

# Basic Techniques in Air Rifle

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## Introduction

Kottke, Halpern, Easton, Ozel and Burrill (1978) estimated that during 15 years professional playing, a soccer defender has passed a ball for 1.4 million times and a basketball player has shot a ball for one million times. An athlete, who desires to reach at high level performance, has to be prepared to fulfil maximum amount of training. There isn't any another way! But the quality of training is important. A person may practice a lot without any outcome at the end of a day, if the practice is low quality or efficiency. Everything must be focused on high quality training process.

In this article, some points about Air Rifle shooting has been mentioned. The subjects about positioning are for a "Right hand shooter", for Left hand shooters everything is opposite surely.

The main topics are:

- Positioning
- Aiming
- Triggering
- Breathing
- Shot routine
- Proceeding with different skills
- Developing Hold ability



## Positioning in Air Rifle

Among different shooting positions, standing is the most unstable position, because it has a small support area and the centre of gravity is high. In order to make a stable position, we need to have an exceptional sense of balance and muscles control. Muscles need to be relatively relaxed, but at the same time, they need to give us the required stability.

To take a standing position, the shooter should stand with an almost 90 degrees angle to the right of the target. The distance between feet should be about shoulder width. This distance depends on height of the shooter, his/her body shape, strength of the muscles, etc.

Feet should be parallel; however, toes may point out slightly to achieve better balance and control.



Has been said that weight of the body-rifle system should be equally distributed on both legs. But practically, left leg supports the most weight. This leg should be straight.

The right leg supports and adjusts direction of the position.

When placing the feet and adjusting their direction, the shooter needs to concentrate on their optimal angle, ensuring a good hip alignment, which needs to be as straight as possible towards the target.



Two different types of feet position, Hips alignment is straight towards the target in both positions

The upper body leans back to get weight of the rifle over the support area and the pelvis tilts to provide a solid platform for the supporting elbow. Hips must remain aligned with the line of the target.



Left arm rests against the rib cage and left elbow sits on the iliac crest or a little in or out, according to length of the arm, fore-arm and upper body, but it must be positioned at the same place for all shots.



Weight of the rifle needs to be transferred through the bones, via left hand, forearm, elbow, pelvis, thigh, leg and foot to the ground.



Butt-plate must be firmly placed at the upper part of the right arm, right shoulder is completely relaxed. The left shoulder needs to be relaxed too.



The left forearm should almost be vertical. Hand-rest which brings the rifle up, is placed on the heel of the left hand or on the fist or any other position of the left hand.

Since the new rules let you having depth of the fore-end up to 12 centimetres, putting the rifle on the palm is recommended, in order to reduce the number of joints at left hand position! Muscles of the left arm, forearm and hand must be relaxed and they mustn't push the barrel to the target. For this purpose, you need to find your zero point accurately.

The right arm should be relaxed, and the right hand grasps the pistol grip comfortably, in the position that the index finger places with the best position on the trigger blade and produces the straight trigger pull without disturbing the rifle and the holding. Right wrist should be as straight as possible.

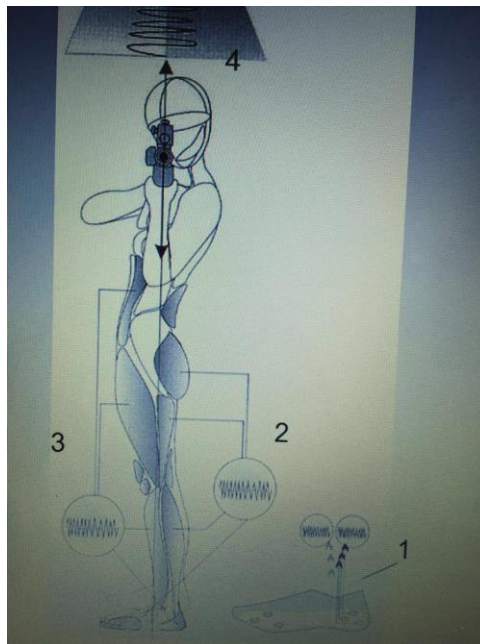


Head is upright and the cheek-bone is placed on the cheek-piece of the butt. This piece must be adjusted in the manner that the dominant eye can look the target through the sights straight, without any tension in neck muscles.





Centre of gravity of the rifle needs to be as close to the body centre line as possible, to achieve a good balance and hold. The muscles in front and behind of lower part of the body are equally little tensed and the agonist and antagonist muscles have an optimal relationship. If the balance is ok, heels and toes will be both equally loaded, be aware of the pressure receptors at your feet.



Front and back view of standing position

Setting up the rifle depends on: length of arm and fore-arm, shoulder width, neck length, hip shape, length of upper body compares to the legs, etc.

The parts of the rifle which need to be adjusted precisely are: height of the sight raisers, length of the butt, height and direction of the butt-plate and cheek piece, trigger distance, depth of the hand-rest, orientation and place of the grip, etc.

You need to adjust all of them properly to take a comfortable and balanced position. To check your zero point, you may close your eyes or look down and relax your muscles (omit the extra tensions) and be on your skeletal position for about 30 seconds and then open your eyes and check where you are. When you are looking through the sights, you usually push the barrel to the centre with some muscles effort and you feel your zero point is ok, however it's not and you push the rifle to the centre by your muscles!

After checking the zero point, if the barrel is higher or lower than the centre, you may adjust it with the butt-plate. If the barrel is up, push the butt-plate down and vice versa. If your barrel is left or right of the centre of the target, you can adjust your position by your feet. But if the distance to the centre is small, you can adjust it with your right foot position.



Some different Air Rifle positioning among Iranian champions

## Aiming process

Aiming process includes: aiming sharpness, aiming time and target approach. For aiming you should put your head on the cheekpiece in the manner that eye positions against the rear sight and be able to see the target through the sights symmetric, whilst head and neck are relaxed.

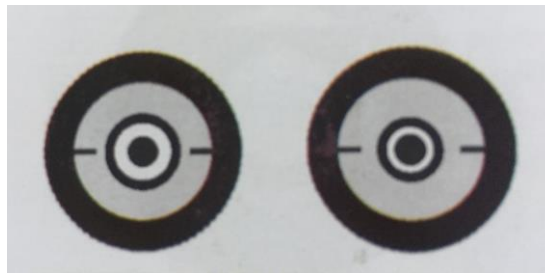


If the eye cannot see the same picture every time, it will not be able to perform accurately. If any muscular effort is required to see through the sights, something is wrong and we should try to solve the problem: cheekpiece may need millimeter adjustment vertically, horizontally, or it may need an angle in different directions, etc.

“Aiming time” is also one of the important factors in aiming process. If aiming takes long time, the possibility of seeing a wrong picture increase. In the other words, when we look at the target through sight elements for a long time, we don’t see the actual picture at the moment of triggering! If aiming takes long time, we should blink, breathe, and start aiming again. It’s been said that the picture can be reliable for 8 seconds after blinking only!

Exact alignment of sight elements is necessary to have a “well-aimed shot”.

There are also different sizes of front sight insert, which need to be selected precisely. Most shooters use 3.8 mm. However bigger sizes are recommended for beginners, to recognise the symmetry of the sight elements easier and faster; and smaller sizes for master shooters in order to increase the accuracy; However, when the distance between the front sight insert and the bulls-eye is very little, you will notice the smallest movement and it may effect on your aiming time, especially during the matches, when the movements are bigger.



Symmetry of the sight elements with 2 different sizes of the front sight inserts

Aiming skills must be learned and practiced. During aiming exercises, eye muscles are developing to perform a specific task for a period of time with a same high accuracy.

Beginners may learn and practice symmetry of the sight elements and target on the bench rest.

#### Few points about aiming process:

- It’s important to know you just need a satisfactory sight picture, not a perfect one.
- You should trust your automatic centring reflexes and don’t go for 11.
- You need to control aiming time; with using SCATT or by coach supervising, etc.
- One of the mistakes in aiming is: Sometimes shooters don’t really aim the centre of the target!
- And finally, one of the most important factors in aiming is “Target Approach”. You need to approach to the target from up (approximately 12:00 o’clock) in standing position, which needs a good zeroing of your position.

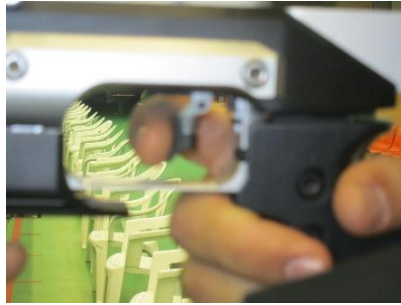


A sample of relatively good Target Approach in air rifle

## Trigger Control

Triggering is the critical moment of shooting performance. What is important about triggering is: trigger timing and trigger cleanness. When we pull the trigger, the only part of the body which moves is the trigger finger, without disturbing the rifle and holding.

When we discuss about triggering, we are actually talking about the trigger releasing and “Follow through”. Follow through is about one second after the trigger releasing, when the shooter must maintain the same stability and proper aiming picture and pause in breathing. With this short extra time after shot releasing, we let the pellet leaves the barrel within the same circumstances.



In order to have a nice triggering, shooters need a well-adjusted trigger: Trigger weight; length and weight of the first stage; place of the trigger blade, etc.

The most important thing during trigger operation is use of the index finger independently. In the other words, the motion of the trigger finger must not affect on anything, neither the rifle nor the body. During the time that trigger is being released and follow through, the body muscles mustn't have any reaction to trigger pulling.

There should be an identical contact between the fingertip and the trigger. Both placement and pressure of the fingertip on the trigger blade are important. We also have to take care about the direction of the trigger finger movement during trigger squeezing, which needs to be backward and almost parallel to the barrel axis.

### Some trigger exercises:

- Dry firing with full concentration on triggering and follow through.
- Dry firing with closed eyes, attention on the inner feeling of triggering and follow through.
- Shooting on a white target, just focus on triggering and follow through, aiming is not important.
- SCATT training, to get feed-back about your trace at the last second before shot releasing, the critical moment of triggering and follow through; and try to improve and modify your techniques, if required.

## Breathing

During shooting, slow stomach breathing is required to reduce movement of shoulders and chest, and make heart beat slower. It's been recommended to have few deep and slow breaths during self-preparation period, before putting your cheek on the cheek-piece; and then two or three shallower breaths during aiming process.

The barrel goes up during in-hale and moves down within ex-hale, in standing position. So, during the last ex-hale the barrel is supposed to come down to the centre, you've already taken the first stage of the trigger if it has two stages, and then stop breathing for few seconds and release the trigger when you see the symmetry of the rear-sight, front-sight and the bulls eye, keep pause in your breathing for at-least one second after shot releasing, and then breath normally. The time when you stop breathing until



end of follow through shouldn't be more than 10 seconds, otherwise your brain and muscles cannot receive enough Oxygen. If so, your vision sharpness will be reduced, your muscles tension and heart beat will be increased, and some more physiological symptoms. Besides that, your concentration will be dropped, your coordination will be affected, etc.

## **Shot Routine**

Routine is the usual order in which we do the things. When we are in a shooting competition or a training session, we do somethings in the usual order which is our "Shot Routine". Every shooter's routine should be well constructed and on conscious basis. If shooters practice without taking care about their routine, they just waste the time because they don't know what they are doing exactly, and during a competition, when pressure level is higher than normal, they will get confused.

In daily training, shooters should try to build and develop a single shot routine. A strong advice for shooters is: writing their routine, such as: Take a proper and steady position; pick up the rifle; check the inner and outer position with few stomach breathing; put the cheek on the cheekpiece and start aiming; be aware of the number of breathing during aiming process; take care of your target approach; you've already taken the first stage of the trigger before your last exhale, if aiming picture is satisfactory and coordination of holding-aiming is good, stop breathing for few seconds and start to increase the pressure on the trigger whilst looking the target through the sight elements; trigger is released; follow through; breath; call your shot; put the rifle on the stand; watch the monitor (or target) to see the result.

The above explanation was an example of a shot routine, the usual things that a shooter fulfils for every single shot and needs to have a sharp picture of these tasks in her/his mind before the next shot, in order to shoot every shot as same as the previous one.

You should know how many breaths you need during the self-preparation time, how many breaths during aiming process, how long is your breathing pause during triggering and follow through and do it almost same for every shot. And whenever you cannot perform according your rhythm, cancel that shot.



**Self-preparation period before aiming, to check inner and outer position**

## **Proceeding with different skills**

Holding, aiming and triggering are the basis of shooting performance. So, they need to be practiced at every training session.

Good holding ability needs fulfilling some kinds of Hold exercises at each training session, some balance exercises should also be done occasionally.

And finally triggering operation, is one of the most important skills which needs a lot of training with full concentration. You need to consider some dry and live shots with focus on triggering every session. Trigger cleanness and timing, and also follow through have to be practiced regularly.

Coordination between these fundamental techniques has to be considered as well. Shooters have to do some training for this purpose too. And finally, some exercises to improve shot routine.

Each training session should be started with warm-up exercises including muscles stretching, short visualization about shooting performance with perfect techniques, practicing the basic techniques at the beginning or at the end of every training session, some Willing exercises, that shooters are required to reach to a certain goal, and cooling-down at the end of each session.

Besides all different shooting training, regular Physical and Mental exercises are necessary to reach to high level shooting performance.

### **Developing Hold ability**

Hold is the ability of control the muscles to keep them still, which mostly depends on mental awareness. In order to improve this ability, shooters can do some special endurance training. These kinds of exercises create some adaptation and changes in human body, which produce some capacities, and improve the resistance to fatigue.

If we study the shooters' SCATT files, we will notice a very high correlation between stability and performance. Hold exercises seem to be the best and quickest way to improve the ability to reach high performance. Developing Hold is one of the most important parts of shooting training even among champions. In fact, during Hold exercises emphasise falls upon: improving rifle coordination with the body, improving shooting position and ability of holding the position, and finally strengthen the body for that special position. As shooters improve the Hold ability, they should increase their holding time gradually until they can do that for several minutes without fatigue. The main goal in improving the Hold is: decreasing the total Hold area.

### **Some kinds of Hold exercises:**

- Taking shooting position without shooting jacket in standing position. The shooters generate a higher tension than the normal shooting position in their lower limbs and hold this tension for a certain time, then make them relax deliberately. And repeat the tension – relaxation for several times. During this exercise, concentration should be on muscles feeling. Aiming is not important.
- Holding the position with and without equipment for one minute, both sides. Aiming is not important.
- Normal shooting with full concentration on the inner position, sometimes with closed eyes.
- SCATT training, to get feed-back about your Hold and steadiness.