C-I-L AMMUNITION & FIREARMS
P. O. BOX 10 - MONTREAL

E. STOCK. RANGE MASTER.
HHRC

BASIC INSTRUCTION ON

Small Bore Rifle Shooting

C-I-L

Introduction

Although there are several classes of rifles used in target shooting, this book deals with the .22 calibre Sporting Rifle. The principles described apply to target rifle shooting of all kinds even though the ranges, rifles, and equipment may be different.

As implied by the term, .22 calibre "Sporting Rifles" are designed for a variety of sporting uses such as target shooting, plinking and small game hunting. Although this is the most common type of .22 calibre rifle in use, organized shooting programs restricted to the .22 Sporting Rifle are unique to Canada.

The first program was organized in 1935 by the Dominion Ammunition Division of Canadian Industries Limited. This "Dominion Marksmen" awards program was so successful that the Sporting Rifle became accepted as the standard rifle in clubs across Canada. In 1949 the national governing body for civilian rifle shooting, the Canadian Civilian Association of Marksmen, recognized the Sporting Rifle and introduced official rules, targets and competitions. Sporting Rifle competitions have become a major part of the program of the national organization, now called the Shooting Federation of Canada.

In 1968 the name "Dominion Marksmen" was discontinued but the competitions were incorporated within the "C-I-L Shooting Sports Program". The C-I-L .22 Sporting Rifle Competition offers a complete series of awards including pins, crests and shields.

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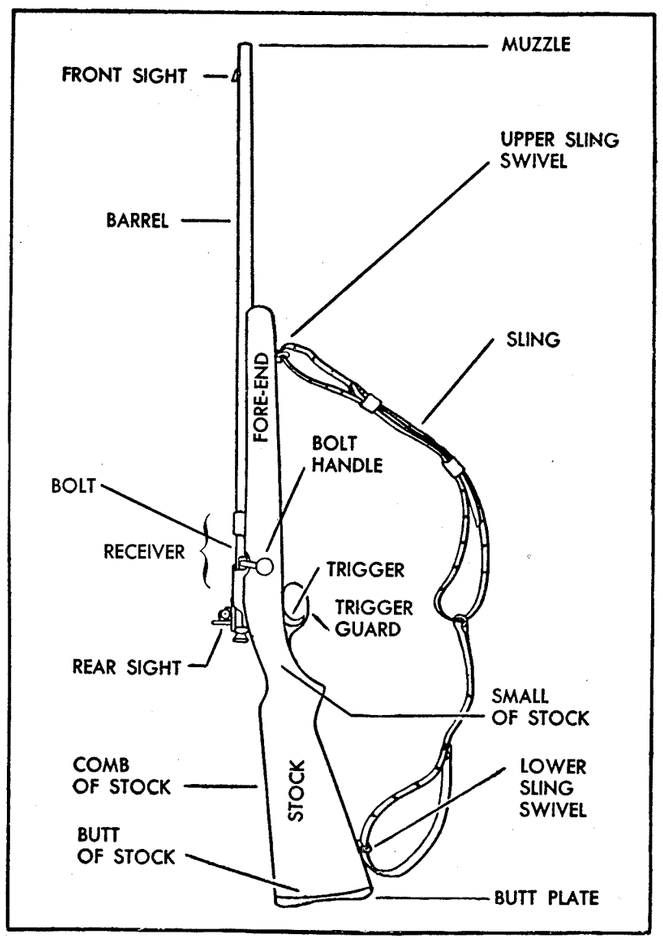
C-I-L SHOOTING SPORTS PROGRAM
P.O. BOX 10 — MONTREAL



A typical single shot, bolt action rifle. Study this illustration and become familiar with the correct names of the various parts so that you will better understand this book and be able o express yourself accurately and clearly.

CHAPTER ONE

The Rifle

Sporting Rifle shooting programs are intended to permit the use of common types and makes of rifles, without excessively handicapping the shooter.

The weight of the rifle cannot be more than 7½ lb. complete. A sling may not be used. Adjustable, aperture (or peep) front and rear sights are allowed. Telescopic sights are prohibited, as are accessories such as hook butt plates and palm rests. The trigger must require at least three pounds pressure to fire.

A repeating rifle with clip or tubular magazine may be used, however the rifle must be capable of being loaded with one cartridge at a time, and the action must be capable of being kept open when not loaded for firing. These rules have been introduced because of the danger that cartridges may be left in the chamber or magazine of a repeater, without the shooter's knowledge.

When choosing a rifle, there are several points to check that will help to ensure that you get good value. First of all, can adjustable aperture sights be easily fitted ? Second, is the barrel and action solidly fitted to the stock, and preferably held in place with two screws ? The trigger should be readily adjustable for firing pressure. The stock should have a moderately full fore-end and well-angled pistol grip to allow proper holding without strain on the hands and wrists.

Rifles that have been designed for target shooting are the C-I-L Models 180 and 190, both single-shot bolt action. The C-I-L Model 310 is a bolt-action repeater that also makes an ideal all round rifle.

CARE OF THE RIFLE

With proper care your rifle will give many years of faithful service. A good padded carrying case, or even better a box, will protect the rifle and sights from damage.

Cleaning is necessary to keep the bolt, barrel face, and trigger mechanism free of accumulated fouling and dirt. The barrel need be cleaned only after firing about 1000 rounds. Every time the rifle is used or handled it should be wiped off on the outside, preferably with a silicone-treated cloth, to prevent rusting caused by perspiration from the hands.

Depending on the amount of shooting done, clean the bolt and barrel face fairly frequently to keep them free of fouling. A toothbrush used with a little special gun treatment oil or solvent makes short work of this job

When 1000 rounds have been fired, or at the end of a shooting season, use a good cleaning rod and proper size cloth patches to clean the bore. The first patch should be a little undersize, and be well anointed with solvent or gun treatment. Run the rod through the bore from the chamber end, and don't let it rub on the bore at either the chamber or muzzle. The rifle should be well-supported for this operation, and is best held in a well-padded bench vise or special cleaning rack.

Give the solvent a few minutes to work on the fouling in the barrel bore, then run a clean patch through. Continue until the patches come out clean.

If you notice any uneveness in passage of the patch through the bore, as though it were dragging or catching in sports, or if you can see streaks or dull spots in the bore, it has probably picked up metallic fouling. To clean out this fouling, use a good brass or bronze cleaning brush with solvent or gun treatment oil. Make certain the brush is the proper size, and that it fits the cleaning rod. Run the brush all the way through the bore, and of course work from the chamber end.

After using the wire brush, clean the bore with patches and then give it a very light oiling. Before the rifle is fired again be sure to clean the oil out of the barrel bore. Otherwise the rifle could become damaged.

Keep the rifle very lightly oiled, with just a film on the working parts. Excessive oil can be harmful, as it picks up dirt which will cause wear, or prevent the action from operating properly.

CHAPTER TWO

Ammunition and Accessories

AMMUNITION

All modern bolt action rifles are chambered for the .22 Long Rifle cartridge, but will also safely fire the .22 Short and .22 Long cartridges.

The .22 Short is an efficient little cartridge for plinking and short range small game shooting. Rifles designed for .22 Long Rifle ammunition have chambers that are longer than the .22 Short cartridge. The rifling in their barrels also has a different "rate of twist", or number of turns, than is needed for the .22 Short. As a result, the accuracy of the .22 Short is reduced when fired from a rifle chambered for .22 Long Rifle.

Continued use of the .22 Short in a Long Rifle chamber can lead to a build-up of fouling at the front end of the chamber, and there is also possibility of other chamber damage.

The .22 Long (which is often confused with the .22 Long Rifle) is a cartridge composed of a .22 Short bullet and a .22 Long Rifle case. This cartridge is available in a High Velocity loading only, and is suitable for plinking and small game shooting.

The .22 Short or the .22 Long should not be used for target shooting.

More research and development time has been spent on the .22 Long Rifle than on any other cartridge. It is the most accurate cartridge regularly produced by ammunition companies. The combination of .22 Long Rifle "Match" ammunition and a good rifle is usually capable of much finer shooting than is the shooter himself.

There are three brands of .22 Long Rifle ammunition made by C-I-L : "Canuck", "Imperial", and "Match".

"Canuck" is standard velocity ammunition, available with either dry lubricated or greased bullets. This brand is the best choice for plinking, target practice, and informal target competitions. The greased bullets will be found better for target shooting.

"Imperial" High Velocity ammunition is intended for plinking or small game hunting where greatest bullet energy is needed. There are two types of bullets: solid, and "Mushroom" hollow point.

"Match" ammunition is produced on special equipment and is manufactured to the strictest standards of uniformity and accuracy. This is the brand to use for the highest scores in serious target practice and competitions.

THE SHOOTING JACKET AND CLOTHING

To be able to concentrate on making good scores, your clothing must be comfortable. A tight collar and tie, as an example, will not only be uncomfortable but may actually cause a heavy pulse beat in the neck and cheek. Any such pulsating will be transmitted to the rifle stock, causing the sights to bobble around on the target.

A heavy sweater or sweat-shirt worn under the shooting jacket will help to cushion any pulse beat or muscle tremors.

Special jackets are manufactured for use in rifle shooting. These have heavy padding on the elbows and on the shoulder where the rifle butt rests. The elbow pads prevent sore elbows and also help the shooter to take up a uniform position for every shot. The shoulder pad protects the jacket material against wear and keeps the rifle butt from slipping.

A shooting jacket can be made by padding a suitable coat or windbreaker with sheepskin. Apply the sheepskin to both elbows and the shoulder, wool towards the inside.

A good, solid pair of boots will be of considerable help when shooting in the kneeling and standing positions. Ski boots are not permitted, and if the boots are over 8" in height the uppers must be of soft leather.

THE SPOTTING 'SCOPE

To obtain your highest scores the bullet groups must be centred on the bulls-eye. Changes in light, shooter position, and particularly wind can affect the location of the groups.

A telescope for "spotting" the shots is a very useful piece of equipment, as it will permit you to see where each bullet strikes. If sight changes are necessary they can be made at once. Without a 'scope you must either shoot "blind" or walk down to the target.

When shooting at 20 yards a 7-power binocular can be used to spot shots. For longer ranges greater magnification is necessary.

While it is preferable for each experienced shooter to have his own 'scope, a coach or spotter can spot shots for up to four shooters. It may be found advisable with juniors or new shooters to limit the use of the spotting scope to the coach or instructor until the shooter gains experience.

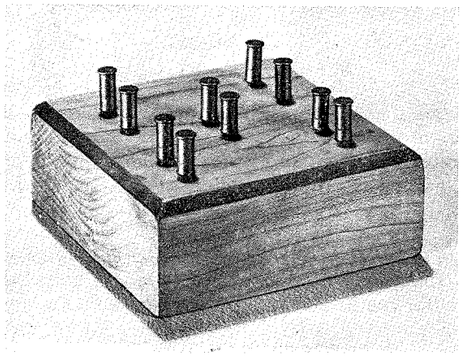
It should be kept in mind that the purpose of the spotting scope is to enable sight corrections during the course of firing. The coach will also use the scope to check on a shooter's progress as shots are fired, and to help in correcting errors in technique.

There is no point in the coach loudly calling out the value of each shot, or the shooter spotting each shot, unless corrections are to be made It is natural for a shooter to worry about poor shots, or to become tense as he makes a good score. There is a great tendency to think about the shots that have been fired, and about which nothing can be done. The shooter should be concentrating on firing his next shot. "Each target should be fired one shot at a time."

When buying a spotting scope it is a good idea to buy the best that one can afford. Often it will be found that the lower-priced models of well known makes will give better results than fancier models of unknown brands. The magnification need not be greater than 20 power, even for 100 yard shooting. Unless the lens quality is excellent, greater power usually results only in a larger, unclear, picture of the target. A good clear image is needed so that bullet holes can be spotted in poor light conditions and their location seen exactly.

THE CARTRIDGE BLOCK

It is a most uncomfortable feeling to finish a match target and then begin to wonder if you fired the correct number of shots. The use of a cartridge block is necessary to keep track of both sighting shots and record shots.



Many clubs make a practice of issuing ammunition in a cartridge block with each target. Illustrated is an ideal cartridge block for use with 10-shot targets. The cartridges are set out in twos, in the same pattern as the 5-bull target. By taking the cartridges from the block in order for each bullseye, you can see exactly which bullseye to fire at next.

C-I-L .22 Long Rifle ammunition is packaged in convenient trays that serve as cartridge blocks. By following a regular routine for selection of sighter and score shots the shooter may use ammunition directly from the box, without any unnecessary handling.

THE KNEELING ROLL

A round cushion, or Kneeling Roll, may be used under the instep of the right foot in the kneeling position. The Kneeling Roll must be fairly soft, round and about eight inches long, and may be either 4 inches or 6 inches in diameter.

Suitable rolls can be made from a heavy cloth bag of proper size filled with excelsior, foam rubber, or similar material. Heavy cloth or foam rubber may also be rolled to form a good cushion.

CHAPTER THREE

The Target

A target may have one or several bulls-eyes. Each bulls-eye consists of a series of concentric circles known as scoring rings. The inner scoring rings of each bulls-eye are black and are called the aiming mark. Inside the 10-ring is an additional ring, either a dotted line or a solid white spot, which is called the X-ring and is used to break tied scores.

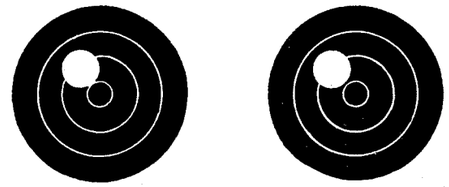
The reason for more than one bulls-eye is that an expert rifleman's shots will often group so closely that they will form one jagged hole, making accurate scoring on a single bulls-eye very difficult or even impossible. Targets are therefore designed so that fewer than ten shots may be fired at each bulls-eye, usually according to the length of the range. Some targets have a "Sighter" bulls-eye in addition to several record bulls-eyes.

There are several types of targets for Sporting Rifles at ranges up to 100 yards. C-I-L supplies both 15 yard and 20 yard targets, free of charge to registered clubs, for use in the C-I-L .22 Sporting Rifle Competition.

More difficult targets with smaller scoring rings are used in tournament shooting. Such targets are available from the Shooting Federation of Canada, who also provide targets for .22 Match Rifle and Handgun shooting.

SCORING

Each shot is given the value of the scoring ring in which it appears. Hits outside the scoring rings are scored as misses. When a shot cuts or touches the line dividing two scoring rings, the higher value is credited. This is clearly illustrated below. On a ten-shot target a perfect score of 100 is called a "possible".



If a shot cuts or touches the X-ring, it is valued as 10-1X. The number of X's is recorded along with the total score value, for example 98-8X, but is used only to break tied scores. If another target scores 98-7X, the 98-8X ranks higher. A 99 or 100 would of course rank higher than either 98, regardless of the number of X's. The highest possible score on a ten-shot target is 100-10X.

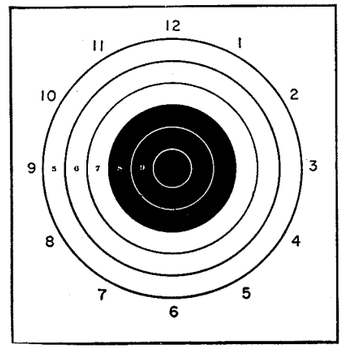
To score accurately it is often necessary to use a "plug gauge", which can be purchased in shooters supply stores. When using a plug gauge, the target should be held in a horizontal position and the gauge should be inserted carefully so that no pressure is exerted to any side. It is necessary to look straight down on the gauge to see whether or not its flange touches the scoring ring.

The gauge should be placed in a shot-hole only once, and be checked by all of the scorers without being touched or removed. It will be found that a scorer's first opinion of the value of a shot is generally most accurate. When there is reasonable doubt as to the value, or when the scorers disagree, the shooter should receive the benefit of the doubt and be awarded the higher value.

THE CLOCK SYSTEM

The clock system is used to accurately describe the location of a shot on the target. Imagine that the target is the face of a clock, with 12 o'clock directly above the bulls-eye, 6 o'clock directly below, 3 o'clock to the right, and 9 o'clock to the left of the bulls-eye, and so on.

By using this system a coach, who is spotting a shooter's shots, can tell him where his shots are going, or the location of his group centre.



CHAPTER FOUR

Range Procedure

Correct range procedure is simply a matter of common sense, courtesy, and safety.

A firearm of any kind is not a toy, and the bullet from a .22 Long Rifle cartridge can cause death or serious injury at a great distance. It is for this reason that 22 Long Rifle ammunition boxes bear the warning "Dangerous within one mile."

When shooting you are responsible for the safety of your companions, yourself, and anyone else who may be within range. Always observe the following rules : —

1. Keep the action of your rifle open at all times, except when actually firing.
2. When you arrive at the range, take your rifle from its case, open the action, and place the rifle in the rack.
3. Never, under any circumstances, point your rifle at anyone.
4. Observe range safety rules at all times, and obey firing line commands promptly.

Whenever two or more riflemen are shooting, someone should be appointed as Range Officer. The Range Officer controls all activity on the range, and his orders are to be obeyed implicitly.

It is especially important that the firing line be controlled during casual club shooting and practice sessions. No one is to be permitted ahead of the firing line at any time without the Range Officer's permission. No one is to commence firing, collect fired targets or put up fresh targets except as permitted by the Range Officer.

Firing line commands must be clearly understood. They should be short and to the point. By following the regulation commands and procedure misunderstanding will be avoided.

The series of firing line commands is as follows : —

1. "Relay No._____ on the firing line." The shooters take the places allotted to them, arrange their equipment, and get into shooting position with their rifles still open and unloaded.

2. When everyone appears to be in position the Range Officer will ask "Is the line ready?" If someone is not ready, he should hold up his hand and call "Not ready on number_____." The Range Officer announces "The line is not ready!"
3. When all are ready the Range Officer announces "The line is ready!"
4. After a short pause the Range Officer warns "Ready on the right, Ready on the left."
5. Then the command "Load, and commence firing" is given.
6. When everyone has finished firing, or the proper time for firing has elapsed, the Range Officer commands "Cease Firing!" followed by "Actions open, clear the firing line."

Any time during shooting the Range Officer may have to command "Cease Firing !" All shooters must stop shooting at once, and open their rifle actions.

In addition to the regulation commands above, clubs may introduce additional short commands for extra control of the range where required.

CHAPTER FIVE

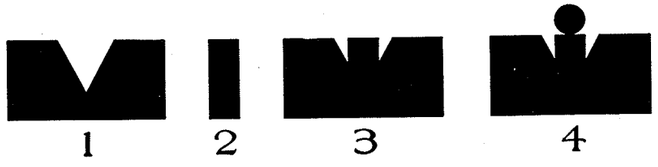
Sights

There are four general types of rifle sights : telescope, open, aperture rear with post front, and aperture rear and front.

The telescope sight gives a definite advantage in aiming but this type is not permitted in Sporting Rifle competition.

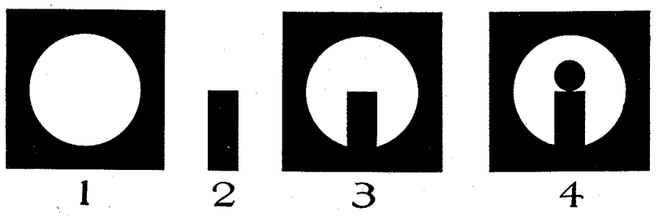
OPEN SIGHTS

These sights consist of a post or bead front sight and a V or U-notch rear sight. Although they are the most common type and are widely used for hunting, they are the least satisfactory for target shooting. When aiming at a target three objects must be lined up — the rear sight, the front sight, and the target. Your eye is unable to focus on all three simultaneously, so that either the target or the sights will be blurred. It is best to focus on the front sight, and get the best definition you can of its position with relation to the back sight and the target.



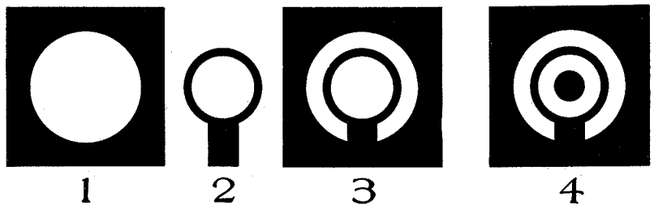
Plates show the correct sight picture. Note the bulls-eye should appear to be sitting on top of the front sight. If you try to hold in the centre of the black bulls-eye you will not be able to see the sights properly.

APERTURE REAR AND POST FRONT SIGHT



This combination is much better than open sights. You do not focus on the rear sight, but only look through it. The eye tends to centre itself and you only have to concentrate on the front sight and the target. It is necessary that the front sight be seen clearly.

APERTURE REAR AND FRONT SIGHTS



This is the best combination for target shooting. The front sight and target can be seen clearly, so that any error in sighting is easily observed and corrected.

THE SIGHT SYSTEM

Each shooter should select the arrangement of front and rear apertures that is best for him. Eyesight varies from person to person, and sights that give one shooter a good clear sight picture may appear blurred to another shooter.

The use of a rear aperture can increase the eye's depth of field so that both the front aperture and the bulls-eye may be brought into focus at once. To aim, look through the rear aperture and check that the hood of the front sight is centred. If it is not, correct the head position. Then look at the front aperture and place it around the bulls-eye.

While aiming, a large amount of movement or "wobble" of the front sight will probably be seen. So long as this movement is consistent, reasonable scores will be obtained. Through practice the amount of movement can be reduced. Efforts to stop the movement, or to fire the rifle at a certain point will, however, almost certainly result in a wild shot.

The size of the front aperture should be one that gives a clear ring of white around the bulls-eye, and allows the bulls-eye to stand out clearly on the white background. As a general rule, the line of white should appear to be almost ¼ the width of the bulls-eye.

Many shooters make the error of using an aperture that gives just a hair-line of white around the bulls-eye. The result is eye strain, false sight pictures, and lost points.

Light conditions affect aperture size. Changing front sight inserts and varying the position of the rear sight can help in obtaining a good sight picture.

CHAPTER SIX

Principles of Shooting

Position is the relationship of the shooter's body, arms, legs, and head, plus the rifle, to the target. If the same position is taken for every shot the rifle will automatically point to the same place each time. By adjusting the position the rifle will naturally point to the target.

The left elbow is the keystone of a good position, and is the point around which all adjustments should be made. Once placed in location, the left elbow should not be moved during firing of a target.

A correct position is comfortable, and there should not be strain or tension on any part of the body.

Holding means control of the rifle by means of bone support and a firm, but relaxed, grip with the hands. Uniform placement of the butt on the shoulder, and even pressure of the face on the stock contribute to good holding.

Breathing, or proper breath control, reduces tension in the chest area, provides an adequate supply of oxygen, and cuts down on the wobble of the rifle. Two or three full breaths with a deep exhalation just before the trigger is squeezed will do the trick. The breath should not be held in nor out, but rather there should just be a long pause between breaths.

Aiming has been discussed under "The Sight System". Tenseness must be avoided in this principle as well as all others. The head position should be high enough so that the shooter can look nearly directly forward out of the eye socket. Do not hold the aim any longer than is absolutely necessary. A tired eye will give you an incorrect image of your sights and the target, so avoid any tendency to "admire the sight picture".

Trigger Control is one of the most important principles, if not the most important. The Sporting Rifle trigger with a 3-lb. pull requires an even, firm pull, or rather squeeze. It will be generally found best to place the index finger of the right hand well onto the trigger so that the pressure is taken on the firm inside of the first joint, rather than on the fleshy pad of the finger-tip.

Concentrate on an even pressure and avoid pulling the trigger when the sights look right. The result of "trigger pulling" is shots well out of the group, generally low and right, about 4 or 5 o'clock. Even though the front sight may be moving around the bulls-eye at a great rate, good trigger control will give you reasonable targets, without any score-destroying wide shots.

Do not feel you have to fire a shot every time aim is taken. An important part of trigger control is learning not to fire a shot when the sight picture blurs, or the breath becomes short. Then is the time to put the rifle down, take a short rest, and start over again.

Follow-through is as important to good rifle shooting as it is to any other sport. When firing, concentrate on a correct sight picture and on good trigger control. The rifle will usually fire unexpectedly, and your shots will be good. Hold your aim for a few seconds after the shot and see where the sights settle on the target. If everything is correct they should return to one position. Remember your sight picture at the instant the shot was fired, and try to "call" where each shot goes on the target.

An even trigger pressure and good follow-through mean 10's !

SHOOTING POSITIONS

Correct position is the foundation upon which good scores are built. Any strain or muscular effort to pull the rifle onto the target will mean a poor score. As a general rule, when shooting the Sporting Rifle, the weight of body and rifle should be balanced and supported by bones rather than by muscles.

The basic principles of shooting apply to all positions ; prone, sitting, kneeling and standing. Observance of these principles is necessary for the highest scores, and to avoid disappointment when learning to shoot in the more difficult positions.

The shooting positions illustrated in this booklet are known as the "standard". It is suggested they be followed until a high level of scores has been obtained, when variations can be tried if felt necessary.

PRONE

Angle the body to the left enough to permit the rifle to be held almost over the left elbow, or within two inches of being over it. Put the left elbow in one spot, and leave it there. The legs may be comfortably spread, and the right knee may also be drawn up slightly. Place the right elbow out to the side so the right arm forms a brace. The weight of the shoulders should be evenly distributed between the right and left elbows.

The fore-end of the rifle should be rested on the heel of the hand and across the palm, so that the rifle is supported by the bones of the forearm. A firm grip is taken with the fingers of the left hand.

Avoid placing the hand extremely far forward on the fore-end, as muscles must then be used for support.

The right hand grip is best described as a firm handshake with the rifle. If the pistol grip shape permits, place the thumb across the grip for added control. Hold with the hand far enough forward to that the finger is properly located on the trigger.

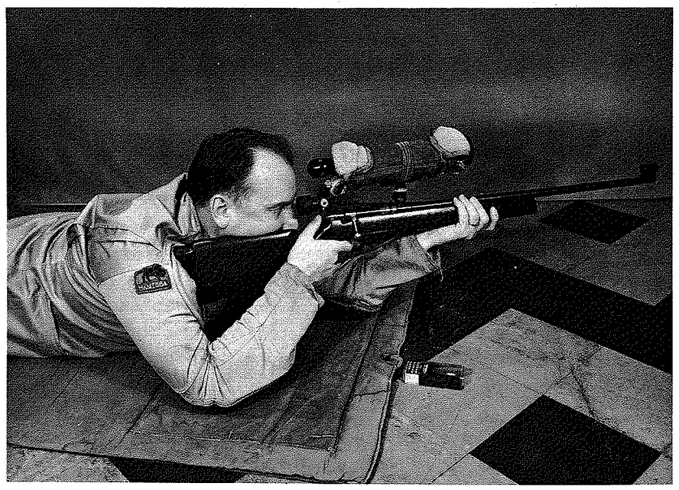
Place the rifle butt well inside the shoulder, and have the butt well up. Rest the head on the comb of the stock, located so the eye is in line with the sights. Do not try to hold the head up, or push hard against the stock.

The rifle probably points somewhere other than on the target, so pivot the legs, body, and right elbow around the left elbow to bring it into line. If the rifle points too high, move the left hand forward slightly. Should even more adjustment be needed, keep the elbows in place and more the body forward.

To raise the point of aim, move the left hand back, or move the body to the rear.

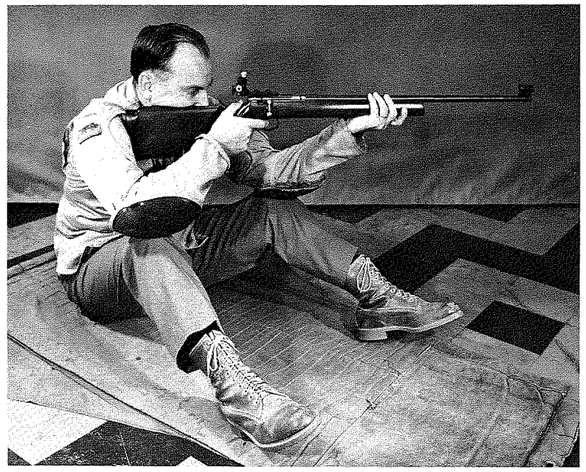
Keep adjusting the position until the rifle automatically points at the proper bulls-eye, and you are then ready to shoot.

On targets with more than one bulls-eye minor position adjustments should be made for each bulls-eye. In addition, you may find that correction is needed while shooting at a single bulls-eye. If so, make the adjustment and don't try to get away by holding the rifle into place with the muscles.

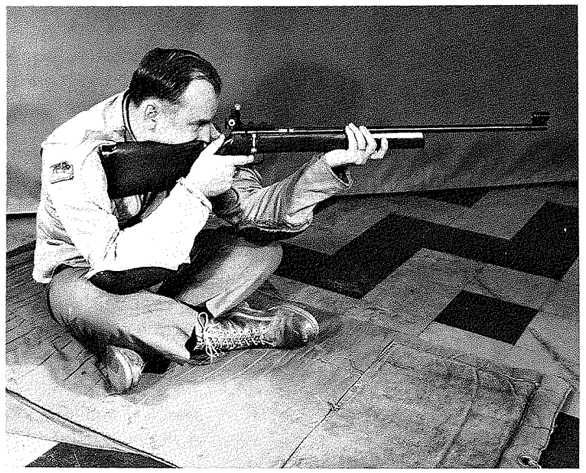


SITTING

For field use sitting will be found to be a very steady and practical position. There are several variations, the Open-Legs, Crossed-Ankles, and Crossed-Legs being most common.



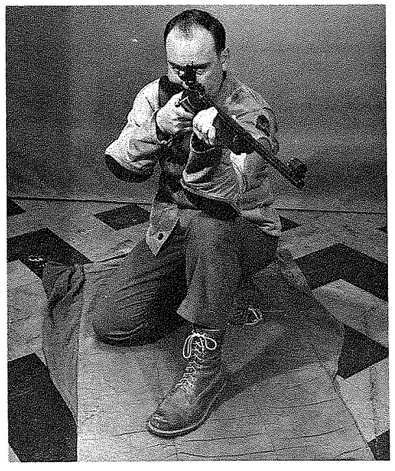
In the Open-Legs position the shooter sits facing slightly to the right of the target, with knees drawn up to support the elbows. The left leg should be under and in line with the left arm, the elbow resting on or below the left knee. The right elbow rests on or below the right knee.



The Crossed-Legs and Crossed-Ankles positions are similar to each other. The elbows are placed on the inside of the knees, the body leaning forward.

KNEELING

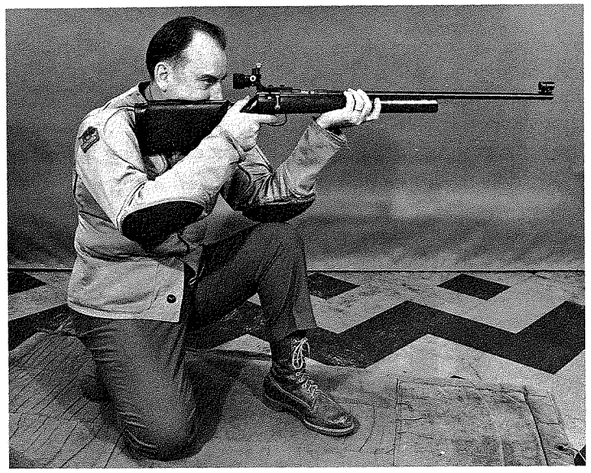
This position is perhaps the most challenging of all, and requires constant attention to principles. Expert shooters are now shooting kneeling scores almost equal to their prone scores. There are two variations of this position, "high" and "low" ; the "high" position illustrated is considered basic and is based upon bone support and balance.



The shooter faces about 45 degrees to the right of the target and sits on his right heel. The right foot is kept vertical, and the kneeling roll is placed under the instep.

Almost all of the body weight is supported by the right heel, the ankle and the kneeling roll, and the body is kept fairly upright and is balanced over the kneeling roll.

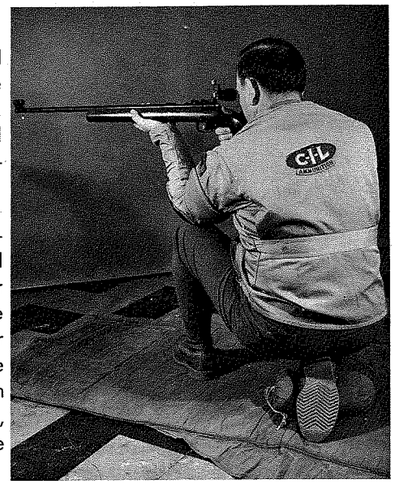
Only the left leg, left elbow, and rifle are supported by the left foot. The left ankle and left shin bone are kept vertical.



The right knee carries little weight, and barely touches the floor.

The left elbow should be placed solidly on the left knee, and the left arm balanced so there is no muscular strain or effort needed to hold the arm and rifle in position.

The right arm and elbow are allowed to take a natural position, without tensing the muscles.

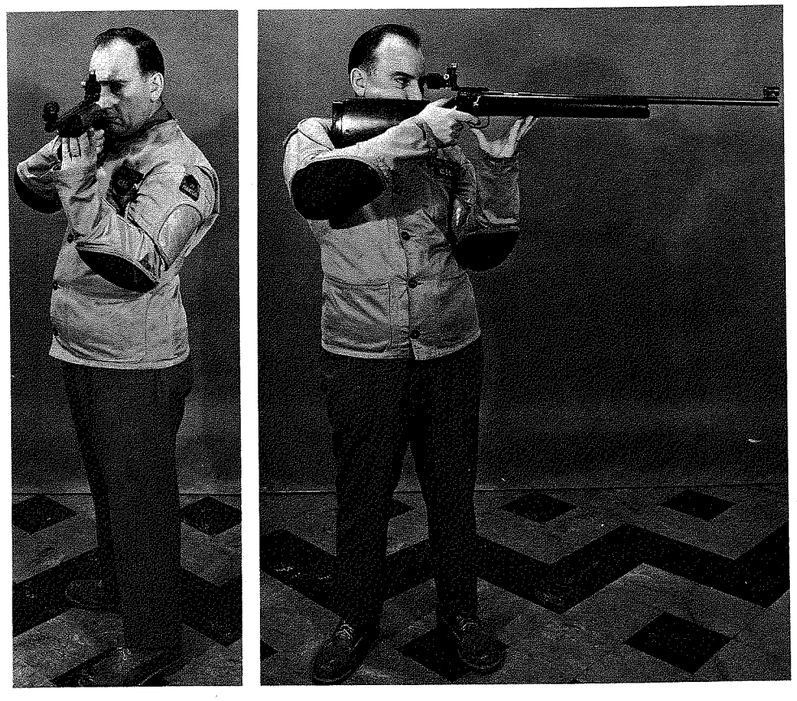


This high kneeling position will likely feel very unsteady until the shooter has been able to find through practice exactly what small adjustments he has to make to obtain balance and steadiness.

Uniform trigger control is essential to good kneeling scores, and any tendency to pull the trigger when the sights are on must be resisted. Keep the weight well over the supporting heel, balance the position, try to obtain uniform movement of the rifle and sights, then apply gradual pressure to the trigger, and follow through !

STANDING

By using full support of the body's bone structure, and finding a point of balance, the shooter can make his rifle point regularly to one place. It will also be found that movements of the rifle will be more or less regular and be centred around the same place. Good standing scores are obtained by taking exactly the same position for each shot, and by controlling the natural movements of the rifle.



The shooter stands facing almost directly to the right of the line of fire, left side toward the target. The feet are placed naturally, spaced about shoulder width apart.

Support for the rifle is given by dropping the left elbow until it contacts the body, and the left upper arm is against the rib cage. The rifle is rested on the fingers and thumb of the left hand.

Keeping the legs straight, the shooter bends slightly backward to balance the body and rifle. Weight is almost evenly distributed on both feet.

It is necessary to keep the head erect, and the rifle butt will likely have to be placed higher on the shoulder than is normal. Adjust the position of the left hand to regulate the elevation of the rifle barrel, and move the feet to change direction to one side or the other.

A firm hold should be taken with the right hand, but the grip or right arm must not be strained. Make certain the finger is properly placed on the trigger so that the pull is directly in line with the rifle.

It is essential that any changes in direction be obtained by movement of the feet or left hand, and not by attempting to "muscle" the rifle onto the target. Make certain the left arm bones and chest are supporting the rifle, and avoid any tendency to hold the rifle up with the left arm muscles.

Control of body sway is obtained by a slight tensing of the leg and body muscles, but there should not be real strain in any part of the body. The body and rifle are balanced over the supporting feet, and the shot should be fired without disturbing this balance.

As in the kneeling position, try to obtain a uniform movement of the rifle and sights, apply gradual pressure to the trigger, and follow through !

CHAPTER SEVEN

Grouping and Sight Adjustment

GROUPING

While you are learning to shoot, the size of the groups your bullets make is more important than the actual scores obtained. Your efforts should be directed towards obtaining small groups.

When a shot does go wide of the group, try to discover the reason and correct the cause so as to avoid a repetition. It will be found that concentrating on the follow through will allow you to "call" the location of shots as they are fired. Analyze each group, and you will soon eliminate any score-reducing wide shots.

SIGHT ADJUSTMENT

To obtain the best possible score the bullet group must be centered on the 10-ring. The only correct way to change the location where bullets hit on the target is by moving the sights. It is possible to hold off in the right direction of course, but you cannot aim exactly the same for every shot.

Sights used for target shooting should have convenient and accurate adjustments for elevation (up and down), and for windage (side to side). Target sights with screw adjustments (micrometer type) are graduated in minutes of angle. A minute of angle almost exactly equals one inch at 100 yards, half an inch at 50 yards, and one fifth of an inch at 20 yards. Each minute of angle graduation is further divided by click-stops. These "clicks" may vary in value on different models of sights. Anschutz sights move 1/6 of a minute per click, while the movement on Lyman and Redfield "Olympic" sights is 1/4 of a minute.

The rule to remember for sight adjustment is "Move the rear sight in the direction you want your shots to go". As an example, if the centre of your group is low and right, in the 8-ring at 4 o'clock, the rear sight must be moved to the left and up.

When sighting-in your rifle, fire at least three shots to locate the group centre before the sights are adjusted. After they have been moved, fire at least three more shots to check that the adjustment was correct. If an adjustment is made from only one shot, it is probable that your group will not be properly centered. Remember too, use the centre of your group to decide the amount of sight adjustment needed rather than one or two good shots, or poor shots, as the case may be.

It will be found that there is only a slight difference in the sight elevation settings for 20 yards and 50 yards. The difference between 50 yards and 100 yards is approximately 6 1/4 minutes. An adjustment on the Anschutz 1/6 minute sight would therefore be about 40 "clicks", while sights graduated in 1/4 minutes would be moved about 25 "clicks". The actual amount of adjustment depends on the velocity of the ammunition being used, the distance between front and rear sights, and the true value of the sight graduations.

Adjustment of open sights is generally quite a problem, as they do not have provision for exact movement. The step elevators on most open rear sights give large changes in elevation, and finer changes can be obtained only by filing down the rear sight notch to lower the point of impact, or filing down the front sight to raise the point of impact. Sideways adjustment can be obtained by driving either the rear sight or the front sight to one side or the other. Note that movement of the front sight for adjustment must be opposite to movement of the rear sight.

It is strongly recommended that open sights be replaced by good, adjustable, and more accurate aperture sights.

WIND AND LIGHT

Even a light breeze can blow a bullet sideways off course, and the effects of wind must be considered when shooting at 50 yards and 100 yards.

The direction and strength of wind both influence bullets in flight and govern the amount of sight adjustment needed to compensate for this bullet movement.

Direction is considered the most important of these two factors. A 45 degree increase in angle of wind direction will have the same effect as a doubling of wind strength, but the change in direction will be much less noticeable. In other words, a change in wind direction from 1.30 o'clock to 3 o'clock has the same effect as an increase in wind velocity from ten miles per hour to 20 m.p.h.

If we attempt to shoot while the wind is changing direction or changing speed and do not make allowance for these changes our shots will be strung out horizontally. Should an attempt be made to adjust the sights for each wind change the results will very likely also be unsatisfactory.

It is considered best to determine the average direction and strength of the wind, and then fire with the wind blowing from this one direction at the same velocity for each shot.

With aperture sights changes in light have little effect on sighting, except where the changes are extreme. A front sight aperture needed for shooting at a target in bright, direct, sunlight may be different from that needed for a shaded target on a dull day. Indoor range lighting usually requires a different aperture size from that used outdoors.

TO FIRE YOUR FIRST TARGET

Before firing a shot make certain that you know all of the regulations and safety rules in effect on the range. If you are not shooting on a regular range, be sure to follow the range procedures described in this booklet.

Clean all oil or grease from the rifle bore, and remove any excess oil from the action and outside of the rifle. Check the sights and their mounting screws.

Following the instructions in the chapter on Shooting Positions, lie down in the Prone position with your rifle unloaded. Check that your position appears to be correct and that the rifle naturally points at the target. Then you can load and fire, keeping the basic principles in mind.

Fire five shots, then check their location on the target. Make any sight adjustment needed to center the group on the 10-ring, and then fire another five shots to check the sight adjustment.

Don't rush while shooting, but do take time to fire each shot as nearly correctly as you can.

By following the principles described in this booklet during shooting practice, you will soon realize a rewarding improvement in your scores.

CONCLUSION

In this booklet we have outlined, step by step, the procedures to be followed in becoming a competent marksman. If, after a reasonable amount of practice, your scores have not reached a satisfactory level, re-read this booklet and review your own shooting. Check each step carefully to discover what you are doing incorrectly. Then practise the correct manner until it becomes a habit.

You will find that shooting against yourself, trying to better your score on each target, helps improve your score. Competing against others, particularly those who are better shooters than yourself, results in a more rapid score improvement and adds to the sport and pleasure of target shooting.

GOOD LUCK
AND
GOOD SHOOTING

The Ten Commandments of Safety

1. Treat every gun with the respect due to a loaded gun. This is the cardinal rule of gun safety.
2. Carry only empty guns, taken down or with the action open, into your automobile, camp, and home.
3. Always be sure that the barrel and action are clear of obstructions.
4. Always carry your gun so that you can control the direction of the muzzle even if you stumble.
5. Be sure of your target before you pull the trigger.
6. Never point a gun at anything you do not wish to shoot.
7. Never leave your gun unattended unless you unload it first.
8. Never climb a tree or a fence with a loaded gun.
9. Never shoot at a flat surface or the surface of water.
10. Do not mix gunpowder and alcohol.