

Striving for Better Prone Scores

Striving for Better Prone Scores

By Gary Anderson, DCM Emeritus



Janette Duestad of Norway established a new Junior Women Prone Qualification World Record in the 2019 Suhl, Germany Junior World Cup. Her prone position is a model for an ideal prone position.

The prone position is part of all popular rifle events practiced by junior shooters. Prone scores make up one-third of the total scores in 3-Position Air Rifle, Smallbore Rifle 3-position and Rimfire Sporter events. Athletes who win 3-position competitions almost always shoot outstanding prone scores. Prone is a game of perfection and juniors who aspire to be great 3-position shooters must set their sights on developing the ability to consistently shoot perfect or near-perfect prone scores.

The objective of this article is to examine the prone position and prone techniques to identify things that must be done to shoot near-perfect prone scores. To achieve that objective, an athlete's position, shot technique and equipment must fulfill these prerequisites:

1. **Stability.** The athlete's firing position must produce a hold where the magnitude of sight picture movements while aiming is significantly less than the size of the ten-ring.

2. **Aiming Accuracy.** Score perfection requires visual perfection. The athlete's eye and aiming process must become capable of distinguishing between perfectly centered sight pictures and sight pictures that are even slightly off-center.

3. **Excellent Shot Technique.** Prone shot technique is more than just lining up the sights and squeezing the trigger. Excellent shot technique requires selective relaxation, precise NPA alignment, precise aiming, a flawlessly smooth trigger release and consistent recoil control.

4. **Accurate Rifle and Ammunition.** Shooting perfect prone scores requires having a rifle-ammunition combination that is capable of shooting perfect scores.

This article is not about learning how to build a prone position. This article is about how to perfect an established prone position. If you are new to position rifle shooting and need information about building an initial prone position, you can download and study an excellent CMP

instructional video titled “*Building the Prone Position*” at <http://vimeo.com/30815959>. A brochure titled “*Teaching Rifle Positions to New Shooters*” can be downloaded from the CMP website at <http://thecmp.org/wp-content/uploads/TeachingRiflePositions.pdf>. A book published by the CMP, ***Coaching Young Rifle Shooters****, includes detailed instructions for beginning prone shooters.

Rechecking the Prone Position

Prone position stability begins with a structurally sound position. The first step in achieving stability is to be sure the athlete’s position is structurally sound. Key position features to recheck are:

1. **Left Elbow Location.** The left elbow, arm and sling provide primary support for the rifle and upper body. The left elbow should be located directly under an imaginary line running from the left hand to the left foot. A coach can check this by looking at a position from above. Another way to check is to determine whether the support triangle formed by the upper arm, lower arm and sling is truly vertical. In a good prone position, this structure supports all of the weight of the rifle and much of the weight of the upper body. If this support structure tilts either in or out, that will cause the position to change during shooting. A vertical support triangle contributes to position stability and consistency.

2. **Sling Support.** Effective use of the sling contributes to rifle stability. Placing the sling high on the arm is usually best. Configuring the sling so it pulls more strongly from the outside of the arm prevents a pulse beat that can be created when the sling pulls off of the inside of the arm where it would press against the brachial artery. Sling tension should be adjusted so the sling supports 100 percent of the rifle weight. This allows the muscles of the left arm and shoulder to be completely relaxed and prevents using these muscles to do any lifting to support the rifle. Adjusting sling tension (length) is a matter of finding a balance between too loose and too tight. A sling that is too loose may require muscle effort to support the rifle. A sling that is too tight forces the right shoulder back and distorts the position.

3. **Rifle Height and Head Position.** A higher prone position creates less strain and a better head position. A low rifle position is not more stable and if the angle between the left forearm and floor is less than 30 degrees, the position is illegal. Keeping the butt-plate well up in the shoulder and close to the neck helps to establish a good head position. A good head position facilitates unstrained aiming where the eye looks forward, not up.

Definitions in this article:

- **Hold.** The magnitude of front sight movements over the aiming bull while aiming.
- **NPA.** Natural point of aim—where the front sight naturally wants to point when the position is relaxed.
- **Cant.** Tipping the rifle to the right or left while aiming.
- **On-Call/Off-Call Shots.** A fired shot is “on-call” when its location on the target closely corresponds with how the shooter called that shot.

THE SUPPORT TRIANGLE



The support triangle formed by the left upper and lower arm and the sling must be positioned so it is vertical, not tipped.



This athlete has an ideal left forearm angle of about 40 degrees. This in turn provides for an excellent head position where accurate aiming is facilitated.

* ***Coaching Young Rifle Shooters*** was written by the author of this article, Gary Anderson. Copies can be ordered through the CMP E-Store “Bookstore” (from the CMP home page, click on “Sales,” “E-Store” and “Bookstore.”)

Striving for Better Prone Scores



RELOADING TECHNIQUE

These athletes in an ISSF World Cup 50m 3-position final are loading with their rifles remaining in their shoulders. Their rifles remain in place after each shot while their right hands move only enough to operate rifle actions and place cartridges in their rifles.

Placement of the head on the cheek-piece is a simple matter of dropping the head down to the cheek-piece. Stretching the head and neck forward to bring the eye closer to the rear sight is wrong and creates unnecessary strain. Solve this problem by moving the rear sight further to the rear. An adjustable cheek-piece should be set up to provide full support for the face. When shooting rifles without adjustable cheek-pieces, it is usually necessary to fix the head position by placing the jawbone on the cheek-piece. Some athletes may experiment with canting the rifle to improve the head position. This is OK if the cant angle is the same for every shot.

4. Mark and Record All Adjustments. A key to position consistency is using the same equipment adjustments for each shooting session. Once equipment adjustments are worked out, it is important to mark them and also to record them in a Shooter's Log. Adjustments with Sporter Class air rifles and Rimfire Sporter rifles are restricted to hand stop locations on the fore-end and sling lengths. Precision smallbore and air rifles have numerous adjustment possibilities that must be worked out, marked and recorded.

5. Basic Shot Technique for Prone. Prone slow-fire shot technique is comprised of five phases: 1) shouldering the rifle and relaxing the position, especially the left arm and shoulder, 2) aligning the sights and bringing them onto

the aiming bull while breathing normally, 3) starting the shot by exhaling and applying initial pressure on the trigger while starting to aim, 4) perfecting front sight movements over the aiming bull while smoothly adding final pressure to the trigger to break the shot and 5) calling the shot and following through as the rifle recoils. Since prone holds are relatively stable and can remain centered for longer periods of time, trigger pressure should be applied smoothly and gradually over a period of two to three seconds (gradual-smooth trigger pressure).

6. Loading Technique. Loading the rifle while keeping it in the shoulder contributes to better prone scores because this helps to maintain position consistency. To do this, keep the rifle in the shoulder after each shot and use the right hand to operate the action and load pellets or cartridges. It may be possible to keep the right elbow in place or it may be necessary to lift the entire arm. Minimizing body and rifle movements during reloading makes it easier to keep the position's NPA centered from shot to shot.

Advanced Prone Position Details

There are some prone position details that are not covered in beginning shooter instruction. The athlete who wants to advance to the top ranks must, nevertheless, dedicate attention to several additional details necessary for perfecting the position.

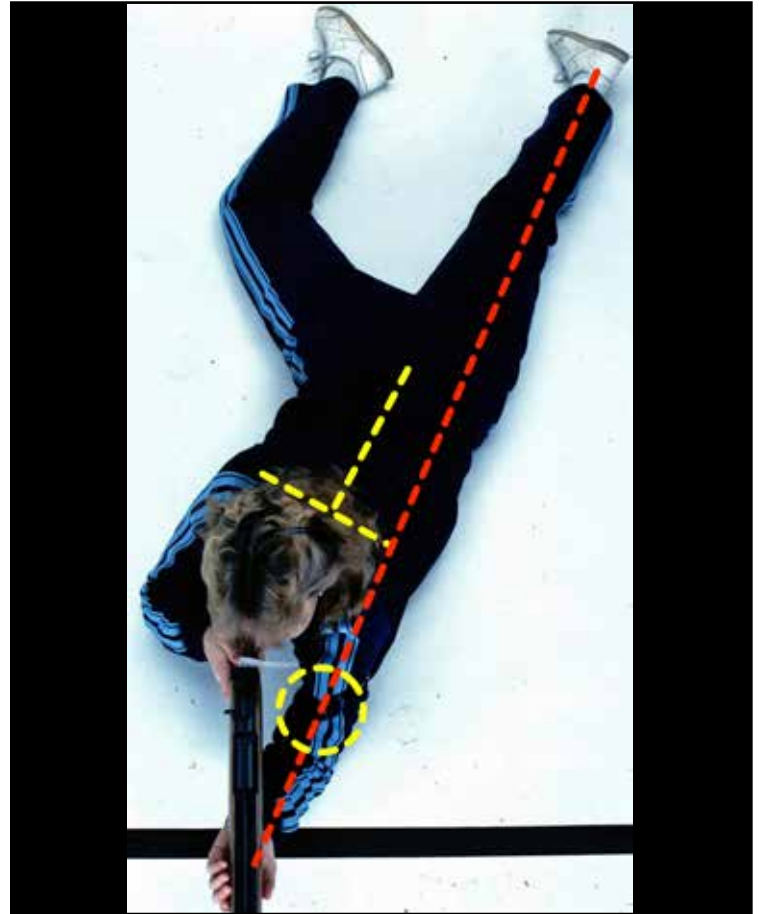
continued...

1. **Position Structure.** Initial instruction recommends establishing a body angle to the line of fire of 20 to 30 degrees. Some outstanding prone athletes reduce that angle to as little as 10 degrees so we can say the body-line of fire angle should be between 10 and 30 degrees. If a coach views a prone position from above, two other position structure details are clearly visible. The left side line that determines left elbow placement is easy to check (see illustration on right). The other structural feature to check is the alignment of the shoulders and spine. They should form a "T." To be avoided is a position where the right shoulder is pushed back by placing the left hand too far out on the fore-end.

2. **Feet and Leg Positions.** An ideal prone position rotates the body slightly onto its left side. This takes pressure off of the stomach and mitigates a possible source of pulse beat tremors. It also makes breathing easier. The position of the feet and legs determines how the body is rotated. Body rotation is achieved 1) by turning the left foot so the heel points up or to the right and 2) by splaying the right leg out or by bending the right knee and shifting it forward. The position of the right leg or knee controls how much the torso is rotated onto the left side.

3. **Right Arm Position.** The right arm serves two purposes in prone. It functions as a brace to stabilize the upper body and position. It should bear little or no weight, no more than five percent of the upper body weight. Its second purpose is to place the right hand and index finger in position for properly pulling the trigger. The diagram (on page 10) illustrates a model right hand and arm position.

In evaluating the right-hand position, pay close attention to trigger finger function. The tip of the index finger should contact the trigger just ahead the first joint. With a lighter precision smallbore or air rifle trigger, trigger contact may be in the middle of the first finger phalanx. Position this



In addition to looking for a body-line of fire angle of 10 to 30 degrees, keys to good position structure include placing the left elbow under the left side line (red line) and aligning the shoulders and spine so that imaginary lines through both form a "T."

hand and finger so that this contact point presses directly to the rear, never to the side. The hand's grasp on the pistol grip should be handshake firm with a Sporter air rifle or Rimfire Sporter rifle but may be lighter with a precision rifle.



Proper body rotation is achieved by turning the left foot, so the heel points up or the toe points to the right. The right leg must be extended out or the knee bent and drawn up. Note how in the front view diagram (inset) the shoulders are tilted so that the right shoulder is higher than the left.

Striving for Better Prone Scores



RIGHT HAND AND ARM POSITION

The right elbow (a) and upper arm act as a brace to stabilize the position. They support little or no weight. The lower arm (b) and wrist should be straight so that they place the hand and trigger finger (c) in the proper position to pull the trigger directly to the rear.

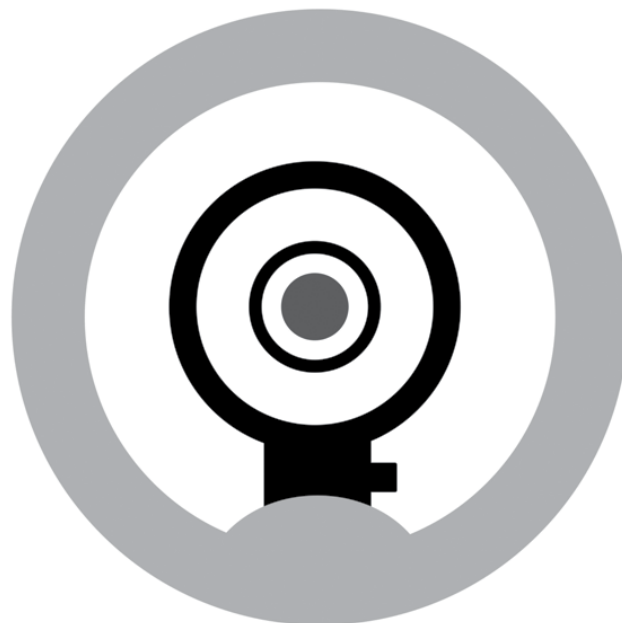
4. Left Arm and Shoulder Relaxation. Letting the sling do all the work in holding up the rifle, learning to relax the left hand, left arm and upper body and eliminating muscle tremors in that support system all greatly contribute to hold stability. The rifle should rest on the hand near the base of the thumb. With a Rimfire Sporter and its fixed hand stop a light grip is necessary, but hand slippage can be prevented by wearing a non-slip glove. With a precision air or smallbore rifle, the hand should rest against the hand stop with the hand and fingers completely relaxed. When the sling supports the weight of the rifle, it becomes possible to totally relax the left arm and upper body. Athletes should use a breathing technique to help them do this. Breathe normally while bringing the aligned sights onto the aiming bull, but each time you exhale, relax the left arm and upper body by consciously telling those muscles to “let go.” Doing this effectively takes practice. It may help to practice this exhale-relax and let go technique while doing holding exercises in the prone position in front of a blank wall or even in a dark room.

5. Position Consistency. It should be clear by now that there is no such thing as one perfect prone position. The best prone shooters adopt a variety of minor variations that do not violate basic structural requirements for a good position. Athletes should feel free to fine tune their positions with variations that are comfortable and most effective for them. However, once they work out their positions, it is

essential to stop experimenting and practice being absolutely consistent from shot-to-shot. A vital aspect of position consistency is making sure shoulder and cheek pressures and any restraints on the rifle such as sling tension or right-hand grip tension are consistent from shot to shot. Position consistency, always shooting the same way for every shot, every day, is absolutely critical.

6. Aiming Systems. Front and rear sight adjustments selected for prone also influence the athlete's score capabilities. Wearing corrective lenses when necessary and adjusting the size or location of the rear sight aperture are essential for keeping the sight picture sharply focused. Front sight ring size is critical. For an experienced shooter, the ring must be large enough to contain all aiming bull movements during aiming but not so large as to make precise alignment

more difficult. A prone front sight ring should be smaller than one used for standing.



The components of an ideal sight picture include a clearly focused sight picture (front sight and bull) and a properly sized front sight ring (aperture). Adjusting the rear sight aperture size and placement keeps the sight picture sharply focused.

7. Rifle and Ammunition Accuracy. To consistently shoot Xs or 10s, the rifle and ammunition must be capable of producing X or 10-ring accuracy in test conditions. Match grade ammunition or pellets are almost always necessary. Ammunition manufacturers and major distributors now offer testing services to match lots of ammunition or pellets with competitors' rifles or an adult with bench rest skills may be recruited to test rifle-ammunition combinations for team members' rifles. Especially with smallbore rifles, regular barrel cleaning is necessary to maintain accuracy.

Prone Technique—Striving for Perfection

Having a structurally sound position and correct shot technique will produce excellent prone scores, but there is still more to be done to consistently produce winning prone scores. Techniques described here are fundamental to top-class prone shooting:

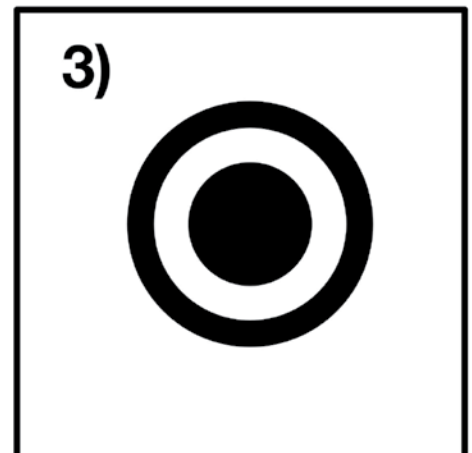
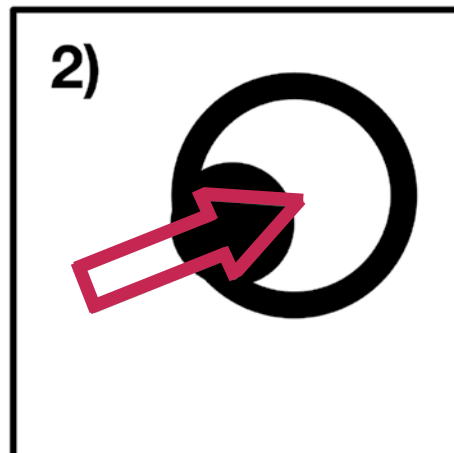
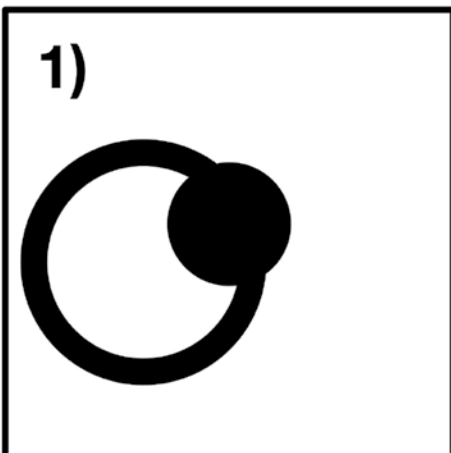
1. Hold Stability. The first prerequisite for shooting great prone scores is having a position that produces a hold where there is little or no perceptible front sight movement. Beginning shooters are instructed to center their hold movements over the aiming bull, but an advanced prone shooter should be able to hold the rifle so steady that he/she sees little or no front sight movement. Striving for

prone perfection requires continuing to practice techniques that contribute to prone stability, letting the sling do all the work in supporting the rifle, developing an effective inner position (see #4 on page 12), learning to relax the left hand, left arm and upper body and eliminating muscle tremors in that support system.

2. Mental Standards. An athlete's mental standards for what constitutes an excellent score make a real difference in the scores he/she will ultimately be able to shoot. Young athletes should study the scores it takes to win, not just in this country, but in international championships. Expect to develop a prone position that produces holds with little or no perceptible front sight movement and expect to shoot 100s prone.

3. Centering the NPA. One of the keys to prone success is developing a position with a precise NPA and being able to center that NPA as perfectly as possible. After doing lots of prone position shooting and becoming totally comfortable with his/her position, an athlete should become capable of seeing and feeling (inner position) when the NPA does not settle on the aiming point. Before each shot, relax and let the front sight ring settle where it naturally wants to point. If the front sight settles off the target, it is necessary to move the whole body left or right,

CENTERING AN OFF-CENTER NPA



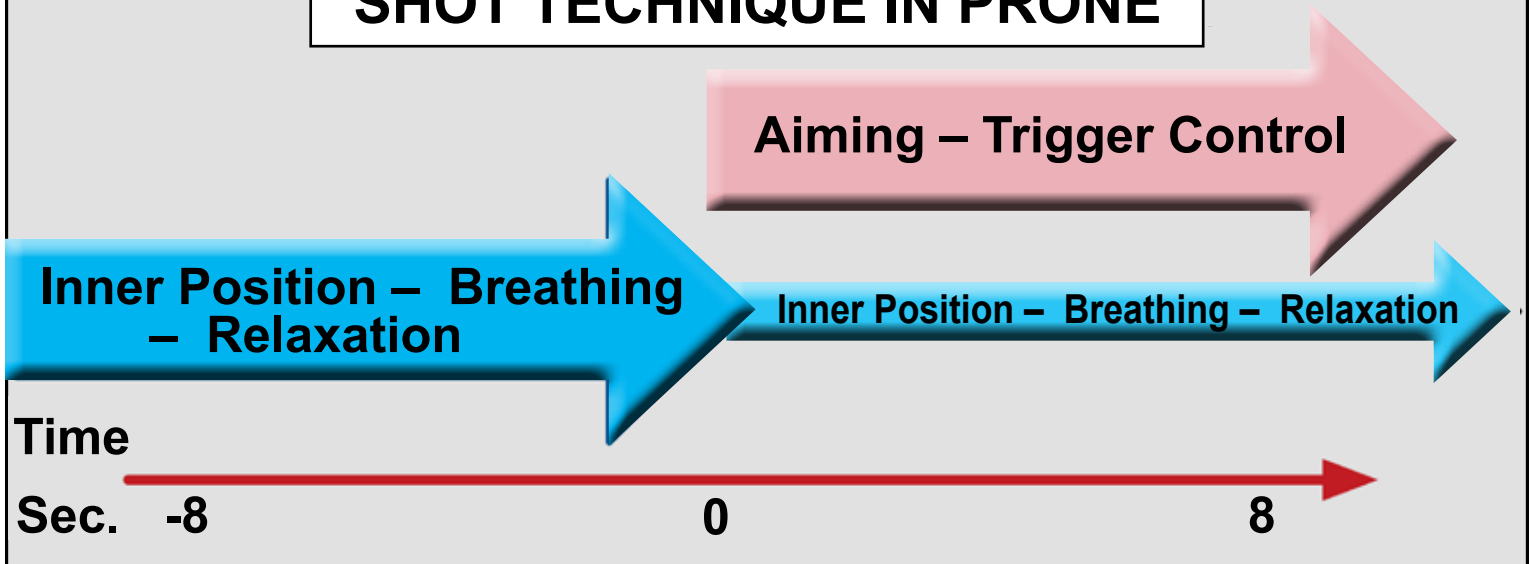
1) After relaxing the position, the front sight settles at 8 o'clock.

2) Correct the off-center NPA by easily pushing the front sight in a direction opposite to the off-centered NPA.

3) Let the front sight settle back to its new NPA. Sometimes two or three minor corrections are necessary.

Striving for Better Prone Scores

SHOT TECHNIQUE IN PRONE



The diagram illustrates the relative times during the firing of prone shots when attention must be devoted to breathing, relaxation and the inner position and when attention is also focused on aiming and trigger control.

or forward or to the rear, to correct the NPA. If the front sight ring settles on the target, but not on the aiming bull, adjust the off-center NPA by nudging the shoulders and upper body to push the front sight ring through the aiming bull and allowing it to settle back onto the bull. Two or three attempts may be necessary to get the NPA to settle on the aiming bull. Preparation for prone slow-fire shots must devote a few seconds before each shot to relaxing, checking the NPA and, when necessary, correcting the NPA onto the aiming bull. When shooting indoors on 10-bull targets, it is necessary to adjust the NPA before each shot.

4. **The Inner Position.** Shooting positions have an outer or externally visible position and an "inner position," which is concerned with what is happening inside the athlete's body while holding the rifle and firing the shot. Advanced prone shooters pay close attention to how their inner positions feel. They check for muscle relaxation and feel whether their NPA is centered. They strive for an inner calmness that contributes to stable holds. The inner position is concerned with breathing, relaxation and centering the NPA. All are important in preparing to fire accurate shots.

5. **Precise Aiming.** Top-class prone scores can only be achieved when the athlete strives to make every sight picture as perfect as possible. Accepting small aiming errors sooner or later leads to shooting nines on some of those shots. The front sight ring must be precisely

centered over the aiming bull. Precise NPA alignment produces closely centered sight pictures but final perfect sight pictures are achieved by applying extremely light, precise muscle pressures to the rifle.

6. **Pulse and Tremor Reduction.** Many shooters, even good ones, complain about seeing pulse beats in their front sight movements. Others report that their front sight movements never really become still. An athlete who experiences these types of hold movements must devote special efforts to finding their causes and to making minor and often subtle changes to eliminate or reduce them. Pulse beat movements can come from how the sling is placed on the arm or from how the body lies on the ground. Avoid a prone position where the body lies flat on the ground. Placing the sling higher or lower and making sure it pulls more off of the outside of the arm may make a difference. Tremor movements can come from tensions in the body that may be reduced by selective relaxation.

7. **Consistent Recoil Control and Follow-Through.** Off-call shots, especially shots that were called tens but ended up in the nine ring are usually caused by something the athlete changed. The usual cause for off-call shots is not that the rifle or ammunition changed but that the shooter changed. In prone, the athlete places pressures on the butt-plate and cheek-piece as well as tensions on the sling and pistol grip. Those pressures and tensions affect how the rifle is allowed to recoil. Since the rifle starts to recoil and jump up while the bullet or pellet travels through the



The CMP now conducts National Smallbore Rifle Prone Championships during the annual National Matches at Camp Perry. Aspiring young shooting athletes can compete with and learn better prone shooting from the best prone shooters in this country in these championships.

barrel, changing those pressures or tensions changes how the rifle recoils. That in turn changes the point of impact on the target, even with air rifles. To keep shots on-call, the pressures and tensions the shooter places on the rifle must be absolutely consistent and they must remain consistent until the shot is well out of the barrel. Hence the critical importance of follow through. To finish a shot correctly, the athlete must 1) call the shot as precisely as possible and 2) continue to focus on the sight picture and how the rifle recoils. If the rifle jumps and returns to the aiming bull after recoil, that is good, but if the front sight ring ends up off of the bull after recoil that is a sign that there are stresses in the position that do not allow the rifle to recoil freely.

A great prone score alone won't win a three-position competition, great standing and kneeling scores are necessary as well. However, today's 3-position scores are now so high that achieving perfection in prone is necessary to accompany great standing and kneeling scores and achieve winning 3-position.

About the Author

Gary Anderson, Director of Civilian Marksmanship Emeritus, retired as the full-time CMP Director at the end of 2009. He continues to work with the CMP as the senior marksmanship instructor. During his remarkable career, he won two Olympic gold medals, seven World Championships and 16 National Championships. He served as a Vice President of the International Shooting Sports Federation (ISSF) from 1990 through 2018. He is a former Nebraska State Senator and Past President of USA Shooting. He served as a Technical Delegate for Shooting during the 2012 and 2016 Olympic Games as well as for the 2014 and 2018 World Shooting Championships.

In 2012, the International Olympic Committee awarded Gary Anderson with the Olympic Order, its highest honor "for outstanding services to the Olympic Movement."

In 2014, the CMP expanded its world-class air gun center at Camp Perry and renamed the facility the Gary Anderson CMP Competition Center, in honor of Anderson's contributions to the organization and the marksmanship community.

