



Jefferson Lab Alignment Group

Data Transmittal

TO: B. Crahen, T. Whitlatch

DATE: 21 Nov 2013

FROM: Chris Gould

Checked: AL

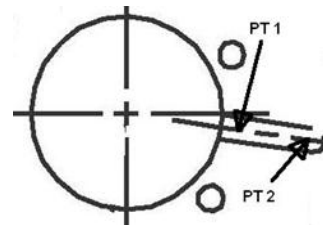
: D1520

DETAILS:

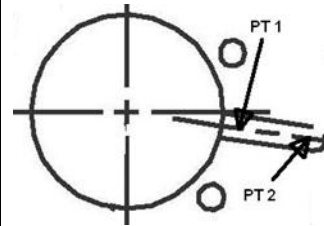
M:\align\DATA\Fiduc\HalID\Hodoscope\131119A

Below are the results of the recent Hodoscope Plate inspection. The coordinate system and "ME Name" were established according to drawing # D00000-19-01-**. The "SA Name" is the reference name used in the field. The diagram shows where the keyway points were taken in order to measure the angles. Dimensions are in inches and degrees.

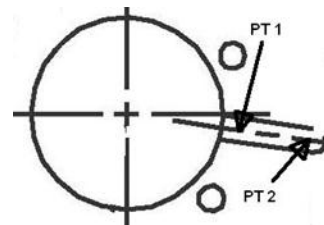
| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas | |
|-----------|------------------|-----------------|--------|--------|--------|--------|--------|-------|------------------|------------------|--------|--|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | | |
| 2003 | 5 | 1 | 4.316 | 1.032 | 4.330 | 1.035 | 0.015 | 0.004 | 44.078 | 44.083 | 0.005 | |
| | 1 | 2 | 1.454 | 4.969 | 1.468 | 4.972 | 0.014 | 0.003 | 43.087 | 43.032 | -0.055 | |
| | 6 | 11 | 18.957 | 1.032 | 18.972 | 1.036 | 0.015 | 0.005 | | | | |
| | 2 | 14 | 17.810 | 4.969 | 17.825 | 4.972 | 0.014 | 0.004 | | | | |
| | 7 | 19 | 32.782 | 1.032 | 32.796 | 1.035 | 0.014 | 0.004 | | | | |
| | 3 | 22 | 31.015 | 4.969 | 31.029 | 4.972 | 0.014 | 0.003 | | | | |
| | 8 | 29 | 49.854 | 1.032 | 49.866 | 1.036 | 0.011 | 0.004 | 24.648 | 24.535 | -0.113 | |
| | 4 | 34 | 49.116 | 4.969 | 49.126 | 4.972 | 0.011 | 0.004 | 22.798 | 22.766 | -0.032 | |
| | | BH1 | | 9.500 | 3.000 | 9.513 | 3.004 | 0.013 | 0.004 | | | |
| | | BH2 | | 41.500 | 3.000 | 41.512 | 3.004 | 0.012 | 0.004 | | | |
| | | | | | | | | | | | | |
| | | KEYWAY 1 | | | | | | | | | | |
| | 1ST POINT | | | | 4.777 | 0.602 | | | | | | |
| | 2ND POINT | | | | 4.972 | 0.413 | | | | | | |
| | KEYWAY 2 | | | | | | | | | | | |
| | 1ST POINT | | | | 1.927 | 4.542 | | | | | | |
| | 2ND POINT | | | | 2.115 | 4.366 | | | | | | |
| | KEYWAY 29 | | | | | | | | | | | |
| | 1ST POINT | | | | 50.427 | 0.778 | | | | | | |
| | 2ND POINT | | | | 50.644 | 0.679 | | | | | | |
| | KEYWAY 34 | | | | | | | | | | | |
| | 1ST POINT | | | | 49.731 | 4.719 | | | | | | |
| | 2ND POINT | | | | 49.940 | 4.631 | | | | | | |



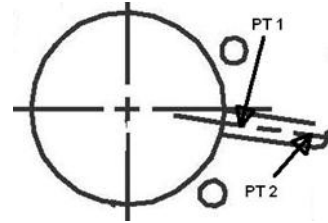
| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas |
|-------------|------------------|---------|--------|-------|--------|-------|--------|--------|------------------|------------------|--------|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | |
| 2004 | 2 | 31 | 1.982 | 1.032 | 1.984 | 1.032 | 0.002 | 0.001 | 23.885 | 23.896 | 0.011 |
| | 1 | 36 | 1.166 | 4.969 | 1.168 | 4.970 | 0.002 | 0.001 | 22.109 | 22.115 | 0.006 |
| | 7 | 39 | 16.487 | 1.032 | 16.488 | 1.031 | 0.001 | 0.000 | | | |
| | 8 | 48 | 17.603 | 4.969 | 17.604 | 4.968 | 0.001 | -0.001 | | | |
| | 6 | 53 | 35.503 | 1.032 | 35.502 | 1.030 | -0.001 | -0.001 | | | |
| | 5 | 62 | 35.338 | 4.969 | 35.336 | 4.967 | -0.001 | -0.001 | | | |
| | 3 | 63 | 49.637 | 1.032 | 49.634 | 1.029 | -0.004 | -0.002 | 16.908 | 16.897 | -0.011 |
| | 4 | 74 | 49.472 | 4.969 | 49.468 | 4.966 | -0.004 | -0.003 | 15.679 | 15.682 | 0.003 |
| | BH1 | | 9.50 | 3.00 | 9.50 | 3.00 | 0.000 | 0.000 | | | |
| | BH2 | | 41.50 | 3.00 | 41.50 | 3.00 | -0.002 | -0.002 | | | |
| | | | | | | | | | | | |
| | KEYWAY 31 | | | | | | | | | | |
| | 1ST POINT | | | | 2.565 | 0.776 | | | | | |
| | 2ND POINT | | | | 2.799 | 0.673 | | | | | |
| | KEYWAY 36 | | | | | | | | | | |
| | 1ST POINT | | | | 1.747 | 4.735 | | | | | |
| | 2ND POINT | | | | 1.973 | 4.643 | | | | | |
| | KEYWAY 63 | | | | | | | | | | |
| | 1ST POINT | | | | 50.220 | 0.850 | | | | | |
| | 2ND POINT | | | | 50.468 | 0.775 | | | | | |
| | KEYWAY 74 | | | | | | | | | | |
| | 1ST POINT | | | | 50.007 | 4.815 | | | | | |
| | 2ND POINT | | | | 50.336 | 4.723 | | | | | |
| | | | | | | | | | | | |



| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas | |
|-----------|-------------------|------------------|--------|-------|--------|-------|--------|--------|------------------|------------------|--------|--|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | | |
| 2005 | 2 | 65 | 1.512 | 1.032 | 1.515 | 1.031 | 0.003 | 0.000 | 16.639 | 16.709 | 0.070 | |
| | 7 | 75 | 13.825 | 1.032 | 13.825 | 1.032 | 0.000 | 0.001 | | | | |
| | 1 | 76 | 0.880 | 4.969 | 0.883 | 4.969 | 0.003 | 0.000 | 15.478 | 15.541 | 0.063 | |
| | 6 | 85 | 25.135 | 1.032 | 25.134 | 1.034 | -0.001 | 0.003 | | | | |
| | 8 | 89 | 13.292 | 4.969 | 13.292 | 4.968 | 0.000 | -0.001 | | | | |
| | 3 | 100 | 37.992 | 1.032 | 37.989 | 1.031 | -0.004 | 0.000 | 13.923 | 14.027 | 0.104 | |
| | 5 | 104 | 25.408 | 4.969 | 25.406 | 4.971 | -0.002 | 0.002 | | | | |
| | 4 | 119 | 38.200 | 4.969 | 38.196 | 4.970 | -0.004 | 0.001 | 12.996 | 12.957 | -0.039 | |
| | | BH1 | | 1.40 | 3.00 | 1.40 | 3.00 | 0.003 | -0.001 | | | |
| | | BH2 | | 33.40 | 3.00 | 33.40 | 3.00 | -0.002 | 0.002 | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | KEYWAY 65 | | | | | | | | | | |
| | | 1ST POINT | | | 2.095 | 0.858 | | | | | | |
| | | 2ND POINT | | | 2.374 | 0.774 | | | | | | |
| | KEYWAY 76 | | | | | | | | | | | |
| | | 1ST POINT | | | 1.504 | 4.796 | | | | | | |
| | | 2ND POINT | | | 1.763 | 4.724 | | | | | | |
| | KEYWAY 100 | | | | | | | | | | | |
| | | 1ST POINT | | | 38.650 | 0.867 | | | | | | |
| | | 2ND POINT | | | 38.844 | 0.818 | | | | | | |
| | KEYWAY 119 | | | | | | | | | | | |
| | | 1ST POINT | | | 38.765 | 4.838 | | | | | | |
| | | 2ND POINT | | | 39.013 | 4.780 | | | | | | |

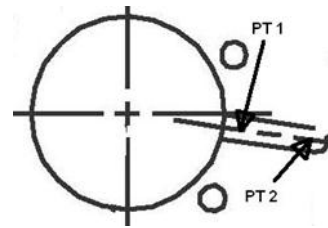


| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas | |
|-------------|-------------------|-----------|--------|-------|--------|-------|--------|--------|------------------|------------------|--------|--|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | | |
| 2006 | 2 | 103 | 1.858 | 0.882 | 1.860 | 0.885 | 0.003 | 0.003 | 13.769 | 13.745 | -0.024 | |
| | 6 | 118 | 14.922 | 1.032 | 14.923 | 1.034 | 0.001 | 0.003 | | | | |
| | 1 | 122 | 1.439 | 4.969 | 1.441 | 4.972 | 0.002 | 0.003 | 12.859 | 12.851 | -0.008 | |
| | 5 | 137 | 15.050 | 4.969 | 15.051 | 4.971 | 0.001 | 0.002 | | | | |
| | 4 | 145 | 40.152 | 1.032 | 40.149 | 1.032 | -0.004 | 0.000 | 11.944 | 11.985 | 0.041 | |
| | 7 | 155 | 29.248 | 4.969 | 29.246 | 4.970 | -0.002 | 0.002 | | | | |
| | 3 | 170 | 40.267 | 5.149 | 40.264 | 5.149 | -0.003 | 0.001 | 11.216 | 11.236 | 0.020 | |
| | | BH1 | | 2.50 | 3.00 | 2.50 | 3.00 | 0.000 | 0.003 | | | |
| | | BH2 | | 34.50 | 3.00 | 34.50 | 3.00 | -0.002 | 0.003 | | | |
| | | | | | | | | | | | | |
| | KEYWAY 103 | | | | | | | | | | | |
| | | 1ST POINT | | | 2.452 | 0.740 | | | | | | |
| | | 2ND POINT | | | 2.764 | 0.663 | | | | | | |
| | KEYWAY 122 | | | | | | | | | | | |
| | | 1ST POINT | | | 2.042 | 4.835 | | | | | | |
| | | 2ND POINT | | | 2.350 | 4.765 | | | | | | |
| | KEYWAY 145 | | | | | | | | | | | |
| | | 1ST POINT | | | 40.718 | 0.910 | | | | | | |
| | | 2ND POINT | | | 41.065 | 0.837 | | | | | | |
| | KEYWAY 170 | | | | | | | | | | | |
| | | 1ST POINT | | | 40.837 | 5.036 | | | | | | |
| | | 2ND POINT | | | 41.177 | 4.969 | | | | | | |

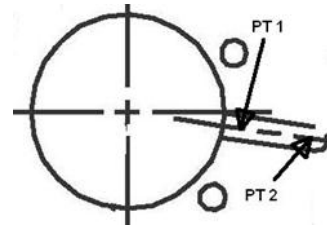


| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas |
|-------------|---------|---------|--------|-------|--------|-------|--------|--------|------------------|------------------|--------|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | |
| 2007 | 2 | 148 | 1.808 | 0.882 | 1.811 | 0.880 | 0.003 | -0.001 | 11.851 | 11.799 | -0.052 |
| | 7 | 166 | 16.107 | 1.032 | 16.107 | 1.031 | 0.000 | -0.001 | | | |
| | 1 | 173 | 2.112 | 4.969 | 2.113 | 4.969 | 0.001 | 0.000 | 11.135 | 11.102 | -0.033 |
| | 6 | 181 | 27.886 | 1.032 | 27.884 | 1.030 | -0.002 | -0.001 | | | |
| | 3 | 193 | 35.860 | 1.032 | 35.856 | 1.029 | -0.004 | -0.003 | 10.733 | 10.773 | 0.040 |
| | 8 | 194 | 16.643 | 4.969 | 16.644 | 4.968 | 0.000 | 0.000 | | | |
| | 5 | 199 | 27.643 | 4.969 | 27.641 | 4.967 | -0.002 | -0.002 | | | |
| | 4 | 204 | 38.443 | 4.969 | 38.440 | 4.965 | -0.003 | -0.003 | 10.109 | 10.112 | 0.003 |
| | BH1 | | 2.70 | 3.00 | 2.69 | 3.00 | -0.01 | 0.00 | | | |
| | BH2 | | 34.70 | 3.00 | 34.68 | 3.00 | -0.02 | 0.00 | | | |

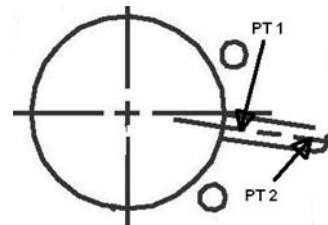
| | | | | | | | | | | | |
|--|-------------------|--|--|--|--------|-------|--|--|--|--|--|
| | KEYWAY 148 | | | | | | | | | | |
| | 1ST POINT | | | | 2.416 | 0.754 | | | | | |
| | 2ND POINT | | | | 2.763 | 0.681 | | | | | |
| | KEYWAY 173 | | | | | | | | | | |
| | 1ST POINT | | | | 2.722 | 4.848 | | | | | |
| | 2ND POINT | | | | 3.017 | 4.790 | | | | | |
| | KEYWAY 193 | | | | | | | | | | |
| | 1ST POINT | | | | 36.491 | 0.908 | | | | | |
| | 2ND POINT | | | | 36.785 | 0.852 | | | | | |
| | KEYWAY 204 | | | | | | | | | | |
| | 1ST POINT | | | | 39.082 | 4.850 | | | | | |
| | 2ND POINT | | | | 39.364 | 4.799 | | | | | |



| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas |
|-----------|-------------------|-----------|--------|-------|--------|-------|--------|-------|------------------|------------------|--------|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | |
| 2008 | 2 | 205 | 15.275 | 1.032 | 15.277 | 1.032 | 0.002 | 0.001 | 10.059 | 10.087 | 0.028 |
| | 6 | 210 | 26.412 | 1.032 | 26.411 | 1.032 | -0.001 | 0.000 | 9.822 | | |
| | 1 | 211 | 5.770 | 4.969 | 5.771 | 4.968 | 0.002 | 0.000 | 9.777 | 9.826 | 0.049 |
| | 8 | 214 | 35.188 | 1.032 | 35.186 | 1.032 | -0.003 | 0.001 | 9.648 | | |
| | 5 | 217 | 18.238 | 4.969 | 18.238 | 4.970 | 0.000 | 0.001 | 9.526 | | |
| | 3 | 218 | 43.856 | 1.032 | 43.852 | 1.031 | -0.004 | 0.000 | 9.487 | 9.492 | 0.005 |
| | 7 | 223 | 30.511 | 4.969 | 30.509 | 4.969 | -0.002 | 0.000 | 9.301 | | |
| | 4 | 228 | 40.606 | 4.969 | 40.603 | 4.969 | -0.003 | 0.000 | 9.130 | 9.141 | 0.011 |
| | BH1 | | 7.62 | 3.00 | 7.63 | 3.00 | 0.01 | 0.00 | | | |
| | BH2 | | 39.62 | 3.00 | 39.62 | 3.00 | 0.00 | 0.00 | | | |
| | KEYWAY 205 | | | | | | | | | | |
| | | 1ST POINT | | | 15.914 | 0.919 | | | | | |
| | | 2ND POINT | | | 16.196 | 0.869 | | | | | |
| | KEYWAY 211 | | | | | | | | | | |
| | | 1ST POINT | | | 6.382 | 4.863 | | | | | |
| | | 2ND POINT | | | 6.696 | 4.809 | | | | | |
| | KEYWAY 218 | | | | | | | | | | |
| | | 1ST POINT | | | 44.518 | 0.919 | | | | | |
| | | 2ND POINT | | | 44.814 | 0.869 | | | | | |
| | KEYWAY 228 | | | | | | | | | | |
| | | 1ST POINT | | | 41.275 | 4.860 | | | | | |
| | | 2ND POINT | | | 41.518 | 4.821 | | | | | |



| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas | |
|-------------|-------------------|-------------------|--------|-------|--------|--------|--------|--------|------------------|------------------|--------|--|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | | |
| 2009 | 7 | 229 | 17.697 | 1.032 | 17.698 | 1.032 | 0.001 | 0.001 | 9.098 | 9.072 | -0.026 | |
| | 8 | 232 | 23.953 | 1.032 | 23.953 | 1.032 | 0.001 | 0.000 | | | | |
| | 1 | 233 | 1.093 | 4.969 | 1.094 | 4.970 | 0.001 | 0.001 | 8.973 | 8.949 | -0.024 | |
| | 9 | 236 | 32.224 | 1.032 | 32.224 | 1.032 | 0.001 | 0.001 | | | | |
| | 2 | 239 | 12.947 | 4.969 | 12.949 | 4.970 | 0.002 | 0.001 | | | | |
| | 10 | 240 | 40.427 | 1.032 | 40.427 | 1.032 | 0.000 | 0.000 | | | | |
| | 11 | 243 | 46.537 | 1.032 | 46.536 | 1.030 | -0.001 | -0.001 | 8.69 | 8.738 | 0.048 | |
| | 3 | 244 | 22.729 | 4.969 | 22.729 | 4.969 | 0.001 | 0.001 | | | | |
| | 4 | 247 | 29.155 | 4.879 | 29.156 | 4.879 | 0.000 | 0.001 | | | | |
| | 5 | 250 | 34.366 | 4.969 | 34.366 | 4.969 | 0.000 | 0.001 | | | | |
| | 6 | 253 | 40.761 | 4.879 | 40.760 | 4.879 | 0.000 | 0.001 | 8.441 | 8.380 | -0.061 | |
| | | BH1 | | 8.00 | 3.00 | 8.00 | 3.00 | 0.000 | 0.001 | | | |
| | | BH2 | | 40.00 | 3.00 | 40.00 | 3.00 | -0.001 | 0.000 | | | |
| | | | | | | | | | | | | |
| | | KEYWAY 229 | | | | | | | | | | |
| | | 1ST POINT | | | | 18.325 | 0.932 | | | | | |
| | 2ND POINT | | | | 18.601 | 0.888 | | | | | | |
| | KEYWAY 233 | | | | | | | | | | | |
| | 1ST POINT | | | | 1.656 | 4.881 | | | | | | |
| | 2ND POINT | | | | 2.013 | 4.825 | | | | | | |
| | KEYWAY 243 | | | | | | | | | | | |
| | 1ST POINT | | | | 47.164 | 0.934 | | | | | | |
| | 2ND POINT | | | | 47.389 | 0.900 | | | | | | |
| | KEYWAY 253 | | | | | | | | | | | |
| | 1ST POINT | | | | 41.380 | 4.787 | | | | | | |
| | 2ND POINT | | | | 41.623 | 4.751 | | | | | | |
| | | | | | | | | | | | | |



| Hodoscope | SA Name | ME Name | Ideal | | Found | | deltas | | Ideal | Found | deltas | |
|-----------|-------------------|-------------------|--------|-------|--------|--------|--------|-------|------------------|------------------|--------|--|
| | | | X | Y | X | Y | X | Y | KEYWAY (degrees) | KEYWAY (degrees) | | |
| 2010 | 5 | 254 | 12.185 | 1.032 | 12.188 | 1.033 | 0.003 | 0.002 | 8.417 | 8.372 | -0.045 | |
| | 6 | 257 | 18.168 | 1.032 | 18.171 | 1.033 | 0.002 | 0.002 | | | | |
| | 7 | 260 | 24.137 | 1.032 | 24.139 | 1.033 | 0.002 | 0.002 | | | | |
| | 8 | 262 | 28.114 | 1.032 | 28.116 | 1.033 | 0.002 | 0.001 | 8.237 | 8.220 | -0.017 | |
| | 1 | 263 | 2.832 | 4.969 | 2.834 | 4.969 | 0.002 | 0.001 | 8.216 | 8.232 | 0.016 | |
| | 2 | 267 | 10.500 | 4.969 | 10.502 | 4.970 | 0.002 | 0.002 | | | | |
| | 3 | 271 | 18.191 | 4.969 | 18.193 | 4.971 | 0.002 | 0.002 | | | | |
| | 4 | 274 | 23.987 | 4.969 | 23.990 | 4.970 | 0.003 | 0.002 | 7.986 | 8.022 | 0.036 | |
| | | BH1 | | 1.50 | 3.00 | 1.50 | 3.00 | 0.00 | 0.00 | | | |
| | | BH2 | | 33.50 | 3.00 | 33.50 | 3.00 | 0.00 | 0.00 | | | |
| | | | | | | | | | | | | |
| | | KEYWAY 254 | | | | | | | | | | |
| | | | | | | 12.739 | 0.951 | | | | | |
| | | | | | | 13.062 | 0.904 | | | | | |
| | KEYWAY 262 | | | | | | | | | | | |
| | | | | | 28.684 | 0.950 | | | | | | |
| | | | | | 28.999 | 0.904 | | | | | | |
| | KEYWAY 263 | | | | | | | | | | | |
| | | | | | 3.436 | 4.882 | | | | | | |
| | | | | | 3.722 | 4.840 | | | | | | |
| | KEYWAY 274 | | | | | | | | | | | |
| | | | | | 24.591 | 4.885 | | | | | | |
| | | | | | 24.868 | 4.846 | | | | | | |

