

Scoring and Results Operations

Scoring and Results Operations

By Gary Anderson, DCM Emeritus

This article is one of a series of OTM articles by the author on "How to Conduct Competitions." It uses many unique terms to define the shooting scoring and results process. When these terms appear for the first time they are shown in CAPITAL LETTERS so readers who are new to competition operations will be sure to distinguish them.

Every competition must have a fast, accurate SCORING AND RESULTS PROCESS that begins by communicating with potential participants and ends when final results with participant rankings are produced and distributed. In international competitions, this process is called CLASSIFICATION. For most matches in the USA, it is usually called STATISTICAL OPERATIONS.

Statistical operations in great shooting competitions are more than just getting scores right and passing out awards. Modern sports not only require correct results, they demand scores quickly and they expect results, during and after competitions, to be available not only to participants, but also to a much wider audience of spectators and fans.

ELEMENTS OF MATCH STATISTICAL OPERATIONS

1. Statistical Officer & Staff
2. Supplies & Equipment
3. Participant Database
4. Match Promotion
5. Entries
6. Squadding
7. Check-In & Start List
8. Scoring & Score Display
9. Penalties & Adjustments
10. Preliminary Results
11. Score Protests
12. Final Results & Results Distribution

Author's Disclosure Statement:

In this article I make multiple favorable references to the Orion Scoring System, Orion Results Center and the Orion match management system. It is widely known that the developer and distributor of Orion products is my son Dr. Erik Anderson. Since Orion is the only system of this type that is adapted for use in USA competitions, there is no competing system, but I nevertheless want to make sure our family relationship is disclosed to any readers who are not aware of this.

A particularly important challenge to modern sports and especially to shooting, is to have statistical operations that not only serve competitors, but that also presents shooting to a broader fan base. All Olympic sports are now expected to strive for greater popularity by appealing to a wider audience than just participants. Shooting competitions must support that effort in their own small ways by using modern technology to reach people outside of the shooting range.

This article examines the elements, structure and procedures for the complete, modern scoring and results process to provide guidelines for competition sponsors on how to conduct their scoring and results operations according to the highest standards.

STATISTICAL OFFICER AND STAFF

The Statistical Officer is responsible for managing the complete scoring and results process.

Every shooting competition must have a STATISTICAL OFFICER. For a small match, the Statistical Officer may also be the Match Director, but in larger competitions the Statistical Officer supervises the work of other Statistical Officers and SCORERS.

Statistical Officers must make sure all scoring is done correctly and quickly. Coaches and shooters must have

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full confidence in their work. It is essential that Statistical Officers know competition shooting and be especially experienced in statistical operations.

Depending upon the type of targets or scoring method used in a competition, the Statistical Officer has these special responsibilities:

1. If MANUAL SCORING of paper targets is used, the Statistical Officer must recruit, train and supervise sufficient scorers to score all targets on time and to adjudicate all SHOT VALUE PROTESTS.

2. In matches where the ORION SCORING SYSTEM is used, the Statistical Officer or an assistant must be able to operate the Orion system.

3. If ELECTRONIC SCORING TARGETS (EST) are used, the Statistical Officer or a trained Technical Officer must be able to operate the EST operating system.

SUPPLIES & EQUIPMENT

Every match statistical office must have the supplies and equipment necessary to do their work.

The equipment needed to conduct statistical operations has been simplified by the advances of the modern electronics age. The basic equipment every Stat Office should have is a portable computer with a printer. Ideally, there should be an Internet connection at the range, but this is not always possible. In addition, requirements for the different scoring methods require:

1. Manual scoring requires the necessary targets plus scoring gauges, templates, magnifiers and other scoring supplies.

2. The Orion Scoring System requires a computer loaded with Orion software (<http://www.orionscoringsystem.com>), a scanner compatible with the software and high quality targets.

3. If the range has EST, a full supply of wear materials is required.

PARTICIPANT DATABASE

Every match sponsor should maintain a contact list of participants and volunteers.

Every match sponsor that intends to run more competitions must have a participant database where contact information and necessary data for all shooters and coaches who participate in their matches is recorded.

The format for maintaining participant data varies. Some match sponsors keep this data in Excel or similar spreadsheets. Some use database programs. The Orion system comes with an internal contact database that

supports sending direct email messages to all shooters in a match or to individual shooters.

The most important data item, other than the competitor's name, is a valid email address. With email addresses, match sponsors can 1) contact individual shooters before the match to clarify questions concerning entries, 2) contact shooters after the match to send electronic final results or advise them concerning results lists posted on the Internet and 3) use this database to promote participation in the next match.

Some concerns remain about missing shooters who don't use the Internet or have email addresses. Today, however, the number of shooters or coaches who don't use the Internet is so small that it is possible to maintain a separate, small list of competitors who can only be contacted by mail. In no case, should that be a reason for not using electronic communications.

MATCH PROMOTION

Early promotion is the key to getting good participation in a match.

Match sponsors must distribute match programs or information about the match to all potential participants well before the match so that they can place the match on their personal schedules and make plans to attend.

As soon as a match is scheduled and the official program is ready, promotion must begin. This is best done by sending match announcements or match programs to shooters, clubs and teams that have participated in previous

COMING EVENTS LISTS

Lists of Upcoming Events are available on these websites:

CMP: <http://ct.thecmp.org/app/v1/index.php?do=matchRegistrationListUpcoming>

NRA: http://www.nrapublications.org/wp-content/ComingEvents/CE_Download.pdf

Orion: <http://www.orionresults.com/team/Upcoming.aspx>

USA Shooting: <http://www.usashooting.org/7-events/match-information>

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matches hosted by the match sponsor. Every match sponsor should also try to contact potential new participants. Many competitors use online listings of COMING EVENTS to link up with new competitors who are looking for matches to attend.

The days when it was necessary to mail printed programs or invitations are over. Match promotion today should be done with electronic communications. Basic promotion methods include 1) using the match sponsor's email contacts list, 2) exchanging lists with neighboring clubs as a way to obtain new contacts and 3) taking advantage of the coming events listings that are available for matches sanctioned by the CMP, NRA or USA Shooting or are available to licensed Orion users.

ENTRIES

Match entries must be easy to make and accepted in advance.

An entry is a competitor's request to participate in a match. Entries are made by individual competitors or a coach who submits entries for an entire team. Entries may be made by 1) email, 2) filling out and returning an entry form that was printed in the match bulletin or 3) completing an online entry. Entries must identify the competitor by name and contact information (email address) and designate the specific events in which they will compete. Additional information such as date of birth (for age group categories) and COMPETITOR ID NUMBER are often required. The latter is necessary if the match is sanctioned by the CMP, NRA or USA Shooting.

Requiring entries in advance is the only way to make sure everyone who wants to fire in a match can be accommodated. Match sponsors must determine what their RANGE CAPACITY is (# of relays times # of available firing points) and publish this in the match program. If the number of advance entries reaches range capacity, subsequent entries must be placed on a WAITING LIST. These individuals must be notified immediately of their "wait list" status. While it is likely there will be one or two cancellations or NO SHOWS, match sponsors are advised not to over-book scheduled relays because this can lead to the difficult situation of not having enough firing points for everyone that comes to the match.

While advance entries should normally be required, most match sponsors will accept WALK-ON entries if entries have not reached range capacity. Unless the match is very small, allowing all competitors to walk in and enter on the day of the match is not advised because this usually creates a chaotic check-in process just before the match.

SQUADDING

Squadding is the process of assigning competitors to relays and firing points.

The rules for SQUADDING different shooting disciplines have specific restrictions that Statistical Officers must know and apply. Some rules require strictly random firing point and relay assignments while other rules allow teams or friends to shoot next to each other or on successive relays on the same firing point.

Squadding may be done in advance or at the match. The match program must explain how and when squadding will be done. When 3-position matches have multiple relays on one or more days, participating clubs and teams must be able to reserve firing times. On the other hand, highpower rifle match sponsors often don't squad competitors until just before the match starts so they can be sure no shows do not leave them without enough competitors on each firing point for scoring and target pulling duties. If squadding is done in advance, keep a master START LIST of all squadding assignments. Be sure to confirm all squadding requests so competitors know if their request can be accommodated.

CHECK-IN AND START LIST

The first scoring and results step at the actual match is to check-in competitors, collect their entry fees and confirm their squadding.

Accepting electronic entries usually means having competitors pay entry fees at the match. The Statistical Officer must set up a check-in station in the range. Competitor CHECK-IN should 1) confirm that the entry data for the competitor is correct, 2) collect entry fees and provide receipts and 3) confirm the competitor's final squadding assignment.

Relay and squadding assignments for every competitor in a match should be recorded on a START LIST that shows competitors' names and firing points by relay. Post this start list on the range so competitors know where to go. Give copies of the start list to Range Officers so they know who is on each firing point that they will supervise. The Statistical Officer who operates Orion and the Technical Officer who operates EST must have the final start list so they can identify the correct shooters with the correct firing point.

It is common in many highpower matches to issue SQUADDING TICKETS with relay and firing point assignments, but this means match officials do not have a master list of competitors and their squadding assignments and must then obtain this data from scorecards when they are turned in.

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The Check-In Station is where the competitor's match experience begins. It must be organized, efficient and friendly.

In matches where paper targets are issued, squadding assignments must also be linked with a system of target identification and accountability. Some match sponsors now produce COMPETITOR LABELS for shooters to place on their targets. Others simply have competitors write relay and firing point information on each target.

SCORING & SCORE DISPLAY
Scoring must accurately and quickly determine the value of each shot fired by every competitor and make those results available to competitors, officials and fans as soon as possible.

There are now two types of targets and three methods of scoring those targets. The chart on the right provides a comparison of scoring accuracies, costs, personnel requirements, scoring times and online

results capabilities of the different systems.

1. Paper Targets and Manual Scoring. This is the old standby, but manual scoring is gradually being replaced by electronic scoring of paper targets or EST. When paper targets and manual scoring are used, Statistical Officers must have actual scoring experience so that they can train new scorers. A serious manual scoring deficiency is that even the best scorers become tired and occasionally make errors. Excellent instructional materials on manual scoring techniques are available and should be used to train scorers.

2. Paper Targets and Electronic Scoring. VISUAL IMAGE SCORING (VIS) uses computer software to analyze and score scanned images of fired targets. Orion is the only VIS system approved by the National Three-Position Air Rifle Council, CMP, NRA and USA Shooting. Electronic scoring of paper targets was well established in Europe 25 years ago and was used by the ISSF in the 1988 Olympic Games. However, because ranges in the USA typically require multi-bull targets, the Orion Scoring System became the first electronic scoring system adapted for USA shooting. Orion comes with match management software that allows Statistical Officers to register competitors, provide online results, produce results lists and post final results on the Internet. It is important for Statistical Officers who operate the Orion system to practice with the system before the match.

A COMPARISON OF SCORING SYSTEMS						
System Scoring	Accuracy	Cost ¹	Personnel Required	Operating Cost	Time to Score	Online Results
Manual Scoring	+/- 0.100 to 0.200 mm ² w/trained scorers ²	\$75-150 for gauges, etc.	One trained scorer per 10 firing points	10-14 cents per 10-shot target ³	2 min. per 10-shot target	None
Orion	<0.100 mm	\$1000 - \$1500 for a 30-40 point range	One to two Stat Officers familiar with Orion software	12-14 cents per 10-shot target	3 sec. per 10-shot target	Online results integrated into software
EST	<0.100 - 0.125 mm	\$3,000 - \$4,000 per firing point	One EST trained scoring officer plus one target officer	8-9 cents per 10 shots for target materials	Instant - real time	Limited or no online results ⁴

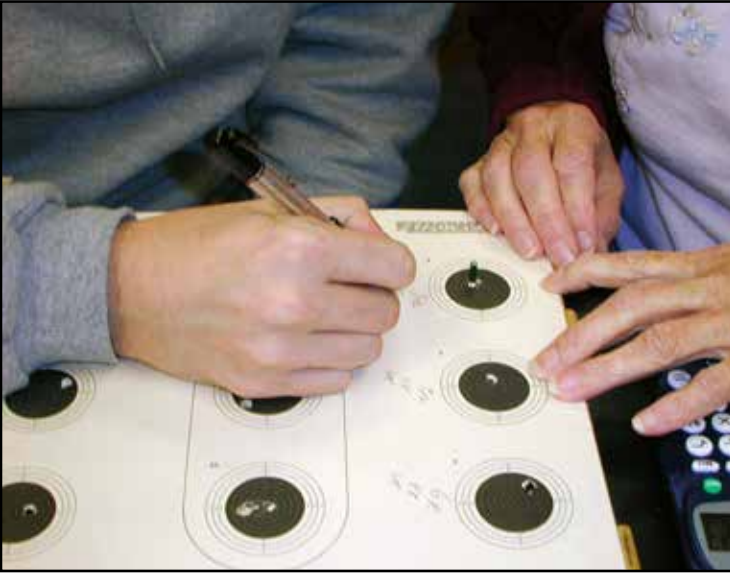
¹ All scoring systems require a computer to score or record shots and a printer to produce results lists. This is not included in the costs in the chart.

² Only trained, supervised scorers can achieve this level of scoring accuracy; untrained volunteers may have error variations as high as +/- 1.00 mm.

³ This cost will be much higher if there are expenses for volunteer scorers.

⁴ Megalink EST systems generate HTML pages, but no hosting service; Sius Ascor EST generate online results when operated by factory technicians; Meyton EST do not generate online results.

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Correct manual scoring of paper targets calls for two scorers to work together and use scoring gauges to make decisions on close shots.

3. Electronic Scoring Targets (EST). EST were first used in the 1992 Olympic Games and have demonstrated their advantages in providing real-time official scores that support shooting's efforts to become a true spectator sport. ESTs are the only target system that provides immediate results on the range so they are especially valuable in making live scores available for spectators or television. As great as EST are, they have the disadvantage of being very costly. The correct operation of EST also requires TECHNICAL OFFICERS who are trained and experienced in operating the EST software.

PENALTIES AND ADJUSTMENTS

Score adjustments for penalties given by match officials or for competitor errors must be made and documented before preliminary results are posted.

When a competitor makes a mistake and shoots on the wrong bulls-eye, shoots too many shots on his/her own target or shoots a CROSSFIRE on another competitor's target, a Range Officer must document these errors so the Stat Office can make the necessary score adjustments. Sometimes, the competitor will report these errors to a Range Officer or a Range Officer will discover an error when a competitor attempts to disclaim an errant shot on his/her target. Any time these incidents occur, the Range Officer must make notes on the target to describe them or write a separate report so the Stat Office can make necessary score adjustments.



Orion scores shots by using optical scan images to measure the precise distance from the center of the aiming black (target) to the center of the shot hole.

Less frequent, but no less important, are the proper application of penalties. Penalties are typically given by Range Officers or a Jury. They must be documented and the competitor's score adjusted according to the rules.

PRELIMINARY RESULTS & RESULTS DISPLAY

Preliminary results inform competitors of their scores to give them an opportunity to question possible errors, but preliminary results should also serve the larger purpose of informing all interested persons regarding competitor scores.

PRELIMINARY RESULTS are provisional or incomplete results that display scores of all fired targets as soon as those scores are available. Preliminary results should be posted on the range scoreboard after the targets for every relay are scored. These posted scores allow competitors to check their scores. If a competitor is given the wrong score, he/she has a right to ask the Statistical to check those scores and make sure they are correct.

How these results are displayed is equally important. Errors in scoring are rare and affect only a few competitors, but there are many shooters, coaches and fans or fans who want to know how the shooters are doing, not just

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after the match, but during the match. For ranges fortunate enough to have electronic targets, real-time results during the match are possible. Scores from Orion are available within a few minutes after targets are retrieved and are immediately uploaded into an online results list that be checked by anyone with a handheld device. Scores from manual scoring must be entered into a spreadsheet and sorted before they can be printed and displayed, usually only on a piece of paper.

SCORE PROTESTS

A score protest is a competitor's complaint about a scored shot. Score protests to correct possible scoring errors must be handled as soon as possible. Score protests to rescore close shots that were correctly scored are problematic.

As soon as preliminary results are posted, there must be a **PROTEST TIME** that varies from 10 minutes for EST to one hour or more for manually scored targets. The rulebooks establish different protest procedures for each type of target and scoring. Competitors have a right to have scoring errors corrected, but there is also a point where seeking error corrections become unsportsmanlike attempts to "buy points" by asking that correctly scored shots be rescored on the chance that the second scoring decision will be favorable. This practice is inherently unsportsmanlike and unfair because no competitors request that close shots which went in their favor be rescored. Applicable rulebooks

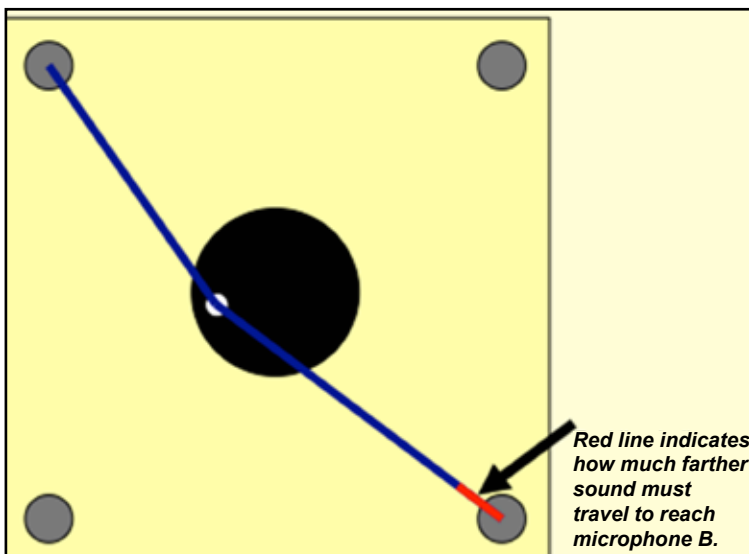
must be studied to identify the correct score protest or **CHALLENGE** procedure.

1. Paper Targets and Manual Scoring. Most rules, including those for the ISSF, USA Shooting and 3-Position Air Rifle allow competitors to pay a fee to challenge close shots that have not already been scored with a **GAUGE** or **PLUG**. Some NRA Rules amazingly allow gauged shots to be rescored again. This might be justified when manual scoring is really bad, but it can also lead to abuses by competitors who are the most aggressive in challenging close shots that went against them.

2. Paper Targets and Orion Scoring. On rare occasions, shot holes that are not cut cleanly will cause Orion to misread the correct location of a shot hole. In the Orion system, this is called an obvious error. When a competitor questions whether a shot is an obvious error, the Statistical Officer can recall an image of that shot and where Orion located the shot hole. The Statistical Officer must then decide if this circle coincides with the actual shot hole. He/she may rule that the shot is an obvious error and correct the location and score. He/she may also rule that the shot was correctly scored.

The rules for electronic scoring in most countries say correctly scored shots may not be protested, but in deference to the long tradition of challenging close shots in the U. S., USA Shooting and 3-Position Air Rifle Rules allow these shots to be protested. Orion has a shot protest algorithm that can be run when there is a score protest for a correctly scored shot, but, like EST score protests, there is a 2-point penalty for each shot challenge that is lost. What is absolutely wrong is to use a scoring gauge to check an Orion-scored shot. Scoring gauges compare the outside edge of a scoring ring with the outside edge of a scoring gauge. Orion measures the distance between the target center and the shot center. Because they measure two different things, one method cannot be used to check the other.

3. Electronic Scoring Targets (EST). Errors or target failures are also rare with EST and competitors occasionally want to question a score they are given for a shot. The ISSF Rulebook has over six pages of rules for dealing with these situations. The ISSF also offers special courses to train and license competition officials to make correct decisions regarding EST protests and complaints. **The National Standard Three-Position Air Rifle Rules** boil this down to one page of basics. Statistical Officers for matches where EST are used must be intimately familiar with these rules and must cooperate closely with Range Officers to apply them when competitors make complaints or protests.



Most EST use acoustical systems for scoring shots that measure time differences for sound from shot impacts to travel to four different microphones. Computer software then calculates the precise location of the shot center to display on competitor and spectator monitors.

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FINAL RESULTS & RESULTS DISTRIBUTION

The final step in scoring and results operations is preparing and distributing final results.

As soon as the protest period is over, the Statistical Office must prepare a FINAL RESULTS LIST that lists all competitors by name, competitor number if required, all scores fired in the match and competitors' final rankings. Including hometown, club or school information is helpful.

A.J. Dimond High School

Chugiak High School at Dimond High School

Result Center's Home Recent Competitions Upcoming Matches Team Home Pages Join Orion's Email List

A.J. Dimond High School's Home Recent Result's Upcoming Matches

Chugiak High School at Dimond High School Individual Team Prone Standing Kneeling Scoreboard

Chugiak High School at Dimond High School

3 Position Air Rifle: 3x10 Tue, 26 Nov 2013 anchorage, ak

Scoreboard

ORION SCORING SYSTEM

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Individual - Sporter

Rank	Participant	Prone	Standing	Kneeling	Individual
1	Canyon, Codgdell (170489)	97 - 3	78 - 0	95 - 3	270 - 6
2	Hobbs, Steven	90 - 2	60 - 0	86 - 2	236 - 4
3	Ernst, Sierra (194704)	88 - 3	72 - 0	76 - 1	236 - 4
4	Gay, Danna (195029)	92 - 1	68 - 0	58 - 0	218 - 1

Individual - Precision

Rank	Participant	Prone	Standing	Kneeling	Individual
1	Friedl, Maddy (150418)	98 - 7	94 - 3	94 - 3	286 - 13
2	DuClos, Julie (170831)	97 - 6	92 - 0	95 - 3	284 - 9
3	Johnson, Garrett (152045)	98 - 7	92 - 5	93 - 1	283 - 13
4	Milligan, Summer (150780)	98 - 7	91 - 1	94 - 2	283 - 10
5	Holt, Keely (170737)	87 - 1	97 - 5	96 - 6	280 - 12
6	Rieser, Ryan (170760)	98 - 7	87 - 2	94 - 3	279 - 12
7	Sargent, Kevin (195054)	99 - 4	85 - 1	95 - 5	279 - 10
8	Devon, Chelsy (140923)	94 - 3	90 - 2	95 - 2	279 - 7

Team - Precision

Rank	Participant	Prone	Standing	Kneeling	Team
1	Dimond A	384 - 21	361 - 6	379 - 11	1124 - 38
2	Dimond C	390 - 19	353 - 5	371 - 13	1114 - 37
3	Dimond B	379 - 19	363 - 9	363 - 12	1105 - 40
4	Chugiak A	376 - 13	315 - 6	362 - 10	1053 - 29
5	Chugaik B	373 - 14	330 - 8	345 - 3	1048 - 25
6	Chugiak C	379 - 14	293 - 1	305 - 1	977 - 16

Complete Results

Individual Results Team Results

All Sporter Precision All Precision

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AdChoices

ORION RESULTS CENTER ONLINE SCORE DISPLAY. A major objective of modern scoring and results operations should be to display live or quickly updated scores on the range and Internet. Electronic targets and Orion are making rapid strides towards achieving this objective. Orion Results Center scores are updated as soon as targets are scored. This Internet view can easily be displayed on an LCD panel placed on the range during matches.

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10-shot series scores and totals must be given. If the match was sanctioned by the CMP, NRA or USA Shooting it will be necessary to send a report with competitor numbers and score data to these organizations, together with the required fees.

In former days, final results were usually not available until well after the match and they came in the mail as printed copies. Some match sponsors still do this, but with modern Internet communications, final results can be posted as PDF files on the match sponsor's website or they can be emailed to all competitors as attached files. The Orion Results Center takes this one step further because Orion online results automatically become final results as soon as protest times are over.

Final results must not only be distributed to competitors, but today they must also be available to anyone interested in the match. Orion does this automatically as part of its match management system. The CMP posts match results that are sent to it after the match. Many match sponsors now have websites where their match results can be posted. Shooting needs to expand its fan base, but this can only be done if results are widely available.

About the Author

Gary Anderson, Director of Civilian Marksmanship Emeritus, retired as the full-time CMP Director at the close of 2009. He continues to work with CMP as the senior marksmanship instructor. He won two Olympic gold medals, seven World Championships and 16 National Championships during his competition career. He is a Vice President of the International Shooting Sports Federation, the President of USA Shooting, a former Nebraska State Senator and was one of the two Olympic Games Technical Delegates for Shooting during the 2012 Olympic Games in London. In June, 2012, the International Olympic Committee awarded Gary Anderson the IOC's highest honor, the Olympic Order "for outstanding services to the Olympic Movement."

Photo courtesy of the ISSF.

