Let’s see how great a concern it should be if we use a median instead of an average for the altitudes and the time. Just by coincidence, exactly one year ago I took two series of nine shots each with my A-7 bubble octant to check its index error.

Here is the data:

May 7, 2011. A.P. 34° 16.6' N, 118° 54.0' W. Center of the sun.

23:46:00	35° 17'
14	06
29	09
43	08
59	06
47:15	02
28	01
40	34° 58
58	52

23:48:18	34° 51'
31	48
46	47
49:04	41
21	39
37	33
51	33
50:09	27
21	25

The first series took 1:58 so the median time was 23:46:59 while the average time for the series was 23:46:58.4, a 0.6 seconds difference. The median altitude was 35 06' while the average altitude was 35 04.3' a difference of 1.7'. Using the median time with the median altitude produced an intercept of 0.4 T; median time with average altitude = 1.3 A; average time with median altitude = 0.2 T; average time with average altitude = 1.5 A so the maximum difference was 1.9 NM.

The second series took 2:03 so the median time was 23:49:20 while the average time for the series was 23:49:19.8, a 0.2 seconds difference. The median altitude was 34° 39' while the average altitude was 34° 38.2' a difference of 0.8'. Using the median time with the median altitude produced an intercept of 2.4 T; median time with average altitude = 1.6 T; average time with median altitude = 2.4 T; average time with average altitude = 1.6 T so the maximum difference was 0.8 NM.

If we combine both series into one 18 shot set then the total series took 4:21 so the median time was 23:48:10.5 while the average time for the series was 23:48:20.2, a 9.7 seconds difference. The median altitude was 34° 51.5' while the average altitude was 34° 51.3' a difference of 0.2'. Using the median time with the median altitude produced an intercept of 0.5 T; median time with average altitude = 0.3 T; average time with median altitude = 2.6 T; average time with average altitude = 2.4 T so the maximum difference was 2.3 NM.