

UNITED STATES NAVY
MARKSMANSHIP
TEAM



RIFLE MARKSMANSHIP
GUIDE

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RIFLE MARKSMANSHIP GUIDE

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SECTION 1: GENERAL

1-1 **SAFETY:** Safety is paramount when handling a firearm. One error in judgment or act of complacency can have tragic consequences. Therefore these basic rules must be followed at all times.

RULE 1 Treat every firearm as if it were loaded. It's always the unloaded rifle that will hurt you

RULE 2 Never point a firearm at anything you do not intend to shoot. Maintain muzzle awareness at all times.

RULE 3 Do not load the firearm until you are instructed to do so. A firearm is loaded if a magazine containing at least one round is inserted into the magazine well.

RULE 4 Keep your finger straight and out of the trigger guard until you are ready to fire.

RULE 5 Keep the firearm on SAFE (locked) until you intend to fire. When you complete your string of fire, CLEAR your rifle by removing the empty magazine, confirming the chamber is empty and inserting the Safety Flag (formerly called Empty Chamber Indicator or ECI).

RULE 6 Obey all commands from the Range Safety Officer and Block Officials.

1-2 SCOPE. The scope of this manual is to provide a ready reference to Navy rifle shooters in the application of the fundamentals of service rifle shooting. For the average sailor, the fundamentals of rifle marksmanship are learned during basic training and are very limited in scope. This manual will increase your understanding of rifle shooting and will enhance your knowledge of marksmanship. Whether you are involved in watch qualification, match competition, or actual combat, the application of the basic fundamentals of marksmanship to each round fired is a requirement for success. Competitive marksmanship, though, necessitates that not only must all of the shots hit the target but they must also impact at a specific point; the bull's-eye! To compete and win in match competition the marksman must understand and apply much more than the fundamentals. The information found in this manual has been reproduced from various DoD sources and from my own experience as a competitive marksman.

I would like to give special thanks to the volunteers and staff of the US Navy Marksmanship Team. Their generous donation of time, energy and knowledge at the Fleet, and All Navy Shooting Championships has paved the way for new shooters to enter the sport and provided an opportunity for the top Navy marksmen to showcase their talent at Interservice and National level competition. The men and women of the US Navy Marksmanship team have successfully represented our country and our service through their hard work and practice. Additionally I would like to thank the US Marine Corps Weapons Training Battalion at Quantico, Virginia for providing many of the concepts and graphics that I used. The US Army Marksmanship Unit at Fort Benning, Georgia for their training programs and hosting the Small Arms Firing Schools at the National Matches at Camp Perry Ohio. Also Mr. H. J. "Walt" Walters, a retired Navy Shooter and NRA board member, who has been training sailors since 1958, for his permission to use his data book graphics. One of my photographers, LT Matt Bartel, a humble man and outstanding marksman, Nikki who helps me reload ammo and Beth who puts up with my stuff all over the house. The Author

1-3 COURSE OF FIRE. The following course of fire is used in individual and team rifle matches. This course of fire is called the National Match Course and is used in all Fleet level and subsequent follow-on matches

STAGE	RANGE	TIME	SHOTS	TARGET
Slow	200 yds	20 min	20	"SR" Standing
Rapid	200 yds	60 sec	20	"SR" Sitting from standing
Rapid	300 yds	70 sec	20	"SR-3" Prone from standing
Slow	600 yds	20 min	20	"MR-1" Prone

1. Slow Fire. In slow fire stages for individual and team matches the time allotted is one minute per round. In team matches an additional 3 minutes will be allowed for each additional pair of shooters which will be included in total team time. Therefore, in a team match with four firing members the total team time is 83 minutes and for six firing members the total time is 126 minutes. The Range Master will control time from the firing line.

2. Rapid Fire. In rapid fire stages, for both individual and team competition, the rifle will be loaded initially with 2 rounds in the first magazine and 8 rounds in the second magazine. Time will be controlled from the pits by the pit boss.

SECTION 2: NATIONAL MATCH RIFLE

2-1 GENERAL. Navy match competition will primarily utilize the scoped AR-15 rifle. Competitors will provide their own rifles for use in the matches. M14 or M1A civilian equivalent or the M1 Garand Rifles are also permitted however due to the lighter recoil and accuracy improvements in the AR-15, the older service rifles are nearly obsolete for higher level competition. All rifles must comply with the Civilian Marksmanship Program (CMP) highpower rifle rules for service rifle.

2-2 DESCRIPTIONS

1. The M16 rifle is a 5.56-mm magazine-fed, gas-operated, air-cooled shoulder fired weapon. It was designed for either semiautomatic or burst fire through the use of a selector lever. The original M16 rifle was introduced for service in Vietnam by the U.S. Army in 1966 and was adopted by the Marine Corps in 1968 after the addition of the A1 upgrade (forward assist). The M16 has gone through several upgrades, the latest being the M16A4 with Safe-Semi-Auto selector, flattop upper receiver, and four-rail handguard system.

2. The AR-15 is the civilian equivalent to the M16 without the selector lever. In 2016 the CMP authorized the AR-15 to have a rifle scope (4.5x max), quad rails and adjustable stock. The vast majority of the CMP and NRA service rifle match competitors use this platform.
3. For information on the M1 Garand, M14/M1A and iron sight AR-15s, see Appendix A.



AR-15 with Scope, A2 Stock and Quad Rail



AR-15 with Scope, Adjustable Stock and Quad Rail

2-3 PROPER CARE

1. Stock. The AR-15 stock is made mostly of plastic and is not subject to the same moisture issues as rifles with wooden stocks. The plastic stock is generally maintenance free. The stock may be the standard fixed length A1/A2 style, or adjustable as shown below.



2. Barrel and Receiver Group. Weather also has an effect on the metal parts of the rifle, in that climatic conditions such as temperature changes cause the metal to sweat or rust. If the weapon is fired during rain, it should be cleaned immediately after firing. Keep a light coat of oil on all metal and in the barrel and chamber when not shooting on the range. Maintain an accurate record of all shots fired and all maintenance performed on the rifle in your gun record book. With the scoped rifle it is sometimes difficult to close the bolt since the competitor must reach over the top of the scope, to alleviate that reach, an Extended Bolt Stop is permitted to be installed. See pictures below. For left handed competitors, manufacturers are producing left hand lower and upper receivers.

3. Firing Mechanism. The firing mechanism should be kept dry and clean, except for points that are to be lubricated in accordance with the service manual.

4. Sling. To keep the leather sling soft and pliable, rub it with saddle soap or neatsfoot oil. However, using too much can cause the sling to become too soft causing stretching. These substances should be used, especially on hard, stiff slings and new slings. Keep all stitching and riveted areas in good repair and replace if necessary. Web slings should be brushed to remove dirt and inspected for fraying.

5. Scope and Scope Mount. The choice for Service Rifle scopes is very wide reaching, models cost from about \$500 up to over \$2500. **All models must be maximum 4.5x power and no greater than 34mm objective lens.** The scope is mounted to the upper receiver with a Scope Mount. There are many of these on the market, the key features are to find one that is not too high and allows the scope to be mounted fairly far forward for proper eye-relief. See pictures below.



Extended Bolt Release left and right hand views



Scope and Mount- Left Hand Side



Scope and Mount - Right Hand Side
(with Safety Flag Installed)

SECTION 3: MATCH EQUIPMENT

3-1 GEAR NEEDED. In an ideal situation all the equipment necessary to successfully compete in Fleet and All Navy competition should be issued by the command sponsoring the team. However that is not always the case. Below is a suggested list of items needed. Not all are required but using them will help improve a shooter's performance.

- | | | |
|--------------------|---------------------------|---------------------------------|
| a. Shooting coat | f. Shooting glasses | k. Ball Cap |
| b. Shooting glove | (required) | l. Shooting Mat |
| c. Data book | g. Ear plugs (required) | m. Timer |
| d. Camp (shooting) | h. Sweatshirt | n. Safety Flag (formerly called |
| stool | i. Sweat bands (headband) | Empty Chamber Indicator |
| e. Spotting scope | j. Pencils or pens | (ECI)) (required) |
| with stand | | |

3-2 USES AND CARE OF MATCH EQUIPMENT.

a. Shooting Coat.

The shooting coat is designed to give the shooter maximum protection from the recoil of the rifle, and protection for the elbows from the ground or firing line. This protection is afforded by means of pads. These pads are usually some type of thick, soft material such as rubber or leather covered felt sewed to the sleeves of the shooting coat. They are sewn on the outside, so the points of the elbows will be in the middle of the pad. The shoulder pad is sewn to the outside of the coat, it is where the butt of the rifle will rest when you are in a shooting position. The pulse pad on the upper left arm protects the arm from a tight sling pinching the artery and causing a pulse beat.

A shooting coat that doesn't fit properly will hinder your shooting. Too large will allow the elbow pad to shift below the point of the elbow (onto the forearm) when the elbows are bent, affording no protection to the elbow. Too small a coat will fit so tightly that the shooter cannot get into a good position. A shooting coat with rubber or leather pads should be dry cleaned in order to keep the pads soft. If washing is necessary, wash in warm water and dry in the shade. Drying pads in the sun or by heat will cause the pads to become hard and brittle.



Shooting Coat Back



Shooting Coat Front

b. Shooting Glove.

The shooting glove or mitt is used in all shooting positions where the loop sling is used. The glove protects the area between the thumb and forefinger from the sling swivel, it also protects the back of the hand when a tight loop sling is used. You can keep the leather glove from getting hard and dry by using saddle soap or neatsfoot oil. Some competitors use a glove inside a mitt for additional padding in sitting and prone position. A glove is also permitted in the standing position.

c. Data Book.

This is a very important item! SECTION 6-1 will discuss the details of the Data Book. Use spring clips of some type to separate the score sheets and to hold them open and convenient for writing. They also keep the wind from blowing the sheets and losing your place. Recommend to always keep a plastic ziplock bag handy in your shooting stool to store the Data Book and protect it from rain.

d. Camp Stool.

The stool is used as a seat while waiting your turn on the firing line between relays, scoring targets and for resting the rifle during offhand. Check the seams for weakness of threads.

e. Spotting Scope and Scope Stand.

The Spotting Scope is used for viewing hits on targets, scoring the target and for reading mirage heat waves (wind). At all times when you are not using the scope, the lens covers should be in place on the scope. These covers protect the lens from dirt and oil and from being scratched. It is aggravating to try to focus a scope to read the wind when both lenses are scratched and dirty! The shooter must take every precaution for care to prolong its usefulness, they are very expensive to replace. Be careful of the legs on the Scope Stand, most are made of cast aluminum and are easy to break. Spotting Scopes with an angled eyepiece assist in positioning the scope closer to the eye in a prone position. Ideally, the competitor only needs to move the head slightly to view the target. Some models have the Long Eye Relief (LER) feature, this allows the head/eye to be about 2 inches further away for viewing, making it easier to observe the target or wind conditions. Below are images with magnifications at 27x LER, 20x and 60x from a zoom lens. The higher magnifications are not always helpful due to slight wobble in the wind making it harder to see the image. The higher magnifications however can be very helpful in coaching or trying to see the shot holes at 200 or 300 yds.



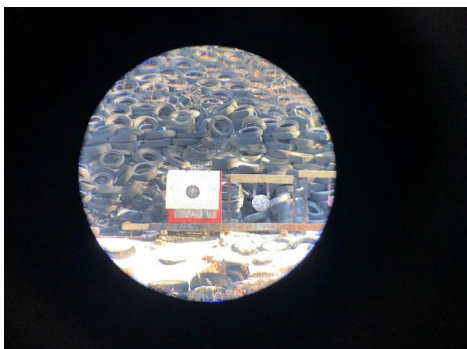
Spotting Scope and Stand Raised for Standing or Sitting Position



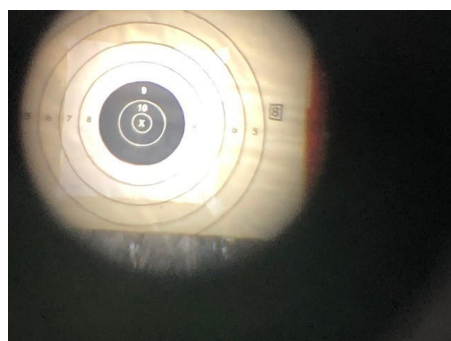
Spotting Scope and Stand Low for Prone Position



27x Long Eye Relief (LER) at 200 yds



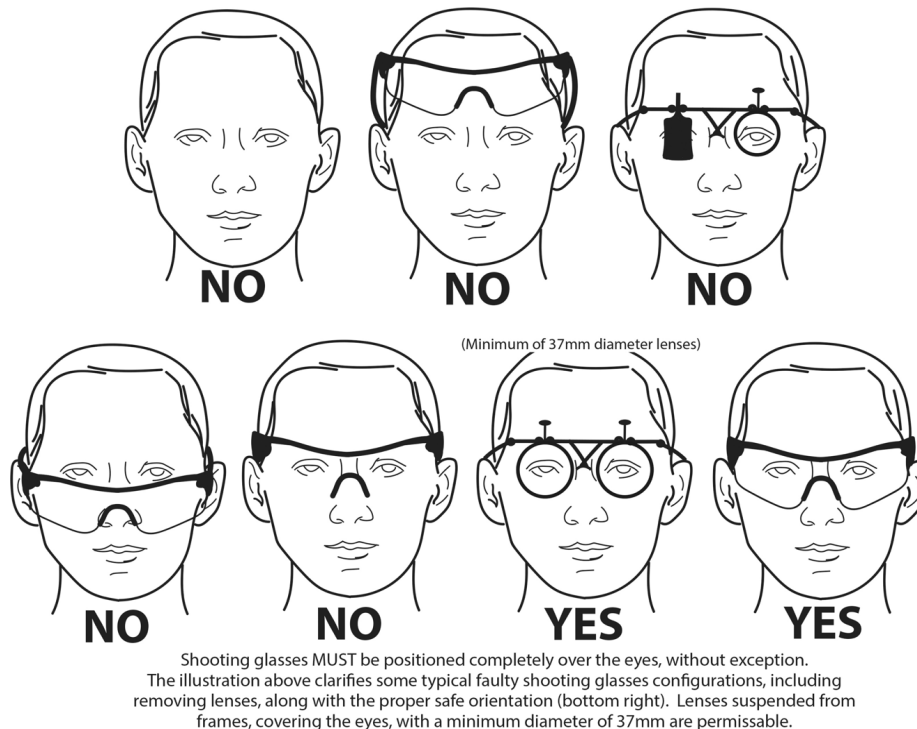
20x on a Zoom Lens at 200 yds



60x on a Zoom Lens at 200 yds

f. Shooting Glasses.

Shooting Glasses are required. Different colored lenses are available (rose, amber, clear or dark) to help some shooters so that they are not bothered by changing light conditions. Shooting glasses, aside from helping the shooter with light change conditions, will protect the eye from oil, rear scope housing, dirt or dust that the wind or muzzle blast have kicked up. Most importantly, they have saved many eyes from flying chips of brass from ruptured cartridges and primers. One disadvantage is that body heat may cause lenses to fog. Recommend choosing a brand of glasses that does not have a top bridge so that there are less obstructions to see through to the scope. Anti-fog coatings or treatment are also helpful. Olympic style shooting glasses are also an option.



CMP Rule 3.6.2 states that all competitors and competition officials, including Scorers or Verifiers, are required to wear eye and hearing protection when on shooting range firing line and in Highpower Rifle target pits during Highpower rifle firing. Eye protection must have two complete lenses with minimum dimensions in depth and width for each lens of 1.30 inches. It is strongly recommended that eyewear worn on firing lines meet or exceed the ANSI Z87.1 safety standard impact protection. Competitors' eyewear must be worn so that the two lenses remain in front of the eyes during firing (see diagram). No one will be allowed to participate in a CMP-sanctioned competition unless they are wearing eyewear and hearing protection that complies with this rule. Any competitor or match official who is not in compliance with this rule will be warned in accordance with Rule 3.12.2 a). Refusal to comply with a warning is grounds for disqualification.

g. Ear Plugs. Hearing protection is required. Ear plugs or sound attenuators protect the eardrums from the sharp crack of the weapon when fired. Over time, the damage to the ears causes loss of hearing in the high frequency range. Keep the ear plugs clean and in the case when not in use. Dirt on the plugs can cause injury to your ears. Many shooters use dual hearing protection with ear plugs and "Mickey Mouse Ears". Custom molded ear plugs are also available and many competitors find them particularly suitable for the prone position where a tight stock weld can push on the skin around the ear canal and dislodge other sound attenuators.

h. Sweatshirt. The sweatshirt not only gives extra padding, but also keeps the body at an even temperature, and reduces the amount of pulse beat that is transferred from the body to the rifle. Wash the sweatshirt for the sake of your teammates. CMP Rule 4.5.2 permits a maximum of two sweatshirts.

- i. Sweat Band. The sweatband is worn on the forehead to keep sweat out of the shooter's eyes. Rinse with plain water very often.
- j. Pencils or Pen. You must always have a pencil or pen with your Data Book and scorecard. Keep spares in your shooting stool so that they are always on hand to record your data. If the Data Book gets wet, the ink will run. Pencils are recommended. For Pit Operations and Scoring Information, see Appendix B.
- k. Ball Cap. A Ball Cap is useful to keep the sun out of the eyes during shooting and scoring. When pulling targets in the pits, sprayed dirt and debris can get airborne and the Ball Cap will help in those situations.
- l. Shooting Mat. The Shooting Mat is used in the sitting and prone phases of the match. It is not required, but will allow for a more padded surface in these positions and can prevent dampness from the ground from gathering on the shooters clothing and shooting jacket.
- m. Timer. A Timer is helpful during the slow fire stages to ensure the competitor is not running out of regulation time. Be advised that CMP and NRA rules do not allow audible alarms.
- n. Safety Flag (formerly called Empty Chamber Indicator or ECIs). All Shooters must have a Safety Flag for their rifle. The Safety Flag must be fluorescent orange, yellow or similar bright color and must have a probe that inserts into the gun chamber and a visible flag that projects out from the open gun action. The Safety Flags must remain in the rifles at all times, except during preparation and firing periods. CMP Rule 3.6.1.



Sample Safety Flags

SECTION 4: COMPETITIVE RIFLE MARKSMANSHIP

4-1 AIMING. Sight/scope alignment, trigger control, and breath control are the most important fundamentals of any type of marksmanship. Without thorough knowledge and application of proper sight/scope alignment and trigger control a well-aimed shot is impossible. Before sight alignment is addressed, a review of the basics of aiming is necessary. The importance of aiming cannot be overemphasized. Aiming provides a means whereby the shooter can check the effectiveness of position and trigger control in later phases of training and firing.

4-2. Sight Alignment for the Scoped AR-15.

With a scoped rifle, alignment is the relationship between the competitors eye, scope front and rear lens and the scope reticle. These should all be directly in line to have the clearest image with no distortion. The competitor should already have adjusted the scope so that the reticle is **crystal clear**. Most scopes have an adjustment to accommodate for some vision correction (about +/- 1.0 diopter). Parallax error can be introduced if the eye is not in the same line as the scope center and reticle. Errors in alignment create angular changes in the position of the axis of the bore resulting in a change to the strike of the bullet.

4-3 The Scoped Rifle.

The AR-15 may have a scope with a maximum magnification of 4.5x and no larger than 34 mm objective tube (see CMP section 4.1 for more details).

1. The scoped rifle allows the shooter with vision problems or older eyes that do not focus well with the iron sights to compete. For all shooters, the scoped rifle allows for some magnification of the target and many, if not most of the competitors are using this advantage.

2. Care must be taken to allow sufficient "eye-relief" so that the shooter can see a clear image of the target and not crowd the rear of the scope, injury can occur due to recoil. CMP rules do not allow the scope (optical sight) configuration to change between stages (Standing, Sitting Rapid, Prone Rapid and Prone Slow). The AR-15 adjustable stock is one way to accommodate the varying eye-relief needed.

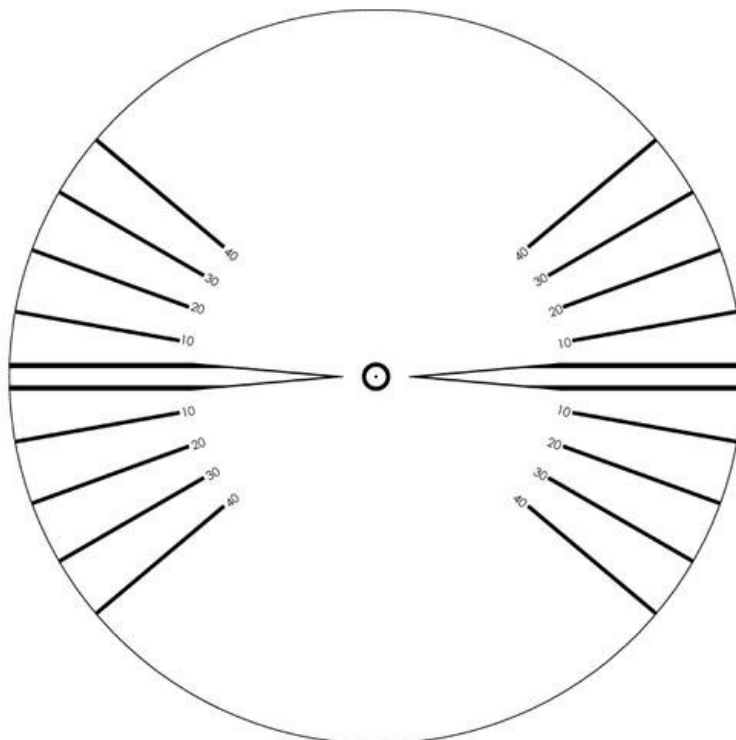
3. There are many scope manufacturers that make CMP legal service rifle scopes. There are also many types of reticles available. Popular reticles include dot, cross hair, dot with circles around for various Minutes Of Angle (MOA), illuminated/non-illuminated etc. Shooters should do their own research to see what they would prefer. See images below.

4. Some scopes have a fixed focus (say for 200 yds) and others have a variable focus. Both types of scopes are used in the current CMP matches. Some competitors who have vision that is not perfect 20/20 can benefit from the variable focus to avoid wearing a prescription lens while shooting.

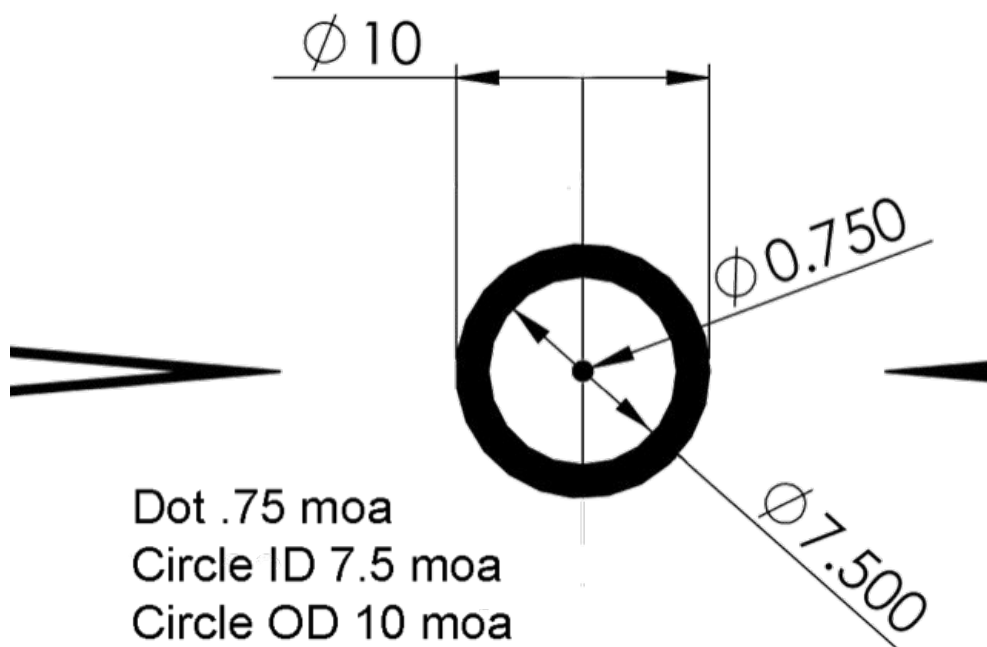


Standard Crosshair Reticle with Small Center Dot

An example of a scope reticle is shown below (provided by permission from White Oak Armaments)



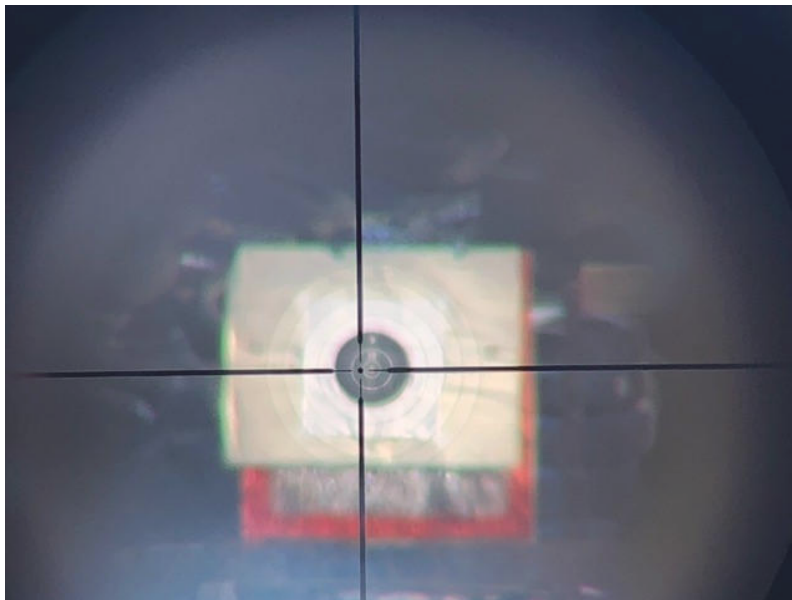
This reticle has a dot for the center aiming spot and an enlarged circle, enhanced below, that is sized to go around the aiming black of the standard high power targets. In addition, there are rifle CANT degree markings for those shooters who have a CANT and want to use the markings to repeat their position.



The high power target aiming black is approximately 6 MOA for all targets.



Example of 4.5x Scope with 200 yd Target



4.5x Scope at 200 yd- Zoomed in to view Sight Picture-
in this case the center dot is not lined up on the center of the target.
In most cases the dot should cover the center of the target.

5. Aiming with the Scope. In most cases the center of the scope is placed on the image of the center of the target (the X ring). The shooter must pay special attention to ensure that their eye is directly in line with the optical image. Parallax errors can occur if the eyeball is not centered. Some shooters use an "aiming aid" to help keep the vision line as perfect as possible. A loose-leaf paper reinforcing circle can be adhered to the rear objective lens in the exact center. Commercial products are also available for this.



Example of Aiming Aid on Rear Lens

6. The rifle scope can often be used instead of the spotting scope to see the shot marker after the target has been pulled and scored. Some shooters adjust the focus of the rifle scope to see mirage also.

7. An advanced technique used mostly in slow fire prone, is that if the wind/mirage changes, instead of adjusting the windage knobs on the scope, the shooter will rather, "Hold Off" with the aimpoint of the scope. In the graphic on the earlier page, there is a 7.5 MOA circle around the approximate 6 MOA aiming black, that would give approximately 0.75 MOA of "white" on either side of the black. The shooter may favor one side or the other and thus adjust for the perceived increase or decrease in the wind. This technique is best practiced so the shooter is confident in ability to do this consistently.

4-4 Relationship Between the Eye and Sights.

1. In order to see what is required during the process of aiming, the shooter must know how to use the eye. Variations in the position of the eye with respect to the scope will cause variations in the image received by the eye. The "Eye" in this respect is called "eye-relief". Proper eye-relief, subject to minor variations, is approximately three inches between the eye and the rear of the scope. The best method of fixing the eye-relief is with the "spot weld" (how your cheek meets the stock). If this is not set properly, this can induce fatigue and eye-strain.

2. The eye/brain is capable of near instantaneous focus from one distance to another. The eye cannot be focused at two distances simultaneously.

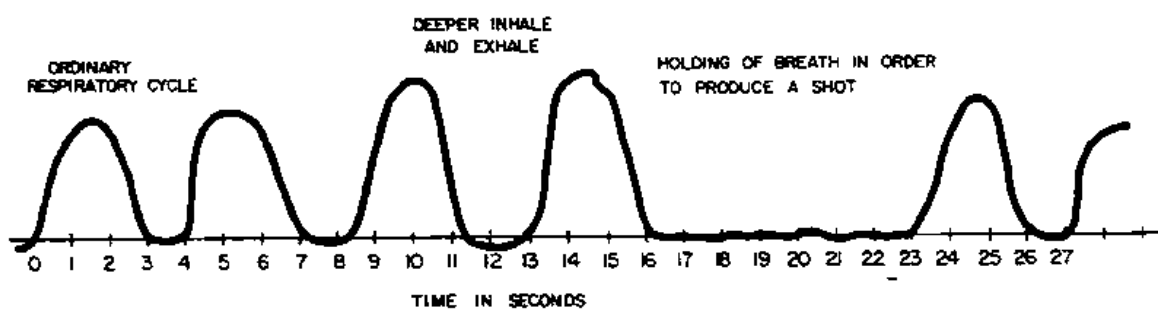
3. To achieve an undistorted image while aiming, position your head so that you look straight out of the aiming eye and not out of the corner or top of the eye. If the head position causes you to look across the bridge of the nose or out from under the eyebrow, the eye will be strained. The strain will produce involuntary eye movements that reduce the reliability of your vision. Train yourself to avoid excessively squinting with one eye open while the other is squeezed shut. This practice after a few seconds reduces the oxygen to the eyes and induces eye-strain. This will not only effect performance, but the inability to see clearly will also have a damaging psychological effect. The eye will function best in its natural forward position. Your eye should not be too close to the rear objective lens, if you are too close it can cause a "wandering zero". A position too far away will cause scope "shadows" at the edges and not allow for a good eye-relief.

4. Do not fix vision on the target for more than about 10-15 seconds. When the eyes are focused on a simple image for a time the image is "burned" into the area of perception. This can be illustrated by staring at a black spot on a piece of paper for 20-30 seconds and then shifting the eyes to a white wall. A ghost image of the black spot will appear, with a corresponding loss of visual acuity in the area of the image. This will have an effect upon the critical area of perception. This image may be mistaken for a true sight picture. Either effect will seriously damage performance.

4-5. **BREATH CONTROL.** The control of the breath is important with respect to the aiming process. If you breathe while trying to aim, the rise and fall of the chest causes the rifle to move vertically. To properly hold the breath, inhale, then exhale normally and stop at the moment of natural respiratory pause.

1. A respiratory cycle lasts four to five seconds. Inhalation and exhalation require only about two seconds. Thus between each respiratory cycle there is a pause of two to three seconds. The pause can be extended to 12-15 seconds without any special effort or unpleasant sensations. The extended pause between breaths (respiratory pause) is the optimum time to fire the shot. During the respiratory pause the breathing muscles are relaxed, the shooter thus avoids strain upon the diaphragm.

2. The respiratory pause should never feel unnatural. If the pause is extended far too long a period, the body suffers from oxygen deficiency and sends signals to resume breathing. The signals produce slight involuntary movements in the diaphragm and interfere with the ability to concentrate. Eight to ten seconds is generally the maximum period for the respiratory pause.



Respiratory pause

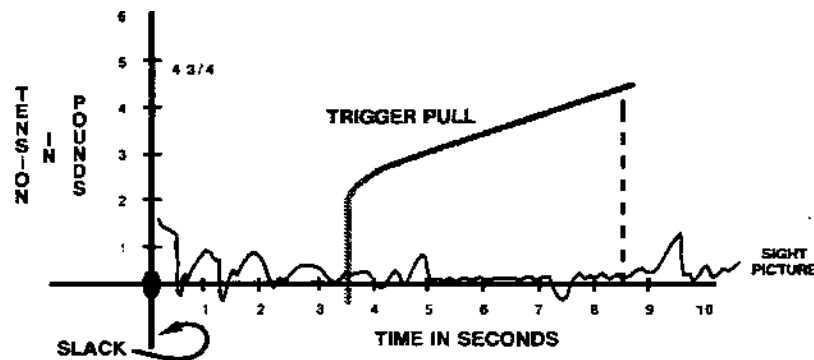
3. Slow Fire Method. Assume your position and breath naturally until your holding movement begins to settle. Then take a slightly deeper breath. Exhale, pause, and try to fire the shot during the pause. If the hold does not settle sufficiently to allow the shot to be fired, resume normal breathing, discontinue the hold, and repeat the process.

4. Rapid Fire Method. In rapid fire, the position is difficult to change while firing so the breath must be held at some point other than the natural respiratory pause. It is difficult to discuss the basics of breath control during rapid fire without an understanding of how to shoot rapid fire. Breath control will therefore be discussed in the techniques of fire section for rapid fire.

4-6 TRIGGER CONTROL. The art of firing the rifle without disturbing sight alignment is an important fundamental of marksmanship.

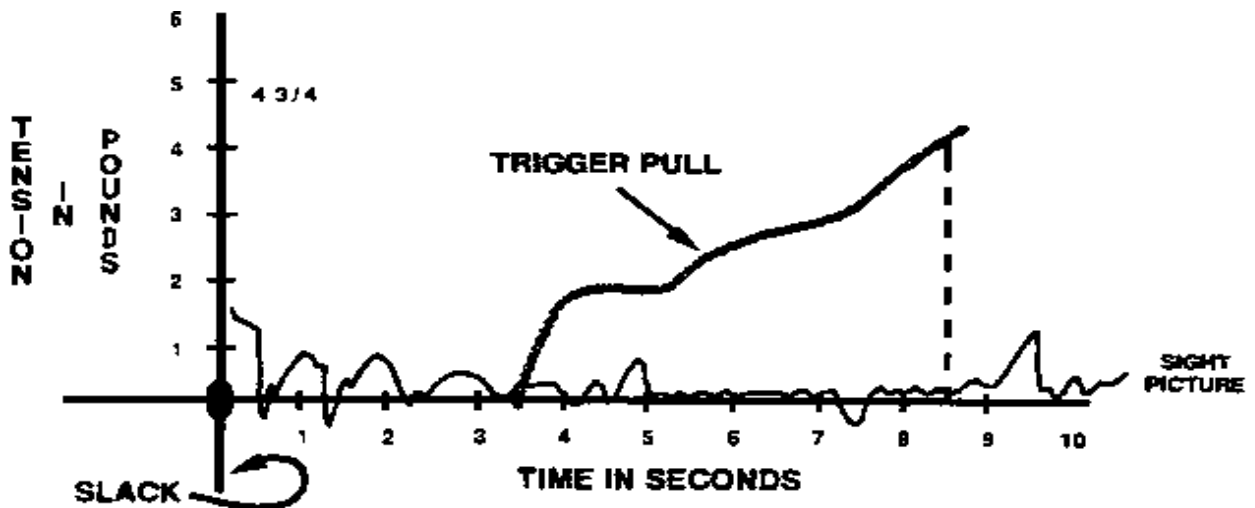
1. Methods of Trigger Control. Controlling the trigger is a mental process while squeezing the trigger is a mechanical process. Two methods of trigger pull used on the service rifle are the uninterrupted and the interrupted pull.

a. Uninterrupted. Take up the slack or free play in the trigger with a heavy initial pressure. When the sight picture settles, the pressure smoothly increases until the rifle fires.



Uninterrupted

b. Interrupted. Pressure is applied to the trigger as long as the sight picture looks good or continues to improve. If the sight picture deteriorates briefly, pressure is maintained at a constant level, and is increased when sight picture again begins to improve.



Interrupted

2. Trigger Control Developed as a Reflex. Develop trigger control to the point where squeezing the trigger requires no conscious (subconscious) effort. You will be aware of the pull, but you will not be consciously directing it. Every one exhibits this type of reflex activity in daily living. The individual who walks, or drives a car, while carrying on a conversation is an example.

a. An analogy to shooting can be seen in a typist. When first learning to type, a typist reads the letter to type, mentally selects the corresponding key, and consciously directs a finger to strike the key. After training, a typist can automatically see and type a letter without thought. A mental thought process has become a reflex.

b. The shooter can develop the same type of reflex circuit. When the shooter first starts firing he/she must consciously direct the trigger finger to pull the trigger when the aim is perfected. As a result of training, however, a circuit will be established between the eye and the trigger finger.

c. The eye, seeing the desired sight picture, will cause the finger to squeeze the trigger without conscious mental effort. The shooter, like the typist, is aware of pressure against the finger but not consciously directing it.

3. Developing Trigger Control. The best method of developing proper trigger control is through dry firing. The coach and the shooter are able to detect errors since there is no recoil to conceal the rifle's undesirable movements. Where possible, trigger control practice should be integrated in all phases of marksmanship training. The mastery of proper trigger control takes patience, hard work, concentration, and a great deal of self-discipline.

a. Concentration. Concentration should be focused on the perfection of aim as trigger control is applied. Concentration, being defined as the will to demand obedience from the mind, is the most important factor of trigger control.

b. Grip on Rifle. A firm grip with the hand on the rifle stock or pistol grip is essential for good trigger control by applying pressure on the trigger without disturbing sight picture or sight alignment. The grip must be the same for each shot.

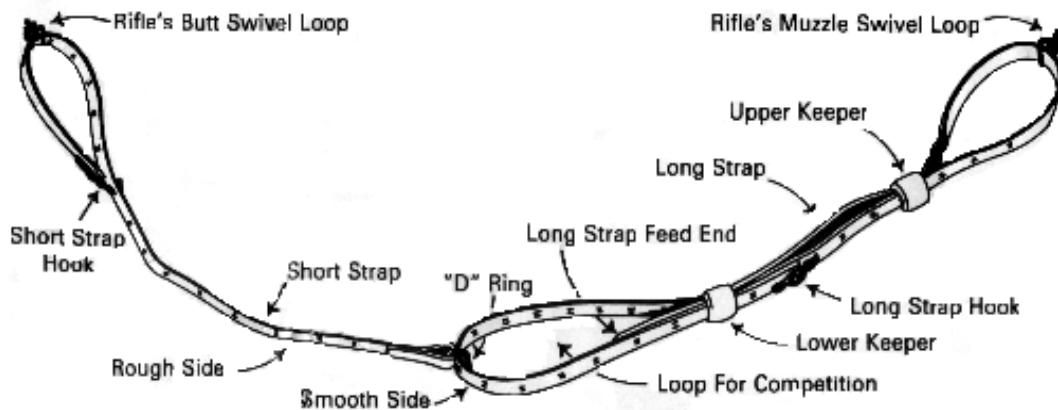
c. Trigger Finger Placement. The finger should be placed with the same amount of finger at the same position on the trigger to be able to pull the trigger straight to the rear.

4-7 FOLLOW THROUGH. Ensure there is no undue movement of the rifle until the bullet leaves the barrel. Continue to hold your breath, focus on the front sight, and practice trigger control even though the rifle has fired. Correct errors in trigger control by noting them during follow through.

4-8 CALLING THE SHOT. You should predict where the shot will hit the target. This is done during live and dry fire. "Call the shot" by noting the relationship of the reticle to the target when the rifle fired. It is important that the shot be called with a minimum amount of error. The less the error in calling the shot the easier it is to analyze the shot or the group of shots. An example of using this technique is noting where the aim was incorrect in a string of rapid fire such as; "9 o'clock two shots, 1 o'clock one shot, 7 shots perfect". By using this method, the shooter won't wonder why there are 3 shots out of the group. This technique can and should be used for each and all shots.

4-9 RIFLE SLINGS. The rifle sling is an aid to attaining and maintaining a proper position. The sling has a two-fold purpose. First, when adjusted properly it will provide maximum stability. Second, when used properly it will aid in reducing the effects of recoil. Two types of slings are utilized with the rifle. The web sling was originally issued with the service rifle. The leather sling is utilized for competitive shooting.

1. The leather sling is assembled as follows:
 - a. Put the feed end of the long strap through both sling keepers,
 - b. Put the feed end of the long strap through the D-ring of the short strap.
 - c. Put the feed end of the long strap through both keepers again to form a loop with the rough side of the leather on the inside.
 - d. Attach the frog of the long strap to a set of adjustment holes in the long strap.
 The sling is now ready to be placed upon the rifle.



The Leather Sling

2. Adjustment of the Leather Sling. To adjust the sling for a right-handed shooter:
 - a. To place the sling on the rifle, set the butt of the rifle on the right hip and cradle the rifle in the crook of the right arm. Unhook the feed end of the long strap from the frog and put it through the upper sling swivel, the frog should be to the outside of the rifle to prevent it from scratching the stock. Put the feed end of the long strap through the keeper and reattach to the long strap frog. You should have both keepers above the frog.
 - b. The loop to be used on the left arm is formed by that portion of the long strap toward the muzzle by pulling the inside strap toward the butt of the rifle. Once the loop is formed, straighten the sling and twist the loop a half turn to the left. Put the left arm through the loop. Position it well up on the arm above the biceps. To tighten the loop on the arm, pull the outside strap toward the arm while pushing the inside strap toward the muzzle. This should pull the frog of the long strap as close to the arm as possible. The frog should be towards the outside of the arm to more naturally align the strap when in the shooting position. Both keepers can be pulled down on top of the frog, locking the loop in place. The feed end of the long strap may be threaded through the top keeper or may be left hanging loose.
 - c. There are also some other sling configurations such as the No-Pulse sling (see book from MGSgt Jim Owens USMC) which the shooter may consider. Slings are also permitted made of synthetics such as Biothane which has the advantage of not soaking up water, exhibits little stretching and has good ability to grip the jacket (less slippage of the sling on the arm).



No-Pulse Sling Configuration



Attach sling to rifle



Open sling loop and give 1/2 turn to the right



Sling keepers
should be more
outside and
higher on arm
than shown

Slip arm through the loop and tighten above the bicep. The keepers go towards the outside of the upper arm.

3. Adjustment of the web sling

a. Place the rifle butt on the right hip and cradle the rifle in the right arm. Disconnect the J-hook from the lower sling swivel. With the M-buckle near the hook, feed the sling through the top of the M-buckle to form a loop large enough to slip over the arm.



Forming a loop

b. Give the loop a half turn outboard (clockwise) and insert the left arm through the loop, positioning the loop above the biceps. The loop is high on the left arm above the biceps muscle in such a position that it does not transmit pulse beat to the rifle. Position the M-buckle on the outside of the left arm.



put buckle here,
and raised higher
on the arm above
the bicep

Tightening the M-buckle

c. Tension on the rifle sling is correct when it causes the rifle butt to be forced rearward into the pocket of the shoulder. This serves to keep the butt plate in the shoulder pocket during recoil. To increase tension on the rifle sling, the sling must be shortened. To lessen the tension, the rifle sling must be lengthened. Move the sling keeper toward the left arm and secure it. The sling keeper should be positioned near the feed end of the sling. Place the left hand over the sling from the left side and under the rifle. The rifle handguard should rest in the "V" formed between the thumb and forefinger and across the palm of the hand. Move the left hand as required to achieve the desired sight picture. Adjust the length of the sling for proper sling tension and support.

4-10 POSITIONS. A correct shooting position is essential to obtain the best results in rifle shooting. The better the position, the easier it is to hold the rifle and control the trigger while the scope reticle is properly aligned with the target.

1. Elements of a Good Shooting Position. The three elements of a good position are bone support, muscular relaxation, and natural point of aim (NPA).

a. Bone Support. Positions are designed as foundations for the rifle. A good foundation for the rifle is just as important as a good foundation is to a house. If a house is built on a weak foundation, it will not stand erect. The same is true when a shooter establishes a weak foundation (position) for his/her rifle. It will not withstand the repeated recoil of the rifle in a string of rapid fire.

b. Muscular Relaxation. Learn to relax as much as possible in each firing position. Undue muscle strain or tension causes trembling which is transmitted to the rifle. In all positions, however, a certain amount of controlled muscular tension is needed. For instance, in a rapid fire position, there should be pressure on the spot weld. Only through practice and achieving a natural point of aim will muscular relaxation be learned.

c. Natural Point of Aim (NPA). The rifle becomes an extension of the body. It is necessary to adjust the position until the rifle points naturally at the target. Take your position, close your eyes, relax, and open your eyes again. With proper sight alignment, the position of the front sight will indicate the natural point of aim and the proper sight picture.

2. Shooting Positions.

a. The three basic shooting positions used in competition are standing, sitting, and prone. These positions are governed by guidelines, which are sufficiently flexible to allow modifications according to the body configuration. Some shooters will have more difficulty in assuming a particular position than others. Whether using the AR-15 with a fixed A1/A2 stock or an adjustable stock, the fundamentals of position are the same.

b. Factors Common to All Positions: There are six factors that affect holding the rifle steady while aligning the sights and squeezing the trigger. These factors are the same for all firing positions. However, the precise manner in which they apply differs slightly from one position to another. (ALL DISCUSSION REGARDS RIGHT HAND SHOOTERS, LEFT HAND SHOOTERS WILL REVERSE THE TEXT FOR THEIR APPLICATION)

(1) **Left Hand.** In all positions but standing, the left hand is forward of the magazine against the stock or handguards. Some shooters have long enough arms for the wrist to reach the sling swivel, which provides a positive stop for the left hand. The wrist is straight and locked so that the rifle rests across the heel of the hand. The hand itself is relaxed. The fingers can be curled against, but not gripping, the stock or handguards. The rifle should only rest on the left hand. The left elbow should be directly under the rifle. (See CMP Rule 5.1.3) The bones of the arm, rather than the muscles, support the rifle's weight. If the elbow is located too far to the left of the rifle, muscular effort will be needed for support. The resulting tensed muscles will cause trembling and a corresponding movement of the rifle. Avoid excessive muscular strain in positioning the elbow. You may have to undergo a trial and error period until finding the best position.

(2) **Rifle Butt in the Pocket of the Shoulder.** The shooter must place the rifle butt firmly into the pocket formed in the shoulder. The proper placement of the butt reduces the recoil, helps steady the rifle, and prevents the rifle from slipping in the shoulder. For the AR-15 with its lighter recoil, this is not as crucial to be deep into the shoulder pocket. Experiment with the position that best suits your physical build.

(3) **Grip of the Right Hand.** The right hand grips the pistol grip firmly, but not too rigidly. A firm rearward pull must be exerted by the right hand to keep the rifle butt in a proper position in the pocket of the shoulder. The trigger finger, when positioned on the trigger, will not contact the side of the grip. This permits the trigger to be squeezed straight to the rear without disturbing the aiming of the rifle.

(4) **Right Elbow.** The placement of the right elbow provides balance to the position. Correctly positioned, the elbow helps form a pocket in the shoulder for the rifle butt. The proper placement of the butt reduces the effects of recoil, helps steady the rifle and prevents the rifle from slipping in the shoulder.

(5) Spot Weld.

The spot weld provides firm contact between stock and head. It is obtained by lowering the cheek to the stock, and rolling up a pad of flesh against the cheekbone to act as a buffer. The firm contact between the head and rifle enables the head and weapon to recoil as one unit, thereby facilitating rapid recovery between rounds. The spot weld also enables the eye to be positioned the same distance behind the rear of the scope (eye-relief). Many AR-15 competitors put their nose on the left hand side of the charging handle as a reference point and establish good eye-relief.

(6) Breathing. If you continue normal breathing while aiming and firing, the movement of your chest will cause a corresponding movement in the rifle. To avoid this, learn to hold your breath for the few seconds required to aim and fire the rifle. Initially take a normal breath, release part of it, and hold the remainder in the lungs. Do not hold the breath for more than 10 seconds or vision may blur.

3. Standing Position. The standing position is used in the first stage of the National Match Course; 20 rounds, with a time limit of 20 minutes, at the 200 yard line.

a. Balance. Balance is as important to a shooter as it is to any athlete. This is especially true for the standing position, when the shooter must be able to stand for long periods without tiring. Compared to the prone or sitting positions, there is little doubt that it is the least steady position, and the most difficult to master. However, there is no reason why excellent results cannot be obtained by applying the fundamentals.

b. Assuming the Standing Position. Face the target, execute a right face, and spread your feet apart at a comfortable distance. First bring the rifle up to your head and let your head fall naturally onto the rifle stock. Your head should be as erect as possible and the aiming eye in a direct line with the sights. Lower your cheek to the stock and relax the entire weight



AR-15 fitting into the pocket of the shoulder

of your head on the stock so that the side of your face will be in contact with the stock. The butt of the rifle should be in the same location on your shooting jacket each and every time you fire. Distribute your weight evenly on both hips. The spot weld for standing is very seldom the same as for sitting or prone. To maintain consistent eye-relief, care must be taken to place the cheek against the stock the same way, and at the same place, every time. Many shooters find that by placing their nose on the left side of the charging handle is a repeatable location and provides suitable eye-relief. By practice and experimentation determine the proper stock weld. Finding a natural point of aim in the standing position can be complicated because of uneven terrain on most firing lines. Always strive to have both feet level. Move either foot in any direction to take advantage of "hills" and "valleys" until finding the desired point of aim. Relax between shots but always keep your feet in place.

c. Shooting in the Wind. In the standing position the entire body is exposed to the wind and only the feet are in contact with the ground. This will cause the rifle to move considerably when the velocity or direction of the wind changes. It is possible to get good results even under these unfavorable conditions if you have a good mental attitude. Assume the position and wait for a lull or at least a period when the wind direction and velocity are constant. While waiting, allow the body to move freely with the wind. When the lull occurs, quickly acquire the correct sight picture and execute the fundamentals of trigger control. Although movement may be greater than usual, you can still fire a relatively well aimed shot. Unsatisfactory scores are usually caused by the temptation to snap-shoot (jerk the trigger) when the reticle is in the vicinity of the black.

d. Holding Exercises. Dry fire and remain in position for a period of time. This period should be gradually increased from 30 seconds to one minute as the training progresses. To avoid excessive fatigue no more than 20 repetitions should be conducted during one training session.

e. Position Checks. Correct position can be checked as follows:

- (1) Feet level and comfortably spread approximately shoulder width.
- (2) Weight equally distributed on both feet and hips.
- (3) Butt of rifle high in shoulder and close to neck.
- (4) Natural point of aim (NPA) on the target.
- (5) Consistent spot weld.
- (6) Neck and torso relaxed.
- (7) Daylight between trigger finger and pistol grip.
- (8) Legal requirements: "Standing erect on both feet no other portion of the body touching the ground or any supporting surface. The sling must be attached to the rifle but may not be used for support. The rifle will be supported by both hands and one shoulder only. The elbow of the forward arm may be placed against the body or rested on the hip."

f. Variations on Position

(1) With the scoped rifle some shooters utilize a CANT with the rifle. The CANT brings the rear objective lens closer to the natural erect head/eye position to improve balance. Some adjustments to the rifle zero will be needed to accommodate this CANT.

(2) Some shooters utilize a 'back bend' and 'twist' to bring the center of gravity of the rifle more in line with the center of gravity of the shooter. The twisting above the waist helps to have more bone support than muscle. As with all these recommendations, the shooter should dry fire and practice to find a position that relies as much as possible on bone rather than muscle for support.

4. Sitting Position. The sitting position is used in the rapid fire or second stage of the National Match Course; 10 rounds, with a time limit of 60 seconds, from standing to the sitting position, at the 200 yard line.

a. There are three variations of the sitting position. They are the open leg, cross leg, and the crossed ankle positions. The position used depends entirely on the shooter. Because of different body configurations, there are shooters who are unable to use the crossed leg or the crossed ankle positions. Try all positions and choose the one that affords the most stability and ease of sight alignment. In the rapid fire position the sling must be tight so the recoil will not disturb the natural point of aim. NOTE: For right handed shooters the feet are always crossed left over right and vice versa for left handed shooters. Only attach the top two buckles of your shooting jacket, leave the others undone. You may also unbutton the top button of your trousers and loosen your belt. This will relieve pressure on your diaphragm allowing your breathing to be easier and less transmitted pulse to the rifle.

(1) Crossed Ankle. Sit down, keep the feet crossed, and slide them forward. Bend at the waist and place the upper arms inside his knees. Using the right hand at the butt of the rifle, push the rifle forward and place the butt of the rifle into the right shoulder. Move the right hand forward, grasp the pistol grip, and lower the upper arm until it rests inside the bend of the right knee. The forward elbow should be on top of the left knee. Relaxing the weight forward and assuming the correct spot weld completes the position.



Crossed ankle

(2) Crossed Leg. The difference between crossed leg and the crossed ankle positions is very slight. In the crossed leg position, after sitting down, keep your feet under your knees and simply leave the position of the upper arms inside the knees. It takes only a short period of time to assume the crossed leg position.



Crossed leg

(3) Open Leg. To assume the open leg position the sling must be shortened about three inches from the prone position adjustment. Face the target and do a half right face. Stand with the feet approximately shoulder width apart and sit down in place. Using the left hand to break the fall. Place the feet a comfortable distance apart. Bend forward at the waist, put the left upper arm down along the left shin bone and the right upper arm inside the right leg at about the knee joint.



Open leg

b. In the three sitting positions it is necessary to adjust the natural point of aim to the target to eliminate using muscles to align the sights. This may be accomplished by moving either foot, both feet, or the buttocks until the sights are naturally aligned on the target with no muscular tension.

c. Position Checks. Use the following checks to ensure that the positions adhere to the fundamentals.

(1) Rifle vertical, not canted.

(2) Left hand forward to the upper sling swivel (when possible). The rifle resting in the "V" formed by the thumb and forefinger. The weight is supported by the heel of the hand. This prevents the hand from slipping, affords the most bone support, and keeps recovery time to a minimum. In some cases, because of body configuration, the hand may be pulled back somewhat to elevate the muzzle on the weapon, raising the natural point of aim. A small amount of tension may be present but the hand and wrist remain as relaxed as possible.

- (3) Left elbow under the weapon as much as possible and blocked inside the left knee.
- (4) Sling positioned well up on the arm above the biceps and tight enough to prevent slipping. Sling tension should be enough to maintain position against recoil throughout the string. The sling is usually shortened approximately one inch from the prone rapid-fire adjustment.
- (5) Rifle butt placed close to the neck and high in the hollow of the shoulder to facilitate positioning of the head and to aid in preventing the butt plate from slipping.
- (6) Right elbow blocked in front of the right knee to prevent the arm from being dislodged during recoil.
- (7) Torso bent forward at the waist with as much of the body behind the rifle as possible to absorb the recoil. Shoulders are approximately level to prevent canting of the rifle.
- (8) Leg muscles relaxed.
- (9) Head should be as erect as possible and looking straight through the rear of the scope. The face is pressed firmly to the stock so that the spot weld is maintained throughout the recoil and recovery.
- (10) The grip of the right hand is firm enough to maintain the position of the hand throughout the string.
- (11) Legal requirements: "In the sitting position, the weight of the body rests on the buttocks and feet or ankles. No other portion of the body shall touch the ground. The rifle will be supported by both hands and one shoulder only. Arms may rest on the legs at any point above the ankles."

5. Prone Positions. The prone positions are used in the third and fourth stages of the National Match Course. The third is 10 rounds, with a time limit of 70 seconds, from standing to prone position, at the 300-yard line. The fourth stage is 20 rounds, with a time limit of 20 minutes, in the prone position, at the 600-yard line.

a. The prone positions are very steady positions, which are easy to assume.

Although the prone position is used in both slow and rapid fire, there are basic differences between them. In rapid fire, the position must be tighter to prevent recoil from disturbing the natural point of aim. In slow fire, the position is much more relaxed and the body is lowered. In the slow fire position, it is not necessary to consider recoil since there is time to recover the correct position between shots. Lowering the body may be done by readjusting the sling. Only the top two or three buckles are used on the shooting jacket depending on personal preference.

- (1) To assume the prone position, stand facing the target with the left hand forward on the fore grip and the right hand grasping the stock at the pistol grip or the stock. Feet are spread to a comfortable distance apart, weight is shifted slightly to the rear, and drop to your knees. With the right hand break the fall and pivot onto the left side, place your left elbow well forward. With the right hand at the rear of the stock, force the butt of the rifle into the right shoulder. The pistol grip is grasped with the right hand and the right elbow is lowered to the ground so that the shoulders are approximately level. Secure a spot weld and relax into the tension of the sling.

The body should be positioned well behind the rifle to absorb the recoil. The legs can be spread with the ankles flat against the ground or with the right leg cocked, whichever is more comfortable.



Assuming the prone position

b. **Breathing Position Check.** To adjust the natural point of aim on the target, use the elbow as the pivot point and move the body either right, left, forward, or backward until the sights are aligned on the target. If, when breathing, the sights move from 6 o'clock to 12 o'clock on the target, it is a well-balanced position.

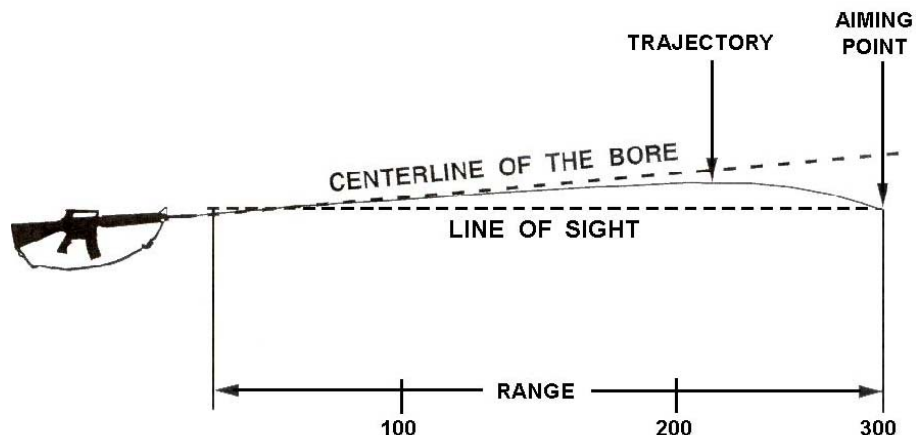
c. **Position Checks.**

- (1) Rifle vertical, not canted.
- (2) Left hand forward to upper sling swivel (when possible).
- (3) Rifle resting in the "V" formed by the thumb and forefinger of the left hand, and the weight supported by the heel of the hand and not the fingers.
- (4) Left elbow well under the receiver (as far as body configuration permits) and without violating CMP Rule 5.1.3.
- (5) Sling high on left arm.
- (6) Rifle butt close to the neck in the hollow of the shoulder.

- (7) Shoulders approximately level to prevent canting the rifle.
- (8) Body well behind the rifle to absorb the recoil.
- (9) Face firmly fixed on the stock weld.
- (10) Daylight between trigger finger and the pistol grip.
- (11) Trigger finger applying pressure straight to the rear.
- (12) Legal requirements: CMP Rule 5.1.3 "No part of the arm ahead of the elbow may touch the ground or any artificial support. The magazine may touch the shooting jacket sleeve, but it may not rest on the jacket sleeve, jacket elbow pad, arm or ground."

SECTION 5: ZEROING

5-1 Bullet Path and Line of Aim. To understand the principles of zeroing, the shooter should have a basic knowledge of the relationship between the path of the bullet in flight and the line of aim. In flight, a bullet does not follow a straight line but travels in a curve or arc which is called trajectory. The maximum height of a bullet's trajectory depends on the range to the target. Therefore, in order to hit a target at a certain distance the barrel must be held in a manner so as to cause the bullet to be fired slightly upward for it to "fall" into the target. The greater the distance a bullet travels before impact, the higher it must travel in its trajectory. On the other hand, the line of aim is a straight line from the eye through the rear sight aperture across the front sight to the aiming point or target. So it follows that after the bullet leaves the rifle, it is initially moving in an upward path, intersecting the line of aim. As the bullet travels farther, it begins to drop and will eventually again intersect the line of aim. The range at which the second intersection occurs is the zero for that sight setting.



5-2. Definition of True Zero. The true zero of the sight is the setting in elevation and windage required to place a shot or shot group in the center of the target at a given range when no wind is blowing.

5-3. Scope Adjustment. To accomplish zeroing, you must first learn the operation of the scope elevation and windage knobs, the use of the elevation and windage rule, and how to compute sight changes. Some scope bases have an elevation built into them to allow the scope range of elevation to be more in the optical center of the lenses. A 10 MOA 'down angle' is popular.

1. Elevation and Windage Rule. This thumb rule is based on "one minute of angle (MOA) elevation or windage moves the strike of the bullet one inch on the target for each 100 yards of distance". The scoped rifle will have windage and elevation knobs, typically each click is worth 1/4 or 1/2 MOA. If the scope has a MIL DOT reticle, then each click is approximately 1/3 MOA (actually 0.36 inch at 100yds). In all cases, see manufacturer specifications for the MOA per click.

MOA Ratios: Examples

1 inch at 100 yards subtends (equals) = 1 MOA
2 inches at 200 yards = 1 MOA
3 inches at 300 yards = 1 MOA
6 inches at 600 yards = 1 MOA
4 inches at 200 yards = 2 MOA
3 inches at 600 yards = 0.5 MOA

2. Sight Changes. To make sight changes, locate the center of the **shot group** and determine the distance between it and the desired location (usually the center of the target). The distance in elevation is determined vertically while the distance in windage is determined horizontally. These distances are converted to clicks by using the elevation and windage rule. As a general rule, bold adjustments will prove more advantageous (See MGSgt Jim Owens "The Big Lie" regarding perils of adjusting sights based on **one shot**). To raise the strike of the bullet you must increase the elevation. Conversely, decrease the elevation to lower the strike of the bullet. For most scopes, if using your right hand, curl around the knob and point your thumb.....the direction of the thumb is the direction the bullet impact will move. In order to raise the impact of a bullet, grasp the top (windage) sight knob and rotate counterclockwise the number of clicks desired. To lower a shot impact, turn knob clockwise.

5-4 ZEROING THE AR-15.

1. The best way to zero a rifle is to shoot it at the position, range, and cadence at which it is intended to be used. All shots should be recorded in the Data Book. The information in the Data Book is used in projecting zero changes. The wind must also be taken into consideration in determining windage zero. For example, if the wind velocity requires three clicks (three x 1/2 MOA clicks = 1.5 MOA) right windage, the windage zero on the sight will be three clicks left of that used in hitting the center of the target. Ideally zeroing will be conducted on low wind days.

a. If the rifle and scope combination are brand new with no previous information, it may be best to "scope in" or "sight in" on a target at 50 or 100 yd. Due to variations in the scope mounting rail, scope rings, unknown position of the scope elevation and windage knobs, you may find it easier to get on paper at the shorter range and then proceed to the 200 yard line.



Scope Knobs



Elevation Knob with
zero mark- 200 yd



Windage Knob set
for No Wind Zero

2. The 200 Yard Line Zeros. The initial zeroing phase should start at the 200 yard line with the sights set at that used at 50/100 yard test. To facilitate determining the 200 yard zero quickly, it is suggested that the rounds be fired slow fire in the sitting position, when the slow fire shots are striking near the center of the target, three shot groups of three rounds each are fired in rapid fire cadence followed by a rapid fire string of ten. During this firing, sight changes are made to bring the group into the center of the target. Often the rapid fire zero will be different from the slow. This is due to a difference in position and trigger control. Therefore, it is necessary to establish a slow fire zero. To do this, simply fire several rounds of slow fire from the appropriate position and call each shot accurately. When the shots appear on call then the slow fire zero has been obtained. Most scopes have a feature to loosen the knob and "reset the 0" to align with the stationary part of the knob. In this way, your 200 yd zero is set to "0" and your come-ups start from there to 300 and 600 yd. The same reset can be done to the windage knob to have it set to "No Wind Zero".

3. The 300 Yard and 600 Yard Zeros. The 300 yard rapid fire zero is determined by firing the same exercises that were fired at the 200 yard line. However, at 600 yards, single shots are fired until the group is centered on the target.

a. Typical sight change "come ups" for 77 gr HPBT ammunition are:

100 yd to 200 yd 2 MOA

200 yd to 300 yd 3 MOA

300 yd to 500 yd 7.5 MOA

300 yd to 600 yd 11 MOA

These "come ups" are subject to variations in shooter sight picture, scope alignment, ammunition lot and temperature.

5-5 TARGET DIMENSIONS.

In order to assist in determining a sight change it is to your advantage to know the size of the target and the scoring rings. This table does not need to be memorized, the data are shown in your Data Book target image.

200 yd SR Military		Rings in White (inches)	
Aiming Black (inches)		8 ring	19.00
X ring	3	7 ring	25.00
10 ring	7.00 (3.5 MOA)	6 ring	31.00
9 ring	13.00	5 ring	37.00

300 yard target SR-3 Aiming Black (inches)		Rings in White (inches)	
X ring	3	7 ring	25.00
10 ring	7.00 (2.3 MOA)	6 ring	31.00
9 ring	13.00	5 ring	37.00
8 ring	19.00		

600 yard target MR-1 Aiming Black (inches)		Rings in White (inches)	
X ring	6.00	6 ring	48.00
10 ring	12.00 (2.0 MOA)	5 ring	60.00
9 ring	18.00		
8 ring	24.00		
7 ring	36.00		

5-6 FACTORS AFFECTING ZERO.

Although zeroing is one fundamental of marksmanship, it must be understood that all other basics have a direct affect upon zeroing. Once a zero has been established there is a constant need to make slight adjustments from that zero to keep the group centered. By virtue of the constantly changing human factors and weather, you must recognize these various affects upon yourself and your rifle. The following is included to assist in the detection and correction of errors that would effect zeros.

1. Position. In order to establish a dependable zero strive for uniformity and consistency in each position. Changes in pressures applied at every point of contact between the rifle and body can cause a change in zero.

2. Aiming. Constant appraisal of sight/scope alignment, sight picture and muzzle movement will help keep "shot calling" honest and dependable for possible sight adjustments. For the shooter with a scoped rifle, if the eye is not directly in line with the center of the scope, the zero will change.

3. Trigger Control. Under actual match conditions, do not underrate this basic fundamental as a possible cause for changes in zero. Dry firing is probably the best method for detection and correction.

4. Ammunition. A change in the brands or lot numbers of ammunition may cause changes in zero. Look at the type of ammunition daily and record any changes.

5. Rifle. Be aware of the capabilities of the weapon. With proper care, cleaning, and analysis accuracy can be maintained.

6. Temperature. The air temperature and ammunition temperature will affect the zero. Protect the ammunition from direct sunlight, higher temp means higher point of impact.

SECTION 6: TECHNIQUES OF FIRE

Establishing a System. The process of methodically firing well-aimed shots, one after the other, requires alertness, concentration, and repetition. You must apply perfect alignment and trigger control to each shot, at the same time adapting each shot to the changing environment. To accomplish this formidable task each shooter must establish a system suited to their own mental makeup. Some aids are provided, such as the Data Book, while others are only suggested and must be developed on your own initiative.

6-1 DATA BOOK.

The use of a Data Book improves individual scores. If kept properly it will give you specific information about your rifle, such as windage and elevation zero's for a specific range, and the effects of weather conditions on zeros. Refer back to it and obtain the zero for the type of day on which you have previously fired. You must be honest with yourself in plotting every shot and call exactly where they are on the target. Keep the Data Book in such a manner that you will never doubt any dope change it may show, for any condition, from one day to the next. Do not feel restricted to using only the space allotted on the score sheet. If need be you may draw pictures and write yourself notes. These examples of Data Book sheets were reproduced with the permission of their creator, Mr. Walt Walters, and are intended for illustration purposes only. Data Books, if not supplied at the Fleet Matches, can be commercially purchased. They all contain the same basic information and are an important part of rifle shooting.

1. COMPOSITION OF THE COMPETITION DATA BOOK

a. 200 Yard Slow Fire Data Sheet, "SR" Target. The target on this data sheet represents the SR Military target. The SR target has a bull's-eye that measures seven inches in diameter and contains an "X" ring. The "X" ring is in the center of the bull's-eye and is used to break ties in scores. When you make sight changes on your rifle make them to bring your

groups as close to the center of the "X" ring as possible. You can win or lose a match by one "X"

2001 FLT MATCH - 200 YARDS SLOW FIRE STAGE®

Remarks:

PLACE <u>DAM NECK, VA</u> DATE _____	
HOUR _____ RIFLE NO. _____	
TARGET NO. _____	RELAY AMMUNITION
LIGHT DIRECTION	WIND DIRECTION
TEMPERATURE _____	MPH MIRAGE _____
ELEVATION USED _____	WINDAGE USED _____
ELEVATION CORRECT _____	WINDAGE CORRECT _____

	SS	SS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	SCORE
Elevation																							
Windage																							
Call																							
Value																							

b. 200 and 300 Yard Rapid Fire Data Sheets

These score sheets have the 200 "SR" and 300 "SR-3" yard targets on the pages to make it easier for the shooter to check rapid fire groups and the sight setting used at the 200 and 300 yard lines. "X"s are also scored in rapid fire. When you plot your shots, remember to plot them exactly where they are on the target. You will then be able to move your groups into the center of the "X" ring when you make your sight changes.

2001 FLT MATCH - 200 YARD RAPID-FIRE STAGE®

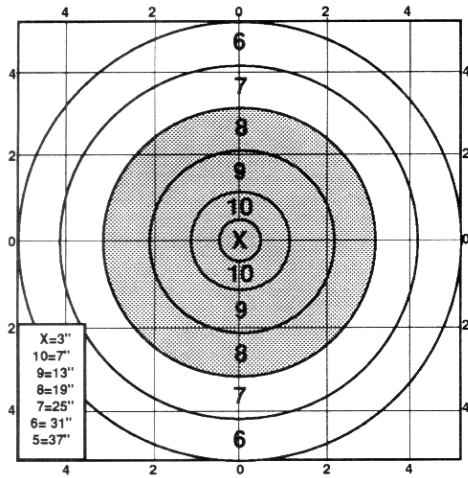
Remarks:

PLACE <u>DAM NECK, VA</u> DATE _____	
HOUR _____ RIFLE NO. _____	
TARGET NO. _____	RELAY AMMUNITION
LIGHT DIRECTION	WIND DIRECTION
TEMPERATURE _____	MPH MIRAGE _____
ELEVATION USED _____	WINDAGE USED _____
ELEVATION CORRECT _____	WINDAGE CORRECT _____

FIRST STRING							
Xs	10s	9s	8s	7s	6s	5s	SCORE
SECOND STRING							
Xs	10s	9s	8s	7s	6s	5s	SCORE

F11 200RF-1/27/01D

2001 FLT MATCH - 300 YD RAPID-FIRE STAGE



Remarks:

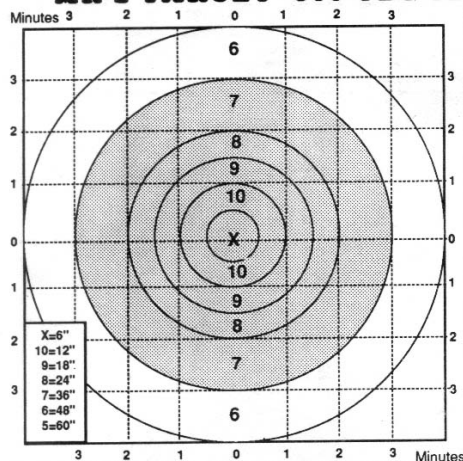
PLACE <u>DAM NECK, VA</u>		DATE _____	
HOUR _____		RIFLE NO. _____	
TARGET NO. _____	RELAY _____	AMMUNITION _____	
LIGHT DIRECTION	WIND DIRECTION	SIGHT PICTURE	
TEMPERATURE _____	MPH _____	MIRAGE _____	
ELEVATION USED _____		WINDAGE USED _____	
ELEVATION CORRECT _____		WINDAGE CORRECT _____	

FIRST STRING							
Xs	10s	9s	8s	7s	6s	5s	SCORE
SECOND STRING							
Xs	10s	9s	8s	7s	6s	5s	SCORE

Flt 300RF-1/27/01C

c. 600 Yard Data Sheet, "MR-1" Target. The stage of fire at 600 yards is recorded on this data sheet. In a match, this stage will consist of 20 shots. There are spaces for recording other information needed for a complete and accurate record of your 600 yard string, under all conditions. This target also contains a "X" ring. The bull's-eye is 12 inches in diameter and the "X" ring is six inches. You can determine how many clicks will be needed to put your group in the center of the "X" ring by checking the location of the group on the score sheet. The numbers or graph that are located on the outer edge of the target on the score sheet will tell you roughly how many clicks you will have to move.

MR-1 TARGET 600 YDS SLOW FIRE PRONE SCORE SHEET



PLACE _____		DATE _____		Reloading Information: Case Type _____ Primer _____ Powder Type _____ Gr.Wt. _____ Bullet Type _____ Gr.Wt. _____
HOUR _____		RIFLE NO. _____		
TARGET NO. _____	RELAY _____	SCOPE PWR _____		
LIGHT DIRECTION	WIND DIRECTION	SIGHT PICTURE		
TEMPERATURE _____	MPH _____	MIRAGE _____		
ELEVATION USED _____		WINDAGE USED _____		
ELEVATION CORRECT _____		WINDAGE CORRECT _____		

Remarks:

		Minutes																				SCORE	
	SS	SS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20
Elevation																							
Windage																							
Value																							

2. Elevation Zero. The elevation is recorded each day so that a record of elevation zeros for all conditions can be maintained for future reference.
3. Place. Record the name and location of the range on which you fire. The relay and target number should also be included. When you fire on different ranges, you may find that your zero changes.
4. Rifle Number. If you are firing more than one rifle, you must know the zeros of each.
5. Hour. Firing conditions will change from hour to hour during the day. Recording the time you shoot will show you how conditions change zeros at different times during the day.
6. Wind (Speed and Direction is the Wind Velocity).
 - a. Speed. The speed of the wind is typically in miles per hour units. When the speed is known, in addition to direction, we can determine the number of clicks required to put the first shot in the black. Record the speed as 2-4, 6-8 etc miles per hour.
 - b. Direction. The direction of the wind also has an effect on the windage zero. To record the direction of the wind, draw an arrow on the data sheet showing the direction from which the wind is coming.
7. Temperature. Variations in temperature will affect elevation by varying the strike of the bullet, thus changing your zero. More information in SECTION 7-4.
8. Ammunition. Usually you will be firing one type (lot) of ammunition for a given match, but there will be instances where this is not the case. When you are issued different types of ammunition for practice purposes you will find that your zero may change from lot to lot. Be sure to record the lot number that you are using. Many competitors use a lighter bullet at magazine length for 200 and 300 yard line, popular bullets are 69, 73, 75 and 77 grains (gr). For the 600 yard line, extra accuracy is possible using bullets with a higher Ballistic Coefficient (BC). Bullets used at 600 yard can be 77TMK, 77VLD, 80HPBT, 80VLD etc. For bullets 69 gr and heavier, a barrel twist rate of 1 turn every 8 inches (1 in 8) is recommended. For heavier bullets like 80 gr or more, a 1 in 7 twist is recommended. Very Low Drag (VLD) bullets have a Secant Ogive profile that is more aerodynamic than a standard Tangent Ogive bullet. VLD bullets often perform better when loaded closer to the rifling (approximately 0 to 0.010 inch jump), where the HPBT style are more "forgiving" to seating depth and usually loaded about 0.025 inch from the rifling. **NOTE: THIS LOADING INFORMATION IS FOR RELOADING INFO ONLY AND ANY LOADS NEED TO BE TESTED IN YOUR RIFLE TO MAKE SURE THEY ARE SAFE, A STEADY DIET OF PROOF OR HIGH PRESSURE LOADS CAN CAUSE CATASTROPHIC DAMAGE.**
9. Light. Another condition which may affect your zero is light. With iron sight sometimes up to two clicks, however light has negligible effect for scoped rifles.
 - a. Direction. Draw an arrow on the data sheet showing the direction from which the sun is shining.
 - b. Type of Light. Record the type of light, such as "bright", "hazy, cloudy", etc.

10. Target Number. Conditions may vary over different parts of the firing line.

A clump of trees may be on one side of the line, shielding shooters from the wind. The wind may look the same on opposite ends of the firing line when it actually is not.

11. Sight Picture. This is just a reminder to show you exactly what sight picture you are using. This is primarily for iron sight shooters.

12. During Slow Fire: Time is very important during the slow fire stage as only one minute is allotted per shot. You must make good use of each second. Save yourself precious seconds by following these steps:

a. After you fire your first shot the target will be pulled down to be marked. During this time record the following:

(1) Windage - The windage you used for the first shot.

(2) Elevation - The elevation you used for the first shot.

b. After recording the elevation and windages, record in the call box, where you think the shot should have gone in relation to the target. By this time the target will be marked and visible again.

c. Look at the target and see where that shot hit. Remember the location of the spotter and make any necessary sight changes.

d. Fire your next shot. The target will again be pulled down to be marked.

e. After you have fired your second shot, repeat steps a, b and c. Then plot the exact location of the first shot with a small figure one (1) on the data sheet target. Record shots on the target by their sequence number (ie 1, 2, 3, 4, etc.).

f. Repeat this procedure until you have expended all your rounds. You will find that by keeping your data book in this manner, staying one shot behind, you will save valuable time, thereby allowing yourself more time "on the gun" to fire each shot.

g. Record all changes in elevation and windage. If you get into the habit of recording the windage and elevation you use for each shot, you will have a record of any change in the wind or light. This will help you when you analyze your Data Book.

13. After Firing.

a. Record under "Remarks" any helpful information you may have in mind for future reference. Examples of what you can enter here are comments such as the number of notches used on the sling for that position, "Bucked fourth shot" etc.

b. After a rapid fire string, your target will be scored and run up. Plot the location of your shots by small x's in your data book. Be sure the shots are plotted exactly as they appear on the target. You may also consider a pen with different colors, use RED for the first ten, plotting 1, 2, etc. and second ten with GREEN for example.

14. Analyzing the Data Book.

a. Compare Conditions

(1) Every five practice sessions take each data sheet and compare the conditions under which you have been firing at each range. Your notes and remarks will help you to determine a

proper zero for a certain type of day at each yardline in both slow and rapid fire.

(2) You will be firing in all types of light; bright, clear, hazy, cloudy etc. Looking back through your Data Book, you can learn what you have to use for a zero under different light conditions by the change of location of your groups on the target.

(3) Learn from your mistakes. Possibly when the wind is from the left your first shot is always right of center. This can tell you that you always read the wind to be lighter than it is.

(4) You can also learn how the wind affects the different types of ammunition.

(5) The variations in temperature may make your shots go high or low. Compare the temperature.

(6) The density of mirage affects your ability to read wind. This should be recorded as heavy, medium, or light. Compare your data sheets to see if you have been reading the wind correctly for your first shots at long ranges.

b. Compare Sight Settings.

(1) Compare all the sight settings for each yardline against the location of your groups.

(2) The windage data used will help you to determine how much windage to use on a certain type of day.

(3) The sight picture recorded in your Data Book can be used as a guide in changing your zero when compared to the location of your groups. If a change is made in your sight picture to improve your score the book should change accordingly.

c. Compare ammunition. If different lots of ammunition were fired your zero may be different for each lot. Compare the lot numbers of production, location of your group and your sight setting with the location of your groups.

d. Compare Groups. Compare all groups under varying conditions. Check the high and low shots as well as those to the right or left of your main group. This will help you to determine your correct zero for each condition and yardline. The less dispersion you have the better. If your groups are tight you will be able to easily move them to the center of the "X" ring. If they are loose you are doing something wrong. Your notes under "Remarks" should help you find the trouble.

(a) Shot groups can be analyzed for errors.

1. Group is strung low and right:

- a. Prone: - Left elbow not under rifle
- Loose sling
- Improper trigger control
- Right elbow slipping.

- b. Sitting: - Right elbow slipping.
- Left elbow slipping down the left leg.

2. Group scattered about bull's-eye:

- Incorrect sight alignment or sight picture.
- Eye focused on the bull's-eye.
- Changing the spot weld.
- Loose position.

3. Group with several erratic flyers:
 - Flinching: Shots may be anywhere.
 - Bucking: Shots from seven to ten o'clock.
 - Jerking: Shots may be anywhere.
4. Group up and down through bull's-eye:
 - Breathing while firing..
 - Improper vertical alignment of the sights
 - Changing the spot weld.
5. Compact group out of bull's-eye:
 - Incorrect zero.
 - Failure to compensate for wind,
 - Position and natural point of aim incorrect.
6. Group from center to bottom of frame:
 - Loose rear sight.
 - Sling sliding down arm.
 - Too low a position.
 - Change in position of the rifle in shoulder after reloading.
7. Horizontal group:
 - Incorrect sight alignment.
 - Canting.
 - Loose front sight.
 - Loose position.
 - Muscling rifle.

e. Make Corrections. After comparing all your data sheets (for at least a week), record any corrections. If you see what you have been doing wrong but forget it on the firing line, it won't help you. Put the corrections under "Remarks" on the data sheet you are going to use for the next practice or match. This will provide an important reminder of what to do on the firing line.

6-2. Dry Firing. Mistakes are often made in shooting that cannot be detected during actual firing. These errors must be discovered and corrected. In dry fire training the shooter is not hampered with the firing of ammunition and can turn his whole attention to searching out his errors.

1. Mental Development

- a. Attitude. Take a positive attitude towards dry fire training. Dry fire training is an important aspect of developing better firing techniques and mind-body coordination. A positive attitude towards dry fire training is the first step to improving.
- b. Concentration. You must be able to concentrate during your periods of dry fire

training. If you don't concentrate your improvement will be hindered. You will also be conditioning against unprepared shooters "pressure". Concentrating on your shooting with your whole mind is one way to help prepare mentally for competition and assist in overcoming match pressure.

c. Attention to Detail. Target shooting is much more than just a matter of lining up the sights and squeezing the trigger. Everything that you do in connection with the weapon, training, diet, position, breathing, trigger squeeze, etc. has an effect on the shot. These details, from the most important to the very minor, must be addressed and analyzed during dry fire training periods.

2. Physical Development

a. New shooters will find those muscles that are not normally used will be sore during those first few days of practice. Dry fire trains the body to perform the task of shooting and will develop and tone the muscles that will be used in shooting.

b. Hold Perfection. Developing a "hold" is one of the prime jobs of the muscles during shooting. The "hold" is the ability, when lining up the sights, to position the center of the reticle on the target where the shooter has to release the shot in order to get a hit of the highest value. It is vital that the job of developing this "hold" be accomplished first. Dry fire training is the only method wherein the "hold" can really be mastered. Once it has been mastered the other physical characteristics of shooting can be developed much quicker and with greater ease.

c. Coordination. The physical and mental coordination needed for shooting are closely related. You must be able to transmit the right message at the right time from the eye to the trigger finger. This is one of the characteristics of shooting that can be best developed after the "hold" is perfected.

d. Position Technique. Dry fire training contributes to perfecting position. Position technique is developed in conjunction with perfecting the "hold" and coordination. If the position and pressures are not the same the shot pattern will change on the target. The position cannot be perfected through shooting alone. It has to be mastered in dry fire training where the proper attention can be paid to the position and its development.

(1) Breathing and Breath Control. Breath control must be developed. You must first discover your "shot capacity". This is the length of time you can hold the breath and still fire a good shot. On the average this time will be twelve seconds. If you go past this "shot capacity" it becomes increasingly more difficult to execute a well-aimed shot.

(2) Equipment. A complete set of shooting gear is used in dry fire practice. Proper dry fire training is conducted exactly like actual shooting. You will then become thoroughly familiar with all equipment. The target can be of any size, but it must be placed at the proper distance from the shooter so as to be seen through the sights as the same size as the actual target. A general rule of thumb is never have the aiming point or bull's-eye wider than the front sight.

(3) Dry Firing Phases. Dry firing is broken down into two phases; slow fire and rapid fire.

3. Slow Fire Phase.

a. The holding exercise is primarily for the standing position. Without any trigger manipulation, the rifle is held in the shoulder with aim being taken on the target. The rifle is held in position for one minute. When the breathing "shot capacity" has been reached, turn your head away from the rifle. When the breathing is normal again, aim in and repeat the process. Take a break after each holding period to allow for relaxation.

b. The trigger exercise is done exactly as if on the range. You must patiently train, concentrate, and analyze yourself. In the trigger exercise, shoot a dry fire record match under regular time limits. The databook will play a vital part. As each shot is fired the sight alignment is recorded on the overlay in the databook. These dry fire overlays will help the shooter to locate errors.

4. Rapid Fire Phase. You must develop perfect timing and hold consistency. Hold consistency is the developed ability to recover from the recoil of the weapon and quickly pick up the correct point of aim. This is learned in dry fire training where time is available for consideration and correction of errors.

a. One Shot Exercise. You must be able to rapidly assume a position and fire the first shot. Assume the regular position and adjust the natural point of aim onto the target. When satisfied with the position, mark the position. Rise and retake the position rapidly using the aforementioned marks as a guide. Readjust the natural point of aim if necessary, and apply the correct sighting, aiming, breathing, and trigger control. Fire the first shot within 11 seconds for sitting and 12 seconds for prone.

b. Reloading Exercise. Reloading with the service rifle can be time consuming. With practice it can be accomplished smoothly with a minimum of time and motion. When completed the simulated firing of the first magazine, drop the butt of the rifle to the thigh (sitting), or the ground (prone). Reach forward and with the index finger, press the magazine release button and place the unloaded magazine on the ground. Reaching for the next magazine (simulated in dry fire) insert it straight into the magazine well, and push it until the magazine is latched. Release the Extended Bolt Release with your index finger to chamber the top round. Some competitors are able to conduct this reloading WITHOUT removing the butt stock from the shoulder. This should be practiced to ensure a safe and consistent position.

5. Planning. Set up a regular schedule. Only on a regular schedule can real benefits be drawn from dry fire training.

a. There are other Dry Fire/Training options as well such as:

(1) The SCATT electronic trainer which uses a computer and laser sensor to track the shooter's wobble area and shot location.

(2) The ManitisX Trainer also uses a laser and scoring target and cell phone app to track the shots.

(3) Using an Air Rifle as a training tool can be very helpful as well for practice.

b. The repetition of the proper marksmanship techniques will improve your position and hence your scores. The conscious mind can only do a few things at once well. The subconscious mind can do MANY things well at once. Through repetition, the trigger pulling sequence (eye-brain-trigger finger) will become more a subconscious activity and improve shot performance. (from Lanny Bassham, "With Winning in Mind")

c. Don't force a shot, "A good rifleman knows when to take a shot, a GREAT rifleman knows when not to." (Hap Rocketto)

6-3 The Spotting Scope.

The spotting scope is very important to the competitor in determining sight adjustments by reading the mirage (wind condition) or observing the locations of hits to accurately plot them in the Data Book. It is also used when the competitor is scoring another relay shooter.

1. At 200 yards, in the standing position, the spotting scope is generally not needed as the 4.5x rifle scope is sufficient to see the shot marker and scoring disk. If the spotting scope is needed, then an extension on the scope that will raise it to a higher level will be needed. The scope should be positioned near the left foot where it does not interfere with position. The scope should be focused on the target.
2. At 200 yards in the sitting position the spotting scope is used primarily for the plotting of hits. While it may be used to check mirage, experience has indicated that the wind seldom affects the bullet at 200 yards. This would not be the case for a strong wind. Under very ideal conditions you may observe the first 2 rounds of a rapid fire string to check location. Its 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 recheck or zero the rifle. The scope should be positioned near the left leg so that you can look through it without shifting position.

3. To utilize the spotting scope to read the mirage use the following adjustment technique: You are concerned with the wind between you and the target. The focus of the scope should be short of the target. It is recommended that at 600 yards the focus be approximately 100 yards short of the target. When wanting to focus on the mirage from any distance, first focus clearly on the target and then turn the eyepiece 1/8 to 1/4 of a turn counterclockwise. Care must be taken not to focus beyond the target as this will produce a "reverse reading" of the mirage. When the intermediate focus is attained adjust the lay of the scope on the target. If using the scope for observing the initial shots of the rapid fire strings at 200 and 300 yards, it will be necessary, after reading the mirage to check the wind conditions, to readjust the focus on the face to the target to facilitate observing the shot holes.

4. At 300 yards the scope is used for reading the mirage, checking the location of the initial shots, and for plotting the hits. In the prone position the scope should be positioned near the left elbow so that you can look through it without shifting position.

5. At 600 yards the scope is focused as mentioned in paragraph 3. above. It is positioned in the same manner as mentioned for 300 yards. Before firing, check the mirage and make the necessary windage adjustment to compensate for any wind. Immediately after firing and before plotting the call in the Data Book, again check the mirage. If any changes are noted they must be considered in relating the strike of the bullet to the call. After making necessary entries in the Data Book again look through the scope to observe the location of the hit and to read the mirage prior to firing the next shot. The above procedures should be used for each shot.

At all ranges the scope is used to check the condition of the target during the preparation period to ensure proper target pasting and condition.

6-4. Personal Preparation. In addition to the preparation required to successfully fire a well aimed shot there are other personal preparation requirements that should be considered before a match.

1. Read and know the rule book for the type of shooting you are to participate in and keep abreast of changes.

2. Arrive at the range early enough to set up your equipment behind your designated firing point.

3. Inspect your ammunition before you go into a match. Keep the ammunition in a cool, dry place.

4. Keep an accurate count of the number of rounds you have fired.

5. Don't worry about looking at other competitor's targets until you have finished firing on your own.

6. Keep an accurate account of the time limits in a match.

7. Make a list of all required items of equipment and check each before the competition. The shooting gear should be inspected to ensure that it is serviceable and complete.

8. Keep track of your score while firing so that you can ensure a correct posting of the resulting score.

10. Diet Change. A change in types of food or style of cooking will change your digestive process. This may lower the body's resistance to colds and upsets the nervous system.

11. Consumption of food. Eating too much food just prior to a match blurs the eyes, causes a strong pulse beat, and causes a general uncomfortable feeling. A light breakfast should always be eaten before shooting because it helps to keep up your strength and stamina. Never eat too much while shooting.

12. Habits. Never change any habit just prior to a match or during an extended match. An abrupt change of any habit upsets the nervous system. This includes coffee, or other energy drinks.

6-5 200 YARD SLOW FIRE, STANDING.

1. Natural Point of Aim. To adjust horizontally turn the feet either right or left depending on the error. Vertical adjustments are made by moving the rear foot either forward or backward, lowering or elevating the muzzle. Any adjustments made in the natural point of aim are accomplished while the breath is at the natural respiratory pause.

2. Procedure for Firing. The following sequence of fire is a suggestion to assist you in establishing your own slow fire system:

- a. Once in position, dry fire 10 to 15 shots. This establishes a sight picture in your mind's eye. It also seats your position and natural point of aim, and ensures equipment is properly set up.
- b. Scope - Check the wind.
- c. Obtain respiratory pause, focus on scope reticle, obtain proper scope alignment and picture, squeeze trigger, and fire shot.
- d. Scope - Check the wind for change.
- e. Call the shot.
- f. Record windage and elevation used in data book.
- g. Load next round.
- h. Scope for value of shot after scoring and check wind.
- i. Shoot.
- j. Call the shot.
- k. Record windage and elevation used.
- l. Plot previous shot. (This is the "shot behind method".) Continue sequence.

6-6 RAPID FIRE.

1. 200 Yard Rapid Fire, Sitting.

a. Cadence. Cadence is important because it allows for a series of well-aimed shots within the specified time. With an established cadence you will obtain better groups and maintain a more consistent zero. Good cadence can be developed with the use of the rapid fire exercises, fired either live or dry.

b. Natural Point of Aim. The natural point of aim is checked and adjusted prior to firing. Any error in the natural point of aim occurring during the string will cause the weapon to recoil in the direction of the error and should be corrected before firing the first shot.

- (1) If the natural point of aim is off horizontally, shift the feet or the buttocks either right or left until the front sight is on a vertical line with the aiming point.
- (2) If the natural point of aim is off vertically, shift the feet or buttocks forward or rearward until the correct sight picture has been obtained, while the breath is at the natural respiratory pause. Minor vertical adjustments may be made by moving the left hand on the stock and by breath control.

c. Firing Procedure. When called to the firing line, build the position and check the natural point of aim while dry firing. At the termination of the preparation period mark the position and clear the weapon. The next command will be "...on the firing line stand...with bolts closed on empty chambers....load." When the targets appear, quickly reassume position, using the preplaced marks as a guide. Cycle the bolt of the rifle, chambering a round. Look along the barrel of the weapon to check target number and lower the head to obtain a good spot weld. Check sight alignment and make a quick adjustment to the natural point of aim if necessary. Inhale, then exhale, and focus on the reticle. Concentrate on a correct sight picture and apply a straight to the rear pressure on the trigger. When the rifle fires make a mental note of the call and again adjust the natural point of aim if necessary. During recovery from the shot take a quick shallow breath and exhale to the respiratory pause. This should reposition the reticle to a correct sight picture. Continue the sequence for the remainder of the magazine. Reload, reassume position, and fire the second magazine in the same manner until the string has been completed

NOTE: Breathing between shots in rapid fire is necessary to help develop a cadence and restore a needed supply of oxygen to the blood system, thus allowing the attainment of a clear sight picture.

2. 300 Yard Rapid Fire Prone

- a. Natural Point of Aim. After assuming a balanced and stable position the natural point of aim should be checked and adjusted.
- b. To check the natural point of aim assume position, inhale, then exhale to the natural respiratory pause. If the reticle does not rise vertically while exhaling, or the sight picture is not correct with the breath held at the natural respiratory pause, the position must be adjusted.
- c. To adjust horizontally, shift the body right or left using the left elbow as a pivot until the front sight is below the bull's-eye.
- d. To adjust vertically, shift the weight of the body forward or rearward using both elbows as pivot points until the front sight is below or above the bull's-eye. The breath must be held at the natural respiratory pause during this adjustment.
- e. Firing Procedures. Prior to firing, several shots should be dry fired until satisfied with position. Mark the left elbow location and rise, keeping one or both feet in place. Reassume position with the left elbow on the mark and check the natural point of aim. If the correct sight picture can be obtained with a quick leg or weight shift, you are ready. Similar to the Sitting Rapid stage, following the preparation period, "...on the firing line stand...with bolts closed on empty chambers....load." When the targets appear, assume position with the left elbow on the mark.

Cycle the bolt chambering a round. Check the target number by sighting along the barrel as the head is lowered onto the thumb and stock. Obtain correct sight alignment and make any necessary adjustment of natural point of aim. Inhale, exhale, and focus on the front sight. Hold the breath and again make any necessary minor adjustments of the natural point of aim. Take up the slack with a heavy initial pressure, maintain focus on the front sight, and concentrate completely on the correct sight picture while applying a straight to the rear pressure on the trigger. When the rifle fires, make a mental note of the call. If the rifle recoils to the left or the right, readjust the natural point of aim. The rifle recoiling to the left (or right) is an indication that the natural point of aim is actually to the left (or right) of the bull's-eye. Following recoil but before the reticle has completely settled, a shallow breath is quickly inhaled, then exhaled to the respiratory pause. This will speed up recovery and reposition the reticle below the bull's-eye. Continue the sequence for the remainder of the magazine. Upon completion of the first magazine unload, reload, reassume position, and continue to fire until the string has been completed.

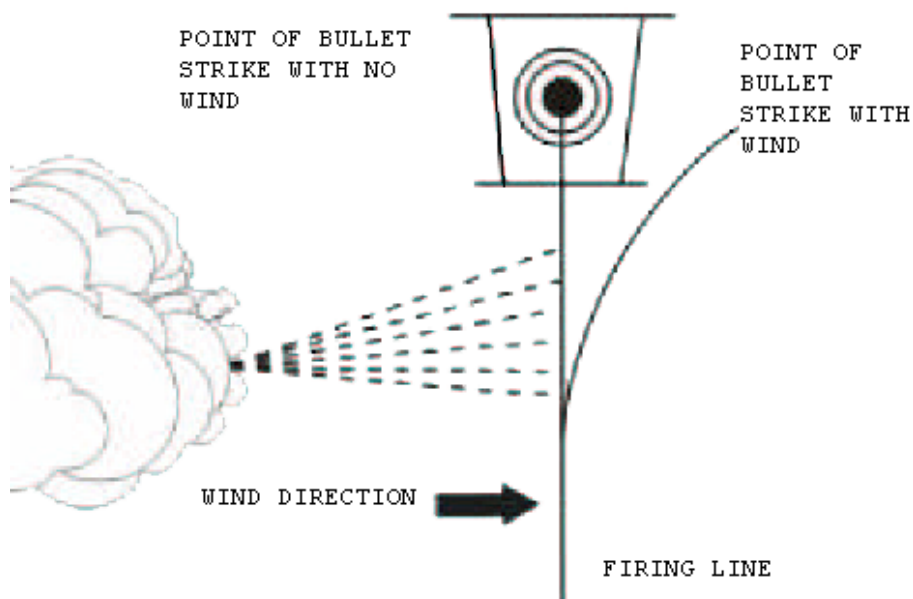
6-7 600 YARD SLOW FIRE, PRONE.

1. Natural Point of Aim. After assuming a balanced and stable position the natural point of aim should be checked and adjusted.
2. To check the natural point of aim, assume your position, inhale, then exhale to the natural respiratory pause. If the front sight does not rise vertically while exhaling, or the sight picture is not correct with the breath held at the natural pause, the position must be adjusted.
3. To adjust horizontally, shift the body right or left using the elbow as a pivot point until the reticle is below the target. To adjust vertically, shift the weight of the body forward or rearward using both elbows as pivot points until the reticle is below or above the bull's-eye. The breath must be held at the natural respiratory pause during this adjustment.
4. Firing Procedures. Prior to firing, several shots should be dry fired to insure that you have completely settled into position with a natural point of aim on the bulls-eye and to condition the mind for complete concentration. When ready to fire load, reassume position, and check scope/sight alignment. Exhale normally and as the sights dip, check the target number. Exhale slowly and the front sight will rise. Focus must be on the reticle before the correct sight picture is obtained. The correct sight picture and the natural respiratory pause should occur simultaneously. Take up the slack with a heavy initial pressure, maintain focus on the reticle, and apply trigger control while concentrating completely on perfecting sight picture. Make a mental note of the location of the reticle in relation to the target at the instant the rifle fires to call the shot. Follow through by maintaining pressure on the trigger and focus on the reticle until recoil is completed. Anticipation of recoil can be prevented by concentration and follow through.

SECTION 7: EFFECTS OF WEATHER

7-1 GENERAL. In the case of the highly trained competitive shooter the effects of the weather are a primary cause of error in the strike of the bullet. The wind mirage, light, temperature, and humidity all have some effect on the bullet and the shooter. Some of these effects such as light and humidity are insignificant depending on the average conditions under which most matches are fired. However, if a match were to be fired under extremes of such effects they would have to be considered. For this reason an explanation will be given of all the conditions of weather.






7-2 WIND. The condition that constantly presents the greatest problem is the wind. Wind has a considerable effect on the bullet that increases with the range. This is due primarily to reduced speed of the bullet as it travels (slows down due to friction forces from the air molecules) and the force of wind acting on the bullet being more effective (force applied over a longer time due to slower bullet speed). Wind also has a considerable effect on the shooter, particularly in the standing position. The stronger the wind the more difficult it is to hold the rifle steady.



Wind effects

1. Before any sight adjustment can be made to compensate for wind, it is necessary to determine its speed and direction. There are certain indicators to accomplish this. There are range flags, mirage, wind meters, smoke, trees, grass, rain, and the sense of touch.

a. A common method of estimating the velocity of the wind is based on observation of the range flags. The angle in degrees between the flag and its pole is divided by the constant number 4. The result gives the approximate velocity of the wind in miles per hour. If no flag is visible, a piece of paper, grass, cotton, or some other light material may be dropped at shoulder height. By pointing directly at the spot where it lands, then dividing the angle between the body and the arm by the constant number 4, the result will be the approximate velocity in MPH.

RANGE FLAG ANGLES										
	5 MPH		10 MPH		15 MPH		20 MPH		25 MPH	
RANGE YARDS	WIND VALUE		WIND VALUE		WIND VALUE		WIND VALUE		WIND VALUE	
	FULL	HALF	FULL	HALF	FULL	HALF	FULL	HALF	FULL	HALF
200	2	1	3	1	5	2	6	3	8	4
300	3	1	6	3	10	5	13	6	16	8
400	4	2	9	4	13	6	18	9	22	11
500	6	3	12	6	18	9	24	12	30	15

Wind Flags

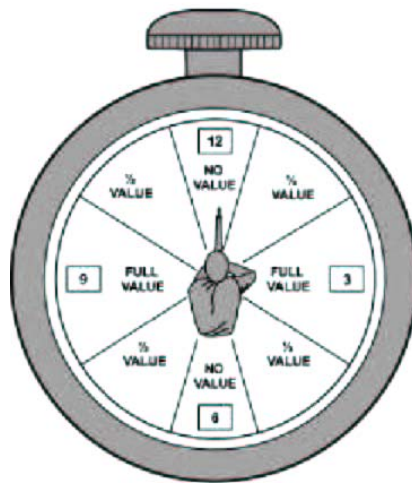
If these methods cannot be used, the following information is helpful in determining velocity:

- (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.

RANGE YARDS	WINDS CAN BE FELT LIGHTLY ON FACE AND LEAVES ARE IN CONSTANT MOTION		WINDS RAISE DUST AND LOOSE PAPER		WINDS CAUSE SMALL TREE TO SWAY		WINDS CAUSE LARGE TREES TO SWAY			
	8-12 MPH		12-15 MPH		16-20 MPH		21-25 MPH			
	WIND VALUE		WIND VALUE		WIND VALUE		WIND VALUE		WIND VALUE	
	FULL	HALF	FULL	HALF	FULL	HALF	FULL	HALF	FULL	HALF
200	2	1	3	1	5	2	6	3	8	4
300	3	1	6	3	10	5	13	6	16	8
400	4	2	9	4	13	6	18	9	22	11
500	6	3	12	6	18	9	24	12	30	15

Wind estimation

- b. You must be able to classify the wind. The accepted method is by use of the clock system. A wind blowing from 2, 3, or 4 o'clock to 8, 9, or 10 o'clock, respectively, or vice versa is classified as a "full value wind" and has the greatest effect on a bullet's flight path. A wind blowing from 1-7 o'clock or vice versa is classified as a "half value wind". A half value wind will affect the strike of the bullet approximately one half as much as a full value wind of the same velocity. The so-called "no value wind" (12-6 o'clock or vice versa) has a definite effect on the bullet at long ranges if it is not blowing directly from 6 or 12 o'clock. This is the most difficult wind to fire in due to the switching or "fishtail" effect which requires frequent sight changes. Depending on the velocity of this type wind it may have an effect on the vertical displacement of the bullet. One some ranges that have a valley between the targets and firing line, certain winds will definitely affect elevation. (Hollister CA)

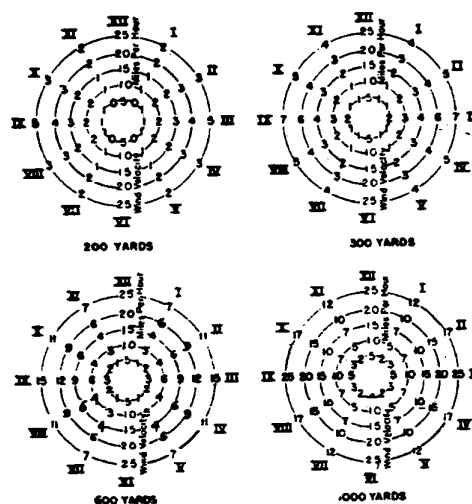


Wind direction values

c. After determining wind direction and velocity, the windage correction placed on the sight will be based on the following formula: $R \times V / 10 = \text{Number of } 1/2 \text{ minute clicks for a full value wind on a National Match M14 Rifle using match grade ammo.}$ For half value winds simply divide the answer by two. In this formula, R= range in hundreds of yards, and V = velocity of the wind in mph. The constant 10 was arrived at mathematically, considering the bullet weight, density of the air, air resistance and distance to target.

WINDAGE DIAGRAM

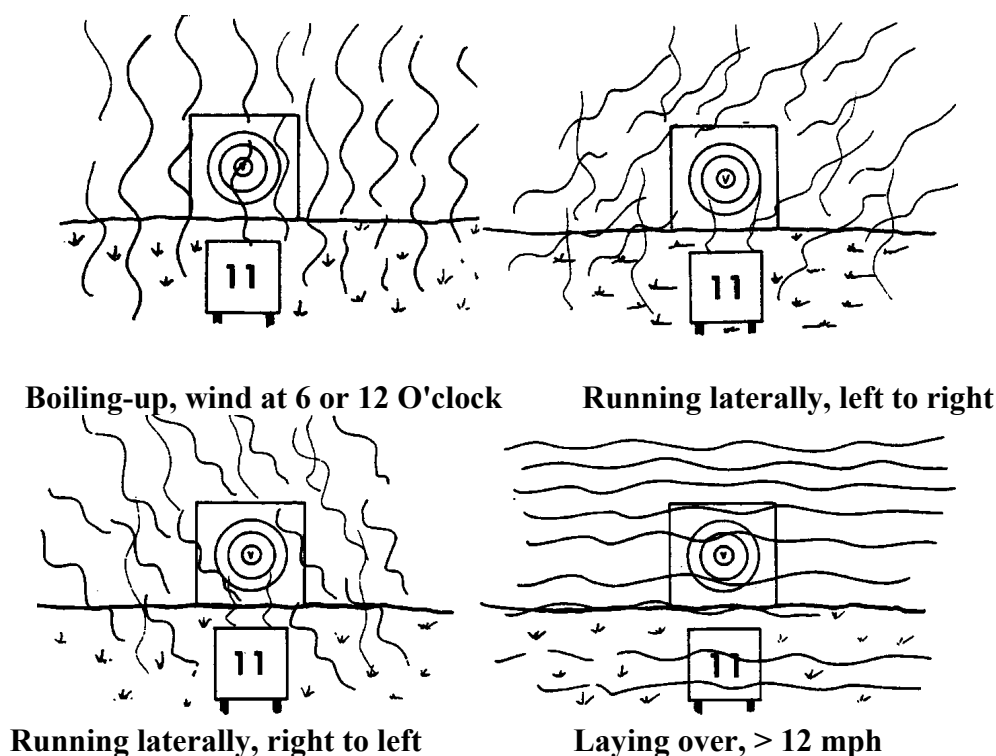
Circles represent wind velocity as indicated.
Roman numerals indicate wind direction.
Arabic numerals indicate clicks of windage,
as found on rear sight of NM M14 Rifle.



WINDAGE DIAGRAM

(NM M14 with match grade ammunition)

7-3 MIRAGE AND USE OF SPOTTING SCOPE. The word "mirage" refers to the heat waves or the reflection of light through layers of air of different temperature and density as seen by the naked eye on a warm, bright day. With the spotting 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 a high degree of accuracy.



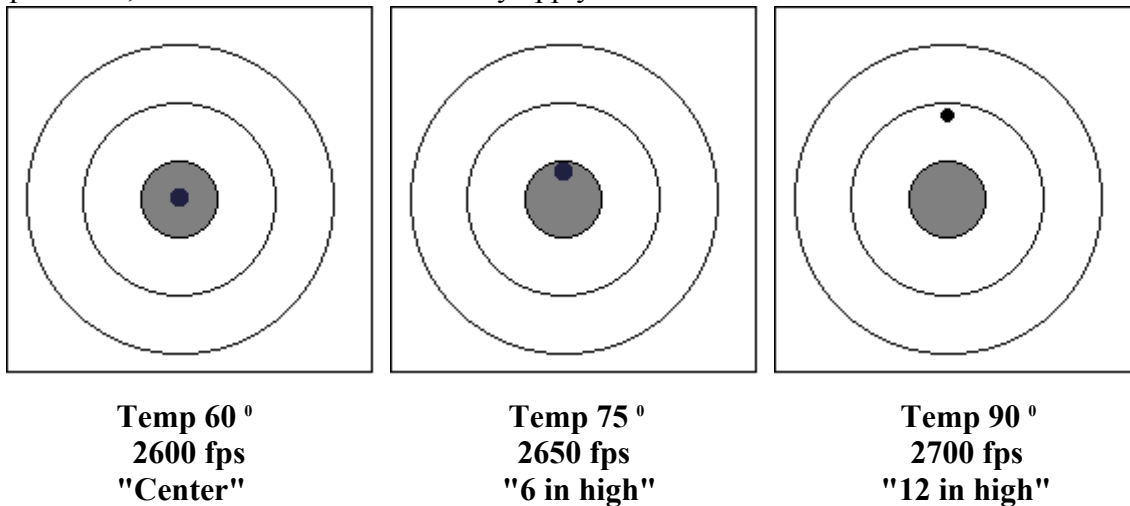
Mirage types

1. As observed through the spotting scope the mirage will appear to move with the same velocity as the 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 12 mph. Beyond that speed, the movement of the mirage is too fast for detection of minor variations. But if there is any lateral movement by the mirage at 600 yards it is usually necessary to make a windage adjustment.

2. Another important effect of mirage is the light diffraction caused by the uneven air densities characteristic of heat waves. Depending on atmospheric conditions this diffraction will cause a displacement of the target image in the direction of the movement of the mirage. Thus, if a mirage is moving from left to right, the target will appear to be slightly to the right of its actual location. Since you can only aim at the image received by the eye, you will actually aim at a point, which is offset slightly from the center of the target. This error will be in addition to the displacement of the bullet caused by the wind. The total effect of the visible mirage (effective

wind plus target displacement) is impossible to predict the amount of error light intensity it produced at any given place and time. In many cases, any one type of mirage may differ in value from one range to another due to differences in terrain features. It is only through considerable experience in reading mirage that the shooter and coach will develop proficiency.

7-4 TEMPERATURE. Temperature has a definite effect on the elevation setting required to hit the center of the target. An increase in temperature will increase the muzzle velocity. This occurs due to the chemical reaction in the bullet case being more 'active'. A higher muzzle velocity will cause the effect of gravity on the bullet to be less due to a shorter flight time to the target. At a higher temperature, the air molecules are farther apart, thus less friction on the bullet and resulting in less force to slow down the bullet in flight. There is a rule of thumb to follow, based on tests conducted at 300, 600, and 1000 yards. A one minute elevation change resulted when the temperature rose or fell 20 degrees at 300 yards, 15 degrees at 600 yards, or 10 degrees at 1000 yards. In extreme temperatures, this rule does not necessarily apply.



Effects of temperature at 600 yards

7-5 LIGHT.

- a. Light has little effect on the scoped rifle zero.

7-6 HUMIDITY. The higher the humidity the greater the resistance to the flight of the bullet. This resistance will slow down the bullet. The shooter must raise elevation to compensate. The effects of humidity at short ranges are not as noticeable as at the long ranges.

7-7 JUDGMENT AND DECISION. It may be difficult to believe that a certain condition can affect the strike of the bullet. You may see an instance where the same condition had two different effects on the bullet. Do not fail to note all the factors of weather. Certain combinations of weather will have different effects on the bullet. You may fire two successive days on the same range, under what appears to be the same conditions, yet utilize two different sight settings. By not considering all of the effects of weather you may over emphasize certain effects. A thorough study of the weather effects might indicate the change. Proper recording, study, and experience are all important with respect to reacting to the effects of weather.

CONCLUSION. I hope that you found this guide useful and that you will pass along your own knowledge of shooting to the next person. You are now ready to shoot competitively. This is a starting point, there are many other advanced areas like rifle testing, ammunition load development and gear testing which will build confidence in your performance. Keep your eyes and ears open, ask questions and practice, practice, practice. Good luck and keep it safe.

SECTION EIGHT- OTHER RESOURCES

Pistol Information and techniques:

Article on Bullseye shooting with illustrations and explanations:

<https://www.gunsamerica.com/digest/bullseye-what-the-old-guys-can-teach-young-people/>

CMP article on how to shoot Bullseye matches

[How to Shoot a Bullseye Pistol Match - Civilian Marksmanship Program \(thecmp.org\)](https://www.thecmp.org/how-to-shoot-a-bullseye-pistol-match-civilian-marksmanship-program)

Videos presented by GySgt Brian Zins USMC Ret. on position, trigger control and sight alignment:

Go to www.youtube.com and search on - **NRA Range Brian Zins**

Video featuring Capt McMillian USMC/Ret. (Olympic Gold Medalist) on basic position, trigger control and sight alignment: <https://m.youtube.com/watch?feature=share&v=PK2eoQlnk4E>

Website with lots of information concerning Bullseye pistol shooting – **WWW: Bullseyepistol.com**

Especially check out the side listing for the **USAMU Pistol Marksmanship Guide** which contains lots of information

CMP Rules and regulations regarding Service Pistol Competition

<http://thecmp.org/wp-content/uploads/2021/04/2022PistolRules.pdf>

Rifle Information:

General Overview of Service Rifle Competition: <https://www.myvssa.org/high-power-rifle>

Basic equipment for rifle shooting:

http://www.odcmp.org/1007/default.asp?page=USAMU_BARENECESSITIES,

http://www.odcmp.org/0308/default.asp?page=USAMU_COATSANDGLOVES

Data book and how to use it: http://www.odcmp.org/0706/default.asp?page=USAMU_DATABOOKS

Rifle sight adjustments and iron sight picture:

http://www.odcmp.org/0607/default.asp?page=USAMU_SIGHTADJ_MOA,

http://www.odcmp.org/0907/default.asp?page=USAMU_SIGHTPICTURE

Rifle trigger Control: http://www.odcmp.org/1207/default.asp?page=USAMU_TC

Rifle Sling use and position on arm: http://www.illinoishighpower.org/general_highpower_info/ISRA%20SR%20Sling.pdf

Rifle positions:

Standing – http://www.odcmp.org/1007/default.asp?page=USAMU_STANDING

<https://www.gunpowdermagazine.com/high-power-service-rifle-competition-mastering-the-basics-of-the-standing-position/>

Sitting – http://www.odcmp.org/0307/default.asp?page=USAMU_CASITTING

<https://www.gunpowdermagazine.com/high-power-service-rifle-competition-how-to-master-the-sitting-position/>

Prone - http://www.odcmp.org/0208/default.asp?page=USAMU_PRONE1

Reading the wind:

http://www.odcmp.org/1206/default.asp?page=USAMU_WIND1

http://www.odcmp.org/0107/default.asp?page=USAMU_WIND2

<https://www accurateshooter.com/shooting-skills/readingwind/>

CMP Rules and regulations regarding High Power Service Rifle Competition:

<http://thecmp.org/wp-content/uploads/2021/04/2022HighpowerRifleRules.pdf?vers=011622>

MIL DOT and MOA measurements:

<https://athlonoptics.com/mil-vs-moa-one-right-one/>

Sling info:

[Setting up a Leather Service Rifle Sling for Competition - Bing video](#)

[Setting Up a Leather Service Rifle Sling for Offhand - Bing video](#)

[The Service Rifle Sling: Configuring and Using in Competition - Bing video](#)

AMU Video - [Training Tuesday: Setting up a sling for standing - YouTube](#)

AMU Video - sling for prone position - [Training Tuesday: Prone Sling - YouTube](#)

AMU Video - Stock/Cheek Weld [Training Tuesday: Stock/Cheek Weld - YouTube](#)

Data book entries and other information:

AMU Video - [Training Tuesday: Data book - YouTube](#)

AMU Video for 600 yard line - [Training Tuesday: Setting up Service Rifle Gear - YouTube](#)

Reading the wind:

[How to Read the Wind | Shooting USA - Bing video](#)

[Reading the Wind - Bing video](#)

Weight Of Rifle:

https://youtu.be/TUJ4hk0_YoU

SECTION NINE- TEAM SHOOTING INFO

TARGET

NATIONAL MATCH COACHES PLOT SHEET

TM SCORE

REMARKS

2 1 0 1 2

WEATHER

REMARKS

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EVENT _____ INFANTRY TROPHY COACH PLOT TEAM # _____, # _____ GUNS DATE _____

		NAME		NAME		NAME		NAME		NAME		NAME		NAME	
300 LOAD	WPN SN			WPN SN		WPN SN		WPN SN		WPN SN		WPN SN		WPN SN	
WIND USED	ELEV														
	WIND														
	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	
500 LOAD															
	ELEV														
	WIND														
TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS		
600 LOAD															
	ELEV														
	WIND														
TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS		
WIND USED	ELEV														
	WIND														
	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	TOT SHOT	TOT HITS	
INDIV LOAD															

REMARKS
IF THE TEMP IS <65 AND DARK, ALL SHOOTERS
NEED UP 2 ON THE 5 & 6. IF DARK AND WARM,
ALL SHOOTERS DOWN 1. ANY TRICKLE IS
WORTH 2 CLICKS ON THE 600.

WEATHER: _____
LIGHT HITS {
TEMP: _____

WIND _____
MPH

600	X 4	+ BONUS	TOT HITS	TOT MISS	AGG
500	X 3				
300	X 2				

High Power Rifle Team Matches

Senior Chief Petty Officer Dwight H. Becherer, USN, Ret.

The procedures and strategies I discuss about High Power Rifle Team Matches are fairly conventional in nature. Some of the things I have to say are my own ideas or things that I have seen other successful teams use. Most of my experience with High Power Team Matches was with the Navy teams at Fleet, All Navy and national level events. I have been coach and shooter during the same time and have gained greater insight with those experiences. I do not suggest that this is a definitive work about team matches. I feel it is only a place to start from.

Many of the teams I have seen often have a common failing - lack of organization. The team that is well prepared in advance stands a much greater chance of succeeding than a team of equal skill. The team that makes fewer mistakes fares better than the team with superior talent that saves 2 rounds in the rapids. Organization, coordination, knowledge, and communication within the team will greatly enhance the probability of success. In a nutshell, it's TEAMWORK.

For the purpose of this discussion, a 4-man team is assumed equipped with M1s, M14s (M1A), or M16s (AR15). Most of the information is general in nature and applies to bolt gun teams as well. I don't discuss wind doping or mirage. There are volumes by others on the subject. I mainly concentrate on team strategy.

The time to prepare for team matches is not when the members show up on the 200 yard line. You may have months or weeks to prepare but more likely the night before or even the morning before the match will be all you have. The selection of team members is often a matter of past performance or predetermined by the club or organization membership. Many times the coach is one of the shooters himself. Few are times when I was on a team that had a dedicated coach. The coach needs to know the abilities of the shooters he will be coaching. The team members also need to be ready to coach the coach when it is his turn to shoot. The coach also needs to know the abilities of the teams around him. If your team is an expert team and the teams next to yours are all High Masters, their performance and what they say about conditions can help. I do not suggest that you rely on another team's judgment but it helps sometimes to confirm your call. It also helps to keep your ear tuned to what is being discussed by other teams because they may see something you overlooked.

The first thing I like to do in organizing the team is go over the equipment that the team takes to the firing line. You can lighten the load of the team if you take only two scopes and one mat to the line. Unless someone has a thing for using their own gear, use the best you have, i.e., don't leave a 77MM Kowa in the car over a Tasco. Ideally, you should have a 100MM team scope and another for scoring duty. The rest of the equipment brought to the line are normal things each shooter needs. Make sure the team has enough ammo for each member to complete the match. Be certain you have all your equipment. Assign a team

member to be responsible for it. You do not want someone running off to get something you will need just as the three minute preparation period starts. Make a checklist and go over it with the team before you head for the line.

Everyone on the team should be doing something all the time. You are either shooting, getting ready to shoot, scoring, or coaching. Even if you are a non-firing butt-puller you can contribute to the success of the team. The butt-puller can ensure that his team's target is the best quality possible. He won't be able to pull his own team's target but he can keep an eye on it if he is pulling the one next to it. A poorly repaired target face during the rapid strings can be hard to read.

The shooter should be ready to go the line with all his equipment except his mat. He ensures that he has the proper elevation for his rifle for that yard line and windage set to zero. Generally, the shooter is responsible for elevation and the coach is responsible for the wind/windage particularly at the 600 yard line. Regardless, the coach must ask the shooter if he has the proper elevation for each yard line, but the shooter must know his zeros. The next shooter should also be getting ready for his turn to shoot. He should have all of his equipment on and ready to assume the shooting position when he gets to the line.

When I coach the slow fire stages, I like to single-fire the shooters. When the coach and one shooter are working together I feel there is less confusion and the shooter can relax into his own rhythm. When pair-firing, you may strain the non-firing shooters performing other tasks. If two shooters and a coach are on the line that leaves the fourth shooter scoring another team. When your team is finished, the coach and scorer are relieved by the shooters coming off the line, but the scorer is probably not finished scoring the other team and not mentally or physically prepared to shoot. The coach has the same problem: he has to prepare to shoot and bring the coach that has just come off the line up to speed on the conditions. The scorer gives his scorecard to one of his shooters coming off the line, and mistakes are more likely to appear on the scorecard. Everyone is scurrying around swapping functions as the clock is ticking. When you single-fire the team, a coach and first shooter are on the line shooting. The second shooter is scoring another team. The fourth shooter is getting ready to shoot. When the first shooter finishes he scores for the remainder of the match. The second goes to the firing line. The second shooter is now getting ready to shoot. When the second shooter comes off the line he becomes the coach. The third shooter goes to the firing line and the first coach gets ready to shoot. The same rotation of shooters works all the way across the course.

If you do have more people to score and coach, pair-firing can be done effectively. But you still put more pressure on the coach to keep the two shooter's calls, data book and sight corrections straight. The shooter also has to wait for the other shooter to fire: that breaks rhythm and can be mentally and physically tiring particularly at the 600 yard line on a hot afternoon.

When the coach gives sight correction to shooters that are pair-firing, it's for both guns. If he feels a windage correction is needed it's much easier to keep

both guns synchronized. He will announce, "Both guns, one right..." Shooter and non-shooter will make the correction. If one shooter needs an individual correction, he will say "Left or right gun one left..." and that shooter alone will make the correction. The coach watches the shooter or shooters make the corrections. The procedure is the same for 200 and 600 slow fire stages. The shooter must give accurate shot calls to the coach. "I don't know where it went" is useless. In the standing position an accurate call can refine a zero that you will need for the rapids to follow. That's important for some team matches that don't allow sighters.

For the slow fire sighters the coach and shooter should communicate between each other, feeding the other information for a common goal. During the rapid stages, communication between the shooter and coach is greatly reduced. Until the shooting starts, the coach and shooter exchange information. But when the targets come out of the pits it's mostly one-way, coach to shooter. That brings up a question that I have rarely heard discussed: Who is in charge? Which can bring up another question: Who has the most information? I feel the person in the driver's seat for the rapids is the shooter because he has almost all the information. The only thing he cannot see that the coach can is a change of conditions during the string.

Consider that the rapid strings are only 60 or 70 seconds. Precise communication is essential. Once while I coached a shooter during a 300 rapid an interesting thing happened. The shooter was fairly competent but not until later did I know that he had not done any team shooting (know your shooter!). During the string he would shoot a 10 and I would call out loudly "GOOD!" Three separate times he stopped and looked at me with a look on his face as if to say, "What do you want?" Toward the end of the string the entire team was yelling in unison "SHOOT!" He got all 10 rounds off with a not so bad score. During the post-shooter de-brief he asked me, "Why did you keep calling out my name?" The shooter's last name was Gustaffson, and he thought I was calling out "GUS! GUS!" when I was really calling his tens as "GOOD! GOOD!"

During the prep time, the coach is busy getting set up. He needs to have a stop watch set for either 60 or 70 seconds. The coach should also have a score data book and duplicate score card. He positions the team scope after the shooter is in position. The coach should position the scope not to interfere with the position of the shooter or when he stands. The coach also needs to clear a path from behind the scope to the shooter's side. You do not want to trip over anything or be blocked by a score keeper. The scope should be as low as practical and aligned with the axis of the shooter's barrel (directly above and behind). The 100 MM team scope comes with three eyepieces (32X, 24X, and 16X). I recommend the 32X for the rapid stages. The object is to see the impact of the bullets on the target. At 600 yards and beyond, choose the eyepiece that reads mirage the best. Center the image of the target in the center of the scope. The center has the clearest image; avoid the edge of the scope. During the preptime the coach examines the target carefully. Look for bullet holes that have not been repaired.

Wrinkles produce shadows that can hide bullet holes. Turned up corners of pasters can look like bullet holes. Corners of black pasters that over-

lap a white line can look like a bullet hole. If the coach sees something on the target that needs attention, he calls for target repair or a reface.

The coach briefs the shooter with the following information:

- Ask him if he has the correct elevation on.
- Ask him if the magazines are loaded 2 and 8.
- Tell him what his target number and color are.
- Go over with him the calls that he will hear.
- Tell him to call the first two shots during the magazine change
- Ask him if his sights are half, full, or quarter minutes.
- Tell him the sight corrections given him will be in clicks except elevation may be in half minute corrections.
- Tell him not to expect any calls on the first two shots.
- Tell him to make the sight corrections only after he has loaded the second magazine and the bolt is closed (on M1s and M14s, this makes it easier to turn the windage knob).
- Tell him "If you don't hear a call from me after the magazine change, I did not see the shot hole. Keep shooting."
- Ask the shooter if he has established his natural point of aim.

For M1 and M14 shooters, cycle their op-rod several times to settle his position.

During the prep time, the coach gives the shooter a windage correction if required and watches him put it on. When the prep time is over, the coach should be standing with the shooter. When the command to rise has been given, the coach tells the shooter to:

- "Take some deep breaths." (This slows down the heart rate and clears the vision)

When the command "LOAD" is given, watch the shooter load with two rounds. The coach re-checks the wind and may give a last windage correction, and watches the shooter make the sight correction.

When the "READY" commands have been given and the targets start to come up the coach tells the shooter:

- "Your target number and color is..."

When the shooter is getting into position, the coach tells the shooter:

- "Op-rod forward" or "Close the bolt" (Watch that the first round chambers).
- "Safety off" (Check that the safety is off).
- "Check your natural point of aim."
- "Breathe between shots" (This helps with timing and keeps vision clear).

The coach moves quickly to the scope and watches the first two shots. During the magazine change the coach moves quickly to the shooter's side and:

- Watch him reload and chamber the third round.
- Have him call the first two shots.
- Give him a sight correction if needed after the bolt is closed and watch him make the sight correction.
- Tell him to recheck his natural point of aim.
- Remind him to breathe between shots.

The coach returns to the scope again and calls each shot seen a loud and clear voice that the shooter can hear.

The calls below are the conventional calls used during the rapid fire strings:

<u>CALL</u>	<u>MEANING</u>
Center	X
Good	10
Out (at a clock position)	9
Wide (at a clock position)	8,7,6,5
Hold Closer	Push front sight into black slightly.
Hold High	Hold half the diameter of the target higher.
Line of White	Move the front sight down away from the black slightly.

<u>CALL</u>	<u>MEANING</u>
Hold Low	Hold half the diameter of the target lower.
Favor RIGHT or LEFT	Move the front sight slightly left or right.
Hold RIGHT or LEFT	Move the front sight half the diameter of the target width right or left.
Time	10 seconds remain in the string.
Roll-um	5 seconds remain in the string.

The calls are used in combination if needed. For example, if the coach calls the shot "wide at 3" he also may give a "favor left" call.

When the shooter fires he must form a call in his head and then listen for the coach to call out the actual placement of the hit on the target. If the shooter and coach make the same call the shooter will know what to do. If the shooter calls a shot a nine at three and the coach calls the shout "out a 3, favor left" the shooter should conclude not to favor left but to break the next shot in the center. If the shooter calls the shot an X and the coach calls it "out at 9, favor right" the logical thing for the shooter to do is to favor right. The point is for the shooter to take the information received from the coach, compare it with his own and take logical action to make the next shot hit the center. This mental process only takes a split second.

When the rapid string is complete and the line is made safe, the shooter clears the line quickly. The off-going shooter counts down his elevation and debriefs the coach. The de-brief can clear up any mysteries about performance. For example, the reason your group was strung out at 6 o'clock is that your elevation ran down during the string. The shooter must be honest with the coach because he will partially base the sight correction for the next shooter from the shooter's first group. If the shooter's elbow was slipping out during a rapid he should say so, if he screwed up he should say so. The coach should look at the other targets. You may notice the other teams groups were out the same as yours. The object is to learn what you did right and correct what you did wrong. Plot the group in a data book for each shooter; it can be helpful when you move to the next yard line when you make sight corrections. Write the score on a duplicate score card and compare it with the official card for discrepancies. Move the next shooter to the line and do it again.

At the 600 yard line, single firing is preferred to pair-firing for the reasons already discussed. The last thing I would like to touch on is the methods the shooter can use for the Slow Fire Prone stage.

Watch a smallbore shooter shoot prone. Most will not take the rifle out of their shoulder to reload. The reason they don't take the rifle out of the shoulder is to maintain a natural point of aim. They don't have to rebuild it every time they reload. High Power shooters usually take the rifle out of their shoulder to reload and rebuild their natural point of aim each time. Natural point of aim is important to the smallbore shooter that competes at 50 or 100 yards. How much more important is it to the High Power shooter that shoots at 600 yards and beyond? It also saves time if you reload the rifle in your shoulder: you do not have to find your natural point of aim again. You might say maybe you can reload a service rifle without taking it out of your shoulder, but I can't. I say it's just a matter of practice. I take the next round, snap it into the magazine and slide it to the rear all by feel. I'm ready for the next shot as soon as the target comes up out of the pits. My natural point of aim is still good, I chamber the round, align the sights and focus on the front sight and start to squeeze the trigger. The shooter breaks the shot as soon as possible and gives the coach an honest call. They all should be good but if you break the shot one way or another, call it that way. Unless the coach tells the shooter to "holdup," the shooter should get all his shots downrange quickly.

When the shooter finishes his string, he clears the line quickly. He counts down his elevation and notes the amount of windage he has on his own rifle and does a quick debrief with the coach while the next shooter is getting into position.

As I mentioned at the beginning, this is only a place to start from and should not be considered a complete work on High Power Team Matches. Each time I shoot a team match, I learn something new or have an opportunity to apply what I have learned somewhere else. I also believe that it pays to keep your head on a swivel and your ears open. A lot of information is discussed and exchanged by the participants in a team match. Some is useless, but sometimes you can pick up a bit of information that you can use. It only takes an X to win.

D.H. Becherer

9-4 National Trophy Infantry Team (NTIT) Match Information- aka “Rattle Battle”

Some portions of this section derived from the 2022 National Matches Rattle Battle Q&A delivered by the USMC Rifle Team.

1. Rattle Battle Basics- The National Trophy Infantry Team Match fires 384 rounds total and is fired at 600 and 500 yards from the Prone position, 300 yards from the Sitting position and 200 yards from the Standing position. There are 6 Firing Members, a Captain and a Coach. The Coach will usually assign the Firing Members in the “Left Bank” and “Right Bank” teams. There are 8 targets that will be fired upon at each yard line in 50 seconds. Since there are 6 shooters and 8 targets, at least 2 of the Firing Members will be assigned as ‘swing shooters’ to shoot at more than one target. The Pit Official will control the raising and lowering of the targets, and the timing can be random after the Team is called to the line, “LOAD AND BE READY”.
2. Scoring- Scoring is different at each yard line- more points are assigned to ‘hits’ (these are shots that hit INSIDE the target displayed) at the farther distances. NOTE: only hits will be shown with a shot marker during scoring, shots outside the target are not marked.
 - a. At 600 yds hits are worth 4 points
 - b. At 500 yds hits are worth 3 points
 - c. At 300 yds hits are worth 2 points
 - d. At 200 yds hits are worth 1 point

At each yard line, the base score is the number of hits times the point value, plus there is an opportunity to be awarded BONUS POINTS based on the number of targets that have “6 or more hits”. That number of targets is SQUARED and added to the base score.

Example: at 600 yds, there are 100 hits total on the 8 targets.

Base Score= 100 hits x 4 points per hit= 400 points

From those 8 targets, assume that 5 of the targets have “at least 6 hits”- that number gets SQUARED (i.e. $5 \times 5 = 25$, or $6 \times 6 = 36$)

Bonus Points= (5 targets) x (5 targets) = 25 bonus points

Total from 600 yd line= 400 Base Points + 25 Bonus Points= 425 points

3. Coach and Captain- The Coach and Captain are non-firing members of the Team. Before the Team is called to the 600 yard line, the Captain and Coach may use a spotting scope to check wind conditions. Once called to the line, only 10x50 power (or less) binoculars may be used. The Captain and Coach will normally assume positions behind the Left and Right Bank Shooters and look for bullet traces to assist getting shots on target. They will also assist in case of a rifle malfunction, giving aiming commands to the Shooters etc. After the targets go down, they will make sure the Firing Members have a safe rifle with Safety Flag inserted, walk with the Team “Line Abreast,” in line with a US Flagbearer to the next firing line. Scores will also be reported back to the line via radio.

4. Targets- the 600 and 500 yd targets are “E” silhouette style and are approximately 20 inches wide; that is about just over 3 MOA wide at 600 yd and 5 MOA at 500 yd. The vertical height is over 40 inches tall, thus less precision is needed for vertical sight placement. At 300 and 200 yd lines the target is the “F” silhouette target, 13 inches tall and 26 inches wide (which is similar to the upper half or shoulders of the “E” target).
5. This match has NO REFIREs or ALIBIS; this is to simulate a combat situation. If a target falls out of the carrier, or targets are pulled early, there are no challenges allowed. If a Shooter has a malfunction, alert the Captain/Coach and try to clear the problem. The Captain/Coach should be ready to assist a Shooter if needed. In between Stages, the Captain/Coach should be ready to reapportion ammunition among the other Shooters to maximize hits.
6. Load Plan/Shooter Position and Hints- The Captain and Coach will assign target and ammunition for the Firing Members. Typical loadouts could be up to 40 rounds of ammo assigned to a Firing Member at a stage. In order to fire the rifle that quickly in 50 seconds, a cadence faster than typical prone-rapid is needed.
 - a. Recommendations to cinch up the sling one notch tighter than usual is common, and shooting several shots with a single breath is typical.
 - b. Digging toes into the soil for stability is permitted.
 - c. Most load plans will include a magazine change; shooters should take several deep breaths during this time to raise oxygen level.
 - d. Wear a hooded sweatshirt to keep brass from shooter on your left from hitting you or distracting your aim.
 - e. Coaches consider staggering your shooters with the far right shooter farthest forward, next shooter a bit aft, and third shooter a bit more aft (6 inches or so, this should keep ejected shells behind the head of the shooter to your right).
 - f. Shoot as soon as you see the target starts coming UP- there is a finite time for the bullet to travel down range, and the shot should be a HIT.
 - g. Swing Shooters (covering two or more targets) usually do NOT change NPA, just muscle the short distance to next target.
 - h. If a rifle goes DOWN, Coach/Captain should adjust to get hits on that target by using terms such as:
 - i. “PICK UP SUPPRESSION ON TARGET #56” (etc.) This directs the Firing Members to shift firing to that target.
 - ii. To direct sight corrections during the firing, there is not time to adjust sights, so commands like “THINK RIGHT”, “HOLD RIGHT” and “RIGHT EDGE” can be used.

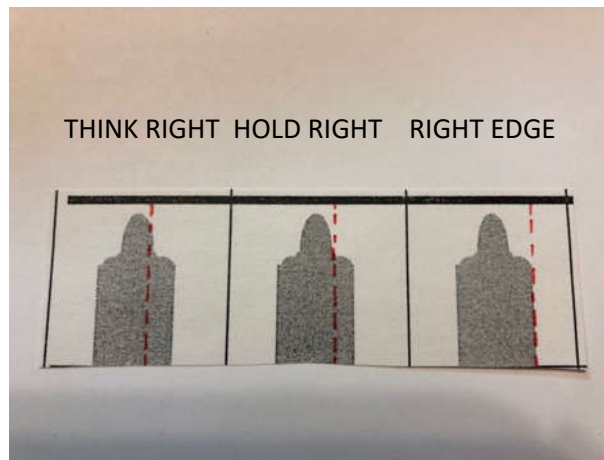


FIGURE 1 AIMING DIRECTIONS

- i. Freshly oil the rifle BCG at the 600 yd line to prevent over heating effect and reduce chance for jammed rifle.
 - j. Teams usually have a non-firing person designated to pick up brass at each yard line.
 - k. A spotting scope may be used by a Scorekeeper/Verifier (not Captain/Coach) to record the HIT values at each yard line.
 - l. Captain and Coach will work with shooters to determine magazine load out, and if 30 round magazines are feasible- NOTE: 20 or 30 mags are not allowed to touch the ground during firing.
 - m. Right Hand swing Shooters usually swing Right to Left, Left Hand swing Shooters generally swing Left to Right.
 - n. Each Firing Member should have their ZEROS plainly marked on their stock, and Coaches to remind Shooters to apply correct ZERO for each stage.
 - o. Captain and Coach need to be very attentive to the wind call at 600 and 500 yard lines. If their call is too far off, the shots off the silhouette are not marked and will provide no feedback and can adversely affect the score (it has happened!).
 - p. Shooters should on the command, "LOAD AND BE READY", chamber a round and put rifle into the shoulder and look through rifle scope for target to come up on your first firing point.
6. Equipment- the Firing Members should have only the essential equipment needed, since will have to carry all items from each yard line- Ex: rifle, sling, glove, glasses, shooting coat, hat, hooded sweatshirt, magazines and ear plugs.
 7. Sample Load Plans: (The National Record is 1466 points (as of 2022))
 - a. Aggressive Load Plan:
 - i. 600 yd- 40 shots per shooter, swing shooter puts 20 shots on two targets
 - ii. 500 yd- 24 shots per shooter, swing shooter puts 12 shots on two targets
 - iii. All ammo expended at the higher scoring targets
 - iv. Mathematically can achieve 1520 points
 - b. Less Aggressive Load Plan:
 - i. 600 yd- 32 shots per shooter, swing shooter puts 16 shots on two targets
 - ii. 500 yd- 32 shots per shooter, swing shooter puts 16 shots on two targets
 - iii. All ammo expended at the higher scoring targets
 - iv. Mathematically can achieve 1472 points

- c. High Scoring Plan that uses 300 yd line (takes advantage of SQUARING at 300yd):
- 600 yd- 40 shots per shooter, swing shooter put 20 shots on two targets
 - 500 yd- 12 shots per straight away shooter, 24 shots for swing shooters, swing shooter puts 12 shots on two targets
 - 300 yd- 8 shots per straight away shooter, 16 shots for swing shooters (for Left Bank, targets 1-2-3-4: Left shooter #1 shoots 8 at #1 target and 8 in target #2, Left Bank #2 Shooter shoots 8 in target #3, Left Bank shooter #3 puts 8 shots into Target #4)
 - Mathematically can achieve 1536 points
- d. Less Aggressive Plan that uses 300 yd line:
- 600 yd- 26 shots per shooter, swing shooter put 13 shots on two targets
 - 500 yd- 26 shots per shooter, swing shooter put 13 shots on two targets
 - 300 yd- 12 shots per shooter, ALL swing, (for Left Bank, targets 1-2-3-4: Left shooter #1 shoots 9 at #1 target and 3 in target #2, Left Bank #2 Shooter shoots 6 in target #3 and 6 in target #2, Left Bank shooter #3 puts 9 shots into Target #4 and 3 in target #3)
 - Mathematically can achieve 1428 points

SAMPLE LOAD PLAN

EVENT INFANTRY TROPHY COACH TEAM # 1/3, # 73 GUNS 1/3 DATE 1/3

300	NAME	NAME	NAME	NAME	NAME	NAME	NAME	NAME
LOAD	WPN SN	WPN SN	WPN SN	WPN SN	WPN SN	WPN SN	WPN SN	WPN SN
WIND	9	3	6	6	3	9	9	3
USED	ELEV 14	ELEV 10	ELEV 10	ELEV 10	ELEV 8	ELEV 31	ELEV 25	ELEV 9
	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT
	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS
500	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD
WIND	13	13	26	26	26	26	13	13
USED	ELEV 33	ELEV 25	ELEV 34	ELEV 21	ELEV 34	ELEV 40	ELEV 40	ELEV 13
	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT
	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS
600	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD
WIND	13	13	26	26	26	26	13	13
USED	ELEV 47	ELEV 42	ELEV 53	ELEV 35	ELEV 35	ELEV 40	ELEV 40	ELEV 13
	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT	TOT SHOT
	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS	TOT HITS
INDIV	300	300	300	300	300	300	300	300
LOAD	26	26	26	26	26	26	26	26
REMARKS	IF THE TEMP IS <65 AND DARK, ALL SHOOTERS NEED UP 2 ON THE 5 & 6. IF DARK AND WARM, ALL SHOOTERS DOWN 1. ANY TRICKLE IS WORTH 2 CLICKS ON THE 600.							
WEATHER	LIGHT HITS { 600 X 4, 500 X 3, 300 X 2							
WIND	MPH							
TOT HITS	TOT MISS		AGG					

EACH SHOOTER 600-500yd 4 1/2 MOA TEMP
 2x 300yd 47 1/2 MOA
 1 MGA 47 1/2 300-200yd 3 MOA

FIGURE 2 SAMPLE LOAD PLAN

5.8 National Trophy Infantry Team Match

The National Trophy Infantry Team Match is a National Trophy Event for the Service Rifle (Rules 4.1.1, 4.1.3, 4.1.4) or the Alternative Rifle (Rule 4.1.2) that is conducted during the annual National Matches or in other CMP-sanctioned competitions.

5.8.1 Team Composition

The team consists of a captain, coach and six team members.

5.8.2 Course of Fire

The National Trophy Infantry Team Match course of fire (Table 6) is used.

- a) For firing at 600 and 500 yards, a standard 600-yard target is reversed to display a white background and pasted on a standard competitive target frame. The Army “E” silhouette target is centered horizontally on this background, with the top of the silhouette 13” below the top of the frame. For firing at 300 and 200 yards, the Army “F” silhouette target is pasted on the face of a standard 200-yard target, with the top of the silhouette positioned at the top of the 8 ring.
- b) Teams take their positions on the 600-yard firing line as directed by team officials. Only the captain, coach, and firing members are permitted on the firing line. A three-minute preparation period is given at the 600-yard firing line only. After the preparation period ends, the command **LOAD AND BE READY** is given and the targets are exposed between 10 seconds and no later than 40 seconds after this command. Shooters may start firing when targets appear. The Chief Range Officer must vary the start command within these standards so that the timing of the **LOAD AND BE READY** command is not predictable. Between stages, each team moves forward abreast. Rifles must be unloaded, with magazines removed and bolts open, with muzzles elevated and pointed down range. The firing procedures at each range are the same as those at 600 yards. Each relay must complete the match before the next relay is called.

Table 6—Infantry Team Match Course

Stage	Distance	Firing Position	Time Limit
First	600 yds.	Prone	50 sec.
Second	500 yds.	Prone, Sitting or Kneeling	50 sec.
Third	300 yds.	Sitting or Kneeling	50 sec.
Fourth	200 yds.	Standing	50 sec.

5.8.3 Competition Conditions

- a) **Ammunition.** Each team starts the match with a total of 384 rounds of ammunition. The team captain allocates the ammunition among stages, divides it among the firing members and decides the number of rounds to be loaded in the clips or magazines.
- b) **Slings.** M1907 or M1 slings may be configured with arm loops and used for support in the prone, sitting or kneeling positions. In the 200-yard standing position stage, the sling may only be used as a hasty sling, without an arm loop, but with the sling strap wrapped around the arm (Rule 4.4.6).

- c) **Targets.** Each team is assigned a block of eight adjacent targets. Gaps in the target line separate one team's targets from those of another.
- d) **Coaching.** During the Infantry Team Match, both the team captain and the team coach may coach and talk directly with the shooters and they may touch the shooters' rifles.
- e) **Target Markers.** During the National Trophy Infantry Team Match, each team must serve as or provide Target Markers for a team on the following relay, except that last relay teams must provide Target Markers for the first relay. Target Markers must be capable of performing these duties correctly. Failure to provide capable Target Markers may disqualify a team.
- f) **Malfunctions.** No malfunctions may be claimed for misfires, disabled firearms or other failures of range or team equipment.
- g) **Score Recording.** A Range Officer is assigned to each team to enforce safety regulations and record team scores. A designated team representative (verifier) may accompany this officer downrange to verify scores.

5.8.4 Scoring

- a) All scores are recorded on the firing line at the end of each stage.
- b) Hits outside the silhouettes are not scored or marked.
- c) Hits on the silhouettes count four (4) points at 600 yards, three (3) points at 500 yards, two (2) points at 300 yards and one (1) point at 200 yards.
- d) A bonus for distribution is calculated at each range. The bonus is determined by counting the number of silhouette targets that contain six (6) or more hits each. The number of targets with six or more hits is squared and that result is added to the total hit score for that range to produce the total score for that range.
- e) Ties are broken according to the highest team score at 600 yards, then at 500 yards, etc.

5.8.5 Telescopes and Field Glasses

In the National Trophy Infantry Team Match, the team captain and coach are permitted to use binoculars that do not exceed 10X50 in power and objective lens diameter. Telescopes may only be used behind the ready line and before the preparation period starts. Telescopes and field glasses may be used as follows:

- a) The team captain and coach may use a telescope behind the assembly line for the purpose of reading the wind before the start of their team's relay. These telescopes may not be used for coaching or reading wind after the preparation period starts.
- b) After the preparation period starts, the captain and coach may use binoculars that do not exceed 10X50 in power and objective lens diameter.
- c) The assistant range officer or verifier may carry one telescope downrange and may use it only to check and verify scores.
- d) Telescopes taken downrange must be turned parallel to the firing line during the time when targets are exposed and may be turned towards the targets only during scoring.

Appendix A- M1 Garand, M14, M1A and AR-15 Iron Sights Info

The following sections are for the firearms listed above and generally follow the same section flow as the main Rifle Marksmanship Manual. The discussion here does not normally apply to the scoped AR-15.

M1 Garand M14 M1A NATIONAL MATCH RIFLE

2-1 GENERAL. Navy match competition will utilize primarily the scoped AR-15 civilian equivalent of the M16. The M14/M1A and the M1 Garand Rifles are permitted, however due to the lighter recoil and inherent accuracy of the NM AR platform, the vast majority of the competitors and champions are using the AR-15. Iron sight AR-15s are allowed as well, but a scoped rifle is far superior in competition. All rifles must comply with the Civilian Marksmanship Program (CMP) high power rifle rules for service rifles.

2-2 DESCRIPTION. The U.S. Rifle, 7.62mm, M14 is a lightweight, air-cooled, gas-operated, magazine-fed, shoulder weapon. It was originally designed primarily for semi-automatic/automatic fire. The National Match M14 or M1A is not capable of automatic fire. It should be noted that these National Match M14's are "custom-made" by hand. The individual and group parts are therefore, not interchangeable.



M1A National Match Rifle



AR-15 National Match Rifle- Iron Sights

The U.S. Rifle 30 cal or the M1 Garand, is a gas operated, semi-automatic rifle fed from a clip holding eight cartridges in either 30-06 caliber or if modified, in 7.62 mm. The Garand is no longer issued as a service rifle but it is still legal to use in National Match competition and John C. Garand matches.



M1 Garand

2-3 PROPER CARE

1. Stock. Weather has an effect on a wooden stock. Neglect of the stock results in the wood drying and shrinking. Rain or moisture causes the stock to swell. Swelling or shrinking prevents the receiver from bedding in the stock properly. Swelling or drying can also cause the stock to warp. This upsets the "zero" of the weapon and causes the apparent loss of accuracy. Avoid leaving the stock in direct heat, sun, damp places, or near a radiator. Do not leave your rifle lying on the grass because of early morning dew that will be absorbed into the stock.
2. Barrel and Receiver Group. Weather also has an effect on the metal parts of the rifle, in that climatic conditions such as temperature changes cause the metal to sweat or rust. If the weapon is fired during rain, it should be cleaned immediately after firing. Keep a light coat of oil on all metal and in the barrel and chamber when not shooting on the range. Maintain an accurate record of all shots fired and all maintenance performed on the rifle in the gun record book.
3. Firing Mechanism. The firing mechanism should be kept dry and clean, except for points that are to be lubricated in accordance with the service manual.

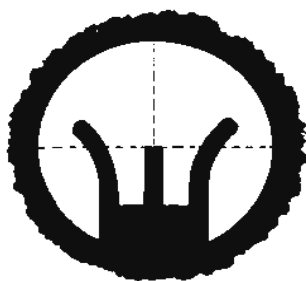
SECTION 3: EQUIPMENT

- a. Sights. There are many methods of blackening the sights. A spray can of sight black is the most common but the carbide lamp has long ago been proven to be the best for putting a non glare black coat on the sights.
- b. Shooting Adhesive. Comes in spray cans and is used to reduce slippage at contact points such as elbows and shoulder pads. (This item was common for the M1/M14/M1A but rarely used for AR-15 applications)

SECTION 4: COMPETITIVE RIFLE MARKSMANSHIP IRON SIGHTS

4-1 AIMING. Sight alignment, trigger control, and breath control are the most important fundamentals of any type of marksmanship. Without thorough knowledge and application of proper sight alignment and trigger control a well-aimed shot is impossible. Before sight alignment is addressed a review of the basics of aiming is necessary. The importance of aiming cannot be overemphasized. Aiming provides a means whereby the shooter can check the effectiveness of position and trigger control in later phases of training and firing.

4-2. Sight Alignment.



Proper sight alignment

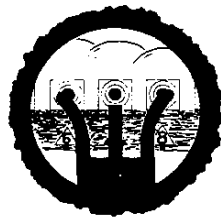
- a. Sight alignment is the relationship between the front and rear sight with respect to the eye. This is the most important aspect of aiming. Errors in alignment create angular changes in the position of the axis of the bore resulting in a change of the strike of the bullet.
- b. When using an aperture rear sight and a post front sight, the correct sight alignment is as follows: The top of the front sight should be centered on a line with the horizontal axis of the aperture. Center the top of the front sight horizontally and vertically in the rear aperture. This is the most natural method of alignment of the sights. The eye will instinctively accomplish this task with little training. This method also causes the least amount of inconsistency from shot to shot.



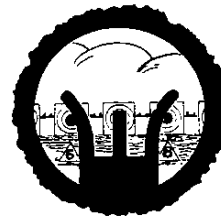
"6 O'Clock Hold"



"Center Hold"



"Line of White"



"Frame Hold"

Different sight pictures

4-3 Sight Picture.

- a. Sight picture differs from sight alignment only with respect to adding the aiming point.
- b. The sight picture used by most shooters is known as the "6 o'clock hold". Most competitive shooters use this picture as it offers a distinctive aiming point.
- c. All experienced shooters do not use the same hold. But whatever sight picture is used, it must be uniform from shot to shot. Some of the other frequently used sight pictures are "center hold", which is used primarily for the standing stage, and the "line of white" hold for slow fire prone.

4-3A The Scoped Rifle. The AR-15, M14/M1A and M1 Garand may have a scope with a maximum magnification of 4.5x and no larger than 34 mm objective tube.(see CMP section 4.1 for more details)

- a. The scoped rifle allows the shooter with vision problems or older eyes that do not focus well with the iron sights to compete. For all shooters, the scoped rifle allows for some magnification of the target and many, if not most of the competitors are using this advantage.
- b. Care must be taken to allow sufficient "eye-relief" so that the shooter can see a clear image of the target and not crowd the rear of the scope, injury can occur due to recoil. CMP rules do not allow the scope (optical sight) configuration to change between stages. The AR-15 adjustable stock is one way to accommodate the varying eye-relief needed for standing, sitting and prone positions.

NOTE: ALTHOUGH SCOPED M1 GARANDS AND M1A/M14 ARE PERMITTED, THEY ARE RARELY USED IN ACTUAL CMP AND NRA COMPETITIONS DUE TO THE RATHER HIGH SCOPE MOUNTS NEEDED AND DUE TO THE HIGHER RECOIL THE SCOPE MOUNTS CAN LOOSEN MORE EASILY- IT IS VERY RARE FOR A COMPETITOR TO USE THESE OPTIONS FOR HIGHER LEVEL COMPETITION.

4-4 Relationship Between the Eye and Sights.

a. In order to see what is required during the process of aiming, the shooter must know how to use the eye. Variations in the position of the eye with respect to the rear sight will cause variations in the image received by the eye. Eye in this respect is called "eye-relief". Proper eye-relief, subject to minor variations, is approximately three inches between the eye and the rear sight. The best method of fixing the eye relief is with the "spot weld".

b. The eye is capable of instantaneous focus from one distance to another. It cannot be focused at two distances simultaneously.

c. To achieve an undistorted image while aiming, position the head so that you look straight out of the aiming eye and not out of the corner or top of the eye. If the head position causes you to look across the bridge of the nose or out from under the eyebrow, the eye will be strained. The strain will produce involuntary eye movements that reduce the reliability of vision. This will not only affect performance, but the inability to see clearly will also have a damaging psychological effect. The eye will function best in its natural forward position.

Do not fix vision on sight alignment for more than 10-15 seconds. When the eyes are focused on a simple image for a time the image is "burned" into the area of perception. This can be illustrated by staring at a black spot on a piece of paper for 20-30 seconds and then shifting the eyes to a whitewall. A ghost image of the black spot will appear, with a corresponding loss of visual acuity in the area of the image. This will have an effect upon the critical area of perception. This image may be mistaken for a true sight picture. Either effect will seriously damage performance.

4-10 POSITIONS. A correct shooting position is essential to obtain the best results in rifle shooting. The better the position, the easier it is to hold the rifle and control the trigger while the sights are properly aligned.

(2) Rifle Butt in the Pocket of the Shoulder. The shooter must place the rifle butt firmly into the pocket formed in the shoulder. The proper placement of the butt reduces the recoil, helps steady the rifle, and prevents the rifle from slipping in the shoulder. Experiment with the position that best suits your physical build.



M14 fitting into the nocket of the shoulder



3. Standing Position. The standing position is used in the first stage of the National Match Course; 20 rounds, with a time limit of 20 minutes, at the 200 yard line.

(1) Balance. Balance is as important to a shooter as it is to any athlete. This is especially true for the standing position, when the shooter must be able to stand for long periods without tiring. Compared to the prone or sitting positions, there is little doubt that it is the least steady position, and the most difficult to master. However, there is no reason why excellent results cannot be obtained by applying the fundamentals.

(2) Assuming the Standing Position. Face the target, execute a right face, and spread your feet apart at a comfortable distance. For the M14: With the right hand at the small of the stock, place the rifle butt high against the shoulder so that the sights are level with the eyes. Hold the right elbow high to form a pocket in the right shoulder. This also permits a strong upward and rearward pull with the right arm and hand. Hold most of the rifle weight with the right arm and place the left hand under the rifle in a position to best assist in supporting and steadying the rifle. Lower your cheek to the stock and relax the entire

weight of your head on the stock so that the side of your face will be in contact with the stock. The butt of the rifle should be in the same location on your shooting jacket each and every time you fire. Distribute your weight evenly on both hips. The spot weld for standing is very seldom the same as for sitting or prone. In the standing position it is very difficult for many shooters to place the cheek against the right thumb. To maintain consistent eye relief, care must be taken to place the cheek against the stock the same way, and at the same place, every time. By practice and experimentation determine the proper spot/stock weld. Finding a natural point of aim in the standing position is complicated because of uneven terrain on most firing lines. Always strive to have both feet level. Move either foot in any direction to take advantage of "hills" and "valleys" until finding the desired point of aim. Relax between shots but always keep your feet in place.



3. Sitting Position. The sitting position is used in the rapid fire or second stage of the Nation Match Course; 10 rounds, with a time limit of 60 seconds, from standing to the sitting position, at the 200 yard line.

(b) Crossed Leg. The difference between crossed leg and the crossed ankle positions is very slight. In the crossed leg position, after sitting down, keep your feet under your knees and simply leave the position of the upper arms inside the knees. It takes only a short period of time to assume the crossed leg position.



Crossed leg

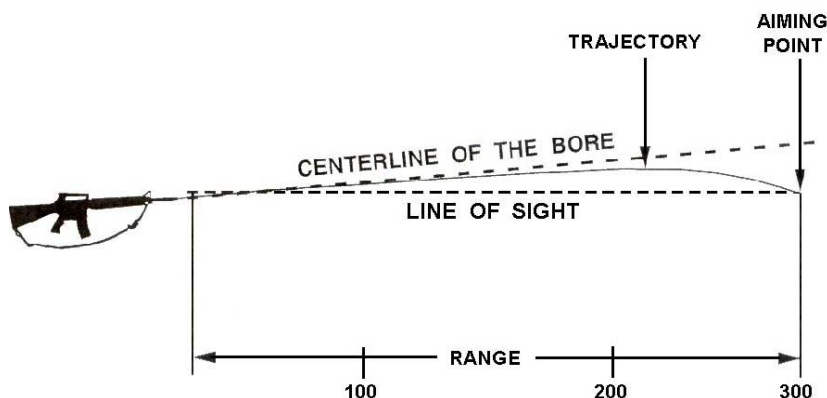
4. Prone Positions. The prone positions are used in the third and fourth stages of the National Match Course. The Third is 10 rounds, with a time limit of 70 seconds, from standing to prone position, at the 300-yard line. The fourth stage is 20 rounds, with a time limit of 20 minutes, in the prone position, at the 600-yard line.



Prone Position

SECTION 5: ZEROING

Bullet Path and Line of Aim.



5-2. Definition of True Zero. The true zero of the sight is the setting in elevation and windage required to place a shot or shot group in the center of the target at a given range when no wind is blowing.

5-3. Sight Adjustment. To accomplish zeroing, you must first learn the operation of the rear sight, the use of the elevation and windage rule, and how to compute sight changes.

a. Rear Sight M14. The rear sight of the M14 has an elevation knob and a windage knob which are used to move the rear sight aperture up or down and right or left respectively. Both knobs make an audible click when they are turned. The elevation knob is adjustable from 0 to 72 clicks. The windage knob can be adjusted from 0 to 32 clicks to the right or left of the center index line. When the elevation knob is set on zero elevation and the center index line on the rear sight movable base is aligned with the center index line on the receiver, the rifle is set at mechanical zero.

b. Elevation and Windage Rule. This rule is based on one minute of elevation or windage moving the strike of the bullet one inch on the target for each 100 yards of distance. The National Match M14 has 1/2 minute adjustment clicks for windage and an elevation hood which also adjusts for 1/2 minute of elevation (notch UP adds 1/2 MOA, notch DOWN adds 0). The National Match AR15 also has elevation and windage knobs, but due to differences in manufacturers the increments may be in 1/2, 1/3, or 1/4 minute clicks. You will have to know how your rifle is set up to apply the one minute rule. The scoped rifle will also have windage and elevation knobs, see manufacturer specifications for the MOA per click.

c. Sight Changes. To make sight changes, locate the center of the **shot group** and determine the distance between it and the desired location. The distance in elevation is determined vertically while the distance in windage is determined horizontally. These distances are converted to clicks by using the elevation and windage rule. As a general rule bold adjustments will prove more advantageous. (See MGSgt Jim Owens "The Big Lie" regarding perils of adjusting sights based on one shot.) To raise the strike of the bullet you must increase the elevation. Conversely, decrease the elevation to lower the strike of the bullet. Right (clockwise) windage moves the strike of the bullet to the right, and left (counterclockwise) windage moves the strike of the bullet to the left.

5-4 ZEROING THE M14.

The best way to zero a rifle is to shoot it at the position, range, and cadence at which it is intended to be used. All shots should be recorded in the data book. The information in the data book is used in projecting zero changes. The wind must also be taken into consideration in determining windage zero. For example, if the wind velocity requires three clicks right windage, the windage zero on the sight will be three clicks left of that used in hitting the center of the target.

1. The 200 Yard Line Zeros. The initial zeroing phase should start at the 200 yard line with the sights set at 12 clicks elevation and mechanical zero windage. To facilitate determining the 200 yard zero quickly, it is suggested that the rounds be fired slow fire in the sitting position, when the slow fire shots are striking near the center of the target, three shot groups of three rounds each are fired in rapid fire cadence followed by a rapid fire string of ten. During this firing, sight changes are made to bring the group into the center of the target. If the windage zero is offset from mechanical zero, the front sight should be moved to allow mechanical zero and windage zero to be the same. To do this, the front sight is moved in the direction of the shot or shot group. After the front sight is moved, it will be necessary to fire another zeroing exercise. Often the rapid fire zero will be different from the slow. This is due to a difference in position and trigger control. Therefore, it is necessary to establish a slow fire zero. To do this, simply fire several rounds slow fire from the appropriate position and call each shot accurately. When the shots appear on call then the slow fire zero has been obtained.

2. The 300 Yard and 600 Yard Zeros. The 300 yard rapid fire zero is determined by firing the same exercises that were fired at the 200 yard line. However, at 600 yards, single shots are fired until the group is centered on the target. The normal sight change is up three clicks from 200 to 300 yards and up 12 clicks from 300 to 600 yards. These changes are subject to variations in shooter sight picture, ammunition lot, light, and temperature.

5-5 ZEROING THE AR15 WITH IRON SIGHTS

The AR15 is available from many different companies, each offering their own configuration of front sight post and rear sight adjustments for elevation and windage. The basic starting point for zeroing the AR-15 should be to read the owners manual to determine the range markings on your sights. National Match sights have finer adjustments than the standard sights of the M16.

Generally they are adjustable in half minute clicks (1/2 inch at 100 yards) in elevation and quarter minute clicks for windage (1/4 inch at 100 yards). The elevation knob on most rifles has 25 clicks for a full revolution. The National Match front sight is usually a tapered blade. It slopes from the rear surface down to the front. It must be adjusted in complete turns to keep the wider rear surface facing the rear sight.

1. TO ADJUST ELEVATION

Initially set the rear sight 3 to 5 clicks up. This allows for changes in conditions or ammunition. Adjusting the front sight only. Fire a group at 200 yards. Adjust the front sight in complete turns. Stop adjusting the blade when the group is centered on the target or when the next turn would shift the group above the target center. Final adjustment will be performed using the elevation knob only.

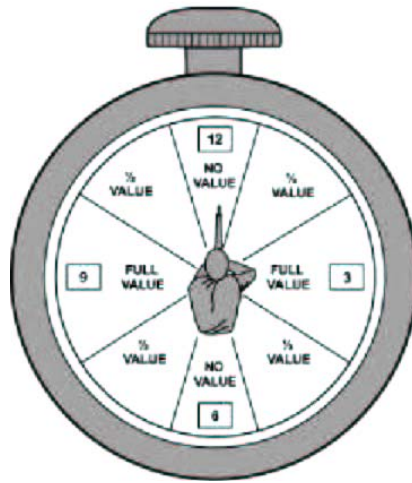
2. TO ADJUST WINDAGE

Adjust windage the same way as described for the M14. You should take notice that the AR-15 has a flip sight with two separate apertures. If you plan on using both apertures be aware that they will have different zeros, therefore you will have to record your zeros for each one.

PRACTICE SESSION M14

Reloading Exercise. Reloading with the service rifle is time consuming. With practice it can be accomplished smoothly with a minimum of time and motion. It must be remembered that the loaded magazine should always be placed in the pouch (if used) with the ammunition down, bullets forward. When completed the simulated firing of the first magazine, drop the butt of the rifle to the thigh (sitting), or the ground (prone). Reach forward and with the right thumb (M14) and place the unloaded magazine on the ground. Reaching to the rear, remove the loaded (simulated in dryfire) magazine from the pouch, invert it, insert it straight into the magazine well, and push it until the magazine is latched. Release the bolt to chamber the top round.

SECTION SEVEN EFFECTS OF THE WEATHER

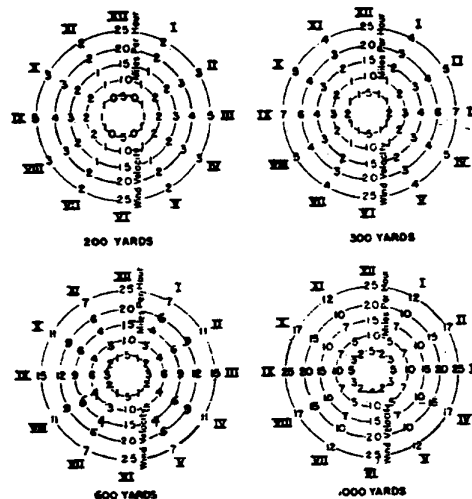


Wind direction values

2. After determining wind direction and velocity, the windage correction placed on the sight will be based on the following formula: $R \times V / 10 = \text{Number of } 1/2 \text{ minute clicks for a full value wind on a National Match M14 Rifle using match grade ammo.}$ For half value winds simply divide the answer by two. In this formula, R= range in hundreds of yards, and V = velocity of the wind in mph. The constant 10 was arrived at mathematically, considering the bullet weight, density of the air, air resistance and distance to target.

WINDAGE DIAGRAM

Circles represent wind velocity as indicated.
Roman numerals indicate wind direction.
Arabic numerals indicate clicks of windage,
as found on rear sight of NM M14 Rifle.

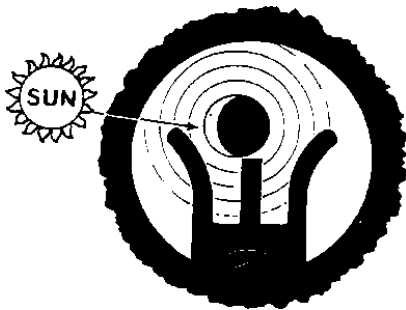


WINDAGE DIAGRAM

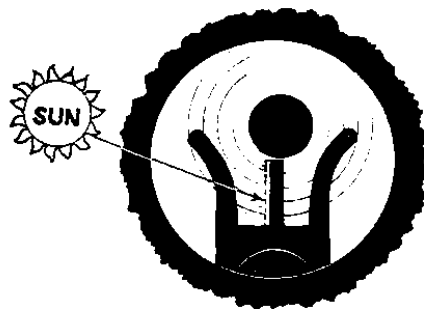
(NM M14 with match grade ammunition)

7-5 LIGHT. This subject is controversial. Light may or may not have an effect on aim. Light affects different people in different ways. The general tendency 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 forms around the bull's-eye causing the aim to be low. On a dull day the halo is gone and the tendency is to hold closer to the bull's-eye 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 bull's-eye tends to look smaller than it actually is. The reduced aiming point will require a lowering of elevation ("Lights up, sights up - lights down, sights down" is a general rule of thumb).

a. Light conditions from the left or right may have an effect on the horizontal impact of a shot group. When a bright light hits on the face of the target, the edge of the bull's-eye from which the light is coming may appear indistinct. This causes the center of the aiming point to be off slightly. The general rule is to click the sights into the light. When a bright light is coming from the side but does not hit directly on the target the effect is on the front sight. This will cause the shot to strike in the direction from which the light is coming. On certain occasions both conditions may be in effect, counteracting the other.



Direct light effects



Indirect light effects

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Highpower Rifle - Target and Scoring Information

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DIAGRAMS

- 1 – NRA Target's
- 2 – Highpower Rifle Scoring System for Slow Fire
- 3 – Highpower Rifle Slow Fire Score Signal Locations
- 4 – Highpower Rifle Rapid Fire Scoring Guide (with score board location)
- 5 – Highpower Rifle Scoring of a Miss and Inadvertently Pulled Target



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Highpower Rifle - Target and Scoring Information

General:

All High Power Rifle Competitors are required to perform Score Keeping duties and perform "Pit Duty".

Score keeping is done usually on the firing line, but if circumstances dictate it, it can also be performed while one is also doing "Pit Duty".

SCORE KEEPING can be broken down into two different stages, Slow Fire and Rapid Fire.

SLOW-FIRE: is when the competitors load and shoot only one round in the rifle at a time. The target is pulled and scored (or marked) after each shot when it hits that target. In the Pits, there is a dirt berm (or impact area) behind the targets which the bullet will impact into. When the bullet strikes the dirt, there will be a dispersion of dirt which is sometimes referred to as a "splash". The person who is performing Pit Duty (aka: Pit Puller) will pull the target down after they see this splash and look for an impact or bullet hole in the target. After they locate the bullet hole, they will place the plug of a 3" Spotter Disk inside the bullet hole to mark its location.



Spotter Disks

The 3" Spotter Disk has a **White Side** and a **Black Side** to it. When a bullet hole is in the Black portion of the target, the pit puller will insert the spotter disk with the White Side facing outwards (towards the shooter - to show Contrast against the Black portion of the target). When a bullet hole is in the White portion of the target, the pit puller will insert the spotter disk with the Black Side facing outwards (towards the shooter - to show Contrast against the White portion of the target).

This is also known as "Integrating the Spotter" (Black on White and White on Black).

The pit puller will also place a 6" Scoring Disk or (Shot Value Scoring Disk) on the outer portion of the target which corresponds with an assigned Shot Value. (Refer to Diagram No.2). The Scoring Disk has a Black side and the other side is painted either bright Orange or bright Green. Usually the brighter side will face back towards the shooter for easy of seeing the Scoring Disk.

After inserting both disks (Spotter & Scoring), the Pit Puller will move the target all the way up in the target carrier so the Shooter and Score Keeper can see the previous shot, its location and its value. The Pit Puller will repeat this process for **all of the Sighter Shots** and **Shots for Record** during Slow Fire. If the shooter has any Misses, two 6" Scoring Disks will be placed in the lower corners of the target frame. (Refer to Diagram No.2)

The Values written inside the score cards should reflect the numerical values shown on the target. If the shooter had any Misses, an "M" will be written inside the appropriate box for each miss.



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Highpower Rifle - Target and Scoring Information

RAPID-FIRE: is when the competitors loads and shoots a *Ten (10) round string of Fire* within a Time Limit of either 60 or 70 seconds. Unlike Slow Fire, the target will remain exposed in the air for the entire time 60 or 70 second time limit. The target **will ONLY be pulled down upon command**. The pit puller will ensure all (10) hits are in that target, PRIOR scoring (or marking) it by placing 1" shot spotters or golf tees inside of any bullet holes on the target.

In the Pits, during a rapid fire string, the pit puller will count the number of impacts into the dirt impact area. Upon Command, the pit puller will pull the target down after the time limit has expired and they will then look for 10 bullet holes inside the target. After the pit puller locates all of the required number of bullet holes, they will place **Golf Tees and/or 1" Spotters inside the Black portion of the Target.**



Golf Tees

Bullet holes inside the White Portion of the Target will have **1" Spotters** with the Black side of the spotters facing outwards towards the shooter.

Insufficient (Less than 10 Rounds) or Excessive or Hits (More than 10 Rounds) in the target:

If the pit puller has less than 10 hits on the target or more than 10 hits, they will need to call for an official and go through the process indicated in Diagram No. 4. **DO NOT Place any golf tees or spotters into the target.** A Scoring Disk will be placed at either the 12 o'clock or 2 o'clock positions on the target frame. (Refer to Diagram No. 3 & 4).

Directions for SCORE KEEPING – During SLOW FIRE:

1. Stand or Sit on the open side of the shooter and slightly back. You should be on the Right Side of a Right Handed Shooter and on the Left Side of a Left Handed Shooter. You should be close enough where you don't have to yell in order to communicate with the shooter and yet, far enough away not to be in their way or in their personal space.

You should also have a spotting scope with you and it should be positioned so you can look at both the shooter and be able to look through the spotting scope.

2. When a shot is fired – Immediately look at the target to see if the target is pulled and it goes down into the pits. If the target does not go down into the pits within a few seconds, **call out for a "MARK" on that target.**



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Highpower Rifle - Target and Scoring Information

Example: You are score keeping for Target number "75". The shooter fires his shot, but the target does not go down into the pits. Look towards the center of the firing line and yell out, "**MARK TARGET 75; 75 MARK**". The target should go down shortly. If the target doesn't go down into the pits, repeat this command.

3. When the target comes back up in the air from the pits, you will need to recognize the shot value by the location of the 6" Scoring Disk. The Scoring Disk should be placed at its location along the edge of the target. (Refer to Diagram Number 2)
4. You need to Double check the indicated value of the **Scoring Disk** against the actual location of the **Spotting Disk**, through your spotting scope. The two should be consistent and correct. If the shot value indicates something different than where the shot actually is located you have two (2) options.

- 1) Tell the shooter the value is incorrect and state what you think the actual value is to them.

Example: The shot spotter is in the "10" Ring, but the Scoring Disk is showing a "7" value. Provided you and the shooter both agree on the correct value, record the proper score and the shooter may continue to shoot their course of fire.

- 2) Tell the shooter the value is incorrect and state what you think the actual value is to them; however, the shooter disagrees with what you are telling them the value is. At this point you will turn to the center of the line and Call Out for them to "**RE-DISK**" that target number.

Example: Yell Out "**RE-DISK TARGET 75**". The target should go back down into the pits and the correct value will re-appear.

5. **CALL OUT EACH SHOT to the competitor.** Prior to the shooter starting their slow fire, ask the shooter if they want the "VALUE" of each shot called out. Some shooters will not want their shot Values called out. If that is the case, you will simply call out the shot number fired out to the shooter.

Example 1: Shooter ***WANTS*** their value called out. You will tell them, "10, One On"; "9, Two On"; "8, Three On"; and etc.

Example 2: Shooter ***DOES NOT Want*** their value called out. You will tell them, "1 On"; "2 On"; "3 On"; and etc.

6. You are **NOT ALLOWED** to call out the **VALUE AND THE SHOT LOCATION**.

Example 1: "That's a 10 at 3 o'clock". A shooter can be disqualified because it is deemed as "Coaching" the shooter which is not allowed during Individual Matches. (Especially if challenged or if a protest is made).



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Highpower Rifle - Target and Scoring Information

7. By calling out the shots to the shooter, any discrepancies in the shot values can be handled immediately between the shooter and score keeper and you ensure no shots are missed during the string of fire.
8. After calling out the Value and/or the Shot number, write down the value onto the score card immediately in the appropriate location on the card.
9. Each stage has a separate line. Begin filling the boxes on the left side of the line. An "X" counts as "10 Points", but you will still write an "X" in the appropriate box. If there is a tie score, the winner will be determined by the number of "X's" shot.

- 1) **HELPFUL HINT:** Place a "Dot" or "Tick Mark" on the outer perimeter of the scoring box of where the shot location is.

1	2	3	4	5
• 10	• 9	8 •	X •	10 •

- 2) This will ensure you did not miss a shot, so long as you are looking through a spotting scope at each and every shot and it will also help resolve any disputes with the shooter (in the event you have to compare it to their data book).

10. **In a CMP Match**, one has to do a separate process.

If the shooter fires and X, you have to write a "10" in the box and then blacken the space for a "X".

If the shooter fires a Miss, you have to write a "0" in the box and blacken the space for a "M".

1	2	3	4	5
9	10	10	8	10
○ X ○ M	● X ○ M	○ X ○ M	○ X ○ M	● X ○ M



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Highpower Rifle - Target and Scoring Information

11. Once the string of fire is completed, add up all the shot values and write down the total points in the space provided. Be careful and double-check your addition.

- 1) Example: The shooter fired a total of "90" with "3" X's in that string. That may be written in either of these methods, both are acceptable.

STRING TOTAL		STRING TOTAL
90 X 3	or	90 - 3x

12. Total or (Add) both strings of fire together in order to get the shooter's **TOTAL SCORE** for the Match Total fired. Be sure to add the number of "X's" fired as well

1st STRING TOTAL	2nd STRING TOTAL	MATCH TOTAL
90 X 3	90 X 3	180 X 6

13. At the conclusion of firing for that match; ensure you (the Score Keeper) sign the score card in the appropriate location and have the Competitor also sign the score card in the appropriate location.
14. Once the Competitor signs the card, the SCORE KEEPER will turn the score card into a line official.

SCORE KEEPING – During RAPID FIRE:

- Stand or Sit to the open side of the shooter and slightly back in the same manner you were in during slow fire.
- You should also have a spotting scope with you and it should be positioned so you can look at both the shooter and look through the spotting scope. Prior to the Rapid Fire Match, each shooter will or should have a Sighter Period. These sighter shots will be scored in the same manner as during Slow Fire.
- Once a shooter is ready for RAPID FIRE, score keepers are NO LONGER ALLOWED TO LOOK THROUGH THEIR SPOTTING SCOPES. In fact the person calling the line may Command, "Scopes Away".
- The Score Keeper **WILL WATCH THE SHOOTER** and **COUNT THE NUMBER OF ROUNDS** they FIRE. You are there to ensure the shooter fired all 10 shots and you will also verify if there was any weapon malfunction or stoppage. This will determine whether the shooter WILL or WILL NOT rate an alibi in the event insufficient or excessive hits are located in the pits.



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Highpower Rifle - Target and Scoring Information

5. After the Rapid Fire string is fired, the procedure is:

- 1) TARGETS will have a Black Score Board placed on the upper LEFT Hand Side of the Target. The number of hits inside the scoring rings will be recorded in the appropriate locations.

Example:

X	3
10	5
9	1
8	1
7	
6	
5	
M	

- 2) Once the target is fully exposed, you should count the number of hits shown on the score board and ensure it totals 10 hits. $3 + 5 + 1 + 1 = 10$
- 3) You will tell the shooter the shot values shown on the score board. Starting with the Highest Values first and working your way down the Score Board.

Example: 3 (X's); 5 (Tens); 1 (Nine); 1 (Eight)

- 4) Once the targets are shown to the firing line, there will be a challenge period to confirm any discrepancies. If, both you and the shooter agree with the score indicated on the score board, write down the total number of hits in each corresponding spot on the score card. The Score Card should reflect the same manner shown on the Score Board.

1	2	3	4	5	6	7	8	9	10
X	X	X	10	10	10	10	10	9	8

- 5) Enter the String Totals in the appropriate boxes on the Score Card.
- 6) Add the String Totals and place the Match Total in the appropriate box on the Score Card in the same manner as in Slow Fire.



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Highpower Rifle - Target and Scoring Information

Refer to Diagram # 4; If any of the examples are present, determine the proper course of action to be taken.

6. At the conclusion of firing for that match; ensure you (the Score Keeper) need to sign the score card in the appropriate location and have the Competitor also sign the score card in the appropriate location.
7. Once the Competitor signs the card, the SCORE KEEPER will turn the score card into a line official. (Refer to the Rapid Fire Target Example)

PIT PULLING DUTIES

Pulling and Marking Targets:

As previously stated; All competitors are required to do "Pit Duty". This is where you will be pulling and marking targets for the relay which is currently shooting. It's not as bad as it sounds; in fact, pulling targets can actually be a lot of fun, especially if you talk and joke with your fellow competitors. Unlike being on the firing line, you have more time to hold conversations with your fellow competitors and even eat while down in the pits.

What is going to be discussed is how to do the "Pulling and Marking of Targets" in the fastest and smoothest manner. While doing Pit Duty, competitors will either have one or two target pullers. The absolute rule in Target Pulling is "In order to get good pit service, you have to give good pit service". It should not take more than ten (10) seconds to pull the target down, score it properly and run it back up. Ideally, excellent pit service is between 6 - 8 seconds.

Good pit service is vital for any good shooter. If they can shoot fast, they can shoot through less wind changes. The information from the previous shot becomes more valuable in understanding what effects the wind did to their previous shot. At 600 yards, an excellent shooter can be done with twenty (20) rounds for record in less than 8 minutes provided they have excellent pit service. These shooters will be ready to fire their next shot, before you are able to put the target up in the air.

Having Two persons pulling a target is definitely the easiest because each person is doing ½ of the necessary work involved; however, a one person detail can almost pull the targets as fast as two people IF they follow the procedures outlined here after.

Duties:

Pulling and Raising the Target

Marking the bullet hole

Marking the shot value or "Scoring" the Target

Pasting over the previous shot hole.



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Highpower Rifle - Target and Scoring Information

These are the four things which are required while someone is pulling and marking targets. When there are two persons in the pits working on One Target, the best way to divide up the work is in this manner:

Person 1 – Pulls the target Up & Down and Moves the Scoring Disk. This person should also watch the impact area for the “Splash” of dirt when the new round arrives into the target. Depending on the proficiency of the shooter, Person 1 - should stand on the right side of the target in order to mark mainly X's, 10's and the occasional 9. If the shooter does not have this capability, then stand on the left side of the target.

Person 2 – Moves the Shot Spotter, repairs the old bullet hole and assist in raising and lowering the target. This person should assist Person 1 if the Scoring Disk needs to be moved to the other side of the target frame. With a two person operation, moving the target down and back up in the air with a proper mark can easily be done within 4 to 6 seconds comfortably.

Communications plays a big part for this two-person team. Person 1 can call out the general location on the target by watching where the bullet impacted in the berm. Once you have a reference point in the dirt berm, you can easily use that reference point to evaluate where on the target the next round hit. The value of the knowing where the previous shot hit in the dirt can almost be measured as if a target face was lying in the dirt itself.

Person 2 can also look up at the target and if they see the impact of the new round into the target they not only know where the round impacted but also the value of the shot. NOTE: Ensure you are wearing eye protection and a billed cap when pulling Pits. There comes a time where the shooter will actually shoot the spindle out and the fragments will fly everywhere, including into your eyes, so protect them. They can call out the value of the new shot and thus allows Person 1 to know where to move the Scoring Disk as they are pulling the target down into the pits.

The key to this kind of speed is to be ready for the next shot to happen. The person who is going to paste up the old shot hold already knows what color the paster needs to be and they should already have that one ready on their finger tip. Once the target is being pulled down, the previous shot is getting the shot spotter removed and it is being placed into the new shot hole while the previous hole is being pasted.

The scoring disk is simply moved to its new value and the target then gets ran back up in the air. One important piece of gear to help move the target up and down quickly is a nylon rope, ¼” – ½” in diameter. The rope should measure approximately 6’ – 8’ in length. It can easily be doubled up to have it attached to the metal portion of the target frame and thus gives the person(s) who are pulling the target down and up leverage without having to bend over too much.

The “Shot Spotter” itself and Placing it into the Target:

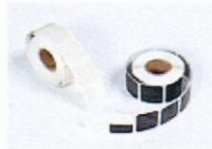
When one gets into the pits, it is important to paste up any old holes inside the shot spotter. On occasion, very good shooters will shoot directly through the shot spotter. Having a clean one (No holes) to start with will allow you to see when that spotter is hit each and every time.



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When placing the shot spotter into the new bullet hole, be sure NOT to drive it all the way into the target. There should be approximately a finger's width, between the target face and the back of the shot spotter. This will allow the pit puller to look up at the target and see if there is a new hole near, behind/through the shot spotter itself.



Paster Preparation:

It is beneficial to have 22 Black pasters counted out already if you know you have a good shooter firing. Do not pull all of the pasters off of the roll. Simply count out 22 pasters and only pull them off one at a time otherwise you will have a mess in your hands.

A good shooter will general shoot quickly and keep all rounds inside the black portion of the target. Using this method will also allow you to know how many shots you have remaining at any time.

SLOW FIRE - One Person Operation:

If there is only one person pulling a target, it doesn't mean that person has to take twice as long to pull the target up and down. One person who prides themselves in giving good service can still do the same operation of two pullers within 6-10 seconds. The key is to do everything which was described above. Have the paster ready, watch the impact area. When the target is pulled down, look for the new shot hole, move the shot spotter to the new hole, paste up the old hole, move the scoring disk to its new location and run the target back into the air and have the next paster ready. As fast as you read this section is also how fast you can pull and mark a target by yourself.

RAPID FIRE TARGET OPERATIONS:

Duties:

- Pulling and Raising the Target
- Counting the shots into the impact area
- Marking the bullet holes with (Golf Tees)
- Marking the Score Board and listing all of the shot values
- Pasting over the previous shot holes.

These are the things which are required while someone is pulling and marking targets. When there are two persons in the pits working on One Target, the best way to divide up the work in a manner similar to Slow Fire. There are some short cuts when pulling targets, such as one person having the golf tees in hand when the actual rapid fire is in progress and waiting to pull the target down into the pits. The other person could have the scoreboard and chalk piece in hand as the rapid fire string is in process. Once the Target is pulled down into the pit and it has been confirmed all required hits have impacted on the target, the scoreboard can be written on and placed in the upper left hand corner of the target as golf tees/spotters are being inserted into the target.



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Highpower Rifle - Target and Scoring Information

Major Differences between RAPID FIRE vs. Slow Fire:

ON COMMAND: All Targets must go UP at the SAME TIME and must COME DOWN TOGETHER at the SAME TIME. There is NO INDIVIDUAL Operation of Targets. Exception is ONLY during the Sighter Period, each shot can be marked after it hits the target.

During all Rapid Fires, The string of fire will begin when all targets are at Half Mast. ON COMMAND, the targets will all go into the air at the same time. The 60 or 70 second time limit begins AFTER all targets are in the air.

Once the time limit has expired, All targets will be pulled down into the pits ON COMMAND. All 10 shots are scored at one time vs. each and every shot.

Insufficient or Excessive Hits on the Target:

If there is anything other than 10 shots inside the target – **DO NOT PLACE ANYTHING** into the shot holes. Call for assistance.

NOTE: One Person (Pit Puller) **failing to follow directions, can cause an entire RANGE Alibis.**

Numerous Problems can arise from Failing to Follow Directions from either the Line Operations or from the Pit Operations.

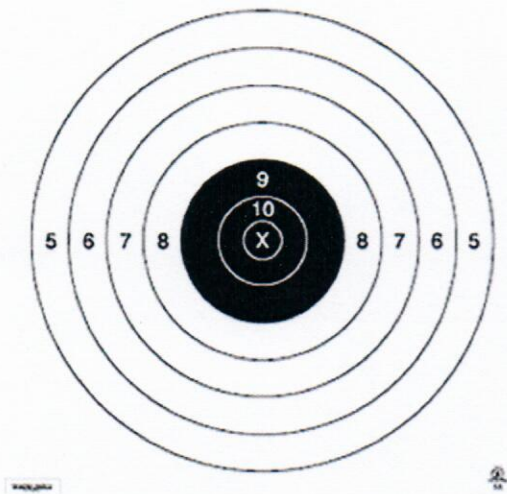
When In Doubt – FOLLOW DIRECTIONS/COMMANDS and **Refer to Diagram Number 4** to resolve problems which will arise.

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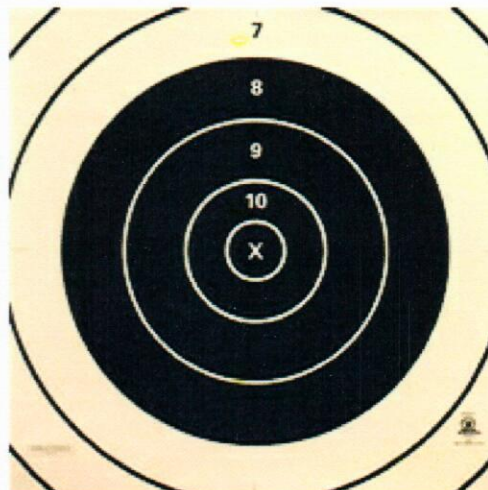
Highpower Rifle - Target and Scoring Information

Diagram 1

NRA Target's



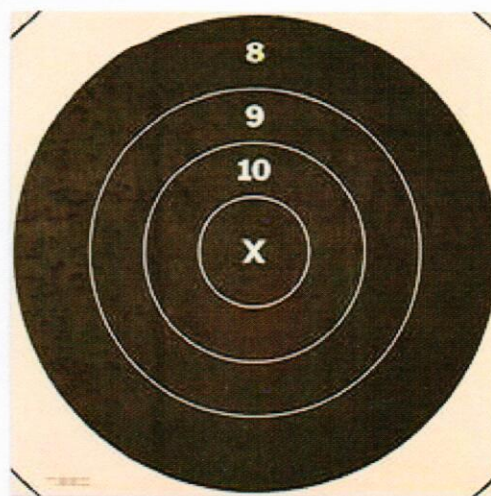
200 Yard Target



300 Yard Target



600 Yard Target

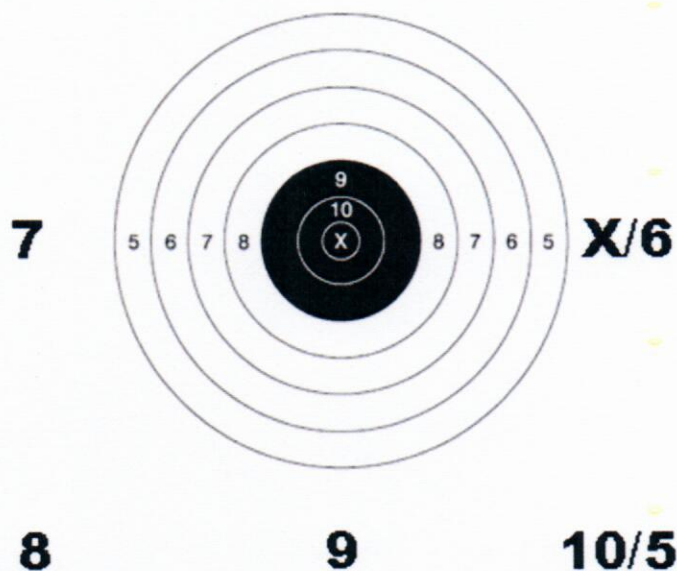


1000 Yard Target

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Diagram 2



Slow Fire: Value spotters are placed as indicated on the target frame, all of a highly visible color such as fluorescent orange or black. The shooter may request the color they can best see.

XCenter Right side

10Bottom right corner

9Bottom center

8Bottom left corner

7Center left side

6..... Center right side (same as X)

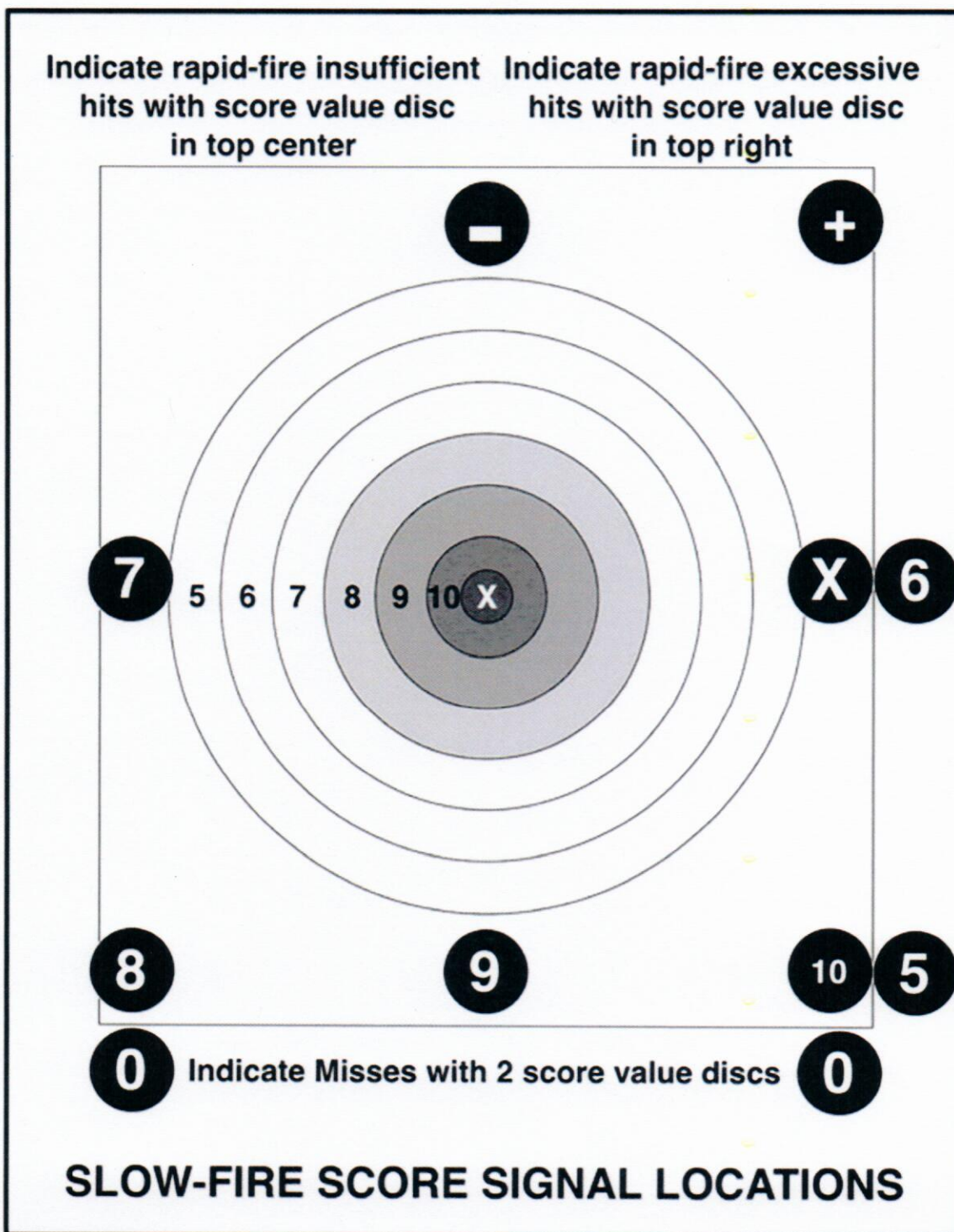
5Bottom right corner (same as 10)

Miss.....Both bottom left corner & bottom right corner

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Diagram 3

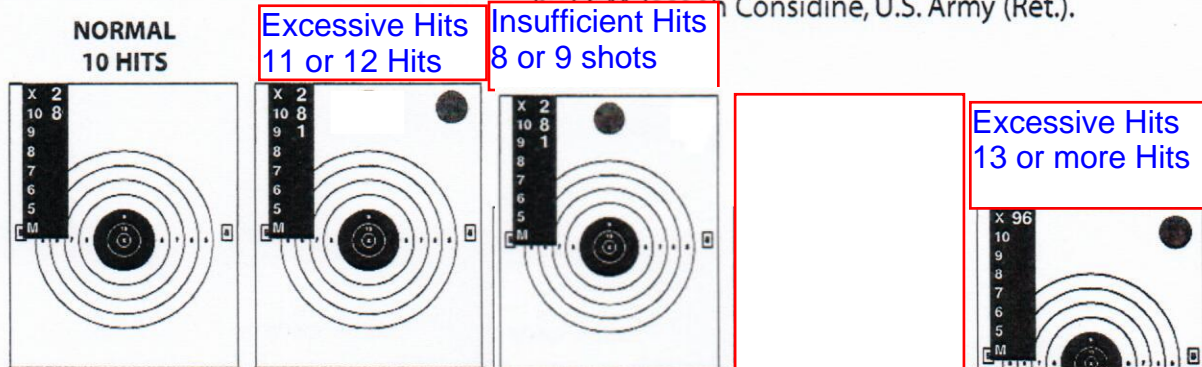


Highpower Rifle - Target and Scoring Information

Diagram 4

Highpower Rifle Rapid Fire Scoring Guide

Modifications
made to
original iaw
CMP 25th
Edition
1/24/2022
TKJ



TARGET IS:	FULLY EXPOSED	FULLY EXPOSED	FULLY EXPOSED	AT HALF MAST
SCORING DISK IS:	Not Showing.	Showing in Top Right.	Showing in Top Center	Showing in Top Right.
SCORE BOARD READS:	10 Hits are Scored.	All 11 or 12 Hits are scored on the Board.	All Hits Scored on Board	Score of the "Low 10 Hits."
SPOTTERS ARE IN TARGET?	Yes. 10 Spotters are Shown.	Yes. All 11 or 12 Spotters are inserted.	Yes. All Spotters are inserted.	No.* Spotters are NOT Inserted.
IT MEANS:	Normal String.	Competitor has 11 or 12 Hits.	8 or 9 Shots on Target, Competitor given the value of the lowest scored shot for their last shot(s).	Competitor has 13 or more Hits.
SHOOTER'S OPTIONS ARE:	Accept Score or Challenge.	Scorekeeper Records <u>HIGH</u> TEN.	1. Accept. 2. Challenge (No refire allowed.)	1. Accept Low Ten. 2. Refire.
TARGET PULLER:	Count 10 holes before inserting Spotters.	Disregard if different Caliber. Call Official.	Check for crossfire two Targets to the left and right. Call Official.	Disregard if different Caliber. Call Official.
RULE:	3.10.3 thru 3.10.10	3.10.11d)	3.10.11b)	3.10.11d)

* **DO NOT** put spotters into target until told to do so by the Pit Officer.

This guide courtesy of
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NOTE: This is only a guide. In the event of a conflict with NPA Highpower Rifle rules, refer to that publication. Send corrections to: hah232@nyhighpower.com

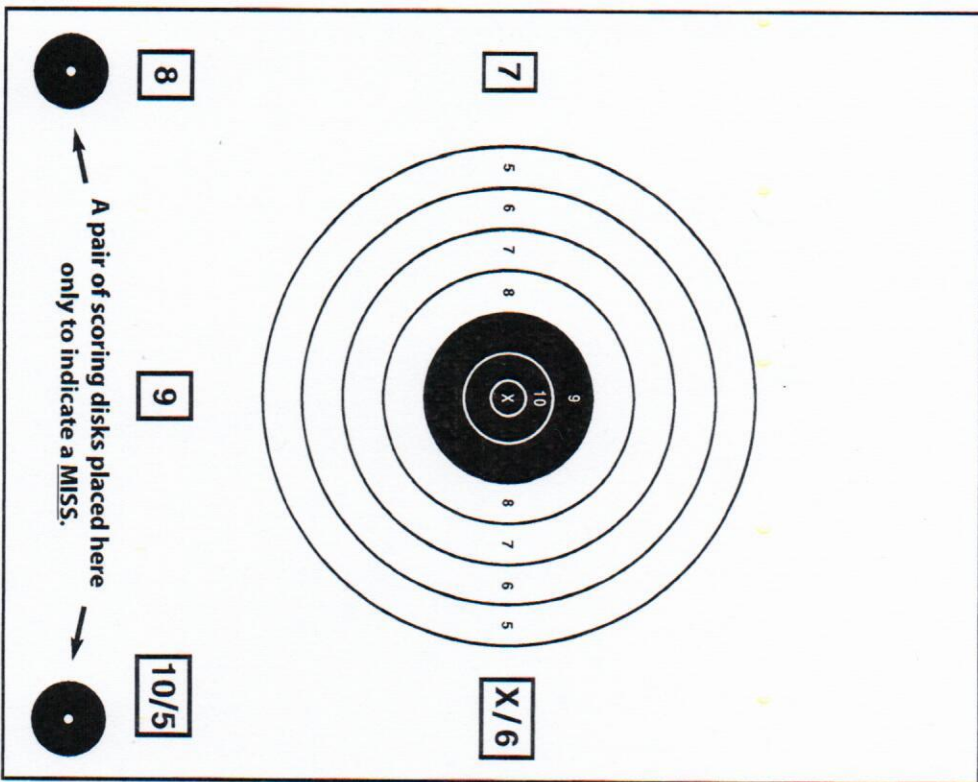
Highpower Rifle - Target and Scoring Information

Diagram 5

HIGHPOWER RIFLE SCORING SYSTEM

for Slow Fire

SR, MR and LR Targets



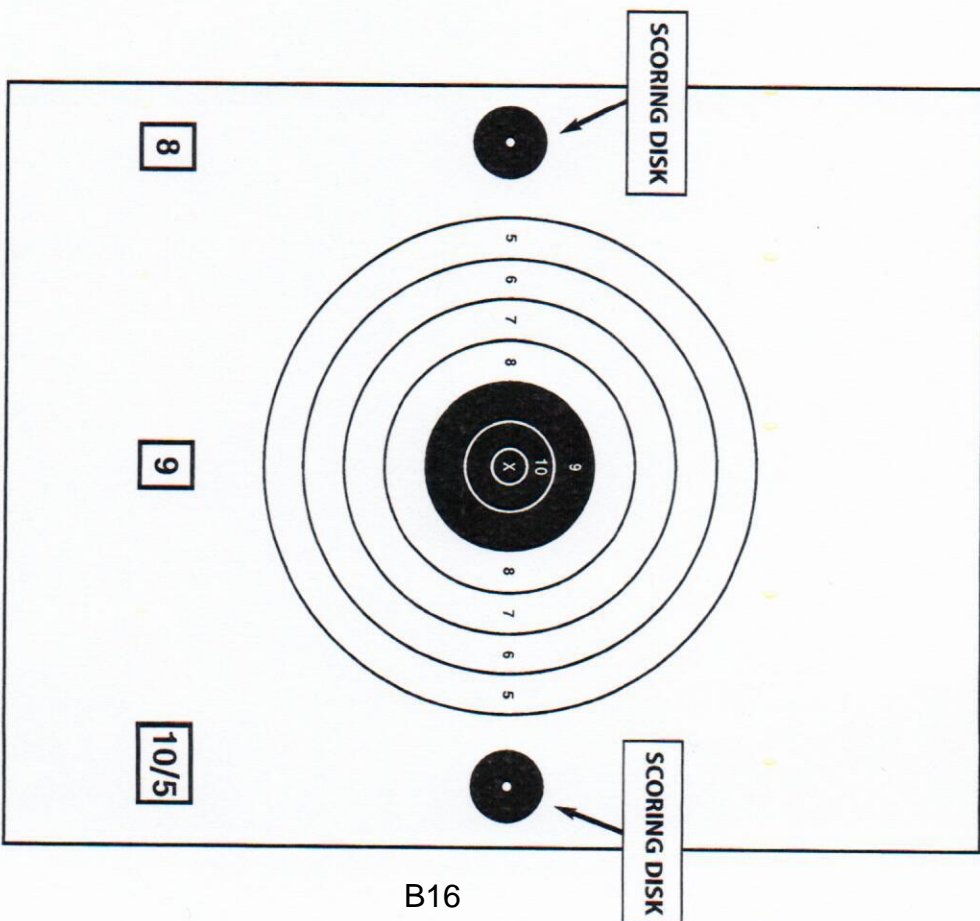
NOTE:

USE APPROPRIATE WHITE OR BLACK SPOTTER TO MARK SHOT LOCATION.

SLOW FIRE

Withdrawn Target - Rule 10.16(a), or

Inadvertently Pulled Target - Rule 14.13(4)



1. NOTIFY PIT OFFICIAL.
2. PASTE SHOT HOLE (IF ANY).
3. PLACE SCORING DISKS IN THE 3 O'CLOCK AND 9 O'CLOCK POSITIONS.
4. RUN TARGET FULLY UP.