1448.77	ci_188	106.49	138.84	-1.31
ci_189	-269.65	166.59	1,869.62	ci_189	-294.08	165.98	1448.78	ci_189	106.37	169.28	-1.31
ci_190	-269.46	196.89	1,869.72	ci_190	-293.87	196.29	1448.89	ci_190	106.57	199.59	-1.30
ci_191	-270.07	227.97	1,869.65	ci_191	-294.44	227.37	1448.78	ci_191	105.94	230.67	-1.29
ci_192	-239.68	-232.36	1,874.87	ci_192	-264.97	-233.00	1456.23	ci_192	136.92	-229.66	-1.52
ci_193	-239.62	-201.60	1,874.95	ci_193	-264.89	-202.24	1456.30	ci_193	136.97	-198.90	-1.52
ci_194	-239.74	-170.70	1,874.98	ci_194	-264.97	-171.33	1456.33	ci_194	136.86	-168.00	-1.51
ci_195	-239.68	-139.91	1,875.05	ci_195	-264.89	-140.55	1456.40	ci_195	136.92	-137.21	-1.51
ci_196	-239.08	-109.68	1,875.22	ci_196	-264.28	-110.31	1456.62	ci_196	137.52	-106.97	-1.50
ci_197	-239.53	-79.04	1,875.19	ci_197	-264.69	-79.67	1456.56	ci_197	137.07	-76.33	-1.50
ci_198	-239.26	-48.17	1,875.30	ci_198	-264.40	-48.80	1456.69	ci_198	137.34	-45.46	-1.49
ci_199	-239.42	-17.20	1,875.32	ci_199	-264.54	-17.83	1456.69	ci_199	137.18	-14.50	-1.49
ci_200	-239.40	13.40	1,875.38	ci_200	-264.48	12.77	1456.76	ci_200	137.21	16.11	-1.48
ci_201	-239.42	44.20	1,875.43	ci_201	-264.48	43.57	1456.81	ci_201	137.18	46.91	-1.47
ci_202	-239.97	75.13	1,875.38	ci_202	-264.99	74.50	1456.72	ci_202	136.63	77.84	-1.47
ci_203	-239.40	105.39	1,875.55	ci_203	-264.40	104.76	1456.94	ci_203	137.22	108.10	-1.46
ci_204	-239.45	136.25	1,875.60	ci_204	-264.43	135.61	1456.98	ci_204	137.17	138.95	-1.46
ci_205	-239.47	167.15	1,875.66	ci_205	-264.42	166.52	1457.03	ci_205	137.15	169.86	-1.45
ci_206	-239.47	197.77	1,875.71	ci_206	-264.40	197.14	1457.09	ci_206	137.15	200.48	-1.45
ci_207	-239.98	228.38	1,875.66	ci_207	-264.88	227.75	1457.00	ci_207	136.62	231.09	-1.44