SERVICE RIFLE MARKSMANSHIP GUIDE

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FORWARD

TO ALL POTENTIAL SERVICE RIFLE CHAMPIONS!

1. The Service Rifle Marksmanship Guide presents proven techniques used successfully in service rifle competition. Techniques described and ideas discussed represent the collective thinking of United States Army medal winners from past interservice and national champions, and other service rifle events. The primary objective of this guide is to help improve competitive performance.

2. Marksmen have different shooting backgrounds; they differ physically and mentally. However, most champions are similar in that they have developed techniques to meet their personal needs and can clearly analyze their own performance. The information and ideas presented in this guide should not be taken as the final word nor the only solution to successful service rifle shooting. Rather, the techniques should be viewed as tools to guide your development as a service rifle shooter. Use this guide to help you develop your own shooting technique and as an aid in learning how to analyze your own performance. Mastering these two skills is the key to gold medal performance.

3. This guide is intended for the shooter who is seriously interested in attaining his or her full potential as a service rifle marksman. For simplicity, the text is written in a manner that pertains to right-handed shooters. Likewise, whenever the masculine gender is used, the text applies to both male an female shooters. You are invited to send comments and suggested improvements directly to: Commander, USAMU, 7031 Bills Street, Fort Benning, GA 31905-3103.

DONALD L. HEUMAN
Service Rifle Coach

ROBERT I. HOIDAHL, JR.
COL, IN
Commanding

INTRODUCTION

In 1956, President Dwight D. Eisenhower ordered the United States Army to establish the Marksmanship Training Unit at Fort Benning, Georgia. President Eisenhower felt it was of great importance to improve this country's status in world competition and the U.S. Army's status in national competition. The mission of the USAMU was to compete and win in interservice, national, and international competition and improve the marksmanship skill of the U.S. Army.

Since its inception, the personnel of the Service Rifle Section have studied the techniques of service rifle shooting and formed a nucleus of competitive talent. Its personnel have been instrumental in successfully representing their country and service and in teaching their methods to newer shooters everywhere. Since 1956, this section has traveled worldwide providing marksmanship clinics to military units, ROTC shooting teams and competitors at the National Matches at Camp Perry, Ohio.

There is no substitute for knowledge and experience in marksmanship. Proficient marksmanship is the result of good coaching combined with long hours of practice and hard work. A good instructor and coach will call on experience to aid him in his job-giving his team the advantage of everything he has learned.

CHAPTER 1

SAFETY

1-1. PURPOSE

Safety is the single most important factor in the sport of shooting. The following rules must be followed to ensure safe use of your competition firearm. These rules have formed the foundation of years of safe, enjoyable target shooting. Shooting has a reputation of being a very safe sport. It will continue to enjoy that reputation only as long as shooters keep safety as their primary concern.

1-2. SAFETY RULES

Safe handling of any firearm is critical. If proper weapons handling procedures are not used, a Shooter risks their safety and the safety of others. A Shooter must react quickly, safely, and be mentally prepared for shooting. To ensure only the intended target is engaged, a Shooter must apply the following safety rules at all times.

(Rule 1) Treat every weapon as if it were loaded. When a Shooter takes charge of a firearm in any situation, he must treat the weapon as if it were loaded, determine its condition, and continue applying the other safety rules.

(Rule 2) Never point a weapon at anything you do not intend to shoot. A Shooter must maintain muzzle awareness at all times.

(Rule 3) Keep your finger straight and off the trigger until you are ready to fire. A target must be identified before taking the weapon off safe and moving the finger to the trigger.

(Rule 4) Keep the weapon on safe until you intend to fire. A target must be identified before taking the weapon off safe. This rule is intended to eliminate the chance of the weapon discharging by accident (e.g., brush snagging the trigger).

FOR ADDITIONAL WEAPONS SAFETY ENSURE:

a. **The gun is safe to operate.** Just like other tools, rifles need regular maintenance to remain operational. Regular cleaning and proper storage are a part of the rifle's general upkeep. Never knowingly attempt to fire a damaged rifle. This could

lead to serious injury. If there is any question concerning a rifle's ability to function, a knowledgeable gunsmith should look at it.

b. **You know how to use the rifle safely.** Before handling a rifle, learn how it operates. Know how to safely open and close the action and remove any ammunition from the rifle or magazine. Get familiar with the basic parts. Using the owner's manual, learn to disassemble and re-assemble the rifle. Remember that a rifle's mechanical safety device is never foolproof. Nothing can ever replace safe gun handling.

c. **Use only the correct ammunition for your rifle.** Only BBs, pellets, cartridges, or shells designed for a particular gun can be fired safely in that gun. Most rifles have the ammunition type stamped on the barrel. Ammunition can be identified by the information printed on the box and on the case head. Do not shoot the rifle unless you know you have the proper ammunition.

d. **You wear eye and ear protection as appropriate.** Rifles are loud and the noise can cause hearing damage. They can also emit debris and hot gas that could cause eye injury. For these reasons, shooters and spectators should wear shooting glasses and hearing protection.

e. **You never use alcohol or drugs before or while shooting.** Alcohol and other drugs are likely to impair normal mental and physical bodily functions. The combination of alcohol or drugs with guns is a dangerous mix.

f. **You store rifles so they are not accessible to unauthorized people.** Several factors should be considered when deciding where and how to store your rifles. Your particular situation will be a major part of the consideration. Safe and secure storage requires that untrained individuals (especially children) be denied access to your firearms. Keep them under lock and key and never store weapons and ammunition together.

1-3. SUMMARY

Practice safe gun handling to make it a habit. Never take short cuts when it comes to safety. Insist those around you follow these rules. Be aware that certain types of weapons and many shooting activities require additional safety precautions.

CHAPTER 2

PRINCIPLES OF SHOOTING

2-1. GENERAL

In order to hit a target with a bullet fired from a rifle, the competitor essentially has to do just two things:

a. Point the rifle at the target (sight alignment).

b. Fire the rifle without moving it (trigger control).

These two steps are the two principles of shooting. They apply to all competitive bulls-eye shooting, regardless of the event or type of rifle used. The process used to accomplish those two things is called the principles of shooting.

Principles vs. techniques. As you practice and study competitive shooting, you will notice there are many techniques used successfully to accomplish a given task. Principles, however, are the same for everyone, every time.

At the United States Army Marksmanship Unit, we teach the two principles: sight alignment and trigger control.

2-2. AIMING

Aiming is the process a competitive shooter uses to point the rifle at the target. Aiming is comprised of sight picture and sight alignment.

2-3. SIGHT ALIGNMENT

Sight alignment is the relationship between the front sight post and rear sight aperture and the aiming eye. This relationship is the most critical to aiming and must remain consistent from shot to shot. To achieve correct sight alignment (Figure 2-1) center the tip of the front sight post vertically and horizontally in the rear sight aperture. Imagine a horizontal line drawn through the center of the rear sight aperture. The top of the front sight post will appear to touch this line. Imagine a vertical line drawn through the center of the rear sight aperture. The line will appear to bisect the front sight post.

Importance of correct sight alignment. A sight alignment error results in a

misplaced shot. The error grows proportionately greater as the distance to the target increases. An error in sight picture, however, will remain constant regardless of the distance to the target.

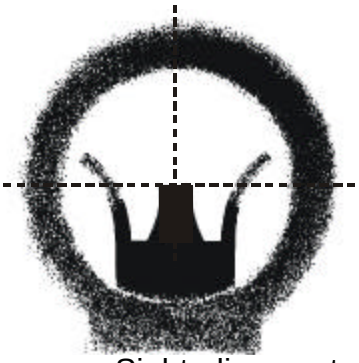
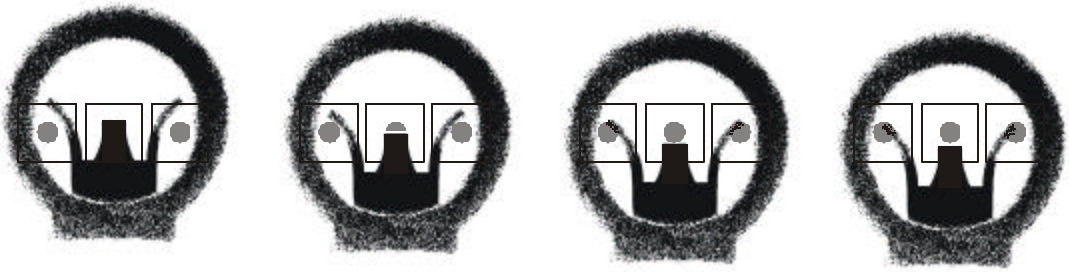


Figure 2-1 Sight alignment

2-4. SIGHT PICTURE

Sight picture is the placement of the tip of the front sight post in relation to the target while maintaining sight alignment. Correct sight alignment but improper sight placement on the target will cause the bullet to impact the target incorrectly on the spot where the sights were aimed when the bullet exited the muzzle. Figure 2-2 shows some sight picture techniques commonly used by successful Shooters. Regardless of which sight picture technique used, it must be done consistently from shot to shot.



Frame hold **Center mass** **6 o'clock hold** **Line of white**

Figure 2-2 Sight picture techniques

2-5. EYE DOMINANCE

Most Shooters have a dominant eye, one that is stronger than the other. In order for you to aim precisely, you must use your dominant eye. An easy way to determine

your dominant eye is to hold your hands out with the fingers extended and joined, thumbs extended out to the sides. Overlap your hands at a 90-degree angle until a small window is made with your thumbs. Place your hands out at arms length and look through the opening in your thumbs at an object (Figure 2-3). Without squinting or closing either eye, bring both hands to your face while maintaining visual contact with the object. The hole will move to your dominant eye as your hands reach your face. If you are still not sure, simply have another individual stand back from you at least 15 ft and look at their face through the hole in your hands. They will be able to see your dominant eye through the hole. It is not uncommon for about 20% of any group to find that they are cross dominant. Many Shooters are successful using shooting right or left handed in order to aim with their dominant eye. Although it may seem awkward at first, it is possible to change your firing hand in order to use your dominant eye.

Figure 2-3 Determining the dominant eye

2-6. POINT OF FOCUS

The eye can only focus on one object at a time. Given two sights and a target, the Shooter has several things to look at while aiming. The technique we recommend is to focus on the tip of the front sight while maintaining sight alignment. This technique has

provided Army shooters with the most consistent results in competition. While the process of aiming requires the Shooter to shift focus to identify the target, achieve a good sight picture and sight alignment, the final focus at the instant the rifle fires should be on the tip of the front sight post ensuring that you have maintained sight alignment. Most beginners have a tendency to want to focus on the target. After all, that is what they are trying to hit. This technique results out of focus front sight, mis-alignment of the sights and inconsistent aiming. With practice, the beginner will notice dramatically better scores when your focus is concentrated on the front sight and sights that are aligned.

2-7. USE OF A BLINDER

Your non-aiming eye will receive distracting visual stimulus unless it is closed or covered. We recommend the use of a blinder, which is a neutral colored material positioned in front of the non-aiming eye. The blinder should be far enough away from the eye to allow ambient light to enter, but close enough to block the image of the front sight and target. The eyes work together. If one eye is closed or covered, the other will compensate by over dilating. Allowing ambient light to enter the non-aiming eye and a neutral color blinder allow the aiming eye to operate most efficiently.

2-8. TRIGGER CONTROL

Now that you understand how to properly point the rifle at the target, the next task is to fire the rifle without disturbing that alignment. We choose to refer to this process as trigger control because that is exactly what you are doing, controlling the trigger. When shooting, you control where the rifle is pointing and when it fires by deliberate movement of the trigger.

Trigger control is the skillful manipulation of the trigger straight to the rear that causes the rifle to fire without disturbing sight alignment or sight picture. Manipulating the trigger requires a mental and physical process. Controlling the trigger is a mental process, while pulling the trigger straight to the rear is a physical process.

Two types of trigger control:

a. **Uninterrupted Trigger Control.** The preferred method of trigger control in a combat environment is uninterrupted trigger control. After obtaining sight picture, the Shooter applies smooth, continuous pressure rearward on the trigger until the shot is fired.

b. **Interrupted Trigger Control.** Interrupted trigger control is used at any time the sight alignment is interrupted or the target is temporarily obscured. An example of this is extremely windy conditions when the weapon will not settle, forcing the Shooter to pause until the sights return to his aiming point. To perform interrupted trigger control: move the trigger to the rear until an error is detected in the aiming process. When this occurs, stop the rearward motion on the trigger, but maintain the pressure on the trigger, until the sight picture is achieved. When the sight picture settles, continue the rearward motion on the trigger until the shot is fired.

Resetting the Trigger. During recovery, release the pressure on the trigger slightly to reset the trigger after the first shot is delivered (indicated by an audible click). Do not remove the finger from the trigger. This places the trigger in position to fire the next shot without having to reestablish trigger finger placement.

2-9. FINGER PLACEMENT

a. **Grip.** A firm grip is essential for effective trigger control. The grip is established before starting the application of trigger control and it is maintained through the duration of the shot. To establish a firm grip on the rifle, position the "V" formed between the thumb and index finger on the pistol grip behind the trigger. The fingers and the thumb are placed around the pistol grip in a location that allows the trigger finger to be placed naturally on the trigger and the thumb in a position to operate the safety. Once established, the grip should be firm enough to allow manipulation of the trigger straight to the rear without disturbing the sights.

b. **Trigger Finger Placement.** Correct trigger finger placement allows the trigger to be pulled straight to the rear without disturbing sight alignment. The trigger finger should contact the trigger naturally. The trigger finger should not contact the rifle receiver or trigger guard. The place where the index finger contacts the trigger is individually based. Competitors with short fingers will have the first meaty portion of their finger on the trigger, while competitors with long fingers may have up to the second joint of the index finger in contact with the trigger. A proper hand position is achieved when the wrist is not bent at an unusual angle, but remains in-line with the firing arm.

2-10. INITIAL PRESSURE

Taking up the "slack" or applying initial pressure to the trigger is also an integral part of trigger control. This means that you apply some pressure to the trigger from the start, taking up the mechanical slack or creep in the trigger. Improper trigger control will disturb the rifle during firing. Begin applying initial pressure as you acquire your

target, and as your final focus goes to your front sight you should be causing the weapon to fire by pulling the trigger smoothly and straight to the rear.

2-11. FOLLOW-THROUGH AND RECOVERY

a. **Follow-through.** The continued application of the fundamentals until the round has exited the barrel. In combat, follow-through is important to avoid altering the impact of the round by keeping the rifle as still as possible until the round exits the barrel. As in other sports, follow-through completes the action and ensures proper form. In shooting, follow-through is continuing to aim and apply pressure to the trigger after the rifle fires. Follow-through prevents anticipating the shot and movement prior to the bullet leaving the barrel. How long the shooter must follow-through may vary from one shooter to another. One to three seconds (about the time it takes to recover from recoil) is typical.

b. **Recovery.** It is important to get the rifle sights back on the target for another shot. This is known as recovery. Shot recovery starts immediately after the round leaves the barrel. To recover quickly, a shooter must physically bring the sights back on target as quickly as possible.

CHAPTER 3

INDIVIDUAL EQUIPMENT

3-1. GENERAL

An understanding of one's shooting equipment, how it is properly employed, and how to care for it can greatly increase your performance on the range. This section includes a brief description of the various items found in a typical shooter's kit.

3-2. SHOOTING ACCESSORIES (Figure 3-1)

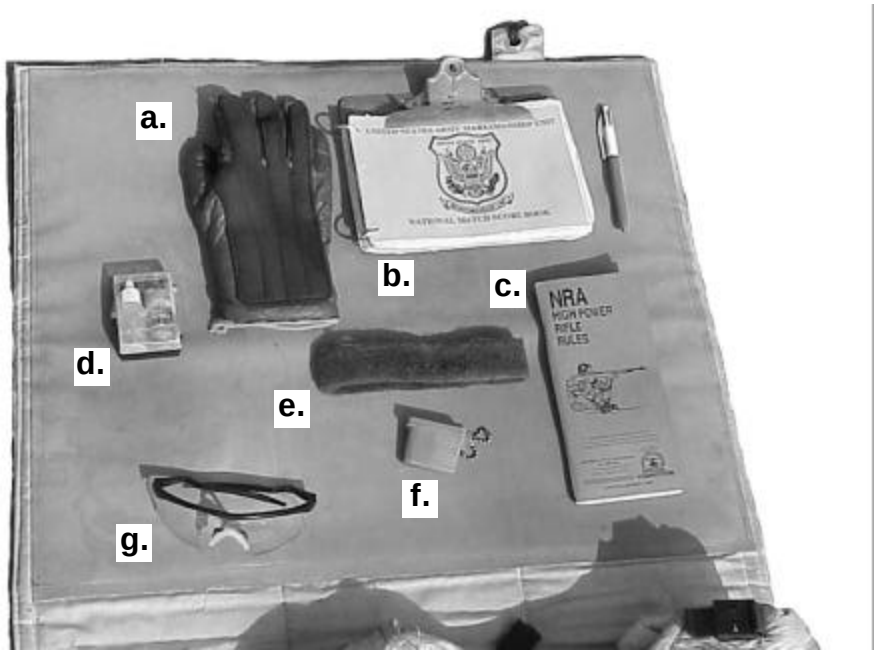


Figure 3-1 Shooting accessories

a. **Shooting Glove.** The shooting glove provides a cushion between the hand and the rifle sling. The two types of gloves normally used are full-fingered and open fingered mitts, which contain padding and rubber to prevent slippage. A specially designed shooting glove is not necessary; a military leather glove will suffice.

b. **Score/Plot Book.** The score/plot book is a valuable learning tool that is used to record your rifle's zeroes, the conditions at the time of firing, and an accurate plot of

your shots. In short, everything that occurs on the range should be annotated in this book.

c. **Rule book.** Every competitor should know the rules. Always keep an NRA rule book in your shooting stool.

d. **Carbide Lamp.** The carbide lamp is used to blacken the rifle's sights, which reduces glare. In the absence of a carbide lamp, a butane lighter, or burning plastic spoon will blacken the sights nicely.

e. **Head Band.** A headband is recommended when shooting in hot weather.

f. **Ear Plugs.** Earplugs and or shooting muffs are required equipment while shooting.

g. **Eye Protection.** Eye protection is recommended. Shooting glasses should be clear or a color that makes the target appear to be clearer; dark sunglasses should not be used.

3-3. SHOOTING APPAREL (Figure 3-2)

Figure 3-2 Shooting apparel

a. **Poncho.** Although there are rain covers that are specially designed for shooting equipment, a poncho does an excellent job of keeping your gear dry.

b. **Shooting Hat.** Some sort of headgear should be worn while shooting. A baseball-type cap, or "boonie hat", are the two types normally used.

c. **Sweat Shirt.** A sweatshirt should be worn beneath the shooting jacket for comfort, stability, and to dampen pulse.

d. **Shooting Jacket.** There are many types of shooting jackets, ranging from simple cloth to heavy leather. The primary concern when selecting a shooting jacket should be the fit. Another Shooter, or coach, can assist you in determining the proper size of your jacket. The jacket should not be so tight that you cannot buckle all the front buckles, or that you cannot raise your arms above your head. Nor should it be loose enough to slide on your torso when all the buckles are fully cinched down. Remember to wear your sweatshirt while checking a jacket for fit.

3-4. ADDITIONAL EQUIPMENT (Figure 3-3)

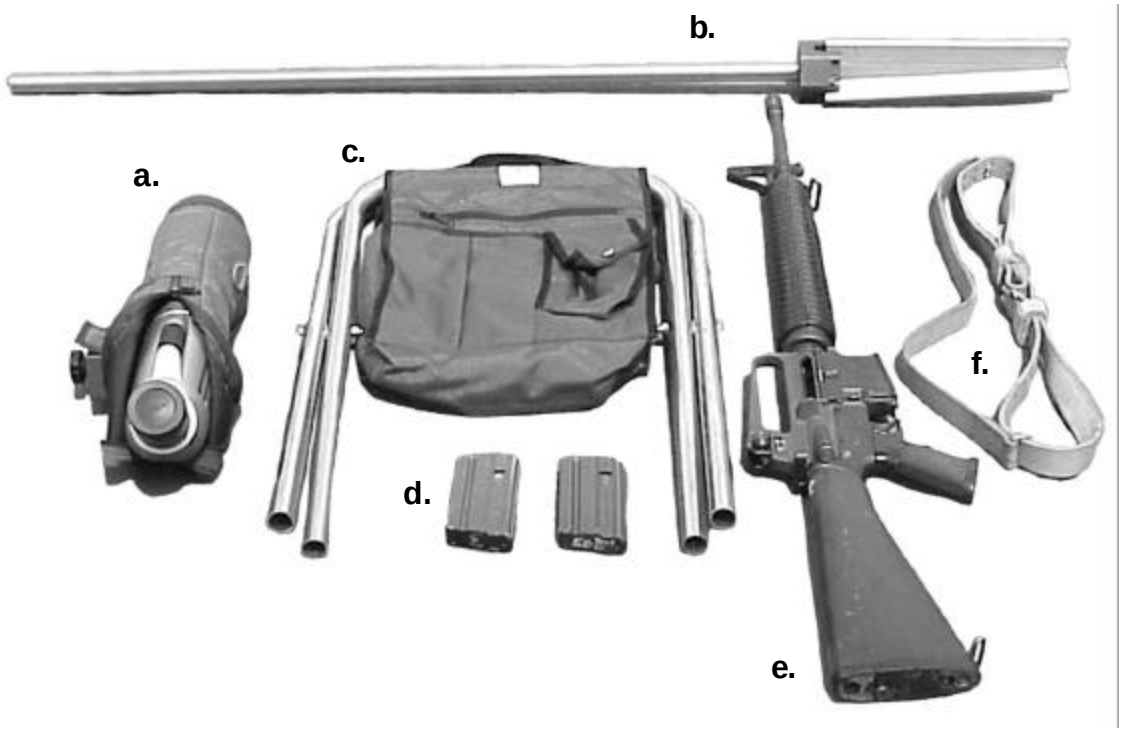


Figure 3-3 Additional equipment

a. **Spotting scope.** It is used to observe the location of target hits, and to determine the wind's effects (see **Chapter 6 Effects of Weather**.) The spotting scope should have a wide field of view and between 20x and 30x magnification. Angled eyepieces allow the Shooter to look through the spotting scope without having to move out of position. Use of the team coach's spotting scope is discussed in Chapter Eight. The spotting scope may not touch the Shooter.

b. **Scope Stand.** There are many types of scope stands, varying in shape and type. It is used to hold the spotting scope. A good scope stand should be both sturdy and portable.

c. **Shooting Stool.** There are commercially manufactured shooting stools available, such as the one pictured above that are specially designed for the purpose. A shooting stool is used to store all of your shooting equipment, ammo, etc., as well as to sit on during scoring.

d. **Magazines.** Twenty round magazines are preferred, as they do not interfere with the various shooting positions.

e. **Rifle.**

f. **Sling.** Most competitors prefer to use a leather "match" sling as it provides more support than a nylon sling. A cotton (web) sling may be used as long as it is in good condition and properly adjusted.

CHAPTER 4

STEADY POSITION FUNDAMENTALS

4-1. GENERAL

Without a consistent, steady position your ability to apply the fundamentals will be limited. There is no "cookie cutter" method for putting competitors into proper shooting positions, because each competitor must be able to build a fundamentally correct position. There may be variations from the way one Shooter's position looks compared to another. Each Shooter is different in body shape, size, and flexibility; but each position must enhance and support aiming and trigger control. In this section you will learn the key elements common to all good positions and how they can be properly used in standing, sitting rapid fire, prone rapid and slow fire.

4-2. HEAD POSITION AND SIGHT ALIGNMENT

For your position to properly support sight alignment you must place your head on the stock the same way for every shot. Your dominant eye should be directly in line with an imaginary plane that runs from the top center of the front sight post through the center of the rear sight aperture. It sounds complicated, but is actually very simple. As you learned previously your eye can find the center of the rear sight (a circle) naturally.

Figure 4-1 Head position

a. First bring the rifle up to your head and let your head fall naturally onto the rifle stock. Your head should be generally erect and level if you were to look at it from either the front or the side (Figure 4-1).

b. Correct vertical placement of the butt stock in the shoulder will allow the rifle to be brought up to your face in a more natural, upright manner. Do not droop your head down to the rifle. Starting with the bottom of the jawbone, drag the firing side of your face in a downward movement across the top of the stock until you are resting the full weight of your head on top of the stock. The side of your face should be in firm contact with the rifle stock.

c. In all positions, your dominant eye should be in line with an imaginary line that runs from the tip of the front sight post directly through the center of the rear aperture. If you look through your sights and notice that you are not looking directly through the rear aperture at the front sight post, your head position on the stock is incorrect. A comfortable, relaxed position is one that can be used effectively. This will only be possible if your head is completely supported by the rifle stock.

Figure 4-2 Eye relief

d. While live firing it is important that your head and the rifle move as a single unit during recoil. If the rifle recoils back separately from the head during firing, a possible result is that the shooter might be hit in the face with the charging handle (hindering good follow-through). Also this critical error in position will change sight alignment

from shot to shot. This can also form bad habits such as anticipating the shot and flinching. To ensure the head and rifle recoil together, the rifle should be firmly placed or pulled into the firing shoulder (not necessarily the pocket), with your head completely supported by the stock. Simply put, the application of sight alignment is correct head position on the stock. Sight alignment, stock weld, and eye relief the distance between your eye and the rear sight aperture can be summed up as the single act of correctly positioning your head on the rifle stock (Figure 4-2). It is common for the distance between the rear sight aperture and the dominant eye to change from position to position.

e. Ideally, your sights should be straight up and down. Canting or tilting the rifle will affect your zero. It is much easier to obtain consistent sight alignment with your sights straight up and down. If you must cant the rifle to achieve a proper head position, the cant must be kept constant.

4-3. STEADY POSITION AND TRIGGER CONTROL

Having a steady position simplifies trigger control. With the sights steady and remaining on target, it is relatively easy to apply smooth rearward pressure on the trigger so as not to disturb sight alignment and sight picture. When you are in a steady position (prone for example) your wobble area will be slow and small. Even a beginner can master trigger control from a steady prone position. If you are shooting from an unstable, wobbly position (such as shooting standing in the wind) the sights appear to move rapidly all over and around the target. A common mistake is to attempt to force a good shot as the sights swing past the target instead of allowing the rifle to settle (however briefly) and utilizing smooth trigger control. Using a proper position and continually refining it reduces the wobble area and makes trigger control easier and easier. Concentrate on building a good steady position by being critical of the characteristics of a steady position.

4-4. CHARACTERISTICS OF A STEADY POSITION

There are three characteristics common to any good position:

a. **Support (bone and artificial).** Bone support is nothing more than properly using the skeletal frame of your body to transmit the stability of the ground into your position. Artificial support is anything external to your own body that you may use to stabilize your position (sling. etc). Maximizing bone and sling support reduces muscle tension, which is the second characteristic.

b. **Muscular Relaxation.** When you are in a position that uses good bone or artificial support, your muscles will tend to be more relaxed. This is also very important in getting your position to have a slow, small wobble area. In general, a position that has less muscle tension has less movement. Slight muscle tension is necessary to maintain the integrity of the position and hold onto the rifle during recoil, particularly the grip of the firing hand.

c. **Natural Point of Aim (NPA).** After establishing good support your muscles may be more relaxed, and your position will be pointing somewhere naturally. This is your natural point of aim. A good position is one where the NPA corresponds to the center of the target. To determine exactly where your NPA is pointing:

(1) Relax and exhale while closing your eyes. Open your eye(s) and look through your sights...this is your natural point of aim.

(2) This will be adjusted by shifting your position so that your aligned system / shooting platform is pointing naturally at the target. This must be adjusted vertically and horizontally within your position. How to achieve an accurate natural point will be further discussed for each different position.

4-5. ELEMENTS OF A STEADY POSITION

There are nine elements to a steady position that we will focus on:

(1) Breath Control. It is necessary to temporarily hold your breath while shooting. Normal breathing causes the chest to rise and fall which will move the aligned sights off the target. Although the breath can be held at any point in the respiratory cycle, we recommend holding the breath after a normal exhalation during what is known as the normal respiratory pause. During this pause the diaphragm muscle is relaxed, relieving the tremor of muscle tension during inhalation and exhalation.

(2) Stock weld. Stock weld is the head position (face) of the competitor on the rifle stock. The goal of stock weld is to provide a method to make your dominant eye and rifle's sight act as a single pointing unit. Proper stock weld is accomplished by keeping your head in the most vertical position possible, while resting the full weight of your head on the stock of the rifle. Your dominant eye should be directly in line with an imaginary line that runs from the top center edge of the front sight post through the center of the rear aperture. Your stock weld will also determine the distance from your dominant eye to the rear sight aperture eye relief. Your stock weld and eye relief will change when using different positions (i.e. you may be further back from the rear sight

in standing than you are in the prone).

(a) To achieve consistent stock weld, the placement of your face should feel the same every time. With correct head position your neck should be relaxed, if not, you may only be holding your head along the side of the stock. Be careful not to shrug your shoulders up, or droop your head down onto the stock. Let your head contact the stock in a natural, upright manner.

(b) Although all M16/AR-15 rifles have the same dimensions, each person is different and there will be variations in stock weld from individual to individual. This is also true with the same competitor using different positions. It is only important that it remains consistent for a given position.

(c) Placement of the nose (determined by stock weld) will be dependent upon several factors such as the competitor's physical size, build and the firing position used. Taller people, and people with a larger build, will tend to have their nose close to the charging handle due to their size (especially in the prone position). In a standing position a shooter may be further back away from the charging handle than in a prone or sitting position, also the rifle may be higher in the shoulder (in order to achieve an upright head position).

(3) Rifle butt. Place the butt of the rifle high enough in your shoulder to bring the rifle up to your face, allowing your head to rest on the stock in a more natural manner. In the prone, the proper placement will generally be in the pocket of the shoulder. As you move higher off of the ground (sitting, then standing) the butt will need to be placed higher in the shoulder to maintain a natural head position. Most tall people will have the lower part of the rifle butt very high in their shoulder to assume a good standing position. Even if the rifle butt has a small amount of contact on your shoulder, the weight of your head resting on the stock is enough to prevent it from moving out of place during recoil.

(4) Firing-hand. The firing-hand grasps the pistol grip to allow for proper trigger control. Placing as much finger as comfortable on the trigger will allow for increased leverage or a better mechanical advantage. The hand naturally grasps the rifle high up on the pistol grip. This is exactly as you would hold a pistol (Figure 4-3). Your handgrip should be similar to a firm handshake; this will prevent your whole hand from tensing and allow your trigger finger to move independently to the rear. The firing-hand can be used to pull the rifle snugly into the shoulder and can also assist in eliminating a cant in your sights, by applying slight pressure to either side of the pistol grip.

Figure 4-3 Firing hand position (left handed shooter shown)

(5) Trigger finger. Proper placement of the trigger finger will give you a straight, rearward pull with the best mechanical advantage (leverage). This is usually where the index finger naturally rests on the trigger as an extension of a comfortable but firm handgrip. Placement is somewhere between the first meaty portion of the finger and the second joint. This is completely dependent upon your hand size. For people with small hands this will probably mean the tip of the finger on the trigger while people with larger hands might almost have the second joint of the finger on the trigger. The trigger finger must work independently of the firing hand so as not to disturb your alignment while firing. This is why you start out with a firm hold on the pistol grip, so that you won't start changing your handgrip as you apply smooth, rearward pressure to the trigger.

(6) Non-firing hand. Depending on the type of firing position used, the non-firing hand can be used as a shelf to rest the rifle on, or to actually grip the rifle firmly and help stabilize it. In prone and sitting, the bottom of the hand guard will rest on the heel of the hand in the "V" formed between the thumb and the forefinger. To prevent a breakdown of the position, the hand guards will be more toward the thumb than out toward the fingers (Figure 4-4).

(7) Non-firing elbow. Ideally, the placement of the non-firing elbow will bring the non-firing arm in line with the rifle, to provide adequate support. The ability to do

this will depend on the individual's flexibility. The front-end of the rifle receives its support from the non-firing arm and the sling.

Figure 4-4 Non-firing hand position

(8) Firing elbow. Should be placed to properly position the firing hand and generally level the shoulders. Proper placement of your firing elbow will prevent it from slipping, so your position won't "break down" while firing. More weight placed on the firing elbow during the construction of your position will prevent this from happening.

(9) Leg and feet placement. Different from one position to another and will be discussed for each particular firing discipline.

4-6. PRONE POSITION

General. Over half of the national match course is fired from the prone position. Fortunately, it is the most stable position. A large portion of the body is in contact with the ground, relative to sitting and standing positions.

a. **Assuming the Position.** Within the confines of your firing point, select a spot that is flat and even. Lay your prone mat down angled slightly from front left to back right.

b. **The next piece of equipment you should set up is your spotting scope.** You

should place your scope on your non-firing side and in such a way that you do not disturb your position as you look through it. If this step is done properly, the only thing that should move is your head from the rifle to the eyepiece of the scope (Figure 4-5).

Figure 4-5 Spotting scope position

c. **Once you have your mat and scope in position, you will place your shooting stool on your firing side within arms reach.** This is important if you need to retrieve any last minute items from within your stool. NRA rules prohibit the stool from being forward of your lead shoulder when in position.

d. **Use only the top two or three straps on your shooting coat in the prone position**. The top strap is snug, but does not restrict movement of the shoulders. The second and third straps are loosely fastened to prevent the coat from flaring out and disturbing the position.

e. **Attach the rifle sling to your left arm.** First, twist the sling a quarter turn clockwise (right-handed) and place your non-firing arm through the loop you have created. Place the sling on the arm directly above or below the biceps muscle. Placing the sling directly on a muscle is not advised as it usually results in unwanted pulse. Then tighten the sling by pulling on the inner strap (Figure 4-6). You should be constantly moving the sling to the backside of your arm when tightening. When complete, your sling should be tight and the keepers at 12 o'clock, or in line with your shoulder (Figure 4-7).

f. **Place your non-firing elbow on the leading edge of your mat and lay down.** It is important to note that you should be lying on the outside of your non-firing elbow.

Figure 4-6 Tightening the sling

This is necessary for maximum bone support. Your non-firing elbow should be placed directly beneath the rifle, or as close as you can possibly get it. (Figure 4-7)

Figure 4-7 Prone position non-firing elbow

g. **Grab the butt of the rifle with your firing-hand, and place the rifle into the pocket of your shoulder.** As you place the rifle into your shoulder, you should look at your firing shoulder so that you can see the placement of the butt. Placement of the butt directly correlates to your head position on the rifle. This is a critical step that must be executed the same each and every time (Figure 4-8).

Figure 4-8 Rifle butt placement

h. **Roll over onto the rifle so that it appears that you are lying on top of it, grabbing the pistol grip and firmly placing your elbow onto the mat.** This will provide optimum support. Your elbow should have firm contact with the mat and be tucked in relatively close to your side.

i. **Your leg on your non-firing side should be straight back with your foot lying as flat on the ground as is comfortable.** You should not be up on your toes, as it will create instability. The leg on the firing side is drawn slightly towards the shoulders. This allows your diaphragm to be raised up off of the ground and will provide easier breathing.

j. **Once in position, dry fire and check your natural point of aim.** To do this you must close your eyes and relax, take a few deep breaths and open your eyes. Take note of where your position is pointing. If you are not naturally aligned with the target you must readjust your position using the following technique: To move the rifle to the

right, shift your hips to the left while keeping your non-firing elbow in place. This elbow will act as a pivot point for all adjustments. To move the rifle to the left, shift your hips to the right. To depress the muzzle, shift your hips forward. To elevate the muzzle, shift your hips to the rear. You will notice that very small movements are necessary to refine your natural point of aim, especially at longer ranges. Check your position continually throughout your adjustments and while firing. Ensure that you have ready access to your ammunition and score book. Be consistent and meticulous in your habits and the shot-making process.

4-7. RAPID FIRE PRONE

The firing of rapid-fire requires some special considerations. Since the 300-yard stage begins with the Shooter standing, your natural point of aim and position of your body on the mat must be determined in the preparation period. Once you have built a stable position and adjusted your natural point of aim, take note where your non-firing elbow is placed. As you stand, do so by moving your body to the rear and keeping your non-firing side foot in position. When the targets come up get back down into position using the following steps:

a. Drop to your knees on the mat, keeping both hands on the rifle.

b. Place your firing side hand on the mat to brace yourself.

c. Move forward and extend your non-firing elbow into position.

d. Grasp the butt of the rifle and place it into your shoulder.

e. Grasp the pistol grip and rotate down into position.

f. Cock your firing side leg and quickly check your natural point of aim (Fig 4-9).

g. After firing your first two shots, depress the magazine release and drop the magazine. Grab the magazine with your firing hand and remove it, ensuring that you place it far enough away so that it will not interfere with your position. Grasp the eight-round magazine and place it into the magazine-well until you here a metallic click, signaling that it is locked into place. Close the bolt by depressing the bolt-release and get back into position starting at step “e.” (above). Do not rush, make slow and measured movements, and be sure to re-check your natural point of aim prior to firing.

Figure 4-9 Prone position left leg (left handed shooter shown)

4-8. SITTING POSITION

Sitting is the second most stable platform after prone. The position should afford maximum stability and facilitate sight alignment through an upright and level head position. There are two common variations of the sitting position: the crossed leg and the crossed ankle. Each will be discussed, but only experimentation and dry firing will allow you to determine which is right for you.

a. In both types of positions the head should be fairly erect. You should look through the rear sight in a manner where the neck and eye are not strained. The rifle butt should be placed in the shoulder high enough to keep the head and neck erect. The sling should be high on the arm and above the biceps muscle. Each step taken should compliment a good head position.

b. The spotting scope should be positioned so that the Shooter can look through it without shifting his position, yet still rise and retake the position without hitting the scope. Some Shooters are able to observe the first two rounds of a rapid fire string through the spotting scope, although the inexperienced Shooter should not practice this technique. The scope's use in this manner is recommended when firing a new rifle, a rifle that has been repaired, or if firing on a new range where no opportunity has been allowed to re-check or zero the rifle.

4-9. CROSSED LEG POSITION

General. The crossed leg position is more common among AR-15/M-16 Shooters than crossed ankle; we recommend you try it first if you are new to the sport. Your shooting coat should have only the top two buckles fastened; the top strap is snug while the second is loose. The sling is placed on the arm in the same manner as in the prone and may need to be shortened by one or two holes. The non-firing hand will be further back (towards the magazine) on the hand guard than in the prone.

a. **Assuming the Position.** Sit down with your left leg crossed over your right. Attempt to place your heels under your knees and not under your calves. You should be facing just to the right of the target (approx 20-30 degrees).

b. Place the flat area, which is to the rear of your non-firing elbow, on top of your left knee (Figure 4-10).

Figure 4-10 Non-firing elbow placement

c. Place the rifle into your shoulder with your firing-hand. Placing the rifle too low will make proper head position and sight alignment impossible. The rifle may need to be turned inward when seated into the shoulder. This will keep the rifle upright when you roll over into position.

d. Bring the rifle up to your face and press down onto the butt stock with your cheekbone as you grasp the pistol grip and place your firing elbow into the pocket formed at your right knee (Figure 4-11).

Figure 4-11 Firing-hand elbow (left handed shooter shown)

e. Check your natural point of aim. If you discover that you need to adjust your natural point of aim, the only part of the position that moves is the buttocks. Sliding to the left or right will adjust side to side. Moving closer or further from the legs/ankles will change to elevation. You can also move your non-firing hand in or out to make a small change to elevation.

4-10. CROSSED ANKLE POSITION

General. The natural point of aim is adjusted in the same way as the crossed legged position. Body composition and flexibility determine the position you use. These positions are merely examples to go by and should be custom tailored to the individual.

a. **Assuming the Position.** Sit down facing the target and extend your legs, leaving them crossed at the ankles, left over right (Figure 4-12).

b. Place the flat area behind the non-firing elbow (towards the shoulder) over the left kneecap (Figure 4-13).

Figure 4-12 Sitting position crossed ankle (left handed shooter shown)

Figure 4-13 Sitting position non-firing elbow

c. The firing elbow is placed in the pocket formed at the bend of the right knee (Figure 4-14).

Figure 4-14 Sitting position firing-hand elbow (left handed shooter shown)

d. The ankles can be moved closer or further from the body to adjust for comfort. The butt of the rifle is placed into the shoulder in the same manner and an upright head position is still the key.

4-11. RAPID FIRE SITTING

As with prone, shooting sitting rapid fire requires some additional steps and techniques. Since you will start from the standing position, your natural point of aim and body position must be determined in the preparation period. The technique will differ for the two variants of the sitting position.

a. **Crossed Leg**. Check your natural point of aim and make a note of the position of your feet on the ground or mat.

(1) Ensure that your filled magazine is placed within easy reach. Your shooting stool should be positioned to the right of your position, and the spotting scope to the

left. The scope should be at a height so you can lean over and see through it, and far enough away so you do not knock it over as you get up and sit down (Figure 4-15).

Figure 4-15 Rapid fire sitting position with spotting scope and magazines

(2) Before standing, mark the position of your left foot. You may use a piece of brass, or your open bolt indicator.

(3) On the command of "Stand," brace your weight on your right hand and push yourself up into standing position, keeping your feet in place.

(4) You should now be facing off to the right of the target with your feet crossed left over right (Figure 4-16).

(5) When the targets come up, look straight down and lower yourself into position using your right hand to support yourself.

(6) Get back into position and quickly check your natural point of aim.

(7) After you have fired your first two shots depress the magazine release button and drop your magazine. Grasp the second magazine and insert it into the magazine well until you hear a metallic click. Release the bolt, get back into position and

Figure 4-16 Standing for rapid fire sitting crossed leg position

re-check your natural point of aim.

b. **Crossed Ankle.** The technique used for the crossed ankle position is similar with the following exceptions (in italics):

(1) Check your natural point of aim and make a note of the position of your feet on the ground or mat.

(2) Ensure that your second magazine is placed within easy reach.

Your shooting stool should be positioned to the right of your position, and the spotting scope to the left. The scope should be at a height so you can lean over and see through it, and far enough away so you do not knock it over as you get up and sit down.

(3) Before standing, mark the position of your left foot. You may use a piece of brass, or your open bolt indicator.

(4) On the command of “Stand,” uncross your ankles and push yourself up into a standing position using your right hand, keeping your right foot in place (Fig 4-17).

Figure 4-17 Standing for rapid fire sitting crossed ankle position

(5) You should be standing, facing the target.

(6) When the command to fire is given and the targets rise from the pits, cross your left foot over your right and sit down using your right hand to support yourself.

(7) Get back into position and quickly check your natural point of aim.

(8) After you have fired your first two shots depress the magazine release button and drop your magazine. Grasp the second round magazine and insert it into the magazine well until you hear a metallic click. Release the bolt, get back into position and re-check your natural point of aim. Throughout this function, do not move your firing elbow. The more body parts you move the better the chance of not re-assuming the same position.

(9) Good rapid fire scores can only be achieved through extensive practice and dry-firing. Work on developing a cadence to your movements. Remember to breathe your sights back up to your desired point of aim each shot and apply the second fundamental, smooth trigger control.

4-12. STANDING POSITION

General. The standing position is the least stable position, but if you understand a few simple concepts to the position, you will have a more successful time shooting standing. A more stable position will produce a better hold. The more balanced you are, the better your hold.

(1) The jacket is the only piece of equipment that you have to help you in stabilizing the position. It must fit properly. It supports your back, and locks your back in with your hips. The jacket must be tight enough as to allow it to support the upper body, yet let you get into a good, comfortable position. The tightness of your jacket will play a part in how you set up your position, and how stable your position is. A general starting point for tightness is that the bottom two buckles should be tight, and the rest of the buckles snug. This will allow you to breathe, to have some ability to move, and receive the support of the jacket.

(2) How still can you stand? How much do you sway? The first thing that allows you to stand still, and not sway, are your feet. Try to find a semi-level piece of ground to stand on. Stand with your heels approximately shoulder width apart at a right angle to the target. Your weight should be evenly distributed on both legs. Your legs should remain fairly straight without locking your knees.

(3) Your non-firing arm supports the weight of the rifle. Your left elbow should be placed on or about your hipbone (Figure 4-18). Your body will determine this. You may pull the elbow up and in towards the front of your body, but beware of trying to achieve an unnatural or awkward position. If you do, this will cause undo pressure on your ribs and lungs, making it difficult to breathe.

Figure 4-18 Standing position non-firing arm (left handed shooter shown)

(4) Your non-firing hand is the platform on which the rifle lies. There are many ways to hold the rifle with your non-firing hand. Remember that any hand position should be comfortable and provide bone support. Your hand position will control the height, or elevation, of your position.

(5) Your firing arm should be at where it falls naturally. Don't lift your elbow up or concentrate on keeping it pressed down. Your firing hand is placed firmly on the pistol grip. As with the other positions, the trigger finger needs to be situated to achieve the best mechanical advantage.

(6) Place the butt stock into your shoulder where you can achieve an optimum head position. Head position is paramount in the standing position. An upright and level head position will greatly enhance your balance. Generally, the butt is placed higher in

the shoulder for the standing position than other positions. To achieve a proper head position you may find that it is necessary to have the butt of the rifle very high on the shooting jacket. This is perfectly acceptable (Figure 4-19).

Figure 4-19 Standing position high butt placement (left handed shooter shown)

(7) Bring the stock up to your face and look through the sights. Can you easily line everything up? If not, work with the placement of your non-firing hand and the butt of the rifle. To achieve an upright head position you may need to cant the rifle towards your body. The position must be comfortable, relaxed, and balanced (Figure 4-20).

(8) As with the other positions, you must now adjust your natural point of aim. To adjust your natural point of aim from side to side move your body as a single unit at the feet. To raise the muzzle of the rifle, slide your trail foot rearward, slide it forward to lower it. It will take experimentation to achieve a steady position for you. You don't have to have an X-ring hold to shoot standing well if you have optimum trigger control. Keep in mind the goals of every position- optimum trigger control...upright head position, and level sights if possible. Be aggressive on the trigger. Being aggressive on

Figure 4-20 Standing position canting the rifle

the trigger means putting initial pressure on the trigger before you get into your hold and then breaking the shot when you want to.

(9) The telescope is used to check the location of hits on the target to aid the Shooter in accurately plotting the hits in the score book. A scope stand extension raises the spotting scope to a position that will allow the Shooter to observe the target while remaining upright. The scope should be positioned near the forward foot of the Shooter so that it does not interfere with his position. The telescope should be focused clearly on the target.

CHAPTER 5

ZEROING

5-1. GENERAL

Regardless of how well you apply the fundamentals, if your sights are not adjusted properly you won't hit the center of the target. Zeroing is the process of adjusting the sights so that your group is centered on the target. This chapter covers how to zero an AR-15, marking your sights, and reading and recording your zeros in your score/data book.

5-2. TYPES OF ZERO

There are three types of zero:

a. **Mechanical zero.** Is when the base of the front sight post in flush with the front sight housing and the rear sight elevation is bottomed out and moved up to the first whole click. The rear sight center index lines are aligned between the moveable and non-moveable base (Figure 5-1). From this sight setting all zeros are obtained. These settings should be marked with a paint pen (Figure 5-2).

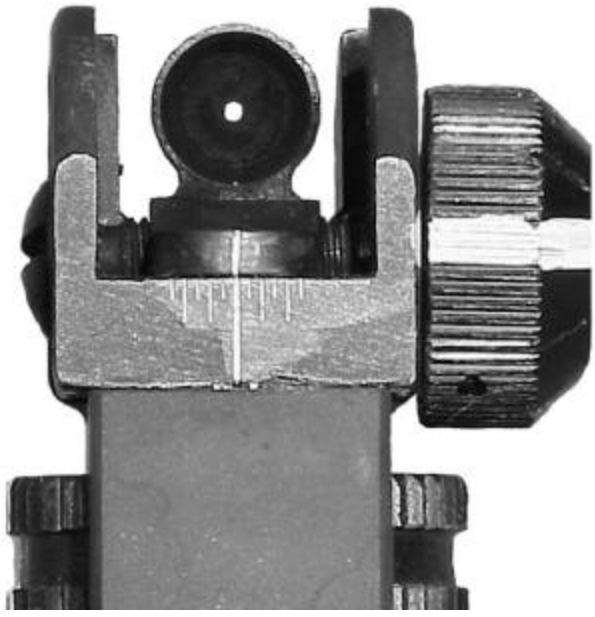


Figure 5-1 Mechanical zero rear sight

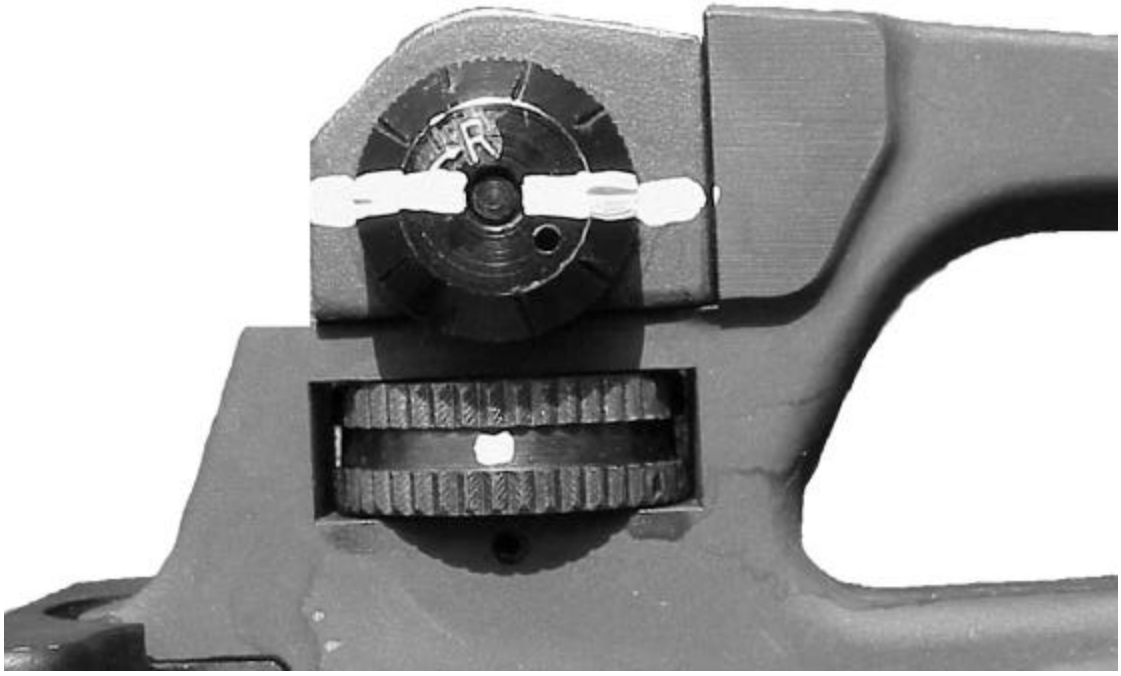


Figure 5-2 Marking the rear sight

b. **True zero or no wind zero.** A true zero is the elevation and windage settings required to place a single shot, or the center of a shot group, in a pre-designated location on a target at a specific range from a specific firing position, with no wind blowing.

c. **Zero.** A zero is the elevation and windage settings required to place a single shot, or the center of a shot group, in a pre-designated location on a target at a specific range, from a specific firing position, under specific weather conditions.

5-3. MINUTE OF ANGLE

Minute of Angle (MOA) is a mathematical term. A circle has 360 degrees of which a MOA is a small part. Let's look at just one degree. This degree is broken down into 60 parts called minutes (Figure 5-3).

In the sport of shooting, you will hear terms like "quarter minute", "half minute", "three-quarter minute", etc. But how much is 1 MOA? Since it is an angle, and angles get larger as distance increases, we take the measurement of this angle at 100 yards:

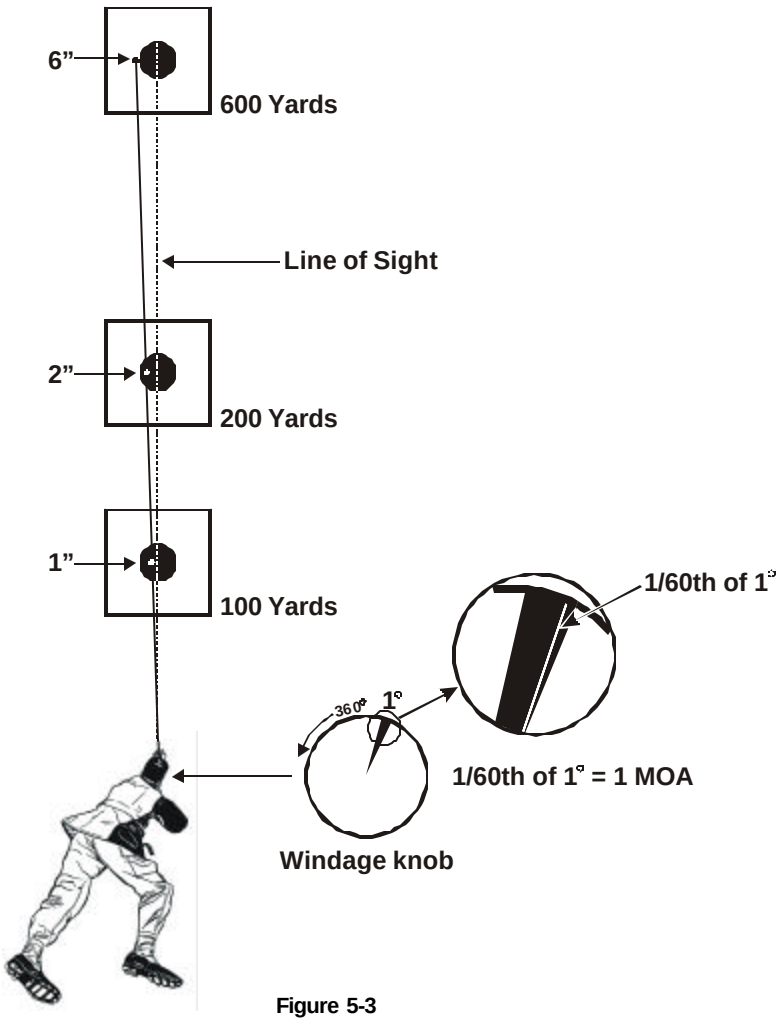


Figure 5-3

1 MOA at 100 yards is 1 inch.

1 MOA at 200 yards is 2 inches.

1 MOA at 600 yards is 6 inches

If you have quarter minute sights, then a movement of 4 clicks will move your sights 1 minute. If you have half-minute sights, then 2 clicks will move your sights 1 minute. But how does this translate to your target? You must determine the correction, in inches, and convert that into minutes so you can adjust your sights. One way to better understand this process is to learn the measurements of each scoring ring on the target. For example, on the 300 yard target the X-Ring is 3 inches in diameter, or 1

MOA, and the ten ring is 7 inches in diameter, or approximately 2 1/4 minutes of angle. Total diameter of the X and 10 ring is 7 inches. If you have a shot on the outer edge of the ten ring, that would require a correction of 3.5 inches or approximately 1 1/4 minutes of angle in order to place a shot near the center of the target.

5-4. INITIAL SIGHT SETTING

To establish an initial sight setting: Adjust the windage by turning the windage knob left or right to line up the center index lines between the moveable and non-moveable base (Figure 5-1). When you have the rear sight centered left to right, mark the windage knob with a paint pen (Figure 5-2). Now, ensure the base of the front sight post is flush with the front sight housing by depressing the detent and rotating the front sight moving the post up or down until flush (Figure 5-4, 5-5). Set the elevation knob running the rear sight all the way down and come up 2 minutes (Figure 5-6), this is to compensate for any dead clicks the sights may have. A dead click is one that does not move the sight when clicked. You have now established an initial sight setting zero for your rifle. The marks on the sights are your reference marks for mechanical zero.

Figure 5-4 Front sight detent

Figure 5-5 Front sight initial setting

Figure 5-6 Rear sight initial setting

During the zeroing process, all elevation adjustments are made on the front sight post. Once a zero is established, the front sight post should never be moved, except when re-zeroing the rifle. (The rear sight elevation knob is used for dialing in the range to the target.) Zeroing is conducted at a range of 200 yards. To prepare a rifle for zeroing, the rifle sights must be adjusted to the initial sight settings as outlined. Perform the following steps to zero the rifle:

a. Fire a 3 round shot group.

b. Find the center of the group.

c. Determine the vertical distance in inches from the center of the shot group to the center of the target.

d. Make an elevation adjustments on the front sight post to move the center of the shot group to the center of the target.

e. Determine the horizontal distance from the center of the shot group to the center of the target.

f. Make lateral adjustments on the windage knob to move the center of the shot group to the center of the target.

g. Repeat preceding steps until shot group is centered.

h. Fire a 4-round shot group to confirm sight setting.

i. When the sight setting is confirmed, determine the value and direction of the wind and remove the number of clicks added to the windage knob (if necessary) to compensate for current wind conditions. This becomes your true zero for that yard line and position fired.

j. Once you have adjusted your windage knob so that you have attained a good zero, count how many clicks (and in which direction) it takes to return to mechanical zero. This will establish your 200 yard line sitting true zero, provided you did not have to compensate for the effects of weather. For example, if you had to go right 5 and down 12 to get back to mechanical zero your true zero would be 12 up and left 5 in a no wind condition. This is an excellent starting point for the standing position. As you

move from one position to another and from one yard line to another you will experience changes in your elevation and windage. Just make sure to count back to mechanical zero after you complete that stage of fire. Write down all sight adjustments in your score book.

CHAPTER 6

EFFECTS OF WIND AND WEATHER

6-1. GENERAL

The effects of the weather are a primary cause of error in the strike of the bullet down range in the case where the shooting principles, the positions used and zero settings are fundamentally correct. The wind, mirage, light, temperature, and humidity all have some effect on the bullet, the Shooter, or both. Some of these effects, such as temperature and humidity, can be insignificant depending on the average conditions under which most matches are fired. However, if a match were to be fired under extremes of these effects, they would have to be considered.

6-2. EFFECT OF THE WIND

Wind is the atmospheric effect that presents the greatest problem to the shooter. Wind has a considerable effect on the bullet and this effect increases with range. This is due primarily to an increased effect on the bullet as velocity is reduced, causing it to deviate from its trajectory. Figure 6-1 illustrates the wind's effect on the bullet, through an analogy describing the bullet as a boat moving through water. The wind does the same thing to the bullet that the water does to the boat. When the shooter compensates for the wind, they are essentially shooting a bullet up wind and letting the current of the wind blow it back on to the target.

6-3. VALUE OF THE WIND

Before any sight adjustment can be made to compensate for wind, it is necessary to determine its direction. Wind blowing at a 90-degree angle to the firing line is known as "full value." When the wind angle is less than 90-degrees to the firing line, it will have less effect on the bullet. Since the Shooter must know how much effect the wind will have on the bullet, he must be able to classify the wind or assign it a value. The accepted method is by use of the clock method (Figure 6-2). A full value wind blows straight across from right to left or left to right (3 to 9 or 9 to 3) as you look down range. It has the fullest effect on the bullet. As the direction of the wind becomes more perpendicular to the firing line and more parallel to the flight path of the bullet, the effect on the flight of the bullet is reduced. Wind will have half the effect on the bullet (half value) wind at 1:30, 4:30, 7:30, and 10:30 as seen on the clock chart. Depending on the velocity of a head (12 o'clock) or tail (6 o'clock) wind, it may have an effect on the vertical displacement of the bullet. Strong tail winds (20 mph or greater) can

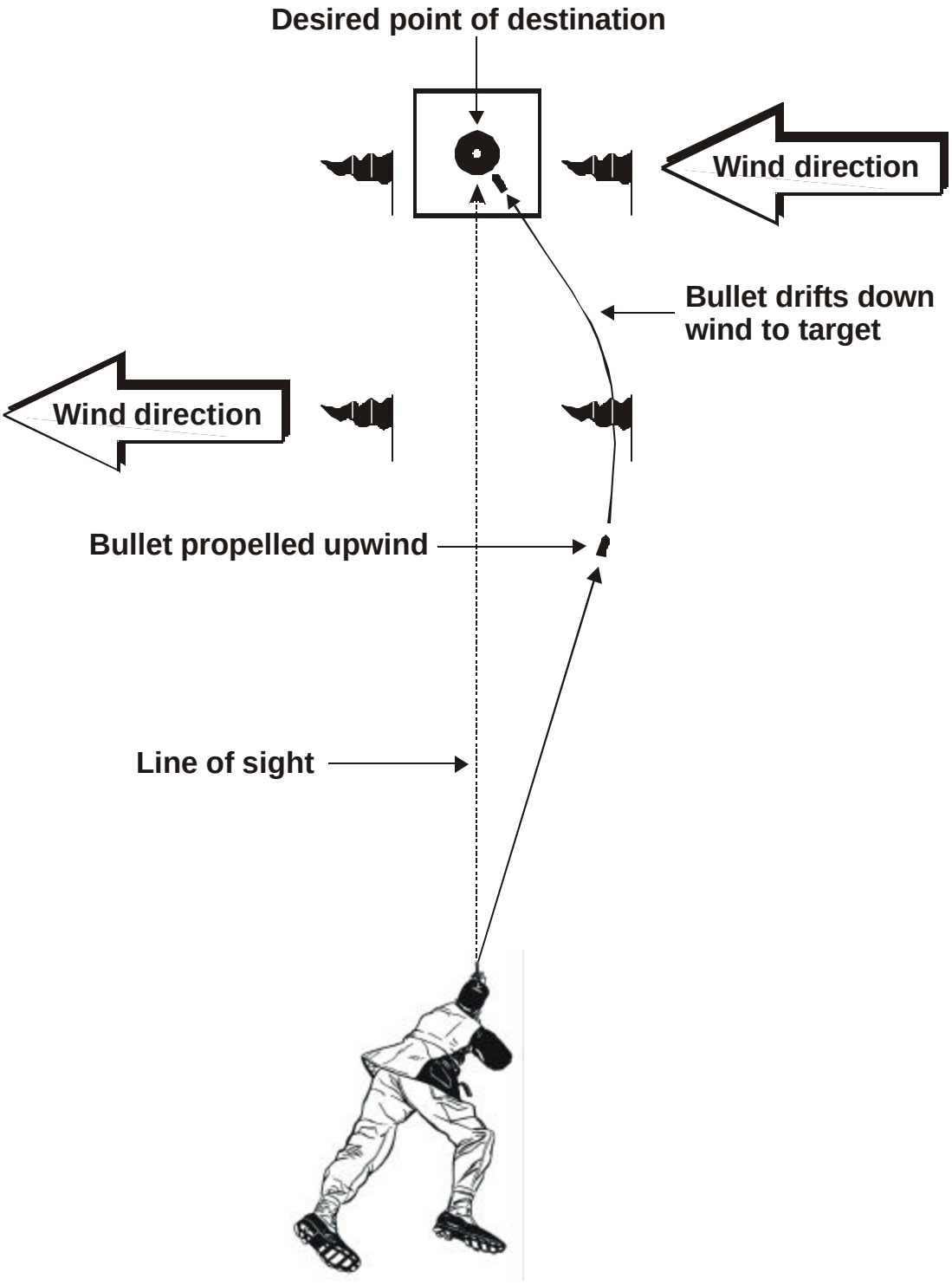

Desired point of destination
Wind direction
Bullet drifts down
wind to target
Wind direction
Bullet propelled upwind
Line of sight

Figure 6-1

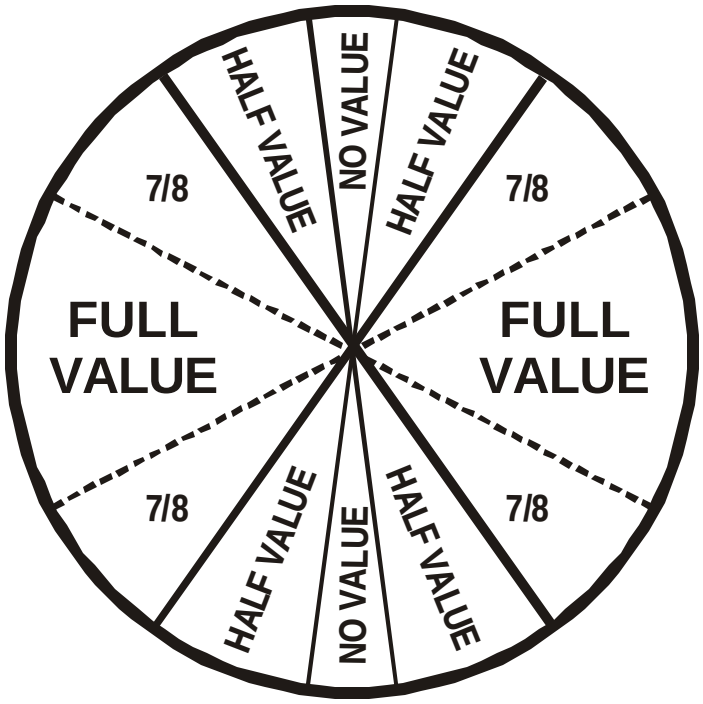


Figure 6-2 Clock method

deflect the bullet upwards (1/2 min to 1 min); strong headwinds have the opposite effect. A strong wind (20 mph or greater) from the right can cause the bullet to rise (1/2 min to 1 min); strong winds from the left have the opposite effect.

6-4. WIND VELOCITY

The following methods can be used to determine velocity:

a. **Environmental.** The indicators the Shooter may use to determine direction are range flags, smoke, trees, grass, rain, the sense of touch, etc.

(1) Under 3 mph, winds can hardly be felt, but may be determined by smoke drift.

(2) A 3-5 mph wind can just be felt on the face.

(3) At 5-8 mph, leaves in trees are in constant motion.

(4) At 8-12 mph, wind will raise dust and loose papers.

(5) At 12-15 mph, small trees begin to sway.

b. **Mirage.** This method will be discussed in Section 6-6.

c. **Wind meter.** Wind meters are fairly inexpensive. They can determine the wind speed at your particular location. You must determine if the wind is similar down range. This is best accomplished viewing the mirage.

6-5. INTERPRET THE CORRECTION

After determining wind direction and velocity, the windage correction to be placed on the sights can best be determined using windage charts designed for the specific load fired. For example, the following charts (Figure 6-3) depicts the windage correction (in 1/4 minutes of angle) needed when firing the 69 grain bullet at approximately 2,850 feet per second at 200 and 300 yards. The 600 yard chart shows the correction needed when

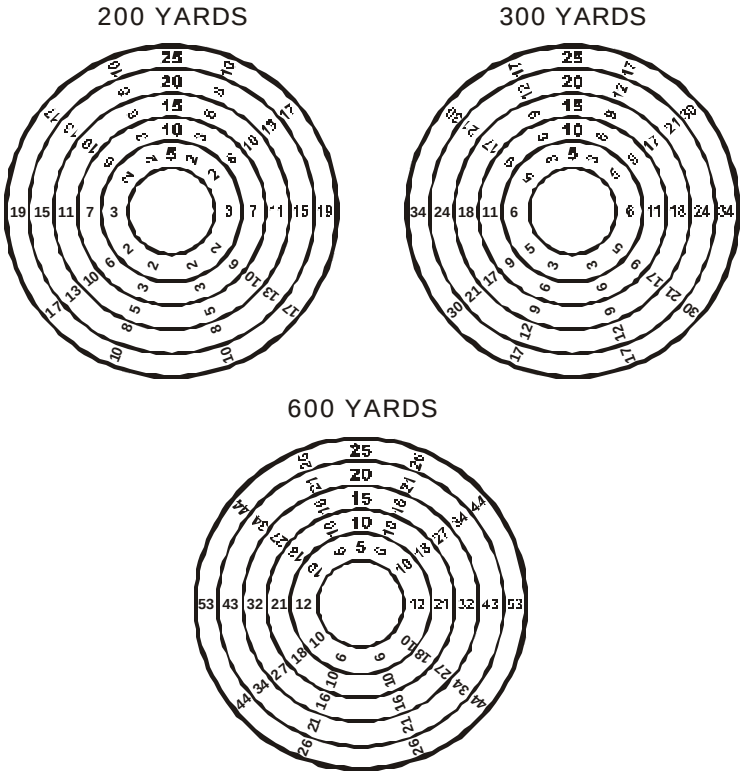


Figure 6-3 Windage charts

firing an 80 grain bullet at approximately 2,800 feet per second.

To effectively utilize these charts the Shooter should first determine the direction and velocity of the wind using the techniques described in sections 6-1 through 6-4.

Once direction and velocity are known you check the wind chart that applies to your ammunition and yardage. By matching the direction of the wind on the chart to the proper velocity a correction can be determined.

A Shooter at 200 yards determines that the wind is blowing at approximately 10 mph from 3 o'clock (full value). He references his 200 yard wind chart (Figure 6-4) to find the correction needed for 10 mph wind. He locates the Number "10" ring and then locates the number printed at the 3 o'clock position which is "7." Therefore the appropiate correction is 7 (1/4 minute clicks) for 1 3/4 minutes of angle adjustment.

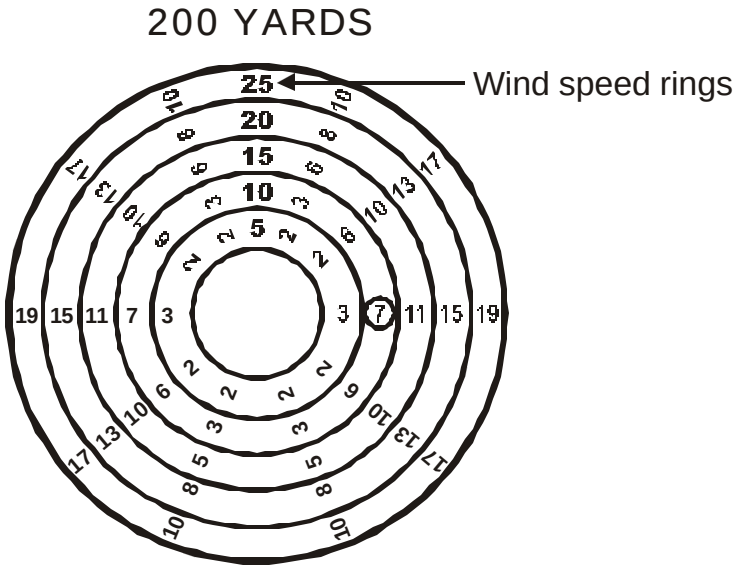


Figure 6-4

6-6. MIRAGE

The word "mirage" refers to the heat waves or the bending of light through layers of air of different temperature. Because they have different temperatures, they will not mix. As you look through these different layers of air, the assorted temperatures react on light, bending it differently. This creates a distortion in each layer as you look through it. As the wind blows these layers of air, and you become accustomed to viewing the mirage, the wind will actually appear to become visible to you.

With the scope, some mirage can be seen on all but the coldest days. Proper reading of the mirage will enable the coach or Shooter to estimate and make windage corrections with the highest degree of accuracy. As observed through the scope, the mirage will appear to move with the same velocity as the effective wind, except when blowing straight into or away from the scope. Then the mirage will give the appearance of moving straight up with no lateral movement. This is termed a "boiling" mirage. In general, changes in the velocity of the wind can readily be determined by observation of the mirage up to speeds of approximately 15 mph. Beyond that speed, the movement of the mirage is too fast and too flat for detection of minor variations.

Use the following technique to use the spotting scope to read mirage. The Shooter is concerned with the wind between the Shooter and the target, so focus the spoting scope short of the target. For example: focus the scope on the number board, then back the focus off until the mirage is picked up. Typically, the focus will be about half way between the firing line and the target. Care must be taken not to focus beyond the target, as this will sometimes produce a "reverse reading" of the mirage. When the intermediate focus is attained, adjust the lay of the telescope on the target.

It is only through considerable experience in reading mirage that the Shooter can develop proficiency as a wind reader.

6-7. TEMPERATURE

Temperature has a definite effect on the elevation setting required to hit the center of the target. This is caused by the fact that an increase in temperature will increase the muzzle velocity. Temperature will effect the elevation of the strike of the bullet. There is a rule of thumb to follow, based on tests made at Fort Benning by USAMU, at 300, 600, and 1000 yards. A 20-degree rise or fall in temperature at 300 yards causes an elevation change of one minute. A 15-degree change at 600 yards causes a one-minute change in elevation; a 10-degree change at 1000 yards causes a one-minute change. In extreme temperatures, either high or low, this rule may not necessarily apply. It should be mentioned that these changes might not affect your zero in the same way each time; by recording and studying, you can determine how and when temperature changes affect your zero.

6-8. LIGHT

The effect of light on the Shooter's aim is different for every Shooter. Light may or may not have an effect on a particular Shooter's aim. The difficulty is that light affects

different people in different ways. It may affect a Shooters vision, how a Shooter sees through the rear sight, or how the front sight is seen. The general tendency for a Shooter that holds 6 o'clock is to shoot high on a dull cloudy day and low on a bright clear day. This is especially true on a day with intermittent clouds. On a bright day, an apparent halo may form around the bullseye causing the aim to be low. On a dull day the halo is gone and the tendency is to hold closer to the bullseye, causing the shots to go high. On an extremely bright day, with the sun directly on the face of the target and a light background, the bullseye tends to look smaller than it actually is. Because of the reduced aiming point the Shooter may unconsciously hold high, thus requiring a lowering of elevation.

Extreme light conditions from the left or right may have an effect on the horizontal impact of a shot or shot group. When a bright light hits on the face of the target, the edge of the bullseye from which the light is coming may appear indistinct, causing the center of the aiming point to be off slightly, so the general rule is to click the sights into the light.

6-9. HUMIDITY

To understand the effects of humidity on the strike of the bullet, one must realize that the higher the humidity the more resistance to the flight of the bullet through it. This resistance will tend to slow down the bullet and as a result the Shooter must raise his elevation to compensate for it. The effects of humidity at the short ranges are not as noticeable as at the long ranges. Again, the experience of the Shooter and his resultant study of hits and groups under varied conditions of humidity will determine its effect on his zero.

6-10. TECHNIQUES USED TO CORRECT FOR WIND

The most common and frequently used method of negotiating the wind:

a. **Chasing the spotter.** Simply stated, it is a correction made for a mistake that has already been made. It is the easiest method for wind correction. An ideal situation for chasing the spotter occurs when there are no known down range indicators, the wind changes are small and constant, or the target service enables the Shooter to fire fast. With the chasing the spotter method, the Shooter makes a sight correction based on the location of the previous shot.

b. **Shooting a condition.** An ideal situation for shooting a condition exists when the wind makes many changes but always returns to a dominant condition, and this con-

dition is nearly the same. The Shooter must identify an indicator, preferably the mirage, which will be used to dictate the condition to be fired in. The Shooter will then only fire when that condition exists. In other words, the Shooter is zeroing for one particular wind.

c. **Firing the extremes.** In this situation the Shooter only fires when the wind has settled at its extreme left or right velocity and value. This method is recommended when firing in a very consistently changing head wind or tail wind with considerable changes. As an example, the wind is changing every five or six minutes from two minutes left to three minutes right. The Shooter will only fire when the wind has reached approximately two minutes left or three minutes right and anticipates the changes.

d. **Reading the value of the wind for each shot to be fired.** This is the most difficult method to master, as it requires much practice to proficiently develop the skill. It also requires the mirage to be readable and the wind to settle long enough to fire the shot. This method should be used when the wind is changing inconsistently left or right. The most important element of this method is the exact knowledge of your sight setting in relation to your "no-wind" zero. It is very easy to become disoriented when many sight changes are made. The technique of recording and tracking sight changes becomes very important. This will be covered in depth in the score book chapter.

e. **The final method for wind negotiation is a combination of the four methods.** The environment being shot determines what method should be used in best compensating for the wind. An important factor to include in this training is the identification of down range indicators, which will allow the coach to properly "read" the wind. Some of these indicators are obvious while others may be very obscure. Some of the indicators you should look for are:

(1) Mirage changes.

(2) Flag direction changes, looking at one or more for comparisons.

(3) Grass or dust blowing downrange or in the pits.

(4) The location of hits on your target, as well as those of your competitors.

(5) Wind changes on the firing line if you are encountering a wind from

(6) Tie downs on the targets.

(7) Directions and movement of your shooter’s vapor trails.

behind.

CHAPTER 7

COACHING

7-1. GENERAL

A coach must give direction to the development of a Shooter. The rate at which a Shooter progresses is, to a great extent, dependent on the Shooters personal desire to excel. However, the coach must help to guide that development. From the very first days of training, a coach must utilize correct training practices to avoid forming harmful habits. It is much harder to correct harmful habits than it is to teach proper techniques initially.

7-2. ATTRIBUTES OF A COACH

A good coach has the ability to impart the benefits of his knowledge to the Shooters on his team in a logical, methodical manner. He must be able to detect errors, analyze problems, and be sympathetic and encouraging to his shooters. Although each person has their own personality, there are some attributes that are common to all good coaches:

a. Personal experience in marksmanship. His experience will give him an insight into the problems his shooters may be experiencing.

b. A positive attitude.

c. Thorough understanding of the fundamentals and proven training techniques.

d. Desire to promote esprit de corps within the team and the drive to win.

e. He must be able to provide an effective training plan for his Shooters development and insist on its execution.

f. He must never forget that each Shooter is an individual, each with his own personality. A good coach will be able to develop an approach to effectively communicate with all of their Shooters.

7-3. EVALUATION OF SHOOTERS

A coach must constantly evaluate Shooter performance and match conduct and techniques used by experienced Shooters and teams. The coach must refine doctrine and raise performance standards by constant review of training manuals, materials and methods used by those that are experienced. This will aid the coach in the preparation of marksmanship training. The coach must maintain a current evaluation and an estimate of the potential of each Shooter. This estimate should include an analysis of the rate of progress, strengths and weaknesses, and an individual training approach so that each Shooter can maximize his potential. A coach must be capable of selecting potential Shooters and members to form teams. During the match, the coach should keep notes on any mistakes made by team members and develop solutions to implement into his training program to prevent the errors from re-occurring. While on the firing line, the coach should study the Shooter's behavior. When guiding the Shooter's technique of employing the fundamentals, observe the Shooters temperament. Study the Shooter's reactions to good and bad shots. Ultimately there should be no difference. A positive attitude usually is conducive to a positive performance. A coach's recognition of a Shooter's performance is also very important. Excellence should be publicized and encouragement rendered. It is important for a coach to keep in touch with his Shooters. A shooting coach is a person who appreciates the problems faced by the competitive shooter and is not inclined to be arbitrary in his judgment.

7-4. SELECTION OF TRAINING AND PRACTICE

A coach must also know the difference between training and practice. Training is the time to try new techniques, to build endurance and stamina with position exercises, and to refine specific skills in the formation of positions. Practice is the conduct of the actual event you are preparing for.

To establish training requirements, a coach should determine the shooting ability of each of his Shooters. This is a difficult but very important job. What the coach selects as the needed training subjects may well determine the later success of the team. The coach must take into account the individual needs and preferences of his team members in planning a training program. At the entry level, with beginning Shooters, team or group training that emphasizes the core tasks (positions) is appropriate. As the Shooters progress, however, individual plans that target the improvement of weak areas and the sustaining of strengths should be developed. A difficult coaching task is to create an atmosphere in which each individual Shooter can experiment and refine personal techniques.

Over-training and “shooter burn-out” are a very real and debilitating phenomena. Prior to a match event, training should gradually taper off to a small rest period to increase a Shooter’s focus. Often, other types of shooting, or “cross-training”, are an effective means of maintaining this focus. Ultimately, any Shooter’s training plan should be tailored so that he will “peak” at the appropriate time: during an important match. Training periods prior to a given match should duplicate the procedure expected in the record match. This is called practice. For example, if a team match will be fired in one relay, shoot the practice match in one relay. Careful observation of individual members and correcting faults during training is one of the primary duties of the coach. The coach should observe the manner in which the scores are fired in practice. These scores will help in initial selection of the training subjects for the immediate future. Match performance will become the basis for training subjects selected later in the training program.

7-5. READING THE MIRAGE AND VAPOR TRAILS

Mirage can be used to judge the speed and direction of wind. The coach takes advantage of watching vapor trails caused by the bullet passing through the mirage. A vacuum that forms behind a projectile creates a vapor trail. As air attempts to fill the vacuum and the bullet pushes air out of it’s path, a cone of distortion is created. If viewed correctly, the path of the bullet can be seen from slightly forward of the muzzle through the apex of the trajectory to just forward of the target. It will appear as a distorted cone of air. It is imperative that you set up directly in line with the lay of the weapon to properly see accurate bullet flight.

In utilizing the scope to read the mirage and vapor trail, the following adjustment technique is used. As we are concerned with the wind between the Shooter and the target, the focus of the scope should be mid-range between the Shooter and the target. Be aware that the further you are from the target, more mirages may be detectable. One is usually the dominant wind and one is an indicator for impending change. Trial, error, and experience are your only ally. Always focus on the most dominant. If you are properly focused on the mirage, you will have the correct focus for vapor trails. With practice and experience you will learn where bullet impact occurs based on vapor trail appearance.

When using binoculars, the techniques are the same, just more critical. When viewing vapor trails and mirage during a trophy match, and the elevation is correct in a no-wind situation at 600 yards, the trace of the bullet should disappear in line with, and approximately six inches above, the head of the silhouette. At 500 yards the trace will

disappear just inside the top of the silhouette. If the team is experienced and zeros are well synchronized but your windage correction is incorrect, give the new correction to the entire team. The best method of checking for correct windage calls in this situation is by using a ”wind dummy.” This is an individual who’s zero has always been consistent. In giving windage corrections, always give direction of change first. For example, say, “left two” instead of “two left.”

7-6. USE OF THE SPOTTING SCOPE

The telescope is very important to the coach in determining sight adjustments by reading the mirage (wind condition) or for observing the locations of hits to accurately plot them on the coaches plot sheet and later transfer the information to the Shooters score book. Depending on the range, the use of the telescope varies.

a. At 200 yards in the standing position, the telescope is used to check the location of hits. The scope should be positioned between the Shooters if pair firing (Figure 7-1), or on the Shooter’s firing side to better observe the Shooter if firing single Shooters.

Figure 7-1 Standing position pair firing coach’s scope

The telescope should be focused clearly on the target.

b. At 200 yards in the sitting position, the telescope is used to watch vapor trails and check mirage. The scope should be directly behind the Shooter, far enough from the Shooter as to not interfere with the Shooter as he assumes a standing position, but close enough to clearly communicate. The scope should be positioned directly in line

Figure 7-2 Sitting rapid fire position coach's scope

with the bore of the weapon to facilitate viewing the vapor trail. (Figure 7-2).

c. At 300 yards, the scope is used primarily for reading the mirage and secondly for the plotting of hits. The scope should be directly behind the Shooter, far enough from the Shooter as to not interfere with the Shooter as he assumes a standing position, but close enough to clearly communicate. The scope should be positioned directly in line with

Figure 7-3 Prone position coach's scope

the bore of the weapon to facilitate viewing the vapor trail (Figure 7-3).

d. At the 600-yard line the scope is positioned in the same manner as mentioned

for 300 yards if firing single Shooters. If pair firing, place the scope between the Shooters but recognize the vapor trails will appear different as you are not directly in line with either bore (Fig 7-4).

Figure 7-4 Prone position pair firing coach's scope.

e. At the 1000-yard line, use the telescope in the same manner as at 600 yards. The focus of the telescope should be at mid-range for reading the mirage.

7-7. COACH'S PLOT SHEET

The coaches plot sheet is to the coach what the score book is to the Shooter. In this respect it is a record of the Shooter's performance, the coach's performance, the rifle, ammunition, weather, etc. The coach should maintain a plot sheet for each shooter and use it as a guide in critiquing the Shooter in his performance. A sample plot sheet is illustrated in (Figure 7-5). These sheets are maintained as part of the Shooter's evaluation file. Whenever the Shooter comes under the direction of a new coach these sheets accompany him.

a. Information recorded on the plot sheet should be concise and complete. Use arrows for recording the light and wind direction. For each stage of the match, a sight change block is provided. This is used to record the Shooter's rifle zero, the elevation and windage used for a shot or string, and the correct zero. For the slow fire stages, additional blocks are used to record subsequent changes due to wind changes. The plot

NATIONAL MATCH COACH'S PLOTTING SHEET

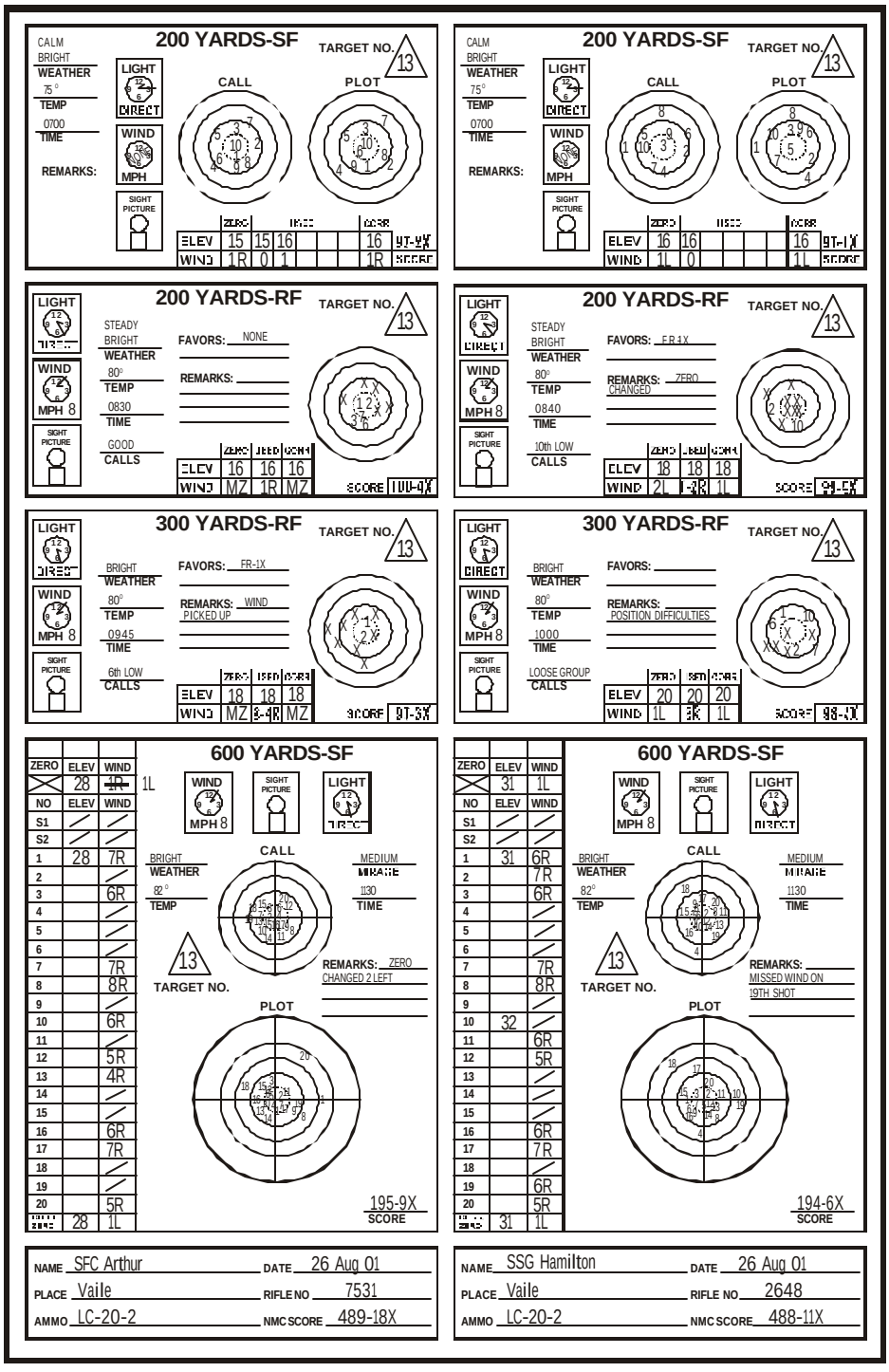


Figure 7-5

sheet has space to record the Shooter's aiming technique. A plotting or hit target is suitable for each stage of firing with an additional call target for the slow fire stages.

b. 200 Yards Slow Fire. This block is utilized to record the conditions and performance of the Shooters for the standing stage. The call and plot targets are located side by side for ease of use. When a shot is called, the coach indicates its location on the call target. When the target is marked, the exact location of the hit is plotted on the plot target. To record these hits and calls, the numbers 1 through 10 or 20 are used. Sighting shots are recorded as "S1" and "S2." The numbers should be small so as not to clutter the target. In this manner the hits and calls can quickly be analyzed to determine if the Shooter is calling properly, if he has his proper zero, or if the coach has properly compensated for weather conditions.

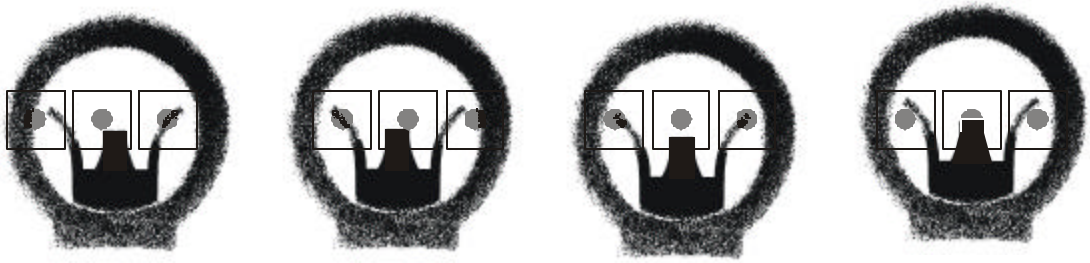
c. 200 and 300 Yards Rapid Fire. These are identical blocks. The plot sheet does not have a target for rapid fire calls as in slow fire. However, a remarks section is labeled "calls" for the coach's use. Here he would indicate the call of the Shooter's first shots and any bad shots indicated at the conclusion of the string. Favors given to the Shooter are recorded in the space provided.

d. 600 Yards Slow Fire. This stage is possibly the most difficult for the coach with respect to maintaining it. Here the coach must record each shot fired in the same manner as for the 200 yards slow fire stage. Keeping abreast of each shot under the varying conditions of the wind is difficult due to the coach's continual observation of the mirage down range. However, every effort should be made to record all sight changes and windage corrections given to the Shooters. There are sufficient blocks provided to record the elevation and windage for each shot fired. It is not necessary to repeat elevation or windage entries; a recording is made only for changes. The Shooter's initial zero is placed in the block provided. If the coach has the Shooter compensate for the wind, the actual number of clicks is placed in the wind column. For example; a three o'clock wind may be worth six clicks right, this is recorded as "R6." In this manner, any subsequent changes or corrections right or left are merely added or subtracted to the initial windage adjustment. Using this system, the coach will, at a glance, know the correct windage adjustment the rifle is using at all times. Elevation changes are recorded from the Shooter's zero. Since elevation is a Shooter's responsibility, he should be instructed to relay any changes made. At the completion of the string the Shooters verify the rifle's zero and also the windage value.

7-8. RAPID FIRE FAVORS

During a rapid-fire string of a team match, the coach may give verbal adjustments

to the Shooter after each shot. These adjustments are called “favors.” If the shot is centered, the coach calls “good” to the Shooter. This is important as the shooter is mentally calling his shots. If the first shot is not centered, due possibly to an incorrect zero, additional wind, or as a result of a bad shot by the Shooter, the coach must give the shooter additional commands to center the group in the black. The standard favors are, “favor right”, “favor left”, “take white”, and hold closer.” These favors are generally six inch favors in the direction indicated. Figure 7-6 depicts sight pictures for the favors based on a six o’clock sight picture. Any time the coach calls for a favor, the coach should call the next shot to confirm the Shooter’s hold off. If a favor is given on the first or second shot, a sight correction may be made at the magazine change rather than continu-



Favor right **Favor left** **Take white** **Hold closer**

Figure 7-6

ing to hold the favor throughout the rest of the string.

CHAPTER 8

TRAINING

8-1. GENERAL

The most accurate rifle and bullets along with the best equipment available will not ensure success on match day. Without a strong grasp of the two principles and steady positions your success will be limited. You have probably heard the phrase, "Practice makes perfect." This is not true. Strictly speaking, it would be better to say, "Perfect practice makes perfect." The following section will explain training techniques and how you can use them to improve and diagnose your performance.

For the beginning Shooter it is best to utilize the crawl-walk-run method of training, or starting with the basics and working up to an advanced level. The drills described below are useful for the beginning Shooter as he learns the basics of position shooting and rapid-fire techniques, and to the advanced Shooter to reinforce important fundamentals.

8-2. NATIONAL MATCH COURSE TRAINING

a. **Dry firing.** Dry firing is an excellent tool for developing a steady position and practicing trigger control. Position difficulties, especially in standing and sitting, can often be resolved prior to actually firing through extensive dry firing practice.

b. **Slow fire ball and dummy drill.** This exercise can be done with or without a partner. It will help to analyze your trigger control and see problems that are sometimes masked by the recoil from live fire. This drill can be done from any position, but is most effective for the standing position, where smooth trigger control is most important. To do this drill alone, you will need to load dummy rounds and mix them in with live ammo.

c. **Rapid fire ball and dummy.** When you apply trigger control and the hammer falls on an empty case your reaction, if any, will be apparent to yourself and anyone watching. If you are flinching or anticipating, work on being smooth and concentrating on the front sight. Adding a partner to this exercise will help to better evaluate your performance. The partner loads the gun and then observes the Shooter. The partner then critiques the Shooter on his performance after each shot.

d. **Rapid fire drills.** The key to consistent rapid fire strings is getting into the same position each and every time and being able to make a smooth magazine change. There are several drills that will help you accomplish this.

e. **One shot exercise.** The Shooter gets into position, dry fires several times and then loads one round in a magazine. The Shooter then stands up and gets back down into position and fires one round. Each shot can be observed to check the Shooter's ability to assume a position that is consistent from shot to shot. A partner can be used to give range commands and observe the Shooter's performance.

f. **Reloading exercise.** A smooth magazine change will give you more time to concentrate on shooting and will help the new Shooter to remain calm during the string. This drill can be done alone or incorporated with the one shot exercise. The Shooter remains in position and has two magazines with one round in each. They load and fire one round and then execute a magazine change and fire the second round. This can be done at home while dry firing, or on the range while a partner gives commands.

The above drills and exercises are only a few of the many possible ones. You can make up your own drills depending on your needs. Remember that the end result of the drill should be a measurable benefit to your shooting.

CHAPTER 9

SCORE BOOK

9-1. GENERAL

The score book is a very important tool for the competitive Shooter. Not only do you use the score book to track your zeros on your rifle, but also you can use it to diagnose various things that affect you. For instance, you might notice through the study of your score book data that you shoot high on cloudy days or that you start shooting low during prone slow fire after ten rounds. Without a well documented score book, it would be very difficult to learn such things. It can also be thought of as a shooting diary. The more information you can record about a performance, whether it is practice or a match, the more information you will be able to review later. Be honest with your assessment of your performance. The data that you enter about your equipment, performance, and weather will help you have a starting point the next time you train. This allows you to review techniques or the effect of a particular condition, allowing you to become more knowledgeable about your shooting.

9-2. BASIC INFORMATION

a. **Location.** Fill in the location of the range where you are shooting. For example, Easley Range, Fort Benning, GA.

b. **Date.** Write in that day's date.

c. **Time.** Write in the time that you are shooting that stage of fire.

d. **Rifle.** Write in the type and serial number of your rifle. This way you don't get it confused with another rifle.

e. **Relay and target point.** Write in what relay and target firing point where you will be shooting. Ex. "R3/T12" stands for relay three, target point number 12. Recording this data will help you remember to shoot on your assigned target point, avoiding cross-fires.

9-3. WEATHER CONDITIONS

a. **Light.** Light affects the Shooter's perception. Consequently, this can affect a shooters zero so be descriptive in your writings of the lighting conditions. Record the type of lighting conditions on the range. For example, is the condition partly cloudy but the light is still bright, or is the condition cloudy and dark. Record the direction the sun is in in relation to the direction you are shooting. Stand facing the targets, holding your score book parallel to the ground. Place the point of your pen in the center of the circle (in the light direction block). The target is 12 o'clock and you are in the center of the circle. The shadow that is cast from your pen is the direction of the light where you are. The light direction at your position is what will affect your perception, which is why light direction is important.

b. **Temperature and humidity.** Write in the temperature and humidity if known. It is easy to carry a small thermometer in your shooting stool to read the temperature. It is simpler to get the relative humidity from a local weather station.

9-4. WIND CONDITIONS

a. **Speed.** Write in the relative wind speed. Ex. "5 MPH" means that it is blowing steady at 5 mph.

b. **Type of wind.**

(1) **Constant.** A consistent or steadily blowing wind.

(2) **Switching or "fish-tailing."** A wind that switches direction as it is blowing. The switches can be small directional changes to 180-degree changes.

(3) **Letting off.** A wind that blows a relatively constant speed but then slows down or lets off to a lesser speed. How fast or frequently the wind does this depends on the day.

(4) **Picking up.** A wind that blows a relatively constant speed but then increases its speed or picks up. How fast or frequently the wind does this depends on the day.

9-5. SIGHT PICTURE

Record the sight picture used during the string (see Chapter 2) by drawing a picture of it. Most score books provide a circle diagram representing the aiming black for this purpose. Over time, you may experiment with different sight picture techniques.

Maintaining a record of the sight picture used is important when you evaluate zero's used on a particular string.

9-6. RECORDING ZEROS

a. **Starting zero.** The starting zero is your yard-line zero (elevation and windage) that you put on the rifle before you shoot any stage of fire, see below for a detailed description of each.

b. **Windage.** Annotate your yard-line windage zero you are going to start this stage of fire with. Write the zero referenced from mechanical zero. For example, your no wind zero for this stage is left three clicks from mechanical zero, write "L3." If your no wind zero were right three clicks from mechanical zero, you would write "R3."

c. **Elevation.** Annotate your yard-line elevation zero you are going to start this stage of fire with. All elevation zeros are referenced from the elevation zero reference mark. This reference mark is where your elevation zero will be counted off. For example, if you must click your elevation knob up twelve clicks from the reference mark to hit the center of the target for this stage of fire, your elevation zero would be "12UP."

d. **Corrections made to your starting zero.** Annotate all zero corrections made during a stage of fire. For example, you are shooting slow fire and have quarter minute adjustments on your sights. After your first sighting shot you make a correction of 4 clicks down and 4 clicks right. It should be noted in your remark section what change you made. Write down the elevation and windage that is on the rifle's sights and for which shot you made the change.

e. **Final or finish zero.** This is where you take weather conditions and sight corrections into consideration and determine what should have been your correct zero. Write down what your starting zero will be for the next time you shoot this stage of fire. As you note differences day to day, you will be able to factor the weather conditions prior to shooting your first sighting shot.

9-7. PLOTTING SHOTS

a. **Sighting shots.** Designate the first sighting shot with "S1" and the second sighting shot with "S2." Mark the sighting shots in your score book target where they appear on the actual target.

b. **Rapid-fire groups.** Plot the first rapid-fire string with each shot being desig-

nated with a letter “X”, then plot the second rapid-fire string with each shot being designated with a small circle or dot. A multi-color pen can also be utilized, using different colors for each string.

c. **Slow fire shots.** The plotting of shots utilizing the “one shot behind” method is recommended. Check the wind and make an initial estimate of the wind’s effect and make the necessary adjustment. Fire your first shot. After shooting, look through the spotting scope and check the wind (mirage). Load, and when the target comes back up observe the location of your shot. As you are doing this, check the wind and make any necessary windage corrections. Fire your second shot. As the target is pulled into the pits to be scored, plot the location of your first shot and load the rifle. When the target comes back up, check your target and note the location of your second shot while simultaneously checking the wind and making any necessary windage corrections. Fire your third shot, check the wind and plot your second shot. This cycle goes on until you are finished shooting. This method plots the last shot while the current shot is being scored in the pits, thus minimizing time spent between shots and allowing for more time to be spent watching for wind changes.

d. **Calling the shot.** Calling the shot will help you to be more mindful of your follow-through and to help diagnose errors.

e. **Plotting the call.** After firing your shot, you should have a mental picture of what your sight picture looked liked as you fired. This is your “call.” Plot your shots using the boxes or small circles found in your score book. Use a small dot within the circle or box that indicates where you believed the bullet should impact on the target.

f. **Remarks.** Record anything else that may help you asses your performance. Keep your remarks positive. A positive attitude will increase your confidence and performance. Recording your goals and physical state may also assist you as you evaluate the data in your score book.

9-8. CONCLUSION

The importance of a well maintained score book cannot be emphasized enough. A detailed score book will provide a valuable reference source for different shooting conditions, as well as a documentation of your progress.

CHAPTER 10

INFANTRY TROPHY

10-1. HISTORY

The Infantry Trophy Team Match, often called “Rattle Battle,” was originally designed to simulate a rifle squad in a combat-firing scenario. Originally, only military teams competed in this match. Each firing team was comprised of six firing members, a coach, and a team captain. Five of the members were using the 1903 Springfield and one man fired the Browning automatic rifle (BAR). This match was fired at the National Rifle Matches with civilians present and watching. As the popularity of this match grew, civilians wanted to participate. Since a civilian team could not field a BAR, the change was made to have all six firing members equipped with a 1903 Springfield. As the service rifle changed to the M-1 Garand, the match changed with it to it’s current configuration.

The Infantry Trophy Team Match as it is currently fired consists of six firing members, a coach and a team captain (Figure 10-1). Each team captain is given 384 rounds, which he divides between his six Shooters. A captain determines this through practice. Since each team engages eight targets, two Shooters from each team shoot the two outside targets on each end. These two Shooters are commonly referred to as “swing Shooters.” This leaves four targets for each of the remaining firing members. These Shooters are known as “straight-away” Shooters. By utilizing this fire plan, six Shooters are able to effectively engage eight targets.

During an Infantry Trophy Team Match, there are no alibis or “re-fires”. Should a firing member have a malfunction, he simply calls for help on his target and attempts to clear his malfunction. The reason he would do this is a scoring issue and will be

Figure 10-1 Infantry Trophy coaching

explained later.

10-2. CONDUCT

The first stage of the match is fired from the 600 yard-line in the prone position.

a. RANGE COMMAND: “Load and Be Ready.”

b. All firing members lock and load their rifles. All targets come up together and time starts when the last target is fully raised. The time limit is 50 seconds for each stage of fire during this match. Magazine changes are done on each Shooter’s own accord and should be expedient. On the magazine change, a swing Shooter shifts to his swing target. He would then fire his remaining rounds on the other target.

c. RANGE COMMAND: “Cease Fire.”

d. All targets go down into the pits for scoring. Once scoring on the line is complete; targets go back into the pits to be cleaned while the firing line advances forward.

e. RANGE COMMAND: “Team captains, move your teams forward, dress center, and advance.”

f. All teams advance to the next yard line on line with each other, for safety reasons.

g. RANGE COMMAND: “Team captains, move your teams to the firing line.”

h. All Shooters move to their respective positions on the firing line. Since there is no preparation period given after the first stage of fire, the next command is “Load and be ready.” At this time the whole sequence starts over again. Prone is also the position for the 500 yard stage.

i. After firing and scoring are complete, teams will again move on line to the 300 yard line. This stage is fired from the sitting position. After firing and scoring are again complete, teams advance to shoot standing from the 200 yard line.

j. At the end of the last stage of fire, all firing teams on that relay move toward the pits and pull their duty in the pits. At the end of the day, the team with the highest score wins. Hits from the 600 yard line are worth more points than from the 500. 500 yard line hits more than the 300, and so on. Each hit from the 600 yard line is worth four points. Simply take the total number of hits on all targets for each team, and multiply

by four. If all targets receive six hits, then that team has just "squared" that stage of fire. For each target that received six hits, (8 targets) multiply that number (8) by itself and you get your bonus. For example: Your team gets six or more hits on all eight targets. Take 8 X 8 = 64 and add that to the total score of the hits. This is the team's total score for the first stage of fire. The second stage (500 yard) is scored the same with the exception that hits are only worth 3 points as compared to four. Shots at the 300-yard stage are worth 3 points and hits from the 200 yard line are worth only one point. The bonus works the same for all stages.

10-3. TRAINING PROGRAM

The Infantry Trophy squad should train for at least four weeks prior to a match. Training should be divided into two phases: an initial instructional training phase followed by a weekly firing schedule.

a. **Differences in developing positions.** The standing and sitting positions are identical to those used in National Match firing. In the prone position, fast recovery may be facilitated if the Shooter employs the following techniques:

(1) Use the sling at least as tight as for National Match rapid fire.

(2) Increase grip of non-firing hand.

(3) Place cheek well up on the stock with a firm downward pressure.

(4) Grasp the pistol grip firmly with the firing hand.

(5) Place as much weight as possible, evenly distributed, on both elbows.

(6) If an elbow slips while firing, make the upper body as rigid as possible. Under these conditions, relaxation must be sacrificed.

(7) With practice, increase the cadence in the prone position until well-aimed shots are fired at intervals of one to two seconds or less.

(8) Emphasize reloading exercises until the period of firing the last shot from one magazine to the first shot from the next magazine is reduced to eight seconds or less.

b. **Aiming.** At all ranges, the Shooters should be taught to aim at the center of the

silhouette rather than the center of the target frame (silhouettes may not be centered on the frame)

c. **Trigger Control.** The trigger control used in National Match firing is satisfactory for Infantry Trophy firing. Some Infantry Trophy Shooters have successfully used another technique, which permits an extremely high rate of fire without disturbing the sight picture. In this method, the slack is not released after each shot. The Shooter merely releases the trigger until the hammer hooks are engaged, at which time a distinct click will be heard and felt. He is then ready to increase pressure on the trigger to fire the next round. This method is sometimes difficult to master, but it can be very effective.

d. **Developing control.** The most common method of controlling fire is to divide the six Shooters into two 3 man teams, each fire team being controlled by one coach (Figure 10-1). The right fire team will fire on the right four targets and the left team will fire on the left four targets. Obviously, when three men fire on four targets, one or more must fire on at least two targets. Usually the most consistent Shooter is designed as the swingman. The swingman will usually use the outside target of his block as the primary target. This facilitates other Shooters swinging to the shift target in case of a malfunction. Both fire teams, although working individually with their coach, are close enough together for all Shooters to hear commands from either coach.

The team's load plan should be designed by the coach to achieve the maximum number of points. A fire plan should emphasize the two farthest yard lines (600 and 500), but should be tailored to the abilities of the individual Shooters to fire accurately. Although the Shooters should fire quickly, accuracy must not be sacrificed for speed. In addition, enough ammunition must be allotted for each yard line so that each target can be squared (see above).

Load plans vary according to the capabilities of the team and the desires of the coaches, but they should, as much as possible, complement the strengths of the team. The fire plan should provide for a maximum assurance of squaring (six or more hits) all targets. The 300 and 500 must be fired and squared to achieve the greatest score. A maximum number of rounds should be fired at the longer ranges because of the increased value of each hit. Hit percentage is the key to determining individual loads. A Shooter that obtains 30 hits out of 30 shots is more valuable than a Shooter that obtains 34 hits out of 40 shots.

The coach's position while using binoculars must be directly in line with the bore of the Shooter observed (Figure 10-2). If not, the vapor trail will not be viewed accu-

rately. With a team in complete synchronization, the coach can opt to use one member of the team as a "wind dummy" and make all corrections from what is observed with that particular vapor trail. This is one of several techniques that can be used. It is the

Figure 10-2 Infantry Trophy coach position

recommended technique, however; the team must be synchronized for it to work.

CHAPTER 11

MATCH ETIQUETTE

You will enjoy shooting most when you and your fellow competitors practice the "golden rule." Shooter's enjoy a reputation of good sportsmanship. That reputation has developed from Shooter's collectively enforcing a code of behavior on the range, which promotes enjoyment of the sport, camaraderie, and good will. The following rules of thumb are a guide for appropriate behavior on the range. Abide by them, and you will enjoy the same reputation of good sportsmanship that characterizes shooters as a whole.

a. When you are near the firing line but not shooting, keep your voice low and avoid distracting those firing. Remember, they are trying to concentrate!

b. Introduce yourself to other competitors on your target and those around you. Most matches are all day affairs. You will enjoy the day of camaraderie if you extend the hand of friendship before the match begins.

c. When it is your turn in the target pit, render prompt service in scoring shots. Prepare in advance for each stage. Ensure you have enough target pasters readily available. Keep a spare shot marker and scoring disk handy; they often fall out or are shot out by follow-on shots. During slow fire, have the appropriate color paster ready. Pay attention to the pit officer and be ready for his commands.

d. Know the rulebook. It is the competitor's responsibility to know and understand the course of fire and scoring duties. Forcing match officials or other competitors to correct your mistakes is distracting and discourteous.

e. Respect the preparation time of other competitors. Many Shooters concentrate deeply just before and during the preparation period. Ask the competitor you are scoring on the line for his scorecard early, and also see if they have any preferences on exchanging scoring information before the preparation period begins. For example, some Shooters like to hear the scorer say the value of each shot out loud; others prefer to not hear their shot value called out.

f. Refrain from outbursts if you are shooting poorly. Don't let vanity get the best of you. Remember it's only a game; be courteous to those around you who are still trying to concentrate.

g. When you are the champion, accept victory with grace and humility. Conversely, when you lose, congratulate the winners on their performance and avoid making excuses for your own performance.

h. Finally, take a moment to thank the match officials and volunteers. Running a competition is not easy and they will appreciate your gratitude.