



UNIVERSITY OF LONDON RIFLE CLUB

ESTABLISHED 1911

Small-bore Rifle Shooting Guide

(From the NSRA Handbook Beginners Guide to Small-bore Rifle Shooting)

Small-bore target shooting is practised indoors at 15, 20 or 25 yards and outdoors at 50 yards, 50 metres and 100 yards. Shooting is conducted in three positions: prone, standing and kneeling. Prone shooting has the largest following in this country and is usually the position in which the beginner starts unless they have started with the air rifle which is predominantly shot standing.

Contents

Small-bore Rifle Shooting Guide.....	1
Safety	2
The Rifle	2
Sights.....	3
Trigger.....	4
Orientation of your Position.....	6
Holding.....	8
Breathing and Rhythm	9
Grouping	10
How to Progress	10

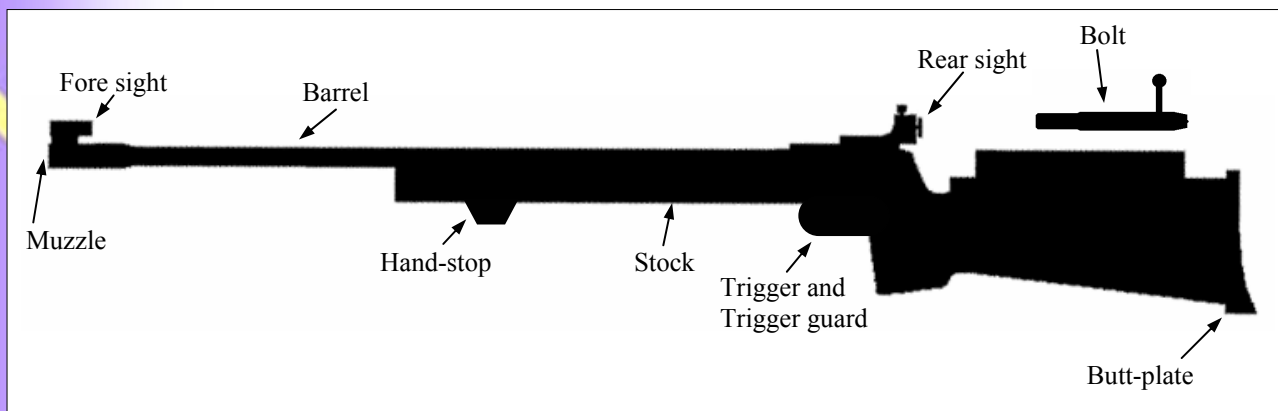


Safety

- Safety is No.1 and must be observed at all times. Although the 5.6mm (.22) bullet is small it has a range of one mile and can be lethal at long as well as short distance. Always handle a rifle with the care it deserves and remember:
- Never point a rifle at anyone, even in fun, whether loaded or unloaded.
- Always ensure that the rifle is unloaded and the breech open before leaving the firing point.
- When off the firing point never operate a rifle's action or leave it unattended before ascertaining that it is unloaded.
- Never load a firearm except at the firing point and always keep it pointed down the range whilst you are shooting.
- Even on the firing point the rifle must not be loaded until the Range Officer has given the command to start shooting.

Always wear ear defenders when in the vicinity of the firing point.

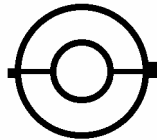
The Rifle





Sights

The purpose of the sights is to obtain an accurate aim and provide accurate fine adjustment so that the bullet strikes the point of aim at all distances and under different wind conditions. The sights consist of two essential parts, the front or foresight, and the back or rear sight.



Foresight element

The foresight consists of a tunnel or body, and a screw that retains the foresight element: a thin piece of plastic or steel that forms the sight. The size of the element chosen is determined by the light conditions, range of the target and users preference. It is not possible to have the front sight and target in focus at the same time – it is the front sight that must be in focus even if the aiming mark on the target is slightly out of focus. The bars holding the central ring of the foresight element can be used to ensure that your cant (rotation from the vertical) is kept constant.

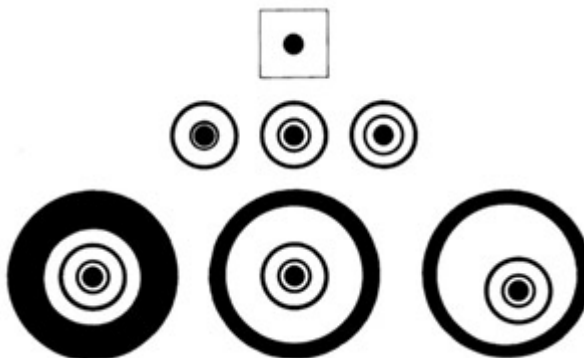
The rear sight gives accurate adjustment in both vertical (elevation) and horizontal (windage) movements. It is also fitted with an aperture to give depth of field just as in a camera. This may be a single hole, an iris, or a number of holes in a rotatable disc. The aperture sight gives the shooter maximum clarity of vision and although an aperture of approximately 1.1mm is used by many, an adjustable aperture is useful, as the single hole may not be ideal under all light conditions. At 25m one click of movement on the rear sight will move your group of shots approximately 1mm on the target. This does not seem very much but it won't be long before you are using your rear sight adjustment to move your group these small amounts.

The eye is placed anywhere between 4cm and 12cm from the aperture. Do not strain the neck to get the head close to the rear sight. Let your head rest in a natural position. It is very easy for the head to be insufficiently supported by the stock and the eye to drop toward the bottom of the aperture or perhaps to the side or even too high. It is necessary to centre the eye in the rear aperture before centring the aiming mark in the front sight element.

Remember:

Clockwise = down and left

ie. if you want your bullet hole to move down and left on the next shot, rotate the elevation and windage screws both clockwise. (Think of using a screwdriver.)



Target: level of brightness determined by lighting
Aiming mark, foresight element and foresight tunnel: ring of light between foresight element and aiming mark varies with element diameter
Aiming mark, foresight element, foresight tunnel and rear aperture: depending on the eye relief, the foresight tunnel occupies a larger or smaller proportion of the sight picture. The misalignment of the right-hand diagram would produce a 6mm error at 50m small-bore.



Trigger

The trigger is the means of firing the rifle. It is pulled in a very special way. The term squeeze, that you may hear, has been used to describe the action of pulling the trigger. However squeeze indicates that the whole hand is involved in the action. If this is the case then it is impossible to stop the rifle from moving, if only slightly, when the trigger is released. Common problems are shown below:



Using the tip of the finger can lead to lateral pressure on the trigger.



Lateral pressure on the trigger produces pulled shots.



The finger is in contact with only the edge of the trigger – lateral and inconsistent pressure.



Correct Trigger Technique:

The index finger is placed on the trigger either on the first pad or up to the first joint but not beyond. It must be placed exactly the same on the trigger each and every time: do not vary this position or else the shot will be displaced. The only part of the hand that moves is the first finger, so make sure that the hand holds the stock without moving but allowing free movement of the first finger. The finger increases pressure on the trigger until the rifle fires but without moving the rifle whilst doing so. Practice holding the rifle and pulling the trigger when unloaded until you can see no movement when the trigger is released; this is called dry-firing.



There are four types of trigger:-

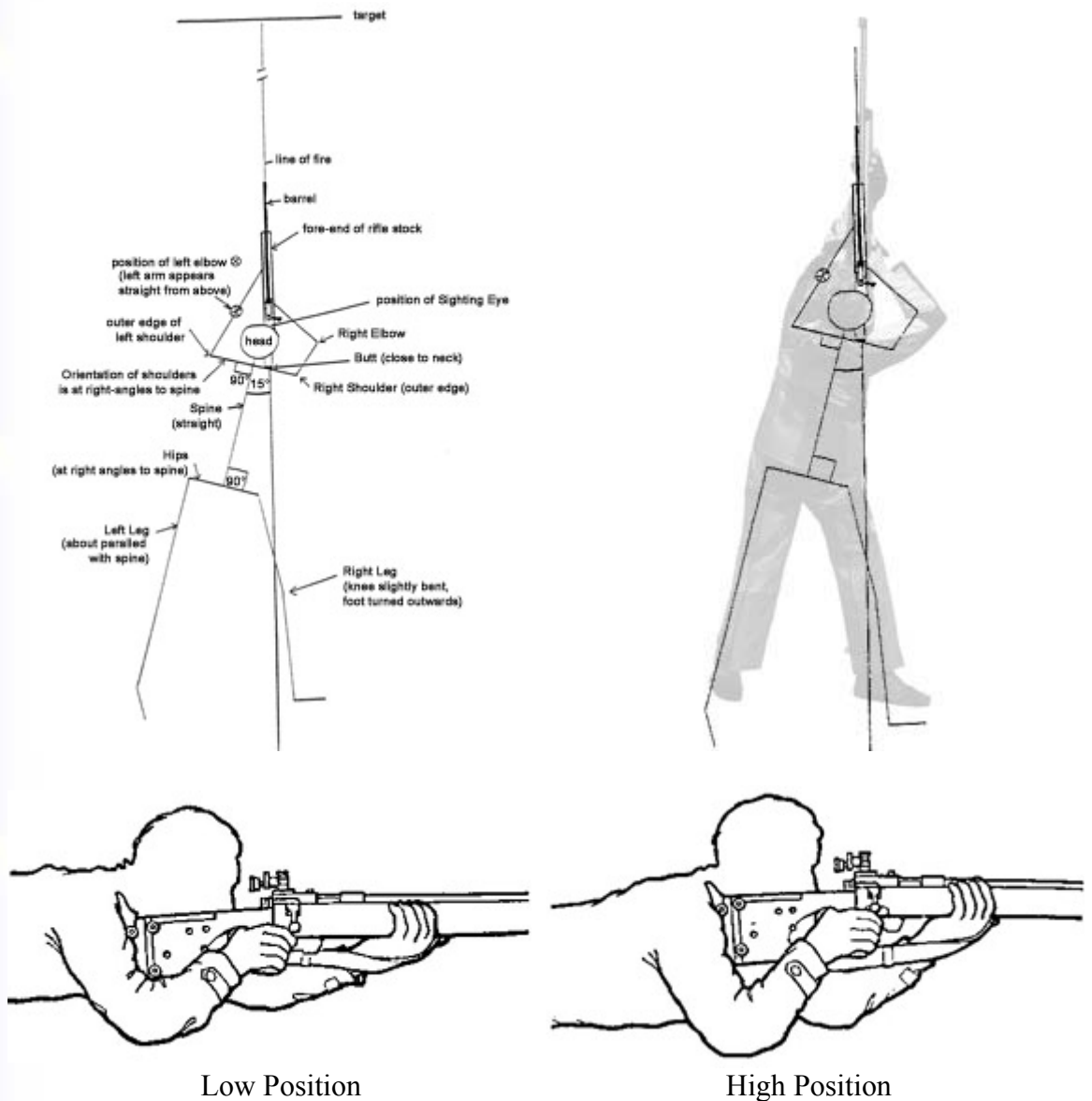
- The single stage trigger which, when pressure is applied, releases and causes the rifle to fire; it has no preliminary take up.
- The two-stage trigger, which has a short preliminary movement before a heavier pressure is felt which upon this additional pressure being applied fires the rifle; this is the most frequently used type of trigger.
- The set trigger.
- The electric trigger.

The last two are rarely seen and are certainly not on the club rifles.

(Photos reproduced from "On the Training of Shooters" by H Reinkemeir)

Orientation of your Position

If, once you have found your position, the sights are not pointing at the target it is necessary to move the position so that the sights settle naturally onto the target. Do not try to push or muscle the rifle onto the target as this causes a strained position causing a variation in the position of the shot.



This does mean that you will have to move your position slightly for each aiming mark. This includes when moving from the sighter to the match target. Assume that your position is as correct as you are able to achieve and the rifle sights are pointing within the area in which you are aiming. For small corrections proceed as follows:



If the rifle is pointing slightly to the right, move your body, pivoting round the left elbow, to the right and you will find that the muzzle of the rifle will move to the left. Only a small movement is needed to make a fairly large movement at the target. The reverse of course when the rifle is pointing to the left. If the rifle is high then, without moving the elbows, push the body forward slightly. If the rifle is low, move the body back. It may be necessary to move the feet slightly for comfort after these changes. Remember these are quite small movements. When shooting on the indoor target with 10 aiming marks and sighting targets to the side, then it is necessary to move the position for each and every shot; however it will soon become second nature.

(Upper diagrams produced by Mark Westmoquette, lower diagrams reproduced from "On the Training of Shooters" by H Reinkemeir)



Holding

Although the bullet travels fast it is measurable time. This combined with the time for the trigger mechanism to operate and the firing pin to fall and ignite the primer, for the powder to burn and turn into gas and send the bullet on its way down the barrel, means that it is possible to move the rifle between the trigger being pulled and the bullet exiting the muzzle. Therefore it is necessary to perfect a good hold, to prolong the length of time in which you are steady. If the position is not comfortable or is unstable it is possible that the rifle will move off the aim before the bullet passed through the target. This sustained hold is called “follow through”. You can see this follow through with the golfer who does not stop his swing on hitting the ball but continues with the swing long after the ball has gone. The whole action of firing the shot has to be continued long after the bullet has left the barrel not only because of the mechanical action but also the mental one.

The brain interprets the pulling of the trigger as a signal to rest; this must be prevented by ensuring that the brain does not rest until the bullet has long left the barrel. In fact it has been seen that this signal to rest can occur even before the trigger control or operation has been completed, an untrained mental approach may even interpret the mere fact of the finger touching the trigger as a signal to rest. Being aware of these requirements in follow through is only half the battle. Putting them into practice takes patience and perseverance.

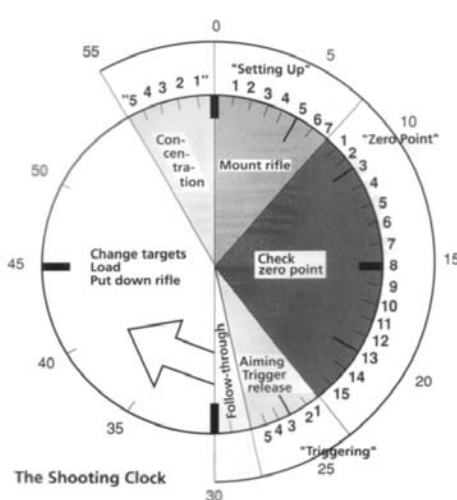
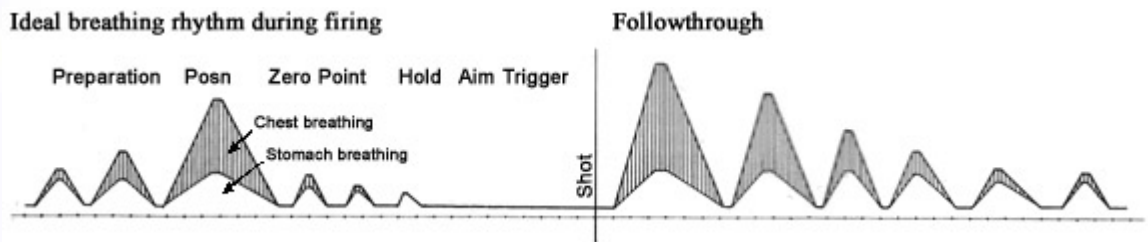
When you first start shooting limit the amount of shots you take in an evening. Make each and every shot the best you are able to do. **Quality not quantity.** Perfect your shooting as an exercise in technique not in achieving a score, then the good scores will come along more quickly. When you get a series of good shots try to analyse why you are shooting good shots, what are you doing right? In this way you will increase the number of good shots and the bad shots will be taken care of automatically.



Breathing and Rhythm

One has to breath to live, but in shooting one has to stop breathing for a few seconds so that the rifle is as still as possible during the release of the shot. There are many rhythms to adopt, but the most preferred one is this: Breath normally for two or three breaths then, as the rifle settles on aim, relax your chest and slowly exhale. Keep your throat open to increase consistency in the amount of breath exhaled. If you do not get the shot off within a five to seven second period of holding the breath take a few breaths and try again.

Do not dwell on aim admiring the sight picture, as the first sight picture is usually the best. Release the shot in an easy manner but do not hold on too long. After firing, including the all-important follow through, start breathing again. Only then look through your telescope to see where the shot has gone. You will find when shooting outdoors it is easier to get a good sight picture as the lighting indoors is never as good as outside in the natural light. However, you will learn that there are also other interesting things to learn when shooting outdoors such as wind, which naturally effects the flight of the bullet and for which allowance has to be made.



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(Diagrams adapted and reproduced from "On the Training of Shooters" by H Reinkemeir)



Grouping

Always remember that even the best of rifles and ammunition do not put all the shots into one hole, but shoot what is known as a group.

This group, although it may be small, is a random pattern and when you first start shooting the grouping capability of you and your rifle may mean that this group is comparatively large. Do not worry it will soon get smaller. Initially you should not concern yourself if the group is not central on the target and certainly no not be concerned about the score, but only in improving the size of the group you are able to shoot. When you are able to shoot a group smaller than the black aiming mark then it can easily be centred by alteration of the sights.

How to Progress

Start competitive shooting in the club as soon as possible and lose no opportunity to gain inclusion in the team. This year we have three trophies up for grabs at the end of the year: the ULRC Individual Small-bore Challenge Cup, the ULRC Small-bore Most Improved Shot, and the ULRC Full-bore Most Improved Shot, and various prizes for achievements throughout the year.

Make every effort to attend shoulder-to-shoulder meetings. Most are held with the entrants grouped or classified according to ability and everybody therefore should have a chance.

Take time to study, not just read, the various books and articles that are written on competitive shooting and on the mental approach to sporting endeavour.

And most of all have fun!