Learn How to Interpret the Individual Score Sheet

Orion's Individual Score Sheet is the shooter's printed individual results from an Orion Match. It serves two purposes. First, to let the shooter see precisely how Orion scored each shot. Second, to provide coaching analysis on the shooter's performance.

This newsletter is intended to help shooters and coaches understand the data on the individual score sheet and how to use it in their training.

Checking for Obvious Errors

At the conclusion of a match it is the shooter's responsibility to verify the shots listed on the Individual Score Sheet correspond with the fired targets. While Orion is very accurate it will occasionally make what is known as an "obvious error." The two most common causes of obvious errors are badly formed shot holes and shots that overlap in a group.

The shooter should spend a few moments to go through each shot and make sure it reasonably corresponds to the fired shot.

If a shooter finds a shot that contains an obvious error in scoring, he or she should bring it to the attention of the stat officer (Orion operator). In all cases the stat officer should inspect the shot within Orion, and if there is an obvious error make a manual correction.

Shot Data

The individual score sheet groups together a shot series. The shots are sorted first by the order of the target number, second by the aiming bull number, and third by the shot value. It is important to recognize that in all likelihood the printed order of shots do not represent the order the shots were fired.

There are six columns of data:

- Shot: Orion's official name for the shot.
- Bull: The aiming bull the shot was scored on.
- Score: The official score of the shot. When integer scoring is used the decimal value is included in parenthesis, and an asterisk next to the value (e.g. 10*) indicates an inner ten.
- X Pos.: The x coordinate of the center of the shot, measured in millimeters.
- Y Pos.: The y coordinate of the center of the shot, measured in millimeters.
- Radius: The radius value of the center of the shot, measured in millimeters.

Each row represents one scored shot. If a shooter received a penalty, a description of the penalty is listed below the shot.

Shot	Bull	Score	X Pos.	Y Pos.	Radius
S1	1	9(9.0)	-4.24	-2.50	4.92
S2	2	9(9.1)	1.72	-4.28	4.61
S3	3	10*(10.7)	-0.01	0.59	0.59
S4	4	3(3.3)	13.70	3.13	14.06
Rule 6.11.7.1.1, Too many shots in a position: 2 points					
S5	5	9(9.2)	2.29	-3.75	4.39
S6	6	9(9.9)	2.04	1.66	2.63
S7	7	9(9.0)	4.57	1.73	4.88
S8	8	9(9.4)	3.51	-1.38	3.78
S9	9	8(8.4)	5.86	-2.63	6.42
S10	10	9(9.0)	-4.40	-2.33	4.98
ST 1: 84 - 1					
Group Center: (2.50, -0.98)					
Group Area: 90.89					
Group Roundness: 2.67					

The Graphical Shot Group and Shot Group Analysis

The graphical shot group, along with the shot group analysis, can be a very powerful coaching tool. The shot group displays each shot on an overlay of the scoring rings. It also shows a statistical representation of the shot group displayed as a blue ellipse. This representation is known as the shot group analysis.

A brief introduction to analyzing the shot group is on the right. In general it can display to the shooter some important qualitative performance metrics.
- Was my group centered?
- How big was my group?
- Was my group circular or elongated?

Did I have any outliers?

Quantitative Shot Group Analysis

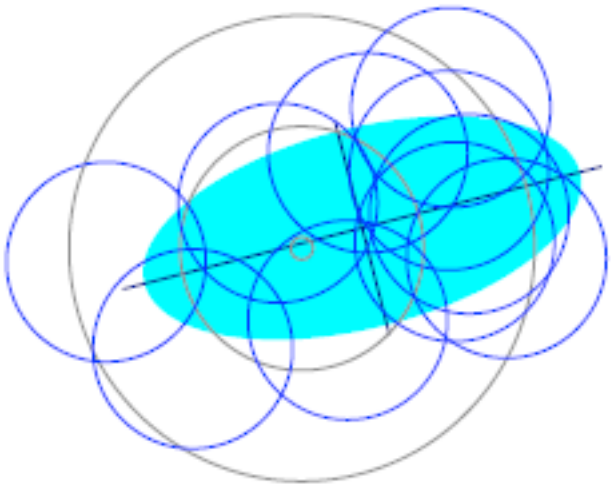
While interpreting the graphical shot group is a great qualitative tool, Orion also calculates three quantitative metrics that map very closely to specific performance oriented objectives. Shooters and coaches should understand these metrics as they are often a better method of measuring a shooter's performance than score alone.

- **Group Center**: This is specifically the X and Y coordinates of the mathematical center of the group. If a shooter did a good job calling his or her shots, mapping them to the actual shot, and making necessary sight adjustments, the group center will be very close to (0.00, 0.00).
- **Group Area**: Group area is the core area where 90% of a shooter's shots statistically were located. It is in units of millimeters squared. Group area is possibility the best single metric measuring a shooter's inner position and mental focus.
- **Group Roundness**: The roundness is a ratio as to how round the shot

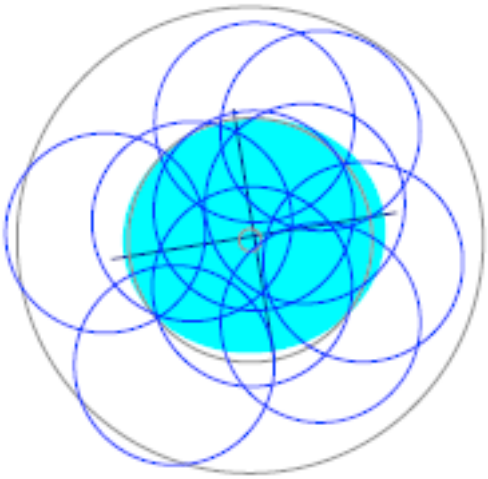
group was. Values close to 1.00 indicate a round group. The further away from 1.00, the less round the group was. This metric can best measure a shooter's outer position, natural point of aim (for rifle), and sight alignment (for pistol).

Analyzing the Shot Group

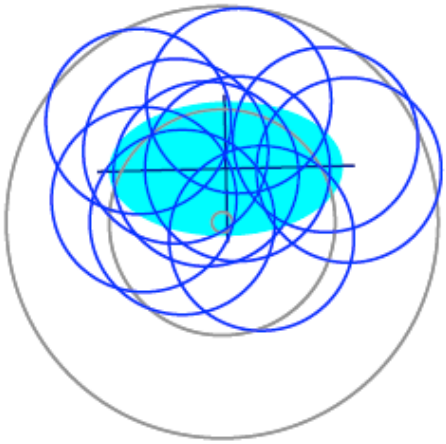
Learning how to interpret the shot groups is a valuable training tool. Certain group characteristics can indicate specific performance related problems, and give hints as to how the shooter can improve.



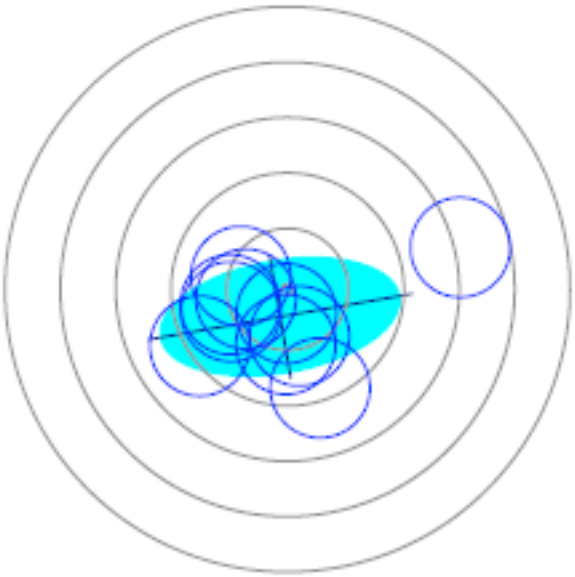
Elongated shot groups may indicated a natural point of aim problem, the position is off balanced, tension within the position, or an unintended position change.



Large round groups may indicate concentration problems, pellets that may not work well, or the shooter simply needs to work on his or her inner position.



Shot groups that are off-centered help indicate the shooter needs to better correlate his or her called shot with the actual shot and to make more timely sight adjustments.



Wild shots should be analyzed. Shooters should learn to identify what they did to cause the shot to fall outside the group.