



NATIONAL RIFLE ASSOCIATION

NATIONAL RIFLE ASSOCIATION TRAINING MANUAL

Updated May 2021

Edition Nine



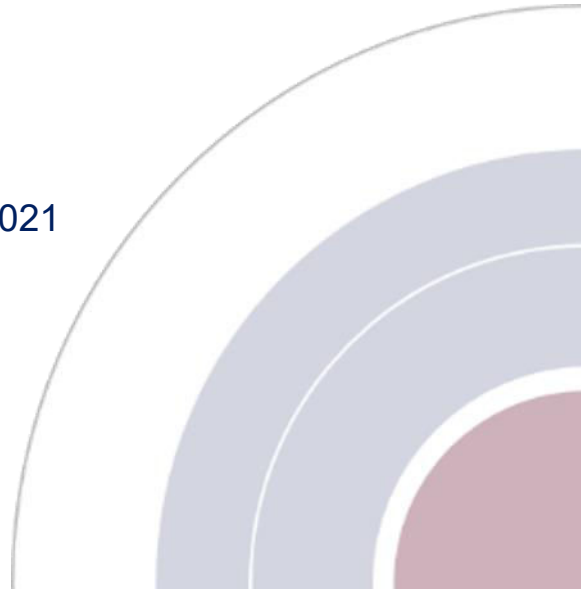


NATIONAL RIFLE ASSOCIATION

PROBATIONARY TRAINING MANUAL

Updated and reprinted May 2021

Edition Nine



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Probationary Training Manual

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Edition Nine
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NATIONAL RIFLE ASSOCIATION

Probationary Training Manual

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Record of Probationary Training

NAME.....

NRA MEMBERSHIP NUMBER

NATIONAL RIFLE ASSOCIATION

Record of Probationary Training

RECORD OF PROBATIONARY TRAINING

<p>Module 1 DATE</p>	<p>TEST PASS PERFORMANCE PASS</p>	<p>INSTRUCTOR NAME AND SIGNATURE</p>
<p>Module 2 DATE</p>	<p>TEST PASS PERFORMANCE PASS</p>	
<p>Module 3 DATE</p>	<p>TEST PASS PERFORMANCE PASS</p>	
<p>Module 4 DATE</p>	<p>FORMAL ASSESSMENTS</p>	
<p>Gallery Rifle</p>	<p>PASS</p>	
<p>Iron Sighted Rifle</p>	<p>PASS</p>	
<p>Scoped Rifle</p>	<p>PASS</p>	
<p>Written Test</p>	<p>PASS</p>	
<p>Module 5 FULLBORE RIFLE</p>		
<p>Module 6 GALLERY RIFLE</p>		

**ALWAYS PROVE A FIREARM IS UNLOADED
WHENEVER YOU PICK IT UP, TAKE IT FROM
ANYONE, OR HAND IT TO ANYONE**

**ALWAYS POINT THE FIREARM AT YOUR
TARGET**

**DO NOT PLACE YOUR FINGER ON THE
TRIGGER UNTIL YOU ARE READY TO SHOOT**

NEVER POINT A FIREARM AT ANYONE

These rules must be memorised. They will be explained in detail on the first day of the Probationary Course.

Introduction

NATIONAL RIFLE ASSOCIATION

Introduction

WELCOME

Welcome to Bisley. We hope that this is the start of many years of safe, successful, and happy shooting.

By joining the National Rifle Association you are becoming part of one of the world's oldest shooting organisations. Not only is the NRA the national governing body of target shooting sports in the UK, it is also the country's largest Home Office Approved Club. When you become a full member you will have virtually unlimited access to what is probably the best known range complex in the world.

One of the many privileges of full membership is that you will be able to shoot on our ranges without supervision. Depending on the type of shooting that you decide to do, you will be able to shoot at distances as short as 10 yards, or as great as 1200 yards. However, with privilege comes huge responsibility. Before we can grant membership, we must be absolutely certain that you are able to handle and use firearms to a high standard of safety. We will train you to the best of our ability although, ultimately, the responsibility is yours.

The number of incidents and accidents involving legally held firearms in the United Kingdom is incredibly low. Safety, however, is not something that can be taken for granted. It has to be worked at. Constantly. All shooters, even the most experienced, can fall victim to complacency unless they constantly monitor their behaviour and always follow the safety rules.

INTRODUCTION TO THE NRA PROBATIONARY COURSE

To comply with current Home Office guidelines, probationary members must complete a course in the safe handling of firearms and shoot regularly under supervision before they can become full member of a Home Office Approved Club. The minimum time period for probationary membership is three months.

The NRA probationary course not only involves training in the safe use and handling of various different types of firearm, but also in the legal aspects of firearms use and ownership. The course stresses the absolute necessity of maintaining a responsible attitude towards all aspects of firearms use, and does not shy away from describing what can happen if safe practices are not observed.

Students will be continuously assessed throughout the course and, on the final day, will be required to pass a written exam (multiple choice) and practical tests in range use, and in the handling and use of firearms. However, students will not be asked to undertake an assessment test until we are satisfied that they have gained sufficient confidence and skill. A probationer who fails an assessment must receive additional training before being re-tested.

NRA probationary training is not specific to any particular shooting discipline. Once full membership has been gained further training is available to enable the new shooter to enter the world of competition shooting in whatever disciplines appeal to them.

ABOUT THIS MANUAL

This book does not pretend to be a stand-alone manual of all things to do with target shooting. It is an integral part of the NRA Probationary Course, and should be studied together with the NRA Handbook (the 'Bisley Bible') which will be issued during Module 1. Most of the questions in the multiple-choice examination are derived from these two publications.

It also functions as your personal record of training. Make sure that you remember to ask your instructor to sign off each section as you progress through the course.

THE NRA SAFE SHOOTING SYSTEM

The Ministry of Defence requires all civilian organisations using military ranges to have an auditable system of training based on a specific risk assessment. In response, the NRA has developed a Safe Shooting System (SSS) which has been approved by the MoD, and was introduced in April 2008. Civilian shooters must also possess a current Shooter Certification Card (SCC) signed by their club chairman.

The NRA SSS is based on four elements: safe person, safe equipment, safe practice and safe place.

Safe Person

A safe shooter is someone who has been trained to a high standard and who has demonstrated that he or she is able to handle and use firearms to a consistently high standard of safety. The NRA Probationary Course provides such training.

Safe Equipment

The NRA Rules of Shooting, contained within the *Bisley Bible* and published annually, define the types of firearms and ammunition that may be used for target shooting. The individual firer is responsible for ensuring that his or her firearm is properly maintained, and that the ammunition is in every way safe and within the range parameters for muzzle velocity (MV) and muzzle energy (ME).

Safe Practice

The NRA Rules of Shooting contain detailed regulations concerning the conduct of shooting for all its shooting disciplines. Qualified NRA Range Conducting Officers (RCOs) are responsible for the safe running of MoD ranges for civilian shooters.

Safe Place

A safe place is one in which the controls necessary to enable shooting to be conducted safely have been identified by a site-specific risk assessment, and directed through the range regulations

NATIONAL RIFLE ASSOCIATION

Introduction

Essentials of Good Marksmanship

ESSENTIALS OF GOOD MARKSMANSHIP

Before we consider how to hold, aim and fire, you must be confident your rifle is capable of the accuracy you are seeking. A worn out bore, loose sight mounts or excessive fouling are just a few of the issues that will lead to inaccuracy that no amount of good marksmanship can overcome. If in doubt, seek advice from a qualified gunsmith or other experienced shooters at your club or within your shooting discipline.

Similarly, ammunition plays a large part in accurate shooting. For novice shooters, using factory produced quality ammunition is the best option. Find a supplier with sufficient stock of the ammunition type that suits your rifle, and while you are developing your shooting ability, use the same ammunition so as to maintain consistency.

Using the correct techniques, hand loading your own ammunition can achieve greater accuracy, with the added bonus of less expense. However, the hand loader should take every care and adhere strictly to the instructions in many publications on the subject.

The Marksmanship Principles

Good shooting ability has its foundations in 'The Marksmanship Principles'. If you are able to apply these principles every time you fire a shot, all your shots will be concentrated in the same area of the target and will form a tight pattern called a group.

The four points below are the very essence of accurate shooting – the best marksmen in the world use them for each and every shot, often with little thought after years of perfecting their technique.

The principles, together with brief explanations are based on a right handed firer (butt in the right shoulder):

1. The position and hold must be firm enough to support the rifle.

Ensure the right hand has a firm hold on the pistol grip in all positions and that the left hand supports the rifle without excessive pressure- especially important in positions other than prone.

2. The rifle must point naturally at the target, without any physical effort.

Don't 'muscle' the rifle into the aim- adjust your position to ensure natural alignment- this is especially important when shooting from the kneeling and sitting positions.

3. Sight alignment or aiming must be correct.

Sight alignment is the relationship between the front and rear sight, relative to the eye. Aiming, breathing and trigger control are key elements in mastering marksmanship skills and will be covered in some detail during the Probationary Course.

4. The shot must be released and followed through without any disturbance of the position

Trigger control is the skilful manipulation of the trigger causing the rifle to fire without disturbing alignment relative to the target. This aspect of shooting is the most fundamental aspect of marksmanship after sight alignment.

All four principles are interconnected but the last two are most important: correct sight picture is crucial to the aiming process and poor trigger control causes 90% of wayward shots.

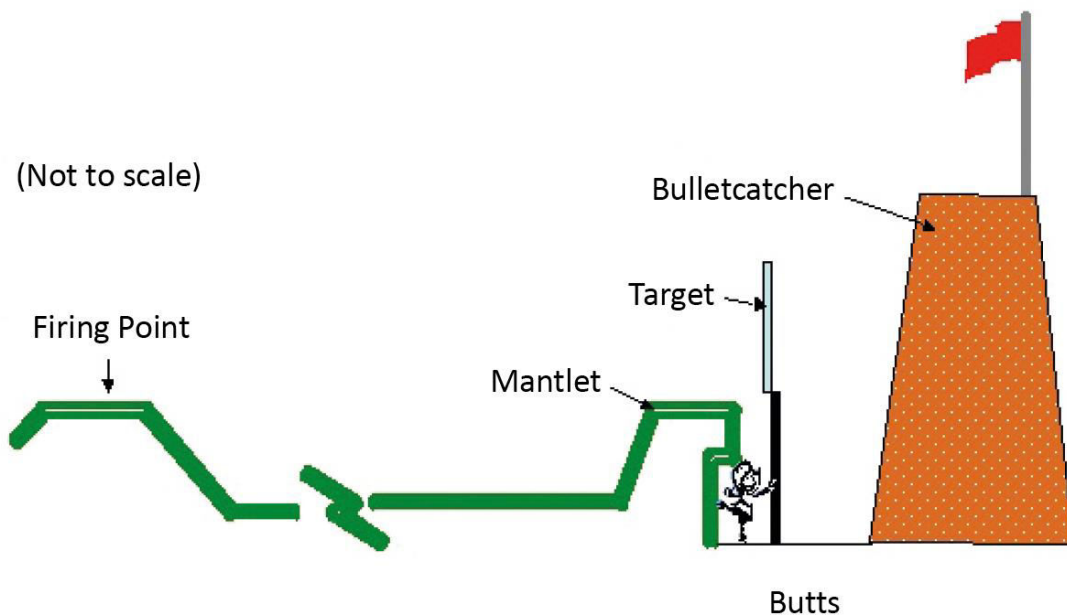
Target Shooting

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Target Shooting

RANGES

There are a number of different range designs; the Gallery Range design shown below is common to many military range complexes. This is a very large outdoor range, which is used mainly for full bore calibre firearms.



There are three main parts to this range:

- **The Firing Point** - This is a raised mound of earth usually with a grass cover. Shooting may usually only take place from the firing point. Numbered pegs placed along the forward edge of the firing point indicate the individual target lanes. A firer may only shoot at his own target and may not cross fire on to another firer's target. Firing points are located at different distances from the targets e.g. 300 yds, 500 yds, 600 yds.
- **The Butts** - The stop butt or bullet catcher is a high bank usually of sand, into which the bullets are fired. The targets are made of paper mounted on to wooden frames, which are positioned in front of the stop butt. The targets move up and down by a pulley or cantilever mechanism so that the shot holes can be easily marked and patched out by the butt marker working in the markers' gallery. The mantlet is a mound of earth, which protects the markers gallery from any low shots. Large numbers boards, which are visible from the firing point, identify each target.
- **Range Danger Area (RDA)** - This is a very large area of land (or sea) extending out from the firing point and beyond the stop butt which will contain any ricochets provided that all shooting on the range is conducted in a safe manner. There is no access to a range danger area when shooting is taking place. There are also air danger height restrictions to protect aircraft flying over ranges.

At Bisley and on all military ranges, a red flag indicates when firing is taking place.

The Range Conducting Officer (RCO) is responsible for the safe running of a Range.

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Target Shooting

RANGE & FIRING POINT SAFETY PROCEDURES

The NRA handbook published annually contains the rules for target shooting. Most of the procedures listed below are common sense precautions designed to ensure the safety and enjoyment of everyone who is on a range.

1. Never aim or point a firearm at another person even if it is unloaded.
2. Always “prove” (show) that a firearm is unloaded and safe when picking up or handing a firearm to another person.
3. Before leaving a firing point always “prove” (show) that your firearm is unloaded and safe. A bolt action rifle must either have the bolt open and a breech flag inserted or the bolt must be removed. A gallery rifle or pistol must be boxed or cased.
4. Obey the orders of the Range Conducting Officer (RCO) or Range Safety Officer (RSO) who is responsible for the safe running of the range and for all persons on the range.
5. Everyone on the firing point or in close proximity to the firing point **must wear hearing protection** when shooting is taking place.
6. Always be aware of other people who are on the range. When moving about the range area extreme care must be taken to watch out for other range users who may be firing from a different firing point. **Always obey the range warning signs.**
7. Do not place your shooting kit on the firing point until the RSO has given permission.
8. No loading or firing may take place on any range before permission (clearance) has been given or signalled by the Range Office (range authority) at the start of each shooting period. Firing may not continue after the close of a shooting period has been signalled, unless permission has been granted by the Range Office (range authority).
9. The loading or firing of a firearm may not take place until the RSO has given permission to load and carry on.
10. During loading or unloading a firearm must point horizontally towards the target. A loaded firearm must always point towards the target.
11. You may only fire if there is an approved target to aim at and the RSO has given permission.
12. “STOP! STOP! STOP!” Stop firing immediately if you hear these emergency words. Keep your firearm pointing at the target and wait quietly for the RSO’s instructions. Do not unload until the RSO gives the order.
13. When firing has finished, you may only move in front of the firing point when all the firearms have been unloaded and cleared and the RSO has given permission.
14. Never leave your firearms and ammunition unattended on the range.

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Target Shooting

15. If a live round is jammed in the firearm and it cannot be unloaded in the normal manner, **DO NOT remove the firearm from the firing point.** Place it on the ground with the barrel pointing towards the target. Inform the RCO who will ensure that the firearm is made safe.
16. If a misfire occurs with a full bore rifle, inform the RCO and wait at least 30 seconds before carefully tilting the rifle to the side, open the bolt ensuring that your hand is not behind the bolt, and that no-one is standing behind the rifle. Check that the cartridge comes out complete with the bullet.
17. If the primer on a round shows an indentation, however slight, it should not be fired.
18. Never force a live round into the chamber.
19. Practice aiming and dry firing on the range must only be done on the firing point with the firearm pointing at the target. This activity may only be done with the permission of the RCO and only when, in all other respects, it would be safe to fire a shot.
20. The firer is responsible for ensuring that his firearm and ammunition are safe to use and that they comply with the range safety regulations in respect of muzzle velocity and muzzle energy.

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Target Shooting

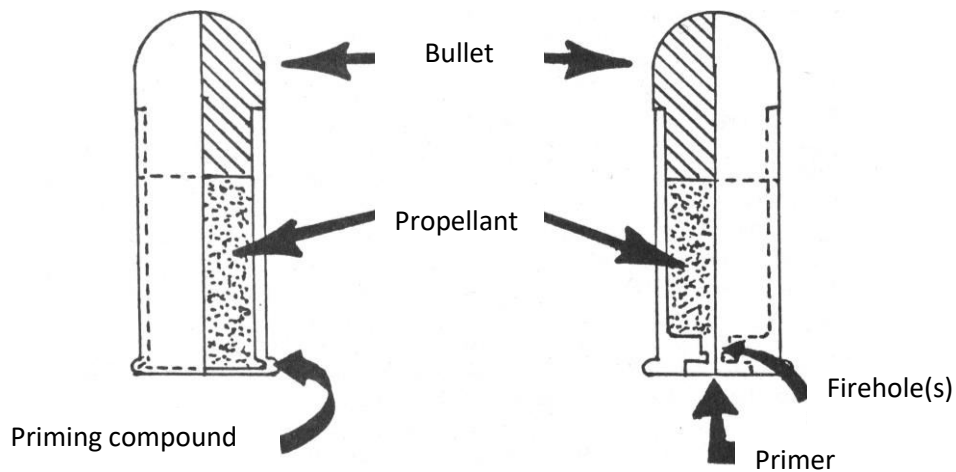
AMMUNITION

The ammunition used in target shooting consists of a brass cartridge case filled with fast burning propellant, a bullet projectile, and a primer which when struck initiates the firing process.

Types of Ammunition:

1. Rim fire e.g. .22in

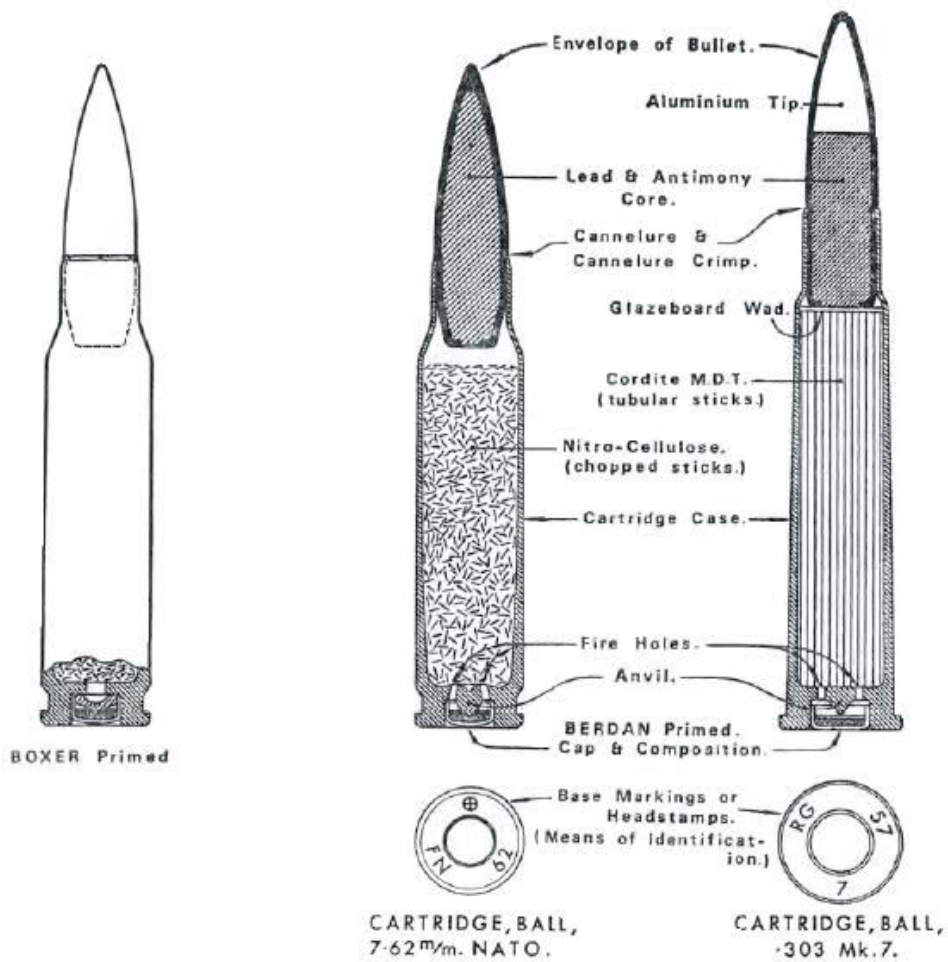
2. Centre fire e.g. 7.62mm, 5.56mm, .38 Special



.38 Special (centre fire) and .22 LR (rim fire) ammunition

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Target Shooting



Cartridge components



5.56mm, 7.62mm, .38 special and .22LR ammunition

INTRODUCTION TO BALLISTICS

When the firing pin hits the primer, the resulting flash from the priming compound ignites the fast burning propellant in the main part of the cartridge case. The rapid burning reaction produces a large volume of hot gas which pushes against the inside of the cartridge case in the chamber of the rifle. The bolt at the back and the strong sides of the chamber resist this force and prevent the case wall from expanding. The increasing pressure within the case therefore forces the bullet out of the neck of the cartridge and into the barrel where it engages in the lands. The rifling, which twists along the length of the barrel, causes the bullet to spin helping to maintain its stability in flight.

Gravity and air resistance affect the bullet as it flies through the air. It follows a downward curved path (trajectory) rather than a straight line to the target. Thus, to ensure that shots will hit the target, it is necessary to slightly elevate the barrel of the rifle above the horizontal. The angle of elevation required must be increased for firing at longer distances. The sights on the rifle are adjusted for different elevation angles. On some rifles the sights can also be adjusted to take account of the effect of wind on the bullet.

SHOOTING DISCIPLINES SUPPORTED BY THE NRA

Target Rifle (TR)

Target Rifle (TR) evolved from Service Rifle [SR(b)] shooting in the late '60s. Previously the No. 4 service rifle was used either without sights adjustable for windage [SR(a)] or with adjustable windage sights [SR(b)]. Modern day target rifles are extremely accurate, and have sights that are fully adjustable for elevation and windage. To "level the playing field" as much as possible without stifling progress, the rifle or all its component parts must be "readily available in quantity". TR involves prone single shot precision shooting using aperture iron sights at "round bull" targets at distances from 300 to 1000 yards, with each shot carefully scored and analysed. The usual calibre is 7.62mm.

F Class (F Class)

F ("Farquharson") Class evolved from Target Rifle (TR) shooting in the late 1990s. F Class may be fired in any calibre up to 8mm. This new variant of TR allows the use of aids such as bipods, telescopic sights etc. Although originally introduced to allow TR shooters with eyesight or other physical problems to continue to shoot competitively, it has now developed into a new discipline in its own right. F Class shooters compete in their own competitions including a national league, and alongside target rifle events.

Match Rifle (MR)

Match Rifle is similar to Target Rifle, but is usually fired at distances from 1000 to 1200 yards. It has always been regarded as a premier discipline, and long range precision shooting matches were fired in the early 1870s between international teams. Handloaded ammunition is usually used, and the specification for the rifles is more open than for TR, allowing for experimentation and innovation. Telescopic sights and hand rests are permitted, and the shooter may fire prone, or use the "supine" position, lying on his back with his feet pointing towards the target!

Service Rifle (SR)

Service rifle shooting is only open to members of the armed forces and police. SR competitions are based on those fired by the armed forces, and usually involve a physical element, may involve run downs, deliberate, rapid fire and snap shooting, and will often involve firing from a variety of positions including prone, sitting, kneeling and standing. The matches are fired with the current military issue rifle (the SA80 for British Forces or, for overseas competitors, that of their own country).

Civilian Service Rifle (Civ SR)

This has evolved as a discipline for civilian shooters using bolt action rifles to replace the old SR(a) class when the armed services adopted the self loading rifle in the late 1960s. Courses of Fire are similar to military service rifle competitions and may involve run downs, deliberate, rapid fire and snap shooting, and will often involve firing from a variety of positions including prone, sitting, kneeling and standing. Civ SR is shot in four classes; Historic, Iron Sight, Optic and Practical. A rifle with a magazine capacity of at least 10 shots is advisable.

300 Metre Rifle (300m)

This is the only NRA discipline governed by International Sport Shooting Federation (ISSF) Rules. It is only fired at 300 metres, but the rifle may be "Standard" or "Free" and in any calibre up to 8mm. Matches may be Prone only, or Prone, Standing and Kneeling (PSK). Firing is from a covered firing point, and a metric target with smaller scoring rings than TR is used. More shots are fired than in most other disciplines, usually 60 shots prone or 3 x 40 PSK (40 shots from each position). Unlike TR

and MR, where Courses of Fire are identical for men and women, ladies fire fewer shots, e.g. they fire 3 x 20 in the PSK event compared to the 3 x 40 for men.

Sporting Rifle (Sport)

Sporting Rifle may either be fired at 100 yards at static targets or at moving targets. The Running Deer match is fired at 100 metres at a moving target, which traverses a 23m gap in four seconds. One shot (in the Singles event) or two shots (in the Doubles event) are fired on each run of the target. The rifles have telescopic sights and may be in a variety of centre-fire calibres. The Running Boar event is similar to Running Deer, but is fired with a .22" rim fire rifle with the target traversing a 10m gap at 50 metres. There are also indoor 10m Running Target events fired with air rifles. All shooting is from the standing position.

Gallery Rifle (GR)

Gallery Rifles (usually lever or bolt actioned carbines, or self loading .22") may be centre fire or small bore. Since the banning of cartridge pistol shooting in GB in 1997 many of the traditional pistol competitions have now been adapted for gallery rifle shooting. Gallery rifles use pistol calibre ammunition, and may therefore be used on any range, indoor or outdoor, previously approved for pistols of the appropriate muzzle velocity and muzzle energy.

Muzzle Loading Pistol (MLP) and Muzzle Loading Rifle (MLR)

Muzzle Loading Pistols and rifles are potentially as accurate as their modern counterparts though their rate of fire is much slower. Shooting may be conducted with original period pistols or with modern replicas. MLP matches may be fired under international standard conditions at 25 metres with single shot flintlock or percussion pistols (best 10 shots from 13 fired in 30 minutes) or with percussion revolvers in a range of matches, many under the same conditions as previous cartridge pistol matches. Most ML rifles (other than those using spherical balls) are capable of accurate shooting up to 600 yards and long range specialist rifles in .451" calibre shoot well out to 1000 yards. Smooth bore muskets may be used for matches at 50 metres.

Classic & Historic Arms (Classic)

Classic and Historic shooting has had an amazing growth in popularity in the last few years. The firearms used are "datelined" to ensure that competitors are always competing against other competitors using a similar class of firearm. e.g. Muzzle Loading (before 1874), Vintage (before 1891), Classic (before 1919), Veteran (between 1919 and 1946 incl), Open (before 1946) and Post Historic (after 1946). Two Historic Arms Meetings are held at Bisley each year, one at the beginning of the Imperial Meeting in July and the other, the Trafalgar Meeting, in October.

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Target Shooting

EXAMPLES OF A NUMBER OF NRA SHOOTING DISCIPLINES



Target Rifle (Queen's Prize Final)



Gallery Rifle



Match Rifle (supine position)



Historic Arms



Civilian Service Rifle



Target Shotgun

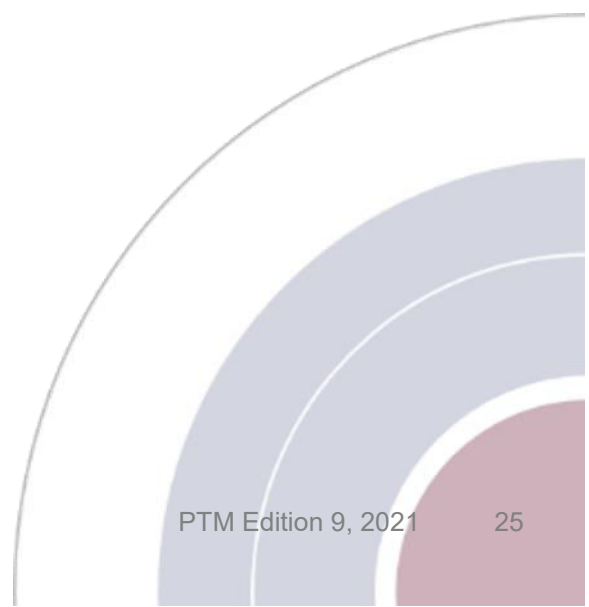


Black Powder Pistol



Long Range Pistol

Target Rifle



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Target Rifle



Marking a target in the Butts



A moment discussing the last shot with the coach

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Target Rifle



Target Rifle and Breech Flag

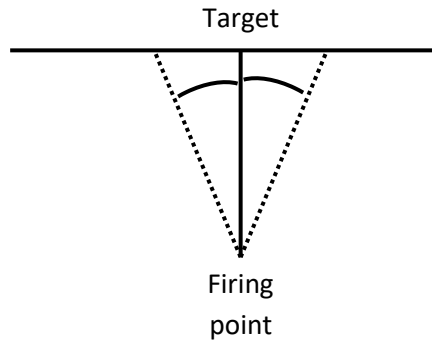


Target rifle and equipment on the firing point

ANGLES IN TARGET SHOOTING

In target shooting, all angles are measured in minutes (sixtieths of a degree).

Although we do not usually measure in inches, a change of one minute of angle is approx equal to a change of one inch per 100 yds, hence one minute at 500 yds is five inches.



WIND ANGLE MEASUREMENT

Deciding on the wind direction is easy: either left or right, depending on which way the wind is blowing - observe the flags on the range. If wind is blowing from the right move your sights to the right and vice versa. Adjustments for wind are done with the scale on the top of the rear sight. The difficult bit is trying to work out how many minutes to set on the sights to counteract the wind strength. However there are methods to help with this, providing the sights are correctly zeroed.

ANGLES OF ELEVATION

When a bullet is fired from a rifle, it slows down due to air resistance. It also drops due to the effect of gravity. Thus, the bullet drops lower as it goes toward the target, the line of flight being a curve. To compensate for this, the rifle has to be angled upward a small amount.

If we stood close in front of the target and fired the rifle, the rifle would be horizontal to the target. The further back we go from the target, the more the muzzle of the barrel would have to be lifted to offset the downward curve of the bullet flight.



The angle the barrel is raised is very small. For example, at 1000 yards, the muzzle only needs to be lifted approximately 36 minutes – just over half a degree!

The angle required has been calculated for different calibre bullets and there are charts which may be used to work out how much angle to set on the sights for each distance.

The scale on the side of the rear sight is used for elevation and, like the wind scale, is graduated in minutes. To assist in making such small changes they involve devices known as Vernier scales.

THE VERNIER SCALE

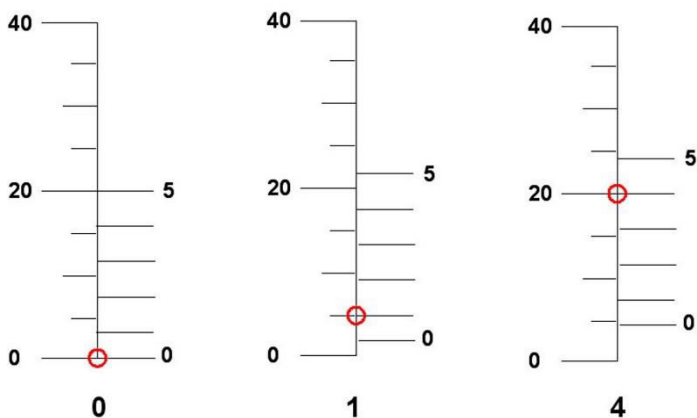
The smallest graduations on a sight that can easily be read by the naked eye are about 5 minutes apart. However in full-bore shooting we must be able to read and adjust the sight settings to within a minute of accuracy. Vernier scales enable us to do this.

How does the Vernier work?

There is a moving and a fixed scale. The fixed scale is marked off in divisions, 5 minutes apart, numbered in twenties. The smaller moving scale has five divisions, which equate to four divisions on the fixed scale. Each time the small scale is moved by one minute, 2 of the lines (one from each scale) will match up.

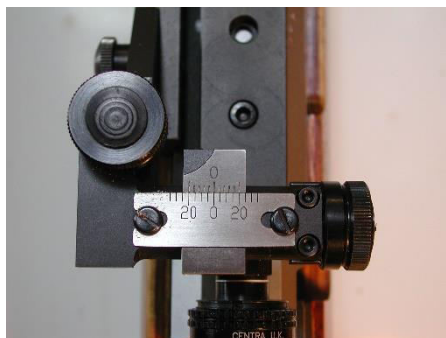
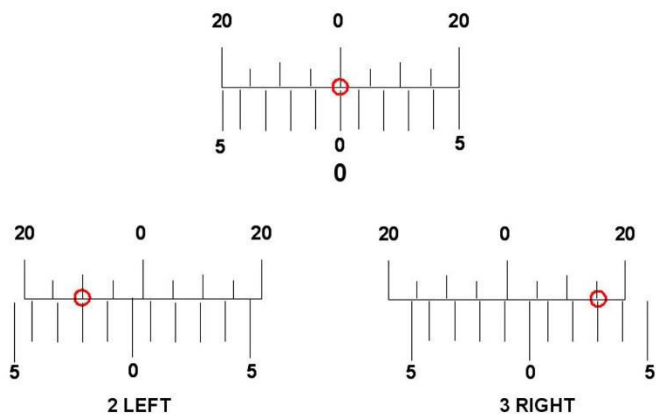
Each movement of the vernier scale can be felt as a “click” as the adjustment knobs move over ball bearings. Most TR sights have quarter minute clicks, therefore rotating the knob 4 clicks will cause a change of one minute of angle on the sight, and 16 clicks will cause a change of 4 minutes etc.

Elevation Verniers



Windage Verniers

These also have fixed and moving scales. When setting sights to adjust for the effects of wind, the vernier scale must be able to cope with wind blowing from either the left or the right this time, the moving scale has graduations to both the left and the right of zero.



Target Rifle
Target Rifle

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Target Rifle

TARGET RIFLE ELEVATION SETTINGS

These settings are based on 144 grain N.A.T.O. bullet with the distance between the rear sight aperture and the foresight element being 36" (sight base).

ELEVATION TABLE									
UP FROM	TO								
	300	400	500	600	700	800	900	1000	
200	2.5	5.5	9.5	13	17.5	23	29	36.5	
300		3.5	6.5	10.5	15	20.5	26.5	34	
400			3.5	7.5	12	17.5	23.5	31	
500				4	8.5	14	20	27.5	
600					4.5	10	16	23.5	
700						5.5	11.5	19	
800							6	13.5	
900								7.5	

The above elevation settings may not be exact for your rifle, but they can be used as a yardstick until you have checked them and recorded more accurate settings for yourself.

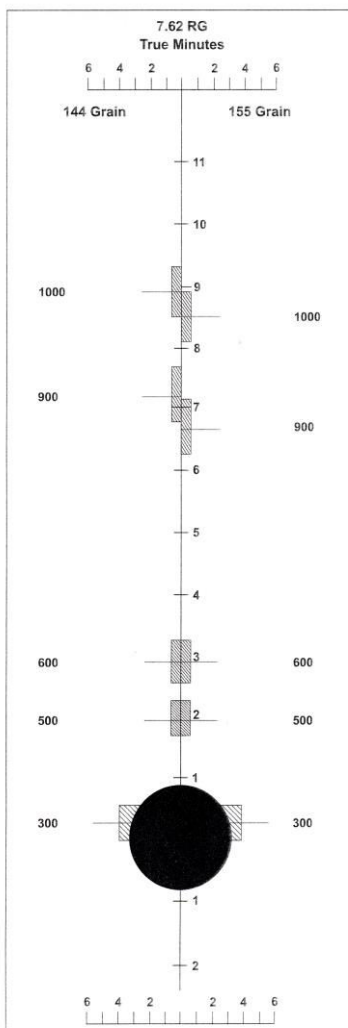
Factors which may affect Elevation Settings:

1. Different makes of ammunition.
2. Different bullet weights.
3. Barometric pressure (high pressure, low shots and vice versa).

ZEROING

Shooters must check that their rifle sights are properly calibrated or zeroed before they start shooting on an open range so that the correct elevation and wind settings can be applied.

At the National Shooting Centre at Bisley, a purpose built No Danger Area (NDA) range is provided for zeroing purposes. Only fullbore rifles may be fired on this range from the prone position (or supine for match rifle). A special zero target is available which has been calibrated for this range which allows firers to check their elevation settings for all distances back to 1000 yds.



Using the Bisley Zero Range & Zero Target

The rifle must be correctly prepared. Lay out the firing point so that it is comfortable and everything is to hand.

The Zero Target must be pinned to the frame so that it hangs vertically. Check this by using a plumb line. If the target is not positioned vertically it will result in incorrect zeroing.

If a rest is preferred, use it only to steady/support the wrist and not as a rest for the rifle. Take care not to cant the rifle.

There will always be some small differences in elevation between different batches of ammunition so it is important to record the batch number used and ensure that different batches are not mixed together.

Lateral or Wind Scale

1. Set the vernier elevation scale to shoot between 600/900 yds. This will avoid spoiling the aiming mark, the lines denoting the distances and the shot holes are easier to see and record.
2. Set the lateral or wind scale at zero and fire a shot. If it is not on the vertical line, adjust the wind scale and fire again. Repeat until the fall of shots cuts the vertical line.
3. Loosen the screw holding the Vernier scale plate, move it to read zero and re-tighten the screw. The wind zero should now be correct.

4. Target Rifle
5. Target Rifle
6. Target Rifle
7. Target Rifle

Vertical or Elevation Scale

1. With the wind scale at zero the Vernier elevation scale is set to what is known or assumed to be the setting for 600 yds. (This is to avoid spoiling the aiming mark, and the shot holes will also be easier to see and record).
2. Fire a shot. If it is not on the 600 yds line, adjust the elevation setting and fire another shot. Repeat until the fall of shot cuts the vertical line in the 600 yds block.
3. Lower the elevation setting 10½ minutes. This should now be the setting for 300 yds or close to. Fire a shot to check although this will spoil the aiming mark.
4. Loosen the screw holding the Vernier scale plate and set the plate to read a suitable value for 300 yds. Re-tighten the screw. Ideally the elevation scale, when set for 300 yds, should read 2½ minutes, but this is not always possible. It is easier to pick a 5 minute or 10 minute rise as a base reading for 300 yds and work up from there. This will then allow for adjustments for a batch of ammunition with a lower elevation than the one used for zeroing.
5. As confirmation, further shots may be fired at the different distances and the readings recorded.

While on the zero range, shots fired after lowering the rearsight to 300 yds (or if raised to 900/1000 yds) which show impact either to the right or left of the vertical line, can indicate that the foresight is not straight and should be checked.

The elevation settings should now be checked on the range at their true distances, adjustments made if necessary, and the readings recorded for future use.

Zeroing on other Ranges

Many club shooters do not have access to the Zero Range at Bisley, so need to zero their rifles at their local range. Zeroing on an open gallery range should be done at short range where the effect of wind will be less. Fire a shot at the target and then adjust the sights as previously described to bring the fall of shot into the centre of the target. After adjusting the sights, a further check shot should always be fired.

Firing at Longer Ranges

Before firing at longer ranges the firer must adjust the sights to the correct elevation setting for the distance he will be firing from. Initially firers should consult and apply the elevation settings as per published tables. Minor adjustments for elevation can then be made as necessary. Eventually the shooter should have an accurate record of the elevation settings for their own rifle at each distance, which they can then refer to.

Target rifle shooters account for every round fired by plotting the shots on their score sheet. Sighting shots fired before the start of all competitions provide the opportunity for minor adjustments to the sights as a result of e.g. a different batch of ammunition.

PREPARATION BEFORE SHOOTING & CLEANING AFTER SHOOTING

Ideally, a flat work surface/framework on which the rifle can be supported and held or clamped firmly by the butt should be available.

Equipment Required

- Cleaning Rod
- Rod Guide
- Phosphor Bronze Brush
- Jag
- Patches
- Solvent
- Oil
- An old toothbrush is also useful

Note: The rod should only be pushed from the breech/chamber end of the rifle towards the muzzle. A rod guide is useful to prevent damage to the chamber.

The phosphor bronze brush, the jag and the mop all screw on to the end of the rod. Take care to insert them at the chamber end of the barrel and unscrew from the rod at the muzzle end.

Keep the solvent/oil away from the woodwork/bedding.

Preparation of the rifle before shooting

1. Push through the barrel, once only, using a clean patch on the jag to clear out the oil/fouling. Likewise wipe the chamber dry using a patch on the chamber stick.
2. With a succession of patches on the jag and chamber stick, dry out and polish the barrel and chamber.
3. Wipe dry and clean the bolt, action, sights, magazine if fitted, etc. Wipe dry and clean all other metal surfaces..
4. After 'drying out' thoroughly check that the rifle is in good order, its action, bolt, bedding screws, sights, trigger, barrel clear of the stock etc.

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Target Rifle

Cleaning the rifle after shooting

1. Scrub the barrel out approximately half a dozen times using the phosphor bronze brush dipped in solvent to loosen the fouling.
2. Push through, once, a clean patch on the jag dipped in solvent to swab out the loose fouling.
3. Using clean patches on the jag and chamber stick, dry out the barrel and chamber.
4. Push through the barrel a clean patch on the jag dipped in solvent to remoisten the barrel. Leave for a few minutes allowing the solvent to work.
5. With a succession of patches on the jag and chamber stick, dry out and polish the barrel and chamber.
6. Thoroughly clean the action, bolt, sights, etc. (toothbrush is useful) and wipe down the other surfaces.
7. Oil the barrel and chamber with 303 oil using the mop head. Lightly oil all the other metal surfaces.

The methods given above for cleaning and preparing the rifle are not hard and fast, but do provide a simple practical guide

Telescope Sight Rifle

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Telescope Sight Rifle



Neilsen F Class Rifle



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Telescope Sight Rifle

Unique–Alpine 12 Practical



Leupold telescope



Tasco Scope - Elevation and Wind readings

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Telescope Sight Rifle

TELESCOPE SIGHTS

A telescope sight, commonly called a scope, is a device used to give additional accuracy using a point of aim for firearms, air guns and crossbows. Other sighting systems are iron sights, reflex sights, and laser sights.

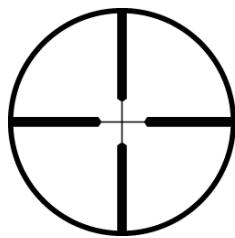
SCOPE TYPES

Telescope sights are classified in terms of the optical magnification and the objective lens diameter, e.g. 10x50. This would denote 10 times magnification with a 50 mm objective lens. In general terms, larger objective lens diameters are better (collect more light and give a wider field of view). On fixed magnification sights the magnification power and objective diameter should be chosen on the basis of the intended use.

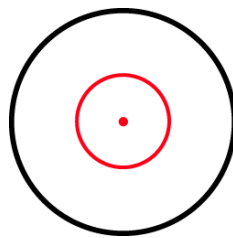
There are also telescope sights with variable magnification. The magnification can be varied by manually operating a zoom mechanism. Variable sights offer more flexibility regarding shooting at varying ranges and targets and offer a relative wide field of view at lower magnification settings. The syntax for variable sights is the following: minimal magnification - maximum magnification x objective lens, for example, 3-9x40.

RETICLES

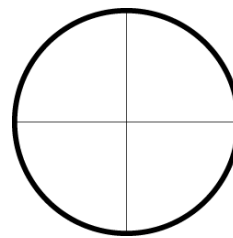
Telescope sights come with a variety of different reticles, ranging from the traditional crosshairs to complex reticles designed to allow the shooter to estimate accurately the range to a target, to compensate for the bullet drop, and to compensate for the windage required due to crosswinds. A user can estimate the range to objects of known size, the size of objects at known distances, and even roughly compensate for both bullet drop and wind drifts at known ranges with a reticle-equipped scope.



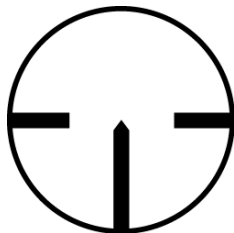
Heavy Duplex



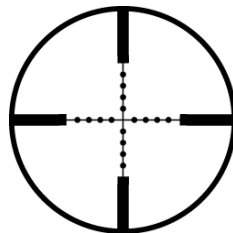
Illuminated Circle-Dot



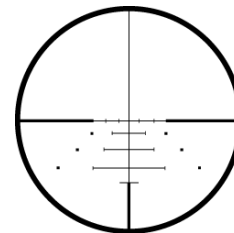
Crosshair



German 1



Mil Dot



BDC

Selection of different reticles. (Diagrams by kind permission of Leupold).

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Telescope Sight Rifle

There are two main types of reticles:

- Wire reticles
- Etched reticles

Wire reticles are the oldest type of reticles and are made out of metal wire. They are mounted in an optically appropriate position in the telescope sight's tube. Etched reticles are images of the desired reticle layout that are etched on an optic element. This optical element (lens) with the etched reticle is then mounted in the telescope sights tube as an integrated part of the optics chain of the sight. When backlit through the ocular a wire reticle will reflect incoming light and not present a black contrast reticle. An etched reticle will stay black if backlit.

Etched reticles are usually considered to be a more refined solution and offer greater reticle lay out flexibility. Because of this some manufacturers can provide client designed custom reticles by special order. In the more expensive and high end contemporary telescope sights etched reticles dominate the market. In cheaper telescope sights wire reticles are still often mounted to avoid a rather specialized and costly production step.

MIL-DOT RETICLES

One of the most flexible ranging reticles for hunters is the "Mil-dot" reticle, which consists of duplex crosshairs with small dots at milliradian (mil) intervals in the field of view. A milliradian equates to 3.43 MOA, that is, approximately 21.6 inches at 600 yards; each MOA equates to 1.04 inch at 100 yards, often rounded to 1 inch at 100 yards for fast mental calculations.

A trained user can relatively accurately measure the range to objects of known size, the size of objects at known distances, and compensate for both bullet drop and wind drifts at known ranges with a Mil-dot reticle-equipped scope. This can be of great use when hunting.

RETICLE FOCAL PLANE

The reticle may be located at the front or rear focal plane, First Focal Plane (FFP) or Second Focal Plane (SFP) of the telescope sight. On fixed power telescope sights there is no significant difference, but on variable power telescope sights the front plane reticle remains at a constant size compared to the target, while rear plane reticles remain a constant size to the user as the target image grows and shrinks. Front focal plane reticles are slightly more durable, but most American users prefer that the reticle remains constant as the image changes size, so nearly all modern American variable power telescope sights are rear focal plane designs. European high end optics manufacturers often leave the customer the choice between a FFP or SFP mounted reticle.

Variable power telescope sights with front focal plane reticles have no problems with point of impact shifts. Variable power telescope sights with rear focal plane reticles can have slight point of impact shifts through their magnification range caused by the positioning of the reticle in the mechanical zoom mechanism in the rear part of the telescope sight. Normally these impact shifts are insignificant but make accuracy oriented users, who wish to use their telescope sight trouble-free at several magnification levels, often opt for front focal plane reticles.

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Telescope Sight Rifle

RETICLE ILLUMINATION

Any type of reticle can be illuminated for use in low-light or daytime conditions. With any illuminated low-light reticle, it is essential that its brightness can be adjusted. A reticle that is too bright will cause glare in the operator's eye, interfering with his ability to see in low-light conditions. This is because the pupil of the human eye closes quickly upon receiving any source of light. Most illuminated reticles provide adjustable brightness settings to adjust the reticle precisely to the ambient light.

Illumination is usually provided by a battery powered LED, though other electric light sources can be used. The light is projected forward through the scope, and reflects off the back surface of the reticle. Red is the most common colour used, as it least impedes the shooter's night vision. This illumination method can be used to provide both daytime and low-light conditions reticle illumination.

Radioactive isotopes can also be used as a light source, to provide an illuminated reticule for low-light condition aiming. The (radioactive) tritium light source has to be replaced every 8-12 years since it gradually loses its brightness due to radioactive decay.

PARALLAX

This is the apparent movement of the target relative to the reticle when the eye is moved away from the centre point of the eyepiece. It will occur when the target does not fall on the same optical plane as the reticle. At short distances, parallax effect does not affect the accuracy and, at long range, parallax will have little effect when sighting straight through the middle of the scope. Most higher power scopes (x12 or more) have parallax adjustment either at the objective end of the scope or on the side of the scope.

On some scope sights the objective lens is adjustable so the telescope can compensate for parallax errors. These scope sights are often called AO or A/O, meaning Adjustable Objective. When the parallax adjustment is on the side of the scope, any adjustment moves a lens within the scope causing the image and reticle to fall in the same optical plane, ensuring optimal accuracy at the distance of the target. This method is technically more complicated to build but generally preferred by shooters because the sidewheel is easier to move without moving the head very much. Such models are sometimes referred to as side focus.

BULLET DROP COMPENSATION

Bullet Drop Compensation (BDC) (sometimes referred to as ballistic elevation) is a feature available on some rifle scopes. The feature compensates for the effect of gravity on the bullet at given distances (referred to as "bullet drop"). The feature must be tuned for the particular ballistic trajectory of a particular combination of rifle and cartridge at a predefined air density. Inevitable BDC induced errors will occur if the environmental and meteorological circumstances deviate from the circumstances the BDC was calibrated for.

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Telescope Sight Rifle

ADJUSTMENT CONTROLS

A telescope sight can have several adjustment controls:

- Focusing control at the ocular end of the sight - meant to obtain a sharp picture of the object and reticle.
- Elevation or vertical adjustment control of the reticle.
- Windage or horizontal adjustment control of the reticle.
- Magnification control - meant to change the magnification by turning a ring that is generally marked with several magnification power levels.
- Illumination adjustment control of the reticle - meant to regulate the brightness level of the lit parts of the reticles crosshairs.
- Parallax compensation control.

Most contemporary telescope sights offer the first three adjustment controls. The other three are found on telescope sights that offer a variable magnification, an illuminated reticle and/or parallax compensation. A rather common problem with the elevation and windage adjustment controls is that once smooth working adjustment turrets 'get stuck' over the years. This is generally caused by long time lack of movement in the lubricated turret mechanisms.

SETTING A SCOPE FOR THE FIRST TIME

If the scope has an eyepiece with a lock ring the shooter needs to adjust the focus of the reticle before fitting the scope on the rifle. To do this:

- Unscrew the eyepiece away from the lock ring.
- Look through the scope from a distance of about 3" to 4" when it is pointed at the sky (do NOT point it at the sun) and take a few quick glances at the reticle, which should appear sharp and clear. If the reticle is not clear, farsighted people should turn the eyepiece anticlockwise three or four turns while nearsighted people need to turn the eyepiece clockwise three or four turns.

This process should be repeated until the reticle is clear and sharp. Once the adjustment is correct, the lock ring should be locked against the eyepiece.

EYE RELIEF

With the scope as far forward in the mounts as possible, the rifle should be held in the normal shooting position. With variable power scopes, the highest magnification should be set. The scope should then be moved to the rear until a full field of view can be seen, at which point the scope mounts should be locked.

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Telescope Sight Rifle

PARALLAX

To eliminate parallax in adjustable scopes the following procedure should be used each time a different distance is shot:

- The reticle should be focussed before adjustment. Determine the distance to the target.
- Turn the focus adjustment to match the number to the distance (usually in yards) to the target.
- With the rifle in a stable, supported position, look through the scope.
- Move your head slightly up and down.
- The aiming point should remain in exactly the same position against the target.
- If the aiming point does move, adjust the focus slightly then repeat until the aiming point does not move.

CHECKING SCOPE AND MOUNTS

The method known as "completing the square" can be used to check where the optics, reticle adjustment or mounts are suspect:

- On the range, set the sights for the centre of the target.
- Fire one shot.
- Adjust the sights ten minutes to the right.
- Fire one shot.
- Adjust the sights ten minutes down.
- Fire one shot.
- Adjust the sights ten minutes left.
- Fire one shot.
- Adjust the sights ten minutes up.
- Fire one shot.

Ideally, the last shot should be superimposed on the position of the first shot.

Service Rifle (Iron Sights)

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Service Rifle (Iron Sights)

EXAMPLES OF SERVICE RIFLE SIGHTS



Mauser rear sight



SMLE rear sight



Enfield aperture rear sight



Enfield battle sight



Pin fore sight

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Service Rifle (Iron Sights)



Enfield No 4.
Safety catch off, bolt open



Enfield No 4.
Fully cocked



P14. Action open, breech
flag in



P14. Action closed and cocked.
Safety catch applied



Enfield magazine and .303 ammunition clips

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Service Rifle (Iron Sights)

EXAMPLES OF FIRING POSITIONS



Prone



Sitting



Kneeling



Standing

Gallery Rifle

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Gallery Rifle

TYPES OF FIREARM

Firearms are divided into four main types and they have separate events in which you can compete. Many competitors own more than one type.

The majority of Gallery Rifle events are “open” which allows you to use either red dot, telescopic or iron sights. Most events also require the use of a holster when shooting with an LBP or LBR. The maximum muzzle velocity for GR&P is 2150 ft/sec and the maximum is 1496 ft lbs.

Gallery Rifle Centre Fire (GRCF)

Three sub types are recognized to ensure that all compete without any disadvantage.

GRCF Standard

This is the type that most competitors use. They are a lever action design (often referred to as underlevers) with an integral tubular magazine and fire a centre fire cartridge.

The most commonly used are Marlin rifles which eject the empty cases out sideways, making them very easy to use when mounted with either electronic or telescopic sights. Winchester and Rossi lever action rifles are also used but eject the empty cases out of the top meaning that they are more suitable for use with the supplied iron sights.



GRCF Open

These also fire centre fire cartridges but are operated by either a straight pull, bolt action or lever release design and have removable box type magazines.



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Gallery Rifle

GRCF Classic

Many of these rifles are similar in design to the lever action rifles in GRCF Standard and there are others of different designs as well. Most of them are based on designs of the late 19th and early 20th century and use iron sights.



Gallery Rifle Small Bore (GRSB)

These rifles are either semi automatic (or self loading), bolt or lever action in design and use either detached, fixed or tubular magazines and fire .22lr rim fire ammunition. Some GRSB rifles also have pump or slide actions. By far the most common GRSB used for competition purposes is based on the semi-automatic Ruger 10/22 rifle.



Long Barrelled Revolver (LBR)

These are revolvers which fire centre fire cartridges. They have a minimum barrel length of 30cm and a fixed rod protruding from the rear to give an overall minimum length of 60cm. Loading is either done by hand for individual cartridges, or by the use of "speed loaders" that hold and insert several at time. The Taurus revolvers are the most popular due to their availability although there are some others.



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Gallery Rifle

Long Barrelled Pistol (LBP)

These are semi automatic .22lr rim fire pistols that are magazine fed with a minimum barrel length of 30cm and a fixed rod protruding from the rear to give a minimum overall length of 60cm.

The Browning Buckmark LBP is by far the most commonly used.



LBR and LBP legal issues

LBRs and LBPs cannot be used by either Probationers or other Firearm Certificate (FAC) holders unless they specifically have the authority to possess the firearm in question on their certificate.

Where to Next?

WHERE TO NEXT?

Your Probationary training is the first stage of what we hope is a long and enjoyable association with the sport of Target Shooting. Once you have successfully completed your course, where can you go next to take your shooting to the next level?

Clubs

Although Bisley has a proud tradition and is home to some of the most iconic ranges in the world, there are numerous shooting clubs throughout the UK offering all forms of target shooting. If you haven't already done so, find out about shooting clubs close to home and get in touch – they will be delighted to hear from you.

Bisley itself has many clubs, most set within characterful clubhouses providing a warm welcome and handy accommodation at reasonable rates. Some clubs specialise in specific shooting disciplines and stage club and 'open' competitions. They will offer further coaching and instruction, and once a full member you will be able to hire a club rifle and make use of other benefits, so it's worth calling in to find out more.

Skills Development Courses

The NRA offers a series of 1 day courses specific to shooting disciplines, all led by some of the best shooters in their field, providing expert 1:1 instruction. If you wish to develop your knowledge and understanding of these types of shooting, attendance on one of these courses is a must. Currently we offer four courses – details can be found on the NRA website:

Civilian Service Rifle (Civ SR) Skills Development Course

Gallery Rifle Skills Development Course

Target Shotgun Skills Development Course

Target Rifle Basic Skills Development Course

Competitive Shooting

Competitive shooting is fun and should be challenging – it's a great way to test and validate your skills, meet new people with similar interests, as well as improve your marksmanship.

Clubs around the country run competitions at various levels, from club, county or national, and joining a club will give you access to all the information and support you need.

The NRA organises competitions for every shooting discipline throughout the year, with details advertised on the website together with entry forms and Courses of Fire. There are often prizes for novice shooters, so don't be put off and think you're not good enough. The training you have received during your Probationary Course, plus any further training from your club or Discipline Day, will put you in a great position to take part.

The **Imperial Meeting** is the focal point for most shooters at Bisley and is internationally famous. Held every year since 1860 (with the exception of two World Wars), the Imperial Meeting covers 4 weeks from mid-June to mid-July, culminating in the Queen's Prize for the best target shooter.

From over 1,000 competitors at the start, the final 100 shoot shoulder to shoulder to win the coveted prize. The champion is chaired off the range by fellow competitors, led by a marching band and with hundreds of spectators in tow.

Every single one of the 'Queen's 100', vying for the top prize, started as Probationary members.

Enjoy your course and we hope to see you at Bisley again soon.

Further Information

1. The NRA Handbook – Rules of Shooting (the 'Bisley Bible').
 - a. Free of charge to new NRA Probationary Members.
 - b. Can be purchased from the NRA.
 - c. Downloadable for free from the NRA website.
2. The NRA Gallery Rifle and Pistol Handbook.
 - a. Free of charge from the NRA.
 - b. Downloadable for free from the NRA website.
3. Art of Shooting by Prof. Philip Treleaven.
 - a. Available for approximately £30 from Amazon and other online retailers.

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Where to Next?

Glossary

Blow back

When some of the gas and particles generated during firing are blasted rearwards out of the base of the round instead of going forwards to push the bullet up the barrel (possibly the result of a damaged primer).

Butt Marker

The person in the butts who marks, scores and patches out the shot holes in your target.

Centre Fire

The primer is seated in a chamber in the centre of the base of the round.

Elevation

The angle to which the barrel must be raised above the horizontal so that the shot will hit the target.

Firearms Certificate (FAC)

A legal document, issued by the police, which entitles the holder to purchase, own and handle firearms and or ammunition. Probationary members may not apply for a FAC.

Firearms Enquiry Officer

A police officer (or police civilian staff member) who is responsible for handling FAC applications, enquiries and renewal applications.

Firing Pin

A thin metal rod projecting from the face of the bolt. It is held under tension until the trigger is squeezed. When the firing pin is released it strikes the primer which results in the round being fired.

Hang fire

A shot that is not fired immediately the trigger is squeezed but fires after a short time lag.

Home Office Approved Club

A shooting club with a licence from the Home Office (HO). Only HO approved clubs may have probationary members and run guest days

Marker panel

A black or fluorescent orange marker board placed along the bottom or sides of the target at set positions to signal the numerical value of the last shot fired at the target.

Minute of Angle

This is a sixtieth of a degree. Over a distance of 100 yards a change of one minute of angle is approximately equivalent to a change of one inch in the position of the shot hole on the target, thus one minute of angle at 500yds is approx = five inches etc.

Misfire

The firearm fails to operate when the trigger is pulled. The term normally applies to a cartridge that does not fire when the primer is struck. In practice, the cause may also be due to a fault with the firearm, or simply that there was no cartridge in the chamber.

Primer

A small amount of percussion-sensitive material contained within the base of a cartridge. When struck firmly by the firing pin it produces the flame that ignites the propellant.

Probationary Member

A person who is undergoing a course of instruction in the safe handling of firearms. Under current Home Office guidelines probationary membership is for a minimum period of 3 months. A Probationary member may only shoot while under the supervision of a full club member who is competent in that discipline. An NRA Probationary Member may only shoot whilst attending an NRA Probationary Training course.

Radio message codes

A list of 14 standard messages. The sender refers to the target and the appropriate message number. e.g. "Hello Butts, target 43, message 4, over."

This tells the butt marker that the message is for him/her and that a shot has been fired at target 43 but the value and position of the shot has not yet been signalled.

The butt marker acknowledges the transmission, lowers the target to inspect it, marks and scores the shot and also reports back to the firing point.

Range

An area of land, or a building, which has been approved for shooting and has a range safety certificate

Range Standing Orders

Safety regulations that detail the way in which the range must be used.

Range Conducting Officer

The person who is responsible for the safe running of the range. The RCO controls all persons on the range.

Range Control

The control station on the network. They can communicate with all ranges and Range Staff. Range Control is always manned when shooting is taking place on the ranges: this is an important safety factor.

Rim Fire

The priming compound is located in a rim around the base of the round. This is typical of small bore .22 ammunition.

Sighting Shots

One or two shots fired at the start of a competition to allow the firer to confirm that the sights are correctly set. Sighters, though recorded, do not usually form part of the final score (but see NRA rules for converting sighters in TR shooting).

Spotting disc

A fluorescent cardboard disc placed in the shot hole to enable the firer to judge the position of the last shot on the target. The spotting disc is visible to the firer when the target is viewed through a telescope.

Trajectory

This is the path that a bullet in flight will follow. It is a shallow curve not a straight line because of the effects of gravity on the bullet.

Vernier

A vernier is a device that is used to measure the subdivisions on a scale accurately.

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Notes

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