# - 马exase <br> <br> Jefferson Lab Alignment Group <br> <br> Jefferson Lab Alignment Group <br> Data Transmittal 

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DETAILS: Inspection\HallB\RICH_MIRRORS\220527A \&220603A, Step2B\HALLB\Carriages\Fwd\220607A
Below are the results of the recent Rich Detector surveys. Coordinates are provided in a local coordinate system as measured in the EEL building and then transformed in the CEBAF Mechanical coordinate system once located in the hall.

In the local coordinate system, the X axis is perpendicular to the measured plane adjacent to the five fiducials. The $Z$ axis is parallel to a line constructed though "Fid A" and "Fid E". The origin is defined by "Fid C" projected to the measured plane and shifted +2 mm in Z . Because of the frame assembly, the 2 mm shift was required in order to set the four planar mirrors at 60 degrees to each other and still be in range with the spring loaded adjustment screws.

## SECTOR 1



## Coordinates relative to local coordinate system (measured at EEL)

|  | RICH 1 Fiducials (millimeters) |  |  |
| :--- | ---: | ---: | ---: |
|  | $\mathbf{X}$ | $\mathbf{Y}$ | $\mathbf{Z}$ |
| FID_A | 9.91 | 2969.74 | -1686.99 |
| FID_B | 9.68 | 1777.59 | -1070.55 |
| FID_C | 10.00 | 0.00 | -2.00 |
| FID_D | 9.54 | 1775.81 | 1067.62 |
| FID_E | 10.00 | 2969.74 | 1680.26 |


|  | SPHERICAL MIRRORS (millimeters) |  |  |  |
| :--- | :---: | :---: | ---: | ---: |
|  | $\mathbf{X}$ | $\mathbf{Y}$ | $\mathbf{Z}$ | RADIUS |
| $\mathbf{1}$ | 1742.96 | 946.77 | -5.19 | 2725.42 |
| $\mathbf{2}$ | 1724.61 | 948.52 | 0.67 | 2713.01 |
| $\mathbf{2 C}$ | 1735.18 | 948.75 | 0.13 | 2717.71 |
| $\mathbf{3}$ | 1750.67 | 934.63 | -12.54 | 2741.79 |
| $\mathbf{3 C}$ | 1734.00 | 945.80 | -2.03 | 2726.48 |
| $\mathbf{4}$ | 1720.35 | 950.86 | 1.00 | 2713.42 |
| $\mathbf{4 C}$ | 1727.43 | 948.84 | 1.85 | 2717.24 |
| $\mathbf{5}$ | 1716.12 | 951.09 | 0.58 | 2701.82 |
| $\mathbf{5 C}$ | 1734.55 | 945.02 | -0.76 | 2724.62 |
| $\mathbf{6}$ | 1720.65 | 950.46 | 0.18 | 2712.99 |
| ALL Mirrors | 1712.10 | 965.78 | -9.21 | 2696.74 |

Below are the results in the CEBAF Mechanical system and in a Beam Following System. The BFS system is relative to the IDEAL target location. A positive $Z$ is downstream of the target, a positive Y is above and a positive X is to the beam left.

| Transformed to CEBAF Mechanical coordinate |  |  |  |
| :--- | :---: | :---: | :---: | :---: |
| system |  |  |  |$|.$


| Beam Following Coordinate system relative to IDEAL target position |  |  |  |
| :---: | :---: | :---: | :---: |
|  | Polarized Target (millimeters) |  |  |
|  | X | Y | Z |
| As-Set | -0.43 | -0.51 | -29.82 |
|  | RICH 1 Fiducials (millimeters) |  |  |
|  | X | Y | Z |
| FID_A | 3000.4 | 1678.4 | 4649.3 |
| FID_B | 1920.0 | 1063.2 | 5154.6 |
| FID_C | 308.4 | -3.4 | 5907.6 |
| FID_D | 1916.3 | -1074.9 | 5156.3 |
| FID_E | 2997.2 | -1688.8 | 4650.4 |
|  | Spherical Mirrors (millimeters) |  |  |
|  | X | Y | Z |
| 1 | 432.2 | -1.1 | 3936.7 |
| 2 | 441.6 | -6.9 | 3952.6 |
| 2C | 437.3 | -6.4 | 3942.9 |
| 3 | 418.0 | 6.3 | 3934.9 |
| 3C | 435.1 | -4.2 | 3945.3 |
| 4 | 445.5 | -7.3 | 3955.5 |
| 4C | 440.7 | -8.1 | 3949.9 |
| 5 | 447.5 | -6.8 | 3959.2 |
| 5C | 434.2 | -5.5 | 3945.1 |
| 6 | 445.0 | -6.4 | 3955.4 |

Below are the locations of the RICH detector fiducials in Sector 4.

| CEBAF Mechanical |  |  |  |
| :---: | :---: | :---: | :---: |
|  | RICH 4 Fiducials (meters) |  |  |
|  | X | Y | Z |
| R4_FidA | -77.5947 | 101.6763 | -403.4701 |
| R4_FidC | -80.2849 | 103.3534 | -404.7302 |
| R4_FidE | -77.5893 | 105.0403 | -403.4916 |


| Beam Following System |  |  |  |
| :--- | :---: | ---: | :---: |
|  | RICH 4 Fiducials (millimeters) |  |  |
|  | X | Y | Z |
| R4_FidA | -3005.31 | -1678.97 | 4648.6 |
| R4_FidC | -315.08 | -1.83 | 5908.68 |
| R4_FidE | -3010.66 | 1685.02 | 4670.08 |

