

ISSF National Coach Course

RIFLE SHOOTING **Shooting Positions**

© By Goran Maksimovic

TABLE OF CONTENTS

ISSF National Coach Course

THEORETICAL PART

1. INTRODUCTION.....	4
2. SHOOTING POSITION IN GENERAL.....	6
Basic biomechanics in shooting.....	7
3. STANDING SHOOTING POSITION.....	10
Biomechanical analysis.....	10
Feet, Legs and Hips.....	12
Back and Shoulders.....	15
Left Arm, Elbow and Hand.....	16
Right Arm, Butt Plate, Hand and Pistol Grip.....	17
Length of the Rifle Stock.....	19
Head.....	20
Balance of the Rifle and of the Shooter-Rifle System.....	21
Differences in Positions between Air Rifle and Free Rifle	22
Position modifications depending on the body constitution.....	24
4. PRONE SHOOTING POSITION.....	28
Biomechanical analysis	28
Upper Body and Legs.....	30
Arms.....	31
Butt Plate and Length of the Stock.....	33
Head.....	33
Sling.....	34
Position Height.....	35

Position modifications depending on the body constitution.....	36
5. KNEELING SHOOTING POSITION.....	39
Biomechanical analysis	39
Upper Body.....	41
Legs and Feet.....	41
Kneeling Roll.....	42
Arms.....	43
Butt Plate and Length of the Stock.....	45
Head.....	45
Sling.....	46
Position modifications depending on the body constitution.....	46
 <u>PRACTICAL PART</u>	
1. METHODOLOGY OF APPROACHING AND TAKING SHOOTING POSITIONS	47
Establishing middle line of position.....	48
Standing position.....	51
Establishing “Zero Point”.....	58
Position correction and correction by setting rifle elements.....	59
Prone position.....	64
Position correction and correction by setting rifle elements.....	68
Kneeling position.....	70
Position correction and correction by setting rifle elements.....	75
2. EXERCISES FOR DEVELOPING BASIC SHOOTING SKILLS	78
3. WORK WITH BEGINNERS	84
4. DEVELOPING SHOOTING SCHOOL SYSTEM	95
 BIBLIOGRAPHY.....	 98

1. INTRODUCTION

Many authorities in the field of shooting and sport in general consider shooting to be a technical sport. It is not without reasons. While in other sports, strength, speed and agility are needed; shooting demands stability, calmness and micro-coordination. In addition to the high level of psycho-physical abilities, the results also depend on the technical elements: the quality of weapons, ammunition, equipment and training conditions. The improvement of the shooting technique is also complicated. In most cases, the coach is unable to see minor errors that occur during shooting, so he relies on the shooter's opinion, on the basis that he takes measures for the improvement of technique. The work of a coach has been made easier through the usage of the training machines (Scatt, Noptel etc.). These machines help coaches to perceive the main aspects of shooting - movement of the weapon, aiming, pulling a trigger, rhythm – and correct possible errors based on this. However, not everybody is in a position to use these advantages. Thus, the coach has to know the solutions for all the events during shooting and, try different possibilities with a shooter to achieve the best scores.

Many shooting coaches dedicate most of their attention to the shooting position. To resolve all technique problems and achieve the ideal position, the use of different configurations is most used. During the initial stages of working with a shooter, it is very important to build a well-balanced and relaxed position: however, that is just a single link in the chain of the complete shooting technique. In order to achieve good results, it is important to practice all elements of the shooting technique and how they interrelate, since a lack of coordination between these elements can lead to bad results.

In order to make exercising the proper shooting technique simpler and more systematic, we need to look at basic shooting technique elements and their resulting factors.

Shooting technique consists of four elements:

1. Shooting position
2. Aiming
3. Pulling a trigger
4. Breathing

With these four elements in consideration, we can say that rifle shooting mainly depends technically, on four different factors:

1. Hold - how steady a shooter can keep their rifle in the shooting position
2. Aiming - is the shooter aiming in the middle?
3. Trigger Control – shooter's ability to pull the trigger at the right moment and pull without any additional disturbing movement
4. Breathing – use of breathing break, how we breath, length of breathing break

These factors have a close relationship. A steady hold can offer good opportunities to aim in the middle and make good trigger control.

2. SHOOTING POSITIONS IN GENERAL

Shooting positions are very important for achieving the high scores. In order to achieve a high score, a shooter needs to have a position that enables him to aim and trigger correctly. First of all, a good position should provide as much stability as possible, so the system shooter's body-rifle moves as little as possible while aiming and triggering. Besides stability, the position should make it possible for a shooter to feel comfortable in relation to the number of shots at the competitions. Following these guidelines a shooter would be less physically and mentally tired.

No matter how many variants of a single position are there, every position should provide the shooter with:

- A biomechanical approach of the shooting position analysis – necessary level of balance of the system shooter-rifle with the least tension of the muscular system regarding the basic laws of biomechanics and physics
- Positions to enable good aim, triggering and hold processes
- the optimal conditions for the function of the sense of sight and the vestibule apparatus (balance)
- normal function of the inner organs, correct blood circulation, and;
- commodity of the position

BASIC BIOMECHANICS IN SHOOTING

Sports biomechanics can be applied across all sports - in shooting, however, this has not been the case. There are a very small number of scientific studies on the subject, being that shooting is a static sport (with the exception of trap shooting and rapid fire shooting). The principals of biomechanics are based on the effects of the laws of physics and mechanics on the movements of the body. Biomechanics is defined by:

“Biomechanics is a science that applies the laws of mechanics and physics to human performance. It examines the internal and external forces acting on the human body and the effects produced by these forces (Lähde).”

The development of different technologies and computer systems, and a higher availability of appropriate devices and software has led to a greater adoption of biomechanics in shooting.

In order to improve the stability, balance and monitoring of specific movements that can be seen during the complete execution of a shot, more attention has been focused on using balance and force platforms, video analysis, and/or measuring muscle activity. These more modern approaches have contributed to the rise of the use of shooting scores in recent years.

In order to better understand biomechanics, and understanding of the laws of physics on which it is based on, Newton’s Laws of Motion are important to consider when looking at biomechanics and shooting.

Newton’s First Law of Motion:

The Law of Inertia (**Inertia** is the resistance of any physical object to a change in its state of motion).

Every object in a state of uniform motion will remain in that state of motion unless an external force is applied to it. Newton's first law refers to an object's amount of resistance to change in velocity.

Newton's Second Law of Motion:

The relationship between an object's mass (m), its acceleration (a), and the applied force (F) is $F = ma$.

The net force on an object is equal to the mass of the object multiplied by its acceleration. Under zero net force the momentum of a system is constant. The acceleration of an object is proportional to the force applied, *and inversely proportional to the mass of the object*

Newton's Third Law of Motion: (The Law of Reciprocal Actions)

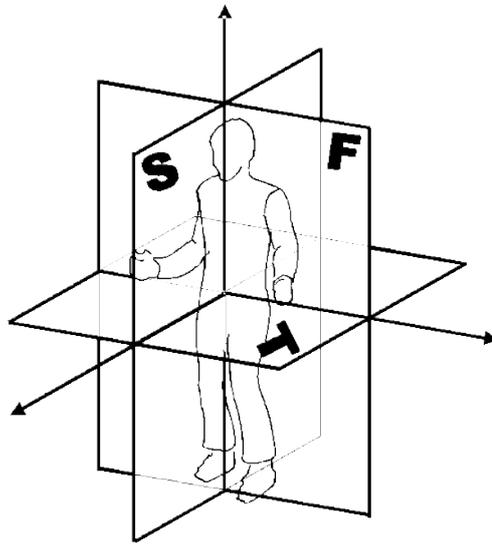
For every action, there is an equal and opposite reaction.

To understand and examine the forces applied to the body and the body-rifle system, there is a need to define a coordinate system which will be used to perform the analysis of moments.

The coordinate system used in this material has three axes.

The axes that represent these planes are:

- ***frontal*** – which lies in the transverse (T) and sagittal (S) planes and passes through the frontal (F) plane.
- ***sagittal*** – which lies in the transverse (T) and frontal (F) planes and passes through the sagittal (S) plane.
- ***vertical*** – which lies in the sagittal (S) and frontal (F) planes and passes through the transverse (T) plane.



Configuring the shooting position with the aid of biomechanics, helps shooters reach a zero net-force state - where the rifle and the shooter's body can be in equilibrium. This can be achieved by modifying the shooting position to minimize the influence of external forces, therefore balance the lines of forces and the centre of gravity (COG) of the body.

The forces in the shooting positions also have to be directed straight back and forth, as well as up and down. The forces in the shoulder have to equal the forces in the supporting hand. We also need to reach optimal forces horizontally.

What this looks like in practice will be shown at the beginning of the explanation of each of the shooting positions.

3. STANDING SHOOTING POSITION

Biomechanical analysis

Biomechanically, the standing position is the most difficult for shooting because:

- the support area of the body is small – this stance relies on only the feet and the area between them
- the center of gravity (COG) of the shooter-rifle system is tall
- there is significant tension in the muscles

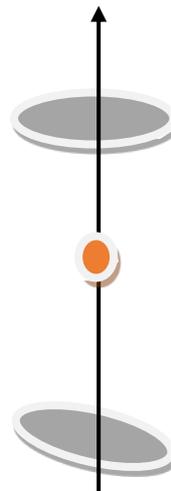
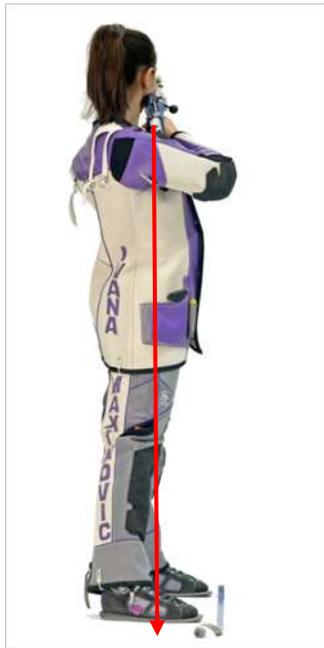
Standing is the most unstable shooting position, therefore the shooter must demonstrate an exceptional sense of balance and muscle control to use it successfully. Muscles should be relatively relaxed, while also giving necessary stability to the position for minimal rifle movement.

The critical factors of the standing position from a biomechanical point of view are:

- Minimal use of skeletal support (bones).
- The balance of the rifle and the system body-rifle has to be positioned so that the weight of the rifle is transferred through bones and ligaments to the ground.
- The rifle has to be close to the body centre line.

These factors directly affect the quality of the hold and the speed of adopting the correct shooting technique. In order to fulfill these requirements, a shooter must minimise the influence of the external forces in all directions.

Sagittal setup (forward-backward) - looking at the surface area of the support and the position of the body, we can conclude this position offers less stability in this plane than in the frontal plane (towards the target – away from the target) as the amount of available support is limited to the size of the shooter's feet. It is crucial that the balance of the body-rifle system is above the middle of the support in order to minimize body rocking.



Frontal and vertical setup - stability of this position is achieved by bending the body rearward to compensate for the weight of the rifle, in order to bring the COG of the body-rifle system above the surface of the support. The hips are moved forward to create better elbow support. The left arm should be vertical.

For stable control of the rifle movement and recoil, it is effective to have the point of the rifle support on the left hand, the point of the left elbow on the hip and right foot are in line to divide the complete power into both the body's support points on the ground (feet).



Transversal setup - in order to have the rifle as close as possible to the COG of the body, the hips and shoulders should be directed straight towards the target. This means that the rotation of the body should be minimal.



The Standing Position Elements (right-handed shooters)

Feet, Legs and Hips (Pelvis)

The position of shooters feet should provide maximum stability, which also serves as a way to correct the shooting position in relation to the target.

The feet are positioned shoulder width apart, or more.

The left foot has a straight angle against the target line (or slightly inwards).

The right foot is either slightly opened or on the straight angle.



There are two variations concerning the weight distribution on the feet:

1. Having equal weight distribution on both feet.
2. Having more weight on the left foot.

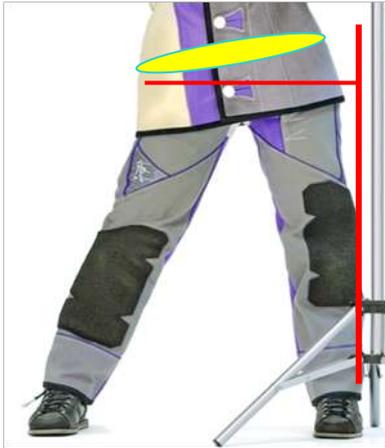
The most common weight distribution is placing more weight closer to the left foot. Doing this automatically raises the hips, giving the shooter a better platform for the supporting arm.

The right foot should either be in line with the left foot or a little back. In this case, the body-rifle system will be balanced and in the middle of the supporting area in the frontal plane.

The position of the feet also helps correct the shooting position in relation to the target. In general, the left foot is fixed and almost normal to the shooting line while the right foot is used for corrections.

The legs are straight, with minimal tension of the muscles needed for the firmness of the position. The pressure on the feet should be equally balanced on the toes and heels to relax the leg muscles.

The hips - there is a straight line going through the hips towards the target.



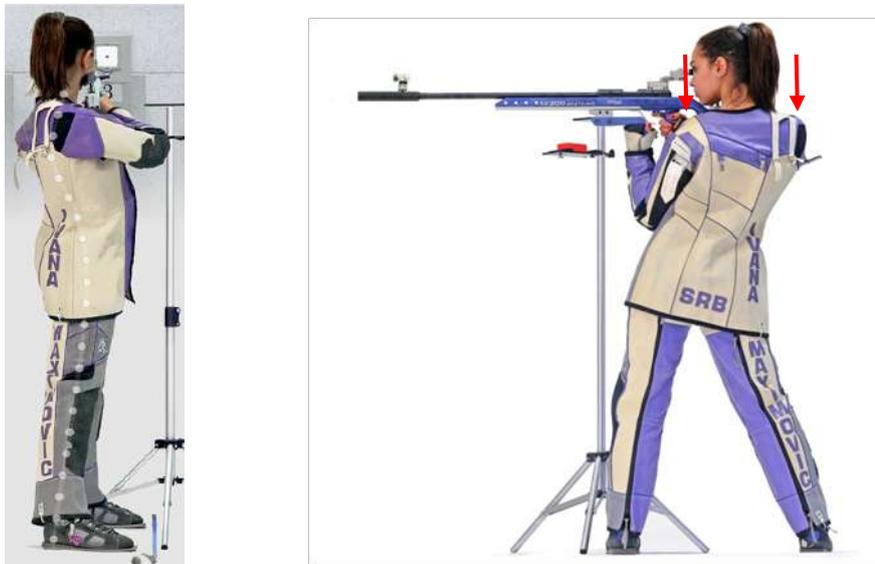
If hips are turned to the side, unequal pressure on the feet occurs and the muscles of the back are tense and tiring faster. This will disturb the concentration of the shooter, as well as disturbing the stability of the position with movement of the rifle.

Opening the hips will create a triangle between the shoulders and the rifle. Moving the rifle further away from the body will increase the use of muscle strength, and the body-rifle system will be out of balance as a result.

When placing the feet and adjusting their angle, the shooter needs to consider the optimal angle to ensure optimal hip alignment. Keeping the left foot at a 90-degree angle and opening the back foot can facilitate a consistent and straight hip alignment. Some shooters also choose to close the left foot to reach the same goal.

The Back and Shoulders

The back is bent rearward. All bending occurs above the waist. The rifle should be positioned above the center of the support area to provide stability to the position. This position brings the center of gravity of the rifle closer to the medium line of the body, decreasing the tension of the muscles caused by holding the rifle. Bending the shooter's back rearward and pointing the body to the right will allow maximum involvement of the sinews and ligaments. The transfer of the center of gravity of the shooter-rifle system to the spine relaxes the muscles, providing stability of the body in the area of the waist and hips.



The upper part of the body should form a ``S`` in the frontal plane. To achieve this, the lower part of the back is backward, while the upper part of the back is forward, and the chest is recessed.

Back muscles should be relaxed.

The shoulders are level and relaxed. Relaxation should be straight down. The most common mistake of shooters is to relax the left shoulder down and back, while lifting the right shoulder.

Left Arm, Elbow and Hand

The left arm supports the rifle. The line of *touch point* of the hand, rifle and the left elbow, should be vertical in the frontal plane. The forearm should be vertical or moved forward in the sagittal plane.

The arm must be totally relaxed.



The left elbow rests against the left hip or slightly to the right. The hips are tilted which give a solid platform for the supporting elbow. Putting the elbow on the stomach or to the left of the hip causes the shooter to be less stable and creates unnecessary tension to the muscles needed to keep the rifle on the target.

The left hand acts as the support point, which plays a very important role in the control of the rifle.

The purpose of the supporting hand is to transfer the weight of the rifle through the bones in the forearm, pelvis, thigh, shin and feet - all the way to the floor.

There are several **wrist** positions that can be used. The body constitution and the length of the forearm usually dictate the wrist position, especially in air rifle where it is limited by the rules of how far the palm rest can be lowered.

The goal with choosing a wrist position is to avoid tension in the wrist.

The best way to transfer the rifle weight directly to the forearm is to have the rifle palm rest on the palm of the hand, which will relax the wrist.



Very often shooters, especially beginners, tend to use the fist position because most shooters forearms are not long enough to give solid vertical support. To avoid tension, the wrist must be straight and relaxed.



Right Arm, Butt Plate, Hand and Pistol Grip

The position and the angle of **the right arm** serves two main tasks:

- to reach a solid contact between the butt plate and the shoulder

- to enable correct and smooth triggering

There is no definitive correct angle for the right arm.

The higher you raise the right arm, the more muscle strength you will have to use, but there will be better contact between the butt plate and the shoulder with this method.

In the lower position, the right arm is more relaxed but the contact between the butt plate and the shoulder is weaker.



Higher position



Lower position

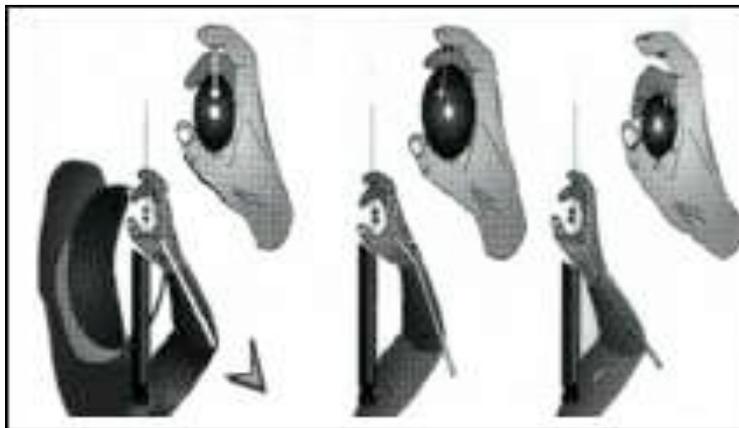
Regardless of the position used, the right arm cannot be totally relaxed as the shooter controls the movement of the rifle only with the right arm.

The butt plate is not leaning on the shoulder: it is instead leaning against the right upper arm between the biceps and the shoulder. This position allows the rifle to be directly over the chest, as close to the left shoulder as possible. It must not touch the left side of the chest (ISSF Rules).



The right hand grasps the pistol grip of the rifle moderately to firmly. The hold of the right hand should be firm, but also allow for correct triggering. This is a problem for many shooters because the hardness of the pistol grip blocks the index finger. When grip on the pistol grip is weak it causes uncontrolled rifle movement.

The wrist should be straight, with the fingers directing the force straight backward, parallel with the axis of the barrel.



The length of the rifle stock should be positioned to satisfy the condition where the wrist is straight and there is good contact with the shoulder. The easiest way to determine the “start length” of the stock is having the shooter place the butt plate in the bend of the elbow and grasping the pistol grip, while maintaining a straight wrist. After that, small adjustments may be needed to establish solid contact with the shoulder.

The Head



The head normally leans on the cheek piece, which has two functions:

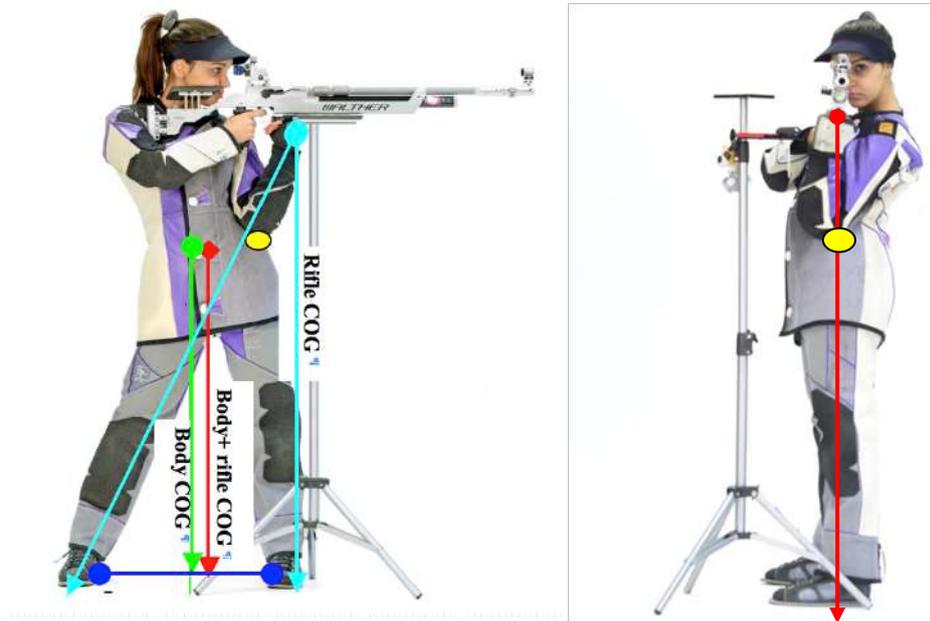
- to provide additional control of the rifle at the back
- provide a head placement where the shooters eye is directly in the line of aiming

When the head leans on the cheek-piece, the neck muscles must relaxed. Raising the head or putting stronger pressure on the cheek-piece can cause misalignment, as the eye is not lined up to the aiming line. By adjusting the cheek piece vertically and laterally, the eye will be in the line of aiming.

The shooter touches, holds and leans the rifle on four points: **the butt plate, pistol grip, cheek-piece, and palm rest**. The basic principle for the acquisition of best conditions for a good shot is for the rifle and the shooter to make contact as precisely as possible. Under these conditions, the jump of the rifle after pulling the trigger is less and disturbance during triggering is minimal.



Balance of the Rifle and of the Shooter-Rifle System



The balance of the rifle should be around the point where the rifle rests on the hand.

If the balance is in front of the hand, there is slow but unstoppable movement of the barrel as the weight of the rifle is too far forward. If it is behind the hand, the pressure is weaker on the hand and there is an uncontrollable jump of the barrel after triggering.

We can adjust the balance of the rifle very easily by placing or moving weights front and back.

The balance of the shooter-rifle system should be between the feet or slightly shifted to the left foot.

If the COG is moved slightly forward, the hips are not fixed well and a bigger movement of the rifle in the lateral plane will occur. If the COG is toward the back, the left hip is going down and does not provide the shooter with good elbow support. This would make it difficult for a shooter to get zero-point of the rifle to the middle of the target.

In order to prevent shaking and movements during triggering in the standing position, **all the muscles of the left shoulder, hand and arm have to be relaxed.**

Differences in positions between air rifle and free rifle (small bore)

Air rifle



- Caliber 4.5 mm (.177) – compressed air power – no or small recoil
- Weight max. 5.5 kg
- Limited adjustments can be made – as per ISSF rules

Free rifle



- Caliber 5.6 mm (.22 LR) – fire arm – bigger recoil
- Weight max. 8.0 kg
- Almost unlimited adjustments

The greater weight and stronger recoil of the small bore rifle drove us to the idea that the position of the shooter needs to be changed in certain aspects - a wider stance, a greater curvature of the back, as well as a stronger hold on the handgrip. Fortunately, the small bore

rifle is highly adaptable, and can be easily configured to enable a good shooting position. The point of interaction - between the left hand and the rifle - should be at, or forward from, the pivot point of the rifle. This can greatly help in keeping a good connection between the shooter's right shoulder and the rifle butt plate. This position will also help maintain the overall balance between the shooter and the rifle. The ability to move the palm rest freely enables us to prevent a scenario where the shooter curves their back excessively in order to compensate for the weight of the small bore rifle. The availability of anatomic pistol grip and palm rest provide an additional customization, which can help the shooter in better holding and controlling the rifle.

All of this led us to the conclusion that the differences in how shooters set up their positions and how they hold their rifles are very small and can be formulated in the following way:

- The upper body has to lean more back in order to get the more weight of the free rifle over the support area,
- The distance between the feet should be slightly larger than with an air rifle. The grip of the right hand should be stronger to control the recoil of the rifle,
- The balance of the rifle is slightly forward as to reduce stronger recoil.



Air rifle



Free rifle

The position modifications depending on the body constitution

Tall shooters

The main challenge for tall shooters is getting the zero point of their stance into the middle of the target - as their sight line, when level, is above the target. To accomplish this, certain specific changes need to be made to the shooter's position and to the elements on their rifle, such as the following:

- Having a more upright stance where the spine is close to being over the center of gravity of the shooter, which enables the left hip to be less raised.
- Moving the shooter's left hand more forward.
- Moving the palm rest closer to, or even right next to, the rifle stock
- Having the butt plate lowered. According to the new ISSF rules, there is no limit to how much the butt plate can be lowered, which can benefit taller shooters. However, the shooter cannot regulate the height of their sight line purely by lowering the butt plate. This is because lowering the butt plate excessively can cause an increase in the space between the shoulder and the cheek piece, which can create problems in maintaining the correct head position.



Short shooters

Short shooters have the same challenges as tall shooters, but in the opposite sense.

The changes to the shooter's position and to the elements on their rifle should be as follows:

- A wider leg position: bend their back more towards the rear and to the right, and their hip should be set more forward.
- The new ISSF rules permit moving the palm rest lower (up to 12 cm for air rifle), which can make it easier for the shooter to take the proper position without creating too much tension in their back, which would otherwise be caused by a need for a greater curving of the back to compensate for the higher palm rest;
- It is recommended that the shooter maintains a vertical position of their left forearm, with the palm rest supported with a fist, to heighten the shooter's sight line,
- The butt plate should not be raised too much, as that can reduce the distance between the shoulder and the cheek rest, leading to an improper head position – the head would be too low and too forward, which would make maintaining proper aim very difficult.



The plump shooters and female shooters with big breasts

The challenges that shooters with these body shapes face are:

- The balance of the rifle is moved further away from the body,
- In the shooting position, when the rifle is parallel to the shooter's chest, there can be contact between the rifle and the left part of the shooter's chest, which is against the rules.
- A weaker support of the left elbow on the left hip.

In order to address these issues, the following changes should be implemented:

- The shooter's back should be bent more rearward, in order for the center of gravity of the rifle to be above the center of gravity of the shooter's body,
- The rifle should be canted to the left, in order to allow for the proper positioning of the head and preventing any contact between the rifle and the left side of the shooter's chest.
- The left elbow should be moved towards the inner side of the abdomen in order to achieve better support of the left arm, as the left forearm is resting on the body. The reinforcement material in the jacket sleeve and elbow will normally give additional support.



SELF - EVALUATING QUESTIONS:

What biomechanical conditions need to achieve for the shooter-rifle system to be in balance in the standing position?

Which parts of the body should be completely relaxed in a standing position?

Where the rifle COG should be concerning the left hand?

How to determinate the COG of the rifle?

4. PRONE SHOOTING POSITION

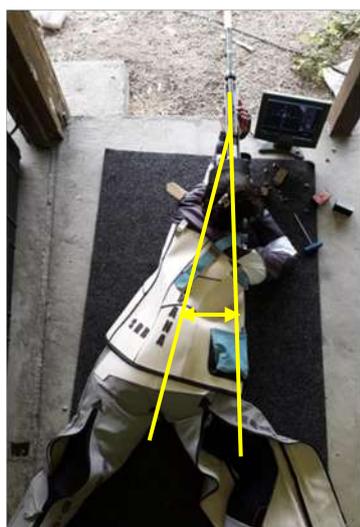
Biomechanical analysis

The prone position is the most stable shooting position. The reason is the largest support area of the body while the center of gravity is at the lowest height. This gives the best stability to a system shooter-rifle.

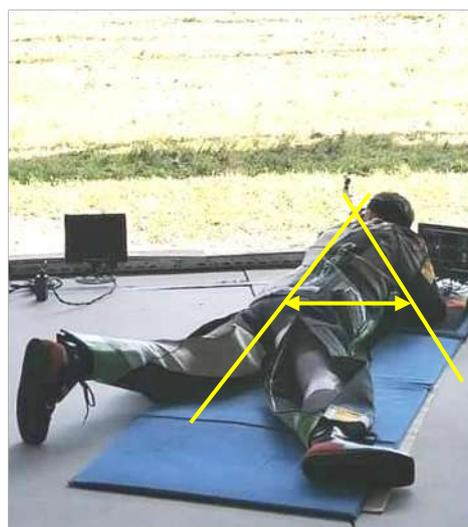
From the biomechanical aspect, the most important area of interest is the combination of shoulder, arms and head positioning. The highest stability of a position is achieved when the COG of the rifle is as close to the centre of this zone as possible. Therefore, the shooter's body should be rotated no more than 20 degrees in relation to the shooting line. Higher rotations cause the COG of the rifle to move to the right and instabilities in the shooting position.



Straight forward



App. 20 degree body angle



Bigger body angle

In addition, the forces that appear in the position need to be balanced.

The forces going straight back-forth should be equal, as should the ones going up-down. This means that the left-hand pressure on the rifle should be equal to the pressure of the stock in the shoulder. Based on that, the length of the stock and the sling is determined, as well as the balancing of the rifle.



In the sagittal plane, the pressure of the head on the cheek piece should be equal to the pressure of the right arm and hand. This acts as a parameter to determine the position of the right elbow.



The angles of the left forearm and upper arm should be the same according to the supporting area. In that case the force is going straight back.



The basic prone position consists of the following elements (right-handed shooters):

Upper body and legs

Body of the shooter should be slanting so that the vertical axis of the shooter and the shooting line is forming an angle of 0-20 degrees. The spine is straight. The spine and shoulders are approximately T-shaped. The left shoulder is drawn forward to slightly open the alignment of the shoulders. The right shoulder should be relaxed.



Slanting in this position is more comfortable for the shooter as the rib cage is not tight and provides freer breathing. It also provides the shooter with ideal conditions for leaning of the

head onto the cheek-piece, and positioning of the butt plate onto the shoulder. With these adjustments, the shooter should have more correct aiming.

Legs should be spread without any tension; the left leg should be leaned onto the ground with the tip of the toes. It is more beneficial to shoot in the shooting shoes because they provide the stability of the left leg with their flat front. The left leg is exactly in line with the rest of the body and is parallel to the spine. The right leg should be bent at the knee (about 45 degrees) and the right foot should completely lie on the ground with its inner side. Bending of the right leg makes breathing easier and avoids pulsation in the stomach as the shooters weight is primarily on their left hip.

Arms

Left arm is bent at the elbow and placed as far forward as possible to the hand stop, but to the limits prescribed by the regulations (the smallest angle between the forearm and the ground is 30 degrees).

Left elbow is placed slightly to the left of the rifle.



If the elbow is placed directly under (or further to the right) the rifle, it will typically result in muscle pain in the shoulder area. When too much pressure is given to the left side of the body, balance is also affected. In order to maintain this position, the elbow has to stay exactly in the same place throughout the whole shooting session or a competition. Left arm has to be as relaxed as possible.

The wrist of the left arm is straight, with a straight line going from the shoulder to the upper arm. This straight line continues through the forearm to the supporting hand. The left wrist should have minimal bending and should be relaxed. The fingers on the left hand should not be tight around the stock. The rifle is leaned onto the middle of the hand, a little toward the thumb.



Majority of the rifles weight is placed upon the left arm.

The placement of **the right arm** is very important in prone.

The right hand holds the pistol grip with a moderate grip. The wrist of the right hand should be straight while the base of the trigger-finger should be separated from the pistol grip. This provides the best feeling for triggering - the shooter should feel as though they are hugging the rifle with his right hand.

The right elbow should be neither pushed near the body, nor separated with effort aside. Once the pistol grip is taken, the elbow is freely put to the ground. The elbow must always be lowered to the same place in order to maintain alignment of the position.



Butt Plate and Length of the Stock

The butt plate is placed on the inside of the shoulder as close to the head as possible.

The length of the stock should be determined so as to allow good contact in the shoulder.

The pressure in the shoulder should almost be the same as the pressure of the rifle to the left hand. If this pressure is weak, the stock should be extended - if the rifle pushes the shoulder backward, the stock should be shortened. The hook should be between the back and the arm, and should not exert pressure on either side.



Head

The head is in front of the spine and leans on the front of the cheek-piece of the stock. The head must not be turned to the right or angled down as it will cause the shooter to aim astray or aim under the forehead (eyebrow). The head should be relaxed. The belt on the right part of the jacket should be tightened to avoid pressure on the neck.



Sling

The sling should firmly connect the left arm and the hand stop on the fore-end stock. The sling should form the firm triangle composed of the left forearm, left upper arm and the sling. This triangle should act as the artificial support for the rifle, which will release the muscles of the left arm while holding the rifle. The sling must not be loose or too tight. If it is loose, the stability decreases and the muscles of the left arm are included into holding the rifle. If it is over-tight, the weapon shakes and there is a pulsation due to the poor blood circulation.

The sling can be put on the upper arm at two places - at the lower part, near the elbow - at the lower position and high, near the shoulder - at the high position. The sling must not be positioned at the middle of the upper arm because then it directly lies in the middle of the triceps and causes the interruption of blood circulation. The sling should be placed as horizontal as possible.



Low position



High position

Position Height

The prone position, concerning the position of the left forearm, can be high, low or medium - all three positions are correct. The only condition is that when using the low position, the angle between the forearm and the ground must be larger than 30 degrees.



Low



Medium



High

Each of these three positions has its own advantages and disadvantages and the height of the position depends on the shooter's body proportions.

The low position is the most stable for shooting as the bodies center of gravity is the lowest. It is a less convenient position as it; presses the rib cage, affects breathing, creates pulsation disturbance, makes it difficult to keep the head correctly positioned, causes tension of the neck muscles. These all add up to the consequence of poorer visibility of the sights, because aiming takes place under the forehead (eyebrow). Because of the inconvenient shooting conditions in this position, but with the greatest stability, the shooter who uses this position should have a fast rhythm of shooting.

The high position relaxes the rib cage, makes keeping the head correctly positioned easier. This position is very good for aiming but it causes a disadvantage as the center of gravity of the system shooter-rifle is high. With this higher center of gravity, the stability of the rifle and shooter are considerably smaller, and the pressure placed on the left elbow is much

stronger than other positions. This high center of gravity also causes the muscles to tighten, which causes the shooter to become fatigued more quickly than in other positions.

The medium position is most frequent with the shooters because it avoids bad and keeps good sides both of the low and high position.

The position modifications depending on the body constitution

Tall shooters

Tall shooters should adjust the position to a longer arm length. They typically assume the higher position, as it provides the most benefits to taller shooters. The sling is in the high position on the upper arm. The left elbow is more to the left, while the right elbow is closer to the body and the right shoulder is higher. As the hand stop is moved forward in this position, the balance of the rifle is shifted backwards, so it is advisable to use the weights on the front of the stock to move the balance of the rifle closer to the left hand.



Short shooters

Because of their shorter arms, short shooters should take a lower position. Position of the sling on the upper arm is set up on the lower position. The left elbow is placed closer to the rifle, while the right elbow is positioned away from the body and the right shoulder is lower in order for the shooter to reach the required target alignment.



Plump shooters and female shooters with big breasts

Shooters with this body type typically take a higher position. The right leg is bent more and they lean on the left hip, as it makes breathing easier and avoids putting the pressure and pulsation on – and pulsation in - the stomach.



SELF - EVALUATING QUESTIONS:

From the biomechanical aspect, which is the most important area of interest in the prone position?

Describe the position of the butt plate in the shoulder and the fore-end of the stock on the left hand?

Which is the smallest angle of the left forearm allowed by the rules of ISSF?

5. KNEELING SHOOTING POSITION

Biomechanical analysis

The kneeling position has less stability than the prone position because the support area is much smaller and the center of gravity of the system shooter-rifle is higher. The support area is limited to the three points - the left foot, the knee and toe tips of the right leg. Because of the uncomfortable and unnatural position of the shooter, the kneeling position is considered to be the most complicated shooting position. It demands extreme versatility and persistence of the shooter. Because of these obstacles, the kneeling position is one that most shooters need practice to refine and perfect.

Depending on the position of the body relative to the target, two options when considering the kneeling position:

- Open position – the body is turned more towards the target
- Closed position – the body is turned more towards the right

Biomechanically, both variations of the kneeling position should have the same characteristics: The barrel line (rifle weight) should be over the kneeling roll in order to reach a balanced position. The size of the kneeling role plays a big role in obeying this rule. Point is to have COG of the system body–rifle around the middle of the support area.



Open position



Closed position

The rifle should be above the left foot and the left lower leg must be vertical in a sagittal plane



Upper part of the body should follow the same rules as in prone. The pressure of the rifle in the left hand should be same as the pressure of the butt plate in the shoulder.



The basic kneeling position should consist of the following elements (right-handed shooters):

Upper body

The position and the angle of the upper body depend on if the shooter is using a more open or close kneeling position. If the shooter uses a open position, the upper part leans forward. If the shooter uses a close position there is more weight placed on the kneeling roll.



The right shoulder is completely relaxed. The shoulders should be level.

Legs and feet

The left leg is bent so that the shin is vertical, providing good support for the rifle. The shin can only be moved forward but not behind the vertical position. Long-legged shooters generally move the shin forward to lower the rifle into the target to adjust for their limbs. The position of the shin depends on the position of the left elbow on the leg - if the elbow is over the knee, the shin is vertical. If the elbow is placed behind the knee, then the shin is positioned slightly forward.

The left foot often follows the angle of the right thigh. Turning the left foot can help to reduce the horizontal movement and give a larger support area.

The left foot is rotated to the right and the axis of the foot and line of fire forms an angle of 35-45 degrees. In the open position, the left foot generally follows the position of the right

thigh. Turning the left foot helps to reduce the horizontal movement and creates a larger support area for the elbow.



In the open position, the right knee is placed at an angle of about 45 degrees to the right of the line of fire. The shooter should place some pressure on the right knee.

The right knee should follow an angle almost to 90 degrees in the close position. The pressure on the right knee is very weak, and in some cases, shooters do not have their knee on the ground at all.



Kneeling roll

The kneeling roll is used as a support for the right leg. Using the proper size of kneeling roll is extremely important for the stability and the correct position of the shooter. The thickness of the kneeling roll depends on the foot size of the shooter. The kneeling roll should allow the

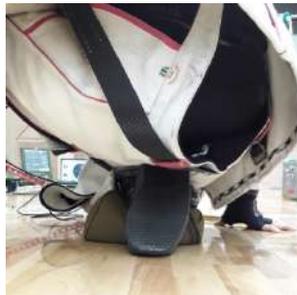
shooter to sit relaxed on the right heel, have a good stability of the position, and not be too high from the ground. The kneeling roll should be placed directly under the ankle.



The right foot is vertical, so that the toes are straight or slightly to the right. It should be placed in the center of the kneeling roll. The shooter leans against either the heel of the right foot, or slightly forward by the last portion of the spine.



Correct



Incorrect

The spine is bent and relaxed straight down or a little forward, depending on the position of left elbow. The spine should not bend aside.

Arms

The left arm is bent at the elbow, and assumes the approximate position as in the prone position

The left elbow can rest on the knee in two ways:

- over the knee with its flat portion just above the elbow, but no more than 100 mm (ISSF rules) or,
- behind the knee, but no more than 150 mm (ISSF rules).



Over the knee



Behind the knee

The left arm is slightly to the left from the rifle, stretched naturally, completely relaxed.

The left wrist is straight, and the hand is leaned against the hand stop. The rifle is leaned against the left part of the hand a little towards the thumb to avoid falling off the rifle, as there is less support on the right elbow like in the prone position. The fingers are fully relaxed.



The right arm is slightly separated from the body, at an angle of 10-20 degrees and it should be relaxed. The right hand holds the pistol grip with the moderate grip. The wrist is straight.



Butt plate and Length of the Stock

The butt plate is placed in the shoulder. The butt stock should be moved to the left (relative to the position of the butt plate) so that the rifle is closer to the head. Also, some shooters choose to hold the rifle slightly canted to the left, because it allows the head to lean straight against the cheek-piece of the stock, and it moves the COG of the system shooter-rifle to the middle of the support area. The hook should be between the back and the arm – but may be placed closer to the back - but without a large amount of pressure.



The length of the stock should be determined the same way as in the prone position.

Head

The conditions for proper posture of the head in the kneeling position are much better than in the prone position. The butt plate is lower than the prone position and is located close to (or slightly lower than) the middle of the butt stock. The bigger space between the butt plate and the cheek piece is allowed the correct head position, especially if the shooter is using the high sights.



Sling

The sling is firmly fixed in the upper position of the left upper arm. Usually, the sling is shorter and the hand stop is closer than in the prone position. With the elbow closer to the body, the left shoulder is more forward and the angle between the left forearm and upper arm is smaller. All other conditions are the same as in the prone position



The position modifications depending on the body constitution

Tall shooters

Due to their long arms and legs, tall shooters typically assume the closed position. Their left shin is forward and their right leg is more to their right. Depending on the elbow placement on the knee, balance of the position is back if the elbow is behind the knee, and slightly forward if the elbow is over the knee.



Short shooters

Because of their shorter arms and legs, short shooters tend to take an open position. The left shin is vertical and the right leg is closer to the left foot. The left elbow is placed slightly behind the knee and the balance of the position is slightly forward.



See Power Point Presentation Shooting Positions.pptx

SELF - EVALUATING QUESTIONS:

Depending on the position of the body relative to the target, which two options are considered in the kneeling position?

Describe how to determine the length of the sling.

Describe the position of the kneeling roll and the right foot.

PRACTICAL PART

1. METHODOLOGY OF APPROACHING AND TAKING SHOOTING POSITION

In the first part of the course we dealt with the theory of shooting positions, biomechanical analysis and basic rules that should be respected when building the shooting position. The main task of the coach is to apply the theoretical knowledge in practice, as this is subject to the success of adopting the positions and the results of the athlete. Therefore, it is necessary to follow a certain methodology of taking up the positions, starting with the so-called "school position" where the general rules of the position setting will be respected. With the help of the coach, the shooter will then build his own position that mainly corresponds to his body constitution with the equipment and rifle that he possesses, using the training and psychological approach.

Shooting equipment

The main parts of shooting equipment are: jacket, trousers, shoes, glove and sling.

This equipment helps the shooter to improve the stability of the position, relax some muscle groups that are active during shooting, neutralize vibrations of the heart beat on the rifle as well as preventing any opportunity of body deformity (spine, feet) during long trainings sessions and competitions.

All equipment must be in accordance with the rules prescribed by ISSF.

The equipment with then have to be firm enough to satisfy the demands mentioned above, and at the same time be comfortable and adjustable for specific positions.

Any problems with the jacket and/or trousers can be solved by tailoring them (making fine adjustments) according to the body of the shooter by moving buttons or belts on the right sling, according to the regulation of the fold on the trousers and by the belt on the trousers.

The shoes must have a flat sole, making it possible to have a larger supporting area for the shooter onto the floor. This is why walking in shooting shoes should be avoided and using the supporters for the shoe soles. The toes must not be tight inside and the size of the shoe has to allow normal circulation of the foot.

The glove should be chosen depending upon the position. In the prone and kneeling positions, it should be kept in mind that the glove must not have stitching between the thumb and the index finger because it can cause blisters as the slide lies on that part of the hand. The ends of the glove fingers must not touch the top of the hand fingers, as the fingers would not be able to relax completely. In the standing position the glove with the rough rubber should be used because of the pressure that the rifle produces on the hand and because of the firmness of the wrist. If the shooter holds the rifle on the palm, a softer glove is recommended.

Most importantly concerning the sling, it must be made of material that will not stretch as this would change the length of the sling during shooting causing change of the firmness and height of the position.

Establishing middle line of position

Before we start to build the shooting position we should teach the shooter how to establish the middle line of the position in relation to the target. In the past, the middle of the target was established very easily as we had mechanical devices with ropes for changing targets. Currently, we use electronic targets so establishing the middle line of the position is not as easy. The shooter needs to know how to find the middle line to the target and mark it on the

firing position. It is very important for the shooter to mark out exactly where he is standing, so that after any breaks he can get back into exactly the same position in front of the measurement place. Some shooters do not stay exactly in the middle of the firing line, but they must *establish* the middle of the firing line to know how far to stand in front or behind. This should always be the same whether just getting out of position or shooting at another shooting range.

Way of determining the middle line towards the target

The shooter should stand two to three meters back of the firing line with folded palms facing the target. When the fingertips are directed in the middle of the target, slowly lower the palms straight down and determine the point on the firing place that corresponds to the middle of the target.



The shooter can also find the middle line by stepping back as far as he can and looking out for lines on the floor, ceiling or walls. If necessary, the shooter can ask an experienced shooter or coach for help. With inexperienced shooters, the coach should always check that they have determined the middle line to the target correctly. Once a shooter has found the line to the target, the shooter will place **a tool** down at the firing place **to mark** it out.



The shooter should then set **a ruler or tape measure** approx 15 cm away from the tool so it is perfectly parallel with the direct line to the target.

Placing the ruler or tape measure helps the shooter to get into the same direction to the target and with the same foot spacing.



The shooting stand (tripod)

In addition to the ruler, the shooting stand also helps by reducing the movements to and from the shooting position. The stand should be placed as far as possible and approx. 30 cm to the right of the line to the target. The height of the stand must not be greater than the height of the shoulders when the shooter is in the shooting position (ISSF rules). By placing the stand in the correct place, we achieve comfortable loading of the rifle with minimal movement of

the position. The goal is to keep the hips in the original position when loading the rifle. Only the left arm should move.



After determining the straight line to the target, we start to build the positions in three phases.

Standing position

I phase – assuming a position without a rifle or equipment

- The shooter is turned 90° to the right from the target.
- The feet position play a very important role because they regulate the statics, alignment and balance of the position. Feet are to be set up joining and parallel with the firing line. Spread the feet shoulder width apart, or more. The right foot can remain in the parallel position or the toes are slightly pointed to the right.
- Move the hips forward towards the target;
- Bend the back rearward and to the right until the weight is equally distributed on both legs and in the middle of the feet;
- Place the left elbow on the left hip and set the right arm in a position as if holding a rifle;

- Turn the head to the left towards the target.

When the shooter has taken the position, he should close his eyes and check the balance of the position. Foot pressure should be evenly distributed on both feet and in the middle of the feet. If not, do corrections with the right foot to get a stable and balanced position.



II phase – with rifle

The shooter will remain in position while the coach places the rifle on the shooter's left fist and in the right shoulder.

- The rifle is directly above the left elbow and the forearm is vertical;
- The butt plate is supported against the right upper arm between the biceps and shoulder;
- The rifle is parallel with the chest and close to the left shoulder;
- He grasps the pistol grip moderately to firmly with his right hand;
- He relaxes the left arm and the right shoulder;
- He places his head on the cheek-piece

After taking up the position with the rifle, some general adjustments to the rifle should be made to set it to the middle of the target. This requires fitting the butt plate, the length of the stock, the cheek-piece adjustment and the location of the rear sight.

Depending on the foot pressure distribution, the shooter should make some corrections with his back and right foot. After assuming a relatively stable and comfortable position, the shooter should close his eyes and remember the inner feeling of the general setting of the position.



III phase – full setting of the position with the rifle and equipment

- As the shooter is wearing the shooting equipment, he will assume the same position as before.
- The middle line of the feet is on a line that is in the direction of the target and marked earlier. The width of the feet was also determined by the ruler earlier.
- He will then take the rifle and put it in the position.
- Fine tuning should be made on four points where the shooter touches, holds and supports the rifle: shoulder, cheek, pistol grip and fore-end. The basic principle for the

acquisition for the best possible conditions of a good shot is to make contact on those four points.

The butt plate

The butt plate should be lowered so it is supported against the shoulder. The butt plate prevents the turning of the rifle and any jump during triggering. The shooter cannot regulate the height of their rifle purely by lowering or moving up the butt plate as this depends on the space between the shoulder and the cheek-piece, or simply put from the length of the shooter's neck. Care should be taken to maintain the correct head position. Getting a good height of the rifle is in the mutual connection of the butt plate and the palm rest. Many shooters make the mistake of only having the *lower* part of the butt plate resting on the shoulder which gives a more comfortable position of the head, but the contact at the shoulder is weak and unstable. The check can be done while the shooter is in position and the coach tries to move the upper part of the butt plate left-right. If the rifle butt turns easily, the contact is weak and the area of contact between the butt plate and the shoulder should be enlarged. This is much easier to set up with small bore rifle because there is a hook support. Both the correct place of support and the pressure on the shoulder are critical as it can cause a bad connection between the butt plate and the body. It goes without saying that the pressure on the shoulder should be the same as the pressure of the fore end of the left arm, but the important question is where the pressure comes from. The pressure must not be the result of active muscle tension by the shoulder pushing forward towards the butt or drawing the butt into the shoulder by the right hand. Muscle tension of both methods can cause uncontrollable movement and dangerous reaction during triggering. The appropriate way of pressure is the correct choice of the butt length which is the distance between the butt plate and the pistol grip. The correct distance allows the relaxation of the right arm, and the lowering of the elbow passively bringing the shoulder forward providing the necessary pressure. The correct

length of the butt is explained in the theoretical part of the course. If the pressure is weaker, the butt plate should be drawn out and vice versa, but it should be kept in mind that the relaxation of the right arm causes the stronger pressure.



Forearm and/or palm rest

The wrist should be straight if the rifle leans on the fist or totally relaxed if the rifle leans on the palm. The connecting point of the left hand and the rifle must be exactly above the connecting point of the elbow and the hip, and the middle line of the feet. The shooter can turn the fist or palm around the vertical axis to get a more comfortable position provided that this rule is followed. The elbow should be exactly on top of the hip or slightly to the right in the direction of the target.

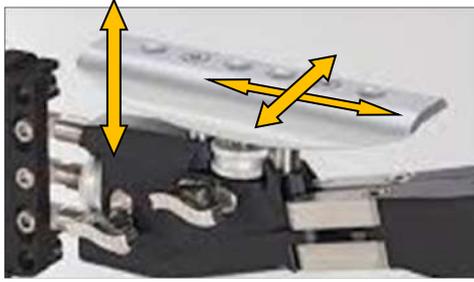
The shooter may have trouble feeling if the position is good with the elbow on the hip. If this is the case, the shooter should take off the jacket, assume the position and check the place of the elbow on the hip. The shooter should then remember the place on the hip and try to assume the same position with jacket on.



The coach should check the correct position of the left hand and elbow by watching the shooter from the front side. The correct position of the hips could also be checked by pressing the hip from the front side. If the hips go straight back then the position of the hips is correct.

Cheek-piece

Proper adjustment of the cheek-piece plays a very important role in setting the position. The head has to be placed so that the eye is in the aiming line and the neck muscles relaxed. The head should naturally be resting on the cheek-piece. By adjusting the cheek-piece vertically and laterally the eye will be in the aiming line without any pressure or raising of the head. Sometimes this adjustment is not so easy and may take some time. The coach should check the head position from the front side of the rifle. NOTICE: CHECK THAT THE RIFLE IS NOT LOADED. We should know how to adjust the cheek-piece depending on the position of the front sight in relation to the rear sight. All movements are opposite of the front sight position. For example, if the front sight is on the left related to the rear sight, we should move the cheek-piece to the right.



Also we can use the high sight blocks to get the straight head position and best conditions for aiming.

Pistol grip

The hold that the right hand has on the grip should be firm but also allow correct triggering. This is a problem for many shooters because a hard grip obstructs the index finger, but a weak grip causes uncontrolled recoil of the weapon. The shooter has to find the middle value of the grip which will allow correct triggering and control of the rifle during triggering. The index finger has to be separated from the grip and in such a position to pull the trigger straight backward through the axis of the barrel. In order to satisfy these requirements, attention should be paid to the size and shape of the grip, according to the rules. The size and the position of the grip should allow correct position of the index finger on the trigger and a grip that is adequate.



In air rifle shooting, it is very important that the butt plate, cheek-piece, grip, sights, trigger blade and palm rest be strictly arranged with the vertical plane that passes through the center line of the barrel.

In small bore shooting there may be minor deviations as the rifle is more customizable and the rules are more flexible. Most often there is a canting of the butt plate to the right so that the rifle is closer to the chest and head.

Establishing ``Zero Point`` in the Middle of the Target

Zero point is a term that the coach may repeat to the shooter each practice. Questions are constantly being asked: Have you checked zero point? Where is your zero point?

This means that zero point is extremely important and needs to be explained in more detail.

The zero point is the point at which the rifle is aimed when the shooter has taken the correct position, relaxed all the necessary muscle groups and has held his breath. We have two very important parts relating to the zero point:

First, we need to set the position and elements on the rifle so that zero point is in the middle of the target. We need to do it in the vertical and horizontal planes. Also, the place of zero point is not only connected with the outer position but is closely related with the inner position as well – muscle relaxation and balance, the jump of the rifle should be straight up and the rifle should fall back to the middle of the target during the follow through.

Second, the zero point must remain in the middle of the target from the first sighting shot to the end of the competition. It requires the same alignment of the position for each shot – position of the hips, placing of the elbow on the hip and relaxation of the muscles. It also requires the same placing of the rifle in the position – the butt plate on the shoulder, head

position, placing of the left hand, gripping with the right hand and placing of the index finger on the trigger blade.

This demands hard work and discipline. The shooter needs to check his alignment before each shot and correct it if necessary. Very often I like to tell my shooters that the shot preparation procedure is 80 percent a good shot.

Position correction and correction by setting rifle elements

Vertical alignment

Alignment with the body

Feet – left foot is parallel with the firing line and fixed. By moving the right foot backward, the zero point is going up and by moving the right foot closer to the left foot, the zero point is going down. When we do these corrections we have to take care about the balance of the position. Each extreme position – too wide or too narrow, will lead to increasing the body sway.

Hips - by tightening the jacket (by rules) the position becomes straighter, the hips are moving backward and zero point is going down. In the opposite way, if the buttons are loosened too much the jacket will then turn the body around, so taking a position will not always be the same.

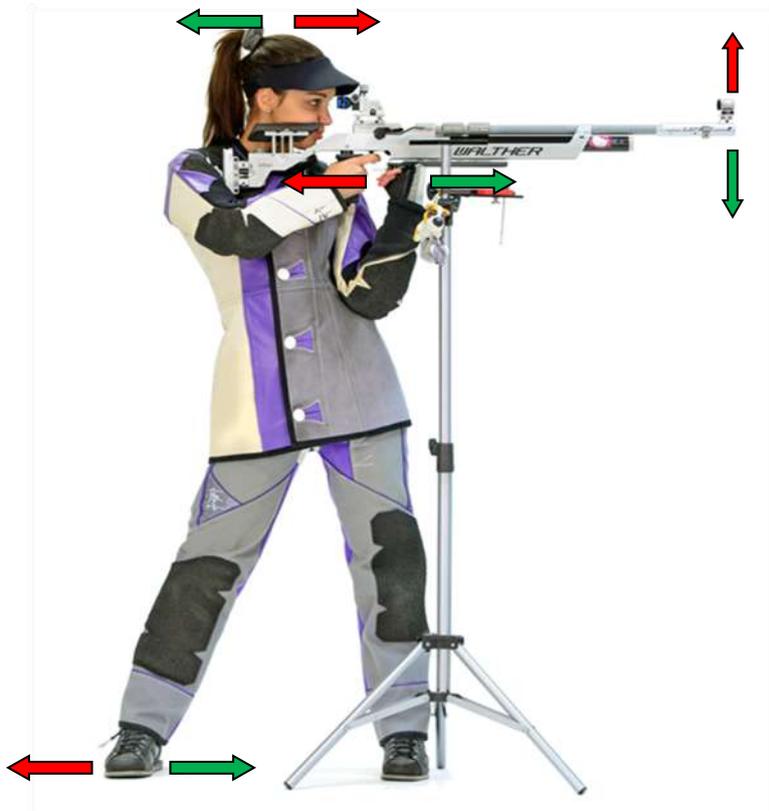
Left elbow – Many shooters use the belt on the pants to get better stability and higher position of the elbow. In that case zero point is going up. By lowering the belt we will get zero point going down.

Left hand - By moving the left hand backward, the zero point is going up and by moving the left hand forward, the zero point is going down. Take care that the left forearm is not bent

more than 90 degrees relative to the axis of the barrel. Also, moving the hand forward too much can produce muscle tension in the left upper arm.

Grip – Holding the grip higher up, the zero point is going down and opposite. If we hold the grip in the lower position, make sure that the grip strength is strong enough.

Head - By moving the head forward (rear sight forward), the zero point is going up, and by moving the head backward, the zero point is going down. These movements should be kept to a minimum as the head should be as straight as possible and the neck muscles relaxed.



Alignment by setting rifle elements

The rifle itself is designed to offer plenty of options for adjusting the zero point in the middle of the target.

The following instruction is to lower the zero point by making adjustments to the elements on the rifle. Movement in the opposite way would raise the zero point.

Butt plate – by moving downward. Take note of the space between the shoulder and the head. The head should be in the proper position.

Butt – by extending the length. Make sure that the contact in the shoulder is firm enough but not too strong. In exceptional cases we can turn the butt downwards. I do not recommend it because in that case the recoil force does not go straight back, so the jump of the rifle increases. This is especially true for small and big bore rifle.

Palm rest – by moving upward or forward.

Cheek-piece – by moving downward. It is directly related to the position of the head and the condition that the eye is in the aiming line.

The weights – moving the weights forward or by putting more weights on the barrel. It is just one of the possibilities but it is not recommended. We should follow the rule regarding the balance of the rifle which is explained in the theoretical part.



Horizontal alignment

Horizontal alignment is more complicated than vertical. That is natural when we know that the group of shots in trained shooters is bigger horizontally than vertically.

In right-handed shooters the right side is completely open so most shooters have the problem that their zero point is to the right of the target.

The following instruction is to move the zero point to the left towards the middle of the target by correcting the position and elements on the rifle. Corrections in the opposite way will move the zero point to the right side.

Alignment with the body

Feet – the left foot remains in the parallel position with the firing line. By moving the right foot forward the zero point moves to the left, but that movement cannot be unlimited. Moving the right foot forward can only be up to a parallel line with the left foot. Any movement of the foot over that line will lead to the opening of the position towards the target. The right shoulder will go to the right and the rifle will automatically be farther from the chest. This completely upsets the balance of the body-rifle system. If the zero point is still to the right, we should move the right foot backward. It sounds insane but it helps. Moving the foot back, the upper part of the body will bend backwards more. The left forearm will be vertical and the rifle will be placed closer to the left shoulder and parallel with the chest. Some small adjustments can also be made by rotating the feet or just moving the right foot to the left. During these corrections we must make sure that the hips remain in the direction of the target.

Left elbow – the next option is by moving the elbow to the left until it is at the top of the hip. If the elbow is already at the top of the hip then it should be moved slightly to the right. In this way we get the same effect as if we move the right foot backwards. The left forearm will lean more to the left and the zero point will move to the left.



Hips and head – they retain the position set during the vertical alignment.

Alignment by setting rifle elements

Butt plate – by moving to the left (air rifle is limited by rules). Turning the butt plate around the vertical axis to the left. These movements should be small as the rifle moves away from the chest which can upset the balance. In free rifle we can turn the butt plate around the horizontal axis to the right and rotate the hook to the left. In that case the rifle will be canted to the left and placed closer to the chest and the left shoulder.

All adjustments to the rifle are long-term corrections and should be done very carefully and with sense because very often the correction of one element requires the correction of another. Corrections of the zero point during the competition, in most cases, should be done by adjustment of the position. Only adjustment of the rifle, which is very often, would be a correction of the butt plate up or down if the height of the target is different than on your shooting range.

Prone position

I phase – assuming a position without a rifle and equipment

- The shooter should lie on the mat facing straight at the target with his hands folded under his chin;
- Turn the body to the left about 10-20 degrees. The body is completely straight while the left leg is parallel to the spine;
- Exhale the air from the lungs and bend the right leg as long as the shooter can inhale comfortably, but not more than 45 degrees, because it causes too much movement onto the left hip and the position will be uncomfortable;
- Stretch the left arm towards the target and rest the right arm on the elbow;



After assuming the provisional position, the shooter should aim between the thumb and index finger to the target, fully relax the body and feel the position of the arms. Adjust the position so the aiming line is straight to the target.

II phase – with rifle

The shooter remains in position and the coach sets the rifle in position.

- Put the rifle along the heel of the left hand and place the butt in the shoulder;

- Move the left hand by gripping the fore-end of the stock, keeping the sights on the target;
- Left arm must be placed in such a way that the angle between the forearm and the ground is at least 30 degrees.
- Left elbow is set slightly to the left of the rifle. Left arm is straight in the vertical plane;
- Provisionally adjust the butt plate – in the upper position with the hook slightly to the right, adjust the length of the butt. The right wrist should be straight;
- Lower the rifle and fix the hand stop 1 cm in front of the left hand position. This position may make better contact of the butt plate with the shoulder.

The shooter should place the left elbow so the weight of the rifle is completely on the left arm. When it is set, he should close his eyes and remember the position.



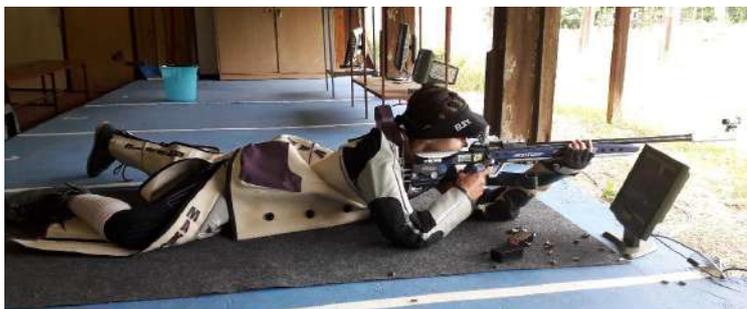
III phase – full setting of the position with the rifle and equipment

- As the shooter is wearing the shooting equipment, we should first set the sling on the left upper arm in the right place and on the right way. We will start with the sling fixed on the upper part of the upper arm, turning a quarter circle to the left. This will

prevent the sleeve from moving to the right during shooting, particularly if the shooter does not have a quality jacket.

- Then we need to determine the starting length of the sling. The shooter should bend the left arm so the hand is the same height as the left shoulder. The length of the sling is equal to the distance between the connecting point on the upper arm and the space between the thumb and the index finger of the hand. The sling passes over the back of the hand.
- We are now ready to attach the sling to the hand stop and assume the position. The position of the fore-end stock on the palm should be closer to the thumb. The wrist should be straight;
- The shooter places the left elbow on the mat slightly to the left of the mark for the direction of the target so the rifle should be located exactly in the direction of the target;
- He then puts the butt plate in the shoulder as close to the head as possible, grasp the grip and lower the right elbow to the mat;
- Adjust the position of the legs and body as in the previous phase;
- Any adjustments to the sling length can be made while the left arm is completely relaxed and the sights are on the target. The length of the sling is directly related to the position of the hand stop. If the length decreases the hand stop moves backwards and vice versa;
- Check the intensity of the pressure of the butt on the shoulder - if it is weak, extend the butt; if the rifle pushes the shoulder backward, shorten the stock;
- Adjust the butt plate so that it rests completely in the shoulder. The hook should be between the body and the shoulder, without any pressure on the body;

- Place the cheek so that it is on the forward portion of the cheek-piece. If needed, adjust the cheek-piece so that the shooter looks directly through the sights;
- The right hand grasps the grip moderately with a straight wrist, allowing the trigger-finger to make a straight rearward movement;



- Check the firmness of the position and the position of the left elbow by pressing the top of the barrel and releasing it abruptly. If the barrel returns vertically to the original position, the position is correct. If it returns to the left of the target, the elbow is too close to or below the rifle;
- The shooter should adjust the position so when the right hand is lowered to the ground, i.e. does not hold the grip, the rifle should be aimed towards the middle of the target;
- The recoil of the rifle shows a lot about position and hold. The recoil should be straight up and back, so the sling should be parallel with the rifle and the ground. If there is big recoil with no control: the sling is not tight enough, the left elbow is too far forward, or the hand stop is too close. If the rifle goes down first and then up: it is most likely that the left arm is not completely relaxed or the sling is too tight. If the rifle is returned aside the middle of the target: the position of the elbow is not good. The shooter should then reposition the elbow so the recoil is straight up.

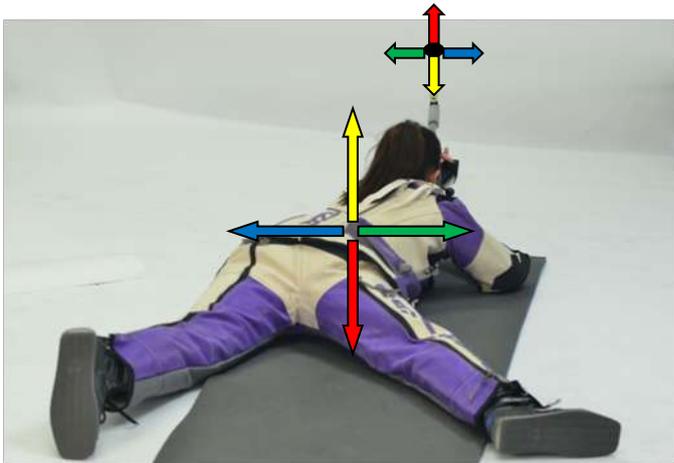
Position correction and correction by setting rifle elements

Alignment with the body

If there are any corrections with the body, the left elbow remains fixed.

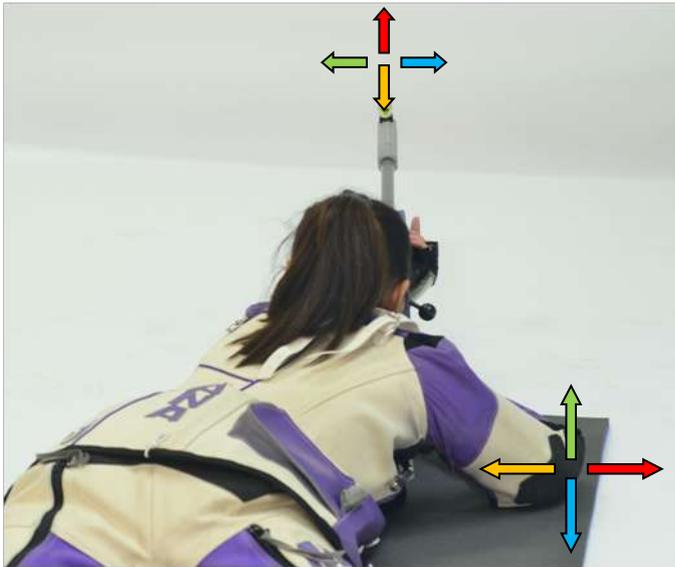
Body - by moving the body to the left, the zero point moves to the right and opposite. These movements cannot be too big. We should follow the basic rule that the body is at an angle of 0 to 20 degrees to the left of the firing line. Any other position will disturb the balance of the body–rifle system.

By moving the body forward, the zero point moves down and opposite. With these movements, we must pay attention to keep the left elbow in the correct position.



Legs – left leg should remain in the parallel position with the spine. We can make small corrections by changing the bending angle of the right leg. Primarily the changes relate to the recoil of the rifle. If the recoil is to the right we need to bend the leg more and vice versa.

Right elbow – very small adjustments of the zero point can be made by changing the support point of the right elbow. By placing the elbow closer to the body, the zero point moves down and opposite and by placing the elbow forward, the zero point moves left and opposite.

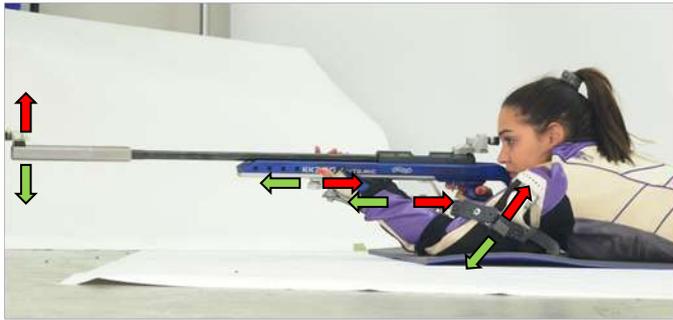


These corrections are usually used by shooters when using the ``shading`` technique when shooting in the wind.

Very often shooters, especially younger shooters, place the right elbow on the edge of the mat or the rubber part on the mat. This leads to errors on the target because the elbow is not always in the same place. More importantly - both elbows should not be close to the edges of the mat.

Head – by placing the head further forward, the zero point moves up and opposite. The position of the head must always be in the same place, to alleviate errors associated with height.

Sling – the position of the sling on the left upper arm is directly related to the height of the position. At the lower shooting position the sling is in the lower position and vice versa. Do not place the sling in the middle of the upper arm. By shortening the length of the sling, the zero point moves upwards and vice versa. Changing the length of the sling is directly related to the position of the hand stop. When we shorten the sling, we should move the hand stop backwards and vice versa. In this way we maintain the same firmness of the position.



Alignment by setting the rifle elements

Butt plate - the principle of zero point correction by means of butt plate setting is the same in all three positions. By moving the butt plate up, the zero point moves up and vice versa. The difference from the prone position to the other positions is that the upper part of the butt plate is placed further forward to achieve better contact in the shoulder.

Hand stop – by moving the hand stop forward, the zero point is going down and vice versa. We use these displacements to fine-tune the zero point using very small adjustments that can also reduce the movement of the rifle along the horizontal axis.

Kneeling position

I phase – assuming a position without a rifle and equipment

- First, the shooter should place the roll directly in the sighting line and rotate it about 45 degrees towards the target. He should then make a depression in the middle of the roll to make the foot rest more comfortable and stable;
- The shooter places the foot in the depression on the roll, taking care that the ankle is in the middle of the roll. The shooter will then sit on his heel so that the end of the spine is on the heel. The right leg is at an angle of about 45 degrees to the sighting line, i.e. at the right angle to the roll and the knee is leaning slightly against the ground;

- Bend the left leg so that the shin is vertical with no bending to the side. The middle of the foot is in the sighting line and turned to the right;
- Place the left elbow behind or over the left knee and set up the right arm as if holding the grip;
- The shooter should bend and relax the back as much as possible and check the stability of the position on the right foot.



After assuming the provisional position, the shooter should aim between the thumb and index finger to the target, fully relax the back and feel the position. Adjust the position so the aiming line is straight to the target.

II phase – with rifle

The shooter will remain in position while the coach sets the rifle in position.

- Put the rifle along the heel of the left hand and place the butt in the shoulder;
- Move the left hand by gripping the fore-end of the stock, making certain the sights are on the target;

- Provisionally adjust the butt plate – in the middle position, the hook is straight or slightly to the left, adjust the length of the butt. The right wrist should be straight;
- Lower the rifle and fix the hand stop 1 cm in front of the left hand position.



When it is set the shooter should close his eyes and remember the position.

III phase – full setting of the position with the rifle and equipment

The kneeling position is very specific and unnatural, so set up of the equipment is also specific.

- The right boot should be unlaced and open so it can stretch enough when the shooter sits on it;
- Both pant legs are open at the back as is the waistband;
- The jacket is buttoned with only two to three buttons;
- Fix the sling on the upper part of the left upper arm and turn it a quarter circle to the left, as in the prone position;

- Before kneeling, the shooter should pull up his pants because then the rubber patches on the pant legs will be in the right place to make good contact between the left elbow and the knee, and the right knee and the ground;
- As the roll is already set, place the right boot in the depression and carefully set in place as explained in Phase I;
- The toes of the boot are flat and must be touching the ground or moved (1cm) to the right, preventing the shooter to fall aside;
- Place the left leg as explained before. It can be slightly moved forward or backward, depending on the shooter's constitution. The boot is approximately parallel to the right leg;
- Close the zip on the left shin up to the knee, giving more stability to the left leg. The right zip is fully open;
- To determine the initial length of the sling and the position of the hand stop, we will repeat the same procedure as in the prone position. Usually the sling is shorter and the hand stop is closer than in the prone position;
- Attach the sling to the hand stop. The position of the fore-end stock on the palm should be closer to the thumb than in the prone position. The wrist is straight;
- Put the left elbow in front, or over the knee. The angle of the left forearm is greater than in the prone position. Some shooters use the fore-end or palm rest to get almost the same angle of the left forearm as in the prone position.
- Put the butt plate in the shoulder as close to the head as possible, grab the grip with the right hand with mild to moderate grip;
- Place the head straight forward on the cheek-piece, bend and relax the back, the left arm and shoulders;

- Adjust the length of the sling until we get the required stiffness of the position and the sights are in the target;
- Fine adjustments can be made in the vertical axis by moving the butt plate up or down;
- The butt plate should rest completely in the shoulder. To avoid the rifle turning to the right, the hook should touch the body but without heavy pressure on the body;
- The butt must be the right length – too short and the shoulder is forced forward, too long and the shoulder is forced back;



- The first indication that the position is well set is that the rifle is above the line connecting the middle of the left boot and the middle of the roll;
- The stability of the position can be checked by pressing the top of the barrel. With good stability there will be no movement of the left shin or body to the side. If the body falls to the left it means the shooter is sitting too far back or the right leg is too far to the right and vice versa;
- The size of the roll affects the stability. If too little the shooter falls backwards and vice versa. We can check this by gently pulling the shooter's shoulders back. If the

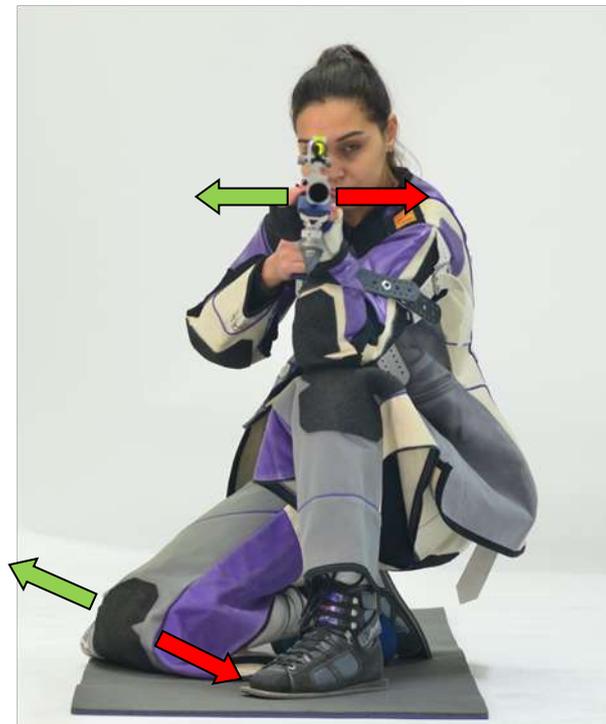
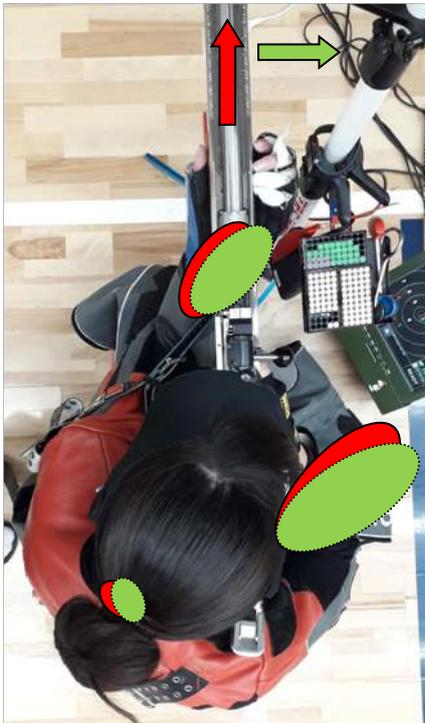
body moves easily or falls to the side, the position and the size of the roll should be checked;

- The recoil of the rifle should be straight up or a little to the right. The recoil a little to the right is acceptable and normal since we do not have support from the right side as in the prone position.

Position correction and correction by setting rifle elements

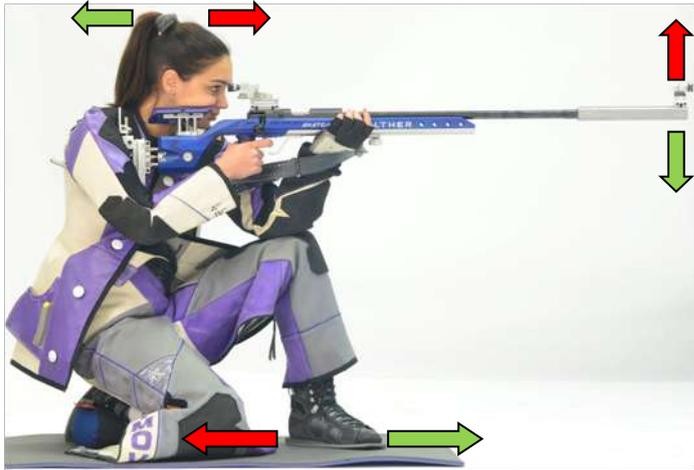
Alignment with the body

- **Horizontal alignment** - major corrections are made by rotating the complete position around the point where the COG of the system body–rifle is. Smaller corrections are made by moving the right leg a little toward the target if the zero point is on the right side of the target and vice versa.



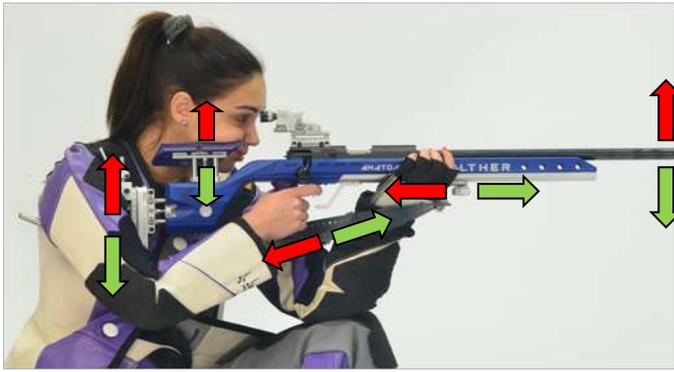
- **Vertical alignment** – most corrections are made by moving the left shin forward or backward. By moving the shin forward, the zero point is going down and vice versa.

Remember that the position of the shin must not be closer than 90 degrees to the ground. By moving the head forward, the zero point moves down and vice versa. Very rarely we can adjust the height of the zero point by changing the thickness of the roll. If we reduce the thickness, the zero point moves upwards and vice versa. If the stability of the position is good these changes are not recommended.



Alignment by setting the sling and rifle elements

- **Horizontal alignment** – usually all horizontal alignments we are doing by the body. Sometimes we can make alignments by small movements of the butt plate to the left or right. If we move the butt plate to the right, the zero point moves to the left and vice versa. The displacement of the butt plate to the side is relative to the stock while the position of the butt plate in the shoulder is always the same.
- **Vertical alignment** – the zero point downward correction can be done in one of the following ways or by a combination thereof: by extending the sling, by moving the hand stop forward, by moving the butt plate downward and by extending the butt. By moving the elements in the opposite direction, the zero point moves upwards.



See Power Point Presentation Methodology of approaching and taking positions.pptx

SELF - EVALUATING QUESTIONS:

Describe how to establish the middle line of position.

Explain in stages approaching and taking the standing position.

How to correct the position in the standing position if the zero point is to the right of the target?

Explain in stages approaching and taking the prone position.

How to correct the butt plate in the prone position if the zero point is below of the target?

Explain in stages approaching and taking the kneeling position.

Describe how the position of the zero point changes if we move the left shin forward in the kneeling position.

2. EXERCISES FOR DEVELOPING BASIC SHOOTING SKILLS

In previous chapters we have been introduced to the methodological approach of learning and position building. Setting a position is only the first step. The following is long and painstaking work to ensure that all elements of the position and all other parts of the shooting technique are properly adopted and trained. This is very important because if you learn wrong in the beginning, it is very difficult to correct later. It will slow down the progress of the shooter and very often completely prevent him from reaching top results.

Just as we follow certain rules in building the position, we should also follow certain rules when performing exercises for developing basic shooting skills. These rules are:

- From simple to more complex
- From easier to more difficult
- Gradual increase in load – watch out for overload

The exercises can be divided into the following groups:

1. General physical preparation - providing physical preconditions for the special event

Here we differentiate the training:

- Which develops the organs and muscles - running, swimming, long walking, mountaineering;
- Exercises for muscles strength and endurance;
- Stretching exercises, which are essential for the improvement of muscle flexibility so that they can maximally relax during shooting.

The task is to provide the base for the shooter buildup. Although exercises to improve general physical endurance and flexibility are relatively simple and easy to perform, I recommend

that they be planned and led by specialized experts. Otherwise, injury and overtraining may occur.

2. Acquiring - adjusting the outer shooting position

- Shooting a group of shots in one target (3, 5, and 10), with leaving the line of fire after each group of shots in order to practice acquiring of the position. Combine dry and live fire;
- Practice in front of the mirror in order to assume the same position every time – pay particular attention to the position of the left elbow and hand, the right hand and head;
- Standing - sitting behind the shooter, the coach monitors whether the hips are always in the shooting line. An easy way to control the position of the hips and upper part of the body is to follow the lines on the jacket and pants. These should be in the same relationship every time a position is taken. Also, the shooter can use the stand as a parameter, ensuring his hips are in the same position every time after loading.

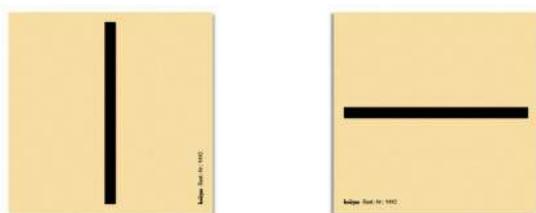
3. Providing balance (standing) and inner position

- General balance exercises – standing eyes closed, standing on one foot eyes closed (both sides). Do the same exercises on the balance pads;
- Balance exercises in the shooting position – without equipment; with jacket and glove only; with jacket and pants but without boots. Do the same exercises on the balance pads;
- Practice the relaxation procedure of individual body parts in the following order: I – legs (quadriceps), II – back and upper body, III – right shoulder and IV – left arm;
- Aiming with occasional eye closing - the control of the balance of the position and the muscle relaxation.

- The coach has all the time to point out the need for the relaxation of some muscle groups as mentioned above.

4. Providing the hold and specific endurance

- Holding the rifle longer in the position with and without the jacket with a focus on inner feeling and balance (no aiming). Aiming at a point on the wall from a short distance (1–2 cm) – try to hold the point in the middle of the front sight during breathing breaks;
- Long duration in kneeling position without rifle - at the shooting range or at home while watching TV or reading a book – gradually extend the time to 45 min. without a break;
- Shooting vertical and horizontal stripes – the width of stripes is 10 mm (air rifle).

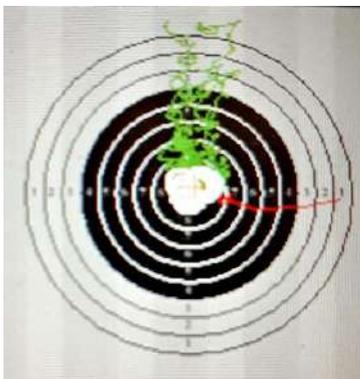


This exercise is very useful to check the balance of the position and the rifle. If the group of shots is larger on the vertical stripe it means that the balance of the rifle is not good. If the group of shots is larger on the horizontal stripe it means that the balance of the position is not good.

5. Aiming exercises

- Shooting at the target without rings or with the hole inside – the goal is to pay attention only to calming the rifle and aiming properly without thinking about the score;

- Control the target approach (green lines in the photo below) – always exactly from the same direction and in the same way. The easiest way to practice and control it is to practice on optoelectronic devices such as Scatt;



- Control the aiming time – the coach should measure the time. The procedure should be divided into two parts – *preparation period* which is before the shooter starts to aim and *aiming period* until the realization of the shot.

5. Trigger exercises

- Since triggering is rather easy, between 50 and 100 grams are needed for the shooter to get the feeling of the triggering weight. It is best to use dry training in a dark room or on the shooting range with eyes closed where the shooter will concentrate on triggering only;
- The first part of training, shooter should practice only withdrawing the first stage so that it does not cause firing. After that he turns to gradual withdrawing of the second stage without firing until the shooter gets the feeling of how much pressure he can produce onto the second stage. Finally he performs complete triggering, paying attention to both stages. Shooters who have direct triggering only train the other two parts;

- The next stage is dry training at a point on the wall. The shooter is concentrating only on triggering that he *should* perform so that while pulling the trigger the rifle does not move;
- We can also practice triggering by shooting from the shooting rest when shooter is learning to trigger during a stable hold;
- Dry and live shooting the groups of shots without watching the shots in the target. When we practice on the electronic targets, we should turn the monitor so the shooter cannot see the shots. Combine 5 shots without watching and 5 shots with watching each shot;
- Shooting at white paper - improves the feeling for triggering and pays attention to the relaxation of the muscles, which may be tensed.



Many shooters try to aim at their first shot to make a smaller group of shots as possible. That is wrong. This exercise is only for triggering - grouping of shots is not important;

- The coach should measure the time for each shot and warn the shooter when greater deviations of triggering occur so that the shooter can get used to the unified rhythm of shooting.

Each training session for basic shooting skills should follow a specific procedure of exercises:

- Warm-up and stretching
- Holding with equipment but without jacket;

- Aiming at the point on the wall with the equipment;
- A combination of the exercises to practice shooting skills;

Shoot 20 to 30 shots for score. We need these results so that we can evaluate the progress of the shooter during the training process.

SELF – EVALUATING QUESTIONS:

Describe exercises for providing the hold and the specific endurance.

Make a set of practices where all elements of the technique are involved.

3. WORK WITH BEGINNERS

Many coaches and psychologists say that working with the youth is the most difficult job but also the most interesting. Children have great demands and expectations, so they expect that their coach is good at what he does and able to make them top competitors. It is not easy and requires good technical and psychological knowledge from the coach.

The coach's first task when a child appears at the shooting range for the first time is to take him around the range and make him feel relaxed. Parents should also be familiar with the conditions on the shooting range, briefly explain the process of working with beginners as well as the training schedule.

Before the beginning of practical training, it is advisable to have 3-5 lessons where a child should adopt:

- House rules at the shooting range in order to follow safety measures;
- Familiarize with the firearms and the shooting equipment;
- Sitting position with a rest, standing position with a support, and standing position;
- Basic knowledge of aiming and triggering, and breathing techniques.

While working with a beginner it is essential for a coach to follow these next steps:

- Explain verbally and pictorially procedures and actions. It should be done in the simplest and most reasonable way possible;
- Demonstrate personally, or by a more experience shooter, certain elements of the technique. Each element of the technique should be explained separately as simple as possible;

- Check whether the beginner has correctly understood everything that has been shown and explained. If not, explain again in a different way and correct the observed errors;
- Make training interesting with elements of the game as it is extremely difficult to keep children's attention at one thing for a long period of time. For example: before each training session one shooter should recite the poem, to compete who will draw the sights and target better, to organize sports games after the training as a form of entertainment and physical preparation...

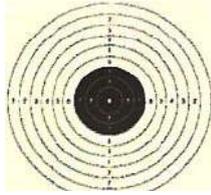
There are different approaches to teaching young people shooting skills around the world.

Usually the shooters begin to learn shooting skills between 8 and 12 years of age. Depending on the country, we encounter three types of rifles for beginners. Each has its advantages and disadvantages:

1. Simple and light air rifle with open sights and without any adjustments on the stock



- Very cheap and available to everyone regardless of budget;
- The weight suits the build of children aged 8 to 10 when the training process starts;
- Open sights makes it easier for children to master the basics of aiming and triggering and will decide later whether they continue to shoot with a rifle or pistol;
- Good precision of the rifle. Training and competitions are conducted on a target where the black circle is the same size as for the standard air rifle. In the black area, the circles start with the number 7 and the center is 2mm in diameter (picture below). This rifle allows good conditions for children to acquire first competitive habits.



2. Standard air rifles in two versions: junior air rifle and usual competitive air rifle



- Junior air rifle is the most acceptable for beginners. It weighs about 3.5 kg and adjusts in all elements as well as competitive air rifles;
- Rifle accuracy is at a high level so it can be used for more serious competitions in younger categories;
- Beginners use rifles, first in the sitting position with a rest then in standing position with a support and finally in a standing position;
- Disadvantage is the price of the rifle. In many countries, clubs or parents do not have enough financial support to purchase new rifles, so clubs use old rifles or multiple shooters share one rifle.

3. Laser and electronic rifles



- This is the rifle that does not shoot;
- With the weight of about 2.5 kg, allowing completely safe training for children aged six and over to use;
- It has an adjustable stock and the same sights as standard air rifle;

- Allows children to start training shooting sport in countries where there are restrictions on how old children can handle air guns, i.e. Germany, Japan...
- The disadvantage is that the shooter does not feel the shot, jerk and recoil of the rifle.

In countries around the world, if there is a difference in the type of rifle used for beginners, learning shooting skills would start in a sitting position with a rest then continues with the standing position with the rest. The reasons for this procedure are as follows:

- Due to the smaller movement of the rifle it is easier to learn the technique of aiming and triggering;
- Children initially do not have enough general and specific physical strength and endurance to be able to shoot without support;
- Gradually increasing the load, we avoid the appearance of physical deformities that can occur due to the specific position of the body in a standing position;
- Shooting from the rest, beginners quickly adopt the basic shooting technique and begin to shoot group shots. The scores become visible, which further motivates them to continue training;
- In most countries there are competitions up to the national level for youth categories. This further enhances their shooting skills, they begin to learn elements of tactics and create a competitive spirit;
- Finally, from a sociological aspect, every training and competition reinforces a sense of belonging to the group, sociability, responsibility and mutual respect.

Sitting position

The shooter sits on a chair with his body turned 45 degrees to the target. Left elbow is resting on the table while the left hand holds the rifle forend that lies on a rest. The butt plate is in the right shoulder, the right cheek is on the cheek-piece, the right hand holds the rifle grip

tightly - but not too tight in order to avoid muscle trembling. The index finger of the right hand is on the trigger of the rifle. Different types of supports are used such as: table, kneeling roll or specially designed supports that can be adjusted in height due the different constitution of the shooters.



Aiming technique depends on the rifle we use.

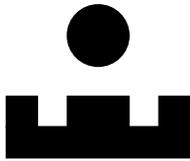
Rifle with the open sights

With this type of rifle, sights are the same as with the pistol. The sights consist of the pin-shaped front sight (post) and the back sight that has a cut, or a dent, in the middle.

Correct aiming

The front sight is in the middle of the back sight, that is, in the middle of the cut of the back sight so that the upper edge of the front sight is on the same level with the upper edge of the back sight. Leveled sights should be put below the black circle. Make sure that the top of the

sight and the lower edge of the black circle do not meet, but a distinctive white line should be seen.



Rifles with the diopter

In these types of rifles the sights consist of the rear sight (diopter) that has a hole through which the shooter aims and the front sight which is in the shape of a ring.

Correct aiming

All three rounds – rear sight, front sight and black circle of the target should be concentric so that the black circle of the target is in the middle of the front sight which is in the middle of the rear sight. As a rule, visually the ring should be a least $\frac{1}{3}$ larger than the black circle. With the beginning shooters, the ring should be larger because the rifle *walks* more and the shooter can't concentrate on triggering because the black circle is not in the ring all the time and he has to "hunt" for it.

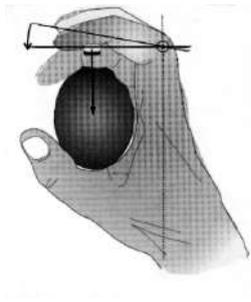


First, the shooter should be taught how to aim. He should be shown a drawing how the sights stand in accordance with the black circle. He then should be given a rifle that is resting on the support for himself to aim and transfer the picture he saw on the paper. A coach checks if the shooter has aimed correctly after the shooter leaves the rifle on a rest. The coach will check the mutual position of the sights (front, rear) in relation to the black circle of the target.

When he adopts the way the sight placement is in relation to the target, he can practice aiming while in the position.

Triggering technique

Triggering technique is a complex process that should be in accordance with the aiming technique. One of the decisive factors to achieve a correct shot is this technique. Triggering mechanism consists of the first and the second stage. The first stage is the shooter's preparation for triggering, the second stage is triggering itself. The position of the index finger on the trigger is 90 degrees if possible, as there is no forward-backward trigger adjustment nor rifle grip adjustment in rifles with open sights.



Even triggering is used with beginners who are still not able to have good balance with the rifle, and because of that the movement of the weapon is great, while the periods of calmness are very short. The shooter should pull the first stage when he stops breathing. Then with no concern to the movement of the rifle, he should start to pull the trigger evenly right after roughly entering the rifle into the target, trying to finish it before the size of the movement of the rifle increases as a result of the muscle tiredness.

Breathing technique

Correct breathing and making a breathing break is another element that the beginners learn at the start. Breathing is performed by the stomach and not by the rib cage. After assuming the

position, a shooter should take two or three breaths, making them shorter respectively. After the last breath, a shooter exhales about half the air and stops breathing.

Learning proper breathing is very important. Many coaches do not pay attention to proper breathing in the beginning so shooters have great difficulty breathing properly later.

Standing position with a rest

When a shooter has mastered the basic shooting techniques in the sitting position, the coach will then transfer the shooter into the standing position. This can be observed at practical shooting sessions, where the shooter is grouping the shots (a group of shots that have the size of the black circle with ten bullets).

The beginners, who practice with air rifles with open sights, will continue their own training in the standing position without any support.

Because of the special features of the rifle, standing position with a rest is different in some elements from the correct standing position such as:

- the butt plate is in the shoulder, not between the shoulder and biceps;
- the right shoulder is lifted a little so that the head could lie more comfortably on the cheek-piece because there is no possibility of adjusting the cheek-piece or butt plate;
- in order to reach the correct height, the rifle is held by the left hand so that the support is forward on the first three fingers, and backward on the thumb that is leaning on the trigger guard.



The next step is to keep training with standard air rifles (rifles with a diopter).

The other beginners who started practicing with standard rifles will continue to learn shooting skills in a standing position with a rest in two levels. The difference is in the type of support they use.

They learn the standing position in a way as it is explained in the theoretical part. ``The school position`` is the base for each beginner.

As they are just beginning to learn the standing position with a sense of balance and relaxation in the stance, this requires a firmer support of the rifle. We can use a shooting stand or specially designed stand with a spring as support. Each stand should be adjustable in height to suit each shooter individually.

The goal is for the shooter to learn technical elements and feel the balance in a relatively stable position without loading the weight of the rifle.



In the next phase of the training process, the shooter will practice with the stand which has a hook and a counter weight.



These conditions are very close to normal shooting conditions without any support. The rifle is relatively free. The stand reduces the weight of the rifle to protect the shooters back from overload.

During training, as the shooter improves his specific physical condition and endurance, the weight of the counterweight decreases until the support is completely removed.



At this level of training, practices become more serious. The shooters begin to practice more complex elements of shooting techniques such as: coordination between aiming, triggering and breathing, rifle approach, aiming time, trigger cleanliness and timing, follow through (prolonged aiming after firing).

Self evaluating questions

Describe a didactical approach to teaching beginners the shooting sport.

Way the training process should start from the sitting position?

4. DEVELOPING SHOOTING SCHOOL SYSTEM

For a better understanding of this chapter, we need to elaborate on the importance of school sport system in general.

It is a well-proclaimed statement that young people should have the possibility to live healthy and active lives. Fact that physical and sport activity at a young age is building positive habits, a lasting lifetime. Not only that sport system is aiming for creating future champions but is also a goal for many governments on how to improve the education system.

Sport shooting is just one among many sports that are finding their place in those systems.

Providing the possibility for young people to have access to our sport on a daily basis can create additional benefits for students and schools, improving learning achievements, behavior, and teamwork within a specific group.

Before making plans and programs, National Federations need to make an action plan in the form of a statement of intent. All relevant and possible “stakeholders” represented by the Department for Education, Sports Department, Health and Social Department, NOC, possible sponsors should be involved in designing a joint commitment. The main goal is to create conditions that sport and physical activity are an integral part of both the school day and after-school activities. Besides promoting physical activities, and sporting goals it is also important to point out the benefits of mental development and wellbeing of children and young people.

Cooperation of all the above-mentioned segments of society is based on the fact that single organizations or groups, clubs, schools, parents, or private sports providers, cannot manage the systematic offer and its maintenance for improving access to sport and activity on their own.

A very important element in establishing an efficient system is to outline the precise measurement of these actions and their impact on targeted groups and organizations.

Competition and the School Games are one of the forms to enhance and promote sport shooting on the local and national level.

The joint effort supported with digital expertise and services will provide optimal conditions by making it easier for interested groups to find and subscribe to physical activities in their local area.

After meeting all the described requirements, practical setup and methods are rather straightforward.

Anyhow, the following requirements have to be achieved and available.

- Human resources - necessity to select and educate various profiles such as coaches, leaders, administration staff, various assisting staff that can be hired on-demand, or borrowed from other sports (physical trainers, doctors, physiotherapists, sports psychologists), etc.
- Infrastructure resources – shooting range/s can be own property or renting one, cooperation with fitness clubs, athletic clubs, swimming clubs, biking clubs, etc.
- Financial resources – from various local or government funds, NOC funds, IOC funds, sponsorship funds, scholarships, commercial incomes, membership fees, personal donations

As a well-established system, I would recommend to interested ones to get more information about Singapore Sport Shooting School.

A practical example of club setup and training methodologies are described in the previous chapter, as a model. One should design a system that will fit their own needs.

Self-evaluating assignment:

Create an optimal Shooting School System that fits the environment in your country/region.

BIBLIOGRAPHY

Heinz Reinkemeier (2002) “Ways of the Rifle”, MEC GmbH, Dortmund, Germany

Prof. dr Predrag Gavrilović (2016) “SPORTSKA BIOMEHANIKA - osnovni principi”, Belgrade, Serbia

Kimmo Yli-Jaskari (2016) “RIFLE SHOOTING” ISSF C COACHES COURSE

H. Reinkemeier & G. Buhlmann (2015) “AIR RIFLE - Training & Competition”, English translation, MEC GmbH, Dortmund, Germany

Dr Željko Todorović (2020) “Developing the Shooting School System”, ISSF NATIONAL COACH COURSE - PISTOL SHOOTING

William Krilling (1992) “Shooting for gold”, Privately printed, United States.